WINTER SERVICE PLAN
2010/2011
(22 October 2010 to 8 April 2011)

Produced by:
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<td>17 Sept ‘10</td>
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1 INTRODUCTION

1.1 Surrey County Council’s Winter Service is essential in terms of both the road safety and the economy. The Service intends, as far as is reasonably practicable, to safeguard the movement and well-being of all Highway users, both the residents of Surrey and those passing through the County. It is economically significant because of the delays and congestion that bad weather can cause.

1.2 Winter Service involves treating the highway in order to:

- Prevent ice from forming (known as “precautionary salting”)
- Melt ice and snow already formed (known as “post salting”)
- Remove snow

1.3 The Winter Service Plan for 2010/11 gives details of how Surrey County Council intends to achieve the standards identified in the County Council’s Winter Service Policy Statement. (See Section 2 of this plan.)

1.4 The Winter Service season for 2010/11 will initially operate from:

Friday 22 October 2010 to Friday 8 April 2011. This is a 24-week period.

Motorways & All-purpose Trunk Roads

1.5 The Department for Transport (DfT) is the highway authority for motorways and all-purpose trunk roads in Surrey and the Highways Agency acts for the Department in this respect. Details of contractors responsible for the operational maintenance of motorways and all-purpose trunk roads within Surrey are:

- Area 5 - M25 Sphere – Mouchel/Carillion
- Area 3 – Enterprise Mouchel - AccordMP
- Area 4 – InterRoute (Mott Macdonald/RCS)

The County Council therefore has no responsibility for winter maintenance service activities on these particular roads.
2 POLICY STATEMENT

2.1 It is the Policy of the County Council to provide a Winter Service that, as far as is reasonably practicable, allows for:

- The “precautionary salting” of roads on major routes within the County.
- The “post-salting” of footways and carriageways in extreme weather to keep congestion, delays and incidents to a minimum.
- The removal of snow from the key areas of the public highway.

2.2 Surrey County Council as the Highway Authority for Surrey has a statutory duty to maintain the public highway. Section 41a of the Highways Act 1980 states that local authorities ‘have a duty to ensure, so far as is reasonably practicable, that safe passage along the highway is not endangered by snow or ice’. The qualification of ‘reasonably practicable’ being that this is not an absolute duty. In addition, highway authorities may take preventive measures against the accumulation of snow and ice.

2.3 Surrey County Council, as the Highway Authority, takes its Winter Service responsibilities extremely seriously. Until recently there has been no legal duty on Highway Authorities to take preventative measures in anticipation of snow or ice. This meant that, so long as any decision as to whether or not to act was taken on reasonable grounds, with due care and with regard to relevant considerations, the authority would not be liable. Moreover it had been said judicially that when there is a transient danger due to the elements, be it snow or ice or heavy rain, the existence of danger for a short time is no evidence of a failure to maintain the highway.

2.4 Following the introduction of the Railways and Transport Safety Act 2003 (31 October 2003), Highway Authorities have to ensure that, so far as is reasonably practicable, safe passage along a highway is not endangered by snow and ice. It is the belief of Officers that the arrangements Surrey County Council has in place are at least adequate to discharge this duty.

2.5 Highway Authorities are permitted to take preventative measures against the accumulation of snow and ice and to protect the highway over and above the minimum statutory requirements. The use of this power is relevant to an Authority’s road safety responsibilities as well as its highway maintenance function.

2.6 As the total highway network cannot be treated simultaneously within the resources reasonably available to the County Council, priorities shall be established as follows.

Carriageway Treatment

2.7 All carriageways forming part of the public highway network shall be allocated to one of the three groupings according to the following criteria;

2.8 Priority 1 – approximately 37% of the County highway network

Precautionary salting will be carried out on all Surrey Priority Network (SPN) 1 and 2 roads within the County. These are the most important roads in terms of the volume of traffic carried, the proportion of large goods vehicles and their strategic function as principal links between major destinations within Surrey and beyond or within settlement hubs or other significant urban areas.

- SPN 1 and 2 (Roads with traffic flows greater than 12000 vehicles per day)
• main access route to A&E, acute, and some district hospitals, fire stations
• major bus routes (50 per day urban, 25 per day rural)
• roads passing through major shopping centres

2.9 Priority 2 – approximately 13% of the County highway network
• roads with traffic flows greater than 5000 vehicles per day
• main access route to important industrial and secondary education establishments
• single access points to villages
• access road/s leading to other hospitals, ambulance stations, railway stations
• roads used by other bus routes and depots
• steep hazardous gradients and over bridges where known local icing conditions occur

2.10 Non-Priority
• all other public highways not covered by the above

2.11 Spot Salting
Spot Salting is a non-routine activity carried out after the completion of the Priority 1 salting when, during periods of adverse weather, parts of the Priority 1 network may remain at risk due to the formation of ice/snow. In these instances there may be a need to undertake post treatment of these sections by spot salting. Requests for spot salting are received and managed by the Operations Group.

Spot salting will not be undertaken on the network when it is unlikely to be completed before the ice begins to melt, or road temperatures are expected to rise. Spot salting can be undertaken either by mechanical spreader or by hand.

Additionally whilst the main priority is to keep the Priority 1 network open and free flowing in some instances it may be necessary to close roads and in these cases the diversion route should also be treated to the same standard as the remainder of the Priority 1 network.

2.12 Time Of Treatment For Frost, Ice And Snow
• Priority 1: to be treated, as routine pre-salting, in advance of any forecast frost, ice, or snow.
• Priority 2: to be treated only when there is prolonged and persistent frost, ice or snow which is expected to continue, or following snow, but only once Priority 1 routes have been cleared.
• Non-priority: to be treated following significant snowfall but only once Priority 1 and Priority 2 routes have been cleared with priority then being determined by the Operations Group.

2.13 The response time to mobilise the gritting fleet for precautionary salting (day or night) will be one hour from the time the Constructors decision maker has indicated treatment is required. The operational requirement is then to complete the treatment of all pre-defined precautionary salting routes within three hours, following the one-hour response time. (The Constructors Winter Service Operational Plans contain route designations and summary information).
2.14 The performance of both Constructors in relation to response and treatment times and salt usage will be monitored by the Asset Planning Winter Service Project Manager.

2.15 Extent of Carriageway to be Salted

- The full width of the running carriageway shall be treated at the specified rate of spread indicated on the agreed action treatment.
- Each carriageway of a dual-carriageway shall be treated individually.
- All slip roads at grade-separated junctions shall be treated individually.
- The full length of the carriageway at roundabouts and gyratory systems shall be treated.
- Treatments will only extend to the Surrey County boundary.

2.16 At the request of Network Rail during the 2009/10 winter season the Council’s policy is to not pre-salt across level crossings. The Constructors may liaise with Network Rail, where known local problems exist, to discuss and agree alternative salting/de-icing arrangements and Network Rail should be notified of the County's precautionary salting decisions in order that they may also take appropriate action.

Highways Policy on the following activities for the 2010/11 Winter Season is subject to Cabinet decisions on a Task Group report to be tabled on 28 September 2010:

- Provision and use of Grit Bins
- Salting Routes
- Footway Treatment
3 CLIENT & CONSTRUCTOR RELATIONSHIP

3.1 Winter Service work will be carried out in 2010/11 under contract as follows:

<table>
<thead>
<tr>
<th>Local Transportation Service</th>
<th>Area Transportation Office</th>
<th>Constructor</th>
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<tbody>
<tr>
<td>Mole Valley</td>
<td>East Area</td>
<td>Carillion Highways Maintenance</td>
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<tr>
<td>Tandridge</td>
<td></td>
<td></td>
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<tr>
<td>Reigate &amp; Banstead</td>
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<td>Epsom &amp; Ewell</td>
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<tr>
<td>Elmbridge</td>
<td></td>
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<tr>
<td>Spelthorne (Precautionary salting only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runnymede</td>
<td>West Area</td>
<td>Ringway Infrastructure Services</td>
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<tr>
<td>Surrey Heath</td>
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<td>Woking</td>
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<td>Guildford</td>
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<tr>
<td>Waverley</td>
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<tr>
<td>Spelthorne (snow clearance, salt bin replenishment etc.)</td>
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</table>

3.2 The division of responsibilities for the various aspects of the Winter Service are:

<table>
<thead>
<tr>
<th>Surrey</th>
<th>Constructors</th>
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<tr>
<td>Winter Service Policy Statement and Winter Plan</td>
<td>Winter Service Operational Plans</td>
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<td>Setting of Standards and Level of Service</td>
<td>Day to day operations</td>
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<tr>
<td>Performance Monitoring</td>
<td>Design of routes</td>
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<tr>
<td>Procurement, installation and support for Ice prediction systems, weather stations and software</td>
<td>Salt procurement and stock management</td>
</tr>
<tr>
<td>Checking Constructors readiness in respect of:</td>
<td>Manning levels</td>
</tr>
<tr>
<td>Rosters and operational staff qualifications</td>
<td></td>
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<tr>
<td>Salt stocks</td>
<td></td>
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<tr>
<td>Proposed methods/routes</td>
<td></td>
</tr>
<tr>
<td>Checking Carillion readiness in respect of:</td>
<td>Maintenance and operation of salt saturators</td>
</tr>
<tr>
<td>Spreaders and Ploughs</td>
<td></td>
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<tr>
<td>Calibration and servicing of equipment</td>
<td></td>
</tr>
<tr>
<td>Publicity and Communications</td>
<td>Provision of other winter maintenance plant / vehicles</td>
</tr>
<tr>
<td>Winter Service Leaflet and SCC web pages</td>
<td>Day to day decision making</td>
</tr>
<tr>
<td>Co-ordinating research and feasibility studies</td>
<td>Procurement of forecast service (Open Road)</td>
</tr>
<tr>
<td>Specifying spreader and saturator equipment</td>
<td>Receipt and dissemination of weather forecasts and updates</td>
</tr>
<tr>
<td>Procurement of web based forecast service (Open Road on the Web)</td>
<td>Use of County Council depots under the contract</td>
</tr>
</tbody>
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4 WEATHER INFORMATION SYSTEMS

4.1 Surrey Highways, together with its Constructors, use four main sources of information to forecast and monitor the weather and road conditions around the County. These are as follows:

- Weather forecasts from a forecast provider (Met Office Open Road)
- Thermal mapping (Vaisala IceViewer and IceNet)
- Ice prediction systems (Vaisala IceViewer and IceNet)
- Weather Radar and regional texts (Met Office Open Road)

Weather Forecasts

4.2 Weather forecasts are currently obtained from the "Open Road" forecasting service provided by the Met Office. The information described below is received daily through either Open Road on the Web, IceViewer or IceNet and is specific to the four climatic 'domains' identified in Surrey.

Morning Summary (0730 hrs)
- Summary of weather condition encountered over last 24 hours
- Minimum road surface temperatures (RST) encountered at weather stations
- Preliminary forecast for next 24 hours

Afternoon Forecast (1300 Hrs)
- Detailed forecast for next 24 hours
- Road surface forecast temperature graphs
- Two-five day forecast

Evening update forecast (1830 hrs)

4.3 The main features of the detailed 24-hour forecast are as follows:

Readiness colour coding

This is based on the traffic light colours; green, amber or red with the following definitions:

<table>
<thead>
<tr>
<th>Readiness Colour Coding</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Green</strong></td>
<td>Road surface temperatures are expected to remain above freezing with no ice and/or snow accumulations</td>
</tr>
<tr>
<td><strong>Amber</strong></td>
<td>Road surface temperatures are expected to fall close to or below freezing with ice and/or snow accumulations possible</td>
</tr>
<tr>
<td><strong>Red</strong></td>
<td>Road surface temperatures are expected to fall below freezing with ice and/or snow accumulations</td>
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Hazards

This section includes the hazards causing the red or amber readiness colours as well as other weather hazards such as heavy rain, high winds or fog, which could accompany a green readiness colour. Where possible qualifying times are given, for example "icy patches expected after 2300 hours".

Version 2 - 20 September 2010
Minimum temperatures

Minimum air and road temperatures for the four climatic ‘domains’ (refer to appendix F) are provided, together with the period when road temperatures are forecast to be below zero.

Confidence statements

This is made up of high or low confidence for each of the hazards described above, together with a qualifying statement, for example “low confidence regarding extent of showers this evening but high regarding road temperatures falling below zero”.

4.4 Where significant changes are expected to take place to earlier predictions, the following procedures will be adopted:

- The Met Office will contact the duty manager (decision maker), who will in turn confirm the changes, and interrogate the IceViewer System where necessary.
- If, as a result of these changes, new instructions are necessary, the instructions will be communicated to all relevant parties.

Thermal Mapping

4.5 All precautionary salting routes in Surrey have been thermally mapped and this technology is used to identify sections of road that are cooler or warmer than average due to topography, type of construction, traffic flow and other factors affecting road surface temperatures. A road may be described as either ‘cold’ or ‘warm’ if thermal mapping shows they are cooler or warmer than average.

4.6 The information yielded from thermal mapping is used in conjunction with site-specific forecasts to predict accurately the minimum temperature of road surfaces across the road network. This allows accurate decisions to be made not only about whether to salt or not, but whether to salt only those roads that require treatment.

Ice Prediction

4.7 Seven automated road weather stations have been installed around the county. These are equipped with sensors to monitor air and road surface temperature, rainfall, humidity, road surface conditions and give an indication of residual salt on the road surface. A number of the sites are also equipped with footway sensors.

4.8 A number of weather stations are also located in adjoining highway authority areas and on the motorway and trunk road network in Surrey. By working in collaboration with the various parties concerned we can view their sensor information to further assist our own decision-making.

4.9 The Met Office, via the Vaisala Bureau at Birmingham, collects information from these sensors at hourly intervals and this assists them in providing more accurate forecasts based on ‘real time’ information.

4.10 Access to enhanced weather radar information is available, during the winter season, via the Met Office Open Road Web system.
5 DECISION MAKING

5.1 Responsibility to instruct precautionary salting operations, based on current information, rests with both Constructors. Detailed arrangements for undertaking this function are included in their annual Winter Service Operational Plans.

5.2 The forecast provider (Met Office) will regularly supply weather forecasts and these will be used in conjunction with information produced by the County Ice Prediction and Thermal Mapping systems. This will allow the Constructors’ Winter Service Duty Managers to predict where and when ice is likely to form and act accordingly although, in certain circumstances, it may also be necessary to apply salt after the formation of ice patches on the carriageway.

5.3 The Constructors will ensure that appropriately qualified and experienced staff undertakes all Winter Service decision-making duties from 22nd October 2010 to 8th April 2011. The type of decision on precautionary salting will vary depending on various factors including the type and severity of the forecast weather, the likelihood of snow and the amount of residual salt on the roads. The decision will also specify the rate of spread of salt, normally 10g/m² pre-wetted.

Local Control

5.4 When the potential for widespread and persistent ice and/or snow is forecast that is likely to result in action other than just P1 precautionary salting initiated by the service providers, the Ringway and Carillion Winter Supervisors will proactively engage with Operations Group Manager or designated representative.

5.5 Where action involves any works other than P1 precautionary salting, including P2 salting in advance of ice and/or snow, ‘Local Control’ will be declared from a particular date and time and all decision making and associated resource management for winter activities will pass to the Operations Group representatives until an agreed date and time when ‘Local Control’ will cease and decision making passes back to the Constructors for Priority1 precautionary salting.

5.6 During periods of ‘Local Control’ the service providers will continue to publish decision sheets and Operations Highways & Countryside Service representatives will provide and communicate morning and evening updates of activities undertaken and ensure records of plant, labour and materials are maintained for payment and audit purposes

5.7 During severe winter weather events an Operations Highways & Countryside Service representative will represent Highways on any group(s) established by the Emergency Planning Team.
6 VEHICLES & INFRASTRUCTURE

Vehicles

6.1 The Highways Winter Service gritting fleet will consist of 16 new or refurbished vehicles and 24 existing vehicles, all managed and maintained by Carillion Highway Maintenance on a 24/7 basis, inclusive of call-out cover.

6.2 Every front line spreading vehicle has a designated plough and attachments for snow clearance. While operating in these conditions each crew must be able to communicate directly with their base. Like the vehicles, all ploughs and attachments have been inspected and maintained as necessary by Carillion prior to the start of the winter season.

6.3 The County normally expects spreading vehicles to be single manned but during severe weather, snow clearing or when dense fog persists, two-man operation may be required.

6.4 All spreaders and ploughs will be available for use during the entire winter service season. The calibration and service of all plant and equipment will be completed prior to the start date of the winter season and deployed at depots specified by the Asset Planning Winter Service Project Manager.

6.5 For the 2010/11 winter season all front line vehicles are fitted with GPS tracking facilities and tachographs. The records from each gritting run are to be collated with the salting return sheets and passed directly to the Operations Group for retention and future audit as necessary.

6.6 After each period of use and at least once every 24 hours, whether in constant use or not, each vehicle and associated piece of equipment will be thoroughly washed to remove any trace of salt or brine.

Saturator Contingency Planning

6.7 The County is committed to a completely pre-wet precautionary salting operation. There are seven brine producing saturators located at the Bagshot, Esher, Godstone, Kingswood, Merrow, Witley and Beare Green depots. Three of the units were supplied by Salinity and were made in Sweden, the others are British made and have been purchased from Forbes Tanks. Essentially the units are of a similar design although there are operational differences between the British and Swedish models.

6.8 As with all mechanical equipment, the units are subject to operational wear and failure of component parts. Maintenance and repairs will be undertaken during the 2010/11 season by Pump Services and supervised by an experienced County employee.

6.9 It is noted that only 50% of the brine tank capacity on the Econ spreaders is used to complete current routes. In order to provide greater operational resilience in all vehicle brine tanks are to be fully replenished by both Constructors at the conclusion of a spreading run so the tanks have sufficient brine for two runs. In these circumstances additional time is allowed to deal with any power failure or saturator plant breakdown without any immediate, direct operational effect.
6.10 Brine is not corrosive to the polypropylene material used for the spreader tanks so prolonged storage is not a problem and the majority of plant malfunctions should be repaired on a permanent or temporary basis within 48 hours.

7 SALT

7.1 Surrey has 8,000t of salt already in stock across the seven county barns and further orders bringing this total up to a minimum of 13,000t have been confirmed by Salt Union with delivery expected in October/November. It is understood that due to ongoing production and stock shortages further orders placed may take six months to complete and, as such, are planned well in advance. Orders can be sourced from abroad but this is more expensive and not the preferred option although certainly an essential course of action during 09/10. If possible, Members wish to see salt stocks maintained at the maximum level that storage permits.

7.2 However, it is recognised that national demands may result in no further significant deliveries being received by highway authorities for the remainder of 10/11 and Salt Cell operation could again be implemented by Government. The Salt Cell formulae has previously disadvantaged Surrey as a council which conserves salt stocks while rewarding other authorities who do not conserve or who may operate less efficiently.

7.3 The Winter Performance Task Group recommends that the Transport Portfolio Holder and Leader of the Council should jointly write to the Minister of Transport in order to have the formulae changed so as not to ‘penalise’ efficient counties, such as Surrey, in 2010/11.

Salting Methods

7.4 The primary precautionary salting operation is undertaken through the application of “pre-wet” salt. This process uses a brine solution comprising 30% salt and 70% water that is pre-mixed in purpose built brine ‘saturators’. The brine solution is then stored in tanks on the spreading vehicles and mixed with dry salt on the spreader plate at a ratio of 30% brine and 70% salt.

7.5 The advantages of this treatment method with its partial dilution at point of application are the immediate de-icing action that takes place on contact with the road surface. There are also significant environmental benefits as the salt solution adheres to the road surface and doesn’t tend to ‘bounce’ during the spreading operation so having less effect on adjacent verges and buildings and also passing vehicles.

7.6 Surrey will again use 6mm salt during the 2010/11 winter season in its 35 frontline, pre-wet spreaders, each dedicated to a pre-defined precautionary salting route.

Residual Grit and Sand

7.7 During severe winter weather events large quantities of grit and sand may be spread on the network to comply with the County’s duty to maintain the highway in a safe condition. Once these materials have served their purpose they could be considered to be litter under the terms of the Environmental Protection Act, particularly where they remain in sufficient quantities. However, spreading grit is considered to be a legitimate and reasonable duty of the Highway Authority and, therefore, not actionable under the terms of the legislation. It is thus the responsibility of the
relevant District Council to clear these materials as part of their street cleansing
duties. However, there will be circumstances where residual grit and sand cause
potentially hazardous conditions, for example:

- On slopes to footways with high pedestrian use
- When significant local spillages have occurred during spreading

These excessive amounts of material should be removed as part of the Highway
Winter Service function.
8 WINTER SERVICE EMERGENCY (SNOW CLEARANCE)

8.1 In the event of snow, carriageways will be treated and cleared commencing with the Priority 1 precautionary salting routes. Other routes will be cleared when resources permit and consideration may be given to treating strategic highway areas, including footways in town centres, shopping precincts and areas leading to hospitals and schools etc. with assistance from Borough, Districts Town and Parish Councils.

Emergency Procedure

8.2 In the event of the Met Office issuing a snow forecast the Operation Group may declare a specific winter emergency situation (Local Control), following discussion with the Constructors duty decision makers.

8.3 The Assistant Director, Operations, Highway and Countryside, or another nominated officer, will inform Emergency Planning of the actual or anticipated increase in the response requirement over and above that of routine precautionary salting.

8.4 In advance and during Local Control daily joint meetings of all front line operational managers may be required at Merrow to pre-plan and provide feedback on operations and priorities to the Assistant Director and Emergency Planning. Such meetings may be virtual or require personal attendance subject to circumstances.

8.5 Once this has been advised the control of Priority 1 routes will pass from the Constructors decision makers to the Operations Group and all decision making relating to salting and other winter activities will be made by that Group. The Constructors decision makers will continue to issue and circulate decision sheets.

8.6 A Control Centre suitable in the circumstances, will be set up and managed by the Operations Group, to provide the focus for Highways management of any Local Control event.

8.7 Management of farmers undertaking any winter service activities will be the sole responsibility of the Operations Group.

8.8 Responsibility for carrying out spot salting and emergency response remains with the Constructors using their routine emergency response crews. Any use of the frontline gritters in these circumstances will be strictly by agreement with the Operations Group, and only under exceptional circumstances, such as a medical emergency.

Control Centre Operational Procedure

8.9 Depending upon the nature of the incident, the following maps will be available as required in the control centre, which will be used as described elsewhere in this section:

- Road Condition Map: identifying latest situation throughout the area, with further information added as actions taken;
- Staff Location: Indicates location of all staff in the field, for safety and tracking reasons;
- Pre-Salting Routes: Indicates priority 1 & 2 salting/ploughing routes, for information;
• Farmer’s Plough Routes: Indicates agreed farmers ploughing routes, for information.

**Resources of the Control Centre**

8.10 Area staff will generally resource the Control Centres

<table>
<thead>
<tr>
<th>Role</th>
<th>Lead Officer</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller</td>
<td>Operations Group Manager</td>
<td>Overseeing setting up and general organisation of Control Centre, resources and actions taken. Liaison with APG</td>
</tr>
<tr>
<td>Condition Co-ordinator</td>
<td>Designated Operations Group Officer</td>
<td>Co-ordination of incoming data, maintaining road condition maps. Liaising with resources Co-ordinator on actions required</td>
</tr>
<tr>
<td>Scouts</td>
<td>Operations Group engineers, Local Service engineers and CHO’s</td>
<td>Fact finding of current situation on the ground at the request of the Control Room, or as part of regular controls of designated areas</td>
</tr>
<tr>
<td>Admin Co-ordinator</td>
<td>Help Desk</td>
<td>Recording and co-ordinating feedback</td>
</tr>
<tr>
<td>Resource Co-ordinator</td>
<td>Contracts Managers (Constructors)</td>
<td>Agreement of action with Condition Co-ordinator, co-ordination of resources and recording actions</td>
</tr>
</tbody>
</table>

**Constructors**

8.11 The vehicles and plant required by snow clearance contractors will be no different to their normal requirements. In exceptional circumstances the Constructors may provide additional special snow clearance plant, this may entail special payments to snow clearance contractors

8.12 The normal snow clearance equipment will be open back lorries and vans, JCB’s and personnel with brooms and shovels, together with hand operated spreading equipment (subject to funding).

8.13 Snow clearance and other winter service activities will be carried out on a priority basis as directed by the Operations Group.

8.14 Snow clearance sub-contractors will be directed to draw salt and grit from depots as appropriate by the Constructors using the installed weighbridges for record and audit purposes.

**Co-ordination of Resources**

8.15 Local Authorities

Effective co-ordination of information, resources and action is required with Borough, District, Town and Parish Councils, and other outside bodies. With increased concern in relation to potential litigation claims against ourselves or third parties working with us, our risk management team are continuing to explore the necessity for supplementary insurance to cover any potential claims.

As discussions continue with Borough, District, Town and Parish Councils in relation to the provision of additional resources for snow and ice clearance during a weather
emergency, the Operations Group, or designated representatives, will be responsible for liaising with these authorities to assess/record their actions and co-ordinate any assistance they may be able to provide.

8.16 Third Parties (Farmers/Contractors)

In some rural areas it may be appropriate to lodge snowplough attachments with farmers equipped with suitable machinery or otherwise hire their equipment and services in extreme events so that they can operate on the public highway with the authority of the Operations Group. They will then be reimbursed at NFU rates agreed by the Operations Group.

Local farmers and plant operators, who are under agreement to Surrey Highways, will carry out snow clearance on certain minor route carriageways using ploughs provided by the Council, agricultural snow ploughs and snow throwers/blowers as directed by the Operations Group.

Snow clearance on other minor routes will be carried out as resources permit. Some minor routes and cul-de-sacs will inevitably have to be left to thaw naturally.

Closure of the Area Control Centres

8.17 The end of Local Control for a weather emergency, and subsequently the closure of the control centre, will be decided by the Operation Group. All those informed of the opening of the control centre will be made aware of its closure. Operations Group should make direct contact with the Constructors Duty Decision Makers and agree the return of any delegated responsibilities.

8.18 A review of the Local Control event and effectiveness of operations should be carried out by the Operations Group Manager and various co-ordinators within five working days of the closure, to ensure valuable feedback is considered, recorded and available for any subsequent de brief or for consideration by the Winter Performance Task Group.
9 POST THAW MAINTENANCE

9.1 During severe winter conditions large quantities of gritting sand are likely to have been used on carriageways and footways. At such times it will be necessary to arrange mechanical and hand sweeping programmes to remove the residual material after the thaw. Such action is needed in the interests of pedestrian safety and to minimise deposition of grit/sand in the gully pots because this could block the pipe outlets.

9.2 Bituminous surfaces may, on occasions, suffer localised disintegration due to winter conditions and emergency-patching works may need to be undertaken in the interests of public safety. Statutory Undertakers are also reminded of their responsibilities if defects result from their trenching activities.

9.3 Concrete roads on frost susceptible sub-grades may also ‘lift’. If this happens, temporary patching over ironwork may be required until resettlement occurs when the patch material may safely be removed. Any cracking or spalling in a concrete slab that puts its structural integrity at risk will be programmed for permanent repair when the weather is suitable.

10 BUDGETS

10.1 The Winter Performance Task Group has prepared a report, including Levels of Service and associated budget proposals, for consideration and decision by Cabinet on 28 September 2010.

11 MEDIA COMMUNICATIONS

11.1 Effective communications and news media management, particularly local radio stations, is of the utmost importance and will be maintained during severe winter events by the Operations Group Manager, supported as required by the Assistant Director, and in liaison with the Executive Member for Transport as appropriate.

11.2 It is also essential that communications with the motoring organisations are maintained so precautionary salting decisions for the County will be issued to AA Roadwatch and subsequently redistributed, by that organisation, to the local radio stations. Additional information will also be provided as appropriate, particularly during periods of snow clearance, to ensure that the travelling public are informed of current road conditions and affected or cleared routes.

11.3 The County Council's Communications and Media Teams will act as the focal point for Winter Service briefings and media communications during the 2010/11 Winter Service Season.
## Appendix A – Surrey County Council Contact Details

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Contact Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Planning Group Manager:</td>
<td>Peter Agent</td>
<td>01483 517540</td>
</tr>
<tr>
<td>Asset Strategy Team Manager:</td>
<td>Tbc</td>
<td></td>
</tr>
<tr>
<td>(Winter Service Project Director)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APG Winter Service Project Manager :</td>
<td>Simon Mitchell</td>
<td>01483 517430</td>
</tr>
<tr>
<td>Operations Group Manager:</td>
<td>Lucy Monie</td>
<td>0208 5419896</td>
</tr>
<tr>
<td>Local Delivery &amp; Customer Services Group Manager:</td>
<td>Richard Bolton</td>
<td>0208 5417140</td>
</tr>
<tr>
<td>Area Highways Manager (NE)</td>
<td>Tbc</td>
<td></td>
</tr>
<tr>
<td>Area Highways Manager (NW)</td>
<td>Andrew Milne</td>
<td>01483 519580</td>
</tr>
<tr>
<td>Area Highways Manager (SE)</td>
<td>John Lawlor</td>
<td>01483 518295</td>
</tr>
<tr>
<td>Area Highways Manager (SW)</td>
<td>John Hilder</td>
<td>0208 5417125</td>
</tr>
<tr>
<td>SCC Contract Manager:</td>
<td>Ivor Smith</td>
<td>0208 541 7306</td>
</tr>
</tbody>
</table>

**Surrey CC Contact Centre:** Tel Number: 08456 009 009  (Mon – Fri  0800-1800)
APPENDIX B - WEATHER INFORMATION CONTACTS

MET OFFICE - LONDON

Address: The Met. Office  
Forecast Advisor  
Fitzroy Road  
Exeter  
Devon  
EX1 3PB

Telephone: 01392 884322 (Duty Forecaster)  
Fax: 0870 9005050 (clearly marked ‘Open Road’)

Open Road Account Manager: Caroline Wilson  
Tel 07824 550087 / Fax 0870 9005050 (clearly marked ‘FAO Caroline Wilson’)

VAISALA LTD

Address: Vaisala House  
349 Bristol Road  
Birmingham  
B5 7SW

Account Manager: Ben Brown

Telephone: 0121 683 1200 (General enquiries)  
0121 683 1269 (Hotline Customer Support)

Fax: 0121 683 1299
Appendix C - Precautionary Salting Process Map

**DECISION MAKING**

- Duty Winter Maintenance Officer collates weather and forecast data – Met Office
- Marginal Conditions
  - Yes
  - Freezing Conditions expected in isolated areas?
    - Yes
      - Post AMBER status on readiness boards at depots and disseminate information
    - No
  - Freezing Conditions expected across whole area?
    - Yes
      - Post AMBER status on readiness boards at depots and disseminate information
    - No

- Post GREEN status on readiness boards at depots and disseminate information
- Await evening update
- Decision communicated and agreed with forecast provider
- Duty Officer determines actions, timings, etc and forwards decision to contact list (appendix???)

- Duty Officer informs standby supervisors/operatives

**INFORMATION DISSEMINATION**

- During Working Hours?
  - Yes
    - Duty Officer informs standby supervisors/operatives
  - No

- Treat Roads

**TREATMENT**

- No Action
- Yes
  - Duty Officer determines actions, timings, etc and forwards decision to contact list
  - Duty Officer determines actions, timings, etc and forwards decision to contact list
  - Duty Officer determines actions, timings, etc and forwards decision to contact list
  - Duty Officer determines actions, timings, etc and forwards decision to contact list

- Duty Officer informs standby supervisors/operatives
  - Duty Officer informs standby supervisors/operatives
  - Duty Officer informs standby supervisors/operatives
Appendix D – Snow Event Process Map

1. Duty Winter Maintenance Officer collates weather and forecast data – Met Office
   - Is snow forecast? (NO)
   - Duty Officer informs Operations and Local Delivery Group Managers

2. Operations and Local Delivery office staff informed immediately
   - Snowfall commences
   - Emergency Planning Gold/Silver Command

3. Operations Group Co-ordinate response
   - Follow procedure for precautionary salting
   - Constructors continue treatment of priority 1 routes
   - Upon completion of priority 1, commence priority 2 after liaison with Operations Group

4. Operations Group and Constructors agree resources requirements for winter service activities
   - Operations and Local Delivery Groups - Identify local prioritisation through CHO patrols

5. Operations Group Manager - Debrief and record of activities
   - Treatment continues until agreed stand down of activities
   - Asset Planning Group - Strategic Overview
   - Customer Services and Communications
   - Local Emergency Planning Gold/Silver Command
   - Operations Team and District/Boroughs agree resource requirements for carriageways and footways

6. Third Parties
   - Operations Group co-ordinates response from farmers and other third party contractors

Version 2 - 20 September 2010
Appendix E – Criteria for the provision of Grit Bins

1. The Council has provided grit bins at certain adopted highway locations that are not included on the primary and secondary precautionary routes already treated as an aid to road safety. The provision and use of grit bins has been investigated by the Winter Performance Task Group during the summer and a number of recommendations have been included in a report to Cabinet on 28 September 2010.

2. Grit bins are placed in consultation with Area Highway Managers, where they can be positioned safely near the highway, to provide for spot treatments at: -

   • Difficult road junctions,
   • Slopes,
   • Acute bends
   • Concentration of pedestrian commuter use.
   • To assist with service for those in isolated rural communities off the primary and secondary precautionary treated routes

Criteria

3. Requests for grit bins are assessed against a score to ensure those provided meet the criteria of servicing the highest priorities within the scope of budget constraints. The Winter Performance Task Group has endorsed the continued use of the same criteria for the 10/11 winter season.

4. The score allocated must reach a minimum of 100 points for a location to qualify, but priority within limited resources will go to those locations with the highest scores. The decision of the Asset Winter Service Project Manager will be final in deciding on the provision of grit bins.

5. In order to conserve the environmental salt is not stored on the highway where its concentrated use may damage trees or areas of conservation verge, or would allow dissolved salt to enter adjacent water courses. Salt is stored in waterproof containers to protect the salt from weathering and to help avoid contamination wherever bins are placed from seepage. Salt is normally stored in yellow bins for ease of location during servicing operations. In sensitive areas, green bins may be supplied as an alternative to standard yellow, which are considered to appear less obtrusive.

6. Difficult junctions

   Grit bins may be positioned to provide spot treatments at junctions where high-density traffic is being joined at peak times, where the added difficulty of snow or ice make the junction particularly difficult to negotiate safely and the potential for wheel spin exists.

7. Slopes

   All slopes are potentially hazardous when snow or ice is present. Drivers are accordingly expected to exercise due caution in extreme winter conditions. Grit bins may be considered at locations where the presence of snow or ice on steep inclines make it almost impossible for drivers to control their vehicles.
8. Bends

All bends are potentially hazardous in snow and ice conditions and drivers are accordingly expected to excise due caution in extreme winter conditions. Grit bins may be considered at locations where an acute bend exists combined with a slope that make it almost impossible for drivers to control their vehicles.

9. Pedestrian locations

The focus of providing grit bins will be at pedestrian locations subject to commuter use. These will include locations where steps, or ramps exist particularly at subways or footbridges. For convenience bins are placed at each access point, as far as possible to ease salt distribution at these locations.

10. Rural Communities

Many isolated rural communities exist that are not readily serviced on the primary and secondary treatment routes. The emphasis at these locations is on self-help. Grit bins may be placed at these locations at the discretion of the Area Highway Managers in consultation with the Parish Council's and the Highways Asset Planning Group.
### Highway Salt Bin Assessment Form

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Severity</th>
<th>Points weighting</th>
<th>Points allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vehicular Movement</strong></td>
<td></td>
<td></td>
<td>Void location rejects application.</td>
</tr>
<tr>
<td>Is site on Priority One precautionary treatment route</td>
<td>Yes</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
<td>Continue assessment</td>
</tr>
<tr>
<td>Is treatment area off priority one routes on which bin will be safely located</td>
<td>Yes</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Surface gradient</td>
<td>Less than 1:10</td>
<td>75</td>
<td>Nil</td>
</tr>
<tr>
<td>1:10 or over</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficult junction requiring precise timing to exit, or</td>
<td>(Exit traffic at peak times)</td>
<td>75</td>
<td>Nil</td>
</tr>
<tr>
<td>Within 25m of and falling towards junction with: -</td>
<td>Moderate Traffic</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Light traffic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bends on slope location with moderate traffic</td>
<td>Yes</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
<td>Nil</td>
</tr>
<tr>
<td>Traffic density at peak times</td>
<td>Moderate Traffic</td>
<td>40</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td>Light traffic</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pedestrian Movement</strong></td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Concentration of use by pedestrian's steps, ramps, footbridge, subway. (Category 1 &amp; 2 Footways)</td>
<td>Yes</td>
<td></td>
<td>Nil</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bin condition damaged yes / no
Locality density
TOTAL POINTS Retain/Remove
### Appendix F – Example Weather Forecast

#### 24 Hour Forecast

<table>
<thead>
<tr>
<th>Domain</th>
<th>Readiness Colour</th>
<th>Min RST</th>
<th>Time Below Zero</th>
<th>Min Air</th>
<th>Ice</th>
<th>Hoar Frost</th>
<th>Snow</th>
<th>Fog</th>
<th>Strong Wind</th>
<th>Rain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain A</td>
<td>GREEN</td>
<td>PS04</td>
<td>N/A</td>
<td>PS03</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>Y/H</td>
</tr>
<tr>
<td>Domain B</td>
<td>GREEN</td>
<td>PS04</td>
<td>N/A</td>
<td>PS04</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>Y/H</td>
</tr>
<tr>
<td>Domain C</td>
<td>GREEN</td>
<td>PS04</td>
<td>N/A</td>
<td>PS04</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>Y/H</td>
</tr>
<tr>
<td>Domain D</td>
<td>GREEN</td>
<td>PS03</td>
<td>N/A</td>
<td>PS03</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>N/H</td>
<td>Y/H</td>
</tr>
</tbody>
</table>

#### Details

<table>
<thead>
<tr>
<th>Wind (mph)</th>
<th>Southwesterly 10-15 mph this afternoon, falling light this evening. Becoming northwesterly 10-15 mph on Thursday morning.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ice / Hoar Frost</td>
<td>N/A</td>
</tr>
<tr>
<td>Snow</td>
<td>N/A</td>
</tr>
</tbody>
</table>

#### 24 Hour Weather Summary

- **Domain 1**: Dry and bright this afternoon, with some sunshine at times. This evening will be largely dry before outbreaks of rain, perhaps heavy for a time, arrive from the south during the early hours of Thursday morning. Daylight hours on Thursday will be mainly cloudy with some further rain from time to time before turning drier towards midday.
- **Domain 2**: As above.
- **Domain 3**: As above.
- **Domain 4**: As above.
- **Domain 5**: As above.

Forecaster: XXXX
Open Road Forecaster Tel: XXXXXXXX
Transmitted by the Met Office on 21 November 2007 at 09:56 UTC

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### Readiness Colour Coding

- **Green**: Road surface temperatures are expected to remain above freezing with no ice and/or snow accumulations.
- **Amber**: Road surface temperatures are expected to fall close to or below freezing with ice and/or snow accumulations possible.
- **Red**: Road surface temperatures are expected to fall below freezing with ice and/or snow accumulations.
APPENDIX H - METEOROLOGICAL OFFICE DEFINITIONS

**Air Temperature** is the temperature of the air measured in the shade in a well-ventilated place (e.g. a Stevenson screen), usually 4 feet above ground. (Measurements made in the sun are generally meaningless since they depend on what the thermometer is made of and where it is lying.)

**Dew Point** - The temperature to which the air would have to be cooled in order for it to become saturated. When the air temperature and the dew point are identical, fog will usually be present. On these occasions the relative humidity is 100 per cent, i.e. the air is saturated. (In practice the temperature at which fog forms at night are usually, but not always, a few degrees below the previous daytime dew point temperature.) Moisture will condense on the road when the road surface temperature is below the dew point of the air - this is called dew (or hoar frost if the road temperature is below freezing).

**Wind Direction** is the direction from which the wind is blowing. It is often expressed as a bearing. An easterly wind is from 090 degrees, a northerly from 360 degrees.

**Wind Speed** - The Met Office measures wind speed 10 metres above ground but roadside sensors are often at 4 metres (and thus perhaps read 10 to 30 per cent less). Usually we refer to the average wind speed.

Beaufort Force 2 is around 5 knots - i.e. 6 mph (a light breeze)
Beaufort Force 4 is around 13 knots - i.e. 15 mph (powdery snow might drift)
Beaufort Force 6 is around 25 knots - i.e. 28 mph (lying snow will drift)
Beaufort Force 8 is around 37 knots - i.e. 43 mph (gale force, rare on low ground inland)

**Gusts** - Typical gust speeds inland will be about one and a half times the average speed with isolated gusts sometimes up to twice the average speed, depending on location.

**Changes of Wind Speed** - Strong winds come mainly with active depressions (look out for closely packed isobars on weather charts). In light wind there tends to be an increase in the wind speed during the day and a decrease at night.

**Time of Maximum Temperatures** - The maximum air temperature normally occurs around 1400 GMT or perhaps a bit later in summer. Road temperatures will normally reach their maximum slightly before the air temperatures on a sunny day.

**Time of Minimum Temperature** - The minimum air and road temperatures normally occur around dawn. The minimum may be quite well defined on a calm clear night. There are however many exceptions and an increase in cloud cover or wind speed may lift the temperature before dawn. On fairly rare occasions in mid-winter the minimum can be during the daytime.

**Air Frost** is defined as when the air temperature (measured between one and two metres above the ground) falls below 0.0 Celsius.

**Grass Frost** occurs when the temperature measured by a thermometer lying horizontally on short grass surface falls below 0.0 Celsius. The thermometer bulb should just be touching the tips of the grass. In practice on clear calm nights the grass temperature will often be 4 Celsius or more below the air temperature. The expression "ground frost" is in common use meaning sub-zero temperatures on grass and in fields, e.g. for farmers. When a TV forecast mentions "ground frost" it refers to grass surfaces. Note that cars will often cool down to a similar temperature to the grass, and therefore have frost on them when road and air temperatures are above zero.
Sub-zero Road Temperature is the expression used when sensor readings are expected to be below 0.0 Celsius. The expression does not necessarily imply ice on the roads that might be dry. In forecasts it will normally be accompanied by a description of the state of road - e.g.: dry, hoar frost patches, icy patches, ice-covered. Road temperatures are normally fairly close to the air temperatures at night but roads are often rather colder in mid-winter and after a cold spell. During the daytime in spring, summer and autumn the road temperature will usually be well above the air temperature - in sunny, mid-summer weather by up to 20 Celsius or more.

Ice can form when puddles or seepage from banks freezes. Since there is little in the way of trapped air, this is more difficult to see than hoar frost and hence commonly known as 'black ice'.

Hoar Frost is a fine, slightly feathered deposit of ice commonly occurring on grass and cars, and somewhat less commonly on roads. It can occur when dew forms and subsequently freezes but is more often formed by moisture from the air freezing directly onto the surface. Strong winds usually prevent dew and hoar frost formation, but a light wind can be favourable, especially very cold spell.

Site Specific Graph Interpretation

Frost: formation of ice on road surface.
Wet Frost: when road surface temperature is below 0 deg C and surface is wet or when road surface temperature is below) deg C and at, or below dew point i.e. hoar or white frost.
Hoar Frost: deposition of ice crystals on the road surface due to saturation of overlying air; also known as white frost.
Heavy or Light Frost: these are not true meteorological terms, but are important when considering the effects on road traffic, they are conditions displayed on the Road States display on the 24hr Ice Prediction Graph.

Light frost is displayed when the rainfall equivalent is less than or up to 1mm of rain. In layman’s terms this could be related to 0.4 to 0.6mm of frost cover when close to 0 deg C or 0.2 to 0.4mm of frost cover when temperature is lower than about 5 deg C.

Heavy frost is displayed when the rainfall equivalent is in excess of 0.2mm of rain.

Rainfall Equivalent: melting the frost per unit area produces this.

Freezing Point: as refers to road surface state: an estimation of the temperature at which moisture on the road surface solidifies to ice, taking into account the effect of any chemicals present (de-icing agents): if the road surface is dry, the freezing point is 0 deg C: if the layer of moisture on the sensor is less than 0.5mm, the instrument will find it harder to analyse the solution and produce an accurate freezing point.

Thermal Map Interpretation
Climatic Domain: an area of a county with broadly similar climatic characteristics, e.g. an urban area, or a high-level area, or a coastal area.

Thermal Map: the representation of relative variations in road surface minimum temperature for each of three weather categories, presented in colour bands (usually of 1 deg C).

Damped: this is the thermal map type that occurs on cloudy, windy nights. Temperature differences along a stretch of road are at a minimum.

Extreme: The thermal map type that occurs on calm, clear nights. Temperature differences along a stretch of road tend to be at their maximum.

Intermediate: The thermal map type that occurs on nights where cloud cover, wind speed (or both) is variable. Road temperature differences tend to lie between the Damped and Extreme values.

Other definitions

Accretion: the build-up of snow on objects such as overhead cables, road signs and tree branches. It occurs when wet snow, with temperatures close to freezing, is accompanied by a strong wind. The wet snow freezes on to objects under pressure of the wind. The build-up of snow can be quite large, and can cause damage to cables and trees.

Black ice: clear ice, which forms on roads due to the freezing of standing water. Occasionally it may be formed by the transformation of hoar frost, under pressure from car tyres. The name black ice is used, as the road blacktop can be seen through the clear ice.

Blustery: used to describe showers, which are accompanied by strong gusts of wind.

Condensation: this is the change of state of water vapour to liquid water, thus forming a thin film or mist of water on surfaces such as roads. During the process, heat is released.

Confidence Factor: used by weather forecast organisations to give guidance to highway engineers on the likelihood of forecasts having to be subsequently amended. Confidence HIGH means that amends are unlikely, and confidence LOW that amends are likely. Some use is made of MEDIUM confidence, although usage is discouraged, as it can be confusing.

Deposition: this term covers the change of state from water vapour to ice without going through the liquid water stage.

Drizzle: small droplets, which fall from low cloud. Drizzle can last for several hours and cover a large area, or be intermittent and localised.

Dry frost: the road surface is at 0 deg C or below, with most roads expected to be dry. However, ice may form due to seepage, burst pipes or in known hollows where moisture persists.
**Evaporation:** the change of state from water to water vapour. The process takes in heat and causes cooling.

**Flash frost:** the rapid build up of hoar frost on roads around sunrise. Roads can change from dry to a significant cover of hoar frost within 15 minutes.

**Freezing fog:** fog when forms when air temperatures are below freezing. The fog droplets remain in the liquid state, but will freeze on contact with trees and other objects, and under some circumstances the road surface.

**Freezing rain /drizzle:** a very dangerous condition where raindrops (from warmer air aloft) fall on to surfaces below freezing, thus freezing instantly and causing widespread ice. Fortunately, rare in the UK and most likely to occur at the end of a prolonged spell of cold weather.

**Frequent:** used in conjunction with showers. The term frequent showers imply that nearly all areas will catch a shower, and many places will see more than one shower.

**Icy patches:** used in road weather forecasts to indicate ice formation in prone areas only (gutters, dips in the road surface, etc).

**Icy stretches:** used in road weather forecasts to indicate more widespread ice.

**Isolated:** used in conjunction with showers, isolated showers imply that most places will stay dry, but somewhere within the area of coverage a shower may occur.

**Interval:** used to describe cloud breaks or amounts of sunshine, generally of less than one hour’s duration.

**Marginal:** this describes nights where the road temperature is expected to be very close to freezing (normally within 1 deg C).

**Period:** used to describe the length of cloud breaks or amounts of sunshine, generally of two hours or more duration.

**Powder Snow:** the form of snow that occurs when air temperatures are well below freezing (-2 deg C or less). This form of snow is very fine (like sugar crystals), drifts very easily, but does not tend to stick to objects (no accretion). It can be handled by snow blowers. Salt is usually less effective.

**Precipitation:** a general term, which covers all water (or ice), which ‘falls’ from the skies. As well as rain, sleet, snow and hail it also includes dew, hoar frost and fog.

**Precipitation Type:** the individual type of precipitation. In winter maintenance activities this will be one of rain, drizzle, sleet, wet snow, dry snow, hail, freezing rain and freezing drizzle.

**Prolonged:** used to describe showers which merge together producing a spell of continuous precipitation, generally lasting more than one hour and covering a relatively large area.
Relative Humidity: this is the amount of actual water vapour held in a sample of air at a given temperature, divided by the maximum amount of water that could be held in that sample of air at that temperature, expressed as a percentage. Within fog or heavy rain, humidity’s may reach 100%. On a sunny, warm afternoon in summer, humidity’s may fall to 30%. On an average night in winter, humidity’s rarely fall below 80% (which is the minimum humidity at which salt crystals will start to absorb water).

Appendix J – Useful Telephone / Fax Numbers / Websites

<table>
<thead>
<tr>
<th>Contact Point</th>
<th>Contact Number</th>
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</thead>
<tbody>
<tr>
<td>Met Office 24 hr Consultancy Service Direct Forecaster access</td>
<td>Tel: 01392 884322</td>
</tr>
<tr>
<td>Vaisala Icecast Customer Support</td>
<td>Tel: 0121 683 1269 Fax: 0121 683 1226</td>
</tr>
<tr>
<td>Primary Winter Service contact: Principal Asset Project Manager (Winter Service Project Manager)</td>
<td>Tel: 01483 517361</td>
</tr>
<tr>
<td>Ringway Infrastructure Services</td>
<td>Tel: 01483 407999 Fax: 01483 407998</td>
</tr>
<tr>
<td>Carillion Highway Maintenance</td>
<td>Tel: 01342 894800 Fax: 01342 894848</td>
</tr>
<tr>
<td>Forbes - Saturator Support (Godstone, Witley, Esher, Merrow Lower Kingswood, Bagshot and Beare Green depots)</td>
<td>Tel: 01366 388941</td>
</tr>
<tr>
<td>SCC Support – Dave Ellis</td>
<td>Tel: 01483 517550</td>
</tr>
<tr>
<td>Salinity UK (Salt Supplier)</td>
<td>Tel: 01235 832086 Fax: 01235 831968</td>
</tr>
<tr>
<td>Carillion Transport Service</td>
<td>Tel:</td>
</tr>
<tr>
<td>Econ Engineering – Main Office Econ Regional Sales Manager – John Saint</td>
<td>Tel: 01765 605321 Tel: 07712 535030</td>
</tr>
<tr>
<td>Useful websites</td>
<td><a href="http://www.metoffice.gov.uk">www.metoffice.gov.uk</a> <a href="http://www.vaisala.com">www.vaisala.com</a> <a href="http://www.econ.uk.com">www.econ.uk.com</a></td>
</tr>
<tr>
<td>Constructors 24hour Control Centre Godstone</td>
<td>Tel: 0870 1266060 Fax: 01342 894890</td>
</tr>
</tbody>
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