WINTER SERVICE PROCEDURES

INDEX

1. RESPONSIBILITIES AND CONTRACTUAL ARRANGEMENTS

1.1 Roles and responsibilities

1.1.1 General

The provision of the winter service is carried out by Cornwall Council and CORMAC Solutions Ltd staff. The service management and policy functions are dealt with by the Highways and Infrastructure Service (part of the Economic Growth and Development directorate). The operational work is carried out by CORMAC Solutions Ltd which is a wholly-owned subsidiary of Cornwall Council and which is contracted to Cornwall Council to provide highway maintenance and network management services.

1.1.2 Highways and Infrastructure Service

The Highways and Infrastructure Service section is responsible for:

- drafting and gaining approval for the winter service policy through the appropriate committee and/or cabinet member;
- development and updating of the winter service plan;
- establishment and maintenance of the ice detection system; and
- procurement of winter weather forecasting.

1.1.3 CORMAC Solutions Ltd

CORMAC Solutions Ltd is responsible for:

- coordination of the service defined in the winter service plan throughout the winter season;
- day-to-day decision making and operational management, including performance monitoring;
- liaison with the media;
- design of the winter service treatment routes;
- execution of the winter service plan and delivery of the service as defined in the plan;
- day-to-day operational management;
- provision and maintenance of the winter fleet; and
- management of salt procurement and stockpiles.

1.2 Organisation and communication

The responsibility for all aspects of the winter service from decision making through to salting operations rests with staff within CORMAC Solutions Ltd who have the appropriate levels of training and experience.

The highways and environment section is led by a general manager who is supported by a network manager, six highway and environment managers and two Technical Managers. For weather forecasting purposes, the county is split into four climatic domains (west, north, south and central).

Each week through the winter period (October to April) one staff member acts as duty coordinator for the whole county. Also in each highway region, standby staff work on a weekly rota to act as duty supervisors.

During normal office hours, the network manager or one of the highway managers in each highway region will assess the daily weather forecast and make a decision on what winter treatment action is necessary in his or her area. This is discussed with the duty coordinator and the instruction given to the operational staff and the duty supervisors.

Out of normal working hours the duty coordinator will assess the daily forecast for the whole county and communicate directly with the duty supervisors, who in turn will issue instructions to the operational staff. The duty supervisors will coordinate and monitor the progress of any treatments on the road network and feed back information to the duty coordinator.

The operational managers are responsible for ensuring that all routes are appropriately resourced to ensure that instructions are executed within the timescales stated in the contract.

1.3 Duty arrangements

Duty arrangements are in place to ensure that winter service activities are undertaken throughout the winter period, 24 hours a day.

The winter period is from 1st October to 30th April. The season is divided into periods of low risk (October and April) and high risk (November to March inclusive).

At present the standby/duty arrangements for the duty coordinator and duty supervisors do not vary between the low and high risk periods. However, the arrangements for the operational staff only cover the “high risk” period.

Rotas are maintained to ensure that all key positions are covered by on-call staff throughout the winter period.

- The rota for the duty coordinator will ensure that a suitably-qualified senior member of staff is on duty throughout the winter period.
- The rotas for duty supervisors will ensure that at least one member of staff is on duty in each highway region throughout the winter period. Some of the larger highway regions may have more than one supervisor on duty because of the physical size and layout of the area.
- The rota for the drivers will ensure that sufficient cover is available to provide a 24/7 service and to comply with working hours and other relevant legislation.

1.4 Contract/voluntary arrangements

For those staff included on the weekend standby rotas they will be contractually obliged to respond as appropriate during the allocated shift.

During week days, the winter gritting operators have voluntary arrangements to cover morning or evening pre-salt applications. This will remain voluntary because there are a minimum of three drivers per route which provides more than adequate cover.

In the event of a heavy snow event requiring major clearance works, CORMAC Solutions Ltd has at its disposal 300 operatives that historically have responded as and when necessary to such emergencies in support of the standby workforce. Furthermore, there is a wide range of vehicles and plant available.

CORMAC Solutions Ltd also maintains a comprehensive list of external suppliers for driven plant and machinery, if required. All requests for additional plant, labour and machinery will be dealt with under the term maintenance contract.

1.5 Training and development

In order to deliver the winter service it is necessary to ensure that all involved are suitably trained and competent in the tasks they are expected to fulfil.

The following training arrangements are in place:

- Training in advanced winter road meteorology for key decision makers on a regular basis. This is provided by the forecast provider.
- Winter maintenance awareness for other staff on a regular basis. This may be provided in house, or through external providers.
- All operatives who carry out salting and snow ploughing on the public highway undergo training in accordance with City and Guilds 6159.
- Attendance at “Cold Comfort” (the national winter service showcase event) every year by a selection of senior staff involved in delivery of the winter service.
- Other training/attendance at seminars/demonstrations as required on specific aspects of the winter service.

Additional training is also given when available in driving techniques and collision avoidance for drivers and supervisors.

A process of coaching/mentoring is in place for all new supervisors working with experienced colleagues for a number of patrols until they are deemed to be competent to undertake the role alone.

1.6 Health and safety

Prior to the commencement of the winter season all staff involved in the winter service meet to discuss operational arrangements. All aspects of the service are covered including safety and communication. Everyone is briefed

with reference to the Safe Working Procedures for Ice Patrols and Salt Distribution (SWP 21), any issues raised are recorded and if necessary further risk assessments carried out.

1.7 Working hours

Duty supervisors will need to take responsibility for monitoring their working hours and should aim to maintain an 11 hour rest period between activities where reasonably practicable.

1.8 Media liaison

The duty coordinator will take a proactive role in providing information to the local media, particularly BBC Radio Cornwall, Pirate FM and Heart FM. Prior to the commencement of the winter season a protocol for communication will be agreed. In sustained periods of freezing or snowy conditions information will also be offered to local TV stations via the Council's media relations department. In severe conditions coordinated/consistent driver advice will be provided to the media either through the Cornwall Council emergency planning team or media relations.

Out of hours, the duty coordinator is responsible for collating information and issuing appropriate advice to the media. However, during exceptionally bad weather or during longer periods of disruption, this workload will be shared with other senior staff.

2. DECISION MAKING PROCESS

2.1 Weather data

2.1.1 Road weather information

The Council maintains a network of road weather outstations. The information is monitored throughout the winter and used in determining the timing, extent and duration of any treatment activities.

The outstations and their Ordnance Survey grid references are as follows:

- Newbridge ** SW 4081 3183
- Edgecumbe ** SW 7156 3278
- Probus SW 8750 4687
- Winnards Perch ** SW 9274 6629
- Whitstone ** SS 2685 0024
- Crimp SS 2556 1540
- Wadebridge SW 9870 7315
- Taphouse SX 1465 6314
- Hewaswater SW 9552 4918
- Trerulefoot SX 3329 5884
- St Anne's Chapel ** SX 4041 7093
- Bodmin SX 0841 6785

Sites marked ** have pan, tilt and zoom CCTV cameras. Fixed pictures are uploaded to web pages for use by winter service staff.

All sites have live broadband which is used to check connections every morning.

We also have consent from the Highways England (HE) and Devon County Council (DCC) for access to the following additional sites:

- Hayle (HE) SW 5608 3622
- Redruth (HE) SW 7173 4404
- Marazanvose (HE) SW 7984 5027
- Goss Moor (HE) SW 9323 5976
- Colliford (HE) SX 1489 7407
- Tolpetherwin (HE) SX 2701 8175
- Halfway House (HE) SX 1599 6528
- Landrake (HE) SX 3707 6038
- Netherbridge (DCC) SX 2350 0898
- Tuelldown (DCC) SX 2425 0780

The weather outstations monitor the following conditions:

- road surface and air temperatures;
- deep temperature (not all outstations);
- wind speed and direction;
- dew point and relative humidity; and
- rate and type of precipitation using radar precipitation sensors.

2.1.2 Road weather forecasting

In order to provide a road weather service the importance of road weather forecasts and consultancy service can not be underestimated. The Council receives the following forecast information on a daily basis from 1st October to 30th April each winter.

Preliminary forecast	Issued before 8am, detailing predicted weather for the next 24 hour period, including any weather risks and hazards, and a diagnostic report on the ice detection system.
Text forecasts	**24 hour** text forecast issued between 12 noon and 1pm. This details evolution of weather, forecast minimum temperatures, likely risks and hazards, and levels of confidence. This initial forecast is supplemented by updates, or further advice as required. It is acknowledged that changes to forecast conditions will occur, and consequently the required actions may be updated, or changed completely based on the most up-to-date information. **5 day** forecast. This gives a detailed overview for the next five days. Allows early preparation for continued periods of adverse weather.
Site specific forecasts	Detailed graphical forecasts for seven forecast sites giving minimum temperatures, predicted surface conditions and dew points.
Supplementary forecast data	Various services available through web including: ❖ Weather radar ❖ Satellite imagery ❖ Observations ❖ Access to Highways England and Devon County Council sites in Devon and Cornwall
24 hour consultancy service	Contact with forecasters to discuss updates, treatment strategies etc.

Weather forecasts may be qualified by confidence levels and hazards by altitude. In planning and carrying out treatments the precautionary principle should apply to ensure that the risk to all road users is minimised.

Procedures 3.3 and 3.4 detail how the forecasts are to be interpreted.

2.1.3 Thermal maps

Thermal maps will not be used for decision making purposes.

2.1.4 Weather domains

The county has been divided into separate weather domains for forecasting purposes. These domains represent areas where the factors influencing the

weather and minimum temperatures are consistent. These are used in the text forecast and risks, alert state and hazards are identified for each of the domains. The specific text forecasts for each domain, with the forecast graphs for the outstations will be used to determine whether different treatment strategies are required for different parts of the county.

2.2 Lunchtime decision

On receipt of the detailed weather forecast, the network manager or one of the highway and environment managers in both of the county's highway regions will consider the risk of freezing conditions and determine the most appropriate treatment. In normal circumstances the initial decision will be made during the early afternoon and instructions detailing the timing, extent and nature of any action will be passed to operational staff.

During the working week, the duty coordinator will discuss the proposed action with the network/highway and environment managers and coordinate these actions for which a record will be kept. The duty coordinator will also access the forecaster's Internet site and update the website as soon as is practicable with relevant decisions and actions. This will inform the forecasters and others who can access the site.

2.3 Changes to forecast

Occasions will occur where due to the level of confidence or nature of the forecast, there will be a range of variables that will influence the treatment strategy. In these circumstances, the network/highway and environment manager (or the duty coordinator outside normal working hours) will advise the operational staff that they will need to mobilise the winter service fleet, and will use best endeavours to confirm the details of the required action in the most expeditious manner.

On occasions where changes to the forecast are made, the operational staff will be made aware of the implications of these changes and the required actions as soon as practicable.

3. TREATMENT

3.1 Overall objective

The overall objective is to complete treatment, where reasonably practicable before the onset of freezing conditions. This section sets out the treatment strategy to be applied to the specific forecast scenario, and also the options for the specific treatment to be applied. The information is not intended to be exhaustive, and actual treatments will be based on a number of variables.

3.2 Route development

The approved policy sets out the basis on which routes are selected for inclusion on the precautionary treatment network.

The precautionary salting network is currently made up of 25 routes as detailed in these procedures. Each route has a specified start point and an order/direction of travel. Each route has been optimised to maximise efficiency, to ensure that in normal circumstances the route can be completed within the specified treatment time, and with regard to the capacity of the individual vehicles. The order in which the salting activities are undertaken reflects this optimisation process and does not relate to the importance of each link that makes up the route.

Where there are operational benefits, alternative starting points may be used. This is most likely to occur when a vehicle is taken “home loaded” ready for salting operations in the middle of the night.

Where parts of the precautionary network are the subject of temporary closure orders, the highway and environment /network manager (or the duty coordinator outside normal working hours) will instruct the signed diversion route to be treated if the diversion is not along roads which form part of the precautionary salting network.

3.3 Treatment strategy

The treatment strategy is shown in the decision matrix guide in Table 1. This is based on the pre-September 2013 complementary guidance to *Well-maintained Highways: Code of Practice for Maintenance Management* issued by the Roads Liaison Group. Refer also to Section 1.2 of the Winter Service Policy. This is used as guidance to determine the best treatment strategy for specific forecast scenarios. The table is not intended to be exhaustive, and actual treatments will be based on a number of variables.

<table>
<tr><th colspan="4">Table 1: Decision Matrix Guide</th></tr>
<tr><th rowspan="2">Road Surface Temperature</th><th rowspan="2">Precipitation etc.</th><th colspan="3">Predicted Road Conditions</th></tr>
<tr><th>Wet</th><th>Wet Patches</th><th>Dry</th></tr>
<tr><td>May fall below 1ºC</td><td><u>No</u> rain
<u>No</u> hoar frost
<u>No</u> fog</td><td rowspan="3">Salt before frost</td><td>Salt before frost
(see note a)</td><td>No action likely, monitor weather
(see note a)</td></tr>
<tr><td rowspan="4">Expected to fall below 1ºC</td><td><u>No</u> rain
<u>No</u> hoar frost
<u>No</u> fog</td><td colspan="2">Salt before frost
(see note b)</td></tr>
<tr><td><u>Expected</u> hoar frost
<u>Expected</u> fog</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 colspan="2"><u>Expected</u> snow</td><td colspan="3">Salt before snow fall</td></tr>
<tr><td colspan="4">The decision to undertake precautionary treatments will, if appropriate, be adjusted to take account of residual salt or surface moisture.
All decisions will be evidence based, recorded and will be continually monitored and reviewed.</td></tr>
</table>

Notes to Table 1

(a) Particular attention will be given to any possibility of water running across carriageways and other running surfaces – e.g. off adjacent fields after heavy rains – washing off salt previously deposited. Such locations will be closely monitored and may require treating in the evening and morning and possible other occasions.

(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 after 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 time of the condition. Hoar frost may be forecast at other times in which case the timing of salting operations will be adjusted accordingly.

(c) If, under these conditions, rain has not ceased by early morning, crews will be called out and action initiated as rain ceases.

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

3.4 Treatment options

The approved winter service policy sets out the following treatment options:

No planned action: No action required

Monitoring: Where the forecast indicates temperatures close to freezing, varying surface conditions, or where roads have been treated in the previous 24 hours, then a monitoring procedure may be followed.

The forecast and road surface temperatures will be monitored using the weather outstations and forecasting service, together with feedback from those on the road. Gritting lorries may be loaded on standby should they be needed.

In these circumstances treatment can be of a reactive nature and rely upon the judgement of all involved in the provision of the service.

Inspect and treat: This is also referred to as “patrolling”. The purpose of inspection is to identify the extent of wet patches requiring treatment, or to verify that previous treatments have been successful. The timing of inspections will be determined based on a variety of factors, and to ensure that appropriate actions are taken to ensure roads are adequately treated where reasonably practical. During inspections, communication between all involved is essential. Guidelines for patrolling are in Section 3.5.

Pre-salt: The timing of pre-salting will be determined to ensure the most effective protection for the motorist. In normal

circumstances the aim will be to complete pre-salting at least one hour prior to the predicted formation of frost/ice.

Reports of freezing conditions: It is inevitable that reports of freezing conditions on the precautionary network and elsewhere will be received. Whilst it is generally considered prudent to respond to these, this will not be done if the response is likely to compromise the effective planned treatment of the precautionary network.

Table 2 is used as guidance to determine the precise treatment to be applied. This is based on the pre-September 2013 complementary guidance to *Well-maintained Highways: Code of Practice for Maintenance Management* issued by the Roads Liaison Group. Refer also to Section 1.2 of the Winter Service Policy. The Table is not intended to be exhaustive, and actual treatments will need to be based on a number of variables.

Table 2: Treatment Matrix Guide (Continued Overleaf)

Weather Conditions **Road Surface Conditions** **Road Surface Temperature (RST)**	**Treatment**		
	Air temperature	**Salting (g/m^2)**	**Ploughing**
Frost or forecast frost RST at or above -2ºC		10	No
Frost or forecast frost RST below -2ºC and above -5ºC		20	No
Frost or forecast frost RST at or below -5ºC and above -10ºC and dry or damp road conditions		20	No
Frost or forecast frost RST at or below -5ºC and above -10ºC and wet road conditions (existing or anticipated)		2 x 20	No
Light snow forecast (<10mm)		20	No
Medium/heavy snow or freezing rain forecast		2 x 20	No
Ice formed	above -5ºC	20	No
Ice formed	at or below -5ºC	2 x 20	No

Table 2: Treatment Matrix Guide (Continued)			
Weather Conditions **Road Surface Conditions** **Road Surface Temperature (RST)**	**Treatment**		
	Air temperature	**Salting (g/m²)**	**Ploughing**
Snow covering exceeding 30mm		20 – 40 (successive)	Yes
Hard packed snow/ice	above -8°C	20 – 40 (successive)	No
Hard packed snow/ice	at or below -8°C	salt/abrasive (successive)	No

Notes to Table 2

(a) Rate of spread for precautionary treatments may be adjusted to take account of variations occurring along the route such as residual salt, temperature variations, surface moisture (in the air or on the road surface) road alignment and traffic density.

(b) All decisions will be evidence based, recorded and continuously monitored and reviewed.

(c) Ice refers to all ice on the road surface, including black ice.

3.5 Patrolling

3.5.1 Purpose of patrol

The network/highway manager (or the duty coordinator outside normal working hours) will request a patrol when the weather forecast is such that there is some doubt about the road weather conditions.

The purpose will be to:

- verify previous treatments have been effective;
- identify and spot treat problem areas; and
- deal with weather conditions that may vary over time/over the network.

3.5.2 Timing

The timing of a patrol will be set to ensure that as far as is reasonably practicable the roads remain free of ice and snow. The duration of a patrol will depend on the prevailing conditions. A patrol will only be finished when the duty coordinator agrees.

The duty supervisors are encouraged to maintain a two-way dialogue with the lorry drivers and duty coordinator throughout.

3.5.3 Taking temperatures

Taking road surface or air temperatures will only assist in understanding the conditions at that given time/location. Therefore, if taken, they are only a broad indicator of conditions and trends cannot be established from a series of temperature readings.

3.5.4 Moisture

Moisture can be derived from run-off, seepages, previous rainfall or hoar frost. The first three are readily identified, but hoar frost can be difficult to predict.

Indicators include frost on cars and road verges. Deposits of hoar frost can occur suddenly due to very slight changes in weather conditions. The phenomenon of the "dawn dip" is well known and it is important that, when appropriate, resources are available to deal with this. During a patrol the duty supervisor will monitor cloud cover, as this will have an impact on temperatures and the likelihood of frost deposits.

3.5.5 Records

It is important that a record of patrolling is kept. This will detail locations and times visited with any observations. See Section 4.3.2.

3.5.6 Extending action

On occasions the conditions may be such that it is prudent to commence a full pre-salt. In these circumstances the duty coordinator will advise the duty supervisors as soon as the decision is made.

3.5.7 Other routes/locations

When activities have been completed on the precautionary network, the duty supervisor will agree with the duty coordinator whether to continue onto other routes. Discussion with adjoining duty supervisors is encouraged.

3.5.8 Handover to normal working day

If the activities are likely to continue into the working day, the duty supervisor will advise the Council's Contact Centre and agree with the regular members of staff when to pass on responsibility for each lorry/route.

4. RECORDS

4.1 General

Record keeping is a fundamental part of the winter service. It is essential that the process from receipt of forecast, through the decision making process, to instructing work to be carried out, and the action taken on the ground is well recorded. All records will be stored centrally in an electronic database. A nominated member of staff in each service area will check on a weekly basis that all electronic records are complete and up to date for that area. All duty coordinators will have access to the database. Paper records may be held temporarily but must be transferred to the database at the earliest opportunity.

It is essential that the network/highway and environment managers (or the duty coordinator outside normal working hours) give clear instructions to duty supervisors and the operational staff. This is best achieved by email but the value of telephone or personal contact cannot be underestimated. The responsibility lies with the sender of the instruction to ensure that the instruction is received and acknowledged by the recipient. Thereafter contemporaneous records need to be made of information received; decisions received and given; and actions taken.

There are four formal records that are to be kept as described below. The duty supervisor records are to be kept in electronic format and emailed to the key decision maker in each highway region at the beginning of the following week.

4.2 Coordinator log

During the working week each network/highway and environment manager will maintain an electronic “coordinator log”. The duty coordinator will maintain the record for the whole county for those periods when the network/highway managers are unavailable. These periods include weekends and holidays periods. The coordinator log will record the following as a minimum:

- date;
- name of duty coordinator;
- details of lunchtime forecast and any update forecasts, including time and state of readiness in each climatic domain;
- lunchtime treatment decisions made, including “No Action”;
- details of any subsequent decisions made which supersede the lunchtime decision; and
- any other relevant information relating to the decision-making process.

4.3 Duty supervisor records

4.3.1 Duty supervisor sheet

The duty supervisor will maintain a record of all instructions received from the network/highway and environment managers (or the duty coordinator outside normal working hours) and will record actions undertaken as a result. This includes “No Action” instructions.

4.3.2 Patrol record sheet

The duty supervisor will record all actions taken in accordance with the guidelines for patrolling in Section 3.5.

4.4 Driver records

Each driver will complete a hand-written record of all instructions and actions – including “No Action”.

Each driver is responsible for the completion of this form and ensuring that a copy is handed to the operational manager and the duty supervisor no later than two working days after the action. The operational manager will ensure that the form is completed satisfactorily. The duty supervisor will arrange for these forms to be scanned for saving onto the database.

5. PLANT AND MATERIALS

5.1 General

The operational managers will ensure that each route is covered by a designated vehicle with the capabilities of providing the appropriate application in accordance with the instruction received.

The winter service equipment is provided in accordance with the term contract.

The salt stock order is managed in accordance with the term contract specification clause 6004AR. The total stock holding will be 10,500 tonnes minimum at the start of the winter season. This equates to the resilience benchmark of 48 salting runs at a spread rate of 20g/m^2 as recommended in the final report *The Resilience of England's Transport Systems in Winter* published in October 2010. The salt stock will be topped up as required (subject to salt availability) during the peak winter months.

5.2 Fleet inventory and maintenance

A comprehensive fleet inventory, including individual vehicle maintenance checks and records, is held at CORMAC Solutions Ltd's Western Group Centre at Scorrier.

For the front line vehicles MOTs are updated outside the winter maintenance period to ensure their availability throughout the winter service season.

Prior to the winter service season each vehicle is checked for its effective operational capabilities. This includes checking the attachments for the gritting spinner and the snow plough hydraulics and linkages.

During September and October the winter service equipment is again checked to ensure everything is serviceable. Ploughs and spinners are test fitted as part of this check.

Other equipment including spare ploughs, snow blowers and self-propelled snow blowers are also checked, oiled and greased at this time ready for the season ahead.

5.3 Calibration

Every year during September and October every gritting vehicle is checked for accuracy of calibration. The calibration is adjusted according to the size of rock salt to be applied. The calibration is checked mid-season, usually in January.

A record will be kept of each checked and calibrated vehicle and a certificate of calibration issued on completion of the tests.

5.4 Communication systems

A global position system (GPS) has been installed in every winter gritting vehicle. This system provides details of where a vehicle is, where it has travelled, its speed, whether salting or free travel, the rate of application and

the time taken. This information is archived as a permanent record of activity on the precautionary network, and may be requested by other agencies and the general public.

Communication between individuals is by way of mobile telephones.

5.5 Salt management

5.5.1 Stockpiles

Prior to the winter service season stocks will be replenished where appropriate to provide the minimum total stock holding in 5.1 above.

This stock will be held in covered storage at the following locations:

- Scorrier
- Castle-an-Dinas Quarry
- Tregongeeves
- Bodmin
- Tolpetherwin
- Notter Bridge
- Tiscott Wood

Salt usage will be measured from the information provided on each driver's record (see Section 4.4). At the end of each week the respective operational managers will quantify the total tonnage used per highway region and this information will then be passed to the stores manager who will adjust the stock holding at each of the above locations to ensure operational needs can be met. General/network managers will instruct the stores manager as to when and where orders for delivery should take place.

5.5.2 Chemical specification

Test methods are as specified in BS3247:1991 *Salt spreading on Highways for Winter Maintenance.*

Property	Unit	Specification	Typical analysis
Soluble Chlorides	%m/m NaCl	>90.0	92.0
Soluble Sulphate	%m/m $CaSO_4$	<2.5	2.3
Insolubles	%m/m	<7.5	5.6
Moisture	%m/m	<4.0	2.0
Anti-caking agent	mg/kg	>30	47

Grading

Passing BS410 Test Sieve	Specification % m/m	Typical analysis
10 mm	100	100
6.3 mm	100	100
2.36 mm	30-80	71
0.3 mm	<20	16

APPENDIX 1 – GLOSSARY OF TERMS

Climatic domain. An area of the county with broadly similar climatic characteristics – eg an urban area or high moorland or a coastal area (see forecast site).

Dew point. The temperature to which a sample of air must be cooled for condensation to take place. Dew point can be measured directly by instrumentation – eg outstations.

Fog. The suspension of water droplets in air at or close to the ground.

Forecast site. An outstation for which a graphical forecast is provided. It is usual to have one forecast site per climatic domain (see climatic domain).

Frost. A generic term to cover temperatures below freezing.

Hoar frost. Deposition of water vapour directly as ice onto ground surfaces. The ice forms as white crystals and is usually highly visible. Hoar frost is more common over grass than on roads. Hoar frost on roads may quickly change to clear ice under pressure from car tyres.

Precautionary salting. Salting undertaken in advance of anticipated freezing conditions to minimise the risk of accidents and ensure the network remains serviceable.

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.

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, the humidity may reach 100%. On a sunny, warm afternoon in summer the humidity may fall to 30%. On an average night in winter, the humidity rarely falls below 80% (which is the minimum humidity at which salt crystals will start to absorb water).

Seepage. Leakage of ground water from roadside verges. Can cause roads to become wet, when otherwise they would have stayed dry, possibly leading to ice formation later.

Site specific forecast. A standardised form of road weather forecast which shows a graphical plot of road temperatures and road states against time, for 24 hours ahead at hourly intervals. The forecast is for a single point in the road surface and is normally co-located with an outstation to allow monitoring of the forecast.

Snow. A form of precipitation where tiny ice crystals bond together into flakes. Snow can be either wet (air temperatures close to freezing) or powder (air temperatures below -2°C).

Treatment time. Time from commencement to completion of salting activities on a route.

Weather radar. A network of radars which uses a beam specifically tuned to detect rain droplets or snowflakes and hence infer the location and intensity of precipitation reaching the surface.

Salting Route Maps and Descriptions

Coloured Routes, Climatic Domain & Height Map

West Cornwall Salting Routes Map

East Cornwall Salting Routes Map

Route	Additional Maps
1	Penzance
2	St Just
3	Hayle, Helston
4	Helston, Mullion
5	Redruth, Camborne
6	-
7	Falmouth, Penryn
8	Chiverton, Perranporth
9	Truro, Avers
10	Treliske & Threemilestone, Truro
11	Newquay
12	Sticker Bypass
13	St Austell
14	Padstow
15	Bodmin, Wadebridge
16	-
17	Bodmin, Fowey
18	-
19	-
20	Bude
21	Launceston
22	-
23	Saltash
24	Torpoint
25	Dobwalls, Liskeard