

**M77 (FENWICK TO MALLETSHEUGH)/
GLASGOW SOUTHERN ORBITAL
DBFO PROJECT**

WINTER SERVICE PLAN 2021/2022

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| | | | | <p>Remove Redacted and replace with Redacted on Distribution List.</p> <p>Remove Redacted from Distribution List.</p> <p>Replacement of 2 x 20g treatments with 40g treatments.</p> <p>Add 40g treatment values to route information.</p> <p>Remove Redacted from list of WSC Maintenance Staff.</p> |
| 24 July 2020 | 29 | Redacted | Redacted | <p>Date changes from 2019/20 to 2020/21.</p> <p>Include Redacted on Distribution list.</p> <p>Remove Redacted (Scotland Transerv) from Distribution List and Replace with Redacted (Amey)</p> <p>Add 2 No. WSC Maintenance Staff.</p> <p>Revised Appendix J in line with Balfour Beatty Plant Agreements.</p> |
| 26 July 2021 | | Redacted | Redacted | <p>Date changes from 2020/21 to 2021/22.</p> <p>Addition regarding Maidenhill Junction.</p> <p>Removal of Redacted as Winter Service Operative.</p> <p>Minor text and formatting amendments.</p> |

Distribution list

| Organisation | Recipient | Copy number |
|----------------------------|---------------------------------------|-------------|
| Connect Roads: | Redacted, Operations Manager | 1 |
| East Renfrewshire Council: | ERC Representative | 2 |
| | Redacted | 3 |
| Transport Scotland | Head of Projects Branch | 4 |
| | Network Impacts Manager | 5 |
| Balfour Beatty | Redacted, Winter Service Manager | 6 |
| | Redacted, Winter Service Duty Officer | 7 |
| | Redacted, Winter Service Duty Officer | 8 |
| | Redacted, Winter Service Duty Officer | 9 |
| | Redacted, Working Supervisor | 10 |
| Police Scotland: | Headquarters | 11 |
| Adjacent Authorities | | |
| East Ayrshire Council: | Redacted | 12 |
| South Lanarkshire Council: | Redacted | 13 |
| South West Operating Co: | Redacted | 14 |

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1. Introduction and policy

- 1.1 This document represents Balfour Beatty Regional Civil Engineering (BBRCE) submission of its annual Winter Service Plan (WSP) to East Renfrewshire Council (ERC), in accordance to Schedule 4, Part 2, Winter Maintenance Management, and Part 5 Series 2800 of the Project Agreement.
- 1.2 The WSP also incorporates the enhanced Winter Maintenance Management requirements instructed under ERC Change Notice ERC CN066.
- 1.3 The WSP describes the procedures for dealing with Winter Service Activities. It is designed to provide a planned and co-ordinated response by BBRCE and its Suppliers on behalf of its Client.
- 1.4 The WSP has been compiled to reflect the consultations with the adjacent road authorities and emergency services and should be read in conjunction with BBRCE's Emergency Response Plan (M77/OPS/003).
- 1.5 Although the WSP becomes effective at the commencement of the winter service period, 1 October 2021 to 15 May 2022, BBRCE has made arrangements whereby, in the unlikely event of winter service being required outside the period, the WSP will be invoked to deliver an appropriate service to maintain a safe and operational Network.
- 1.6 The major and most frequent activity of Winter Service is the precautionary salting of roads to keep them free from ice and hoar frost. This is a routine activity, which is activated through a weather forecasting system and a computerised Ice Prediction System.
- 1.7 BBRCE's response to frost and snow warnings is pre-planned as outlined within this document. On receipt of an adverse weather forecast the precautionary salting plans will be activated and put into operation by the Winter Service Duty Officer (WSDO) concerned.
- 1.8 BBRCE's objective is to initiate and manage procedures for dealing with winter conditions, enabling as far as reasonably possible the safe movement of traffic on the M77/A77 Malletsheugh to Meiklewood, the Glasgow Southern Orbital, A726 West Mains Road roundabout to Philipshill Interchange and the A727, Philipshill Interchange to the Carmunnock Roundabout.
- 1.9 BBRCE is responsible for the management of winter service. This coverage is detailed in Appendix A. In addition to these carriageway areas, the winter service plan covers footways, cycle tracks and lay-bys as defined in Appendix B.
- 1.10 Precautionary salting routes for the network are included in Appendix C.
- 1.11 It is BBRCE's intention that a consistent and co-ordinated service is achieved along the M77/A77, GSO A726 and A727, together with the adjacent Agents and Authorities ensuring the available resources are deployed in an efficient manner. This will require liaison and co-ordination with adjacent Agents and Authorities, co-operation in route planning and working across administrative boundaries.
- 1.12 It is BBRCE's policy to endeavour that the M77/A77, GSO, A726 and A727 are kept open to traffic and to minimise disruption to road users.
- 1.13 BBRCE's operatives will be available for winter services in accordance with the WSP at least one month prior to commencement of the winter period.

- 1.14 Salt bins or heaps shall not be used unless problems such as regular water flow from a verge, occurs. In such cases temporary use of a salt bin or heap shall be made until a permanent solution can be found.
- 1.15 In exceptional circumstances, where it would benefit the service to road users, the use of salt bins containing grit or a mixture of salt and grit may be considered for difficult footway areas, i.e. approaches to footbridges and subways, well used footpaths on steep gradients. Their use should be considered carefully, bearing in mind the resources available for spreading grit and the subsequent increased cleansing requirements.

2. Management arrangements

- 2.1 The Winter Service Manager (WSM) has the delegated responsibility for winter service decisions and operational actions. The WSM will have sufficient experience in delivering winter service operations to enable competent supervision and responsibility for all aspects of the Winter Service.
- 2.2 The WSM has delegated and overall responsibility for the winter service decisions, operational actions and ensuring compliance with the Contract and the following activities:
 - Ice prediction and weather forecasting service
 - Collection and management of weather data
 - Approval of daily winter service decision making
 - Plant and communications
 - De-icing material stock levels and storage
 - Staff and Operative training and rosters
 - Maintaining records
 - Daily and annual reporting
- 2.3 All winter maintenance activities will be carried out in full compliance with the COVID-19 Safe Systems of Work in force at the time.
- 2.4 The BBRCE Winter Service Duty Officers (WSDOs) are contacted either at the Connect Operations Centre or by mobile telephone during working hours or outside working hours. Details of the WSDOs are provided in Appendix F. If there is a requirement to contact the WSDO in an emergency, then contact can be made through the BBRCE emergency number, Redacted.
- 2.5 The WSDOs have the relevant experience and training to be responsible for receiving weather information, taking decisions and initiating appropriate action for all winter events that take place during the period for which he or she is on duty. The WSDO will have received, as a minimum, RoadCast Standard Training Course provided by MeteoGroup. This training includes basic meteorology and for the interpretation of weather forecasts to make informed winter maintenance decisions. Training certificates will be available for inspection.
- 2.6 The algorithm in Appendix G will be used to facilitate the decision-making process, but decisions will not be restricted to its recommendations or in accordance with the action flowchart on Appendix H.

- 2.7 The altitude maps contained in Appendix N will further assist the WDSO's interpretation of the weather forecast and feed into the decision-making process described above.
- 2.8 For co-ordination purposes a supplementary information sheet containing key contact names within the adjacent Agents and Authorities is included as Appendix I.
- 2.9 Consultation has been made with the South West Trunk Road Unit Operating Company, East Renfrewshire, East Ayrshire and South Lanarkshire Councils with regards to any boundary issues with regards to precautionary gritting.

3. Weather forecast provider



- 3.1 MeteoGroup will act as the Forecasting Organisation during the 2021/2022 winter season.
- 3.2 From 1 October 2021 to 15 May 2022 weather forecasts will be issued daily by MeteoGroup. These will be transmitted to the Forecasting Organisation's web-based viewer to facilitate interrogation of the disseminated data. The web-based viewer will be available at the Connect M77 Operations Centre and to all WSDOs.
- 3.3 The following forecast data will be available via the web-based viewer:
 - (a) **by 1300hrs**
 - 24 hour forecast
 - 2-5 day outlook
 - Prediction graphs for outstations
 - (b) **by 1900 hours**
 - Updated prediction graphs if required when the 1300 hours minimum road surface temperature prediction is below +3°C.
 - (c) Further amendments as advised throughout the 24-hour period.
- 3.4 All amendments to the forecast will be advised by telephone from MeteoGroup to the WSDO.
- 3.5 If, for any reason, access to weather forecasts is not possible by normal means (company issued computers) any web enabled device may be utilised instead, including computers at other locations and smart telephones.
- 3.6 A 24-hour consultancy service is available from MeteoGroup not only to answer specific queries but also to be made aware of actions being taken in response to forecasts. This helps the forecaster in deciding the need to update information to BBRCE.
- 3.7 Contact details of MeteoGroup can be found in Appendix I.
- 3.8 MeteoGroup has confirmed that the Project Roads pass through one climatic domain and that forecast provision will be based on this climatic domain.
- 3.9 Weather radar and archive facilities will be available via the MeteoGroup web site.

4. Ice prediction system



- 4.1 The Computerised Road Weather Information System (CRWIS) shall assist the WSDO in the decision-making process for the winter operations. This system will be provided by Vaisala Limited.
- 4.2 The CRWIS provides for incoming road meteorology forecasts, being issued by the forecast provider, to be captured and stored on the system.
- 4.3 The CRWIS will be set to poll ice sensor outstations at hourly intervals.
- 4.4 The CRWIS has an archive facility which will back up the data from the system on a regular basis. Vaisala also back up their whole system and information can be retrieved for the purpose of audit and any potential third-party claims. All proposed actions will be sent out via e-mail and posted through the MeteoGroup Message Board web page to designated personnel.
- 4.5 There are three ice sensor stations located at M77 Gardrum Mill, A726 Peel Park and the GSO Glasgow Road. The Gardrum Mill site will be used as a forecast site by the Forecast Organisation. The locations of the sites, relative to the route, are shown in Appendix E.
- 4.6 If in the unlikely event that the CRWIS fails for any reason, then the WSDO can contact the 24-hour CRWIS helpdesk and/or the MeteoGroup consultancy service for assistance.

5. Decision making

- 5.1 For planning and operational purposes three Winter Service periods are defined as follows:

| | |
|----------|--|
| High | The months of December, January and February, when severe conditions might reasonably be expected. |
| Low | The months of November and March, when severe conditions may occur. |
| Marginal | The months of October, April and May, when severe conditions are not expected, but will be continually monitored with appropriate action taken when required |

- 5.2 Winter Service site operations will be undertaken by BBRCE from 1 October 2021 to 15 May 2022. BBRCE will have appropriately qualified staff available to carry out all winter service duties. BBRCE will have sufficient resources available on a **Normal** and **Stand-by** basis to cover precautionary salting actions within a total treatment and response time of three hours. Additional staff will be made available by BBRCE to enable 24-hour **Continuous** operation, when required. The definitions of the highlighted terms are:

| | |
|------------|---|
| Normal | On duty, based at the depot during normal working hours. |
| Standby | Personnel available at the depot, no more than one hour after being called out. |
| Continuous | On duty, based at the depot on a 24-hour/day basis. |

| Decision Matrix Guide | | Predicted road conditions | | |
|----------------------------|---|--|-----------------------------------|-----------------------------------|
| Road surface temperature | Precipitation etc. | Wet | Wet patches | Dry |
| May fall below +1°C | No rain No hoar frost No fog | Salt before frost | Salt before frost | No action likely, monitor weather |
| Expected to fall below 1°C | No rain No hoar frost No fog | | (See note A) | (See note A) |
| | Expected hoar Frost Expected fog | | Salt before frost (see note B) | |
| | Expected rain BEFORE freezing | Salt after rain stops | | |
| | Expected rain DURING freezing | Salt before frost and after rain stops (see note C) | | |
| | Possible rain Possible hoar Frost Possible fog | Salt before frost | | Monitor weather conditions |
| Expected snow | | Salt before snow fall | | |
| Freezing rain | Before rain | Salt before rainfall (see note C) | | |
| | During rain | Salt during rainfall (see note C) | | |
| | After rain | Salt after rainfall (see note C) | | |

Notes:

- Particular attention should be given to any possibility of water running across carriageways and such locations should be monitored and treated as required.
- When a weather warning contains reference to expected hoarfrost considerable deposits of frost are likely to occur and close monitoring will be required. Particular attention should be given to the timing of precautionary treatments due to the possibility that salt deposited on a dry road may be dispersed before it becomes effective.
- Under these circumstances rain will freeze on contact with running surfaces and full pre-treatment should be provided even on dry roads. This is a most serious condition and should be monitored closely and continuously throughout the danger period.

| Forecast weather | Frost susceptible/surface water run off area (grammes/m ²) | Road surface wet (grammes/m ²) |
|---|--|--|
| A. RST higher than plus 1 °C | 0 | 0 |
| B. RST lower than or equal to plus 1 °C but higher than minus 2 °C | 10 to 20 | 10 to 20 |
| C. RST lower than or equal to minus 2 °C but higher than minus 5 °C | 10 to 20 | 10 to 20 |
| D. RST lower than or equal to minus 5 °C | 20 | 20 |
| E. RST lower than or equal to plus 1 °C but higher than minus 2 °C following rain. | 20 | 30 |
| F. RST lower than or equal to minus 2 °C but higher than minus 5 °C following rain. | 30 | 40 |
| G. RST lower than or equal to minus 5 °C following rain. | 40 | 40 |
| H. Hoar frost | 20 | 20 |
| I. Freezing fog | 10 | 20 |
| J. Freezing rain | 40 (See decision matrix) | 40 (See decision matrix) |
| K. Snow accumulations up to 30mm | 30 | 40 |
| L. Snow accumulations over 30mm | 40 | 40 |
| M. Hard packed snow/ice | See clearance matrix | See clearance matrix |

- 5.3 The text forecast provided by the weather forecast provider will be the primary factor in deciding upon the appropriate action to be taken.
- 5.4 Treatment times for precautionary salting will not exceed two hours. The maximum combined response/treatment time during any winter service period shall not exceed three hours. BBRCE will undertake internal audits of the Winter Operations to ensure that contractual response times are being achieved.
- 5.5 Outside Normal working hours the winter service operations will be controlled by the WMO, who has 24-hour communication access to the operational personnel.
- 5.6 Clear communication channels will be established between the WSDO, adjacent agents and authorities and Traffic Scotland. It is BBRCE's intention that a consistent approach to winter service operations can be established between adjacent agents and authorities, e.g. times of gritting. However, it should be noted that forecast information may vary between all parties therefore a consistent approach may not always be possible. Contact details for adjacent agents and authorities can be found in Appendix I.

- 5.7 The WSDO will liaise with the ERC representative, Connect M77/GSO plc and Traffic Scotland on a day-to-day basis as appropriate to the conditions.
- 5.8 BBRCE will distribute copies of proposed actions to adjacent Agents, Authorities and Police by e-mail and posted on MeteoGroup message board.
- 5.9 Full use will be made of the weather forecast and CRWIS to determine the optimum time to commence precautionary salting. However, Winter Service Patrols as described in Section 7 of the WSP will be carried out when conditions dictate.
- 5.10 Due to the network road surface having Stone Mastic Asphalt, residual salt in an open texture surface is negligible.
- 5.11 In the event of hoarfrost, black ice or freezing fog being forecast, precautionary salting or salting using pre-wetted salt will be carried out even if roads are dry.
- 5.12 In the event of frost forecast after rain, precautionary salting will be delayed until cessation of precipitation to reduce loss of salt by runoff unless precipitation occurs at the time of forecast frost. In the event of precipitation occurring unexpectedly before forecast frost all affected sections of the project roads will be inspected and, if required, corrective action will be taken before the forecast frost to re-salt any sections of the project road where salt has been lost due to runoff.
- 5.13 In the event of a report of hoarfrost or freezing fog occurring without a forecast and causing the road surface to become icy, the Patrol driver will be deployed by the WSDO for immediate salting of routes affected as soon as the conditions are reported unless thawing is likely before salting can begin.
- 5.14 In the event that a query of any decision is made by the WSDO or no treatment is planned when a red code readiness is forecast, then the Network Manager will be notified.

5.14 Records

5.14.1 The WSDO shall maintain sufficient records to enable:

- (a) a detailed check of monthly accounts
- (b) an annual performance appraisal
- (c) handling of third-party insurance claims

5.14.2 These reports will be either stored and archived by MeteoGroup/Vaisala and accessed via their websites or kept electronically by BBRCE on computer network drives. The records content will include at least the following:

- Weather reports
- Action taken
- Route length treated (particularly where this relates to spot treatment)
- Plant and manpower deployed
- Hours worked
- Salt usage
- Number and nature of complaints

5.14.3 Winter service records will be retained for the minimum periods stated within Schedule 4, Part 7 of the Project Agreement.

5.15 Reports

5.15.1 The following routine reports will be prepared by the WSO throughout the three winter service periods:

- (i) Daily, minimum ice sensor temperature summaries are available via the Vaisala web-based system. All other temperatures and road states are also available within the same system.
- (ii) A monthly summary of, actions taken and daily salt usage. Salt usage will be related to the daily forecast and will therefore cover the period 1200hrs – 1200hrs. The scheduled routine weather forecasts are accessible via computers and smart telephones at any time. In the event of unscheduled forecast updates the Forecasting Organisation will inform the WSO, who will in turn verify the changes on their own computer and notify the operatives of any change in the proposed action.

5.15.2 Any major incident arising on the Project Roads as a result of winter conditions will be notified immediately to ERC by telephone. A written report will be provided to ERC within 12 hours of the DBFO Company becoming aware of the incident.

5.15.3 An end of season Winter Service report will be produced by 31 May 2022, in accordance with the Project Agreement.

5.15.4 Prior to the 15th June 2022, the company shall convene a meeting with adjacent road authorities to review the company's operations. In turn a report will be submitted by the 30th June 2022 containing proposals and recommendations.

6. Salting routes

6.1 Maps and descriptions of the salting routes and depot location are detailed in Appendix C.

6.2 Prior to the commencement of pre-salting operations, salt spreading plant will be subject to dry running to ensure compliance with the salting route duration requirements and to prove mechanical worthiness. Dry running will include for the fitting of ploughs and other associated equipment. Records of dry runs will be produced.

7. Patrol routes

7.1 The purpose of Winter Service Patrols is to identify sections of the route where ice may be forming at an early stage and provide advance warning of potential adverse conditions.

7.2 Where the forecast provider is predicting road temperatures of +3°C or below, winter service patrols will be instructed.

7.3 Winter service patrols are normally carried out during the period 1 November to 31 March inclusive, between the hours of 02:00hrs and 10:00hrs, however patrols may also be instructed at the discretion of the WSDO outside this period should marginal conditions prevail.

7.4 Where patrols are instructed, they will take place not less than one hour driving with one hour rest throughout the period where the road temperature remains below 3°C.

- 7.5 Duty Operatives will follow two prescribed routes of patrol in a loaded gritter. One gritter will concentrate on the M77 between Junction 3 to A77 Grassyards and the other on the GSO, A726 and A727. Should ice/hoar frost be encountered, the Duty Operatives will notify the WSDO and seek further instruction.
- 7.6 A map and description of the patrol route are provided in Appendix D.
- 7.7 It should be recognised that the threshold of winter service patrol deployment is stated within the Project Agreement and this may, on occasion, lead to disparity of winter service treatments with the inter-connecting road network.

8. Snow clearing

- 8.1 When a snow warning is received precautionary salting will be carried out on all routes. Snowploughs will be fitted to appropriate vehicles on commencement of snowfall.
- 8.2 Snowploughing will not normally take place if the depth of snow is less than 30mm.
- 8.3 If precautionary salting has been carried out before the snowfall and the depth of snow reaches 30mm then ploughing with simultaneous salting will be carried out utilising dry salt.
- 8.4 If precautionary salting has not been carried out and the depth of snow is less than 30mm, salting only will be carried out.
- 8.5 If precautionary salting has not been carried out and the depth of snow exceeds 30mm, simultaneous salting and ploughing will be undertaken.
- 8.6 Ploughing will be carried out based on “ploughing by lanes”. In the first instance this will generally imply the nearside lane of dual carriageways and full width clearance of single carriageways, with subsequent ploughing of other lanes. Ploughing will be undertaken in such a manner as to not deposit snow from more than two lanes into the central reserve. No snow will be deposited onto areas below elevated carriageways, multi-level or grade separated junctions
- 8.7 Ploughing of slip roads will be undertaken as soon as practically possible following the clearance of the main carriageway nearside lane to ensure a single lane each way of Network is operable. Only when this single lane of Network has been secured will ploughing operations commence in the offside lanes of dual carriageways and slip roads.
- 8.8 Lighter falls may call for ploughing where local drifting has occurred or to remove snow not dispersed by traffic, e.g. where traffic is reluctant to use offside lanes or at night when traffic is light.
- 8.9 Ploughing will continue for as long as necessary to clear all routes. It is important that the M77/A77, GSO, A726 and A727 within the Project Network are cleared and that no area is abandoned for the sake of concentrating resources on localised areas. In all cases, therefore, the defined precautionary salting routes will be adhered to for snow ploughing. Where conditions demand a more intensive treatment in specific areas a reserve vehicle will be called out to attend such areas.
- 8.10 Where reasonably practical, ploughing will be undertaken to join with neighbouring authorities' operations as to provide a consistent clearance of the larger network. BBRCE will endeavour to advise its neighbouring authorities of when ploughing operations are to commence.

- 8.11 In all ploughing conditions care will be taken wherever possible to ensure that any resulting windrows are kept to a minimum and are removed as soon as possible so not to obstruct the flow of water to highway drainage outlets and to ensure that road markings and road studs are visible.
- 8.12 It may not be possible to remove deep accumulations of snow or snowdrifts by normal ploughing and the use of other mechanical plant, including snow blowers, may be necessary.
- 8.13 In exceptionally adverse conditions BBRCE will bring into operation previously arranged plans to use other plant and labour such as farmers' tractors and loading shovels and plant hires or other recourses within BB Group as described in Appendix J.
- 8.14 In the event of exceptional snowfall, which may require the temporary dumping of accumulated snow, the WSDO will decide to stockpile off site and store within depot/lay by holding areas or storage facilities/arrangements.
- 8.15 Should extreme conditions persist and road closures have to be considered, the WSDO will consult with the Police and contact Traffic Scotland staff and advise them accordingly. There are no snow gates on the project network.

8.16 Rates of spread

- 8.16.1 Salt will melt ice and snow at temperatures as low as -20°C, however, below -10°C the amount needed becomes environmentally and economically undesirable. Salt will therefore be applied at the rates shown in Section 5 – Decision Making.
- 8.15.2 Use of salt alone to treat hard packed snow and ice must be done with caution as in low temperatures it can result in an uneven and slippery surface. In exceptional circumstances a 6mm single size abrasive aggregate will be applied either separately or mixed with the salt. This application is purely to assist traction and does nothing to clear snow or ice and its use will be discontinued as soon as possible to avoid blocking of gullies and drains on thawing.

8.17 Footways and cycle tracks

- 8.17.1 In times of snowfall, heavily used footways and footbridges as detailed in Appendix B will be cleared in accordance with the priorities defined therein so to ensure that ice and snow is removed by 1700hrs the following working day.
- 8.17.2 As much as possible priority will be given to pedestrian crossing and waiting points such as bus stops.

8.18 Follow-up actions

- 8.18.1 Arrangements will be made to keep drains and drainage channels clear to deal with floodwater in the event of a rapid thaw.
- 8.18.2 After periods of snow and frost, arrangements will be made to inspect the roads for frost damage and where necessary, in the interests of safety, carry out temporary or permanent repairs.

8.19 Method Statements and Risk Assessments

- 8.19.1 Maintenance works will be undertaken by the operatives in accordance with BBRCE's Health and Safety Procedures Manuals.

9. Labour

- 9.1 The minimum training requirement for BBRCE operatives will be the City & Guilds award for Winter Service Operatives, or an acknowledged industry equivalent.
- 9.2 Details of the operatives' training are included as Appendix F. All records are kept centrally at the Connect M77 Operations Centre.
- 9.3 Call out procedures in the event of an emergency will be as defined in M77-OPS-003 Emergency Response Plan.

10. Plant, equipment and depots

- 10.1 The operations described within this Winter Service Plan shall be run from the Connect M77 Operations Centre at Maidenhill.
- 10.2 The vehicles described in Appendix K are to be used for winter service functions on the M77/A77, GSO, A726 and the A727. Salt spreading vehicles used on the Network will be capable of GPS satellite positioning. The tracking of vehicles will be provided by Masternaut.
- 10.3 Major servicing of the vehicles, including the reserve vehicle, will be carried out before 1st October 2021.
- 10.4 All gritters will be fitted with road sensor temperature probes which will transmit GPS positioning and temperatures to a web page accessible by Transport Scotland, Traffic Scotland and the WSDO.
- 10.5 Routine servicing, comprising daily vehicle checks, when operational, and an eight-weekly vehicle inspection will be carried out.
- 10.6 BBRCE has appointed Balfour Beatty Fleet Services who will supply a fitter and will be available on call 24 hours per day during the whole winter maintenance season to deal with any defects of the gritting vehicle, spreading equipment or loading shovel.
- 10.7 All vehicles, plant and equipment will be provided by Balfour Beatty Fleet Services and be available for use at the depot during the winter service period. An in situ calibration check will be carried out bi-annually in September and January. In addition, an ad hoc calibration will be undertaken of a spreader that has undergone repair to the hopper and spinner mechanism.
- 10.8 It is a BBRCE requirement that all winter service vehicles have a radio or hands-free telephone and on-board data capture equipment within each vehicle.
- 10.9 All winter fleet vehicles will carry welfare kits for distribution in the event of a critical incident involving stranded vehicles. Each vehicle will have on board a minimum of 24 kits which will include the following:
 - Space blankets
 - Bottles of water
 - Energy bars

11. De-icing materials

11.1 Details

- 11.1.1 Salt will be kept as dry as possible in a purpose-built salt barn. Dry salt is easier to handle and can be more accurately spread at the specified rates with the equipment available.
- 11.1.2 Run-off from the salt will be collected by the positive drainage system within the depot.
- 11.1.3 Steps will be taken to ensure that salt is correctly rotated in use and that old salt is not allowed to accumulate at the end of each season.
- 11.1.4 All salt for treatment purposes will be ordered by BBRCE.
- 11.1.5 BBRCE will arrange for salt stocks to be periodically tested to the current British Standard (BS 3247) for grading and also for moisture content and density, and will endeavour to arrange that testing commences at the beginning of each season or will only order salt from Quality Assured suppliers.

11.2 De-icing Material Stock

- 11.2.1 Details of salt stockpiles are included as Appendix L

11.3 Pre-wetted Salt

- 11.3.1 BBRCE will continue to use pre-wetted salt as a precautionary treatment. Precautionary salt spreading rates will be reduced by 30% for the pre-wetted applications. These applications will be made up of 70% rock salt and 30% brine.
- 11.3.2 Pure white salt will be stored at the Connect M77 Operations Centre for the production of brine on site. Salt concentration in the brine will be manufactured to a target of 23%, in accordance with the manufacturer's guidelines.
- 11.3.3 A salt saturator is installed within the yard area of the Connect M77 Operations Centre and will also act as a storage vessel. The capacity of the tank is 5,000 litres, which is the equivalent to two precautionary treatments on the network.
- 11.3.4 Brine will be regularly monitored to ensure that it is manufactured to a target of 23%.
- 11.3.5 Appendix C scopes out the amount of salt and brine required for pre-wetted treatments.

12. Variable message signs and publicity

- 12.1 The use of Variable Message Signs (VMS) to inform motorists of road conditions will be encouraged where possible. The WSDO will endeavour to co-ordinate information to Traffic Scotland (NNCC) on a regular basis to enable current road conditions to be disseminated via the national VMS system.
- 12.2 During periods of heavy snowfall or other extraordinary circumstances, where media attention is considered highly likely, contact will be made with the East Renfrewshire Council Representative who will be requested to inform the media. The relevant contact details can be found in Appendix I.
- 12.3 Should parts of the Network, including the associated roads, be closed as a result of snow or ice, BBRCE will notify ERC, following the procedures set out in the project's Emergency Response Plan.

13. Locations for special treatment

- 13.1 Careful consideration will be given to areas along the route which are known to be susceptible to frost. Similarly, areas that are also affected from surface run off from adjacent land will be identified and closely monitored during low temperature periods, and additional salt dispersed as deemed appropriate by BBRCE. Any locations for special treatment will be detailed in Appendix M.

14. Other comment

14.1 Maidenhill Junction

- 14.1.1 It is anticipated that the new Maidenhill Junction on the GSO will still be under construction during the early part of the winter season. BBRCE will ensure there is close liaison and co-ordination with the developer's temporary traffic management (TTM) provider, CTM, to ensure that any winter service treatment required as a result of a change to the TTM layout is captured and carried out.
- 14.1.2 Once construction is complete, the precautionary salting routes and patrol route will be revisited and any amendment required will be provided as an addendum to the relevant appendices of this WSP.

Appendix A: Areas of responsibility

| Ref | Name and start point | Route length (m) | Full description |
|-----|---------------------------------|---------------------|--|
| A | M77 /A77 | 17,000 | M77 Junction 5 Ayr Road Overbridge to approximately 180m south of Meiklewood Interchange |
| B | A726 – Glasgow Southern Orbital | 10,000 | A726 Glasgow Southern Orbital from M77 Maidenhill Interchange to Philipshill Interchange |
| C | A726 | 1,250 | West Mains Road Roundabout to Philipshill Interchange |
| D | A727 | 1,250 | Philipshill Interchange to Carmunnock Roundabout |

Appendix B: Additional snow removal areas

High: To be carried out when all carriageway lanes open

Medium: To be carried out when High priorities complete

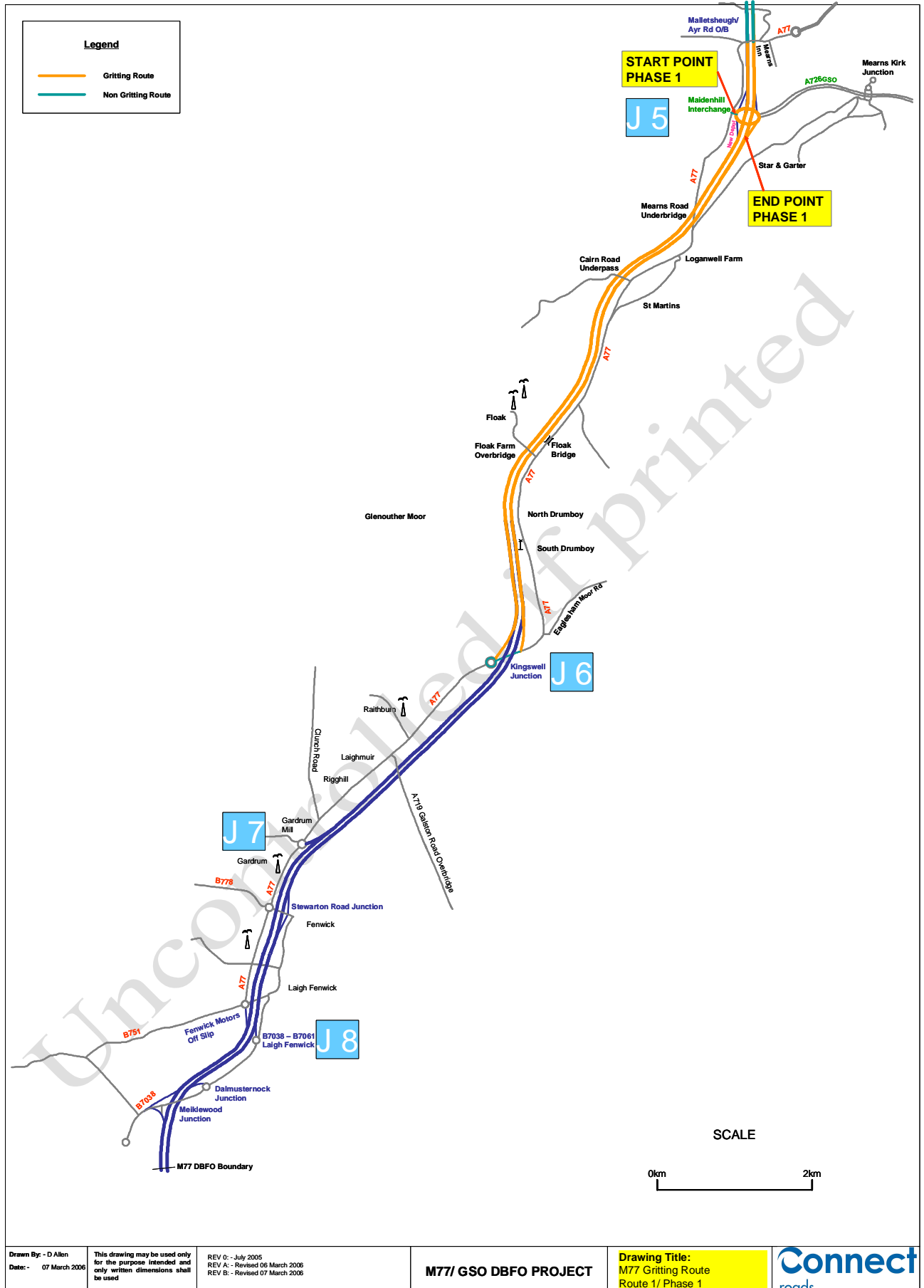
Low: To be carried out when Medium priorities complete

| | Layby | | Layby footway | | Other comments |
|--------------------|----------------------------------|----------------------------------|---------------|--------------|--|
| Priority | Northbound | Southbound | Northbound | Southbound | |
| M77/A77 | | | | | |
| High Priority | Police patrol point M77 | Police patrol point M77 | | | |
| Medium Priority | | | | | |
| Low Priority | | | | | |
| A726, A727 and GSO | | | | | |
| High Priority | Two bus stops Emergency layby | Two bus stops Emergency layby | | | To include footbridge and pedestrian crossing facility |
| Medium Priority | | | One footpath | One footpath | |
| Low Priority | | | | | |

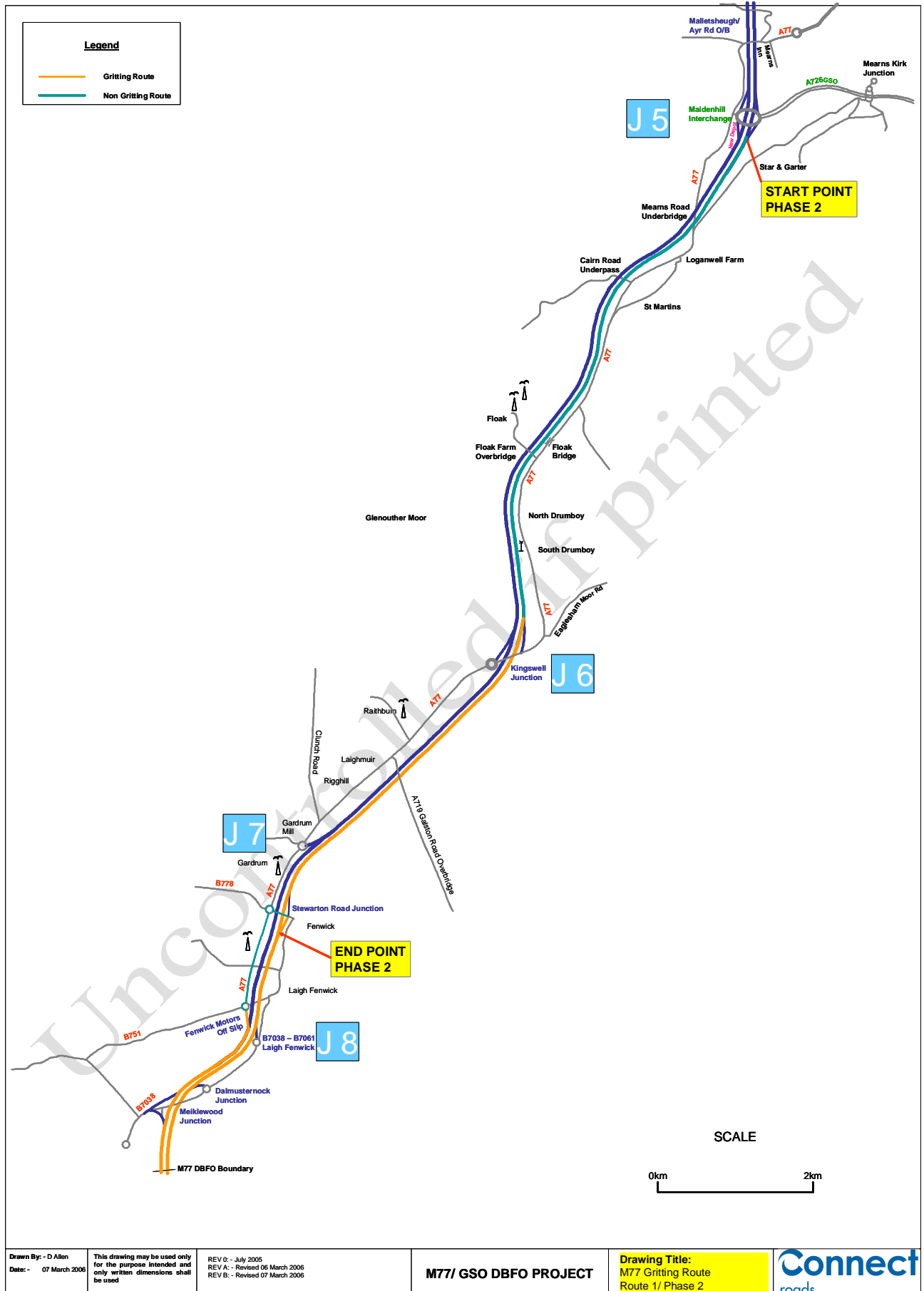
Appendix C: Precautionary salting routes

The routes defined below will be followed in order to treat the M77 during the 2021/22 winter season.

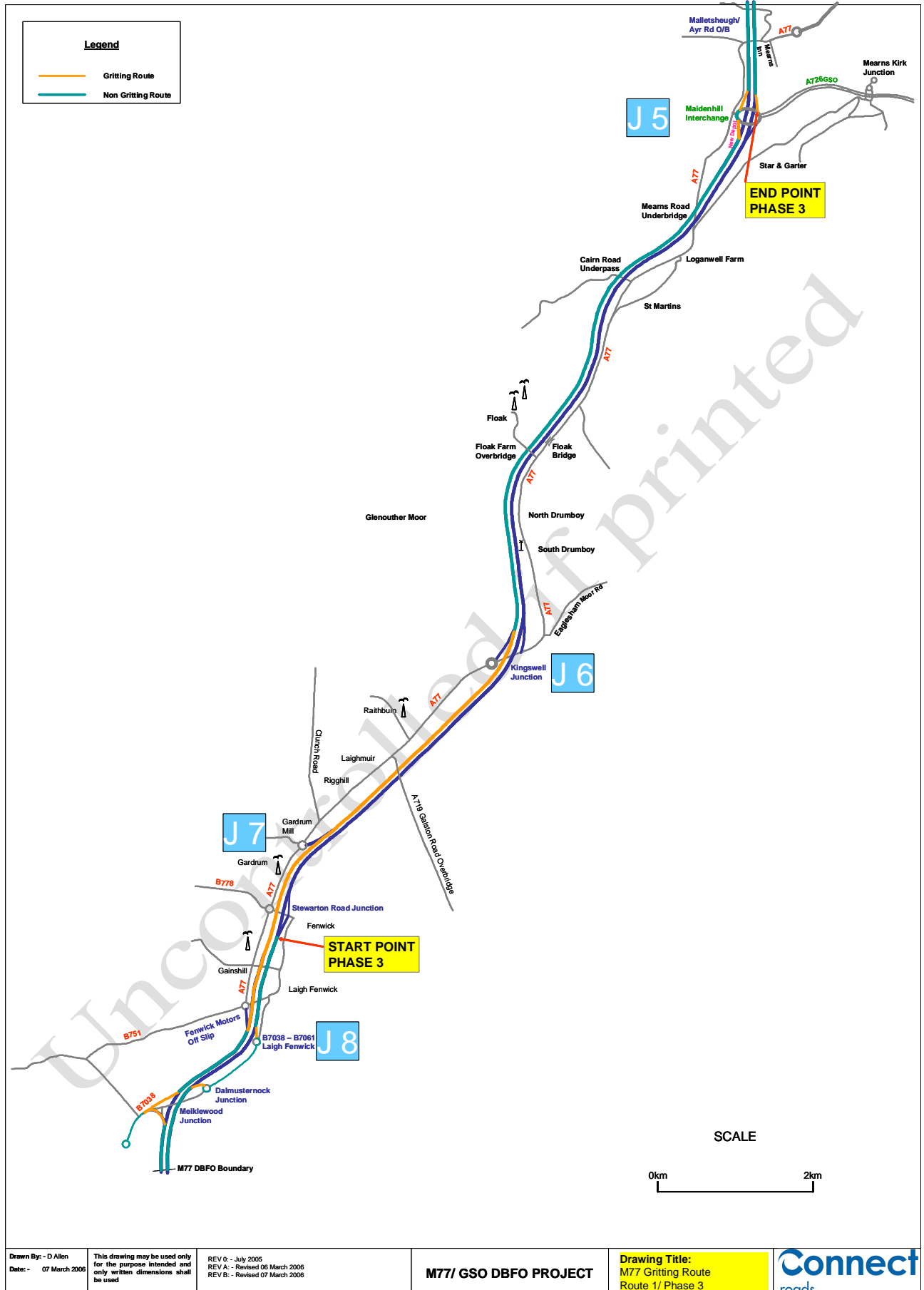
| M77 (Fenwick to Malletsheugh) Glasgow Southern Orbital DBFO | | |
|---|--|---|
| Route Number | One | Route Description M77 Motorway Malletsheugh to Meiklewood |
| Base Compound | Connect M77 Operations Centre | |
| Part | Description | Action |
| 1 | From Depot - to Maidenhill Roundabout (Junction 5) | Travel |
| 2 | Maidenhill Roundabout, M77 SB on slip, M77 main line to and including Kingswell (Junction 6) SB off slip | Salt |
| 3 | Proceed to Kingswell (Junction 6) NB on slip | Travel |
| 4 | Kingswell (Junction 6) NB on slip and M77 main line to boundary at Ayr Road Overbridge | Salt |
| 5 | Proceed to junction 3, turn at Jct 3 then back to Ayr Road Overbridge SB | Travel |
| 6 | Ayr Road Overbridge SB to merge with Maidenhill SB on slip | Salt |
| 7 | Proceed to Kingswell SB off slip | Travel |
| 8 | from Kingswell SB off slip to end of A77 network boundary | Salt |
| 9 | Turn at New Farm Loch and proceed to NB network boundary | Travel |
| 10 | NB from network boundary to and including Fenwick motors off slip | Salt |
| 11 | Proceed to Fenwick North (Junction 7) SB on slip | Travel |
| 12 | Fenwick North SB on slip | Salt |
| 13 | Proceed to Fenwick south (Junction 7) SB off slip | Travel |
| 14 | Fenwick south SB off slip | Salt |
| 15 | Proceed to A77 Meiklewood SB on slip | Travel |
| 16 | A77 Meiklewood SB on slip | Salt |
| 17 | Proceed to New Farm Loch, turn and proceed to Meiklewood NB off slip | Travel |
| 18 | Meiklewood NB off & on slip | Salt |
| 19 | Proceed to Fenwick motors off slip | Travel |
| 20 | From mainline Fenwick motors to Kingswell (Junction 6) NB on slip merge | Salt |
| 21 | Proceed to Maidenhill (Junction 5) NB off slip | Travel |
| 22 | Maidenhill NB off slip and NB on slip | Salt |
| 23 | Proceed to Junction 3, turn, and return to Maidenhill (Junction5) SB off slip | Travel |
| 24 | Maidenhill SB off slip | Salt |
| 25 | END OF ROUTE RETURN TO DEPOT | |



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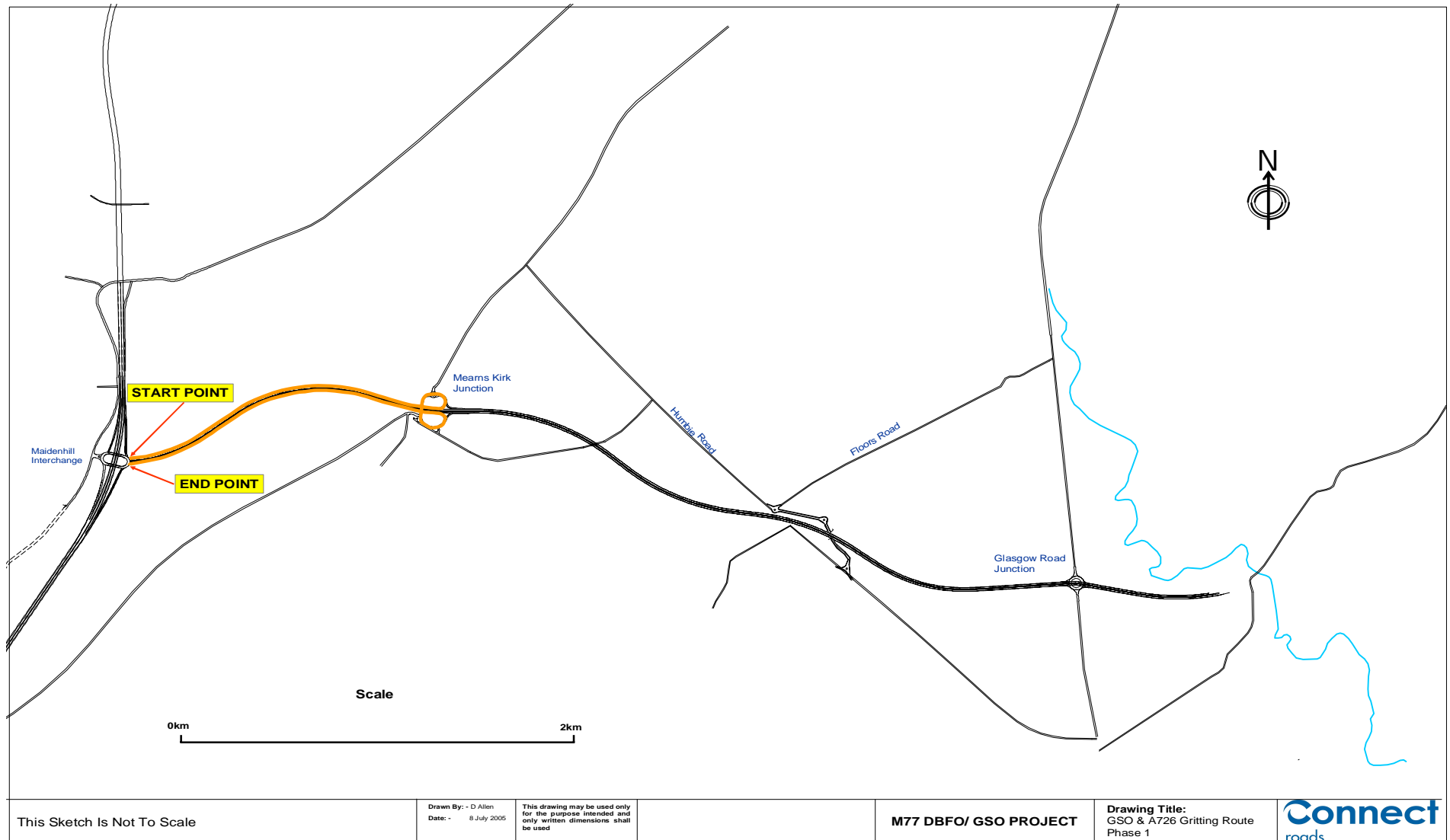


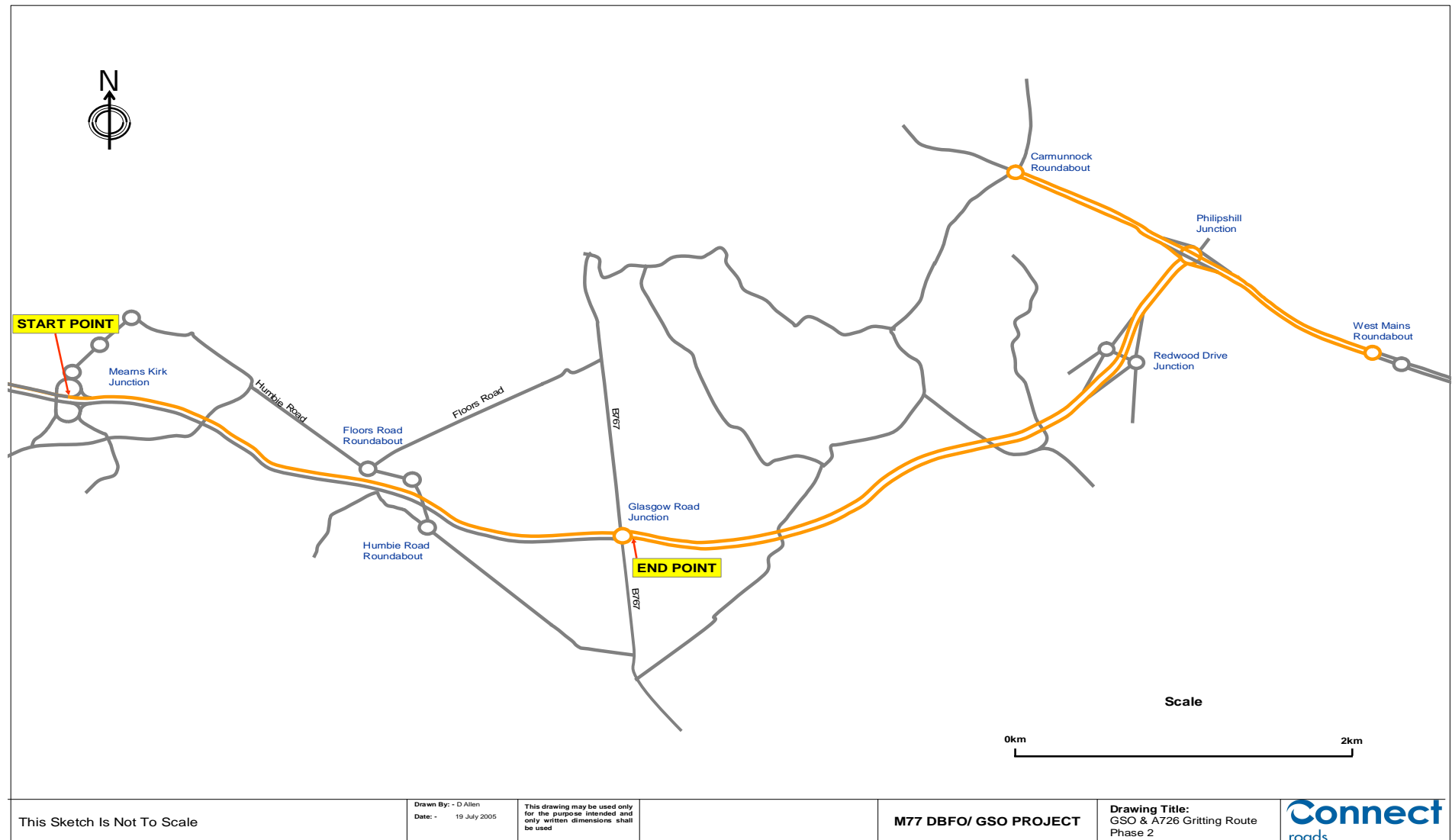
| | | | | | |
|---|---|---|-------------------------------------|--|---------------------------------|
| <p>Drawn By: - D Allen</p> <p>Date: - 07 March 2006</p> | <p>This drawing may be used only for the purpose intended and only written dimensions shall be used</p> | <p>REV D: - July 2005</p> <p>REV A: - Revised 06 March 2006</p> <p>REV B: - Revised 07 March 2006</p> | <p>M77/ GSO DBFO PROJECT</p> | <p>Drawing Title: M77 Gritting Route Route 1/ Phase 3</p> | <p>Connect roads</p> |
|---|---|---|-------------------------------------|--|---------------------------------|

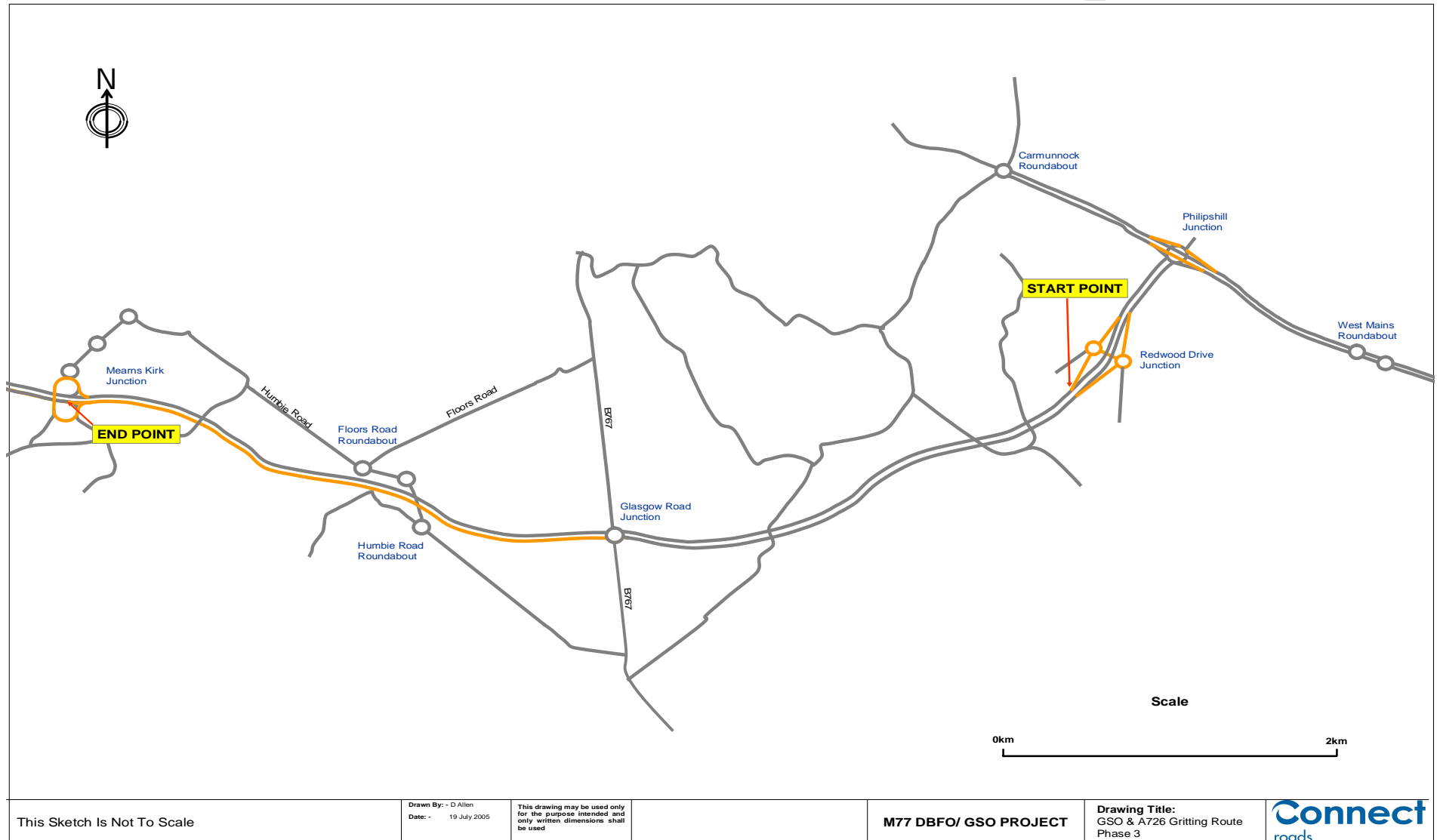
Winter Service Plan 2021/22

The routes detailed below will be followed to treat the GSO, A726 and A727 during the 2021/2022 Winter Season.

| M77 (Fenwick to Mallettsheugh) Glasgow Southern Orbital DBFO | | |
|--|--|---|
| Route Number | Two | Route Description Glasgow Southern Orbital and A726, A727 |
| Base Compound | Connect M77 Operations Centre | |
| Part | Description | Action |
| 1 | Maidenhill Interchange (Junction 5) to GSO Eastbound | Travel |
| 2 | GSO E/B and continue to & including Mearns Road E/B off slip, the over bridge onto W/B on slip to Maidenhill Interchange (Junction 5). | Salt |
| 3 | Return E/B to Mearns road E/B off slip | Travel |
| 4 | Main carriageway from Mearns E/B off slip to Glasgow Road Roundabout, circle r/about continue E/B to and including circling Philipshill r/about, A727 W/B on slip at Turnkey to and circle Carmunnock r/about and continue to A726 and circle West Mains r/about, to Philipshill W/B off slip and continue back to Glasgow Road Roundabout westbound. Stop | Salt |
| 5 | From Glasgow Road to Redwood Drive E/B off ramp | Travel |
| 6 | Redwood Drive E/B off and on slips. Stop | Salt |
| 7 | Proceed to Philipshill E/B on slip | Travel |
| 8 | E/B Philipshill on slip. Stop | Salt |
| 9 | turn at West Mains to W/B Philipshill flyover | Travel |
| 10 | Philipshill flyover from W/B off slip to W/B on slip. Stop | Salt |
| 11 | Proceed to Philipshill E/B off slip | Travel |
| 12 | E/B Philipshill off slip. Stop | Salt |
| 13 | Proceed to Redwood Drive W/B off slip | Travel |
| 14 | Redwood Drive W/B off slip and W/B on slip. Stop | Salt |
| 15 | Proceed W/B to Glasgow Road | Travel |
| 16 | Glasgow road W/B to and including Mearns Rd W/B off slip and continue over bridge to and including E/B on slip. Stop | Salt |
| 17 | Proceed to Glasgow Road Roundabout then proceed back to Mearns Road W/B off slip | Travel |
| 18 | between Mearns Road W/B off and on slips. Stop | Salt |
| 19 | Proceed to the M77 Fenwick North (Junction 7) SB off slip | Travel |
| 20 | Fenwick North (Junction 7) SB off slip | Salt |
| 21 | Proceed to Grass Yard, turn and proceed to Meiklewood NB stub slip | Travel |
| 22 | Meiklewood NB Stub slip | Salt |
| 23 | Proceed to Gardrum mill (Junction 7) NB on slip | Travel |
| 24 | Gardrum Mill (Junction 7) NB on slip | Salt |
| 25 | END OF ROUTE RETURN TO DEPOT | |







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Precautionary Salting Routes

| Precautionary salting route | | M77/A77 Malletsheugh to Fenwick |
|-----------------------------|---|---------------------------------|
| Route number | 1 | |
| Depot | Connect M77 Operations Centre | |
| Description | Malletsheugh to Meiklewood | |
| Depot to route (km) | 100m | |
| Time to route (minutes) | 1 minute | |
| Salting length | 37.2km | |
| Average speed (km/h) | 45km/h | |
| Route time (minutes) | 85 minutes | |
| Route to depot (km) | 300m | |
| Average width of route (m) | 10.10m | |
| Route tonnage at: | | |
| 10 g/m ² | <ul style="list-style-type: none"> • 3.89 tonnes (dry salt) • 2.72 70% of dry salt tonnage • 1,170 litres of 30% brine | |
| 20 g/m ² | <ul style="list-style-type: none"> • 7.79 tonnes (dry salt) • 5.45 70% of dry salt tonnage • 2,340 litres of 30% brine | |
| 40 g/m ² | <ul style="list-style-type: none"> • 15.58 tonnes (dry salt) • 10.90 70% of dry salt tonnage • 4,680 litres of 30% brine | |

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| Precautionary salting route | | Glasgow Southern Orbital (GSO) and A726 |
|-----------------------------|--|---|
| Route number | 2 | |
| Depot | Connect M77 Operations Centre | |
| Description | GSO and A726 | |
| Depot to route (km) | 100m | |
| Time to route (minutes) | 1 minute | |
| Salting length | 36.156km | |
| Average speed (km/h) | 45km/h | |
| Route time (minutes) | 70 minutes | |
| Route to depot (km) | 14.7km | |
| Average width of route (m) | 7.3m | |
| Route tonnage at: | | |
| 10 g/m ² | <ul style="list-style-type: none"> • 2.66 tonnes (dry salt) • 1.86 70% of dry salt tonnage • 800 litres of 30% brine | |
| 20 g/m ² | <ul style="list-style-type: none"> • 5.32 tonnes (dry salt) • 3.72 70% of dry salt tonnage • 1,6000 litres of 30% brine | |
| 40 g/m ² | <ul style="list-style-type: none"> • 10.64 tonnes (dry salt) • 7.44 70% of dry salt tonnage • 3,200 litres of 30% brine | |

Appendix D: Patrol routes

The route detailed below will be followed to patrol the M77, GSO, A726 and A727 during the 2020/2021 winter season.

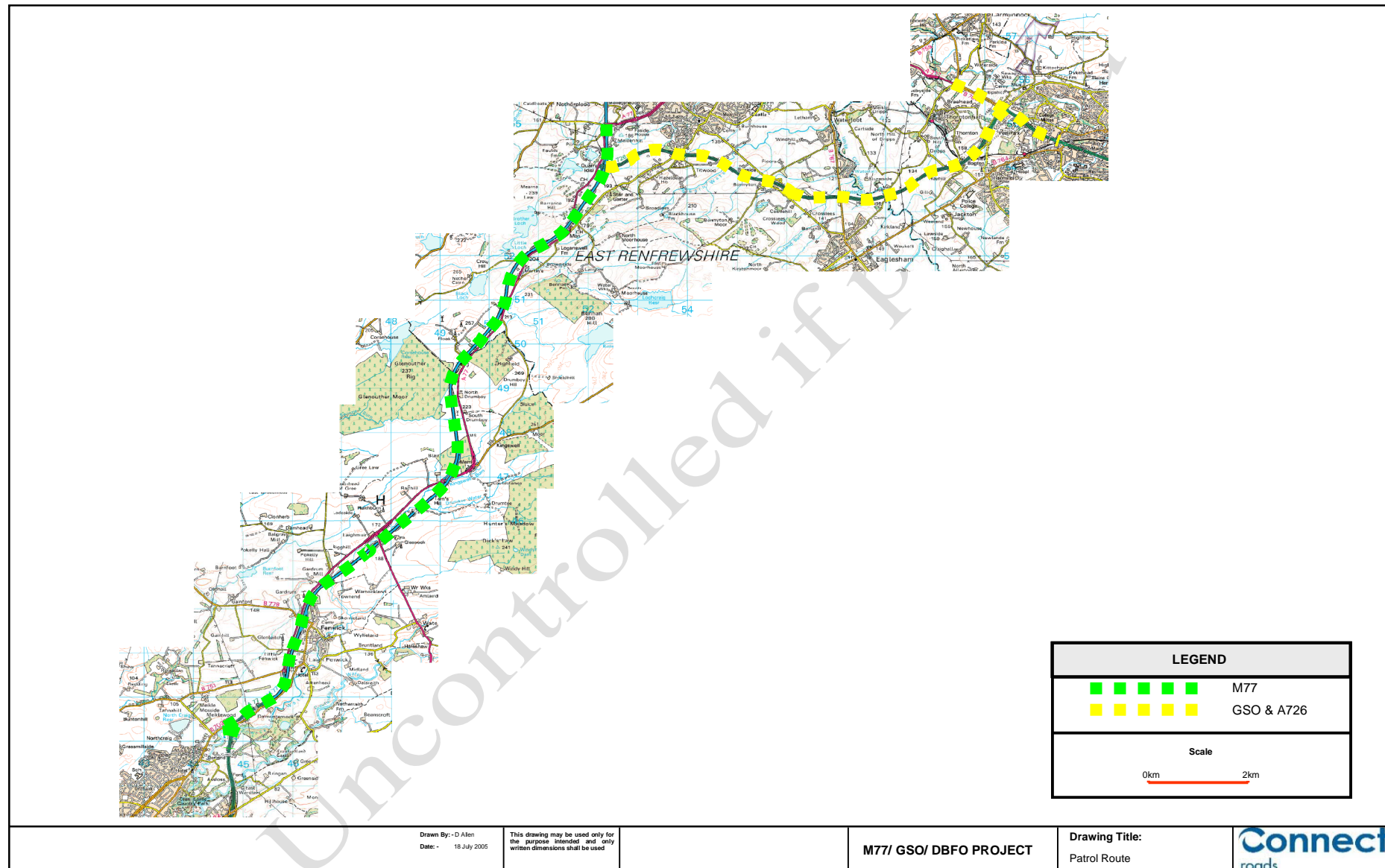
From Depot:

1. A726 Maidenhill to Philipshill Interchange
2. Philipshill Interchange to Carmunnock Roundabout
3. Carmunnock Roundabout to West Mains Roundabout
4. West Mains Roundabout to Philipshill Roundabout
5. Philipshill Roundabout to Maidenhill Interchange

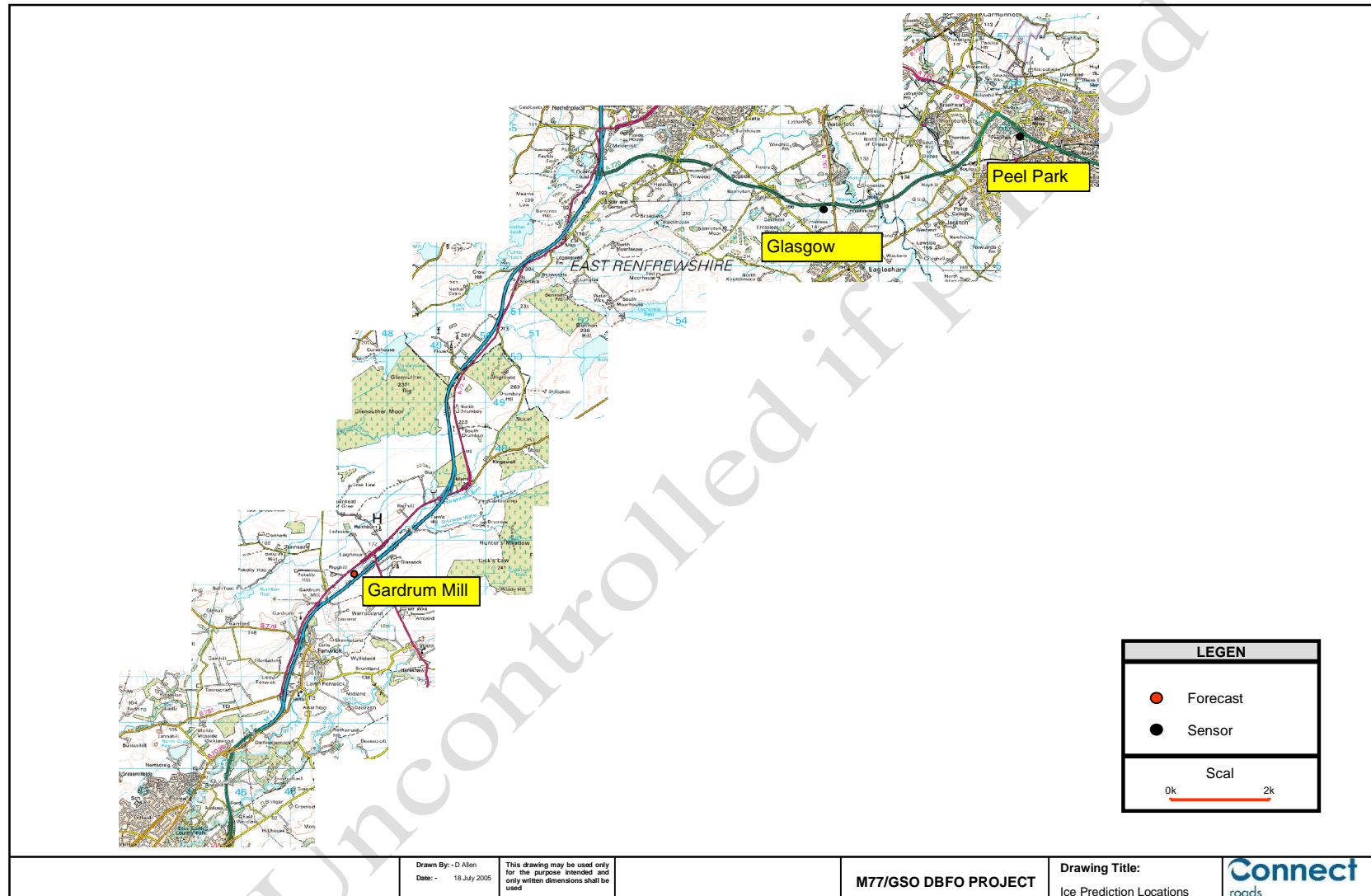
Resting place to be located on the GSO eastbound layby

1. Maidenhill Interchange to southern end of network at Meiklewood Interchange
2. Turn at Grassyards Interchange to northbound start of network
3. Meiklewood start of network to Maidenhill Interchange Junction 5 northbound on slip
4. Junction 5 northbound on slip to Junction 3 northbound off slip and return to Maidenhill Interchange

Resting place to be located on the Maidenhill Roundabout.



Appendix E: Ice station locations



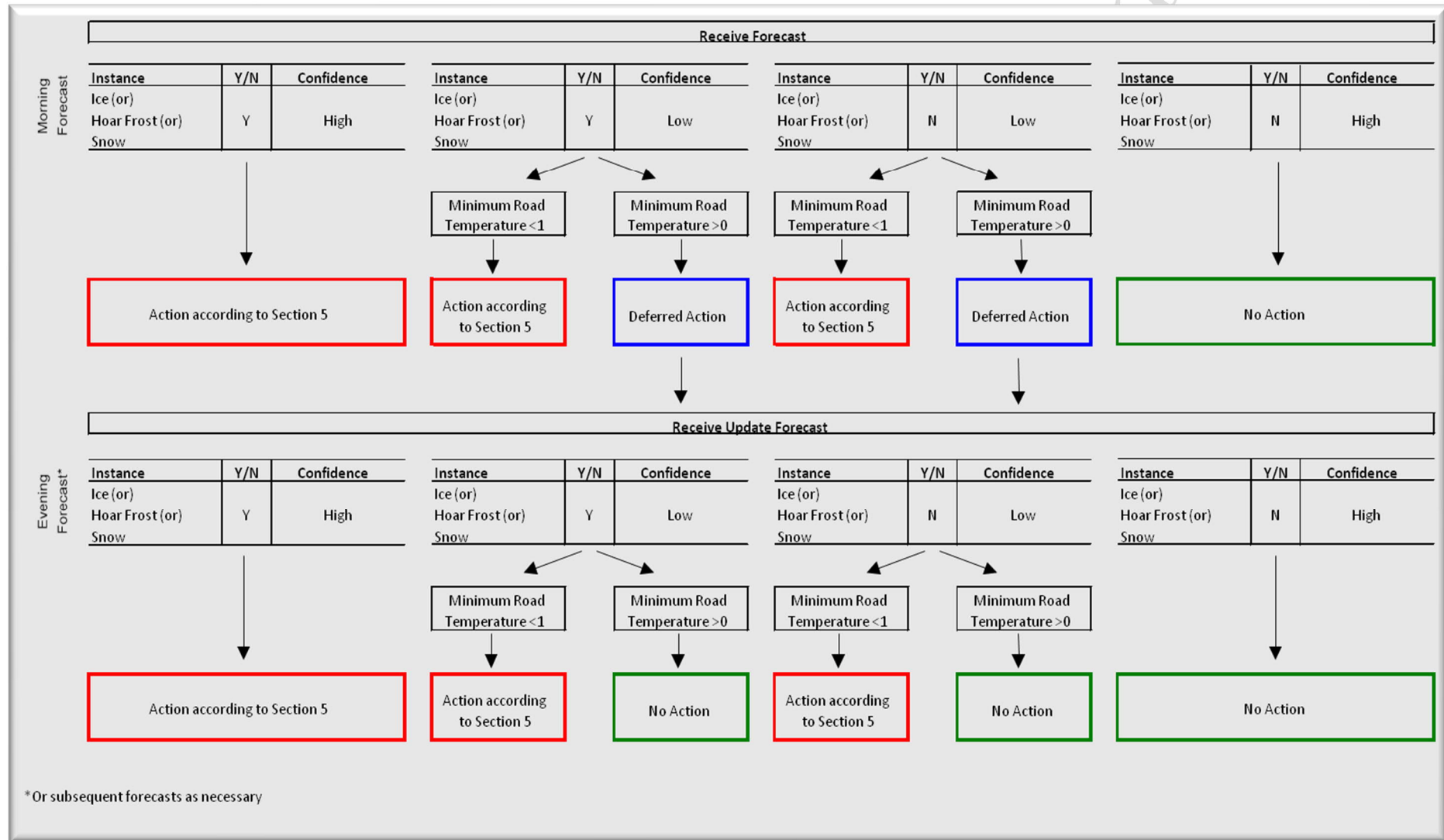
**Appendix F: Balfour Beatty winter maintenance staff and operatives
(this appendix is for restricted distribution)**

| Name | Role | Telephone number | Mobile telephone number |
|----------|------------------------|------------------|-------------------------|
| Redacted | Winter Service Manager | Redacted | Redacted |
| Redacted | WSDO | Redacted | Redacted |
| Redacted | WSDO | Redacted | Redacted |
| Redacted | WSDO | Redacted | Redacted |

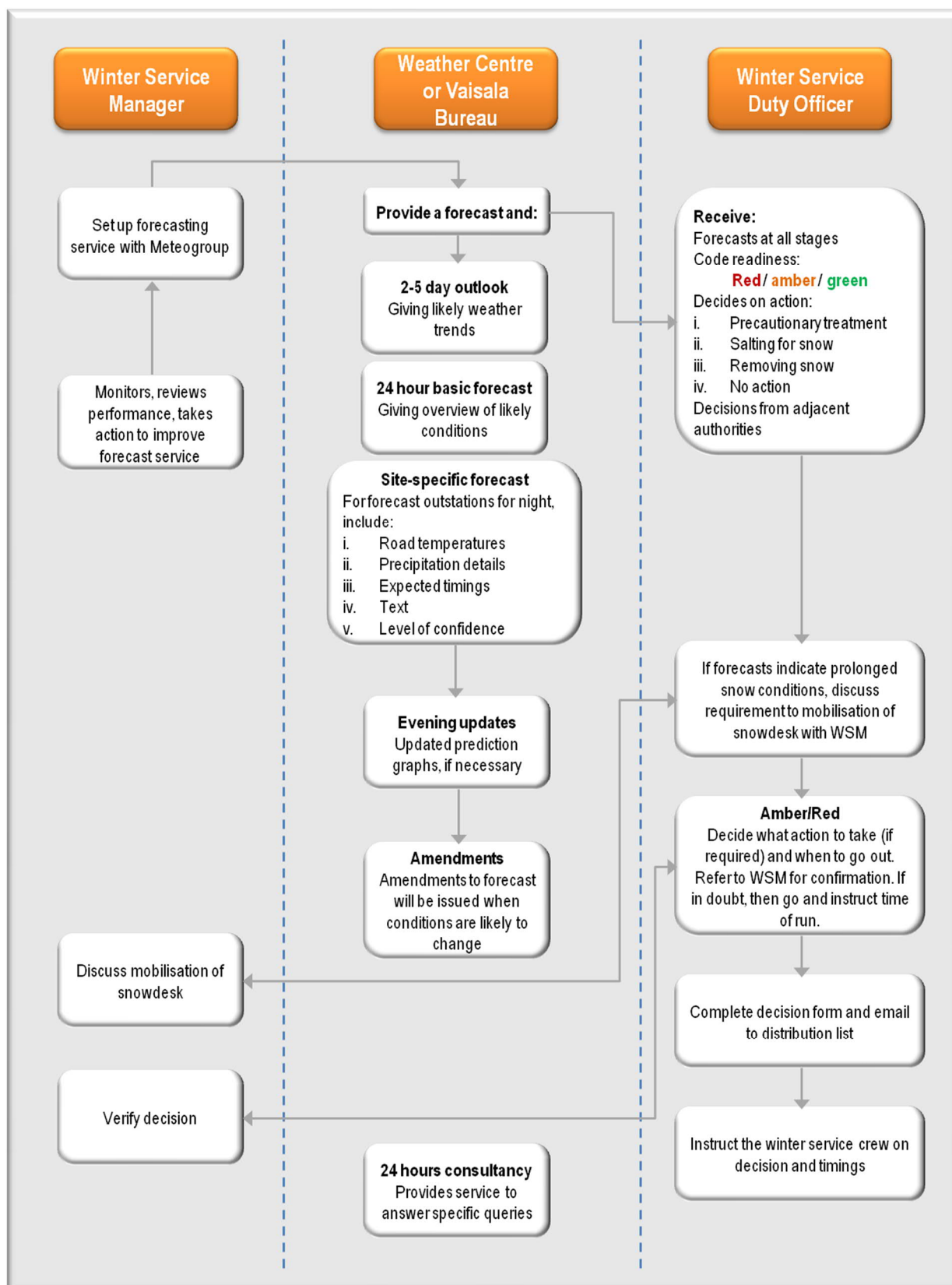
| Name | Role | Qualification | Mobile telephone number |
|----------|--------|---------------|-------------------------|
| Redacted | Driver | City & Guilds | Redacted |
| Redacted | Driver | City & Guilds | Redacted |
| Redacted | Driver | City & Guilds | Redacted |
| Redacted | Driver | City & Guilds | Redacted |
| Redacted | Driver | City & Guilds | Redacted |
| Redacted | Driver | City & Guilds | Redacted |
| Redacted | Driver | City & Guilds | Redacted |

In the event of a prolonged snow event further assistance will be provided from Balfour Beatty O&M winter maintenance teams at the CNDR and AWPR/B-T projects.

Appendix G: Winter Service decision making algorithm



Appendix H: Actions flowchart



Appendix I: Adjacent agents and authorities contact list

| Name of organisation | Telephone number |
|---|------------------|
| Connect M77/GSO plc | 0207 121 3780 |
| Balfour Beatty Regional Civil Engineering | |
| Office Hours | 0141 639 8638 |
| Out of Office Hours and Emergency | 0141 639 8638 |
| Balfour Beatty, Press Office 24 hour contact centre | 0207 963 2150 |
| Adjacent authorities | |
| East Ayrshire Council (for A77 and associated roads within EAC boundary) | 01563 573150/164 |
| East Renfrewshire Council (for associated roads within ERC boundary) | 0141 577 3000 |
| South Lanarkshire Council (for A726 and associated roads within SLC boundary) | 01355 806 337 |
| MeteoGroup | 0207 963 7575 |
| Duty Weather Forecaster (24 hours service) | 0203 808 2009 |
| Duty Weather Forecaster (Back up Number) | 0207 963 7574 |
| Vaisala helpdesk (for forecast communication queries) | 0121 683 1269 |
| Police Scotland | |
| Operations Room | 0141 532 2000 |
| Traffic Management and Abnormal Loads | 0141 532 6449 |
| Traffic Scotland Operations Room | 0131 203 8700 |
| East Renfrewshire Council | |
| Office Hours | 0141 577 3417 |
| Out of Office Hours | 0800 37 36 35 |
| South Lanarkshire Council | |
| Representative | 01698 453 692 |
| Out of hours | 0800 24 20 24 |
| East Ayrshire Council | |
| Representative | 01560 323 207 |

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| Name of organisation | Telephone number |
|--|------------------|
| Out of Hours | 0845 724 0000 |
| South West Trunk Road Operating Company Control room | 0800 042 0188 |
| Media | |
| AA | 0906 888 4322 |
| RAC | 01922 437 000 |
| Westsound | 01387 250 999 |
| BBC Scotland | 0330 123 0184 |
| Scottish Television | 0141 300 3000 |
| Bus Operators | |
| Scottish Citylink | 0871 266 33 33 |

Appendix J: Plant and equipment

The following table details the plant and equipment that can be called upon in exceptional adverse weather conditions.

| Contact name | Address | Telephone no. | Description of equipment |
|-------------------------------|---------|---------------|---|
| Blackwood Plant | | 01560 482 136 | JCBs, excavators, telehandler, 8 wheeled wagons |
| AB2K | | 0345 287 2999 | JCBs, excavators, telehandler, wheeled loading shovel |
| Malcolm Plant | | 0141 435 5200 | JCBs, excavators, 8 wheeled wagons |
| Balfour Beatty Fleet Services | | 01332 476 071 | Additional gritters |
| Balfour Beatty Plant | | 01142 329 760 | Telehandler, small tools |
| CNDR Contract | | 01228 713 050 | Additional gritters |
| WM Hamilton & Sons | | 01698 792 211 | 8 wheeled wagons |
| East Ayrshire Council | | 01563 576 680 | Gritters and snow blowers |
| A Plant | | 0141 445 5959 | Telehandler and small plant |

Appendix K: Winter service constructional plant

Table 1 – Operational Spreading Vehicles

| Location | Vehicle Type | Snowplough(s) | Capacity | Reg Number |
|------------------|--------------|---------------|-----------------|------------|
| Maidenhill Depot | Fixed body | Yes | 9m ³ | FM 66 LFG |
| Maidenhill Depot | Fixed body | Yes | 9m ³ | YH 67 VHX |
| Maidenhill Depot | Fixed body | Yes | 6m ³ | YR 14 OND |

Table 2 – Reserve Spreading Vehicle

| Location | Vehicle Type | Snowplough(s) | Capacity | Reg Number |
|------------------|--------------|---------------|-----------------|------------|
| Maidenhill Depot | Fixed Body | Yes | 6m ³ | TBC |

Table 3 – Tractor Loading Shovels

| Location | Vehicle Type | Capacity | Number |
|------------|--------------|----------|--------|
| Maidenhill | Telehandler | 7m | |
| | | | |
| | | | |

Table 4 – Brine Tank

| Location | Plant | Supplier | Capacity (l) | Number |
|------------|-----------------|----------|--------------|--------|
| Maidenhill | Brine Saturator | Schmidt | 5,000 | |
| | | | | |
| | | | | |

Appendix L: Salt stockpiles

| Location | Minimum stock level (tonnes) at 1 October | Minimum stock level (tonnes) from 1 March |
|--|--|--|
| Connect Roads M77 Operations Centre Ayr Road Maidenhill Newton Mearns Glasgow G77 6RT | 1,000 | 100 |

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Appendix M: Locations for special treatment

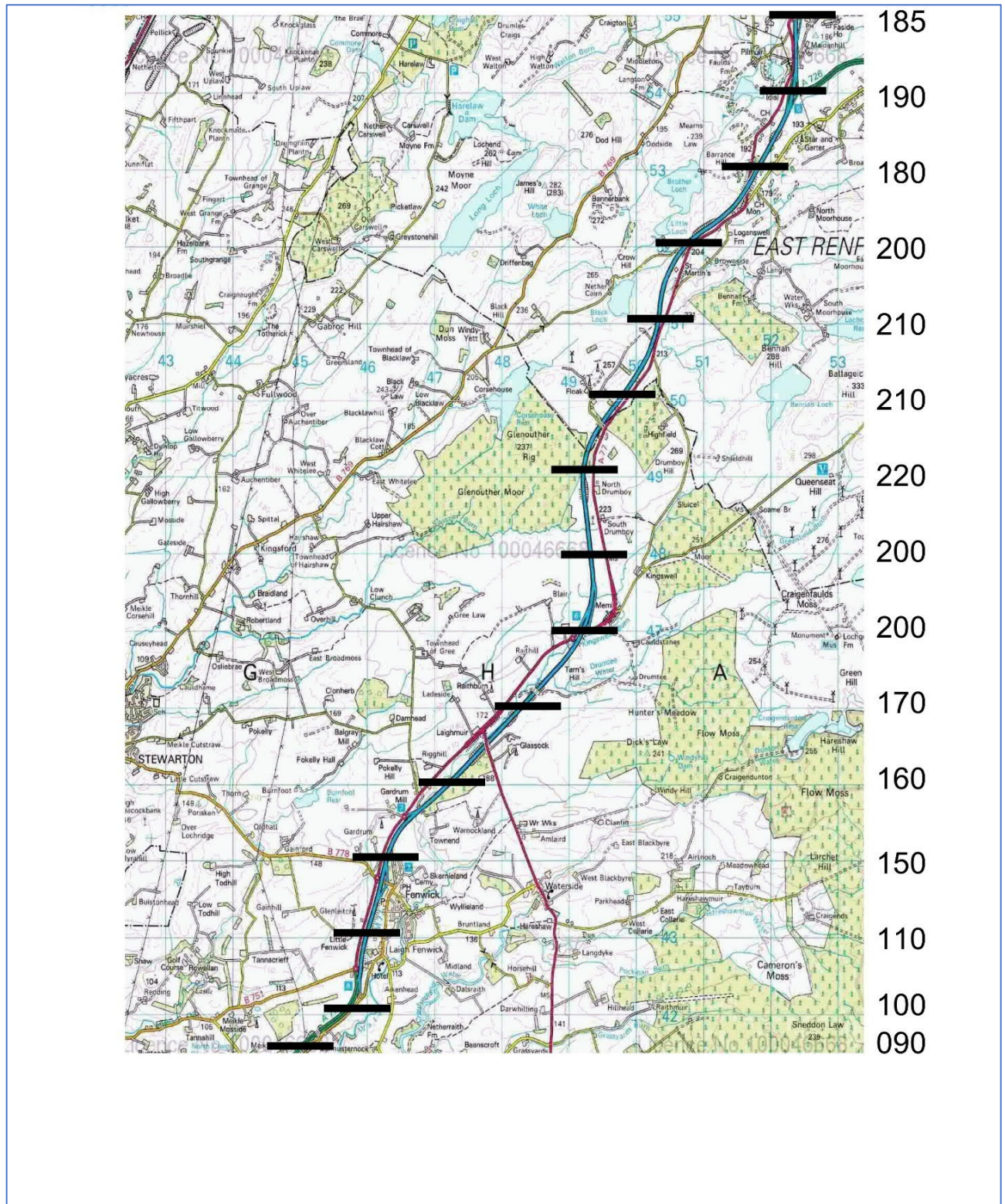
| Route | No. | Direction | Location | Seepage possible | Susceptible to frost |
|-------|-----|---------------------------|----------------------|------------------|----------------------|
| M77 | 1 | Northbound and southbound | Kingswell Overbridge | No | Yes |

The Projects Roads will be inspected regularly and this Appendix will be updated and issued as an addendum to this document when required.

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Appendix N: Altitude maps

Map 1: M77 Junction 5 to Junction 8



Map 2: A726, Glasgow Southern Orbital

