



# **M50 UPGRADE PPP CONTRACT**

# OPERATION & MAINTENANCE PROCEDURES Winter Maintenance Strategy 2021-2022

QEMS M50OP-313 - Revision 19  $31^{st}$  August 2021

M50 Concession Limited Luttrellstown Road Diswellstown, Castleknock, Dublin 15



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### **TURTLE DIAGRAM**





## **REGISTER OF COPIES ISSUED TO RELEVANT PERSONS**

This Register highlights the named recipients of this Winter Maintenance Strategy. Hard copies will be issued to the named holders on each revision of the document.

ISSUED TO	<b>COMPANY / ORGANISATION</b>	LOCATION
Winter Maintenance Manager	M50 Concession Ltd	M50 Office
General Manager	M50 Concession Ltd	M50 Office
O&M Manager	M50 Concession Ltd	M50 Office
Works Manager	M50 Concession Ltd	M50 Office
Network Engineer	M50 Concession Ltd	M50 Office
Works Supervisor	M50 Concession Ltd	M50 Office
Authority's Representative	Transport Infrastructure Ireland	Parkgate Street Dublin 8
Authority's Site Representative	Atkins	Swords
Traffic Inspector	An Garda Síochána	Dublin Castle
Traffic Inspector	An Garda Síochána	Blackrock
Traffic Inspector	An Garda Síochána	Terenure
Traffic Inspector	An Garda Síochána	Blanchardstown
Traffic Inspector	An Garda Síochána	Santry
Chief Operating Officer	Egis Road & Tunnel Operation	Dublin Port Tunnel
Chief Ambulance Officer	HSE Ambulance Service	Ambulance HQ Dublin
Chief Fire Officer	Dublin Fire Brigade	Dublin Fire Station
Director of Services	Fingal County Council	County Hall Blanchardstown
Director of Services	South Dublin County Council	County Hall, Tallaght
Chief Executive	Dun Laoghaire Rathdown County Council	County Hall, Dun Laoghaire
Head of Forecasting	Met Eireann	Glasnevin Hill, Dublin 9
Manager	Motorway Traffic Control Centre	Dublin Port Tunnel, Dublin 3
General Manager	MMaRC Network A Operator	Castleknock Office



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# 1. PURPOSE AND SCOPE

1.1 The purpose of this document is to identify the processes, procedures and control measures employed by M50 Concession Ltd, the Company, to ensure that Winter Maintenance and associated elements under the M50 PPP Contract are carried out in accordance with contractual requirements.

# 2. HEALTH & SAFETY

- 2.1 The Company will ensure so far, as is reasonably practicable:
  - Safe and healthy working conditions,
  - Safe equipment and systems of work,
  - · Provision of appropriate information, instruction, training and supervision,
  - Provision, where necessary, of a competent person to advise and assist in securing the health, safety and welfare of employees and others.
  - This procedural document should be read in conjunction with the Company's Policies and Procedures for Health & Safety;
    - QEMS M50MP-07. 01 Safety Statement.
    - QEMS M50MP-07. 02 Management Responsibilities.
    - QEMS M50MP-07. 03 Emergency Response Procedures

#### 3. ASSOCIATED RISKS & SAFE WORKING

3.1 This document should be read in conjunction with the Company Policy and Procedures for Associated Risk with Activities.

### 4. ENVIRONMENTAL POLICY

- 4.1 The Company regards environmental protection as an integral and essential part of good business practice. We are committed to achieving and maintaining a high standard of environmental quality in our operations.
- 4.2 This document should be read in conjunction with the Company Environmental Policy, Procedures and Control Measures QEMS M50MP-06.01 Environmental Operating Plan.

# 5. PROCEDURE PERSONNEL

5.1 In addition to the permanent and temporary employees of the Company, personnel of any relevant subcontractors may also be involved in the procedures and activities described in this document.

### 6. **RESPONSIBILITIES**

#### **O&M Manager**

- 6.1 The responsibilities of the O&M Manager are:
  - To ensure a Winter Maintenance Manager is nominated.
  - To ensure sufficient resources are available to carry out Winter Maintenance Operations efficiently.



#### Winter Maintenance Manager

- 6.2 The Winter Maintenance Manager for the 2021/22 Winter Maintenance Season will be the M50 Concession Ltd's Network Manager. His responsibilities are:
  - To ensure a Winter Maintenance Strategy is produced prior to the start of each winter maintenance season.
  - To ensure suitably experienced Duty Engineers are placed on a rota to ensure availability of Decision Maker throughout entire Winter Season.
  - To ensure suitably trained Gritter Drivers are placed on a rota to ensure availability of labour throughout entire Winter Season.
  - To ensure an Ice Prediction System and Weather Forecasting is available throughout the entire Winter season.
  - To ensure suitable plant, equipment and salt supplies are available to undertake effective winter maintenance operations for the duration of the Winter Season.

#### **Duty Engineer**

- 6.3 The winter maintenance Duty Engineer's role is carried out by a suitably qualified person within the Operations and Maintenance department with adequate technical ability to understand the forecast information and make the decision to treat the Project Road. Their responsibilities are:
  - Receive text forecast and graph site forecasts from forecast provider via the Vaisala Manager system.
  - Make an initial decision based on the forecast data and inform the Works Manager of the treatment for that day/night.
  - Monitor the weather during the day/night and ensure that any changes to the forecast are identified and instructions communicated to mobilise operatives to commence gritting.
  - Communicate with other 3<sup>rd</sup> parties and M50CL Management.

### 7. WINTER MAINTENANCE

#### **Objectives**

- 7.1 Winter maintenance operations shall allow the safe movement of users of the Project Road and shall keep to a minimum, delays caused to such users by adverse winter weather (ice and snow) in accordance with the Contract specification as detailed in Schedule 7 of the M50 PPP Contract.
- 7.2 The purpose of this document is to identify the processes, procedures and control measures employed by M50 Concession Ltd (M50CL) to ensure that all Winter Maintenance Activities associated with the Project Road under the M50 PPP O&M Contract are addressed and managed in accordance with best practice, statutory duty and contractual requirements as outlined in contract Schedule 7, Part 1 and as otherwise defined within the contract document and associated schedules.

# Winter Maintenance Strategy

7.3 The Winter Maintenance Strategy will contain all the necessary detailed arrangements for all aspects of winter maintenance as set out in the Contract. All members of staff being involved with Winter Maintenance shall be fully acquainted with this Winter Maintenance Strategy and will have access to copies of it.



- 7.4 The timely response by M50CL personnel and its sub-contractors will be vital in protecting the safety of the travelling public and minimising the disruption to Users of the Project Road.
- 7.5 As part of an agreement with the MMaRC Network A Operator, M50CL will also treat within its winter routes the M50 interchanges and several stretches of motorway outside the Project Road which are adjacent to the M50 and radiate out from the M50 but remain within the same climatic/urban domain as the Project Road.
- 7.6 The integration of the Project Road and interchanges into the same winter service routes is the only practical way to deliver a comprehensive winter maintenance service to the M50, while ensuring consistency of treatment. In this approach, mainline and interchanges are being treated at the same time. There are also synergies to be achieved in combining routes in respect to prevent dead mileage and wasted travel time, providing a quicker response, earlier treatment and ensuring a seamless co-ordination in decision making and treatment implementation.
- 7.7 The current Winter Maintenance Strategy 2019-2020 document only refers to the Project Road. The winter service specifications for the areas treated by M50CL that don't form part of the Project Road are included under the MMaRC Network A's Winter Maintenance Strategy 2019-2020.

### Resources

- 7.8 Adequate resources will be made available to treat the Project Road within the 2-hour requirement
- 7.9 Resources will be made available to cope both with those winter conditions normally associated with the particular areas of the Motorway and will be identified to manage all the weather conditions, which might apply from time to time. Resources and facilities will be available to enable reactionary salting to be completed within 3 hours of a decision to begin treatment, i.e. 1 hour to commence the operation and 2 hours to completion of gritting. The operational winter maintenance period shall be 1<sup>st</sup> October 2019 to 15<sup>th</sup> May 2020 however should extreme conditions demand, this may be extended depending on particular conditions.

### Weather Forecasting

7.10 A specialist weather forecasting service provider has been appointed to utilise information, initially from the existing ice sensor network, to give detailed forecasts for each identifiable climatic domain within the area. Facilities will also be provided in order that information from Met Eireann and/or other Weather Radars available and thermal mapping if utilised, can be applied to give the best information concerning existing or anticipated conditions. Use will be made of Met Eireann and/or other Weather Radars available for forecasting services together with Vaisala for ice alert and data collection.

### Winter Maintenance Depot

7.11 Proposed depot location to enable provision of winter service, emergency response and all other specified services is to be at the Company's Depot at Luttrellstown Road, Diswellstown, Castleknock, Dublin 15.

### Management Structure – during working hours

7.12 Members of the Winter Maintenance Team based at the M50 depot in Castleknock will carry out the management of the Winter Maintenance Service provision.



- 7.13 The information gathering and decision-making process will be managed by the O&M Network Manager who will assume the role of Winter Maintenance Manager having specific responsibility for service provision.
- 7.14 A roster of Duty Engineers to give 24-hour coverage will be agreed to manage information from the forecaster and Vaisala. The Duty Engineer will have authority to instruct treatment as required. Consultation with the Winter Maintenance Manager will be carried out as necessary.
- 7.15 The Duty Engineer will also ensure plant and personnel are mobilised. The Duty Engineer will instruct the Works Manager when a decision to treat has been made. The Works Manager will ensure the drivers are instructed and ready to treat the road at the time required. The Works Manager will take instruction from the Duty Engineer.
- 7.16 The management and reporting structure will be as the following flowchart:





### Management Structure – Out with working hours

- 7.17 In order to provide the required response to weather conditions, operational staff required to drive the gritters will operate a combination of standby at home, standby at compounds, normal dayshifts, nightshifts and continuous shifts. Manning arrangements are defined as follows:
  - Call Out available off-duty personnel if demand arises, contacted by the Duty Engineer.
  - Standby personnel available at home or at a compound for immediate duty outside normal working hours or shifts, contacted by the Duty Engineer.
  - Normal Shifts maintenance compounds manned during normal working hours.
  - Continuous Shifts 24 hour manning at the maintenance compound.
- 7.18 The Duty Engineer will confirm to the Works Manager the particular manning arrangements required each day by 15:00 hours.

# Monitoring of Weather Conditions

- 7.19 It is the responsibility of the Duty Engineer to ensure that forecast and information from the Weather Stations are monitored at all times. The Duty Engineer working a dayshift (08:30 to 18:00 hours Monday to Friday) will monitor the weather conditions in the M50 Office from the 1<sup>st</sup> October to 15<sup>th</sup> May. During the night (18:00 hrs to 08:30 hrs) and at weekends the task of monitoring the road temperatures will done by the Duty Engineer from home. It will remain the responsibility of the Duty Engineer to review the forecast and data available and make the initial decision on the action for that day or night. The Duty Engineer who will have access to a laptop and internet connection will access the updated information and take the appropriate action. If adverse weather conditions are forecast the Duty Engineer will report to the M50 Office.
- 7.20 Monitoring of actual road conditions during adverse weather will be carried out by a driver in a loaded gritter. Areas susceptible to ice will be monitored closely.
- 7.21 The Vaisala Manager system which is available to each Duty Engineer, will be set up with an alarm which will give an audible warning & text/email message function. When pre-set parameters are breached the system will warn the user. This gives a further level of monitoring to ensure human error is minimised.
- 7.22 The Duty Engineers will work to a roster system, the list of Duty Engineers and contact numbers is provided below in list of contacts and in **Appendix 5**.
- 7.23 In all cases a Duty Engineer and sufficient labor resources will be provided to ensure that treatment of the Project Road will be completed within 2 hours of work starting on salting runs. The Duty Engineer will record the response times achieved for reactionary treatment or snow ploughing.
- 7.24 In the event of severe winter weather being forecast a decision will be made and the Duty Engineer will be present in the Castleknock Depot to co-ordinate all operations. Operatives will be put on either a continuous 12 hour or 8 hour shift pattern depending on the forecast and duration of event to ensure an immediate response on a 24 hour basis.

### **Reaction Time for Call Outs**

7.25 The requirement of the contract is to commence gritting within 1 hour of a call to treat being received.

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# List of contact numbers with post names/locations/tel. no. (24 hours)

7.26 Please refer to **Appendix 5**.

### Liaison with other parties:

#### Liaison with Adjoining Local Councils / Maintaining Agents

- 7.27 Contact will be made by telephone, fax or e-mail with the Winter Maintenance Duty Engineers of adjacent authorities if the need arises. Copies of the agreed Winter Maintenance Strategy will be provided to the Local County Councils, MMaRC Network A Operator and other emergency services.
- 7.28 The Duty Engineer will advise the Winter Maintenance Duty Engineers of local authorities by email of M50CL's decision regarding precautionary treatment on a daily basis.

#### Across Boundary Contacts:

7.29 Please refer to **Appendix 5**.

#### Liaison with the Garda Siochana:

- 7.30 Copies of the agreed Winter Maintenance Strategy will be provided to the Garda Síochána and other emergency services.
- 7.31 Garda Traffic Patrols on the network may be requested to report any local adverse conditions to the service provider in order that appropriate action can be taken and resources deployed.
- 7.32 In the event of severe weather conditions Gardai assistance may be requested when moving winter maintenance equipment, arranging for any required road closures or for dealing with any abandoned vehicles.
- 7.33 In difficult conditions a Garda presence may be requested to accompany the snow clearing or gritting plant until a reasonable passage for traffic has been obtained. The Duty Engineer will make requests for Garda presence to the appropriate Garda Control Room.

#### Gardai Contacts:

7.1 Please refer to **Appendix 5**.

### 8. WEATHER FORECAST PROVIDER

# **Provider Contact Details**

8.1 24 hour weather forecast updates will be provided by the Forecast Provider, namely:

Met Eireann Glasnevin Hill Dublin 9 Ireland Tel No: 01 806 4200 Fax No: 01 806 4247

8.2 Facilities will also be provided on site for the display of weather radar from Met Eireann and other weather radar providers.

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8.3 A full forecast service shall be available throughout the period 1<sup>st</sup> October to 15<sup>th</sup> May, although outside this period a road danger warning system service shall be utilised. The provider shall be Met Eireann, Dublin.

## **Description of Service Received**

- 8.4 Met Eireann provide on a daily basis, to be delivered to the internet-based Ice Prediction System, the following:
  - Site specific ice prediction graphs
  - 24 hour text forecasts for operational areas within the network including expected minimum road surface temperatures and weather hazards, issued by 15:00 hours daily
  - Routine updates for operational areas including expected minimum road surface temperatures and weather hazards, issued by 20:00 hours daily.
  - Non routine amendments to the text forecasts as required.
- 8.5 The forecaster shall telephone the M50CL Duty Engineer and shall issue non-routine amendments to the site-specific forecasts graphs and revisions to the 24-hour text forecast if:
  - there is, or the forecaster expects there to be, deterioration in the forecast road surface state i.e. a change from no-frost to frost, on either the 24-hour text forecast or any of the site-specific forecast graphs.
  - there is, or the forecaster expects there to be, an improvement in the forecast road surface state i.e. a change from frost to no-frost, on either the 24-hour text forecast or on any site-specific forecast graphs.
  - there is, or the forecaster expects there to be, a difference of at least 1 hour between the original forecast onset of freezing conditions and the revised onset of freezing conditions, except where a precautionary salting has already been carried out, or is planned to be carried out prior to the onset of freezing conditions, and no precipitation is forecast for the intervening period.
  - Snow, ice, hoarfrost or freezing rain which were in the original forecast and are now not expected, but only if the relevant Service Providers nominated out of hours personnel can be contacted before 24:00 hours.
  - The timing of rainfall changes such that rain is now expected after the planned time for precautionary gritting, but only if relevant Service Providers nominated out of hours personnel can be contacted before 24:00 hours.
  - The amount of snow changes from light to moderate or from moderate to heavy.

Light = less than 3cm Moderate = 3 to 10cm Heavy = greater than 10cm

8.6 Notwithstanding the above, the forecaster shall immediately telephone the Duty Engineer, to advise them of a deterioration in the prevailing weather and surface conditions when the actual road surface temperature on any site specific forecast graph falls to zero degrees Celsius or lower and this has not been forecast beforehand.



- 8.7 The Duty Engineer will record the receipt of verbal updated forecast information provided by forecaster. This will be recorded real time on the Vaisala Diary function.
- 8.8 Met Eireann shall prepare and issue severe weather warnings of heavy rain, as necessary, to M50CL Duty Engineers. This service shall be provided throughout the year.
- 8.9 Met Eireann shall prepare and issue severe weather warnings of gales, as necessary, to the M50CL Duty Engineers. This service shall be provided throughout the year.
- 8.10 Gale warnings shall be issued up to 24 hours in advance when gusts of 50 miles per hour or more are expected. The warning will detail the expected wind speeds and the validity time.
- 8.11 Meetings will be held as necessary between M50CL and the forecasting agency to discuss the forecast accuracy and level of service provided. An annual meeting will be held each year during the summer to discuss the forecasting during the previous winter season and to discuss problems and issues and to look at improvements or changes to the service in the coming season.

# 9. ICE PREDICTION SYSTEM

#### **Sensor Locations**

- 9.1 The relevant Road Sensors and Ice Stations for the provision of the winter services are installed at the following locations:
  - M1/M50 Interchange J3 (non-Project Road)
  - Blanchardstown, between J6 (N3) and J7 (N4)
  - Ballymount between J9 (N7) and J10
  - Ballinteer, at J13.
  - Sandyford, Between J14 and J15
  - Bray, at J5 of the N11 (non-Project Road)

### Highlight Forecast Sites

9.2 The location of the existing sensor locations with forecast sites is detailed in **Appendix 2.** 

### **Road Weather Information System Arrangements**

9.3 An Ice Prediction System will be supplied by:

Vaisala TMI Ltd Vaisala House 349 Bristol Road Birmingham B5 7SW

Tel No: +44 (0)121 683 1200 Fax No: +44 (0)121 683 1299

9.4 The server for the network Ice Prediction System will be housed at the Vaisala office in Birmingham



- 9.5 The Ice Prediction System will poll the outstations on the network at maximum intervals of one hour. This may be reduced to shorter intervals depending on conditions during the winter season.
- 9.6 Any faulty sensors detected by the forecaster shall be notified to M50CL on the morning summary and a member of the O&M team will arrange for sensor repairs.
- 9.7 Access to the Vaisala Manager website will be available to all the responsible Duty Engineers. Access to the Vaisala Manager website is available from any computer with internet access.

# Weather Radar

9.8 Access to weather radar information is available to the Duty Engineer through the Eireann met.ie and/or Metoffice.gov.uk Web Site to assist in response arrangements and to give maximum warning of the arrival time of inclement weather to permit resource mobilisation. Other web-based weather imaging sites are available and will be utilized to improve the service.

### **Existing Thermal Map Coverage**

- 9.9 Existing thermal mapping will not be used as route-based forecasting is not carried out and all five routes are treated when a decision is made to treat.
- 9.10 Updating and upgrading will take place as required if and when new products and technologies are available.

### Thermal Map Usage

9.11 Thermal mapping can be used as an additional tool in the decision-making process in relation to Precautionary Salting. Thermal mapping, if available, can be used to highlight potentially hazardous areas or cold spots on the Project Road requiring additional or specific treatment. The thermal mapping system can be designed to be driven from the forecast minimum temperatures from out station data with an updated thermal map produced at the time of each revised forecast. However, thermal mapping it is not currently utilised by M50CL due to the five routes being in the same one climatic zone, their short length, weather uniformity and lack of particular hazardous areas or cold spots.

### **10. DECISION MAKING**

### Roles and responsibilities related to management structure

- 10.1 The Duty Engineer at the M50 Office or at home will be responsible for:
  - Receiving and disseminating weather forecast information
  - Keeping the Winter Maintenance Manager informed with current status
  - Liaison with the Gardai
  - Maintaining records of all messages and movements of all operational plant
  - Keeping records of road conditions and of any blocked lanes
  - Providing factual information concerning the network to the Gardai for onward distribution to the press, local radio, RTE, AA and giving a response to any public enquiries
  - Dealing with any difficulties or complaints from the general public which may arise
  - Receiving and disseminating information from the appointed specialist forecast analyst
  - Keeping all other records as required.
- 10.2 The Duty Engineer will maintain a log of all messages from patrol vehicles or vehicles engaged on snow clearing and record them on the Vaisala diary function.

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- 10.3 The Winter Maintenance Manager will be responsible for ensuring delivery of the specified winter maintenance operations and will appoint Duty Engineers who will work to an agreed roster to ensure that full time cover is provided in the event of inclement weather. The Duty Engineer will issue instructions for required winter maintenance based on specialist forecasts and local information.
- 10.4 Duty Engineers, also working to an agreed roster will arrange for mobilisation of resources at the maintenance depot and also have overall responsibility for monitoring progress and managing change.
- 10.5 A report on the Winter Maintenance operations undertaken will be submitted to TII each year within the PPP Co's Annual Report and 5 Year Management Plan.

### **Decision Making Procedure**

- 10.6 The decision to carry out treatment will be made by the Duty Engineer who will phone the required operatives to give them instructions.
- 10.7 Provisional Arrangements to commence Winter Maintenance Operations will be made during each afternoon based on information from the forecaster augmented by information from the Weather Bureau Service (Vaisala). Decisions will be regularly monitored to include for variations in the forecast weather or to reflect actual conditions on site and confirmed at the latest by 20:00 hours daily. These decisions will be reviewed on receipt of non-routine weather forecast updates. The decisions will be recorded on the salting decisions form which will form the basis of the action plan.
- 10.8 Forecasted information to be utilised will include weather radar to give the Duty Engineer maximum warning of the arrival time of inclement weather to permit resource mobilisation.
- 10.9 Detailed information will be available from Winter Patrols when operating on the Project Road 24 hours per day during adverse weather.
- 10.10 The exact time at which precautionary salting will take place, to all, or part of the Project Road will be determined from forecast and local information available. A roster for the operatives will be held at the M50 Office and will be updated by the Works Manager as appropriate.
- 10.11 On receipt of a forecast of abnormal weather/snow the decision will be taken to implement the prolonged snowfall strategy. Operational staff will be instructed to commence a 12 hour or 8 hour shift pattern depending on forecast and be on a 24 hour rota to cover the period of the adverse weather.

#### **Record of events**

- 10.12 The following list identifies typical records required:
  - Decisions taken when and by whom
  - Treatment Records
  - Ice detection records
  - Weather forecasts and actual weather experienced
  - Response times achieved
  - For each depot quantities of de-icing materials used in stock and on order
  - Plant and equipment deployment records and driver / operator logs
  - 'Dry Run' Records



- 10.13 These records will be stored on the Vaisala Manager system. It is the responsibility of the Duty Engineer to ensure details of decisions, treatment records, quantities of salt used, etc. are entered into Vaisala Manager on a daily basis and to utilise the diary function to record decisions made, and of the Winter Maintenance Manager to ensure records are up to date.
- 10.14 For each treatment undertaken the operator will log the details of the treatment on Standard Form **QEMS M500P-313 F.77** Operator Daily Plant & Equipment Log & Times.
- 10.15 By 10am the following working day of completing each precautionary salting operation, or other snow or ice removal, a treatment report will be generated from the Vaisala system and held electronically. These reports will be held electronically on the server and available for inspection by any interested party.

# Notification

- 10.16 TII shall be notified immediately by telephone of any major incident arising on the Project Road as a result of winter conditions and in particular of any parts of the Project Road closed to traffic followed up with written confirmation.
- 10.17 During normal working hours the Authority's Site Representative will be contacted by telephone. For out of normal working hours or if for any reasons the above contact cannot be made then the Authority's Site Representative will be emailed directly. Please refer to **Appendix 5** for contact details.

#### Accuracy of forecast, justification for changing decisions

10.18 Monitoring of the actual road surface temperatures in relation to the forecast road surface temperatures will determine the accuracy of the forecast and will provide the necessary information for the Duty Engineer to amend the treatment requirements.

#### Arrangements for continuous monitoring of forecasts

- 10.19 Winter Maintenance operations will be administered from the M50 Office situated on Luttrellstown Road, Diswellstown, Castleknock, Dublin 15.
- 10.20 Weather conditions during the winter maintenance period will be continuously monitored.
- 10.21 This will be achieved by:
  - The duty forecaster.
  - Expert weather forecast providers will regularly access ice sensors / ice prediction system to monitor road and weather conditions.
  - The Duty Engineer will also access the ice sensors / ice prediction system to monitor road and weather conditions.
  - Feedback of road condition information from patrol vehicles, Gardai reports and calls from members of the public.

#### Spread rates

#### Precautionary Salting

10.22 The philosophy behind Winter Maintenance operations is, wherever possible, to carry out presalting before ice can form or snow settles and compacts on the road. To enable this to be undertaken effectively depends on a mixture of local knowledge and experience, good local weather forecasts, and knowledge of the state of the road at the time through patrols (i.e. is it wet or dry, salt covered or not etc.).



- 10.23 If no forecast is available for whatever reason and the temperature has fallen to +1°C, then precautionary salting in the Project Road shall take place unless:
  - No moisture is or is expected on the road
  - There is enough residual salt on the road to deal with the expected conditions.
  - There is enough cloud cover to suggest that temperatures will not fall any further.

#### Rates of Spread for Precautionary Salting

- 10.24 For precautionary salting the preference will be for pre-wet treatment. Pre-wet treatment involves spraying the de-icing salt with a brine solution before the salt is applied to the road surface. This is more effective than traditional dry salting as the wet salt adheres to the road surface instead of bouncing off or being swept off by traffic. The other benefit is that dry salt requires moisture to be effective as a de-icing agent. By pre-wetting the salt this ensures moisture is always present and that it is effective as a de-icer immediately.
- 10.25 For pre-wet treatment the quoted spread rate is the combined weight of dry rock salt and brine, combined in a 70:30 ratio of dry salt to brine. The brine is composed of water and marine salt, with a salt concentration of 20 to 23%.
- 10.26 Spread rates for precautionary treatment are described in the table below.
- 10.27 If freezing conditions are expected after rain salting will be delayed as long as possible to reduce loss of salt by run off, unless freezing conditions coincide with rainfall. If freezing conditions coincide with rainfall then the salting will be timed to be complete prior to freezing but with an increased spread rate.
- 10.28 If continuous snow is forecast, salt shall be spread at 20-40g/m<sup>2</sup> according to the anticipated severity of the snowfall. Every effort will be made to ensure enough salt is applied before snow starts to adhere to the road to melt the initial snowfall and to provide a wet treated surface.
- 10.29 Elevated sections of road, including bridges and sections of low-lying ground or where the local topography channels windborne cold air is more prone to freezing and drifting of snow and may need special treatment and specific attention. These areas will be identified through local knowledge and real time reports from the winter maintenance patrol drivers.
- 10.30 It is intended that Precautionary Action forms the major part of winter operations.
- 10.31 A matrix showing the proposed levels of treatment in the Project Road is shown below. These treatments are only a guide and actual conditions and information from forecasters, patrol drivers and real time data may mean that a different treatment may be applied

Weather	Definition	Spread Rates		
conditions		Salt (gram /square metre)	Pre-wetted salting (gram /square metre) (see Note 1)	
Light	Frost and/or light snow	10	10	
	Freezing conditions after	20 to 30	20 to 30	
Moderate	rain			
Severe	Continuous snow	30 to 40	30 to 40	
Note 1: Spread rates for pre-wetted salting are the combined weight of dry salt and brine combined in proportion 70:30 by weight with brine of concentration 20 to 23%.				



## Winter Maintenance Precautionary Treatment Spread Rates

10.32 A matrix showing the proposed levels of treatment between 10g/m<sup>2</sup> and 40g/m<sup>2</sup> in the Project Road is shown below. These treatments are only a guide and actual conditions and information from forecasters, patrol drivers and real time data may mean that a different treatment may be applied.

		Treatment			
Road Surface Conditions	Air Temp	Spreading gram/square metre	Spreading gram/square metre	Ploughing	Blowing
		Salt	Pre-wetted Salting	1	
Ice formed	less than minus 5ºC and stable	20 to 40	20 to 40	No	No
Snow covering exceeds 30 to 50 millimetres thick	less than minus 5ºC and stable	10	10	Yes	No
Snow covering exceeds 30 to 50 millimetres thick	less than minus 5ºC and dropping	10 to 40	10 to 40	Yes	No
Snow accumulations due to prolonged falls	less than minus 5ºC and stable	20 to 40	20 to 40	Yes (continuous)	Where applicable
Hard packed snow/ice less than 20 millimetres thick	greater than minus 5ºC	30 (successive)	30 (successive)	No	No
Note 1: Spread rates for pre-wetted salting are the combined weight of dry salt and brine combined in proportion 70:30					

Note 1: Spread rates for pre-wetted salting are the combined weight of dry salt and brine combined in proportion 70:30 by weight with brine of concentration 20 to 23%.

Note: Wet / moist road conditions will be determined by weather forecast interpretation supplemented by information obtained from winter patrols, gritting operations, other operational crews and inspection teams.

### Treatment of ice already on the Road

- 10.33 If ice has already formed on the road, salt shall be spread up to a rate of 40g/m<sup>2</sup> depending on the amount of ice present and the air temperature to ensure a rapid melt. Particular attention will be paid to lengths of the Motorway, which are known to be susceptible to poor run-off.
- 10.34 Application of salt at 40g/m<sup>2</sup> will be made in severe conditions where road surface temperatures falls to below -5°C or where hard packed snow is present on the network.

## Treatment of snow already on the road after Precautionary Salting

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- 10.35 Snow ploughs will be fitted to vehicles when snow is forecast and ploughing shall commence as soon as snow depths allow or as directed by the Duty Engineer.
- 10.36 Each pass of the plough may be supplemented by an application of salt at a rate of 10-40g/m<sup>2</sup> depending upon the temperature trend and prevailing condition and will be instructed by the Duty Engineer depending on the accumulations and forecasted snow fall. Information from the Ice Prediction System together with temperature measurements at the depot will be available.
- 10.37 Special salting may be necessary to deal with melted water from snow, which may freeze at night, and such conditions will be monitored closely.
- 10.38 Snow ploughing routes will be as the precautionary salting routes for simplicity of driver training.

### Treatment of Hard-Packed Snow and Ice

- 10.39 If the above procedures are carried out successfully then the formation of hard-packed snow and ice should be rare. However, should these conditions occur provided that the ice is no more than 20mm thick and the air temperature is below -5°C, then removal shall be carried out by successive salt applications of 20-40g/m<sup>2</sup>.
- 10.40 The use of salt spread at the upper limits of 40g/m<sup>2</sup> is however applied selectively in the following circumstances:
- 10.41 Precautionary salting of the Project Road in those areas where continuous heavy snow is forecast. The intention is to melt the initial snowfall to make operation of snow ploughing more effective.
- 10.42 Treatment of ice formed on relatively lightly trafficked sections of the Motorway when the temperature is sustained and below -5°C.
- 10.43 Successive treatment for areas of hard packed snow or ice less than 20mm thick with temperatures above -5°C. Local observations and local experience will essentially identify these areas. A timely application of precautionary treatment should make the formation of hard packed snow/ice a rare event.
- 10.44 When temperatures fall below -10°C or where snow is more than 20mm thick a single sized abrasive aggregate of particle size up to 6mm shall be added as necessary to the salt. A reversion to the use of salt only is to be made at the earliest opportunity to avoid the possibility of blocked drains or gullies.

### **11. SALTING ROUTES**

#### **Routes for Precautionary Salting**

- 11.1 To complete precautionary salting on the Project Road within the contract requirements five routes have been proposed.
- 11.2 All five routes will operate from the Castleknock depot and decision making will be made by the M50CL Duty Engineer.
- 11.3 The five routes are designed to treat the entire Project Road as well as the adjoining Interchanges and radial routes within the MMaRC Network A as per the following split:
  - Route 1: M50 J5 To J2 and M1 to J2



- Route 2: M50 J7 to J5 and M3 to J6
- Route 3 M50 J7 to J10 and N4 to J4
- Route 4 M50 J10 to Edmondstown O/B J12 J13 and N7 to J3
- Route 5: M50 Edmondstown O/B J12-J13 to J17 and N11 to J5 Bray
- 11.4 A general map of the routes is included in **Appendix 1**. The detailed drawings and descriptions of these routes are in **Appendix 3**.

#### **Routes for Reactive Salting**

11.5 In the event of prolonged snowfall and the necessity to complete 40g/m<sup>2</sup> dry salt treatments then the five routes used for precautionary treatment will be utilized. The five routes are as per **Appendix 3**.

### Philosophy for Reactive Salting

- 11.6 Following the route optimisation exercise it has been decided that only one set of reactive routes will be implemented at this stage.
- 11.7 Due to the necessity to potentially carry out a 40 g/m<sup>2</sup> salting exercise and this being the most onerous to achieve in the timescale because of the implications for the likelihood to re-loading, these routes should be considered as the primary reactionary salting routes.
- 11.8 Reactionary salting at 10 25 g/m<sup>2</sup> will be carried out on these routes which will obviously mean that they can be completed quicker and without re-loading.

#### 'Dry Runs'

11.9 Prior to 1<sup>st</sup> October each year a 'dry run' and route familiarisation of each route will be carried out which will include the fitting and removal of plough to every vehicle. Records will be kept of these dry runs detailing times taken to traverse the route, fit the plough, and any other relevant comments.

#### **12. PATROLS & PATROL ROUTE**

#### Policy for Patrolling in adverse weather.

12.1 Patrolling of the Project Road will be carried out during the period 1<sup>st</sup> October to 15<sup>th</sup> May when adverse weather is being experienced or is predicted. Periods of adverse weather are those when the Project Road is likely to be affected by snow or severe frost/freezing conditions.

#### Patrolling when Very Low Temperatures and Hoar Frost Predicted

12.2 The Company will put out one patrol vehicle to cover all routes when a forecast is predicting temperatures lower than -4oC or severe hoar frost. The Patrol will be undertaken in a loaded gritter to enable timely spot treatment of potentially hazardous conditions as opposed to full blanket precautionary salting.

#### Patrolling when Snow or Freezing Rain is Predicted

12.3 The Company will put out one patrol vehicle per route (5 gritters in total) when a forecast is predicting snow or freezing rain. Patrols will be undertaken in loaded gritters with ploughs fitted to enable timely commencement of treatment of potentially hazardous conditions when they occur.



- 12.4 Patrols shall be carried out to ensure that the whole route or individual routes are covered at intervals not exceeding 4 hours.
- 12.5 Priority on patrol runs will be given to main carriageways; slip roads will be patrolled where their condition cannot be assessed from the main carriageway and where they are found to be abnormally prone to icing.
- 12.6 Patrol drivers will report on conditions to the Control Room and Duty Engineer if conditions require a gritter to be actioned.

# **13. SNOW CLEARING STRATEGY**

#### Description of arrangements and resources for snowfall

- 13.1 To assist in route familiarity for operations it is intended that snow ploughing of single lanes will be carried out on the same routes as for reactionary salting. This readily enables ploughing and salting.
- 13.2 Ploughing of snow will normally commence at a snow depth of 30mm and will be accompanied by salt applications at 10-40 g/m2. Should snow depth on the carriageway exceed 100mm then salting may be suspended and ploughing carried out without the application of salt. The application of salt shall be recommenced as soon as practicable.
- 13.3 In consideration of carriageway lanes, traffic volumes and the incidence of slip roads, salting vehicles and other vehicles with plough attachment fitted will team up to enable echelon ploughing (two or more vehicles moving in the same direction, one behind each other, each on different lanes). Care will be taken to coordinate slip road clearance with main carriageway clearance. Where echelon ploughing is deployed salting may take place over the full carriageway width by the trailing vehicle but where ploughing over a single lane width salt will normally be spread only on the ploughed width.

# Prolonged snowfall strategy

- 13.4 In the event that extreme weather conditions are forecast or experienced, a dedicated 'snow' control room will be established at the M50 Office.
- 13.5 All Winter Maintenance Operations on the Project Road would be controlled by the Winter Maintenance Manager or by allocated staff (Duty Engineer) to ensure that the optimum use is made of dedicated and any externally resourced plant items on the Project Road.
- 13.6 Routine and Cyclical works will cease. All operational staff will commence a 12 hour shift rota for forecasted snowfall lasting 1-4 days to allow 24 hour working. If snowfall is forecasted to last longer than 4 days then staff will commence 8 hour shift rota and this shift pattern will be maintained until the adverse weather has finished.
- 13.7 The five routes will be precautionary treated with salt in accordance with the above spread rates. The routes will be patrolled throughout the period of the forecasted adverse weather and otherwise the winter trucks will be on standby at the following locations:
  - Route 1- J3 M50/J1 M1
  - Route 2- J6 M50 J1 N3
  - Route 3- J7 M50 J1 N4
  - Route 4- J11 M50
  - Route 5- J13 M50
- 13.8 The roster of Duty Engineers will be available to give continual management presence in periods of extreme weather. The appointed drivers of winter maintenance equipment will be



available to operate the equipment on a 24-hour operation should conditions require. Stocks of salt and winter quality fuel will be maintained at sufficient levels in the depots over the winter period to permit full-scale operations for an extended period.

- 13.9 During severe weather conditions the Winter Maintenance Manager will liaise directly with the Gardai to ensure that up to date information is available regarding travel conditions and blocked highways. All media enquiries will be directed to the Company's General Manager.
- 13.10 The Winter Maintenance Manager will, where considered to be appropriate, make suggestions to TII in relation to the broadcasting of information during or in response to forecast severe winter weather conditions and shall advise winter controllers of adjacent authorities or agents accordingly.
- 13.11 Where extreme conditions persist and road closures or partial closures have to be considered, then the Winter Maintenance Manager will contact the TII and advise them accordingly.
- 13.12 Where appropriate and after consultation with the Gardai the Duty Engineer shall arrange for installation of signs that clearly show the road closure, with reason for the closure and where appropriate, diversion routes.
- 13.13 TII's Authority's Site Representative shall be notified immediately of any major incident arising on the Project Road as a result of winter conditions and in particular of any parts of the Project Road closed to traffic followed up with written confirmation the next working day.
- 13.14 During normal working hours the Authority's Representative on Site will be contacted by phone. For out of normal working hours or if for any reasons the above contact cannot be made then the Authority's Representative on Site will be emailed.
- 13.15 During heavy prolonged snowfall it may be not possible to keep all lanes clear of snow at all times. In that situation, the Company will prioritize auxiliary lane and lane 1 and endeavour to keep them open at all times. Once these lanes are safe and allow traffic to move freely the other lanes will then be cleared of snow to allow traffic to move freely.
- 13.16 For clearing the other lanes a strategy of echelon ploughing will be implemented. To avoid snow accumulations in the fast lane and up against the median wall all snow will be ploughed from the fast lane across the other lanes using the echelon ploughing method and into the hard shoulder/verge. The timing of this type of echelon ploughing is dependent on many factors and the decision to implement this operation will be made by the Duty Engineer in conjunction and with liaison with TII and the Gardai.

### Arrangements for procurement of back-up resources in severe conditions

- 13.17 The Company will make the necessary arrangements with local contractors to supply qualified and trained labour during prolonged adverse weather events in order to ensure continuity of the level of resources described in this Winter Maintenance Strategy.
- 13.18 Contact and negotiations with a number of plant suppliers will be made to ensure that equipment can be made available at short notice to respond to emergency situations or to protracted periods of inclement weather.
- 13.19 Loading shovels and trucks as appropriate will be utilised from local quarry operators, local contractor operations and haulage companies and external plant hirers.

### 14. LABOUR

### **Numbers Available**

14.1 The required resources are based on 3 trained and qualified drivers per spreading vehicle. Drivers are trained to the standards required by City & Guilds (Winter Maintenance Operations).

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14.2 Current permanent staffing levels are at 15 number staff with HGV license and qualifications/experience to operate winter maintenance equipment.

# Training

14.3 Training of Winter Maintenance Operatives will consist of informal 'Tool Box' talks, formal training courses (City & Guilds Winter Maintenance Operations, or equivalent), and hands on experience.

### **`Tool Box' Talks**

- 14.4 'Tool Box' talks consisting of Specific Procedures, Method Statements, Risk Assessments, and other related information. This will be given by the operatives Supervisor on a regular basis to ensure Operatives are aware of relevant information and hazards. The patrolling in loaded gritters when adverse weather conditions are being experienced or predicted will emphasised to ensure all operators are aware of when to treat the road and also to communicate the conditions to the Control Room Operator.
- 14.5 Records of these informal 'Tool Box' talks will be kept to ensure compliance.

### Hands on Experience

- 14.6 Dry runs of salting routes will take place in the autumn for driver training in route familiarisation and to demonstrate compliance with the specified response times.
- 14.7 The three new Schmidt winter spreading units described in clause 15.2 will have an autologic system which will allow for automated route selection and GPS controlled route guidance. Lane widths and routes are pre set and once spread rate is selected the operator does not have to touch any spreader controls and follows the pre-set route.

### **Formal Training**

14.8 All operatives' formal training will conform to the following training matrix:

	Gritter Operator	Snow Plough Operator	Telehandler Operator
City & Guilds Winter Service – Spreader (fixed/demount)	Yes	Yes	
City & Guilds Winter Service – Snowplough (angle/vee)	Yes	Yes	
RTITB Telescopic Handler – Forks/Bucket			Yes
Schmidt Autologic Control System	Yes	Yes	

### Call Out Procedures

- 14.9 Call out of the required level of resources will be coordinated by the Duty Engineer and Works Manager.
- 14.10 The decision to carry out treatment will be made by the Duty Engineer who will instruct the Works Manager to mobilise resources and give the instruction to carry out the appropriate treatment at the specified time. The Works Manager will then contact the required operatives who will proceed to the depot to start the treatment.



#### **Adverse Weather**

When snow or adverse weather is forecast a 12 hour or 8-hour shift pattern rota will be introduced depending on the duration of the extreme forecast to ensure there is cover 24 hours a day with 7 men on each shift. This will ensure that each of the routes can be patrolled and treated immediately and also have drivers for the plough only vehicles to ensure snow clearance can commence immediately and be maintained.

### **15. PLANT, EQUIPMENT AND DEPOTS**

- 15.1 The fleet size and its replacement is reviewed after each Winter Maintenance season.
- 15.2 3 No. new winter maintenance units were purchased in 2019 and delivered in February 2020. The units are 26T Mercedes chassis fitted with Schmidt hoppers, brine tanks, ploughs and associated operating controls which include Autologic for GPS controlled route guidance and treatment.
- 15.3 To carry out the gritting on the other two routes, 2 No. gritters will be provided by the MMaRC Network A Operator, these are Romaquip Spreaders on Volvo 26T chassis.
- 15.4 To supplement the 5 No. units, the existing 2 No. 9m3 demountable units will be kept in service as back up units.
- 15.5 The Loadall-Telescopic Handler was replaced in 2020 for a secondhand JCB unit.
- 15.6 A brine saturation plant is located in the Castleknock Depot and is capable of generating the correct brine solution and storing 28,000 litres (18,000 litres in main saturation tank and 10,000 litres in 2no. 5000 litre tanks). The plant is manually filled with white marine salt and the brine making process is automatic and shuts down when the tank is full.
- 15.7 A storage shed is proposed to be built in the North Bound Depot to provide cover for 5 gritters. Planning permission has been granted and construction is to commence September 2021.

#### Number, capacity and location of vehicles available for precautionary/reactive salting

- 15.8 The following tables give an indication of the plant which will be dedicated to the winter routes.
- 15.9 Location and Type of Loading Shovel

Location	Type / Capacity	Number		
Castleknock Depot	JCB Telescopic Handler / 3.2T	1		

#### 15.10 Location and Type of Spreading Vehicles

Location	Vehicle Type	Snowplough	Capacity	Number of Snowploughs	No of Gritters
Castleknock Depot	26T HGV with Permanent Mounted Gritter	Yes	9m³	5	5
Castleknock Depot	26T HGV with Demountable Gritter	Yes	9m³	2	2
Castleknock Depot	18T Traffic Management Wagon	Yes	0	3	0
	Total:			10	7

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## Number, capacity and location of vehicles available for winter maintenance patrols

- 15.5 Patrol vehicles will be the ISU which is available to patrol at any time 24 hours per day.
- 15.6 In adverse weather conditions one of the gritters loaded with salt will patrol the winter routes.
- 15.7 When adverse weather is forecast and snow is likely then five gritters will patrol the Project Road during the timing that the adverse weather is forecasted. The two spare demountable units will be fitted to the wagons and ploughs attached. The ploughs will be also fitted to the 2No. 18T TM Wagons in preparation for a snow event.

#### Additional equipment/plant/labour

- 15.8 In the event that extreme conditions are experienced, sufficient trained labour will be available within the scope of the operation to operate all plant.
- 15.9 M50CL have trained operatives from selected subcontractors and have arrangements in place to call on these operatives when adverse weather conditions are forecasted.

#### Vehicle servicing and maintenance

- 15.10 Servicing and maintenance will be coordinated by the Works Manager.
- 15.11 Gritting vehicles will be mechanically maintained by the manufacturer's agents who will call on local resources. Drivers will be responsible for daily maintenance and for vehicle washing after each salt operation. Qualified motor fitters will be on call at all times during the Winter Maintenance period. The Works Manager will be responsible for calling out fitters and will have contact numbers.

#### Calibration of equipment

- 15.12 Calibration checks will be carried out on the spreading equipment of winter maintenance vehicles at the final service before the winter maintenance season of each winter maintenance period. Schmidt or other suitable contractor will carry out the calibrations. Calibration records for all gritters to be utilised will be held at the M50 Office.
- 15.13 Spot checks will be carried out on the calibration at least three times during the season. Once prior to the start of the season (after Schmidt has carried out calibration), once at the beginning of December and once at the beginning of February.
- 15.14 The Company will appoint Vaisala Ltd to carry out annual detailed inspections and calibration checks on all ice sensors in accordance with the manufacturer's recommendations (Aug/Sept). Repairs and re-calibration of faulty equipment will be carried out within 14 days of defect notification.

#### On board data capture equipment

- 15.15 All salt spreading vehicles are fitted with data loggers which will provide an accurate record of driver time distance traveled when salting / not salting, rate of spread, and width of spread. Data logger information is kept by and accessed through the GPS tracking company's web portal and is available for inspection.
- 15.16 In the event of a GPS/data logger malfunction, equivalent manual records will be produced.
- 15.17 The data collected will help in the salt reconciliation system which is developed and based on information from the on board data collection equipment, individual driver logs and controls on material deliveries.



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#### **Communication equipment**

- 15.18 All Winter Maintenance vehicles and patrol vehicles will carry a two way radio system and operatives will be trained in the effective use of the provided system. During the course of normal daily usage, any faults in the communication system will be reported to the Duty Engineer who will instigate any repairs necessary.
- 15.19 Contact with maintenance staff during and outside normal work hours will be made by the cellular telephone system. Staff will operate on a roster basis.

#### Depots and storage facilities

15.20 Depot location to enable provision of winter service, emergency response and all other specified services are to be located at M50 Concession Ltd, Luttrellstown Road, Diswellstown, Castleknock, Dublin 15.

#### **16. DE-ICING MATERIALS**

#### Salt stock quantities

- 16.1 The rock salt will be stored at the Castleknock Depot. Salt is delivered from Salt Sale Co in Belfast.
- 16.2 Marine Salt will be stored at the MMaRC Network A Balbriggan Depot. Salt will be delivered/collected to Castleknock when required. Five tonnes will be stored at Castleknock as back up.
- 16.3 Details of the proposed stock level for the Winter Maintenance Operations for the Project Road at the Castleknock Depot is as below:

Period	Minimum Stock Level (T) – Rock Salt	Minimum Stock Level (T) – Marine Salt
Location	Castlecknock	Balbriggan
1 <sup>st</sup> October	898	88
Oct – March	513	51
April & May	256	25

#### Salt testing

- 16.4 Rock salt supplied will be compliant with BS 3247.
- 16.5 Salt Sales Co. who supply the Company with salt for spreading on highways are BS 3247:2011 compliant and a letter of conformity from Salt Sales Co. is held with the winter maintenance records.
- 16.6 An accredited testing laboratory will be used to provide chemical analysis and grading of salt supplied. A sample will be taken from one of the deliveries and sent for testing. Details of testing will be kept in the winter maintenance file.

#### Salt management strategy

16.7 Prior to the commencement of the season on 1<sup>st</sup> October M50CL will ensure there is sufficient salt in the Project Road stock to complete 63 no. 25g/m<sup>2</sup> runs on the Project Road as per TII

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advice note. Each treatment requires 14.25 Tonnes of 6mm rock salt, equating to 898 Tonnes. During the winter maintenance season this will not be allowed to drop below the stock required to complete 36 no.  $25g/m^2$  runs on the Project Road, 513 tons, except in April and May when that may drop to 18no. runs which is equal to 256 tons.

- 16.8 M50CL will order stock on a regular to replenish what has been used, this will keep stock at a high level and mitigate the effects of any supply problems during periods of exceptionally high demand.
- 16.9 Salt storage areas will be maintained to ensure the following:
  - It is stored in dry conditions
  - No sheer faces left in stock piles
  - Salt stockpiles do not become contaminated.
  - Salt stockpiles or adjacent operations do not affect the environment.
  - Salt Storage
- 16.10 The salt will be stored at the Castleknock Depot in a purpose build storage facility with hard standing to ensure the salt pile is kept dry. This is capable of storing up to 1700T.
- 16.11 The marine salt will be stored at the Balbriggan depot and collected when required and has access to at least 100 T. at any time. A stock of 5 tons will be kept at Castleknock as backup.
- 16.12 The brine solution generated from the marine salt is kept in tanks totaling 28,000 litres and pumped into the brine tanks on the gritters.

# Other materials – Fuels

16.13 Fuel is stored at the Castleknock depot in a 10,000 litre bunded tank and a computerised delivery system. A minimum level of 5000 litres of fuel will be stocked to ensure continuity of operations in severe weather conditions.

# **17. PUBLICITY**

### Arrangements for informing media and public

- 17.1 The Company will work closely with the Gardai who may supply information to the media regarding traveling conditions during periods of adverse weather.
- 17.2 The Duty Engineer will be responsible for providing factual information concerning the network to the Gardai for onward distribution to the press, local radio, RTE, AA, and giving a response to any public enquiries.

# **18. LOCATIONS FOR SPECIAL TREATMENT**

### Ice susceptible areas- Inclines/Declines

- 18.1 During heavy periods of snow and with freezing conditions the action of the vehicles can turn the snow into ice. On areas of the Project Road where there are steep inclines and declines the formation of ice will cause traction problems either preventing vehicles from gaining grip and unable to climb the gradient or loosing grip and being unable to stop.
- 18.2 A number of these locations exist on the Project Road. When snow is forecast and during snow fall these areas will be given priority and the spread of salt will be increased to ensure there is adequate application of salt.
- 18.3 These areas include
  - Exit Slips at J13 Ballinteer/Sandyford, J9 N7, J7 N4 and J6 N3

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- Entry Slips at J13 Ballinteer/Sandyford
- Inclined Carriageway between J14 N31 and J13 Ballinteer northbound and between J12 Firhouse and J13 Ballinteer/Sandyford heading southbound.
- Sheltered areas between J14 N31 and J12 Firhouse and in particular where the camber falls to the median
- J6 N3 slip roads with steep incline/decline and crossfall.
- Areas liable to seepage from double skinned concrete barrier particularly at J14 N31 northbound, between J13 Ballinteer/Sandyford and J12 Firhouse, at J5 N2 and J3 M1.

#### Frost susceptible areas

- 18.4 Areas susceptible to frost shall be identified by inspectors/patrols and reported to the Duty Engineer for inclusion in the daily action plan, and precautionary gritting routes:
- 18.5 These areas include:
  - Elevated sections of trunk roads or bridges
  - Exposed sections of trunk road
  - Frost hollows

#### Known surface water run off locations

- 18.6 Areas susceptible to surface run off shall be identified by inspectors/patrols and reported to the Duty Engineer for inclusion in the daily action plan and precautionary gritting routes.
- 18.7 These areas include:
  - Sections of Project Road in low ground
  - Areas susceptible to water run-off from side roads
  - Known drainage design problematic areas.

#### Areas Prone to Snow Drifting

- 18.8 During heavy snow events combined with strong winds there are areas of the motorway that can be susceptible to snow drifting and large deep accumulation of snow settling on the on the carriageway.
- 18.9 These locations are hard to predict and are dependent on the direction of the prevailing wind, however they tend to be in areas where the adjoining lands are open fields or parkland. During snow events, areas of drifting will be identified early to ensure ploughing is carried out effectively. This will prevent large accumulations from forming which require shovels and excavators to remove.

### **19. OTHER COMMENTS**

#### Movement of Abnormal Loads

- 19.1 When conditions due to ice and snow become too severe for the safe movement of heavy or abnormal loads and it is known that a movement is imminent or in progress, the Duty Winter Manager will inform the appropriate Gardai Control Room.
- 19.2 A request will be made for Gardai co-operation in advising the driver of the abnormal load of the road conditions in order to encourage him to cease traveling until the road is considered safe. If the movement has not commenced or is due on the network within 24 hours the Network Manager will inform the haulage contractor of problems on the network.



## Salt Usage Prohibitions

19.3 There are no salt prohibitions on the Project Road.

## **Annual Review**

- 19.4 A report on the winter maintenance management Operations and winter maintenance Operations for the period ending 31st December will be prepared and submitted as part of the Annual Performance Report and the 5 Year Management Plan.
- 19.5 An annual review of the previous winter maintenance season will take place mid-summer. All interested parties will be invited to forward their comments and to participate. Minutes of the review will be written and any actions carried out prior to the season commencement.



### **APPENDIX 1 - MAP OF TREATMENT ROUTES**





## **APPENDIX 2: WEATHER STATIONS LOCATIONS**





# **APPENDIX 3 -TREATMENT ROUTES**

# M50 ROUTE 1

M50 Route 1									
Primary Station	M50 J3/Airport								
Secondary Station	Blanchardstown		Average Non Salting Speed (km/hr)	70					
Salting Depot	Castleknock		Average Salting Speed (km/hr)	50					
Route No:	1		Route time to end salting (hr)	1hr 48mins					
Rate of Spread	10 - 25g/m2		Dry 10g Treatment Tonnes	1.50					
Depot to Route (km)	5.9		Route tonnage Pre-Wet (10g, 15g, 20g& 25g) Rock Salt (70% ratio)	1.06T/1.58T/2.11T/2.63T					
			Route Tonnage Pre-Wet (10g, 15g, 20g, & 25g) Marine Salt in Brine (10% ratio)	0.11T/0.16T/0.21T/0.26T					
Time to Route (min)	6 min		Brine Volume (10g, 15g 20g & 25g) 4 X Salt weight	4511/6761/9021/11271					
Treated Length (m)	54700	1 Hour 7 min	Route to depot (km)	6.3					
Dead Length (m)	53150	0 Hour 46 min	Square Meter of surface Treated m2	150,171					
Total Route Time	107850	1 Hour 53 min	Average Spread width (m)	8.78					



					Project Road					
	M50 Route 1 Page 1									
							Dist	Dead/	width	
Nc 🔻	Start 👻	Chainage 🔻	End	Chainage 🔻	•	Dist Liv 🔻	Dead 🔻	Live 🔻	spread 🔻	Area m2 🔻
1	Castleknock Depot	13300	J5 Offslip	7400	travel M50 mainline n/b		5,900	Dead		
2	M50 J5 Offslip	7400	J3 Free flow	1400	treat M50 mainline n/b J5 - J3	6,100		Live	11	64,050
3	M50 J3 Free flow	1400	J3 Rotary	1000	treat to j3 rotery n/b	500		Live	7	
4	J3 Rotary	1000	J3 Rotary		treat J3 rotary	500		Live	11	
5	J3 Rotary		J3 Rotary		travel west to east rotary		200	dead	-	
6	12 Datas		N22 Ustal David de aut		treat D120/h to reter	550		Live	7	
5	J3 Rotary		N32 Hotel Roundabout		treat R139 W/B to rotary	550		Live	/	
/	N32 Hotel Roundabout		J3 Rotary		treat R139 W/B to J3 rotary	550		Live		
8	J3 Rotary	1000	J3 Rotary	4200	travel rotary J3	200	200	dead	-	
9	J3 Rotary	1000		1300	treat MSU S/B from J3 Rotary S/B	300		live	/	40.250
10	MS0 J3 S/ B Mainline	1300	M50 J6 S/B Offslip	6000	treat MSU mainline \$/b J3 - J5	4,700		LIVE	11	49,350
11	M50 J5 S/B Offslip	6000	N2 N/B	N2 N 0.2	treat off slip to N2 n/b	1,200		Live	7	
12			NO N/D Mainling to turn North Dood	N2 N 2 2			2 000	Deed		
12		N2 N U.2	N2 N/B Mainline to turn North Road	N2 N 2.2	travel cold winter		2,000	Dead	-	
13	Turn at North Road TLs	N2 N 2.2	N2 S/B freeflow slip to M50 S/B	N2 S 0.7	travel cold winter	500	2,000	dead	-	-
14	N2 S/B freeflow slip to M50 S/B	N2S0.7	M50 N/B J5 Onslip Aux Lane	5900	treat N2 s/b freeflow to m50 N/B	500		Live	/	= ===
15	M50 N/B J5 Onslip Aux Lane	5900	J4 Offslip	4200	treat M50 Aux Lane to n/b J5-J4	1,700		Live	4	5,950
16	J4 N/B Off slip	4200	J4 Rotary	3600	treat slip off to J4	600		Live	7	
17	J4 Rotary	3600	J4 Rotary	3600	treat rotary J4	500		Live	7	
18	14 Botany	3600	R108 at TL's to NCT Centre		treat R108 N/B from Rotary to TL,s and	200		Live	4	
10	P108 at TI's to NCT Contro	3000	A Botany		treat B109 5 /B to 14 Botan	200		Live	7	
19	A Deter North Side		J4 Rotary			200	200	Live		
20	14 Rotary North Side		J4 Rotary south side			200	200	ueau	- 7	
21	J4 Rotary South Side		R108 S/B for 200m		Treat S/B R108	200	150	live	/	
22	R108 S/B for 200m		ILS on R108 @ IKEA Jnct		travel R108 S/B		150	dead	-	
23	TLS on R108 @ IKEA Jnct		R108 N/B 200m prior to J4 Rotary		travel R108 N/B		150	dead	-	
24	R108 N/B 200m prior to J4 Rotary		J4 Rotary		treat R108 N/B to J4 Rotary	200		live	7	
25	J4 Rotary		J4 Rotary @ on slip N/B		Travel J4 Rotary to N/B onslip		250	dead	-	
26	J4 Rotary @J4 onslip	3600	M50 N/B mainline Aux lane	2900	treat on slip J4 n/b	700		Live	7	
27	J4 Mainline onslip Aux lane	2900	J3 Free flow to airport	1700	treat M50 Aux Lane n/b j4-j3	1,200		Live	4	4,200
	·				treat freeflow M50 N/B to M1 to					
28	J3 Free flow to airport	1700	M1 N/B J3 to airport	M1 N1.5	airport	1,500		Live	7	
20		N41 NI 1 F	12 Driver off alia N/D	N41 N 4 2		2 700		Live	11	
29	MIN/BJ3 to airport	MIN 1.5	J3 Drinan off slip N/B	MI N4.2	treat MI mainline n/b 3 lane J1 - J3	2,700		Live	11	
30	J3 Drinan off slip N/B	M1 S4.2	M1 J3 Rotary Drinan	M1 S 4.5	treat n/b slip M1 j3	300	1	Live	4	-
31	J3 Rotary Drinan		J3 Rotary		treat J3 rotary	100		Live	7	
32	J3 Rotary onslip S/B M1	M1 S 4.5	M1 J3 S/B mainline	M1 S 4.2	treat onslip J3 s/b	400		Live	4	
33	M1 J3 S/B onslip mainline	M1 S 4.2	M1 J3 S/B Off slip	M1 S 1.2	treat M1 s/b mainline	2,800		Live	11	
34	M1 13 S/B Off slip	M1 S 1 2	M1 S/B at merge with M50 freeflow	M1 S O 1	treat M1 s/h mainline	1 100		Live	7	
54		1111 5 1.2	MES/Bachleige with MSB freehow	1011 5 0.1		1,100		LIVC	,	
35	M1 S/B at merge with M50 freeflow	M1 S 0.1	M50 Tunnel Entrance	M50 N 5.3	treat M50 s/b mainline	1,200		Live	11	
36	M50 Tuppel Entrance	M50 N 5 3	N1 to Whiteball	M50 N 5 0	Whitehall	300		Live	7	
37	N1 to Whiteball	11.50 11 5.5	Whitehall TI's	1115011 510	travel s/h to whitehall	500	1.400	Dead		
20			N1 N/R At Tuppel Exit		travel from whitehall n/h		1,400	Dood		
20	NITERIAL IES					200	1,400	Deau	- 7	
39			MEO N/B at runner Exit	NISU 5 5.4		1 200		Live	/	
40	MEO N/B ALTURNET EXIT	NEO C C 7	MED froe flow S/R MED	1500 5 6.7	treat freeflow mE0 at 12	1,300	-	Live		
41	NISU N/ B Mamme at Freetiow 13	IVIDU 5 6. /	NOU THE TOW S/B MOU	1000	ireat freehow mou at J3	900		Live	- '	
42	M50 free flow S/B M50	1500	J4 Off slip M50 N/B	3000	Treat M50 Aux Lane s/b j3-j4	1,500	<u> </u>	Live	4	5,250
43	J4 Off slip M50 N/B	3000	J4 Rotary	3600	treat Slip Road off J4 s/b	600	L	Live	7	
44	J4 Rotary	3600	J4 On slip S/B	3700	Travel Rotary J4		100	Dead	-	
45		2700		4200	treat R108 start treatment at freeflow	500		Live	7	
45	14 On slip 5/B	3700	NISO Mainine S/B J4 onsinp	4200	Mamine S	500		Live	/	
46	M50 Mainline S/B J4 onslip	4200	J5 Offslip S/B to N2	6000	treat M50 Aux Lane J4 - J5 S/B	1,900		Live	4	6,650
47	J5 Offslip S/B to N2	6000	Diverge of Offslip J5 S/B offslip	6400	Travel off slip		400	dead	-	
48	Diverge of Offslip J5 S/B offslip	6400	N2 S/B meets M50 offslip TLs	N2 S 0.2	treat off slip to N2 TL,s	300	L	live	4	
49	N2 S/B meets M50 offslip TLs	N2 S 0.2	N2 S/B Roundabout and Turn		travel N2 S/B and turn at R/B		1,000	dead	-	
	·, · · · · · · · ·		N2 N/B J5 diverge freeflow to M50							
50	N2 S/B Roundabout and Turn		N/B	N2 N 0.4	turn at R/B and travel N2 N/B		1,100	Dead	-	
51	N2 S/B at on slip to M50 N/P freeflow	N2504	N2 S/B	6200	treat frreflow n/b M50	700		live	A	
51	M50 freeflow J5 onslip merge from N2	112 3 0.4	112 3/ 0	0200		/00	<u> </u>	ive	4	-
52	S/B	6200	J4 Off slip N/B	4200	travel M50 N/B J5-J4		2,000	dead	-	
1										
53	J4 Ott slip N/B	4200	J4 N/B offslip at Freeflow slip to R108	3700	travel M50 offslip J4		500	dead	-	
54	J4 N/B offslip at Freeflow slip to R108	3700	R108 N/B		treat Freeflow slip N/B to R108	300		Live	4	
55	R108 N/B		R108 S/B	1	turn at TL,s	500	100	dead	ļ į	
			R108 S/B Freeflow onslip to M50 N/B				100			
56	R108 S/B		at J4	3600	Turn at TL's and travel R108 S/B		100	dead	-	



M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary @ J3 Rotary J4 M50 S/B offslip R108 S/B offslip R108 S/B offslip R108 S/B merge R108 TL's for IKEA R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge J5 offslip at N2 TL's R/B on N2 N2 N/B slip to M50 S/B M50 S/B freeflow from N2 S/B	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500 3800 6700 N2 N 0.0 7000	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary M/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary Off slip J3 Rotary Off slip J3 Rotary J4 M50 S/B offslip R108 S/B off Slip R108 TL's for IKEA R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge J5 off slip at N2 TL's R/B on N2 N2 N/B slip to M50 S/B M50 S/B freeflow from N2 S/B Castleknock Depot Slip Roads to and from J3 Rotary. S/B 6 N/B onslip. Treated by Globalvia Jons	M1 S 1.4 1300 3600 1000 900 M1 S 0.2 M5 0 N S.5 M1 N 0.3 1000 3500 3500 400 500 400 7000 13300 400 7000 13300 400 700	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3 - J4 S/B M50 travel J3 - J4 S/B M50 travel J4 - J3 M50 N/B Travel part of J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel M50 N/B to coolock and turn travel M50 N/B to coolock and turn travel M50 S/B 13 rotary to J4 offSlip treat offslip from M1/M50 N/B to J3 Rotary travel R108 S/B to TL's and turn turn and travel R108 N/B to freeflow slip treat freeflow J4 S/B to J4 onslip M50 S/B to J5 offSlip at TL's with N2 S/B travel S/B N2 into city and turn at R/B travel from R/B on N2 N/B to onslip S/B M50 S/B M50 S/	600 1,600 400 300 300 400 400 54,700	2,300 2,600 300 1,300 2,500 350 2,500 2,500 2,900 900 700 6,300 53,150	Live Live dead dead dead dead dead live dead dead live dead live dead dead Live dead dead dead dead	4 7 - 4 - 4 - - - - - - - - - - - - - -	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary off slip J3 Rotary 0ff slip J3 Rotary J4 M50 S/B offslip R108 S/B merge R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge J5 offslip at N2 TL's R/B on N2 N2 N/B slip to M50 S/B M50 S/B freeflow from N2 S/B	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500 3800 6700	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary (%) M50 J3 Rotary (%) M50 J3 Rotary (%) M50 J3 Rotary (%) M50 J3 Rotary (%) M1/S/B J2 Coolock Rotary J3 Rotary (%) J3 Rotary J3 Rotary J4 M50 S/B offslip R108 T/S for IKEA R108 T/S for IKEA R108 T/S for IKEA R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge J5 offslip at N2 TL'S R/B on N2 N2 N/B slip to M50 S/B M50 S/B freeflow from N2 S/B Castleknock Depot	M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500 3800 6700 N2 N 0.0 7000 13300	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3 - J4 S/B M50 travel J3 - J4 S/B M50 travel part of J3 Rotary Treat Onslipfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel coolock to J5 M50 S/B treat offslip from M1/M50 N/B to J3 Rotary travel M50 S/B J3 rotary to J4 offslip treat freeflow J4 S/B to R108 travel R108 S/B to TL's and turn turn and travel R108 N/B to freeflow slip treat freeflow slip R108 to J4 onslip M50 S/B travel R050 S/B to J5 offslip at TL's with N25 S/B travel from R/B on N2 N/B to onslip S/B M50 treat slip road to the merge with M50 S/B onslip from N2 S/B Travel M50 S/B to Depot	600 1,600 400 300 300 400 400 54,700	2,300 2,600 3000 1,300 1,400 2,500 250 250 2,900 900 700 6,300 53,150	Live Live dead dead dead dead dead dead dead live dead dead dead dead dead dead dead	4 7 - - 4 - - - - - - - - - - - - - - -	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary M/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary off slip J3 Rotary off slip J3 Rotary 0ff slip J3 Rotary H M50 S/B offslip R108 S/B merge R108 TL's for IKEA R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge J5 offslip at N2 TL's R/B on N2 N2 N/B slip to M50 S/B M50 S/B freeflow from N2 S/B	M1 N 2.6 M1 N 2.5 M1 S 1.4 1300 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500 3800 6700 N2 N 0.0 7000	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary J J4 M50 S/B offslip R108 S/B merge R108 TL's for IKEA R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge J5 offslip at N2 TL's R/B on N2 N2 N/B slip to M50 S/B M50 S/B freeflow from N2 S/B Castleknock Depot	M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500 5700 6700 7000 13300	Aux Lane M1 S/B 12 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3- J4 S/B M50 travel J3- J3 M50 N/B Travel part of J3 Rotary Treat Onslipfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel M50 N/B to coolock and turn travel coolock to J5 M50 S/B treat offslip from M1/M50 N/B to J3 Rotary travel M50 S/B J3 rotary to J4 offslip treat freeflow J4 S/B to R108 travel R108 S/B to TL's and turn turn and travel R108 N/B to freeflow slip travel M50 S/B to J5 offslip at TL's with N2 S/B travel M50 S/B to TL's and turn at R/B travel S/B N2 into city and turn at R/B travel S/B N2 into city and turn at R/B travel S/B N50 S/B M50 treat slip road to the merge with M50 S/B onsip from N2 S/B Travel M50 S/B 15 to Depot	600 1,600 400 300 300 400	2,300 2,600 300 1,300 2,500 2,500 250 2,900 900 700 6,300	Live Live dead dead dead dead dead live dead live dead live dead dead live dead Live	4 7 - - - - - - - - - - 4 - - - - - - -	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary off slip J3 Rotary J4 M50 S/B offslip R108 S/B merge R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge J5 offslip at N2 TL's R/B on N2	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500 3800 6700	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary Off slip J2 Coolock Rotary J3 Rotary Off slip J3 Rotary Off slip R108 S/B off slip R108 S/B merge R108 TL's for IKEA R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge J5 off slip at N2 TL's R/B on N2 N2 N/B slip to M50 S/B	M1 S 1.4 1300 3600 1000 900 M15 0.2 M50 N 5.5 M1 N 0.3 1000 3500 3500 6700 N2 N 0.0	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3 - J4 S/B M50 travel J4 - J3 M50 N/B Travel part of J3 Rotary Treat Onslipfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel G00 J4 S/B to R108 travel K108 S/B to R108 travel R108 S/B to R108 travel R108 S/B to TL's and turn turn and travel R108 N/B to Foreflow slip treat freeflow J4 S/B to B 108 travel S/B NJ R018 N/B to Foreflow S/B travel S/B NJ R108 to J4 onslip M50 S/B travel S/B N2 into city and turn at R/B travel from R/B on N2 N/B to onslip S/B M50 treat slip road to the merge with M50	600 1,600 400 300 300 400	2,300 2,600 300 1,300 1,400 2,500 350 250 2,900 900 700	Live Live dead dead dead dead dead live dead live dead live dead dead	4 7 - 4 - - - - 4 - - - - - - - - - -	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary J3 Rotary J4 M50 S/B offslip J3 Rotary J4 M50 S/B offslip R108 S/B merge R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge J5 offslip at N2 TL's	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500 3800 6700	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary (MB M50) J3 Rotary (@ onslip to tunnel) Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary J3 Rotary J3 Rotary J4 M50 S/B offslip R108 T/S for IKEA R108 T/S for IKEA R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge J5 offslip at N2 TL'S R/B on N2	M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500 3800 6700	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3 - J4 S/B M50 travel J3 - J4 S/B M50 travel J4-J3 M50 N/B Treat Onslipfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel M50 N/B to coolock and turn treat offslip from M1/M50 N/B to J3 Rotary travel M50 S/B J3 rotary to J4 offslip treat freeflow J4 S/B to R108 travel M50 S/B to TL's and turn turn and travel R108 N/B to freeflow slip treat M50 S/B to J5 offslip at TL's with N25 S/B travel M50 S/B to J5 offslip at TL's with N2 S/B travel M50 N/B to conslip travel from R/B on N2 N/B to onslip	600 1,600 400 300 300 400	2,300 2,600 300 1,300 1,400 2,500 250 250 2,900 900	Live Live dead dead dead dead dead dead live dead dead live dead	4 7 - - 4 - - - 4 - - - 4 - - - 4 -	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary M/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary J3 Rotary J3 Rotary J3 Rotary J4 M50 S/B offslip R108 S/B merge R108 TL's for IKEA R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary Off slip J3 Rotary J4 M50 S/B offSlip R108 S/B merge R108 TL's for IKEA R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge J5 offSlip at N2 TL's	M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500 3500 5700	Aux Lane M1 S/B 12 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3- J4 S/B M50 travel J4-J3 M50 N/B Travel part of J3 Rotary Treat Onslipfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel M50 N/B to coolock and turn travel coolock to J5 M50 S/B treat offslip from M1/M50 N/B to J3 Rotary travel M50 S/B J3 rotary to J4 offslip treat freeflow J4 S/B to R108 travel R108 S/B to TL's and turn turn and travel R108 N/B to freeflow slip travel R108 S/B to TL's and turn turavel R108 S/B to TL's and turn turn and travel R108 N/B to J4 onslip M50 S/B travel M50 S/B to J5 offslip at TL's with N2 S/B	600 1,600 400 300 300 400	2,300 2,600 300 1,300 1,400 2,500 350 250 2,900	Live Live dead dead dead Live dead live dead live dead live dead	4 7 - - 4 - - - 4 4 - - - 4	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary off slip J3 Rotary J4 M50 S/B off slip R108 S/B merge R108 TL's for IKEA R108 N/B J4 freeflow slip to M50	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 3600 1000 900 M1S 0.2 M1 N 0.3 1000 3500	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary off slip J3 Rotary off slip R108 S/B offslip R108 TL's for IKEA R108 N/B J4 freeflow slip to M50 J4 onslip S/B merge	M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500 3500 3800	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3 - J4 S/B M50 travel J4 - J3 M50 N/B Travel part of J3 Rotary Treat Onslipfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel M50 N/B to coolock and turn travel M50 S/B J3 rotary to J4 offslip treat freflow J4 S/B to R08 travel R108 S/B to TL's and turn turn and travel R108 N/B to Freeflow Slip M50 S/B	600 1,600 400 300 300 400	2,300 2,600 300 1,300 1,400 2,500 350 250	Live Live dead dead dead Live dead dead live dead dead live dead live dead	4 7  - 4 - - - - - - 4 - - - 4 -	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary M/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary off slip J3 Rotary off slip J3 Rotary J4 M50 S/B offslip R108 S/B merge R108 TL's for IKEA	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary (MB M50) J3 Rotary (@ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary J3 Rotary J3 Rotary J4 M50 S/B offslip R108 S/B merge R108 TL's for IKEA R108 N/B J4 freeflow slip to M50	M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500	Aux Lane M1 S/B 12 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3- J4 S/B M50 travel J3- J4 S/B M50 Travel part of J3 Rotary Treat Onslipfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel coolock to J5 M50 S/B treat offslip from M1/M50 N/B to J3 Rotary travel M50 S/B J3 rotary to J4 offslip treat freeflow J4 S/B to R108 travel R108 S/B to TL's and turn turn and travel R108 N/B to freeflow slip	600 1,600 400 300 300	2,300 2,600 300 1,300 1,400 2,500 350 250	Live Live dead dead Live dead dead live dead live dead dead	4 7 - - - - - - - - - - - - 4 4 - - - -	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary M/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary off slip J3 Rotary off slip J4 M50 S/B offslip R108 S/B merge	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500	M1 5/B freeflow slip to M30 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary off slip J3 Rotary J4 M50 S/B offslip R108 S/B merge R108 TL's for IKEA	M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3 - J4 S/B M50 travel J4 - J3 M50 N/B Travel part of J3 Rotary Treat Onslipfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel coolock to J5 M50 S/B treat offslip from M1/M50 N/B to J3 Rotary travel M50 S/B J3 rotary to J4 offslip treat freeflow J4 S/B to R108 travel R108 S/B to TL's and turn was nad heavel 11 070 1/5 fr	600 1,600 400 300 300	2,300 2,600 300 1,300 1,400 2,500 350	Live dead dead dead dead dead dead dead de	4 7 - - - - - - - - - - - - - - - - - -	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary [J3 Rotary] J3 Rotary [J4 M50 S/B offslip J3 Rotary]	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500	M1 5/B freeflow slip to M30 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary (@ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary off slip J3 Rotary J4 M50 S/B offslip B108 S/B merge	M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000 3500	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3 - J4 S/B M50 travel J4 - J3 M50 N/B Travel part of J3 Rotary Treat Onslipfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel coolock to J5 M50 S/B treat offslip from M1/M50 N/B to J3 Rotary travel M50 S/B J3 rotary to J4 offslip treat freeflow J4 S/B n9 R9	600 1,600 400 300	2,300 2,600 300 1,300 1,400 2,500	Live dead dead dead Live dead dead live dead live	4 7 4 - 4 - 4	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary off slip	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 3600 1000 900 M15 0.2 M50 N 5.5 M1 N 0.3	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary	M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3 1000	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3 - J4 S/B M50 travel J4-J3 M50 N/B Travel part of J3 Rotary Treat Onsilpfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel coolock to J5 M50 S/B treat offslip from M1/M50 N/B to J3 Rotary	<u>600</u> <u>1,600</u> <u>400</u> <u>300</u>	2,300 2,600 300 1,300 1,400	Live dead dead dead Live dead dead dead	4 	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary J3 Rotary off slip	M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5 M1 N 0.3	Aux Lane M1 S/B 12 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3- J4 S/B M50 travel J4-J3 M50 N/B Travel part of J3 Rotary Treat Onslipfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn travel coolock to J5 M50 S/B	600 1,600 400	2,300 2,600 300 1,300 1,400	Live Live dead dead Live dead dead	4 7 - - - 4 - -	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/5/B	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 3600 1000 900 M1S 0.2	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary (J/B M50 J3 Rotary @ onslip to tunnel Onslip merge with M1/S/B J2 Coolock Rotary	M1 S 1.4 1300 3600 1000 900 M1S 0.2 M50 N 5.5	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3- J4 S/B M50 travel J4-J3 M50 N/B Travel part of J3 Rotary Treat Onslipfrom J3 Rotary to M1/M50 to tunnel travel M50 N/B to coolock and turn	600 1,600 400	2,300 2,600 300	Live Live dead dead dead Live dead	4 7 - - 4	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 3600 1000	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50 J3 Rotary @ onslip to tunnel	M1 S 1.4 1300 3600 1000 900	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3 - J4 S/B M50 travel J4-J3 M50 N/B Travel part of J3 Rotary Treat Onslipfrom J3 Rotary to M1/M50	600	2,300 2,600 300	Live Live dead dead dead	4 7	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300 3600	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary J3 Rotary N/B M50	M1 S 1.4 1300 3600 1000	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3- J4 S/B M50 travel J4-J3 M50 N/B Travel to J2 - J	600	2,300	Live Live dead dead	4 7 -	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline M1 S/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3	M1 N 2.6 M1 N 2.5 M1 S2.0 M1 S 1.4 1300	M1 5/B freeflow slip to M50 S/BM1 S 1.4 M50 S/B merge at J3 J4 off slip and Rotary	M1 S 1.4 1300 3600	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50 S/B travel J3- J4 S/B M50	600 1,600	2,300	Live Live dead	4	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline	M1 N 2.6 M1 N 2.5 M1 S2.0	M1 S/B freeflow slip to M50 S/BM1 S 1.4	M1 S 1.4	Aux Lane M1 S/B J2 - J1 Treat freeflow from M1 S/B to M50	600		Live	4	
M1 S/B off slip to J2 J3 Rotary J3 Rotary M1 S/b onslip to mainline	M1 N 2.6 M1 N 2.5 M1 S2 0	M1 S/B freeflow slip to M50 S/BM1 S 1.4	M1514	Aux Lane M1 S/B 12 - 11	600		Live		
M1 S/B off slip to J2 J3 Rotary J3 Rotary	M1 N 2.6 M1 N 2.5	wit 3/ b ofisitp to marinine	1				r		
M1 S/B off slip to J2		J3 Rotary	M1 N 2.5 M1 S2.0	Travel part of J2 Rotary treat J2 onslip to M1 S/B	500	100	dead live	- 7	
US N/B JUNCTION DRINNAM	M1 S 3.5	J3 Rotary	M1 N 2.6	treat M1 off slip to J2 Rotary	900	1,000	Live	- 7	
12 N/D junction Drink	M1 C 4 5		M1 C 2 C	turn at Drinham and travel on slip and		1,000	do-d	_	<u> </u>
M1 J2 Rotary M1 N/B Onslip 12	M1 N 2.6 M1 N 3 5	M1 N/B Onslip J2 J3 N/B junction Drinham	M1 N 3.5 M1 N 4.5	treat M1 N/B onslip from J2 travel M1 N/B and turn at I3 Drinham	900	1.000	Live dead	7	
J2 link road to J2 from airport		link road to J2 from airport M1 J2 Rotary	M1 N 2.6	Rotary travel link road to J2	500	500	Live dead	- 4	<u> </u>
R132 S/B freeflow slip to link road to M1				treat R132 freeflow road to m1 J2		300	uedū	-	
P122 North R/P		R132 S/B freeflow slip to link road to				300	do-1	-	
R132 N/B airport R/B		airport roundabout R132 North R/B	+	travel airport R/B travel R132 N/B to R/B and turn		150 600	dead dead	-	
R132 S/B TL's turn		R132 N/B airport R/B	<u> </u>	travel n/b R132 to aiport R/B		350	dead	<u> </u>	$\vdash$
R132 S/B		R132 S/B TL's turn	<u> </u>	travel S/B and turn on R132 TL's		250	dead		
Airport R/B slip to R132 S/B		R132 S/B		treat freeflow to R132	350	150	live	- 4	
J2 Rotary		Link road to airport R/B		treat slip road link to airport	300	150	Live	4	
J2 Rotary		J2 Rotary		Travel J2 Rotary		500	dead	-	
J2 Rotary		J2 Rotary		Treat J2 Rotary	600		Live	7	
Airport Roundabout		Airport Roundabout		travel airport roundabout	700	200	dead	11	
Airport Round		Airport Roundabout		treat Airport roundabout	250		live	11	
Airport link road merge with slip from J2		Airport Roundabout		treat airport link road to R/B	400		Live	11	
M1 free flow to airport	M1 N 2.1	from J2	<u> </u>	treat M1 free flow to airport link road	800		live	7	<u> </u>
M1 Mainline at m50 freeflow merge	M1 N 1.6	M1 free flow to airport	M1 N 2.1	travel M1 N/B J1 - J2 airport freeflow		500	dead	-	<u> </u>
M1 Main line at m50 freeflow	M1 N 0.2	M1 Mainline at m50 freeflow merge	M1 N 1.6	treetlow under J3	1,400		live	7	
ייייט אויט אויט איש	14130 5 0.2	INTE MAIL THE ALTIOUTRETIOW	IVIL IN U.2	Treat M1 N/B from freeflow to		900	uedū	-	
Coolock Rotary	M50 S 5.5	Onslip to M50 N/B	M50 S 6.2	M50 S/B	600		live	4	
Coolock Rotary	M50 S 5.4	Coolock Rotary	M50 S 5.5	travel part of Coolock rotary treat on slip from coolock rotary to		150	dead		
slip to Coolock rotary N1 N/B	M50 S 5.1	Coolock Rotary	M50 S 5.4	treat off slip from N1to Coolock rotary	250		Live	4	
Turn at Whithall Junction		slip to Coolock rotary N1 N/B		N1		1,400	dead	-	
Slip onto N1 S/B City Bound	M50 N 5.1	Turn at Whithall Junction		travel to whitehall N1 travel from whitehall to coolock Int		1,400	dead	-	
Coolock Rotary	M50 N 5.4	Slip onto N1 City Bound	M50 N 5.1	treat on slip to N1 from Coolock	250		Live	4	<u> </u>
Coolock Rotary		Coolock Rotary		travel part of rotary		150	dead	-	
Coolock Rotary J2	M50 N 5.5	Coolock Rotary	1115011 515	treat Coolock Rotary	500		Live	7	
M50/M1 Merge Offslip to Coolock 12 M50	M1 S 0.2 M50 N 6.0	Offslip to Coolock J2 M50	M50 N 6.0	travel M50 N/B J3 - J2 treat Offslip to Coolock	500	600	dead Live	- 4	
J3 M50 Mainline at diverge	1300	M50/M1 Merge	M1 S 0.2	Treat Free flow to port tunnel	1,600		Live	7	
J4 Onslip from Rotary	3400	J3 M50 Mainline at diverge	1300	travel J4 on slip and m50 mainline		2,000	dead	-	
R108 Freeflow onslip J4 to M50 N/B	3600	Merge with J4 Onslip N/B from Rotary	3400	treat freeflow m50 n/b	300		Live	4	
Start	Chainage	End	Chainage		Dist Live	Dist Dead	Live	spread m	Area m
						<b>.</b>			
M50 Route 1: Page 2									
	MS50 Route 1: Page 2         Start         R108 Freeflow onslip J4 to M50 N/B         J4 Onslip from Rotary         J3 M50 Mainline at diverge         M50/M1 Merge         Offslip to Coolock J2 M50         Coolock Rotary J2         Coolock Rotary         Slip onto N1 S/B City Bound         Turn at Whithall Junction         slip to Coolock rotary N1 N/B         Coolock Rotary         Coolock Rotary         Onslip to M50 N/B         M1 Mainline at m50 freeflow         M1 Mainline at m50 freeflow merge         M1 Free flow to airport         Airport Roundabout         J2 Rotary         J3 Rotary         Link road to J2 from airp	MS0 Route 1: Page 2StartChainageR108 Freeflow onslip J4 to MS0 N/B3600J4 Onslip from Rotary3400J3 M50 Mainline at diverge1300M50/M1 MergeM15 0.2Offslip to Coolock J2 MS0MS0 N 6.0Coolock Rotary J2MS0 N 5.5Coolock RotaryMS0 N 5.4Slip onto N1 S/B City BoundMS0 N 5.1Turn at Whithall JunctionMS0 S 5.1Coolock RotaryMS0 S 5.5Coolock RotaryMS0 S 5.5Coolock RotaryMS0 S 5.5Onslip to M50 N/BM50 S 5.5Onslip to M50 N/BM50 S 5.5Onslip to M50 N/BM50 S 5.2M1 Mainline at m50 freeflow mergeM1 N 1.6M1 free flow to airportM1 N 2.1Airport RoundaboutIJ2 RotaryIJ2 RotaryIJ3 N/B airport R/BIAirport R/B Airport R/BIAirport R/B Airport R/BIAirport R/B Airport R/BIJ3 N/B junction DrinhamM1 S 2.6J3 RotaryM1 N 2.6J3 Rot	M50 Route 1: Page 2           Start         Chainage         End           ht08 Freeflow onslip J4 to M50 N/B         3600         Merge with J4 Onslip N/B from Rotary           J4 Onslip from Rotary         3400         J3 M50 Mainline at diverge           J3 M50 Mainline at diverge         1300         M50/M1 Merge           M50/M1 Merge         M15 0.2         Offslip to Coolock J2 M50           Offslip to Coolock J2 M50         M50 N5 6.0         Coolock Rotary J2           Coolock Rotary J2         M50 N 5.0         Coolock Rotary           Coolock Rotary J2         M50 N 5.4         Slip onto N1 City Bound           Slip to Coolock rotary N1 N/B         M50 S 5.1         Coolock Rotary           Coolock Rotary         M50 S 5.4         Coolock Rotary           Coolock Rotary         M50 S 5.5         Onslip to M50 N/B           Onslip to M50 N/B         M50 S 5.5         Onslip to M50 N/B           Onslip to M50 N/B         M50 S 5.5         Onslip to M50 N/B           M1 Mainline at m50 freeflow merge         M1 N 1.6         M1 Mainline at m50 freeflow merge           M1 Mainline at m50 freeflow merge         M1 N 1.6         M1 Free flow to airport           M1 Mainline at m50 freeflow merge         M1 N 1.6         M1 Free flow to airport           M1 Mainline at	M50 Route 1: Page 2         Image         End         Chainage           Start         Chainage         End         Chainage           R108 Freeflow onslip J4 to M50 N/8         3600         Merge with J4 Onslip N/B from Rotary         3400           J4 Onslip from Rotary         3400         J3 M50 Mainline at diverge         1300           J3 M50 Mainline at diverge         M15 0.2         Offslip to Coolock J2 M50         M50 N 6.0         Coolock Rotary         M50 N 5.5           Coolock Rotary         M50 N 5.4         Slip onto N1 City Bound         M50 N 5.1           Coolock Rotary         M50 N 5.4         Slip onto N1 City Bound         M50 N 5.1           Slip oto N1 S/B City Bound         M50 N 5.1         Turn at Whithall Junction         Slip to Coolock rotary N1 N/B           Slip to Coolock Rotary         M50 S 5.4         Coolock Rotary         M50 S 5.4           Coolock Rotary         M50 S 5.5         Onslip to M50 N/B         M50 S 5.2           Coolock Rotary         M50 S 5.5         Onslip to M50 N/B         M50 S 5.2           Coolock Rotary         M50 S 5.2         M1 Main line at m50 freeflow merge         M1 N 1.6           M1 Main line at m50 freeflow merge         M1 N 1.2         M1 Main line at m50 freeflow merge         M1 N 1.2           M1 Main line at m50 fr	MSD Route 1: Page 2         Instrume         Chainage         End           Stat         Chainage         Chainage         Chainage           Procession         3600         Merge with J4 0MSD r/S 140 MSD n/S         3400         treat Freeflow nSD n/S           J3 MSD Mainline at diverge         130         MSD/ML Merge         MI S 0.2         Travel MSD N/B 13-12           Offsig to Coolock Rotary         200         Coolock Rotary 12         MSD N S 5         Treat Free flow to port tunnel           Offsig to Coolock Rotary         Coolock Rotary 12         MSD N S 5         Coolock Rotary         Treat Page 1 of rotary           Coolock Rotary         Coolock Rotary         Creat Onlock Rotary         Treat Page 1 of rotary           Coolock Rotary         MSD N S 5         Coolock Rotary         MSD N S 1         Treat en offs to N1 from Coolock           Sig to Coolock Rotary         MSD N S 1         Treat en offs to N1 from Coolock Rotary         NSD S 5.4         Treat on fift to N1 from Coolock Rotary           Turn at Whithell Junction         sig to Coolock Rotary         MSD S 5.4         Treat end fift from N1 to Coolock Rotary           Coolock Rotary         MSD S 5.4         Coolock Rotary         MSD S 5.4         Treat MI N/S from Freeflow Rotary           Coolock Rotary         MSD S 5.5         Coolock Rotary	MSD Route 1: Page 2         Image         Image <td>MS0 Route 1: Page 2         Image End         Image Part of Control (Control (C</td> <td>MSO Route 1: Page 2         Image         Image<td>MSO Route 1: Page 2         model         model         model         model         model         model           Sant         Chainage         End         Chainage         End         Date         Date         Date         Date         Date         Date         Date         A           Sant         Sant         Sant         Sant         Sant         Date         Sant         Date         A         Date         A         <t< td=""></t<></td></td>	MS0 Route 1: Page 2         Image End         Image Part of Control (Control (C	MSO Route 1: Page 2         Image         Image <td>MSO Route 1: Page 2         model         model         model         model         model         model           Sant         Chainage         End         Chainage         End         Date         Date         Date         Date         Date         Date         Date         A           Sant         Sant         Sant         Sant         Sant         Date         Sant         Date         A         Date         A         <t< td=""></t<></td>	MSO Route 1: Page 2         model         model         model         model         model         model           Sant         Chainage         End         Chainage         End         Date         Date         Date         Date         Date         Date         Date         A           Sant         Sant         Sant         Sant         Sant         Date         Sant         Date         A         Date         A <t< td=""></t<>



# M50 Route 2

M50 Route 2										
Primary Station	Blanchardstown									
Secondary Station	M50 J3/Airport		Average Non Salting Speed (km/hr)	70						
Salting Depot	Castleknock		Average Salting Speed (km/hr)	50						
Route No:	2		Route time to end salting (hr)	1 hr 41 mins						
Rate of Spread	10 - 25g/m2		Dry 10g Treatment Tonnes	1.47						
Depot to Route (km)	0.3		Route tonnage Pr-Wet (10g, 15g, 20g& 25g) Rock Salt (70% Ratio)	1.04T/1.55T/2.07T/2.59T						
			Route Tonnage Prewet (10g, 15g, 20g, & 25g) Marine Salt in Brine (10% ratio)	0.11T/0.16T/0.21T/0.26T						
Time to Route (min)	1		Brine Volume (10g, 15g & 20g) x4 salt weight	4431/6641/8851/11061						
Treated Length (m)	55150	1 Hour 06 min	Route to depot (km)	2.2						
Dead Length (m)	42300	0 Hour 36 min	Square Meter of surface Treated m2	147,454						
Total Route Time		1 Hour 42 min	Average Spread width (m)	7.84						



					Project Road					
	M50 Route 2: Page 1									
No						Distance	Distance		spread	
NU	Start	Chainage	End	Chainage		Live	Dead	Dead/Live	width	Area m2
1	Castleknock Depot	13300	M50 N/B J6 Onslip	13000	travel M50 N/B Depot to J6 N/B north side at on slip		300	Dead	0	
2	M50 N/B J6 Onslip	13000	J5 N/B Offslip start	7400	Treat M50 N/B mainline J6 to J5	5600		Live	10.5	58800
3	J5 N/B Offslip start	7400	J4 N/B off slip	4200	travel M50 N/B To J4 Ballymun		3200	dead	0	
4	J4 N/B off slip	4200	J4 Rotary	3600	travel slip to J4 N/B		700	dead	0	
5	J4 Rotary	3600	M50 S/B Onslip	4200	Travel slip on from J4 S/B		700	dead	0	
6	M50 S/B Onslip	4200	M50 S/B offslip to J5	6000	Travel M50 S/B J4 to J5		1800	dead	0	
7	M50 S/B offslip to J5	6000	M50 S/B J6 offslip to J6	10000	Treat M50 S/B J5 - J6	4000		Live	10.5	42000
8	M50 S/B J6 offslip to J6	10000	N3 N/B at off slip to J2	N3 N 0.4	Treat M50 S/B J6 offslip	1000		Live	3.5	
9	N3 N/B at off slip to J2	N3 N 0.4	N3 N/B at off slip to J2	N3 N 1.0	Treat N3 N/B mainline	600		Live	7	
10	N3 N/B at off slip to J2	N3 N 1.0	M3 Onslip from J 4 Clonee	N3 N 7.5	Treat M3 N/B mainline J2 to J5	5800		Live	7	
11	M3 Onslip from J5 Clonee west	N3 N 7.5	M3 J6 Rotary		travel J5 to J6 and turn		2700	dead	0	
12	M3 J6 Rotary		M3 Off slip to J5 Clonee west	N3 S 7.5	turn and travel J6 to J5		2700	dead	0	
13	M3 Off slip to J5 Clonee west	N3 S 7.5	M3 J5 roundabout S/B off slip	M3 S 6.9	treat M3 off slip to J5 off slip	500		Live	3.5	
14						200				
	M3 J4 roundabout S/B	IVI3 5 6.9	M3 J4 roundabout N/B		IS treat North Roundabouts S/B link road	300		Live	3.5	
15	M3 J4 roundabout N/B		M3 J4 roundabout S/B		road	300		Live	3.5	
16	M3 J4 roundabout S/B		M3 J4 roundabout N/B	M3 N 6.9	travel between roundabouts		300	dead	0	
17	M3 J4 roundabout N/B	M3 N 6.9	M3 Onslip from J 4 Clonee	N3 N 7.5	Treat J5 N/B onsluip	500		Live	3.5	
18	M3 Onslip from J 4 Clonee	N3 N 7.5	M3 J5 Rotary		travel J5 to J6 and turn		2700	dead	0	
19	M3 J5 Rotary		M3 Off slip to J4 Clonee	N3 S 7.5	turn and travel J6 to J5		2700	dead	0	
20	M3 Off slip to J4 Clonee	N3 S 7.5	M3 S/B at slip to hospital	M3 S 1.5	Treat M3 mainline S/B J5 to J2	6000		Live	7	
21	M3 S/B at slip to hospital	M3 S 1.5	M3 S/B deverge	M3 S 0.4	Treat M3 mainline S/B J2 to J1	1100		Live	10.5	
22	M3 S/B deverge	M3 S 0.4	N3 S/B TL's Auburn Av	M3 S 0	Treat M3 mainline S/B J1	400		Live	7	
23										
	N3 S/B TL's Auburn Av	M3 S 0	N3 Interchange Rail Stn		Travel N3 S/B and turn at interchangeturn		1000	dead	0	
24	N3 Interchange Rail Stn		N3 N/B TL's Auburn Av	M3 N 0	Interchange turn and travel N3 N/B		1000	dead	0	
25	N3 N/B TL's Auburn Av	M3 N 0	J6 Rotary	M3 N 0.3	Treat M3 N/B Auburn Rd to J6 Rotary	300		Live	10.5	
26	J6 Rotary	M3 N 0.3	J6 Rotary	M3 N 0.3	Treat J6 Rotary	600		Live	10.5	
27	J6 Rotary	M3 N 0.3	Rotary Onslip N/B to M50	10900	Travel part of Rotary		400	dead	0	
28	Onslip N/B to M50	10900	M50 N/B on slip	10700	Treat M50 N/B onslip from J6 Rotary	200		Live	7	
29	M50 N/B on slip	10700	M50 N/B Start of Aux lane	9800	Treat M50 N/B onslip from J6 Rotary	800		Live	3.5	
30	M50 N/B Start of Aux lane	9800	M50 N/B Off slip	7400	Treat M50 N/B Aux Lane J6 - J5	2400		Live	3.5	8400
31	M50 N/B Off slip	7400	M50 offslip N/B diverge	6900	Treat M50 N/B offslipSlip to diverge	500		Live	7	
32	M50 offslip N/B diverge	6900	N2 S/B J5	N2 S 0.3	Treat M50 S/B offslip loop to N2 S/B	600		Live	3.5	
33	N2 S/B J5	N2S0.3	N2 S/B J5	N2 S 0.2	Travel across 2 lanes on N2 S/B		100	dead	0	
34	N2 S/B J5	N2 S 0.2	M50 Freeflow on slip S/B		Treat M50 S/B J5 onslip from N2		300	dead	0	
35	M50 Freeflow on slip S/B		M50 S/B Aux -mainline	7400	Treat M50 S/B onslip from N2		600	dead	0	
36	M50 S/B Aux -mainline	7400	M50 S/B off slip to J6	10000	Treat M50 S/B Aux lane J5 - J6	2600		Live	3.5	9100
37	M50 S/B off slip to J6	10000	J6 Rotary	10900	Treat M50 S/B offslip to J6 Rotary	800		Live	7	
38	J6 Rotary	10900	J6 Rotary N3 S/B		Travel part of Rotary		100	dead	0	
39	J6 Rotary N3 S/B	M3 S 0.3	N3 N/B TL's Auburn Av	M3 S 0	Rotary J6 to N3 Auburn Av	300		Live	7	
40	N3 S/B TI 's Auburn Av	M3.5.0	N3 Interchange Rail Sto		Travel N3 S/B and turn at interchangeturn		1000	dead		
41	N3 Interchange Rail Stn		N3 N/B TL's Auburn Av	M3 N 0	Interchange turn and travel N3 N/B		1000	dead		
42			. ,				1000		l	
42	N3 N/B TL's Auburn Av	M3 N 0	Slip Road to M50 Freeflow S/B	M3 N 0.2	Treat M50 onslip to N3 freeflow to M50 S/B	350		Live	3.5	
43	S/B	M3 N 0 2	M50 S/B merge 16	11600	Treat M50 S/B onslip from N3	500		live	7	
44						500				
	M50 S/B merge J6	11600	J6 Uff Slip S/B to N7	13800	Treat M50 S/B Aux Lane J6 - J7	2200		LIVE	3.5	7700
45	J6 Off slip S/B to N7	13800	J6 Off slip S/B to N7 W/B diverge	1400	M50 S/B offslip to J7	200		Live	3.5	
46	I6 Off slip S/B to N7 W/B diverge	1400	16 Off slip to N4 morgo	NAWOS	Ireat free flow slip to N4 W/B from M50	200		live	2 6	
47	I6 Off slip to N4 merge	N4W06	12 offslin W/P	N4 W/ 1 F	Travel to 12 Liffy Valley W/P off clip		1000	dead	3.3	
48	12 offslin W/B	N4W15	12 Liffy Valley Interchange	N418	Travel 12 off slip Interchange		200	dead	0	
49	12 Liffy Valley Interchange	NA 1 9	12 offelin W/B	N/ W/ 1 5	Travel 12 on slip Interchange	-	200	dead		
50	12 offslip W/P	N/ E 1 F	NA E/R off clip to MEON/R	NAE1 1	Travel N4 E/B mailing		300	dood		
51	N4 F/B off slip to M50 N/B	N4F11	N4 slip onto M50 N/R	13800	Treat N4 E/B freeflow to M50 N/B I7	700	400	live	2 5	
52	N4 slip onto M50 N/B	13800	M50 Offslip to 16 Rotary	11800	Treat M50 N/B Aux Jane 17 - 16	2000		live	3.5	7000
52	M50 Offclin to 16 Potony	11900	In Botony	11000	Troat M50 N/R offslip 15 to Potani	2000		Livo	3.5	7000
54	In Botony	11000	le Poton	11000		/00	100	doad	3.5	
55	le Poton		Planchardstown Village Entrop		Treat Link Pd to Planch from 16 Poter	400	100	Livo	10 5	
56	Blanchardstown Villago Entranco	N3 N 0 5	Blanchardstown Villago Entrance	N3 N 0 0	Turn at Blanchardstown Village	400	200	dead	10.5	



	M50 Route 2: Page 2									
		-		-		Distance	Distance		spread	
	Start	Chainage	End	Chainage	Treat Link Bd to Blanchardstown to 16	Live	Dead	Dead/ Live	width	
57	Blanchardstown Village Entrance	N3 N 0.9	J6 Rotary	N3 S 0.5	Rotary	400		Live	7	
58	J6 Rotary	N3 S 0.5	J6 Rotary	N3 S 0.3	Travel J6 Rotary		200	dead	0	
59	J6 Rotary	N3S0.3	Dunsink Lane TL's	N3S0	Treat slip to Dunsink Lane	300	400	Live	7	
61	J6 Rotary	N3 N 0.4	N3 N/B prior to Blanch Village TLs	N3 N 0.4 N3 N 0.8	Travel J6 Rotary to Blanchardstown TL.s		400	dead	0	
67			N3 N/B lane drop after Blanch							
02	N3 N/B prior to Blanch Village	N3 N 0.8	village	N3 N 1.2	Treat N3 onto N3 past Blanch Tl,s	400		Live	7	
63	N3 N/B lane dron after Blanch village	N3 N 1 2	12 N3 N/B off slip	N3 N 1 5	Travel N3 N/B Blanch to 12		300	head		
64	J2 N3 N/B off slip	N3 N 1.5	J2 S/B offslip TL's	N3 N 2.0	Treat N3 N/B offslip J2 to Snughborough	500	500	Live	10.5	
65	J2 S/B offslip TL's		Roundabout Blanch Shopping Cent		Travel to R/B in Blanch Shopping Centre		300	dead	0	
66	Roundahout Blanch Shanning Cont		13.5 /D offelin TI's		Travel from B/B in Blanch Shanning Contro		200	dood		
67		N2 N 2 O		N2C20	Trace 12 Our chaid as Waster Fast	250	500	live	10.5	
68	J2 S/B OTSTIP TES	N3 N 2.0		N3 5 2.0	Treat J2 Overbridge West to East	230		Live	10.5	
69		N352.0	N3 S/B onsilp	N3 5 1.5		500	200	Live	/	
70	N3 S/B Onslip from J2	N351.5	N3 S/B Slip off to Hospital Connelly	N351.2	Travel N3 S/B J2 to offslip for Hospital	200	300	dead	0	
70	N3 S/B SIIP OF TO HOSPITAL CONTENY	N351.2	N3 S/B ILS Connelly Hosp	N3 5 0.9	Treat slip off N3 S/B to TLS at Hospital	300		live	3.5	
71	N3 S/B TLs Connelly Hosp	N3 S 0.9	N3 Junction with Blanch Village Rd	N3 N 0.7	Treat road from Hospital to Naven Rd N3	300		Live	10.5	
72										
	N3 Junction with Blanch Village Rd	N3 N 0.7	Blanch Village Main street	N3 N 0.9	Treat slip rd accessto N3 N/P from Planch		400	dead	0	
73	Blanch Village Main street	N3 N 0.9	N3 Junction with Blanch Village Rd	N3 N 0.9	Village	100		Live	3.5	
74	N3 Junction with Blanch Village Rd	N3 N 0.9	N3 N/B Offslip to J3	N3 N 2.5	Travel N/B N3 J1 to J3		1800	dead	0	
75	N3 N/B Offslip to J3	N3 N 2.5	spur into Blanch shopping cent	off slip	Treat off slip N3 N/B	300		Live	3.5	
/6	spur into Blanch shopping cent		roundabout in Blanch Shop cent		Treat spur into Blanchards town Shopping	200		LIVE	3.5	
77	roundabout in Blanch Shop cent		off slip J3 N/B		Treat spur from Blanchards town Shopping	200		Live	3.5	
78	off slip J3 N/B		J3 N/B N3 TL's at Junt with R121		Treat off slip N3 N/B to TL's J3	100		Live	10.5	
79	I2 N /P N2 TI's at lunt with P121		D121 12 N2	12 ovorbridgo	Troat P121 Over bridge E/P	200		Livo	10.5	
80	TL's on R 121 S/B slips		TL's on R121	12 Over Dridge	Travel R121 E/B and Turn	200	400	dead	10.5	
81	TL's on R121		TL's on R 121 S/B slips		Turn and Travel R121 W/B W/B		400	dead	0	
82										
07	IL's on R 121 S/B slips		J3 N/B N3 IL's at Junt with R121	J3 overbridge	Treat R121 Over bridge W/B	200		Live	10.5	
03	J3 N/B N3 IL's at Junt with R121	N3 N 2.9	N3 N/B on slip mainline	N3 N 3.2	Treat J3 N/B onslip 2 lanes	200		Live	/	
04	N3 N/B on slip mainline	N3 N 3.2	N3 N/B on slip mainline	N3 N 3.5	Treat J3 N/B onslip 1 lanes	300		Live	3.5	
85	N3 N/B on slip mainline	N3 N 3.5	N3 N/B J4 Off slip	N3 N5.2	Travel N3 N/B J3 to J4		1800	dead	0	
80	N3 N/B J4 Off slip	N3 N5.2	J4 Int TL's S/B	N3 S 5.7	Treat N3 N/B off slip to J4	500		Live	7	
8/	J4 Int TL's S/B	N3 S 5.7	J4 Int TL's N/B	N3 S 5.7	J4 over bridge	150		Live	10.5	
00	J4 Int IL's N/B	N355.7	J5 S/B Int Roundabout	N3 S 6.9	Treat R156 N/B Link Road J4 - J5	1200		Live	/	
00	J5 S/B Int Roundabout	N356.9	J4 Int IL's N/B	N355.7	Travel R156 S/B link Rd J5-J4	500	1200	dead	0	
90	J4 Int IL's N/B	N355.7	M3 S/B on slip to mailine	N3 S 5.2	Treat N3 S/B J4 Onslip Treat Aux Lane N3 S/B from I4 to Westfield	500		Live	3.5	
91	M3 S/B on slip to mailine	N3 S 5.2	Westfield junct ind est	N3 S 4.6	Inct	600		Live	3.5	
92	spur into Westfield N/B		spur into Westfield S/B		Treat off slip into Westfield/Services	150		Live	3.5	
93	spur into Westfield S/B		Turn at Rounabout Damastown Rd		Travel to Damastown Rd R/B		250	dead	0	
94	Turn at Rounabout Damastown Rd		spur into Westfield S/B		Travel From Damastown R/B		250	dead	0	
95	spur into Westfield S/B		N3 S/B mainline	N3 S 4.5	Treat On slip from Westfield/Services	150		Live	3.5	
96	N3 S/B mainline	N3 S 4.5	N3 S/B offslip J3	N3 S 3.3	Treat Aux Lane N3 S/B Westfield to J3	1300		Live	3.5	
97	N3 S/B offslip J3	N3 S 3.3	TL,s J3 Interchange offslip		Treat J3 S/B off slip	400		Live	7	
98					Travel through TL's S/B to J3 S/B Onslip and					
	IL,s J3 Interchange		J3 S/B onslip		turn Travel through TL's N/P to TL's at offslip	300		Live	10.5	
99	J3 S/B onslip		TL,s J3 Interchange at offslip		from N3 S/B	300		Live	10.5	
100	TL,s J3 Interchange at offslip		TL,s J3 Interchange at offslip		Turn at TLs		100	dead	0	
101	TL,s J3 Interchange at S/B offslip	N2627	J3 S/B Onslip	N3 S 2.7	Travel trough TLs to S/B onslip J3	400	300	dead	0	
102	13/5/B Mainling	N352./	12 S/B Mainline at ondia	N3516	Treat N3 S/B Aux Loop 12 -12 5/P	400		Live	3.5	
	ט וע אווווווופ אווווווווופ	11332.3	12 3/ B Marinine at Onstip	0.1 6 6 11	Travel M3 S/B J2 to Slip to Connelly	/00		LIVE	3.5	
104	J2 S/B Mainline at onslip	N3 S 1.6	Connelly Hospital		Hospital and Turn		1000	dead	0	
105	Conelly Hospital		J3 N/B offslip		Travel N3 N/B Connelly to J3 offslip		1900	dead	0	
106					Travel N3 N/B offslip to slip off to Blanch					
	N3 N/B Offslip to J3	N3 N 2.5	spur into Blanch shopping cent		Shopping		300	dead	0	
107	N3 J 3 Off slip @ spur into Blanch		N3 J 3 Off slip @ spur from Blanch		slips Blanch Shopping	100		Live	7	
108	N3 J 3 Off slip @ spur from Blanch		TL's at J3 R121		Travel N3 N/B off slip to TL's with R121		100	dead	0	
109									_	
	TL's at J3 R121		Onslip J3 N3 S/B Loop		Travel R121 E/B to onslip S/B onslip to N3		100	dead	0	
110	Onslip J3 N3 S/B Loop		N3 S/B onslip to mainline	N3 S 2.7	Treat N3 S/B onslip from J3 to N3 S/B	500		Live	3.5	
111	N3 S/B onslip to mainline	N3 S 2.7	N3 S/B freeflow to M50 N/B	N3 S 0.6	Travel S/B N3 to freeflow slip to M50 N/B		2100	dead	0	
112					Treat Freeflow N3 S/B to M50 S/B at merge					
112	N3 S/B freeflow to M50 N/B	N3 S 0.6	N3 S/B free flow merge with on slip Denot Castleknock	11000	Slip from Auburn	600	2200	Live	7	
			por custication				2200			
						55,150	42,300			133,000
								Adjusted Area		147.454



# M50 Route 3

	M50 Route 3									
Primary Station	Blanchardstown									
Secondary Station	Ballymount		Average Non Salting Speed (km/hr)	70						
Salting Depot	Castleknock		Average Salting Speed (km/hr)	50						
Route No:	1		Route time to end salting (hr)	1hr 36 mins						
Rate of Spread	10 - 25g/m2		Dry 10g Treatment Tonnes	1.85						
Depot to Route (km)	0.5		Route tonnage Pre-Wet (10g, 15g, 20g& 25g) Rock Salt(70% ratio)	1.3T/1.95T/2.6T/3.24T						
			Route Tonnage Pre-Wet (10g, 15g, 20g, & 25g) Marine Salt in Brine (10% ratio)	0.13T/0.2T/0.26T/0.32T						
Time to Route (min)	1		Brine Volume (10g, 15g & 20g) x 4salt weight	5561/8331/11111/13891						
Treated Length (m)	54400	1 Hour 05 min	Route to depot (km)	1						
Dead Length (m)	37550	0 Hour 32 min	Square Meter of surface Treated m2	185,094						
Total Route Time		1 Hour 37 min	Average Spread width (m)	9.12						



					Project Road					
	M50 Route 3: Page 1									
No	Ctart	Chainago	End	Chainage		Distance	Distance	Dead/	width	Area m2
1	Castle knock denot	12200	M50 S/R at offslip to 17	13800	Travel Depot M50 S/R	Live	500	dead	o spread	
1		13300	M50 S/B at CH 16900 at Ronans Town		Treat mainline M50 S/B J7 to CH 16900			ueau		
2	M50 S/B at offslip to J7	13800	Rail Bridge	16900	Ronanstown Rail Bridge	3100		Live	10.5	32550
3	M50 S/B at CH 16900 at Ronans Town Rail Bridge	16900	M50 J10 S/B offslip	19900	Travel Ch 16900 to J10 M50 S/B offslip		3000	dead	0	
4	M50 J10 S/B offslip	19900	J10 Off slip TL's @R838	20300	Treat J10 S/B Offslip	400		Live	7	
5	J10 Off slip TL's @R838	20300	J10 Onslip TL's @ R838	20300	Travel R838 overbridge		100	Dead	0	
6	J10 Onslip TL's @ R838	20300	M50 N/B mainline at J10 onslip	19800	Treat J10 N/B Onslip	500		Live	7	
7	M50 N/B mainline at 110 onslin	19800	M50 N/B mainline at CH13000	13000	Treat Mainline M50 N/B 110 - 16(north side)	6800		Live	10.5	71400
8	M50 N/B mainline at CH13000	13000	M50 N/B J6 offslip for N3	11800	Travel M50 N/B to J6 off slip for N3		1200	dead	0	
9	M50 N/B J6 offslip for N3	11800	N3 N/B mainline at merge	N3 N 0.5	Treat M50 N/B J6 freeflow to N3 N/B	1200		live	7	
		N3 N 0.5	, , , , , , , , , , , , , , , , , , ,	N3 N 2.0			1600		0	
10	N3 N/B mainline at merge	10110.5	N3 J2 Interchange Snugborough Turn	115 11 2.0	Travel N/B N3 to J2 and turn		1000	dead	0	
11	N3 J2 Interchange Snugborough Turn	N3 S 2.0	N/B	N3 S 0.7	freeflow to N/B M50		1400	dead	0	
	N3 S/B Mainline at freeflow to M50	N3 S 0.7		9900	Treat Ns S/B freeflow On slip to M50 N/b at	1000			3.5	
12	N/B M50 N/B 16 onslin to mainline	9900	M50 N/B J6 onslip to mainline	7500	J6 Travel M50 Mainline N/B I6 - 15		2400	live dead	0	
10		7500	M50 N/B J6 off slip at diverge N2	7000			500	acaa	0	
14	M50 N/B J6 off slip	7300	Freeflows	7000	Travel N/B M50 J5 Off slip To diverge		500		0	
15	Freeflows	7000	N2 N/B	N2 N 0.6	diverge	450		Live	3.5	
16	N2 N/B	N2 N 0.6	N2 Coldwinters Junction	N2 N 2.4	Travel N2 to Coldwnter Junct and turn		1800	dead	0	
		N2 S 2.4		N2 S 0.3	Travel N2 S/B from Coldwinters to J5 M50		2100		0	
1/	N2 Coldwinters Junction		N2 S/F Freeflow to M50 S/B		S/B onslip			dead		
18	N2 S/B Freeflow to M50 S/B	N2 S 0.3	M50 S/B at Onslip from N2 S/B	7400	Treat N2 S/B freeflow on slip tp M50 S/B	600		live	7.5	
19	M50 S/B at Onslip from N2 S/B	7400	M50 S/B at Offslip to N3	10000	Travel M50 S/B J5 - J6		2600	dead	0	
20	M50 S/B J6 at Offslip to N3	10000	M50 S/B at offslip to J7	13800	Treat M50 S/B Mainline J6-J7	3800		live	10.5	39900
					Travel M50 S/B J off slip to diverge of N4		200		0	
21	M50 S/B at offslip to J7	13800	M50 S/B J6 offslip to N4 diverge slips	14100	slips		300	dead	0	
22	M50 S/B J6 offslip to N4 diverge slips	14100	N4 E/B merge with mainline	N4 E 0	Treat Freeflow offslip M50 S/B J6 to N4 E/B	600		Live	3.5	
23	N4 E/B merge with mainline	N4 E 0	N4 Traffic Lights Palmerstown		Travel N4 E/B and turn at Palmerston TL's		250	dead	0	
24	N4 Traffic Lights Palmerstown		N4 W/B Mainline	N4 W 0	Palmerstown TL's Travel N4 W/B		250	dead	0	
25	N4 W/B Mainline	N4 W 0	M50 S/B onslin from N4 17	14800	Treat N4 W/B freeflow slip to M50 S/B aux	1000		live	3.5	
26	M50 S/B onslip from N4 I7	14800	M50 S/B offslip to N7 I9	18200	Treat M50 S/B Aux Jane 17 - 19	3400		Live	3.5	11900
27	M50 S/B offslip to N7 J9	18200	M50 S/B Offslip diverge N7 E&W	18750	M50 S/B Offslip to diverge of N7 slips	550		Live	10.5	
28	M50 S/B Offslip diverge N7 E&W	18750	N7 W/B entrance to Luas	N7 W 0.7	M50 S/B Freeflow to N7 W/B at Luas	800		Live	7	
29	N7 W/B entrance to Luas	N7 W 0.7	Luas station entrance R/B		Sliproad from N7 into Luas	200		Live	7	
30	Luas station entrance R/B		Luas station entrance R/B		Treat R/B at Luas Station	100		Live	7	
31	Luas station entrance R/B		Monastry Road R/B		Treat Bowstring bridge	250		Live	7	
32	Monastry Road R/B		Monastry Road R/B		Treat R/B Monastry Road	100		Live	7	
33	Monastry Road R/B		M50 S/B on slip Monastry Rd	N7 E 0.5	Treat Monastery Road E/B	200		Live	7	
34	M50 S/B on slip Monastry Rd	N7 E 0.5	M50 19 on slip N/B merge with slip	18600	Treat Onslip Monastery Rd to M50 Onslip N/B	400		Live	3.5	
25	M50 IQ on slin N/R merge with slin	19600	M50 N/R onslin merrie with mainline	18100	Treat Slip on to M50 S/R from N7	500		Live	7	
		18000		14900		3200		LIVE	3.5	11200
36	M50 N/B onslip merge with mainline	18100	M50 N/B offslip to J7 N4		Treat Aux lane N/B J9 - J7			Live	-	
37	M50 N/B offslip to J7 N4	14900	M50 Off slip to N4 slips diverge	14400	Treat M50 N/B J7 offslip to diverge of slips	550		Live	/	
38	M50 Off slip to N4 slips diverge	14400	N4 W/B onslip @ bus stop	N4 W 1.0	Treat freeflow M50 N/B J7 to N4 W/B	300		Live	3.5	
39	N4 W/B onslip @ bus stop	N4 W 1.0	N4 W/B offslip to J4	N4 W 4.7	Treat N4 W/B mainline J1 to J4	600		Live	7	
40	INH W/B @ UNSIIP FROM J4	N4 W 4.7	14 OTISTIPW/B at ILS K403	N4 F 5 3	Treat J4 W/B N4 OTTSIID	100		live	, 7	
41	IA Onslip at TI's RA02	N4 W 5.3	N4 F/B Mainline at off clip to 14	N4 F 4.8	Treat NA F/B onclin to mainline	500		Live	3.5	
44	5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 -	14+L J.J	N4 E/B Mainline at freeflow to M50	NAFAA	near the groom promanilite	4000		cive:	10.5	
43	N4 E/B Mainline at off slip to J4	N4 E 4.8	N/B	IN4 C 1.1	Treat mainline N4 E/B J4 - J1	4000		Live	10.2	
44	N4 E/B Mainline at freeflow to M50 N/B	N4 E 1.1	N4 E/B Mainline	N4 E 0	Ireat Mainline N4 E/B J1 over M50	1100		Live	7	
							250		0	
45	N4 E/B Mainline	N4 E 0	N4 Traffic Lights Palmerstown		Travel N4 E/B and turn at Palmerston TL's		250	dead	-	
46	N4 Traffic Lights Palmerstown		N4 W/B Mainline	N4 W Ü	Palmerstown TL's Travel N4 W/B		250	dead	U	



	M50 Route 3: Page 2									
	-			Chainage		Dist Live	Dist	Dead/	width	
No.	Start	Chainage	End	NAW 1.0		1000	Dead	Live	spread	
4/	N4 W/B Mainline	N4 W 0	N4 W/B onslip @ bus stop	N4 W 1.0	Ireat Mainline N4 W/B through J1	1000		Live	25	
48	N4 W/B onslip @ bus stop	N4 W 1.0	N4 W/B Mailine off slip to J2	104 00 1.5	Traet Aux Tane J1 - J2 N4 W/B	500		Live	3.5	
49	N4 W/B Mailine off slip to J2	N4 W 1.5	Valley		Treat N4 W/B offslip to J2 Liffey Valley	250		Live	7	
50	J2 Rotary freeflow slip to Liffey		Free flaw into Liffer Channing and		Treat J2 Aux lane Rotary to Liffy V shopping	300		1	3.5	
50	valley		Free flow into Liffey Shopping center		travel into liffy valley shopping and turn at			Live		
51	Free flow into Liffey Shopping center		Roundabout in ind est		R/B		200	dead	0	
52	Poundabout in Indest		Poundahout on P112		travel out of liffy valley shopping to R/B		250	beab	0	
52	Noundabout in nid est		Roundabout on R113 Enterance to		N115	200		ueau	10.5	
53	Roundabout on R113		Liffy Valley		Treat R113 roundabout	200		Live	10.5	
54	Roundabout on R113 Enterance to		R113 x 2 roundabouts to E/B side		Treat link road R113 N/B at 12 and under N2	500		live	7	
	R113 x 2 roundabouts on E/B side		Roundabout on R113 Enterance to			500			7	
55	under N4		Liffy Valley		Treat link road S/B J2 under N2 to R/B R113	500		Live	,	
56	Liffy Valley		N4 W/B onslip from J2	N4 W 2.0	Treat N4 EW/B J2 onslip	500		Live	7	
57	N4 W/B onslip from J2	N4 W 2.0	N4 W/B offslip to J3	N4 W 3.0	Treat Aux Lane N4 W/B J2- J3	900		Live	3.5	
				N4 W 3.4		400			7	
58	N4 W/B offslip to J3	N4 W 3.0	J3 Interchange Traffic Lights @ R136		Treat N4 W/B offslip to J3			Live		
59	J3 Interchange Traffic Lights R136	N4 W 3.4	N4 W/B Mainline at on slip from J3	N4 W 3.9	Treat N4 W/B J3 onslip	500		Live	7	
				N4 W 4.9		1000			3.5	
60	N4 W/B Mainline at on slip from J3	N4 W 3.9	N4 W/B mainline at off slip to J4	NAMES	Treat N4 W/B Aux/Bus Lane J3 - J4		200	Live	0	
61	N4 W/B mainline at off slip to J4	N4 W 4.9	N4 J4 Offslip at TL's	N4 W 5.3	Travel N4 W/B J4 offslip		100	dead	0	
62	N4 J4 Offslip at TL's	N4 W 5.3	J4 Interchange overbridge R120	N4 E 5.3	Travel Over bridge J4		100	dead	0	
63	J4 Interchange overbridge R120	N4 E 5.3	N4 Mainline E/B at Onslip from J4	N4 E 4.9	Travel N4 E/B on slip		400	dead	0	
64	N4 Mainline E/B at Onslip from J4	N4 E 4.9	N4 mainline E/B at offslip to J3	N4 E 3.9	Treat N4 W/B Aux/Bus Lane J4 - J3	1000		Live	3.5	
65	N4 mainline E/B at offslip to J3	N4 E 3.9	N4 E/B J3 Offslip to TL's	N4E 3.4	Treat N4 E/B J3 off slip	400		Live	7	
66	N4 E/B J3 Offslip at R136	N4 E 3.4	R136 n/b to TL's at Lucan Road		Treat R136 N/B link road from J2 to Lucan Rd	200		Live	7	
			R/B at end of Lucan Road on slip to			200			7	
6/	R136 n/b to TL's at Lucan Road R/B at end of Lucan Road on slip to		N4J2		Treat Lucan Rd from R136 to Onslip			Live		
68	N4 J3		roundabout N4 J3 E/B		Treat roundabout	100		Live	7	
69	roundabout N4 J3 E/B	N4 E 3.2	N4 E/B mainline on slip from J3	N4 E 2.9	Treat n4 J3 E/B Onslip	300		Live	7	
70	N4 E/B mainline on slip from J3	N4 E 2.9	N4 E/B mainline at onslip from J2	N4 E 1.0	Treat N4 E/B Aux/Bus Lane J2 -J1	1400		Live	3.5	
	N4 E/B mainline to diverge J1 for M50			14400		900			7	
71	S/B freeflow	N4 E 1.0	M50 Mainline S/B at onslip J7	14000	Treat N4 E/B freeflow to M50 S/B j7 Loop	400		Live	2.5	
72	M50 Mainline S/B at onslip loop	14400	M50 Mainline S/B at onslip loop	14800	Treat M50 S/B aux lane	400		Live	3.5	
73	M50 Mainline S/B at onslip loop	14800	M50 J9 S/B Off slip at Diverge to N7	18600	Travel M50 S/B J7 - J9		3900	dead	0	
				N7 E 0.0	Treat M50 S/B freeflow offslip to N7 E/B	300			3.5	
74	M50 J9 S/B Off slip at Diverge to N7	18600	N7 E/B onto Nass Road		City			Live		
75	N7 E/B onto Nass Road	N7 E 0.0	Longmile Rd on N4		Travel N4 E/B longmile rd and turn		1000	dead	0	
76	Longmile Rd on N4		N7 W/B Nass Road	N7 W 0.0	Longmile Rd W/B N4	700	1000	dead	0	
70	N / W/B Nass Road	N/W0.0	M50 N/B Mainline at onslip	14800	N4 W/B to M50 S/B freeflow loop	700	3800	Live	3.5	
78	M50 N/B Mainline at onsilp	18600	M50 N/B OTT SIIP to N4 J7	14300	W/F		400	dead	0	
		1,000	inso on sup to it i de siverge	M4 E0 5	Treat M50 N/B freeflow to N4 E/B merge	400		ucuu	25	
80	M50 offslip to N4 at Diverge	14400	N4 E/B mainline merge with slip	1VI4 E0.5	with mainline	400		Live	3.5	
81	N4 E/B mainline merge with slip	M4 E0.5	Palmerstown TL's N4		Travel N4 E/B to Palmerstown TL's and Turn		800	dead	0	
~	Deleterateure Till NA		NAID Official States 1	N4 W 3.4			3700	ا معام	0	
82	rannerstown TE's N4		R136 Over bridge at off slip from N4		inaver N4 W/B Palmerstown IL's to N4 J3			ueaa		
83	N4 J3 Off slip at TL's on interchange	N4 W 3.4	E/B	N4 E 3.4	Treat R136 Overbridge N/B J4	100		live	10.5	
94	R136 Over bridge at off slip from N4	N4 F 2 4	Junction with Jucan Poad		Travel R136 N/B from J4 Interchange to		150	dead	0	
85	Lunction with Lucan Road	N4 L 3.4	Lucan Road, F/B		Treat small slip to Lucan Road W/B	50		live	3.5	
86	Lucan Road E/B		N4 E/B J4 Onslip		Travel Lucan Road E/B	-	250	dead	0	
87	N4 E/B J4 Onslip	N4 E 3.2	N4 E/B J2 offslip to liffy valley	N4 E 2.1	Travel N4 E/B Mainline J3 - J2		200	dead	0	
88	N4 E/B J2 offslip to liffy valley	N4 E 2.1	r/b at J2 Liffy Valley E/B	N4 E 1.8	Treat N4 E/B J2 offslip to Liffy Valley	300		Live	7	
89	r/b at J2 Liffy Valley E/B	N4 E 1.8	r/b at J2 Liffy Valley E/B	N4 E 1.8	Travel part of Rotary J2		50	dead	0	
90	r/b at J2 Liffy Valley E/B	N4 E 1.8	N4 E/B mainline	N4 E 1.5	Treat N4 E/B J2 Onslip to mainline	300		Live	7	
01	N4 E/R mainline	NAFAF	NAE/R polyporter Th	13300	Travel NA E/D to Deleverate The set		1800	dord	0	
91	IN4 C/B Mainine	N4 E 1.5	IN4 C/ B parmerston IIS		Travel N4 E/B to Paimerstown IL's and turn.		75.0	uead		
92	N4 E/B palmerston TIs		N4 W/B freeflow to M50 N/B Loop	N4 W 0.5	N/B		750		0	
93	N4 W/B freeflow to M50 N/B Loop	N4 W 0.5	M50 Mainline On slip from J6 N4	14300	Treat N4 W/B freeflow loop to M50 N/B	500		live	3.5	
94	M50 Mainline On slip from J6 N4	14300	M50 Depot at Castleknock	13300	Travel N4 E/B - M50 N/B to depot.		1000	dead	0	
L						54 400	37 550			166.050
						54,400	57,350	Adjusted		100,950
								Area		185,094



# M50 Route 4

			M50 Route 4	
Primary Station	Ballymount		Average Non Salting Speed (km/hr)	70
Secondary Station	Sandyford		Average Salting Speed (km/hr)	50
Salting Depot	Castleknock			
Route No:	4		Route time to end salting (hr)	1hr 38 mins
Rate of Spread	10 - 25g/m2		Dry 10g Treatment Tonnes	2.08
Depot to Route (km)	3.6		Route tonnage Pre-Wet (10g, 15g, 20g& 25g) Rock Salt(70% ratio)	1.46T/2.19T/2.92T/3.64T
			Route Tonnage Pre-Wet (10g, 15g, 20g, & 25g) Marine Salt in Brine (10% ratio)	0.15T/0.22T/0.29T/0.36T
Time to Route (min)	3		Brine Volume (10g, 15g & 20g) x 4 salt weight	6241/9361/12481/15601
Treated Length (m)	49800	1 Hour 00 min	Route to depot (km)	5.3
Dead Length (m)	51450	0 Hour 44 min	Square Meter of surface Treated m2	207,988
Total Route Time		1 Hour 44 min	Average Spread width (m)	9.63



					Project Road					
	M50 Route 4: Page 1									
No	Start	Chainage	End	Chainage		Dist Live	Dist Dead	Dead/	width	M2 Area
140.		13300	M50 S/B at CH 16900 at Ronans Town Rail	16900			3600	dead	0	
1	Castle knock depot M50 S/B at CH 16900 at Ronans Town Rail	15500	Bridge	10500	travel M50 S/B mainline Treat M50 S/B mainline J10 to		5000	ucuu		
2	Bridge	16900	M50 Edmondstown O/B	26400	Edmondstown O/B	9500		live	10.5	99750
3	M50 Edmondstown O/B	26400	M50 S/B at offelin to 113	29600	Travel M50 S/B Edmondstown to J13		3200	dead	0	
4	M50 S/B at offslip to 113	29600	M50 S/B I13 off slip @ Boundabout	30400	Treat 113 S/B offslip	800		live	7	
		30400		30400	Treat 2x roundabouts and link rd at J13	600		live	7	
5	M50 S/B J13 off slip @ Roundabout	20400	M50 S/B J13 off slip @ Roundabout	30400	Dundrum	000	400	dood	,	
6	M50 S/B J13 off slip @ Roundabout	30400	M50 N/B J13 on slip @ Roundabout	29400	travel from off to on slip	1000	400	live	7	
/	M50 N/B J13 on silp @ Roundabout	20400	MSO Mainline onsilp from J13	25400	Travel Mainline from J13 to Edmondstown	1000	2000	deed	,	
8	M50 Mainline N/B onslip from J13	29400	M50 Edmondstown O/B	26400	O/B		3000	dead	U	
9	M50 Edmondstown O/B	26400	M50 N/B at on slip from J10	19500	O/B to J9 offslip	6900		live	10.5	72450
		19500		19200	Travel J9 N/B offslip to diverge of slip for		300	dead	0	
10	M50 N/B at on slip from J10	10200	M50 N/B J/ diverge of slips to N/	N7E0.2	N7	500		livo	2.5	
11	M50 N/B J7 diverge of slips to N7	13200	N7 J9 E/B merge with mainline N7	N/ L 0.2	Treat J9 N/B freeflow slip to N7 E/B	500	1200	dood	3.5	
12	N7 J9 E/B merge with mainline N7	N/ L 0.2	Longmile road		Turn and Travel N7 from Longmile Road and Turn		1300	ueau	0	
13	Longmile road		N7 J9 W/B off slip to M50 S/B N7	N7E0.0	19		1000	dead	0	
14	N7 19 W/B off slip to M50 S/B N7	N7 E 0.0	M50 Mainline S/B onslip from J9 Auxlane start	19300	Treat N7 W/B onslip to M50 S/B freeflow	600		live	3.5	
14	M50 Mainline S/B onslip from J9 Auxlane	10200		10900		E00		liue	25	1750
15	start	19300	M50 S/B Aux lane at off slip J10	19800	Treat M50 S/B Aux lane J9 - J10	500		live	3.5	1750
16	M50 S/B Aux lane at off slip J10	19800	M50 S/B off slip J10 diverge of freeflow	20200	Travel M50 S/B off slip J10 to diverge of freeflow	400		Live	7	
17	M50 S/B off slip 110 diverge of freeflow	20200	110 Ballymount R838 road		Treat 110 S/B off slip freeflow to B838	200		live	3.5	
	inse sy b on sup stourcige of rection				Travel R 838 to Ballymout Ind Est R/B and		300	heab	0	
18	J10 Ballymount R838 road		R838 Ballymount Roundabout J10		Turnturn Travel R838 from Bally mount Ind Est R/B		500	ucuu	v	
19	R838 Ballymount Roundabout J10		R838 W/B J10 Overbridge TL's		to J10 S/B onslip		300	dead	0	
20	P229 W/P 110 at freeflow to S/P opclin		P228 W/P 110 frooflow on slip to MEO S/P		Treat J10 S/B freeflow slip from R838 to	200		live	3.5	
20		20200	Kasa w/b 110 neenow on silp to wiso 3/b	20000		500		livo	2.5	
21	R838 W/B J10 freeflow on slip to M50 S/B	20500	M50 S/B mainline on slip from J10	20900	Treat J10 S/B onslip to M50 S/B Aux lane	500		iive	5.5	
22	M50 S/B mainline on slip from J10	20900	M50 S/B aux lane at off slip to J11	22500	Treat M50 S/B Aux Lane J10-J11	1600		live	3.5	5600
23	INISO S/B aux lane at off slip to JII	22300	J11 Rotary M50 onslip	22900	Treat III Rotany	600		live	10.5	
25	111 Rotary M50 offslip S/B	22900	111 Rotary M50 onslip 5/B	23000	travel part of 111 Rotary		200	dead	0	
26	J11 Rotary M50 onslip S/B	23000	M50 S/B Mainline/aux onslip from J11	23400	Treat J11 M50 S/B on slip	400		live	3.5	
27	M50 S/B Mainline/aux onslip from J11	23400	M50 S/B Mainline/aux offslip to J12	24100	Treat M50 S/B Aux lane J11 - J12	700		live	3.5	2450
28	M50 S/B Mainline/aux offslip to J12	24100	J12 off slip from M50 S/B R133	24500	Treat M50 S/B off slip to J12	400		live	7	
29	J12 R133 off slip from M50 S/B	24500	J12 R133 on slip to M50 N/B	24500	Treat J12 overbridge W/B	150		live	10.5	
30	J12 R133 on slip to M50 N/B	24500	M50 N/B mainline/Aux from J12	24200	Treat M50 N/B on slip J12	300		live	7	
31	M50 N/B mainline/Aux from J12	24200	M50 N/B mainline/aux slip off to J11	23400	Treat M50 N/B Aux Lane J12 - J11	400		live	3.5	
32	INSUN/B mainline/aux slip off to J11	23400	JII Rotary at MSU S/B off slip	23000	Treat MSU N/B J11 Offship	400	550	dead	,	
55	211 NULALY AL IVIDU 5/ Β UTL STIβ			22000	Turn at Roundabout on R81 and travel E/B		450	dead		
34	N81 W/B to Roundabout		J11 Rotary N81 freeflow N/B onslip	22900	to J11 Rotary		450	uead	U	
35	J11 Rotary N81 freeflow N/B onslip	22900	M50 N/B onslip J11	22700	onslip	200		live	3.5	
26	MEO N/R onslip 111	22700	MEON/P mainling (Aug from an alla 140	22300	Treat M50 N/B J11 onslip to M50 N/B Aux	600		live	7	
36	M50 N/B mainline/Aux from on slip 111	22300	M50 N/B mainline/Aux from on slip J11	20900	Treat M50 N/B Aux Lane 111- 110	1300		live	35	4550
38	M50 N/B mainline/aux slip off to 110	20900	J10 Ballymount R838 road at TLs	20300	Treat M50 N/B off slip J10 to TI's	600		live	7	
		20300		19800	Travel M50 N/B J10 Onslip to M50		500	dead	0	
39	J10 Ballymount R838 road at TL,s	10000	M50 N/B mainline/aux at onslip from J10	10400	mainline	200		lie	-	1050
40	M50 N/B mainline/aux at onslip from J10	19800	M50 N/B mainline off slip to J9 N7	19400	Treat M50 N/B Aux lane J10 - J9 Treat M50 N/B off slip to diverge for N7	300		live	3.5	1050
41	M50 N/B mainline off slip to J9 N7	19400	M50 J9 N/B off slip at diverge of slips to N7	19100	E&W	300		live	7	
42	M50 J9 N/B off slip at diverge of slips to N7	19100	N7 Mainline W/B under bow string bridge	N7 W 0.7	Treat M50 N/B freeflow J9 to N7 W/B	500		live	3.5	
43	N7 Mainline W/B under bow string bridge	N7W0.7	N7 W/B mainline at J2 off slip	N7 W 3.5	Treat N7 W/B Mainline to J2 Kingswood	2800		live	10.5	
44	N7 W/B mainline at J2 off slip	N7W3.5	N7 J2 W/B off slip Kingswood rotary R136	N7W4.0	Treat N7 W/B off slip to J2 Kinswood	500		live	3.5	
45	IN/ J2 W/B OTT SIIP rotary R136	117 11 4.0	N7 J2 E/B on SIIP rotary R136 N7 E/B mainline at onslip from J2	117 117 4.0	Treat J2 Kingswood O/B N/B Treat N7 E/B onslip J2 Loop from	400			10.5	
46	N7 J2 E/B on slip rotary R136	N7W4.0	Kingswood	N7 E 3.6	Kingswood	800		live	3.5	
47	N7 E/B mainline at onslip from J2 Kingswood	N7 E 3.6	N7 E/B mainline at slip diverges on J1/17	N7 E 0.7	Treat N7 E/B Mainline J2 to J9 M50 at slip diverges	2900		live	10.5	
		N7 F 0.7	,	N7 F 0.3	Treat N7 E/B mainline at diverges in N7 to	300		live	7	
48	N7 E/B mainline at slip diverges on J1/J7		N7 Mainline E/B at slip from Monastry Rd		City Treat N7 E/B Mainline @ merge with M50					
49	N7 Mainline E/B at slip from Monastry Rd	N7 E 0.3	N7 Mainline E/B at Nass Rd into City	N7 E 0.0	N/B slip to city	300		live	10.5	
		N7 E 0.0					1000	dead	0	
50	N / Mainline E/B at Nass Rd into City		Longmile Rd -Turn		Travel N7 E/B to Longmile Road and Turn Travel N7 W/B from Longmile Road to J9		40			
51	Longmile Rd -Turn		N7 J9 W/B mainline Nass Rd	N7W0.0	Interchange		1000	dead	0	
52	N7 I9 W/B mainline Nass Rd	N7 W 0.0	N7 Mainline W/B under how string bridge	N7 W 0.8	Treat N7 W/B Mainline to entrance to past	800		live	7	



# **QEMS M500P-313**

	M50 Route 4: Page 2									
N	Church	Chainage	E-d	Chainage		Dist Live	Dist Dead	Dead/Liv	width	
INO.	Start	N7W0.8	End	N7W 1.2	Treat N7 W/B Aux Lane Aux lane from	400		live	3.5	
53	N7 Mainline W/B under bow string bridge	10 10 0.0	N7 Mainline at off slip to Newlandscross	N7W10	Luas to J1 Newland X	700		live	7	
54	N7 Mainline at off slip to Newlandscross	N7 W 1.2	Newlandscross off slip at R113 TL's	N7 W 1.5	Treat N7 W/W offslip to Newlands X J1	600		live	3.5	
56	N7 W/B mainline at Newlandscross on slip	N7 W 2.5	N7 W/B mainline at 12 offslip	N7 W 3.6	Travel N7 W/B and turn at J2 Kinswood		1100	dead	0	
57	N7 W/B mainline at J2 offslip	N7 W 3.6	N7 J2 W/B off slip Kingswood rotary R136	N7 W 4.0	Travel N7 W/B off slip to J2		400	dead	0	
58	N7 J2 W/B off slip Kingswood rotary R136	N7 W 4.0	N7 J2 E/B on slip Kingswood rotary R136	N7 E 4.0	Travel N/B R136 J2 Overbridge		400	dead	0	
59	N7 J2 E/B on slip Kingswood rotary R136	N7 E 4.0	N7 E/B Mainline at onslip from J2	N7 E 3.6	Travel N7 E/B J2 On slip		800	dead	0	
60	Kingswood	N7 E 3.6	offslip	N7 E 2.5	Treat N7 E/B Aux/Bus Lane J2 - J1	1100		live	3.5	
61	N7 E/B mainline/bus lane to Newlandscross	N7 E 2.5	N7 E/B offslip to Newlandscross P113	N7 E 1.9	Treat NZ E/B I1 Off Slip to Newlands X	700		live	7	
01	onsip	N7 F 1.9		N7 F 1.4	Treat N7 E/B J1 On Slip (stay left and treat	500		live	7	
62	N7 E/B offslip to Newlandscross R113		N7 E/B onslip to N7 mainline/Aux		aux/bus lane) Treat N7 E/B Aux/Bus lane J1 to					
63	N7 E/B onslip to N7 mainline/Aux	N/E1.4	N7 aux lane to Monastry rd	N7E0.5	Monastery Rd (stay left)	900		live	3.5	
64	N7 aux lane to Monastry rd	N7 E 0.5	Turn at Monastry Rd R/B		Travel W/B Monastery Rd to R/B and tun		200	dead	0	
65	Turn at Monastry Rd R/B		N7 F/B onslip at Monastry Bd	N7 E 0.5	Travel E/B Monastery Rd R/B to Onslip N7 F/B		200	dead	0	
		N7E0.5		N7E0.3	Treat N7 E/B Freeflow from Monastery Rd	250		live	7	
66	N7 E/B onslip at Monastry Rd	N7E0.3	N7 Slip Road to M50 S/B Loop	18900	to M50 S/B on slip loop	550		live	7	
67	N7 SIIP ROAD TO MISU S/ B LOOP	18900	M50 S/B mainline merge with on slip from	19300	Treat M50 S/B Aux Lane from N7 E/B	400		live	35	
68	M50 Mainline merge S/B loop onslip M50 S/B mainline merge with on slip from	10500	N7 M50 S/B_110 Off slip at Diverge freeflow to	15500	onslip and N7 W/B onslip Travel M50 S/B 19 to 110 off slip diverge	-100		iive	5.5	
69	N7 W/B	19300	R838	20200	for R838		800	dead	0	
70	R838	20200	M50 S/B off slip J10 Junct with Traffic Lights	20300	E/B	150		live	7	
71	M50 S/B off slip 110 Junct with Troffic Links	20300	R838 E/B to merge with freeflow from J10		Treat R838 E/B for 100m to merge with freeflow	100		live	7	
/1	R838 E/B to merge with freeflow from J10		or on stip		Travel R838 E/B to Ballymount Ind est R/B		300	dead	0	
72	S/B offslip		R838 E/B at R/B Ballymount Ind Est R838 W/B R/B to freeflow onslin 110 S/R		and turn Travel R838 W/B to J12 at where freeflow		500	JCOU	v	
73	R838 E/B at R/B Ballymount Ind Est		(East Side of J10)		to M5 S/B starts		300	dead	0	
74	K838 W/B R/B to freeflow onslip J10 S/B(East Side of J10)		кказк W/B at merge with freeflow from M50 N/B (West Side of J10)		Treat R838 W/B across J10 Overbridge	350		live	10.5	
75	R838 W/B at merge with freeflow from M50		P020 W/P Junt at Polgard Poad		Travel P229 W/b and turn an Polgard Poad		1100	dead	0	
75	R838 W/B Junt at Belgard Road		R 838 F/B C/W (West side of 110)		Travel R838 F/B from Belgard Rd to 110		1100	dead	0	
77	R 838 E/B C/W (West side of J10)		R 838 E/B C/W (East side of J10) @ TL,s	20300	Treat R838 E/B across j10 Overbridge	300		live	10.5	
70		20300	J10 S/B Onslip at merge with freeflow from	20500	Treat M50 S/B onslip J10 from TL's to	200		live	3.5	
/8	J10 S/B Onslip at merge with freeflow from	20500	8830	22600	merge with freehow from R838		2100	dood	0	
79	R838	20300	J11 Offslip at diverge with freeflow to N81 N81 F/B merge with freeflow from M50 off	22000	Travel M50 S/B J10 to J11 Treat M50 S/B ofslip J11 freeflow to N81		2100	ueau	0	
80	J11 Offslip at diverge with freeflow to N81	22600	slip	N81	E/B	400		live	3.5	
81	slip	N81	R/B on N81 Spawell	N81	Travel N81 E/B to Spawell R/B and turn		600	dead	0	
87	R/B on N81 Snawell	N81	111 Rotary	N81	Travel N81 W/B from Spawell R/B to J11 Rotary		700	dead	0	
							350	dead	0	
83	J11 Rotary	22000	J11 N/B onslip to M50 M50 onslip N/B merge with freeflow from	22800	Treat M50 N/B onslip J11 to merge with	100		livo	7	
84	J11 N/B onslip to M50 M50 onslip N/B merge with freeflow from	22500	N81 I12 Offslip N/B at diverge with freeflow to	22800	freeflow from N81 E/B	100		iive	,	
85	N81	22800	R838 W/B	20500	Travel M50 N/B J11 to J10		2300	dead	0	
86	R838 W/B	20500	R838 W/B J10	20400	offslip to R838 W/B	150		live	3.5	
87	R838 W/B J10		Turn at Belgard Rd R838		Travel R838 W/b and turn an Belgard Road		1200	dead	0	
88	Turn at Belgard Rd R838		R838 E/B J10 Freeflow to M50 N/B		Travel R838 E/B from Belgard Rd to J10		1300	dead	0	
20	P229 E /R 110 Ercoflow to MEO N /R	20300	110 onclin N/R morro	20000	Treat R838 E/B freeflow slip to M50 N/B	400		live	3.5	
90	J10 onslip N/B merge	20000	J9 offslip N/B to N7 diverge	19200	Travel M50 N/B J10 to J9 offslip		800	dead	0	
		19200			Travel M50 N/B J9 off slip to N7 E/B and		1900	dead	0	
91	J9 offslip N/B to N / diverge		Longmile road N7	N7W01	turn at longmile road Travel N7 W/B from Longmile Road to J9		1100	doad	0	
92	Longmile road N7 turn		N7 J9 onslip to M50 S/B	IN 7 VV U.1	Interchange Treat N7 W/B freeflow to merge with M50		1100	uead	U	
93	N7 J9 onslip to M50 S/B	N7 W 0.1	M50 off slip N/B to N7 inbound	N7 E 0.4	N/B offslip to N7 E/B	300		live	3.5	
94	M50 off slip N/B to N7 inbound	N7 E 0.4	Longmile road N7		I ravel M50 N/B J9 off slip to N7 E/B and turn at longmile road		1400	dead	0	
05	Longmile road N7 turn		11 Newlands X W/P Officia	N7 W 1.8	Travel N7 W/B from Longmile Road to N7		2900	dead	0	
55	congrime road in/ turn	N7W1.8	zz recivitinus z w/b Offstip		Treat N7 J1 off slip spur to Belgard Road	150		live	3,5	
96	J1 Newlands X W/B Offslip		Belgard Road R113 S/B merge		K113 S/B					
97	Belgard Road R113 S/B merge		Belgard Rd R113 Turn		Travel Belgard Road R113 and turn at TL's		250	dead	0	
98	Belgard Rd R113 Turn		Belgard Road R113 N/B merge to N7 onslip W/B	N7 W 1.9	Travel Belgard Road R113 N/B TL's to N7 J1 W/B onslip		250	dead	0	
	Belgard Road R113 N/B merge to N7 onslip	N7 W 1.9		N7 W 1.9	Treat R113 freeflow slip to N7 W/B onslip	100		live	3.5	
99	W/B	N7W19	N / J1 Unslip W/B	N7W41	at J1 Newlands X		2200	dead	0	
101		N7 W 4.1	N7 E/R off slip to 11	N7E2.7	Travel N7 E/B 12 to 11 Nowing V - 44		1400	dead	0	
101	N7 E/B off slip to J1	N7 E 2.7	N7 E/B onslip from J1	N7 E 1.9	Travel N7 E/B J2 to J1 Newlands X offslip		800	dead	0	
	NIZ E/D analia far unit	N7 E 1.9		N7 E 1.5	Travel N7 E/B Newlands X onslip TLs to		400	dead	0	
103	N7J1 onslip trom J1	N7 E 1.5	N7 E/B mainline merge with on slip	N7 E 1.2	uverge of on slip Treat N7 E/B J1 Onslip to N7 mainline	350		live	3.5	
	N7 F/D maialing to the fill of the	N7 E 1.2		N7 E0.7	Travel N7 E/B Mainline to diverge of N7		400	dead	0	
105	IN/ E/B mainline merge with on slip	N7507	N7 On slip to M50 N/B at merge with	19600	STIP roads Treat N7 E/B freeflow slip to M50 N/B	600		live		
106	N7 mainline diverge for M50 S/B onslip N7 On slip to M50 N/B at merge with	N/E0./	Monastery Rd slip	10000	mainline J9 Travel M50 Mainline 19 to Castleknock	300		inve	1	
107	Monastery Rd slip	18600	depot Castleknock	13300	Depot	40.000	5300	dead	0	407.000
		N7 E/P +	ISO S/B Loop onsile at divores (NIZ E. O.F.)	n on fram		49,800	51,450			187,600
		Monastry R	d (N7 E 0.3)=200m x 2 lanes TBC by Globalvia J	ons on				Adjusted		
		return to Sa	ndyford Depot		I			Area		207,988

OPERATION & MAINTENANCE PROCEDURES - Winter Maintenance Strategy 2021 - 22 Date: 31<sup>st</sup> August 2021 Rev: 19 Ref.: QEMS M50OP - 313



# M50 Route 5

			M50 Route 5		
Primary Station	Sandyford				
Secondary Station	Leopardstown		Average Non Salting Speed (km/hr)	70	
Salting Depot	Castleknock		Average Salting Speed (km/hr)	50	
Route No:	5 (M50/CMA)		Route time to end salting (hr)	1hr 49 mins	
Rate of Spread	10 - 25g/m2		Dry 10g Treatment Tonnes	1.11	
Depot to Route (km)	13.1		Route tonnage Pre-Wet (10g, 15g, 20g& 25g) Rock Salt(70% ratio)	0.87T/1.3T/1.73T/2.16T	
			Route Tonnage Pre-Wet (10g, 15g, 20g, & 25g) Marine Salt in Brine (10% ratio)	0.09T/0.13T/0.18T/0.22T	
Time to Route (min)	12 min		Brine Volume (10g, 15g & 20g) x 4 salt weight	3711/5561/7411/9261	
Treated Length (m)	50150	1 Hour 01 min	Route to depot (km)	17.1	
Dead Length (m)	76600	1 Hour 05 min	Square Meter of surface Treated m2		123,396
Total Route Time		2 Hour 06 min	Average Spread width (m)	11.64	



					Project Road					
	M50 Route 5: Page 1									
	_			Chainage			Distance	Dead/	width	
No.	Start	Chainage	End M50 Mainline Edmondstown		Travel M50 S/B Mainline Depot to	Dist Live	Dead	Live	spread m	Area m2
1	Castle knock depot	13300	Bridge	26400	Edmondstown O/B		13100	dead	0	
				31900	Treat M50 S/B Edmondstown O/B to					
2	M50 Mainline Edmondstown Bridge	26400	M50 S/B J14 Offslip		J14 Offslip Treat M50 S /R J14 Offslip to M11 S /R	5500		Live	10.5	57750
3	M50 S/B J14 Offslip	31900	M50/N11 Merge	M11 S 9.5	Merge	7900		Live	7	
	_			M11 S 11	Treat M11 S/B from M50 to J5 Bray					
4	M50/N11 Merge	M11 S 9.5	N11 Off slip to J5		Offslip	1500		Live	10.5	
5	N11 Off slip to J5	M11 N 11	J5 Rotary end of off slip		Treat M11 J5 S/B off slip to Bray	750		Live	3.5	
6	J5 Rotary end of off slip		Rotary J5		Treat J5 Bray North Rotary	150		Live	7	
7	Botary 15		N11 On slip merge with Mainline	M11 N 11	M11 Mailine	900		Live	3.5	
				M11 N 0 7	Treat M11 N/B Mainline to start of					
8	N11 On slip merge with Mainline	M11 N 11	M11 N/B at diverge for N11/M50	WIII N 3.7	M50 N/B	1300		Live	10.5	
9	M11 N/B at diverge for N11/M50	M11 N 9.7	M50 N/B J14 at onslip merge	31500	slip	8300		Live	7	
	,,, ,,		M50 Mainline Edmondstown	26400	Treat M50 N/B J14 Onslip merge to					
10	M50 N/B J14 at onslip merge	31500	Bridge	20400	Edmondstown O/B	5100		Live	10.5	53550
11	M50 Mainline Edmondstown Bridge	26400	M50 Mainline Offslip to J12	25000	Travel M50 N/B Edmondstown O/B to J12 offslip		1400	Dead	0	
12	M50 Mainline Offslip to J12	25000	J12 Offslip N/B TL @ R133	24500	Treat M50 N/B Offslip to J12	500		Live	7	
13	J12 Offslip N/B TL @ R133	24500	M50 N/B onslip @Tls J12	24500	treat R133 E/BOverbridge J12	150		Live	7	
14	M50 N/B onslip @Tls J12	24500	M50 Mainline Onslip from J12	25200	Treat M50 S/B onslip from J12	700		Live	7	
15	M50 Mainline Onslip from J12	25200	M50 S/B at offslip to J13	29600	Travel M50 S/BMainline J12 to J12		4400	dead	0	
16	M50 S/B offslip to J13	29600	Rotary J13 Off slip	30400	Treat M50 S/B off Slip J13	800		Live	7	
				30400	Treat J13(N) 2 x rotarys and link Road					
17	Rotary J13 Off slip	30400	Rotary J13 Off slip		betwwen them	600		Live	7	
18	Rotary J13 Off slip		Rotary J13 Off slip		Travel rotary at J13 (N)		100	dead	0	
19	Rotary J13 Off slip	30400	J13 Rotary	31900	to J13(S)	1500		Live	7	
20	J13 Rotary	31900	J13 Rotary	31900	Treat J13(S) Rotary	600		Live	10.5	
21	J13 Rotary		J13 Rotary		Travel J13(S) Rotary		150	dead	0	
22	J13 Rotary	32000	M50 S/B J14 on slip merge	33300	Treat M50 S/B J13(S) onslip	1200		Live	3.5	
23	M50 S/B off slip merge	33300	M50 S/B J15 Offslip	34900	Travel M50 S/B J13 to J15		1600	dead	0	
24	M50 S/B J15 Offslip	34900	J15 Rotary Off slip	35500	Treat M50 S/B offslip to J15	550		Live	3.5	
					Treat 2 x rotarys and link roads at					
25	J15 Rotary Off slip		J15 Rotary Off slip		J15(N)	600		Live	7	
26	J15 Rotary Off slip		rd		Travel rotary at J15		100	dead	0	
				35700	Treat Ballyogan Link Rd S/B between					
27	J15 Rotary Off slip to Ballyogan rd		J15 Rotary On slip		Roundabouts J15	200		Live	7	
28	J15 Rotary On slip		Ballyogan		Treat at J15(S) Rotary	250		Live	7	
	J15 Rotary On slip from link Rd									
29	Ballyogan		J15 Rotary On slip to M50 S/B		Travel Rotary J15		100	dead	0	
30	J15 Rotary On slip to M50 S/B	35800	J15 on slip merge with M50	36300	Treat M50 S/B Onslip J15	500		Live	3.5	



	M50 Route 5: Page 2									
Ne	Chart .	Chairman	<b>F</b> = 4	Chainage		Distance	Distance	Dead/	width	
NO.	Start	Chainage	LNC C (D L1C off alia diversa	37200		Live	Dead	Live	spread m	
31	M50 S/B 116 off slip diverge	30300	116 offslip junct R118	37800	Treat M50 S/B offclip to 116	600	900	Live	7	
52	NOUS/DITEON SHP UNCIGE	57200			Treat R118 E/B link road J15 to TL's	000		LIVE	<u> </u>	
33	J16 offslip junct R118	37800	R118 Interchange		Cherry Wood	700		Live	10.5	
34	R118 Interchange		R118 Interchange		TL's		200	dead	0	
35	R118 Interchange		J16 Onslip S/B	37800	Treat R118 W/B Cherrywood TL's to J15 M50 Onslip S/B	600		Live	10.5	
36	J16 Onslip S/B	37800	M50 S/B merge with mainline	38400	Treat M50 S/B On slip at J16	600		Live	3.5	
27		20400	N111 IS Doors lat Datage		Travel M50 S/B J16 to J5 M11 Bray		25.00	deed		
3/	NISU S/B merge with mainline	38400	N11J5 Bray Int Rotary	20200	North		3500	dead	0	
38	N11 J5 Bray Int Rotary		M50 N/B offslip to J16	38300	Travel M11 N/B from J5 to M50 N/B J16		3700	dead	0	
39	M50 N/B offslip to J16	38300	J16 R118 Interchange N/B	37600	Treat M50 N/B J16 Off Slip	700		Live	7	
40	J16 R118 Interchange N/B	37600	R118 junst with S/B off slip		merge with M50 N/B off slip	200		Live	10.5	
					Travel R118 E/B to TL's Cherrywood		700			
41	J16 Onshp Junct R118		R118 Interchange	27700	Travel R118 W/B from TL's Cherrywood		700	dead	0	
42	R118 Interchange		J16 Onslip S/B	37700	to M50 On slip S/B		600	dead	0	
43	J16 Onslip S/B R118		J16 R118 to N/B on slip		over bridge to M50 N/B Onslip	300		Live	7	
44	J16 R118 to N/B on slip	37700	M50 N/B mainline onslip merge	37000	Treat M50 N/B on slip J16	700		Live	7	
45	M50 N/B mainline onslip merge	37000	M50 N/B offslip to J15	36200	Travel M50 N/B J16 to J15		800	dead	0	
46	M50 N/B offslip to J15	36200	J15 Rotary N/B off slip	35500	Treat M50 N/B Off Slip to J15	650		Live	3.5	
47	J15 Rotary N/B off slip	35500	J15 Rotary N/B off slip	35400	Travel Rotary J15		150	dead	0	
48	115 Rotany N/B off slip	35400	M50 J15 N/B mainline onslip	34800	Treat M50 N/B On Slip 115	600		Livo	35	
19	M50 I15 N/B mainline onslin merge	3/800	M50 I13 N/B offslip to rotary	32900	Travel M50 N/B 115- 113	000	1900	dead	5.5	
50	M50 115 N/B offclip	22000	112 Potany South officia	32000	Treat M50 N/R Off Slip to 112	900	1900	Livo		
50	IIE Boton	32000	113 South Poton	31900	Travel Retary 112	500	100	dood	,	
51	JIS KOLAIY	52000	J13 North Rotary @ Green route	20500	Treat M50 N/B Aux/Green route to		100	ueau		
52	J13 Rotary South at Green Route	31900	N/B	50500	J13(S) t oJ13(N)	1400		Live	7	
53	J13 North Rotary Green route N/B		J13 South Rotary Green route		J13(N) to J13(S)		1800	dead	0	
54	J13 Rotary South at Green Route	32000	J15 Interchange	35500	Travel M50 S/B J13 (S) Rotary to J15		3500	dead	0	
	115 Interchange	35500	J13 N/B offslip at freeflow to	32100	Travel MEO N/R J1E to J12 offelin		3400	doad	0	
	J13 N/B offslip at freeflow to	35500	Bearnaway		Treat M50 N/B J13 freeflow slip to		3400	dead	0	
56	Bearnaway	32100	Bearnaway Rd freeflow slip		Bearnaway S/B	200		Live	3.5	
57	Bearnaway Rd freeflow slip		Bearnaway TL's		Travel S/B Bearnaway to TL's with R113		300	dead	0	
58	Bearnaway TL's		J14 Rotary On slip N/B		Travel R113 to J14 Rotary		800	dead	0	
59	J14 Rotary On slip N/B	32500	J14 M50 N/B mainline	31100	Treat M50 N/B Onslip J14	1400		Live	7	
60	J14 M50 N/B mainline	31100	J12 Interchange	24500	Travel M50 N/B J14 to J12		6600	dead	0	
61	J12 Interchange	24500	M50 S/B J14 off slip	31600	Travel M50 S/B J12 to J14		7100	dead	0	
62	M50 S/B J14 off slip	31600	J14 Rotary	32500	Treat M50 S/B Offslip J14	900		Live	7	
63	J14 Rotary	32500	Bearnaway TL's		Travel Rotary J14 and R113 to TL's with Bernaway.		800	dead	0	
					Travel N/B Bernaway to J13 Freeflow					
64	Bearnaway TL's		Freeflow slip to Green route N/B		slip N/B Green route Treat Freeflow Bernawav N/B to		300	dead	0	
65	Freeflow slip to Green route N/B		Green route N/B @ J13 South	31800	Green Route N/B at J13(S)	150		Live	3.5	
66	Green route N/B @ J13 South	31800	Green route N/B @ J13 North	30400	J13(N) to J13(S)		1400	dead	0	
6	Correct N/D C 112 N 1	20100	Castlalizadi Dav	13300	Travel M50 N/B J13 to Castleknock		17400		_	
6/	Green route N/B @ J13 North	30400	сазнекпоск рерот		Depot	50,150	76,600	uead	0	111,300
								Adjusted		
								Агеа		123,396



# APPENDIX 4 - WINTER MAINTENANCE DUTY ENGINEERS' ROSTER FOR THE PERIOD 1ST OCTOBER 2021 TO 15TH MAY 2022

Please see below for details for M50CL Duty Engineers for Winter 2021/22. Duty Engineers hand over each Tuesday at 08:30hrs.

Date	Duty Engineer	Date	Duty Engineer	Date	Duty Engineer
01/10 - 05/10	TM & Network Inspector	14/12 – 21/12	O&M Network Manager/Winter Manager	01/03 - 08/03	Works Manager
05/10 - 12/10	Works Manager	21/12 – 28/12	O&M Manager	08/03 - 15/03	Works Supervisor
12/10 - 19/10	Works Supervisor	28/12 - 04/01	Operations & Data Manager	15/03 – 22/03	Project Manager
19/10 – 26/10	Project Manager	04/01 - 11/01	TM & Network Inspector	22/03 – 29/03	O&M Network Manager/Winter Manager
26/10 - 02/11	O&M Network Manager/Winter Manager	11/01 – 18/01	Works Manager	29/03 – 05/04	O&M Manager
02/11 - 09/11	O&M Manager	18/01 – 25/01	Works Supervisor	05/04 - 12/04	Operations & Data Manager
09/11 - 16/11	Operations & Data Manager	25/01 – 01/02	Project Manager	12/04 – 19/04	TM & Network Inspector
16/11 – 23/11	TM & Network Inspector	01/02 - 08/02	O&M Network Manager/Winter Manager	19/04 – 03/05	Works Manager
23/11 - 30/11	Works Manager	08/02 - 15/02	O&M Manager	03/05 - 10/05	Works Supervisor
30/11 - 07/12	Works Supervisor	15/02 – 22/02	Operations & Data Manager	10/05 – 17/05	Project Manager
07/12 - 14/12	Project Manager	22/02 - 01/03	TM & Network Inspector	17/05 – 24/05	O&M Network Manager/Winter Manager



# **APPENDIX 5 - LIST OF CONTACT NUMBERS**

# **M50CL Supervisory and Management Contacts:**

Desition	Location	Contact Numbers					
Position	Location	Office	Email				
O&M Manager	Castleknock Depot	01 823 5888	info@m50concession.com				
O&M Network Manager/Winter Manager	Castleknock Depot	01 823 5888	info@m50concession.com				
Works Manager	Castleknock Depot	01 823 5888	info@m50concession.com				
Project Manager	Castleknock Depot	01 823 5888	info@m50concession.com				
Technical Engineer	Castleknock Depot	01 823 5888	info@m50concession.com				
Works Supervisor	Castleknock Depot	01 823 5888	info@m50concession.com				
TM & Network Inspector	Castleknock Depot	01 823 5888	info@m50concession.com				



# M50CL Operatives Contacts:

Position Route		Contact Numbers
		Mobile
Works Supervisor	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Electrician	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888
M50 Concession Operative	All Routes	01 823 5888

# Authority's Site Representative

Authority	Location	Telephone Nos.		
		Office	Mobile/24Hr	
TII (Atkins)	Swords	01 890 5811	01 890 5111	



# **Across Boundary Contacts:**

Authority	Location	Telephone Nos.		
		Office	Mobile/24Hr	
Fingal County Council	Blanchardstown	01 890 5811	ТВС	
South Dublin County Council	Tallaght	01 414 9000	086 856 0552	
Dun Laoghaire Rathdown County Council	Dun Laoghaire	01 205 4700	086 383 7290	
Dublin Port Tunnel (Egis Road & Tunnel Operation)	Dublin Port Tunnel	01 884 8438	087 328 6523	
MMaRC Area A (Globalvia Jons Maintenance)	Castleknock	01 891 3302	086 077 2785	

# Gardai Contacts:

Namo / Position	Location	Contact Numbers
		Office
Traffic Inspector	Dublin Castle	01 666 9800
Traffic Inspector	Santry	01 666 4000
Traffic Inspector	Blanchardstown	01 666 7000
Traffic Inspector	Terenure	01 666 6400
Traffic Inspector	Blackrock	01 666 5200



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