

Project

S2S Cycle & Footway Interim Works Bull Road to Causeway Road

Report Title

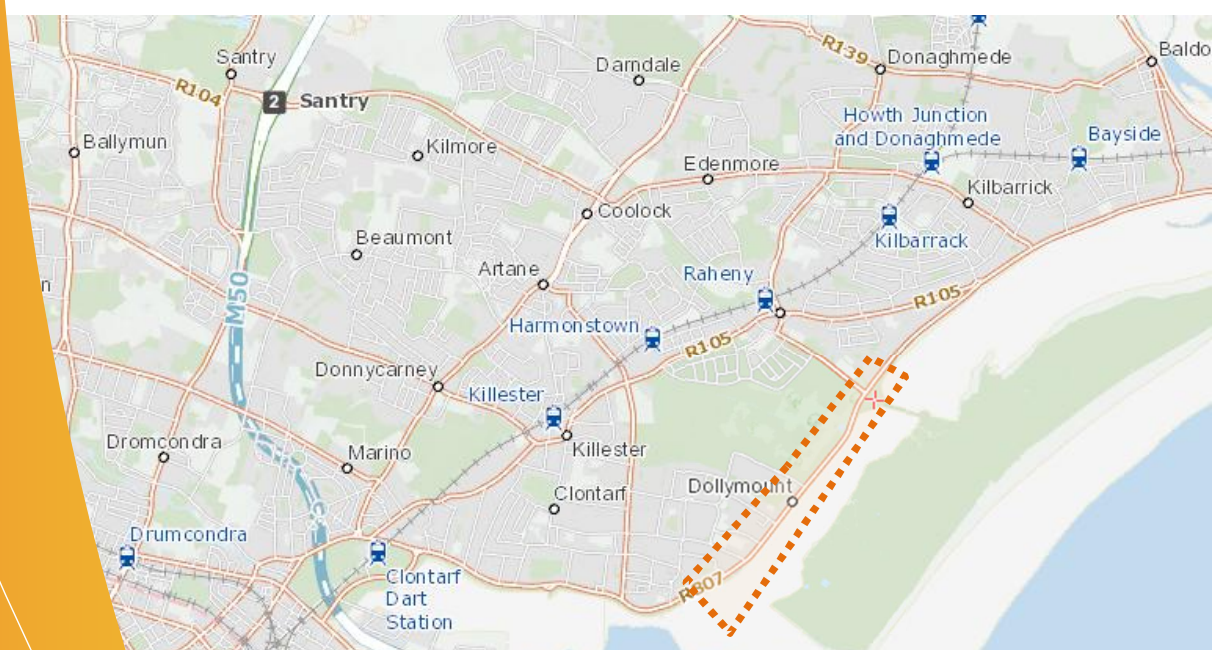
Stage 3 Road Safety Audit

Date

August 2017

Client

Dublin City Council



Document Control

Job Title: S2S Cycle & Footway Interim Works, Bull Road to Causeway Road

Job Number: p170145

Report Ref: p170145-Rep-001

Author: Jacqueline Haley

Approved by: Jacqueline Haley

Date: August 2017

Distribution: Dublin City Council
DBFL Consulting Engineers (Dublin)
DBFL Consulting Engineers (Waterford)

| Revision | Issue Date | Description | Prepared | Reviewed | Approved |
|-----------------------|------------|---------------|----------|----------|----------|
| 1 st Draft | 29/08/2017 | Client Review | JH | RK | JH |
| | | | | | |
| | | | | | |
| | | | | | |

DBFL Consulting Engineers

Dublin Office
Ormond House
Upper Ormond Quay
Dublin 7

Tel 01 4004000
Email info@dbfl.ie
Web www.dbfl.ie

Waterford Office
Unit 2
The Chandlery
1-2 O'Connell Street, Waterford

Tel 051 309500
Fax 051 844913
Email info@dbfl.ie
Web www.dbfl.ie



DBFL Consulting Engineers disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence within the terms of the Contract with the Client and generally in accordance with ACEI SE 9101 Conditions of Engagement and taking account of the manpower, resources, investigations and testing devoted to it by agreement with the Client. This report is confidential to the Client and DBFL Consulting Engineers accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

CONTENTS

| | | |
|-----|---|----|
| 1.0 | INTRODUCTION..... | 4 |
| 1.2 | SCHEME DESCRIPTION | 4 |
| 1.3 | RSA SCOPE | 4 |
| 1.4 | PREVIOUS ROAD SAFETY AUDITS..... | 6 |
| 1.5 | SITE OBSERVATIONS..... | 7 |
| 1.6 | COLLISION HISTORY..... | 7 |
| 2.0 | ITEMS RAISED DURING THIS STAGE 3 ROAD SAFETY AUDIT .. | 11 |
| 2.1 | GENERAL PROBLEMS OR PROBLEMS AT MULTIPLE LOCATIONS..... | 11 |
| 2.2 | PROBLEMS AT SPECIFIC LOCATIONS..... | 16 |
| 3.0 | COMMENTS..... | 34 |
| 4.0 | AUDIT TEAM STATEMENT | 35 |
| 5.0 | LIST OF INFORMATION RECEIVED | 36 |

APPENDICES

| | |
|------------|--------------------------|
| APPENDIX A | Problem Location Figures |
| APPENDIX B | Feedback Form |

1.0 INTRODUCTION

1.1.1 This report describes a Stage 3 Road Safety Audit (RSA) carried out at the request of Dublin City Council. The Audit, undertaken during August 2017 considers the S2S Cycle & Footway Interim Works (Bull Road to Causeway Road) scheme. The general location of subject scheme is graphically presented in Figure 1.1 below.

1.2 SCHEME DESCRIPTION

1.2.1 The scheme is located along the (R809) Clontarf Road regional road in County Dublin, which serves moderate to high volumes of traffic. Clontarf Rd road is a single carriageway road, varying in width from approximately 6m to 6.5m. The route has a relatively straight alignment, with intermittent parking and footpaths provided on both sides of the road.

1.2.2 The scheme included the provision of a segregated two-way cycle track on the seaward side (eastern side) of Clontarf Road.

1.2.3 A number of pedestrian and cyclist crossing facilities have been provided as part of the scheme.

1.3 RSA SCOPE

1.3.1 The geographical scope of this Stage 3 Road Safety Audit considers the subject Clontarf Road scheme between approximately 30m to the south west of the Kincora Rd junction to approximately 50m to the northeast of the Clontarf/Causeway Rd/Watermill Rd/James Larkin Rd junction as indicatively illustrated in Figure 1.2 below. The immediate pedestrian/cycle/vehicular routes leading to/from these crossings and other factors which may affect the operation/use of the pedestrian crossings have also been considered as part of the audit.

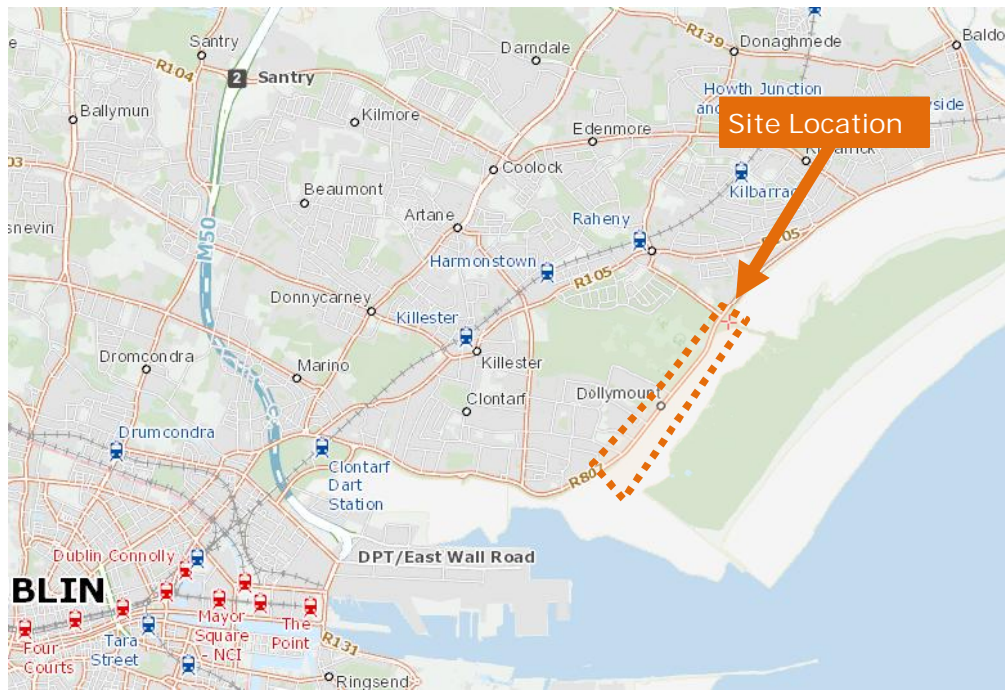


Figure 1.1: Site Location (Source www.OSI.ie)

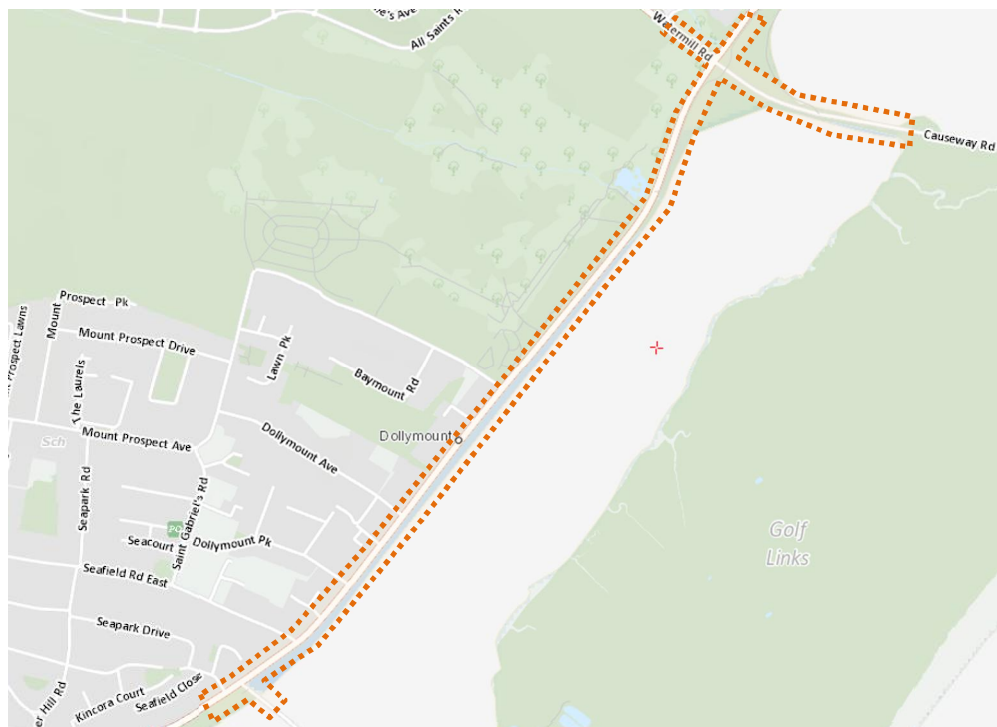


Figure 1.2: Scope of Stage 3 RSA (Source www.OSI.ie)

1.3.2 The Audit Team membership was as follows:

Team Leader: Ms Jacqueline Haley
BEng PGDip. MSc Ceng MIEI Cert Comp RSA
DBFL Consulting Engineers (Waterford)

Team Member: Mr Robert Kelly
BAI, MA, PGDip. Const Law, Ceng MIEI
DBFL Consulting Engineers (Dublin)

1.3.3 The Audit comprised a desktop review of the information listed in Section 5 of this report in addition to an examination on-site of the existing site characteristics. The site was visited on Monday 21st August 2017 between 19:30 and 21:30. At the time of the site audit on the weather was fine with some road / footpath surfaces noted as being dry. Evidence of surface water ponding was present from earlier rain showers.

1.3.4 This Audit has been carried out in accordance with the relevant sections of the Transport Infrastructure Ireland guidance GE-STY-01024 March 2015 (formally NRA HD 19/15) for Road Safety Audits.

1.3.5 The problems identified and described in this report are considered by the Audit Team to require action in order to improve the safety of the Scheme and minimise accident occurrence.

1.3.6 Prior to undertaking the audit, the audit team have been informed by Dublin City Council that local residents have raised concerns regarding the scheme in relation to: -

- Conflicts points at bus stops and all shared spaces;
- Cyclists travelling too fast;
- Not enough road signage; and
- Service vehicles and others parking in the new cycle track.

1.4 PREVIOUS ROAD SAFETY AUDITS

1.4.1 The audit team have been provided with copies of previous road safety audits that have been undertaken on the scheme: -

- PMCE Stage 2 Road Safety Audit (February 2017);
- Roughan & O'Donovan Stage 2 Road Safety Audit (January 2014); and
- Roughan & O'Donovan Stage 1 Road Safety Audit (October 2012).

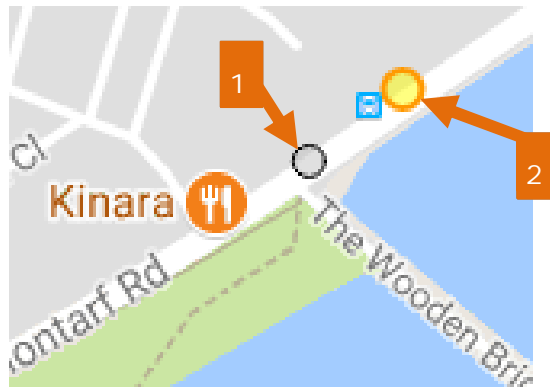
1.5 SITE OBSERVATIONS

- 1.5.1 At the time of the site audit, the auditors noted the public lighting elements of the works were not complete, with some lighting columns surrounded by bollards/hoarding. Furthermore, during the hours of darkness, in the areas where old lighting columns were being replaced by new lighting columns, neither the new or old columns were operational.
- 1.5.2 In addition, it was noted that the traffic signals at the junction of Dollymount Park/Clontarf Road and at the pedestrian crossing to the south west of St Anne's car park were hooded/not switched on.
- 1.5.3 The audit team have noted that there are some differences between the package of drawings issued to the Audit Team by Dublin City Council (Ref. Section 5) prior to the site audit and the as-built scheme on site. Such differences include the shared space areas at the crossing points, amongst others.

1.6 COLLISION HISTORY

- 1.6.1 The collision statistics on the Road Safety Authority (RSA) website were reviewed in order to ascertain the safety record along the 'S2S Cycle & Footway Interim Works, Bull Road to Causeway Road Scheme' over the most recent nine-year period. This includes information for the years 2005 to 2013 inclusive, and indicates basic information on all reported incidents. It should be noted that information relating to reported incidents for the years 2014, 2015, 2016 and 2017 is not yet available on the Road Safety Authority (RSA) website.
- 1.6.2 The RSA records detail only those occasions where the incident was officially recorded such as the Garda being present to formally record details of the incident. According to the RSA website there were a number of reported incidents within the immediate vicinity of the subject scheme, as detailed in the following paragraphs.

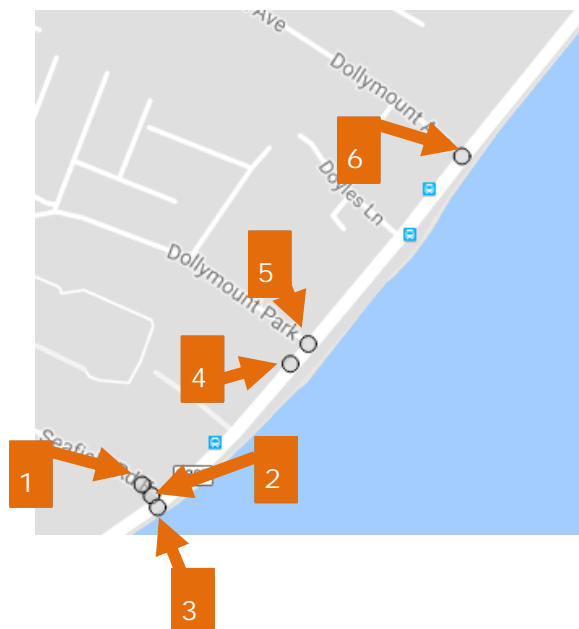
Bull Road/Clontarf Rd Junction



| Ref | Year | Vehicle | Circumstances | Day | Time | Severity | Total Casualties |
|-----|------|---------|---------------------|-----|-------------|----------|------------------|
| 1 | 2011 | Car | Other | Sat | 23:00-03:00 | Minor | 1 |
| 2 | 2005 | Car | Single Vehicle Only | Sat | 10:00-16:00 | Serious | 1 |

1.6.3 Two incidents have arisen within direct proximity of the Bull Road/Clontarf Rd junction within the nine-year period (2005-2013). Neither of these incidents involved Pedestrians, with one being a minor incident, and the other being a serious 'single vehicle only' incident.

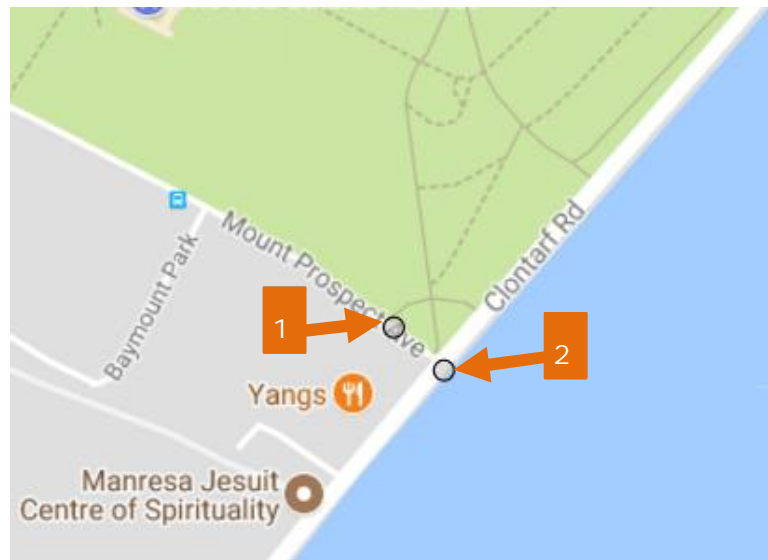
Seafield Road East to Clontarf Road Junctions



| Ref | Year | Vehicle | Circumstances | Day | Time | Severity | Total Casualties |
|-----|------|---------|---------------------|------|-------------|----------|------------------|
| 1 | 2012 | Car | Pedestrian | Mon | 10:00-16:00 | Minor | 1 |
| 2 | 2008 | Car | Rear end, Straight | Wed | 19:00-23:00 | Minor | 1 |
| 3 | 2008 | Car | Single Vehicle Only | Fri | 10:00-16:00 | Minor | 1 |
| 4 | 2010 | Car | Other | Sat | 16:00-19:00 | Minor | 1 |
| 5 | 2012 | Car | Rear end, Straight | Wed | 23:00-03:00 | Minor | 1 |
| 6 | 2013 | Car | Other | Thur | 10:00-16:00 | Minor | 1 |

1.6.4 Three number minor incidents were recorded at the Seafield Road/Clontarf Rd junction, one of which involved a pedestrian over the nine-year period under consideration.

Mount Prospect Avenue/Clontarf Rd Junction



| Ref | Year | Vehicle | Circumstances | Day | Time | Severity | Total Casualties |
|-----|------|---------|--------------------|------|-------------|----------|------------------|
| 1 | 2011 | Car | Other | Tues | 10:00-16:00 | Minor | 1 |
| 2 | 2009 | Car | Rear end, Straight | Fri | 10:00-16:00 | Minor | 1 |

1.6.5 Two minor incidents occurred at/on approach to the Mount Prospect Avenue junction during the nine-year period under consideration (2005-2013). The first incident is cited involving a car with circumstances of 'other'. The second incident occurred on the Clontarf road and its circumstances were 'rear end'.

Clontarf Rd/Watermill Rd/Causeway Rd/James Larkin Rd Junction



| Ref | Year | Vehicle | Circumstances | Day | Time | Severity | Total Casualties |
|-----|------|---------|---------------------|------|-------------|----------|------------------|
| 1 | 2008 | Bicycle | Other | Sun | 16:00-19:00 | Minor | 1 |
| 2 | 2005 | Car | Head-on conflict | Mon | 19:00-23:00 | Minor | 2 |
| 3 | 2007 | Car | Angle, right turn | Wed | 16:00-19:00 | Minor | 2 |
| 4 | 2005 | Car | Angle, right turn | Tues | 19:00-23:00 | Minor | 6 |
| 5 | 2008 | Car | Single vehicle only | Mon | 19:00-23:00 | Minor | 1 |
| 6 | 2012 | Car | Other | Sun | 16:00-19:00 | Minor | 1 |

- 1.6.6 There were four number recorded collisions at the Clontarf Rd/Watermill Rd/Causeway Rd/James Larkin Rd Junction. Two collisions involved vehicles undertaking right turn manoeuvres.
- 1.6.7 There was one collision involving a cyclist on Clontarf Rd however the circumstances are unknown.
- 1.6.8 The review of the RSA data reveals that there are no apparent trends between the collisions which have occurred during the most recent 9-year period (2005-2013).

2.0 ITEMS RAISED DURING THIS STAGE 3 ROAD SAFETY AUDIT

2.1 GENERAL PROBLEMS OR PROBLEMS AT MULTIPLE LOCATIONS

2.1.1 Problem (G1) Sign Poles/Lighting Columns/Street Furniture located in pedestrian footways/bus stops

Throughout the scheme there are multiple instances of sign poles/lighting columns/other items of street furniture located within the pedestrian footways or at bus stops. These present a hazard to visually impaired pedestrians and/or an obstruction to all pedestrians (including wheelchair users or pedestrians with buggies). Due to the narrow footway widths at these locations (less than 1200mm in some places) pedestrians may be forced to enter into the adjacent cycle track/road carriageway to pass another pedestrian which could lead to conflict with cyclists/vehicles travelling along the cycle track/road carriageway.

This problem was also noted during the Stage 2 RSA undertaken by PMCE (Problem Ref. 3.1.6).

Recommendation:

It is recommended that a clear footway width of at least 1200mm (at obstructions only) is provided to ensure pedestrians are not forced to enter the adjacent cycle track or road carriageway to continue their journey.

2.1.2 Problem (G2) Surface Water Ponding

The audit team noted various instances of surface water ponding, in addition to blocked drainage channels at various locations throughout the scheme. Inadequate surface water drainage may result in slip/trip hazards for pedestrians, and/or cause cyclists/vehicles to lose control during icy weather conditions, bringing them into potential conflict with pedestrians/cyclists/vehicles.

Recommendation:

It is recommended a review of the surface water drainage throughout the scheme is undertaken. Ensure adequate surface water drainage is provided along all of the immediate approaches to and within the subject schemes extents.

2.1.3 Problem (G3) Tactile Paving at Shared Areas

During the site visit the audit team noted the absence of the tram line paving at the entrances/exits between the shared areas and the cycle route. The drawings provided for the purposes of the audit indicate the provision of this paving.

In the absence of the appropriate tactile paving at all of the locations where the pedestrian route meets a shared area or a cycle route, all pedestrians including visually impaired and mobility impaired pedestrians may encounter difficulties navigating the route. This may lead them to enter a cycle route unexpectedly and come into conflict with moving cyclists.

This problem is exacerbated due to both: -

- a) the expansive layout of some of the shared areas; and
- b) where the cycle route meets the shared area, in most cases there is no level difference (or central delineator) between the cycle side and the pedestrian side of the route.

Recommendation:

It is recommended that appropriate tactile paving is provided to guide vulnerable road users along the most appropriate route, and to provide the necessary warnings at conflict points.

2.1.4 Problem (G4) Cycle Route Centre Line Marking

During the site visit the audit team noted the absence of the centre line road marking along the cycle route. The drawings provided for the purposes of the audit indicate the provision of this marking.

The provision of the centre line will help to reinforce to cyclists the correct position to travel along the cycle route to avoid conflict with cyclists travelling in the opposite direction. Furthermore, the provision of the centreline may serve the function of a speed reducing feature whereby the perceived width of the cycle route would be reduced.

This problem is exacerbated due to both: -

- a) The volume of cyclists travelling along the route; and
- b) The speed at which cyclists were observed to be travelling.

Recommendation:

It is recommended that the centre line is provided along the cycle route particularly along the sections on approach to the shared areas.

2.1.5 Problem (G5) Speed of Cyclists

The audit team are concerned about both the speed of cyclists travelling along the route, and the speed at which cyclists are approaching/travelling through the shared areas.

Cyclists travelling at high speeds on approach to/through the shared areas may fail to observe the shared area and as a result fail to give priority to pedestrians. The severity of any collisions/conflicts with pedestrians will increase with higher speeds.

Whilst cyclists travelling at high speeds along the route increases the severity and the likelihood for conflicts with other cyclists (i.e. during overtaking manoeuvres etc).

Recommendation:

The audit team recommend that supplementary signage should be provided on approach to the shared areas to warn cyclists of the upcoming shared area, to reduce their speed and the necessity to give priority to pedestrians. Following the implementation of the additional signage, monitor the situation and should cyclists fail to reduce their speeds to an acceptable level, it is recommended that other physical speed reducing measures be provided. It is recommended that a Stage 4 RSA is carried out.

2.1.6 Problem (G6) Signage at exit from Shared Areas

The auditors noticed several instances of pedestrians entering into the cycle track, causing cyclists to swerve to avoid them. It was also noted that sign face RUS 009 has been provided at the exit from all of the shared areas. This sign indicates Pedal Cycles only and prohibits all VEHICLES from entering the cycle track.



The audit team are concerned that there may be confusion amongst pedestrians regarding the correct (and safe) side of the route upon which to travel. This problem could be exacerbated by the use of the incorrect signage.

Recommendation:

The audit team recommend that, where appropriate, the RUS 009 signs are replaced by RUS 058CL or RUS 058CR, as these signs indicate the correct side of the route for pedestrians to take.

2.1.7 Problem (G7) Blocked Drainage Channels

The audit team noted various instances of drainage channels which were full of debris/silt. Although it was not raining at the time of the site visit, the audit team are concerned that these blocked drainage channels could result in poor surface water drainage of adjacent pedestrian/cycle areas. Inadequate surface water drainage may result in slip/trip hazards for pedestrians, and/or cause cyclists/vehicles to lose control during icy weather conditions, bringing them into potential conflict with pedestrians/cyclists/vehicles.

Recommendation:

It is recommended that a cleaning/maintenance regime is implemented to ensure all drainage channels, pedestrian and cycle areas are free from silt/debris.

2.1.8 Problem (G8) Kerbed Upstand between Footpath & Cycleway

During the site visit the audit team noted several instances where due to construction techniques there is no kerbed upstand (with a level difference) between the footpath and the cycle track. This may lead pedestrians to enter a cycle route unexpectedly and come into conflict with moving cyclists.

This problem is exacerbated due to both: -

- a) the absence of the tram line tactile paving at shared areas and; and
- b) the absence of the central delineator between the cycle side and the pedestrian side of the route.

This problem was also noted during the Stage 2 RSA undertaken by PMCE (Problem Ref. 3.1.3).

Recommendation:

Monitor the situation, should pedestrians continually enter the cycle route at these locations, a level difference with a kerbed upstand should be provided between the footpath and the cycleway.

2.1.9 Problem (G9) Narrow Width of Clontarf Road Carriageway

The auditors are concerned about the narrow width of Clontarf Road carriageway. Along some sections, larger vehicles (buses, HGV's) encroach over the centreline into the opposing traffic lane. This could lead to conflict with vehicles travelling in the opposing direction.

Recommendation:

Monitor the situation, should issues arise with the narrow carriageway width, the carriageway should be widened to a width which adequately accommodates all classes of vehicles travelling along it; or alternatively restrictions should be implemented to prevent certain classes of vehicles from travelling along the route.

2.1.10 Problem (G10) Footway Reinstatement at New/Old Lighting Columns

The auditors note that some of the older lighting columns have yet to be removed, whilst at others temporary footway surfacing has been provided.

Failure to reinstate the footway after the removal of the lighting columns could lead to trip hazards for pedestrians.

Recommendation:

Ensure the footway surface is reinstated following the removal of the lighting columns.

2.1.11 Problem (G11) Exposed Cables/Wires

The auditors note at some of the cables/wires from the lighting columns are exposed/covered with temporary casing. Failure to cover these cables/wires permanently could result in personal injury and or electrocution.

Recommendation:

Ensure the cables are covered permanently and made safe.

2.2 PROBLEMS AT SPECIFIC LOCATIONS

2.2.1 Problem (S1) Pedestrian Crossing Provision at Bus Stop

There is no pedestrian crossing, or suitable transition provided in close proximity to the bus stop to enable mobility impaired pedestrians or pedestrians with buggies to cross the road carriageway to access/egress the bus stop. This may result in mobility impaired pedestrians experiencing difficulty accessing/egressing the bus stop to/from the northern side of Clontarf Rd. The nearest crossing location available on the northern arm of Clontarf Rd at the junction of Bull Rd/Clontarf Rd and will necessitate the pedestrian to undertake two crossings to access/egress the bus stop.

Recommendation:

It is recommended either: -

- a) a pedestrian crossing is provided in the vicinity of the bus stop; or
- b) a pedestrian crossing is provided on the southern arm of Clontarf Rd at the junction of Bull Rd/Clontarf Rd to reduce the distance mobility impaired pedestrians would be required to travel to access/egress the bus stop.

2.2.2 Problem (S2) No Tactile Paving at Kincora Rd/Clontarf Rd junction

There is no tactile paving provided at the pedestrian crossing at the junction of Kincora Rd/Clontarf Rd. In the absence of the appropriate tactile paving and at the pedestrian crossing point, visually and mobility impaired pedestrians may encounter difficulties crossing the road carriageway. This may lead them to enter the carriageway at an unsafe location and/or come into conflict with moving vehicles, cyclists, or raised kerbs (trip hazard).

Recommendation:

It is recommended that appropriate tactile paving is provided to guide vulnerable road users along the most appropriate route and to provide the necessary warnings at conflict points.

2.2.3 Problem (S3) No Yield Sign at Kincora Rd/Clontarf Rd junction

There is no regulatory Yield sign provided at the Kincora Rd/Clontarf Rd junction. Failure to provide the regulatory sign may result in vehicle drivers failing to yield or stop before entering into the Clontarf Rd carriageway resulting in potential side impact collisions with cyclists/vehicles travelling along Clontarf Rd.

Recommendation:

Provide the regulatory sign in accordance with the requirements of the Traffic Signs Manual.

2.2.4 Problem (S4) No Dropped Kerbs at Crossing on Bull Road

The auditors noted there are no dropped kerbs provided at the crossing on Bull Rd, a temporary surfacing has been provided. In the absence of the appropriately constructed dropped kerbs all pedestrians including visually and mobility impaired pedestrians and cyclists may encounter difficulties navigating the route. This could lead to trip/slip hazards for pedestrians



or loss of control incidents for cyclists should they try to navigate a full height kerb.

Recommendation:

It is recommended that appropriately constructed dropped kerbs are provided at the crossing location.

2.2.5 Problem (S5) Carriageway Surface at Crossing on Bull Road

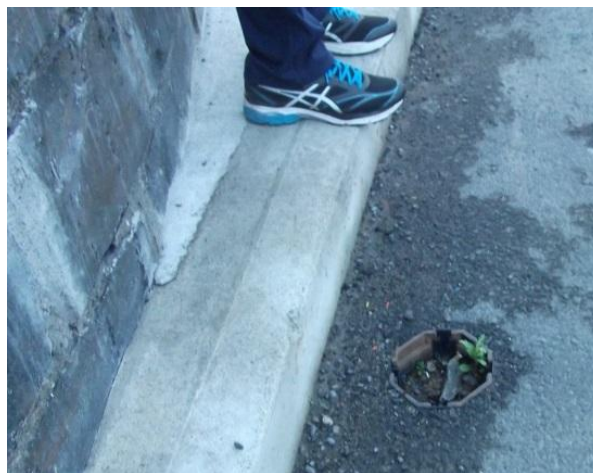
The existing carriageway surface at the crossing presents a trip hazard and an uneven surface for both pedestrians and cyclists. Additionally grit/loose gravel on the carriageway may result in vehicles skidding leading to loss of control incidents.

Recommendation:

It is recommended the carriageway is finished to an appropriate standard to ensure an even surface for pedestrians/cyclists/vehicles.

2.2.6 Problem (S6) Redundant Inductive Loop Box at Crossing on Bull Road

There is a redundant loop box on approach to the crossing on Bull Road. This presents a trip hazard for pedestrians or could result in loss of control incidents to for cyclists should they hit a low point unexpectedly.



Recommendation:

Remove the loop box and finish the carriageway to an appropriate standard.

2.2.7 Problem (S7) Traffic Signals at Bull Rd/Clontarf Rd junction

During the site audit, the auditors witnessed instances of drivers disobeying the traffic signals and proceeding through red lights at the junction. This could result in conflicts between pedestrians/cyclists undertaking the crossings or other vehicles travelling through the junction.

Recommendation:

Monitor the situation to determine if there are any underlying factors which could be causing drivers to disobey the traffic signals.

2.2.8 Problem (S8) Stop Road Marking on Bull Road

There is a 'Stop' road marking on Bull Rd which could result in driver hesitation or vehicle drivers failing to observe the traffic signals at the junction.

Recommendation:

Ensure the 'Stop' road marking is removed.

2.2.9 Problem (S9) Southwestern Arm of Bull Rd/Clontarf Rd junction

There is a pedestrian desire line across Clontarf Rd (southwestern arm) at the Bull Rd/Clontarf Rd junction. The absence of a pedestrian crossing at this location results in pedestrians entering the carriageway when it is unsafe to do so, bringing them into conflict with moving vehicles. The auditors observed several occurrences of pedestrians crossing at this location during the site audit.

Recommendation:

It is recommended a pedestrian crossing is provided at this location.

2.2.10 Problem (S10) Southwestern Arm of Bull Rd/Clontarf Rd junction

During the site audit the audit team observed several instances of vehicles crossing over the carriageway centre line to wait for a gap in opposing traffic before undertaking the right turn



into Bull Rd. There is potential for conflict between vehicles travelling southwest bound through the junction and these vehicles that have encroached over the carriageway centreline.

Recommendation:

It is recommended that either: -

- a) Right turning vehicles are formally held at the stop line (by the traffic signals) until they have been given notification to proceed; or
- b) A yellow box marking is provided to prevent vehicles stopping/waiting at an inappropriate location in the junction.

2.2.11 Problem (S11) Footway Surface on western side of Clontarf Rd

The existing footway surface on the western side of Clontarf Rd between the Clontarf Rd/Bull Rd junction and the commercial premises presents a trip hazard and an uneven surface for both pedestrians.

Recommendation:

It is recommended the footway surface is finished to an appropriate standard to ensure an even surface for pedestrians.

2.2.12 Problem (S12) Accesses to Commercial Premises on western side of Clontarf Rd

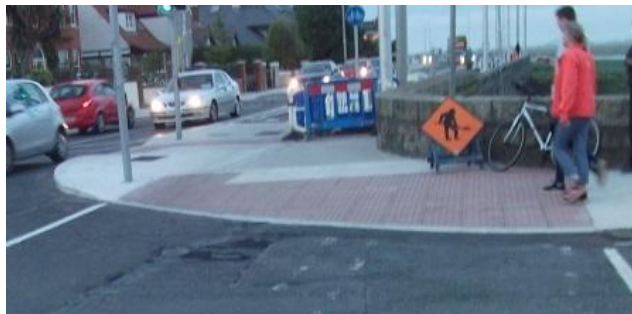
Vehicles must cross the footway on the western side of Clontarf Rd (to the north of the Clontarf Rd/Bull Rd junction) to gain access to the adjacent commercial premises. The footway surface across these accesses is almost flush with the adjacent road carriageway. Due to the lack of height difference (less than 25mm) there is a risk that visually impaired pedestrians may fail to observe the edge of the footway and inadvertently enter into the adjacent road carriageway, leaving them at risk of conflict with vehicles travelling northbound along Clontarf Road.

Recommendation:

As soon as the opportunity arises, it is recommended that either a kerb upstand of greater than 25 mm is provided or tactile paving is provided to warn pedestrians of the adjacent road carriageway.

2.2.13 Problem (S13) North-Eastern Crossing Location at Bull Rd/Clontarf Rd junction

During the site visit the audit team noted the incorrect layout of tactile paving the toucan crossing (i.e. the stem is too short). In the absence



of the appropriate tactile paving visually impaired may encounter difficulties in locating the crossing point or they may enter into the road carriageway come into conflict with moving vehicles and cyclists.

Recommendation:

It is recommended that appropriate tactile paving is provided to guide vulnerable road users along the most appropriate route.

2.2.14 Problem (S14) Toucan Crossing on Bull Road

There are no push button units for cyclists at the Toucan crossing on Bull Road. The provision of a single push button at this wide crossing encourages weaving of pedestrians and cyclists in this confined area. This could lead to confusion and conflicts between pedestrians and cyclists.

Recommendation:

It is recommended push button units are provided for cyclists at the junction.

2.2.15 Problem (S15) Pedestrian Footway on Bull Rd

The auditors have concerns with the narrow footway provision along Bull Rd. During the site audit several instances of pedestrians travelling along the road carriageway were observed. Pedestrians travelling along the road carriageway are at risk of conflict with cyclists or vehicles travelling Bull Road.

Recommendation:

The audit team recommend, where possible, the pedestrian footway is increased in width in line with the requirements of DMURS.

2.2.16 Problem (S16) Weight Restriction Signs at Seafield Rd East/Clontarf Rd Junction

The vehicle weight restriction sign faces are rotated away from the direction of oncoming vehicle drivers. As a result, vehicle drivers may be insufficiently advised of the weight restriction and proceed along a route that may not be suitable for their class of vehicle.

Recommendation:

Ensure all sign faces are clearly visible to oncoming vehicle drivers where appropriate.

2.2.17 Problem (S17) No Yield/Stop Sign at Seafield Rd East/Clontarf Rd Junction

There is no regulatory Yield or Stop sign provided at the Seafield Rd East/Clontarf Rd junction. Failure to provide the regulatory sign may result in vehicle drivers failing to yield or stop before entering into the Clontarf Rd carriageway resulting in potential side impact collisions with cyclists/vehicles travelling along Clontarf Rd.

Recommendation:

Provide the regulatory sign in accordance with the requirements of the Traffic Signs Manual.

2.2.18 Problem (S18) Parking Bays Across Residential Property Accesses

On the western side of the Clontarf Rd carriageway (in the vicinity of chainage 0+350) the parking bays are marked across the accesses/driveways of the adjacent residential properties. Vehicles parked within these bays may inadvertently prevent local residents from accessing/egressing their driveways.

Recommendation:

Ensure there are gaps provided in the parking bays to enable residents to access/egress their driveways.

2.2.19 Problem (S19) Pedestrian Footway on Clontarf Rd (in the vicinity of nos 361-365)

The auditors have concerns with the narrow footway provision along the western side of Clontarf Rd (in the vicinity of nos 361-365). Due to the narrow footway width pedestrians may be forced to enter into the adjacent road carriageway to pass another pedestrian which could lead to conflict with cyclists/vehicles travelling along Clontarf Rd.

Recommendation:

The audit team recommend, where possible, the pedestrian footway is increased in width in line with the requirements of DMURS.

2.2.20 Problem (S20) Bus Stop South of Dollymount Park

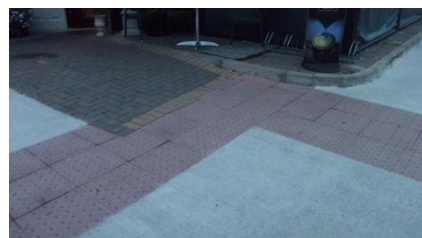
The auditors are concerned that when northbound buses are stopped at the bus stop (as located to the south of Dollymount Park), forward sight visibility to the new pedestrian crossing (and associated signal heads) may be restricted for northbound vehicle drivers. Failure to provide adequate forward sight visibility to the pedestrian crossing may result in vehicle drivers failing to observe a pedestrian utilising the crossing, and/or vehicle drivers may not be given insufficient time to reduce their speed, both of which increases the potential for conflict between a vehicle and a pedestrian.

Recommendation:

The designers should ensure sufficient visibility to the crossing and signal head is provided. If sufficient visibility cannot be achieved, relocate the bus stop to north of the new pedestrian crossing.

2.2.21 Problem (S21) Dollymount Park Pedestrian Crossing

During the site visit the audit team noted that the layout of the stem of the tactile paving at the northern side of the crossing is incorrect. This could result in visually impaired pedestrians encountering difficulties in locating the crossing point or could result in personal injury should they trip at the full height kerb.



Recommendation:

As soon as the opportunity arises, the stem of the tactile paving should be extended to the back of the footway.

2.2.22 Problem (S22) No Yield Markings at Cycle Junction opposite Dollymount Park

There are no Yield markings provided at the cycle junction with Clontarf Rd and at the cycle junction with the adjacent cycle route. Failure to provide these Yield markings may result in cyclists failing to yield or stop before entering into the Clontarf Rd carriageway or entering into the cycle track resulting in potential conflict with vehicles travelling along Clontarf Rd if cyclists utilising the cycle track.

Recommendation:

Provide the Yield markings at the junction to ensure cyclists are made aware of the need to Yield for traffic on Clontarf Rd or the adjacent cycle track.

2.2.23 Problem (S23) Cycle Junction opposite Dollymount Park

Due to the generous width of the cycle transition between the cycle route and Clontarf Rd (with dropped kerbs along its length), the audit team are concerned that vehicle drivers could misinterpret this area as a vehicle route and proceed to enter the area resulting in conflicts with cyclists travelling along the cycle route. Vehicle drivers may also misinterpret this area as a parking area resulting in inappropriate parking practices which could lead to the route could be obstructed for cyclists.

Recommendation:

Ensure sufficient signage is provided to advise vehicle drivers of the route being for cycle use only.

2.2.24 Problem (S24) Cycle Route/Dollymount Park/Clontarf Road Signals

As the new traffic signals were hooded/incomplete at the time of the audit, and in the absence of the provision of traffic signal staging data, it is unclear to the audit team when cyclists will be given notification to exit the cycle route and cross the Clontarf Rd carriageway. Failure to incorporate a cycle phase into the traffic signal staging could lead to cyclists entering into the Clontarf

Rd carriageway when it is unsafe to do so, resulting in potential conflict with vehicles travelling through the junction.

Recommendation:

The designers should confirm how cyclists will be given notification to proceed into the Clontarf Rd carriageway.

2.2.25 Problem (S25) Bus Stop on Clontarf Rd opposite Doyles Lane

There is a pedestrian desire line between the western footway on Clontarf Rd (at Doyles Lane junction) and the bus stop on the eastern side of the carriageway. The absence of a pedestrian crossing at this location could result in pedestrians entering the carriageway when it is unsafe to do so, bringing them into conflict with moving vehicles.

Recommendation:

It is recommended a pedestrian crossing is provided at this location.

2.2.26 Problem (S26) No Yield/Stop Sign at Dollymount Avenue/Clontarf Rd Junction

There is no regulatory Yield or Stop sign provided at the Dollymount Avenue/Clontarf Rd junction. Failure to provide the regulatory sign may result in vehicle drivers failing to yield or stop before entering into the Clontarf Rd carriageway resulting in potential side impact collisions with cyclists/vehicles travelling along Clontarf Rd.

Recommendation:

Provide the regulatory sign in accordance with the requirements of the Traffic Signs Manual.

2.2.27 Problem (S27) Narrow Footway at Steps

Due to the narrow footway width at the steps pedestrians may be forced to enter into the adjacent cycle track to pass another pedestrian which could lead to conflict with cyclists/vehicles travelling along the cycle track/road carriageway.



Recommendation:

It is recommended that a clear footway width of at least 1200mm (at obstructions only) is provided to ensure pedestrians are not forced to enter the adjacent cycle track to continue their journey.

2.2.28 Problem (S28) Blocked Sign face opposite Seafield Rd East Junction

Visibility to the Shared surface sign is blocked by the cycle route sign. As a result, cyclists may be insufficiently advised of the presence of the shared area, the need to reduce speeds and the potential for pedestrians to be present. This could lead to conflict.



Recommendation:

Ensure all sign faces are clearly visible to oncoming cyclists.

2.2.29 Problem (S29) Low Wall Height – Throughout Scheme

The auditors are concerned about the low sea wall height throughout the scheme and the flat top capping provided, particularly opposite the Mount Prospect Avenue junction (pictured). This presents a hazard to visually both impaired pedestrians (trip hazard) and to children who may be encouraged to run/walk/climb on the wall leading to falls from a height into the sea and/or drowning.



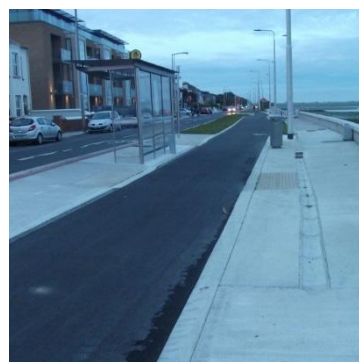
This problem was also noted during the Stage 2 RSA undertaken by PMCE (Problem Ref. 3.1.5).

Recommendation:

We note the designers' response to the PMCE Stage 2 RSA problem, nonetheless the problem still remains. At a very minimum the designers recommend the provision of angled along the top of the wall to ensure children cannot walk/run along the top of the wall. This angled capping would still allow pedestrians to rest at the wall without sitting on top of it completely.

2.2.30 Problem (S30) Drainage Channels Located at Pedestrian Crossings

The audit team noted some instances of the provision of drainage channels immediately to the rear of pedestrian crossing locations. These drainage channels may present a trip hazard to visually impaired pedestrians as they expectantly encounter the channel upon undertaking the crossing. Or a slip hazard or all pedestrians could arise if the channel is full of water during wet or icy weather conditions.



Recommendation:

Monitor the situation, if issues arise relocate the pedestrian crossing. Ensure the drainage channel can adequately shed surface water during poor weather conditions.

2.2.31 Problem (S31) No Yield/Stop Sign or Marking at Doyles Lane/Clontarf Rd Junction

There are no regulatory Yield or Stop signs or lines provided at the Doyles Lane/Clontarf Rd junction. Failure to provide the regulatory sign and line may result in vehicle drivers failing to yield or stop before entering into the Clontarf Rd carriageway resulting in potential side impact collisions with cyclists/vehicles travelling along Clontarf Rd.

Recommendation:

Provide the regulatory sign and line in accordance with the requirements of the Traffic Signs Manual.

2.2.32 Problem (S32) Bus Stop on Clontarf Rd opposite Doyles Lane

The auditors have concerns regarding the narrow width of island/refuge area provided at the bus stop. Failure to provide a sufficient width of refuge may result in pedestrians encroaching into the adjacent cycle route, leading to conflict.



Recommendation:

Monitor the situation, should the bus stop be utilised by high passenger numbers, either the refuge area should be widened accordingly; or cyclists are brought to the rear of the bus stop at appropriate transition points.

2.2.33 Problem (S33) Narrow Footway at Steps

There is no corduroy hazard warning paving provided at the top of the steps warn visually impaired pedestrians of the presence of the hazards. This could lead to them expectantly proceeding into the steps and subsequently falling down the steps.



Recommendation:

Provide the corduroy hazard warning paving at the top of the steps.

2.2.34 Problem (S34) Pedestrian Desire Line between The Oaks and Pedestrian Route on Eastern Side of Clontarf Rd

There is a pedestrian and cycle crossing desire line between The Oaks and the pedestrian route on eastern side of Clontarf Rd. The absence of a pedestrian crossing at this location could result in pedestrians entering the carriageway when it is unsafe to do so, bringing them into conflict with moving vehicles.

Recommendation:

It is recommended a pedestrian crossing is provided at this location.

2.2.35 Problem (S35) Cycle Desire Line between The Oaks and Cycle Route

There is a cycle crossing desire line between The Oaks and the cycle route on Clontarf Rd. The absence of a suitable transition to enable cyclists to access/egress the cycle route at this could result in loss of control incidents for cyclists as they attempt to navigate the full height kerb bringing them into conflict with moving vehicles.

Recommendation:

It is recommended a suitable cycle transition is provided at this location.

2.2.36 Problem (S36) 50kph & Ramps Sign Faces south of Mount Prospect Ave Junction

The 50kph and Ramps sign faces restrict the forward sight visibility to the traffic signals for northbound vehicle drivers. Failure to provide adequate forward sight visibility to the traffic signals may result in vehicle drivers not being given sufficient time to reduce their speed and stop, leading to potential rear end shunt incidents.

Recommendation:

These sign faces should be relocated to a more appropriate location.

2.2.37 Problem (S37) Pedestrian Crossing at Mount Prospect Ave Junction

There is a planter located immediately at the pedestrian crossing point which restricts the forward sight visibility for northbound vehicle drivers to a pedestrian standing at the pedestrian crossing location.

Failure to provide adequate forward sight visibility to the pedestrian crossing may result in vehicle drivers failing to observe a pedestrian utilising the crossing, and/or vehicle drivers may not be given insufficient time to reduce their speed, both of which increases the potential for conflict between a vehicle and a pedestrian.

Recommendation:

This planter should be relocated to a more appropriate location.

2.2.38 Problem (S38) Speed Limit Sign North of Mount Prospect Ave Junction

The visibility of the speed limit sign is obscured by overhanging trees. This could lead to vehicle drivers being insufficiently advised of the correct speed limit.

Recommendation:

Ensure all sign faces are clearly visible to oncoming vehicle drivers where appropriate.

2.2.39 Problem (S39) Gap in Sea Wall at Mount Prospect Ave Junction

There is a gap in the sea wall opposite the Mount Prospect Avenue junction. This could lead to visually impaired pedestrians crossing the road carriageway and proceeding straight to the gap in the wall, resulting in falls and potential drowning.



This problem was also noted during the Stage 1 RSA undertaken by Roughan & O'Donovan (Item No. 5).

Recommendation:

Ensure the gap in the wall is filled/removed.

2.2.40 Problem (S40) Lighting Levels on Cycle Route opposite St Anne's Park Car Park & north of Watermill Rd junction

The audit team are concerned that they may be insufficient lighting levels along the cycle route to the south of St Annes Park Car Park and to the north

of the Watermill Rd junction. The existing public light over hangs the Clontarf Rd carriageway and is set back several metres from the cycle route. This could lead to personal security issues for cyclists.

Recommendation:

Undertake a public lighting review to determine if the cycle route is adequately lit. If not provide additional lighting along the route.

2.2.41 Problem (S41) St Anne's Park Car Park Access/Egress Junction

The audit team are concerned that there may be insufficient visibility for vehicle drivers when exiting St Anne's Park Car Park junction, when vehicles are parked in the spaces adjacent along Clontarf Rd. this could lead to potential overshoot incidents as vehicles proceed forward into the Clontarf Rd carriageway to obtain visibility to exit the junction.

Recommendation:

The design team should determine if the visibility available (when the parking spaces are full) is sufficient for the 85th percentile speed of vehicles travelling along Clontarf Rd at this location. If sufficient visibility is not achievable, parking restrictions or build outs should be provided at the junction to safeguard visibility.

2.2.42 Problem (S42) Parking Bays along Clontarf Rd in the vicinity of St Anne's Park Car Park

The audit team are concerned that during the hours of darkness, when the parking spaces along Clontarf Rd in the vicinity of St Annes's Park Car Park are vacant, vehicle drivers may misinterpret the parking bays as part of the road carriageway. This could result in vehicle drivers expectantly driving straight into a stationary parked vehicle due to insufficient lighting levels.

At the time of the site audit the public lighting in this location was not operational.

Recommendation:

Ensure the lighting levels at this location are sufficient that vehicle drivers are sufficiently advised of the presence of parked vehicles.

2.2.43 Problem (S43) Incorrect Lane marking at Clontarf Rd/Watermill Rd junction -southern arm

The lane marking indicates ahead only however ahead & left turn manoeuvres are permitted. This could result in driver confusion/hesitation leading to potential shunt incidents.

Recommendation:

Ensure the correct lane marking is provided.

2.2.44 Problem (S44) Cycle Desire Line between Watermill Road and Cycle Route

It is unclear to the audit team how cyclists travelling from Watermill Road can access the cycle route. The absence of a suitable transition to enable cyclists to access/egress the cycle route at this could result in loss of control incidents for cyclists as they attempt to navigate a full height kerb bringing them into conflict with moving vehicles.

Recommendation:

It is recommended a suitable cycle transition is provided at this location.

2.2.45 Problem (S45) No Warning of Ramp/Carriageway Narrowing on Causeway Rd

There are no warning signs provided to warn vehicle drivers of the presence of the ramp and associated carriageway narrowing on Causeway Rd to enable them to adjust their speed accordingly. This could lead vehicle drivers to approach the ramp at an inappropriate speed and could result in loss of control incidents or rear end shunt incidents should they break suddenly.

Recommendation:

Provide the warning signs in accordance with the Traffic Signs Manual.

2.2.46 Problem (S46) No Warning of Cycle Crossing on Causeway Rd

There are no warning signs provided to warn vehicle drivers of the presence of the cycle crossing. As a result, vehicle drivers may be given insufficient warning of the presence of cyclists and may lead to them failing to adjust their speed accordingly.

Recommendation:

Provide the warning signs in accordance with the Traffic Signs Manual.

2.2.47 Problem (S47) Lighting Levels on Causeway Rd

The audit team are concerned that they may be insufficient lighting levels along Causeway Rd particularly in the vicinity of the cycle crossing. In the absence of appropriate street lighting, road safety issues such as trip hazards could arise for all road users whilst security concerns could prove a significant concern for pedestrians and cyclists.

Recommendation:

Undertake a public lighting review to determine if the route is adequately lit. If not provide additional lighting along the route.

2.2.48 Problem (S48) Landscaping at Cycle Crossing on Causeway Rd

The landscaping on approach to the cycle crossing is overgrown and restricts forward sight visibility to the cycle crossing for approaching vehicle drivers. This could result in vehicle drivers failing to observe a cyclist at the crossing points, leading to potential conflict.

Recommendation:

It is recommended that a maintenance regime is implemented to visibility to the crossing is provided for approaching vehicle drivers.

3.0 COMMENTS

3.1.1 Comment (C1)

Prior to undertaking the audit, the audit team were informed that residents had raised concerns in relation to vehicles parked within the cycle track. The audit team did not witness any inappropriate parking during the site audit. Nonetheless it is recommended the situation is monitored and if the problem persists/arises an adequate parking enforcement regime should be implemented or the provision of physical barriers to restrict vehicle access should be provided.

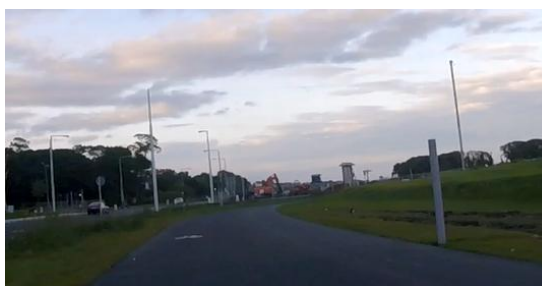
3.1.2 Comment (C2)

The auditors noted the provision of short poles along the edges of the footway. It is unclear to the auditors what the purpose of these poles is. Should they be unnecessary they should be removed to prevent clutter/over proliferation of sign poles.



3.1.3 Comment (C3)


There is a sign pole located directly adjacent to the Cycle Track (south of Causeway Rd junction). There should be a gap of at least 500mm between the edge of the cycle track and any street furniture. Further to C2 above, if the sign is unnecessary remove it or relocate to a more suitable location.



4.0 AUDIT TEAM STATEMENT

4.1 I certify that I have examined the drawings and other information listed in Chapter 5. This Audit has been carried out with the sole purpose of identifying any features of the Design that could be removed or modified to improve the safety of the Scheme. The problems that I have identified have been noted in the report, together with suggestions for improvement which we recommend should be studied for implementation.

Audit Team Leader: Ms Jacqueline Haley
BEng PGDip. MSc CEng MIEI Cert Comp RSA
DBFL Consulting Engineers (Waterford)

| | |
|---------|--|
| Signed: |  |
| Date: | 29/08/2017 |

Audit Team Member: Mr Robert Kelly
BAI, MA, PGDip. Const Law, Ceng MIEI
DBFL Consulting Engineers (Dublin)

| | |
|---------|---|
| Signed: |  |
| Date: | 29/08/2017 |

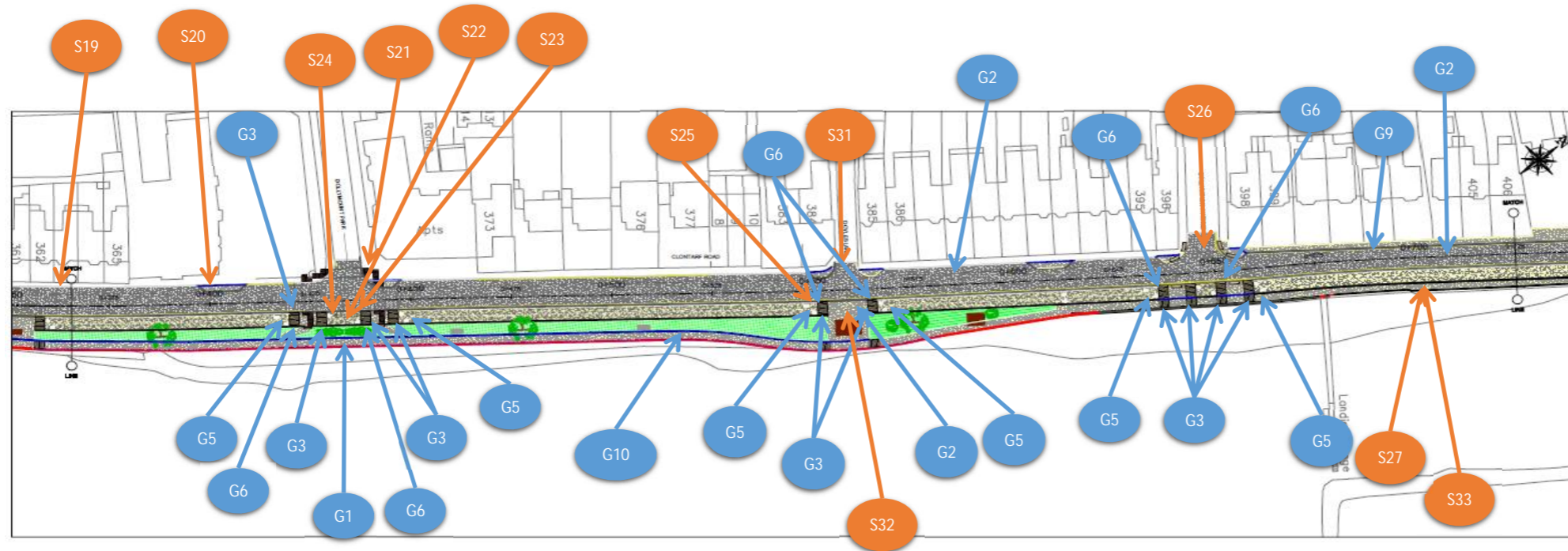
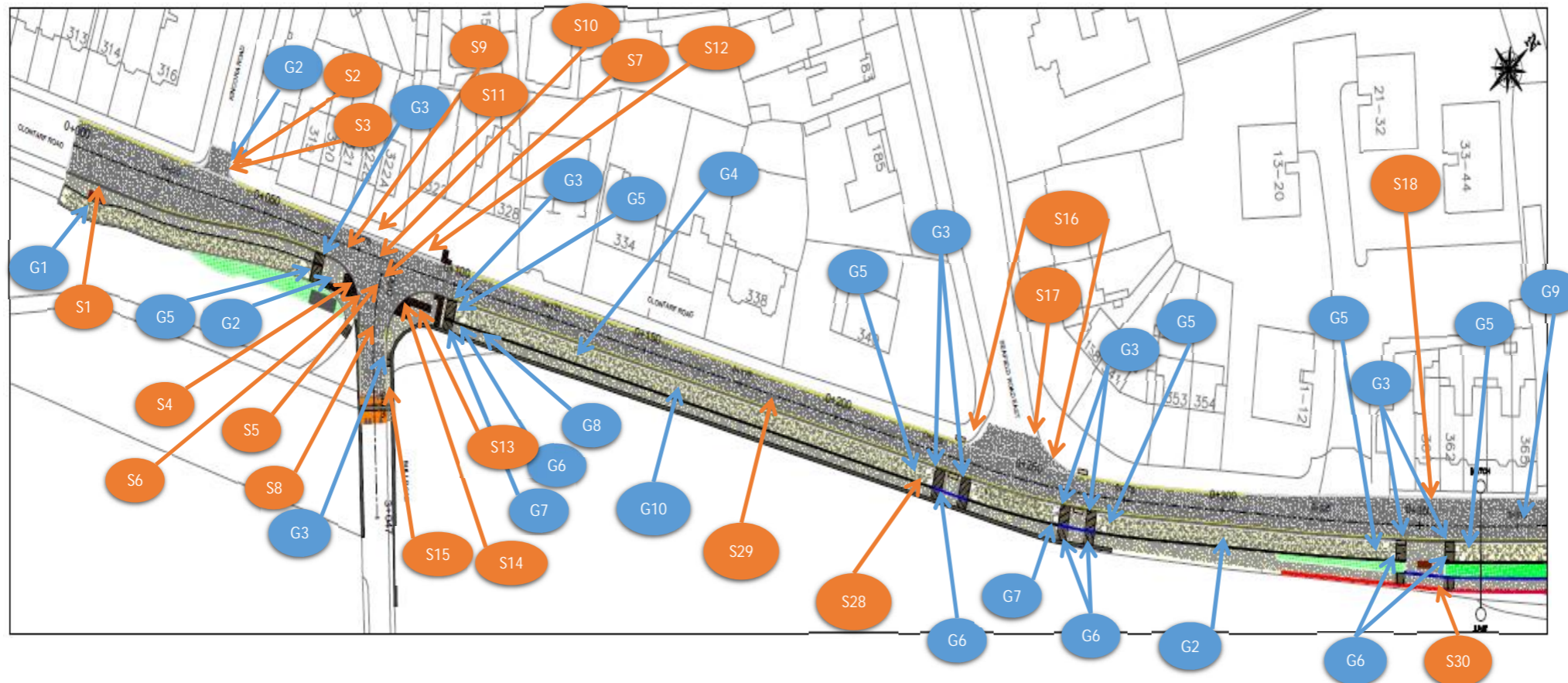
5.0 LIST OF INFORMATION RECEIVED

| Items Received | | Yes /No | Details |
|----------------|---------------------------|---------|--|
| 1 | Scheme Description | Yes | <ul style="list-style-type: none"> As part of Audit Brief |
| 2 | Project Brief | Yes | <ul style="list-style-type: none"> Informal Brief as part of Tender Process |
| 3 | Scheme / Project Drawings | Yes | <ul style="list-style-type: none"> Roughan & O'Donovan drawing no. 001 - LS – 001 entitled <i>Scheme Location Plan sheet 1 of 1;</i> Roughan & O'Donovan drawing no. 002 - SL – 001 entitled <i>Sheet Layout sheet 1 of 1;</i> Roughan & O'Donovan drawing no. 003 - APE – 001 entitled <i>Area Provided by Employer sheet 1 of 5;</i> Roughan & O'Donovan drawing no. 003 - APE – 002 entitled <i>Area Provided by Employer sheet 2 of 5;</i> Roughan & O'Donovan drawing no. 003 - APE – 003 entitled <i>Area Provided by Employer sheet 3 of 5;</i> Roughan & O'Donovan drawing no. 003 - APE – 004 entitled <i>Area Provided by Employer sheet 4 of 5;</i> Roughan & O'Donovan drawing no. 003 - APE – 005 entitled <i>Area Provided by Employer sheet 5 of 5;</i> Roughan & O'Donovan drawing no. 004 - GA – 001 entitled <i>General Arrangement sheet 1 of 5;</i> Roughan & O'Donovan drawing no. 004 - GA – 002 entitled <i>General Arrangement sheet 2 of 5;</i> Roughan & O'Donovan drawing no. 004 - GA – 003 entitled <i>General Arrangement sheet 3 of 5;</i> Roughan & O'Donovan drawing no. 004 - GA – 004 entitled <i>General Arrangement sheet 4 of 5;</i> Roughan & O'Donovan drawing no. 004 - GA – 005 entitled <i>General Arrangement sheet 5 of 5;</i> Roughan & O'Donovan drawing no. 005 - MLA – 001 entitled <i>Mainline Alignment Plan & Profile SHEET 1 OF 12;</i> Roughan & O'Donovan drawing no. 005 - MLA – 002 entitled <i>Mainline Alignment Plan & Profile SHEET 2 OF 12;</i> Roughan & O'Donovan drawing no. 005 - MLA – 003 entitled <i>Mainline Alignment Plan & Profile SHEET 3 OF 12;</i> Roughan & O'Donovan drawing no. 005 - MLA – 004 entitled <i>Mainline Alignment Plan & Profile SHEET 4 OF 12;</i> Roughan & O'Donovan drawing no. 005 - MLA – 005 entitled <i>Mainline Alignment Plan & Profile SHEET 5 OF 12;</i> Roughan & O'Donovan drawing no. 005 - MLA – 006 entitled <i>Mainline Alignment Plan & Profile SHEET 6 OF 12;</i> Roughan & O'Donovan drawing no. 005 - MLA – 007 entitled <i>Mainline Alignment Plan & Profile SHEET 7 OF 12;</i> Roughan & O'Donovan drawing no. 005 - MLA – 008 entitled <i>Mainline Alignment Plan & Profile SHEET 8 OF 12;</i> Roughan & O'Donovan drawing no. 005 - MLA – 009 entitled <i>Mainline Alignment Plan & Profile SHEET 9 OF 12;</i> Roughan & O'Donovan drawing no. 005 - MLA – 010 entitled <i>Mainline Alignment Plan & Profile SHEET 10 OF 12;</i> Roughan & O'Donovan drawing no. 005 - MLA – 011 entitled <i>Mainline Alignment Plan & Profile SHEET 11 OF 12;</i> Roughan & O'Donovan drawing no. 005 - MLA – 012 entitled <i>Mainline Alignment Plan & Profile SHEET 12 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 001 entitled <i>Cross Sections SHEET 1 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 002 entitled <i>Cross Sections SHEET 2 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 003 entitled <i>Cross Sections SHEET 3 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 004 entitled <i>Cross Sections SHEET 4 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 005 entitled <i>Cross Sections SHEET 5 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 006 entitled <i>Cross Sections SHEET 6 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 007 entitled <i>Cross Sections SHEET 7 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 008 entitled <i>Cross Sections SHEET 8 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 009 entitled <i>Cross Sections SHEET 9 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 010 entitled <i>Cross Sections SHEET 10 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 011 entitled <i>Cross Sections SHEET 11 OF 12;</i> Roughan & O'Donovan drawing no. 007 - XS – 012 entitled <i>Cross Sections SHEET 12 OF 12;</i> Roughan & O'Donovan drawing no. 101 – SOP – 001 entitled <i>Setting Out Points SHEET 1 OF 10;</i> Roughan & O'Donovan drawing no. 101 – SOP – 002 entitled <i>Setting Out Points SHEET 2 OF 10;</i> Roughan & O'Donovan drawing no. 101 – SOP – 003 entitled <i>Setting Out Points SHEET 3 OF 10;</i> Roughan & O'Donovan drawing no. 101 – SOP – 004 entitled <i>Setting Out Points SHEET 4 OF 10;</i> Roughan & O'Donovan drawing no. 101 – SOP – 005 entitled <i>Setting Out Points SHEET 5 OF 10;</i> Roughan & O'Donovan drawing no. 101 – SOP – 006 entitled <i>Setting Out Points SHEET 6 OF 10;</i> Roughan & O'Donovan drawing no. 101 – SOP – 007 entitled <i>Setting Out Points SHEET 7 OF 10;</i> Roughan & O'Donovan drawing no. 101 – SOP – 008 entitled <i>Setting Out Points SHEET 8 OF 10;</i> Roughan & O'Donovan drawing no. 101 – SOP – 009 entitled <i>Setting Out Points SHEET 9 OF 10;</i> Roughan & O'Donovan drawing no. 101 – SOP – 010 entitled <i>Setting Out Points SHEET 10 OF 10;</i> Roughan & O'Donovan drawing no. 201 – SC – 001 entitled <i>Site Clearance sheet 1 of 4;</i> Roughan & O'Donovan drawing no. 201 – SC – 002 entitled <i>Site Clearance sheet 2 of 4;</i> Roughan & O'Donovan drawing no. 201 – SC – 003 entitled <i>Site Clearance sheet 3 of 4;</i> Roughan & O'Donovan drawing no. 201 – SC – 004 entitled <i>Site Clearance sheet 4 of 4;</i> Roughan & O'Donovan drawing no. 501 – SWD – 001 entitled <i>Proposed Surface Water Drainage sheet 1 of 7;</i> Roughan & O'Donovan drawing no. 501 – SWD – 002 entitled <i>Proposed Surface Water Drainage sheet 2 of 7;</i> |


- Roughan & O'Donovan drawing no. 501 – SWD – 003 entitled *Proposed Surface Water Drainage sheet 3 of 7*;
- Roughan & O'Donovan drawing no. 501 – SWD – 004 entitled *Proposed Surface Water Drainage sheet 4 of 7*;
- Roughan & O'Donovan drawing no. 501 – SWD – 005 entitled *Proposed Surface Water Drainage sheet 5 of 7*;
- Roughan & O'Donovan drawing no. 501 – SWD – 006 entitled *Proposed Surface Water Drainage sheet 6 of 7*;
- Roughan & O'Donovan drawing no. 501 – SWD – 007 entitled *Proposed Surface Water Drainage sheet 7 of 7*;
- Roughan & O'Donovan drawing no. 502 – EIR – 001 entitled *Proposed EIRCOM Diversions sheet 1 of 4*;
- Roughan & O'Donovan drawing no. 502 – EIR – 002 entitled *Proposed EIRCOM Diversions sheet 2 of 4*;
- Roughan & O'Donovan drawing no. 502 – EIR – 003 entitled *Proposed EIRCOM Diversions sheet 3 of 4*;
- Roughan & O'Donovan drawing no. 502 – EIR – 004 entitled *Proposed EIRCOM Diversions sheet 4 of 4*;
- Roughan & O'Donovan drawing no. 502 – ESB – 001 entitled *Proposed ESB Diversions sheet 1 of 4*;
- Roughan & O'Donovan drawing no. 502 – ESB – 002 entitled *Proposed ESB Diversions sheet 2 of 4*;
- Roughan & O'Donovan drawing no. 502 – ESB – 003 entitled *Proposed ESB Diversions sheet 3 of 4*;
- Roughan & O'Donovan drawing no. 502 – ESB – 004 entitled *Proposed ESB Diversions sheet 4 of 4*;
- Roughan & O'Donovan drawing no. 503 – DCT – 001 entitled *Proposed DCC Ducting Diversions sheet 1 of 5*;
- Roughan & O'Donovan drawing no. 503 – DCT – 002 entitled *Proposed DCC Ducting Diversions sheet 2 of 5*;
- Roughan & O'Donovan drawing no. 503 – DCT – 003 entitled *Proposed DCC Ducting Diversions sheet 3 of 5*;
- Roughan & O'Donovan drawing no. 503 – DCT – 004 entitled *Proposed DCC Ducting Diversions sheet 4 of 5*;
- Roughan & O'Donovan drawing no. 503 – DCT – 005 entitled *Proposed DCC Ducting Diversions sheet 5 of 5*;
- Roughan & O'Donovan drawing no. 504 – DCT – 001 entitled *Proposed DCC Ducting Chambers sheet 1 of 5*;
- Roughan & O'Donovan drawing no. 504 – DCT – 002 entitled *Proposed DCC Ducting Chambers sheet 2 of 5*;
- Roughan & O'Donovan drawing no. 504 – DCT – 003 entitled *Proposed DCC Ducting Chambers sheet 3 of 5*;
- Roughan & O'Donovan drawing no. 504 – DCT – 004 entitled *Proposed DCC Ducting Chambers sheet 4 of 5*;
- Roughan & O'Donovan drawing no. 504 – DCT – 005 entitled *Proposed DCC Ducting Chambers sheet 5 of 5*;
- Roughan & O'Donovan drawing no. 601 – EW – 001 entitled *Proposed Earthworks sheet 1 of 4*;
- Roughan & O'Donovan drawing no. 601 – EW – 002 entitled *Proposed Earthworks sheet 2 of 4*;
- Roughan & O'Donovan drawing no. 601 – EW – 003 entitled *Proposed Earthworks sheet 3 of 4*;
- Roughan & O'Donovan drawing no. 601 – EW – 004 entitled *Proposed Earthworks sheet 4 of 4*;
- Roughan & O'Donovan drawing no. 701 – PAV – 001 entitled *Pavement Design sheet 1 of 8*;
- Roughan & O'Donovan drawing no. 701 – PAV – 002 entitled *Pavement Design sheet 2 of 8*;
- Roughan & O'Donovan drawing no. 701 – PAV – 003 entitled *Pavement Design sheet 3 of 8*;
- Roughan & O'Donovan drawing no. 701 – PAV – 004 entitled *Pavement Design sheet 4 of 8*;
- Roughan & O'Donovan drawing no. 701 – PAV – 005 entitled *Pavement Design sheet 5 of 8*;
- Roughan & O'Donovan drawing no. 701 – PAV – 006 entitled *Pavement Design sheet 6 of 8*;
- Roughan & O'Donovan drawing no. 701 – PAV – 007 entitled *Pavement Design sheet 7 of 8*;
- Roughan & O'Donovan drawing no. 701 – PAV – 008 entitled *Pavement Design sheet 8 of 8*;
- Roughan & O'Donovan drawing no. 1101 – KFP – 001 entitled *Kerbs, Footpaths & Paved Areas sheet 1 of 7*;
- Roughan & O'Donovan drawing no. 1101 – KFP – 002 entitled *Kerbs, Footpaths & Paved Areas sheet 2 of 7*;
- Roughan & O'Donovan drawing no. 1101 – KFP – 003 entitled *Kerbs, Footpaths & Paved Areas sheet 3 of 7*;
- Roughan & O'Donovan drawing no. 1101 – KFP – 004 entitled *Kerbs, Footpaths & Paved Areas sheet 4 of 7*;
- Roughan & O'Donovan drawing no. 1101 – KFP – 005 entitled *Kerbs, Footpaths & Paved Areas sheet 5 of 7*;
- Roughan & O'Donovan drawing no. 1101 – KFP – 006 entitled *Kerbs, Footpaths & Paved Areas sheet 6 of 7*;
- Roughan & O'Donovan drawing no. 1101 – KFP – 007 entitled *Kerbs, Footpaths & Paved Areas sheet 7 of 7*;
- Roughan & O'Donovan drawing no. 1201 – TRSM – 001 entitled *Traffic Signs & Road Markings Sheet 1 of 4*;
- Roughan & O'Donovan drawing no. 1201 – TRSM – 002 entitled *Traffic Signs & Road Markings Sheet 2 of 4*;
- Roughan & O'Donovan drawing no. 1201 – TRSM – 003 entitled *Traffic Signs & Road Markings Sheet 3 of 4*;
- Roughan & O'Donovan drawing no. 1201 – TRSM – 004 entitled *Traffic Signs & Road Markings Sheet 4 of 4*;
- Roughan & O'Donovan drawing no. 1301 – PL – 001 entitled *Public Lighting Sheet 1 of 4*;
- Roughan & O'Donovan drawing no. 1301 – PL – 002 entitled *Public Lighting Sheet 2 of 4*;
- Roughan & O'Donovan drawing no. 1301 – PL – 003 entitled *Public Lighting Sheet 3 of 4*;
- Roughan & O'Donovan drawing no. 1301 – PL – 004 entitled *Public Lighting Sheet 4 of 4*;
- Roughan & O'Donovan drawing no. 2701 – WM – 001 entitled *Proposed WaterMain Sheet 1 of 8*;
- Roughan & O'Donovan drawing no. 2701 – WM – 002 entitled *Proposed WaterMain Sheet 2 of 8*;
- Roughan & O'Donovan drawing no. 2701 – WM – 003 entitled *Proposed WaterMain Sheet 3 of 8*;
- Roughan & O'Donovan drawing no. 2701 – WM – 004 entitled *Proposed WaterMain Sheet 4 of 8*;
- Roughan & O'Donovan drawing no. 2701 – WM – 005 entitled *Proposed WaterMain Sheet 5 of 8*;
- Roughan & O'Donovan drawing no. 2701 – WM – 006 entitled *Proposed WaterMain Sheet 6 of 8*;
- Roughan & O'Donovan drawing no. 2701 – WM – 007 entitled *Proposed WaterMain Sheet 7 of 8*;
- Roughan & O'Donovan drawing no. 2701 – WM – 008 entitled *Proposed WaterMain Sheet 8 of 8*;
- Roughan & O'Donovan drawing no. 2701 – WM – 001 entitled *Proposed Landscaping & Street Furniture Sheet 1 of 4*;
- Roughan & O'Donovan drawing no. 2701 – WM – 002 entitled *Proposed Landscaping & Street Furniture Sheet 2 of 4*;

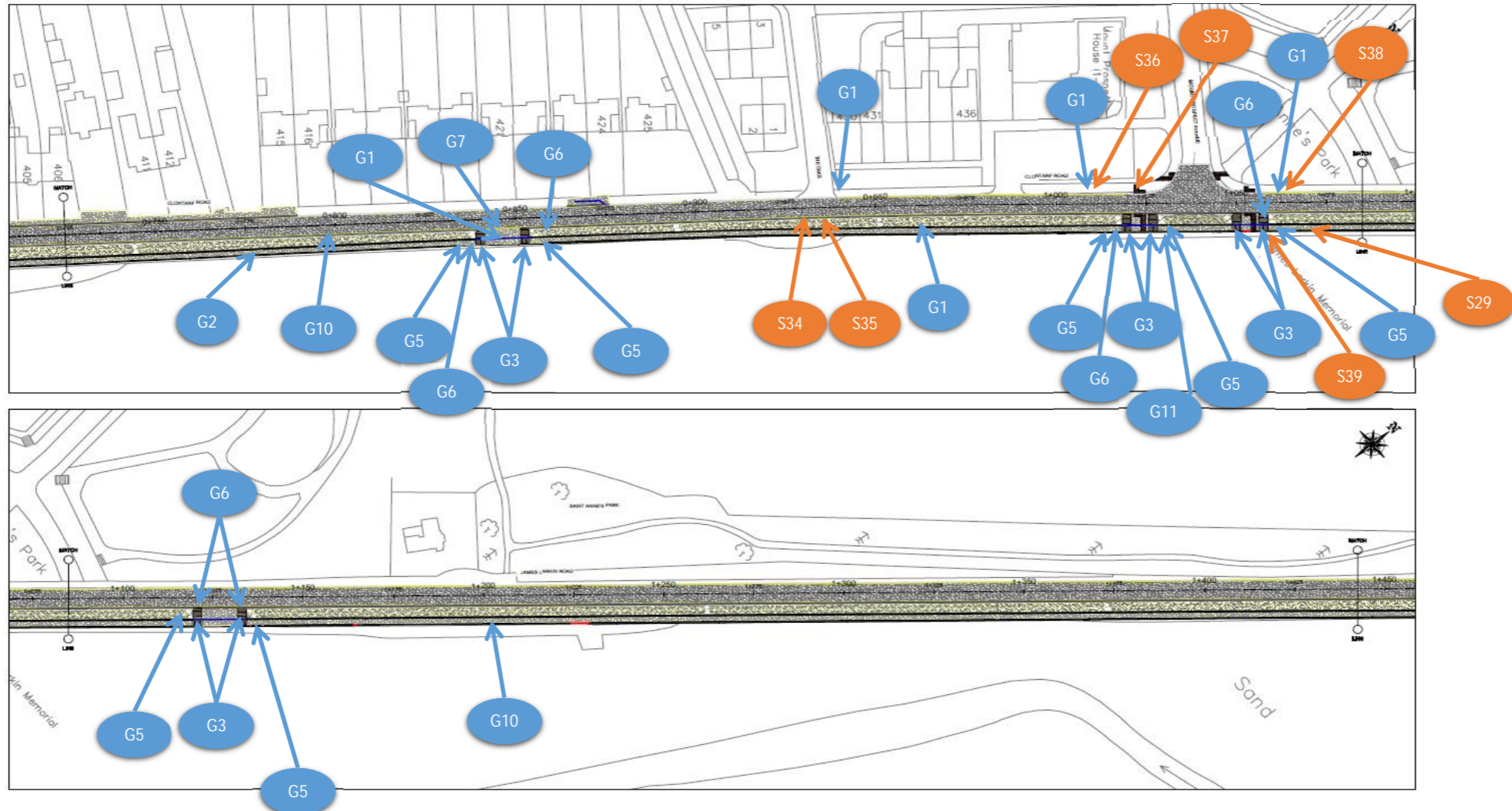
| | | | |
|----|------------------------------------|-----|--|
| | | | <ul style="list-style-type: none"> Roughan & O'Donovan drawing no. 2701 – WM – 003 entitled Proposed Landscaping & Street Furniture <i>Sheet 3 of 4;</i> Roughan & O'Donovan drawing no. 2701 – WM – 004 entitled Proposed Landscaping & Street Furniture <i>Sheet 4 of 4;</i> |
| 4 | Departures from Standard | No | |
| 5 | Traffic Signal Information | No | |
| 6 | Road Signs & Road Marking Details | Yes | |
| 7 | Traffic Count Information | No | |
| 8 | Speed Survey Data | No | |
| 9 | Collision Data | No | Obtained from www.RSA.ie |
| 10 | Previous Road Safety Audit Reports | Yes | <ul style="list-style-type: none"> Roughan & O'Donovan Report Entitled <i>Sutton to Sandycove Cycleway –Dollymount Improvement Scheme – Stage 1 Road Safety Audit Report</i> Roughan & O'Donovan Report Entitled <i>Sutton to Sandycove Cycleway –Dollymount Improvement Scheme – Stage 2 Road Safety Audit Report</i> PMCE Report Entitled <i>Stage 2 Road Safety Audit of the Sutton to Sandycove Cycleway – Dollymount Improvement Works</i> |
| 11 | Relevant Design Standards | No | |
| 12 | Public Transport Information | No | |
| 13 | Other Information | No | |

APPENDIX A
Problem Location Figures




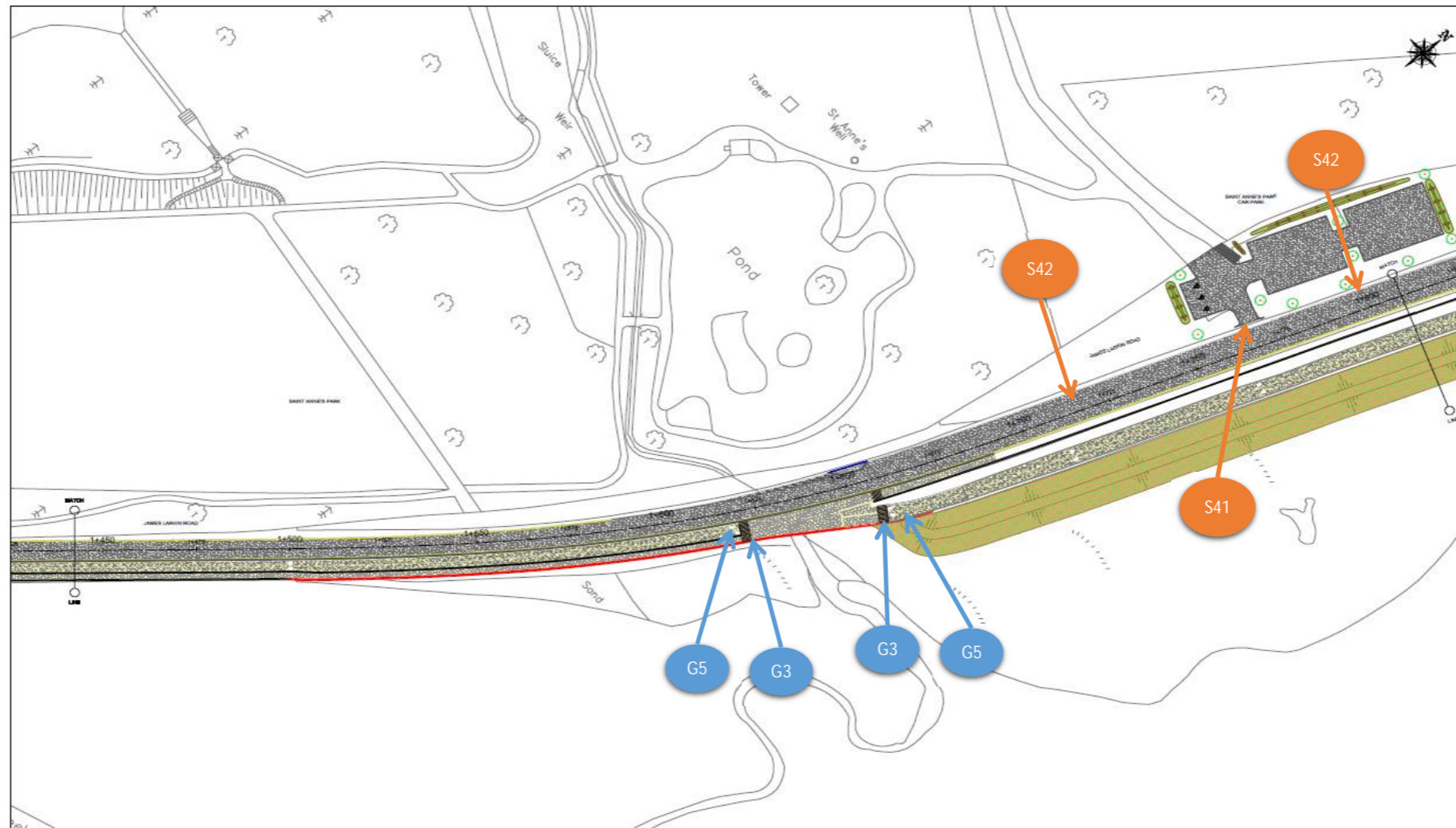
Extract DCC Drawing No. 004-GA-001

| | | | | | |
|-----------------|--|--------------|------------------|--|-----|
| Project : | S2S Cycle & Footway Interim Works - Bull Road to Causeway Road | Designed : | JH | Prepared : | PMG |
| Client : | Dublin City Council | Date : | August 2017 | Checked : | JH |
| Drawing Title : | Stage 3 Road Safety Audit Indicative Problem Locations | Scale : | NTS |  DBFL Consulting Engineers | |
| | | File Ref : | 170145 RSA-Fig 1 | | |
| | | Drawing No : | 170145 Figure 1 | | |




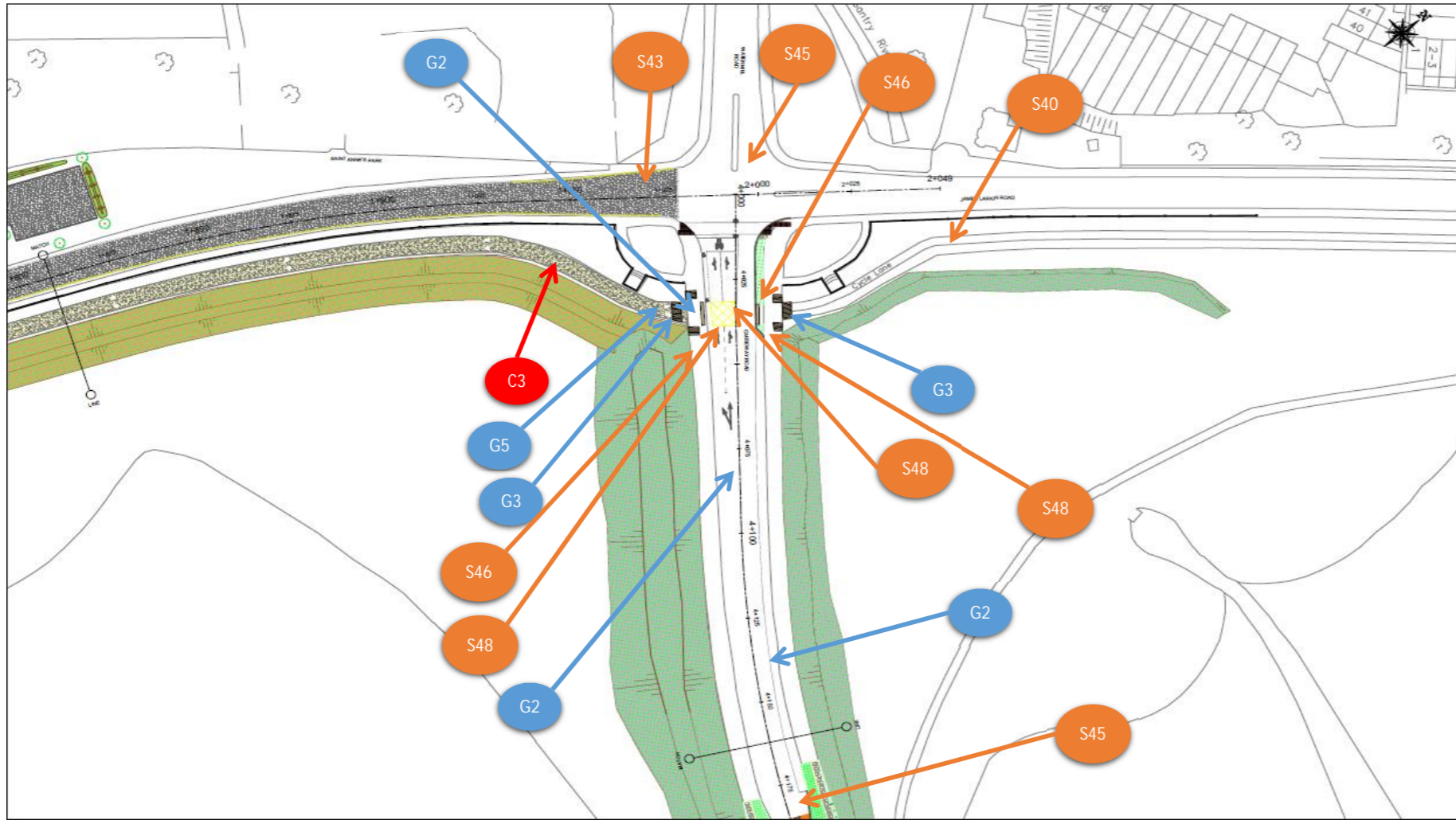
Extract DCC Drawing No. 004-GA-002

| | | | | | |
|-----------------|--|--------------|------------------|--|-----|
| Project : | S2S Cycle & Footway Interim Works - Bull Road to Causeway Road | Designed : | JH | Prepared : | PMG |
| Client : | Dublin City Council | Date : | August 2017 | Checked : | JH |
| Drawing Title : | Stage 3 Road Safety Audit Indicative Problem Locations | Scale : | NTS |  DBFL Consulting Engineers | |
| | | File Ref : | 170145 RSA-Fig 2 | | |
| | | Drawing No : | 170145 Figure 2 | | |




Extract DCC Drawing No. 004-GA-003

| | | | | | |
|-----------------|--|--------------|------------------|--|-----|
| Project : | S2S Cycle & Footway Interim Works - Bull Road to Causeway Road | Designed : | JH | Prepared : | PMG |
| Client : | Dublin City Council | Date : | August 2017 | Checked : | JH |
| Drawing Title : | Stage 3 Road Safety Audit Indicative Problem Locations | Scale : | NTS |  DBFL Consulting Engineers | |
| | | File Ref : | 170145 RSA-Fig 3 | | |
| | | Drawing No : | 170145 Figure 3 | | |



Extract DCC Drawing No. 004-GA-001

| | | | | | |
|-----------------|--|--------------|------------------|--|-----|
| Project : | S2S Cycle & Footway Interim Works - Bull Road to Causeway Road | Designed : | JH | Prepared : | PMG |
| Client : | Dublin City Council | Date : | August 2017 | Checked : | JH |
| Drawing Title : | Stage 3 Road Safety Audit Indicative Problem Locations | Scale : | NTS |  DBFL Consulting Engineers | |
| | | File Ref : | 170145 RSA-Fig 4 | | |
| | | Drawing No : | 170145 Figure 4 | | |

APPENDIX B
Feedback Form



ROAD SAFETY AUDIT FEEDBACK FORM

Scheme: S2S Cycle & Footway Interim Works, Bull Road to Causeway Road

Audit Stage: 3

Date Audit Completed: August 2017

| Problem Ref No. in RSA Report | Problem accepted (yes/no) | Recommended measure accepted (yes/no) | Alternative measures (describe) | Alternative Measures accepted by Auditors (yes/no) |
|----------------------------------|---------------------------------|---|---------------------------------|--|
| G1 | | | | |
| G2 | | | | |
| G3 | | | | |
| G4 | | | | |
| G5 | | | | |
| G6 | | | | |
| G7 | | | | |
| G8 | | | | |
| G9 | | | | |
| G10 | | | | |
| G11 | | | | |
| G12 | | | | |
| S1 | | | | |
| S2 | | | | |
| S3 | | | | |
| S4 | | | | |
| S5 | | | | |
| S6 | | | | |



| | | | | |
|-----|--|--|--|--|
| S7 | | | | |
| S8 | | | | |
| S9 | | | | |
| S10 | | | | |
| S11 | | | | |
| S12 | | | | |
| S13 | | | | |
| S14 | | | | |
| S15 | | | | |
| S16 | | | | |
| S17 | | | | |
| S18 | | | | |
| S19 | | | | |
| S20 | | | | |
| S21 | | | | |
| S22 | | | | |
| S23 | | | | |
| S24 | | | | |
| S25 | | | | |
| S26 | | | | |
| S27 | | | | |
| S28 | | | | |
| S29 | | | | |
| S30 | | | | |
| S31 | | | | |
| S32 | | | | |
| S33 | | | | |
| S34 | | | | |



| | | | | |
|-----|--|--|--|--|
| S35 | | | | |
| S36 | | | | |
| S37 | | | | |
| S38 | | | | |
| S39 | | | | |
| S40 | | | | |
| S41 | | | | |
| S42 | | | | |
| S43 | | | | |
| S44 | | | | |
| S45 | | | | |
| S46 | | | | |
| S47 | | | | |
| S48 | | | | |

Design Team

Signed off:

Design Team Leader:

Date:

Safety Audit Team

Signed off:

Audit Team Leader

Date:

Please complete and return to safety auditor.
