

Title: **QUALITY AUDIT
INCLUDING ROAD SAFETY AUDIT STAGE 1
Proposed Residential Development at Glenamuck Road**

Client: **DBFL Consulting Engineers**

Date: **November 2020**

Report reference: **0878R01**

VERSION: **FINAL**

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1.0 Introduction

This report was prepared in response to a request from Mr. Nick Fenner, DBFL Consulting Engineers for a Quality Audit of the proposed residential development at Glenamuck Road/Golf Lane Co. Dublin.

The Quality Audit has been carried out in accordance with the guidance in the Design Manual for Urban Roads and Streets (DMURS), produced by Department of Transport Tourism and Sport in March 2013 and as updated in June 2019.

This Quality Audit includes a road safety audit, an access audit, a walking audit and a cycle audit.

The Road Safety and Quality Audit Team comprised of;

Team Leader: **Norman Bruton**, BE CEng FIEI, Cert Comp RSA.

Team Member: **Mark Kelly**, BA BAI MSc CEng MIEI

The Quality Audit involved the examination of drawings and other material provided by DBFL and a site visit by the Audit Team, together, on the 7th October 2020.

The weather at the time of the site visit was dry and the road surface was dry.

The problems raised in this Quality Audit may belong to more than one of the categories of Audit named above. A table has been provided at the start of Section 3 of this report detailing which category of audit each problem is associated with.

Recommendations have been provided to help improve the quality of the design with regard to the areas described above. A feedback form has also been provided for the designer to complete indicating whether or not he/she will accept those recommendations or provide alternative recommendations for implementation.

The information supplied to the Audit Team is listed in **Appendix A**.

A feedback form for the Designer to complete is contained in **Appendix B**.

A plan drawing showing the problem locations is contained in **Appendix C**.

2.0 Background

It is proposed to construct a residential development between Golf Lane and Glenamuck Road/M50. The vehicular access to the site will be on Golf Lane (Old Glenamuck Road). This will be a simple priority junction leading to access to the basement car park and a small surface car park/set down area.

There will be pedestrian and cyclist access along Golf lane for surface level and separate cyclists access to the basement.

A cycle track and footpath will be provided along the southern side of the development linking Golf Lane to Glenamuck Road. A separate shared use facility (4m wide) will be provided along the northern boundary which will link with the basement cycle parking. This track will also be linked to Glenamuck Road somewhat closer to the M50 Junction.

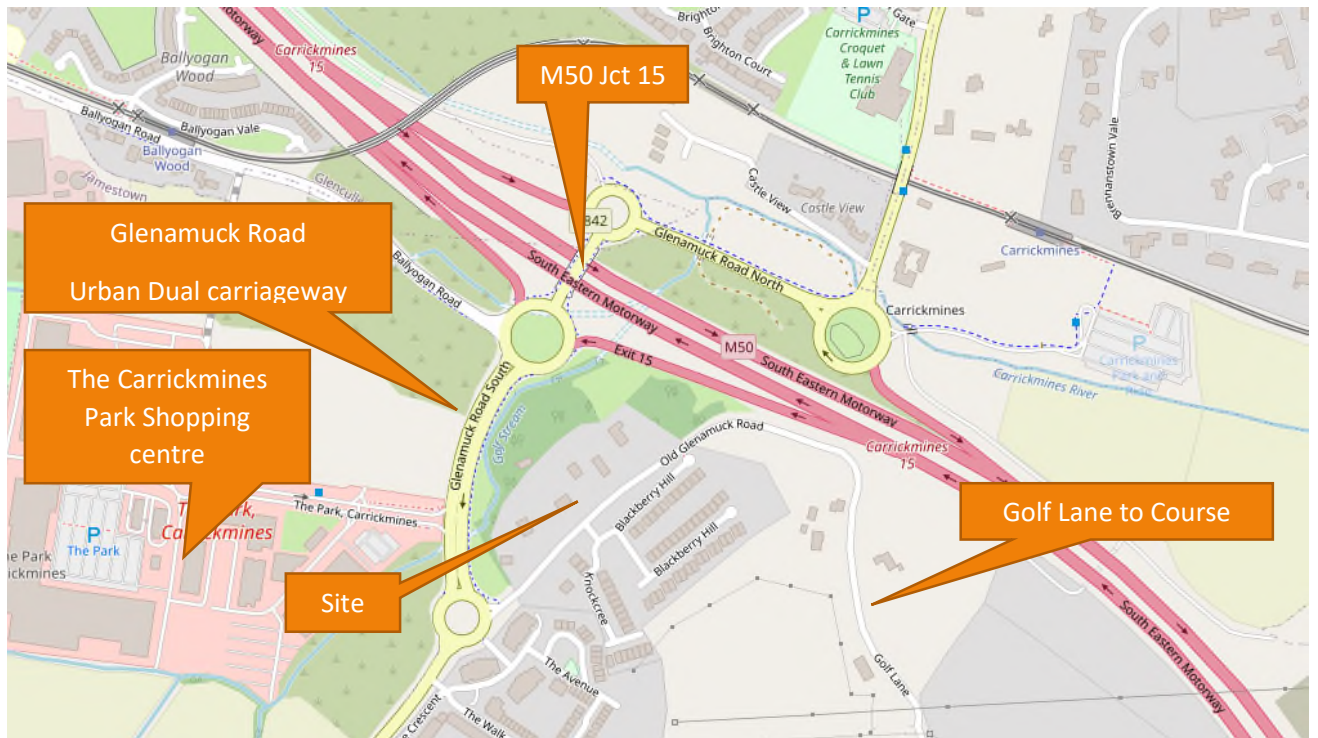
Both of the vulnerable road user facilities will cross the Golf Stream.

Upgrade works will take place on Glenamuck Road including a new toucan crossing just north of the access to The Carrickmines Park Shopping centre.

There will be surface level bicycle parking throughout the development.

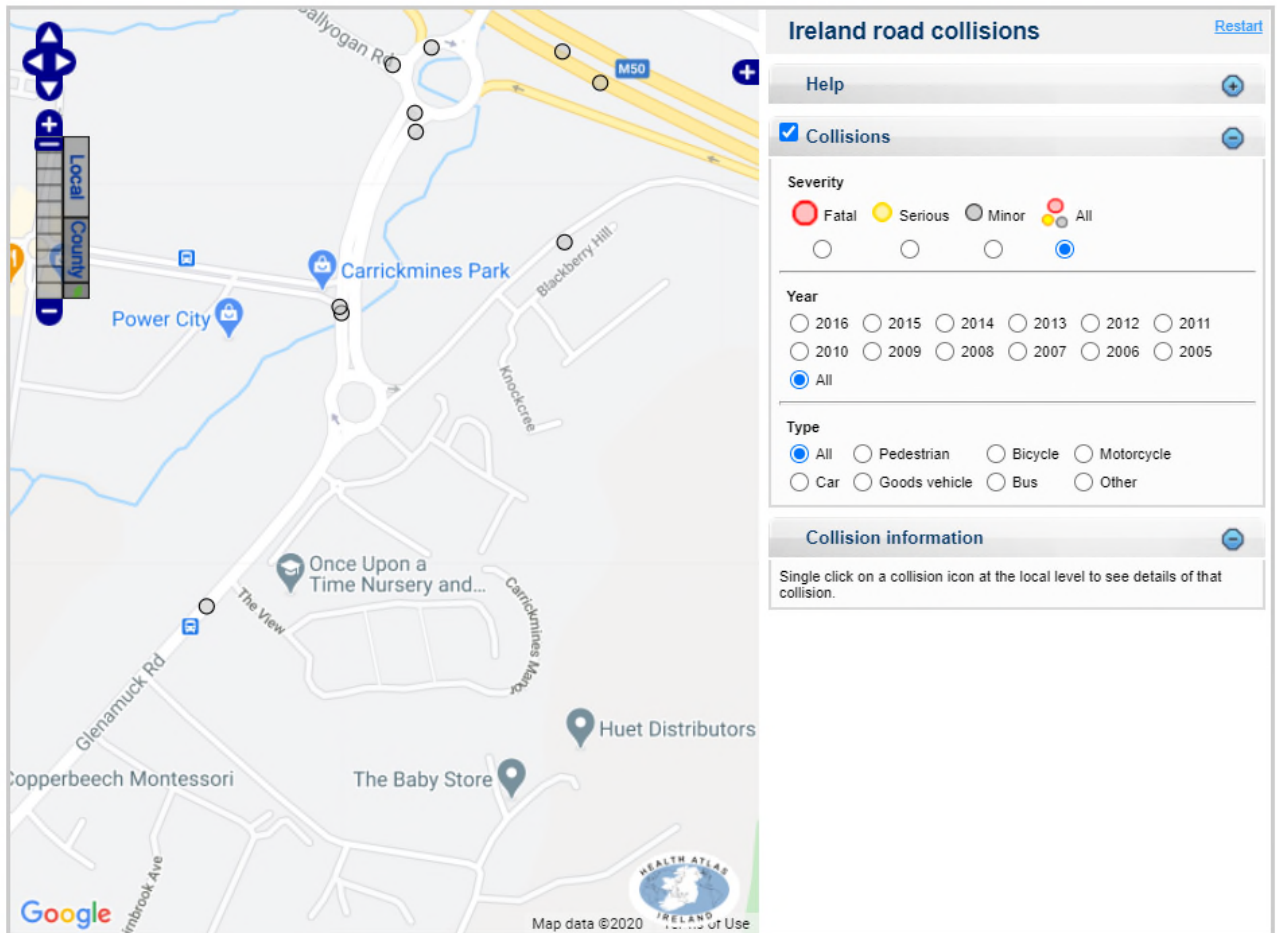
Glenamuck Road is an urban dual carriageway and Golf Lane is a single carriageway leading to the Carrickmines Golf course. The future upgrade of Golf Lane to the Kiltarnan Link Road has been taken into account by providing an offset footpath along the development boundary.

The location of the site is shown below.



Site Location Map (courtesy of openstreetmap.org)

A review of the Road Safety Authority’s website shows that between the years 2005 and 2016 there was one recorded minor injury collision on Golf Lane and two minor injury collisions at the entrance to The Carrickmines Park Shopping Centre. Both of those collisions had a primary collision type of ‘rear end-straight’.



3.0 Main Report

Summary Table of Problem Categories

Problem Reference	Access Audit	Walking Audit	Cycling Audit	Road Safety Audit	Quality Audit
3.1		✓	✓	✓	✓
3.2		✓	✓	✓	✓
3.3		✓	✓	✓	✓
3.4		✓	✓	✓	✓
3.5		✓	✓	✓	✓
3.6		✓	✓	✓	✓
3.7			✓	✓	✓
3.8	✓				✓
3.9				✓	✓
3.10	✓				✓
3.11	✓			✓	✓
3.12	✓				✓
3.13	✓		✓		✓
3.14		✓	✓	✓	✓

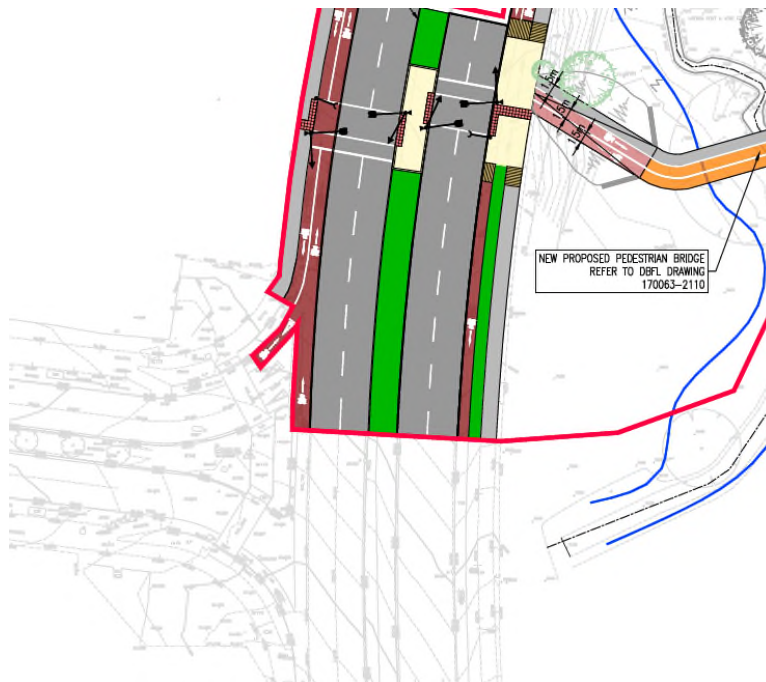
3.1 Problem

LOCATION

Drawing 170063-2100 Rev P02, Toucan Crossing Glenamuck Road.

PROBLEM

The audit team have concerns regarding the location of the toucan crossing on the western side of Glenamuck Road. As there is a good level of visibility to the right for vehicle drivers travelling along the Carrickmines Park Shopping centre's egress lanes (in advance of the immediate approach to the junction), vehicle drivers can clearly see (in advance of the junction) if there are oncoming vehicles on Glenamuck Road. If there are no vehicles approaching in both (or the nearside) lanes on Glenamuck Road, vehicle drivers were observed to exit The Carrickmines Park Shopping centre without stopping/yielding at the junction. Due to these rapid exit practices being undertaken, vehicle drivers may fail to acknowledge the toucan crossing signals located immediately to the left of the junction in sufficient time to stop. This could result in conflict with pedestrians/cyclists crossing the carriageway.



RECOMMENDATION

It is recommended that the toucan crossing be moved further away from the junction or that the junction of The Carrickmines Park Shopping Centre is altered to ensure that vehicles exiting onto Glenamuck road are travelling at a very low speed.

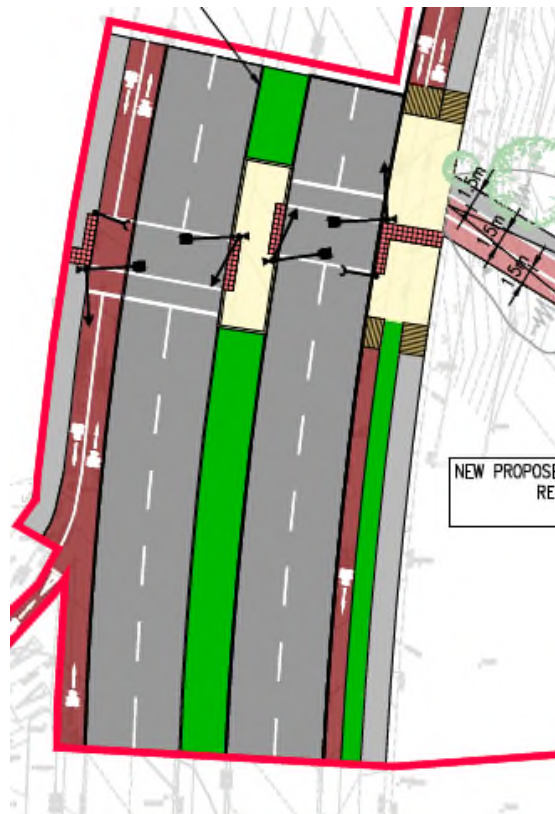
3.2 Problem

LOCATION

Drawing 170063-2100 Rev P02, Toucan Crossing Glenamuck Road.

PROBLEM

There is an existing median hedge on Glenamuck Road dual carriageway. It is unclear if the hedge is to be cleared and if so to what extent. Without sufficient clearance of the median hedge inter-visibility between crossing cyclists and pedestrians with oncoming drivers may be limited leading to collisions.



RECOMMENDATION

It is recommended that the median hedge be cleared for sufficient distance in both directions to ensure adequate visibility to crossing vulnerable road users.

3.3 Problem

LOCATION

Drawing 170063-2100 Rev P02, Toucan Crossing Glenamuck Road.

PROBLEM

There is a lack of warning for drivers that they are approaching a signalised toucan crossing. This could lead to high speeds on approach to the crossing and overshoot of the stop line leading to possible collisions with pedestrians or cyclists.

RECOMMENDATION

It is recommended that warning signs for the signalised junction are provided and that suitable zig-zag road markings are provided.

It is also recommended that the skid resistance be checked on the surfacing course on approach to the signals and where necessary, high friction surfacing or surfacing with aggregate of suitably high polished stone and aggregate abrasion values be provided.

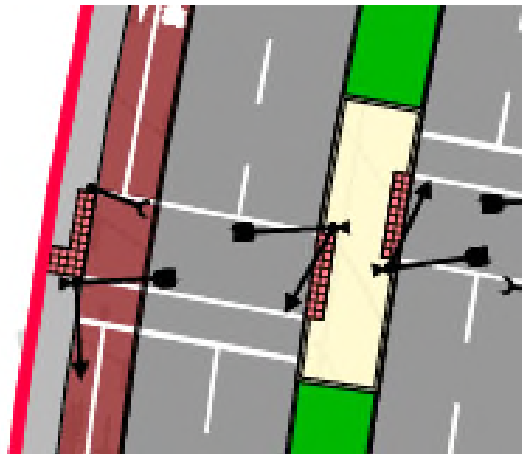
3.4 Problem

LOCATION

Drawing 170063-2100 Rev P02, Toucan Crossing Glenamuck Road.

PROBLEM

Cyclists on the western side of Glenamuck Road may collide with crossing pedestrians if they do not expect them to cross at the proposed toucan crossing.



RECOMMENDATION

It is recommended that the toucan signals be provided at the carriageway edge rather than at the back of the cycle track and that a shared area be provided for pedestrians and cyclists to share.

QUALITY AUDIT – GLENAMUCK ROAD/GOLF LANE
DBFL

3.5 Problem

LOCATION

Drawing 170063-2100 Rev P02, Internal cycle track.

PROBLEM

There are a number of sharp horizontal bends on the internal cycle track linking Golf Lane with Glenamuck Road. This may lead to cyclists travelling across their lane into oncoming cyclists or pedestrians resulting in injury.



RECOMMENDATION

It is recommended that that the sharp bends be smoothed or that localised widening of the track be provided.

3.6 Problem

LOCATION

Drawing 170063-2100 Rev P02, Internal footpath

PROBLEM

The internal footpath linking Golf lane with Glenamuck Road is only 1.5m wide. This would result in pedestrians having to enter the cycle track if they meet, particularly the mobility impaired and buggy pushers.



RECOMMENDATION

It is recommended that the footpath be widened to cater for the volume of expected users and the need for pedestrians to pass without having to step into the cycle track.

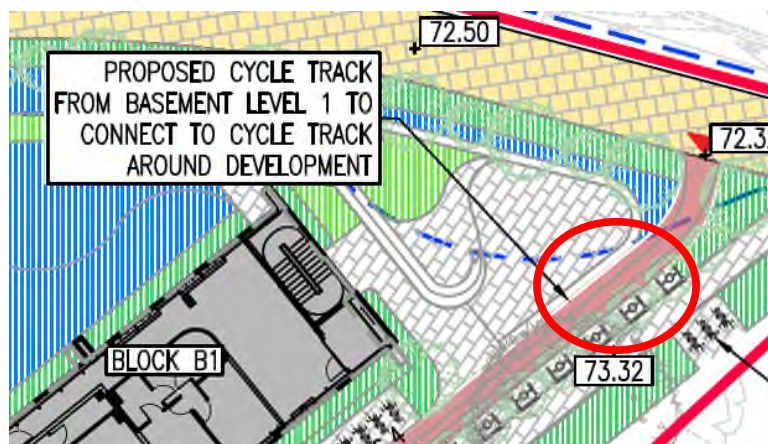
3.7 Problem

LOCATION

Drawing 170063-2100 Rev P02, cycle track to basement.

PROBLEM

It is unclear what width the two-way cycle ramp to the basement is. If it is too narrow, there is a risk of collision between passing cyclists. The speed differential could be high given the high gradients which could lead to higher severity injuries.



RECOMMENDATION

It is recommended that the two-way cycle lane to and from the basement is of suitable width to accommodate fast moving cyclists.

3.8 Problem

LOCATION

Bus route.

PROBLEM

There appears to be a lack of adjacent bus stops to the proposed development to cater for public transport to neighbouring hubs. This may lead to higher usage of private vehicles resulting in traffic delays and parking issues.

QUALITY AUDIT – GLENAMUCK ROAD/GOLF LANE
DBFL

RECOMMENDATION

It is recommended that provision be made for a future bus stop along Golf Lane adjacent to the development.

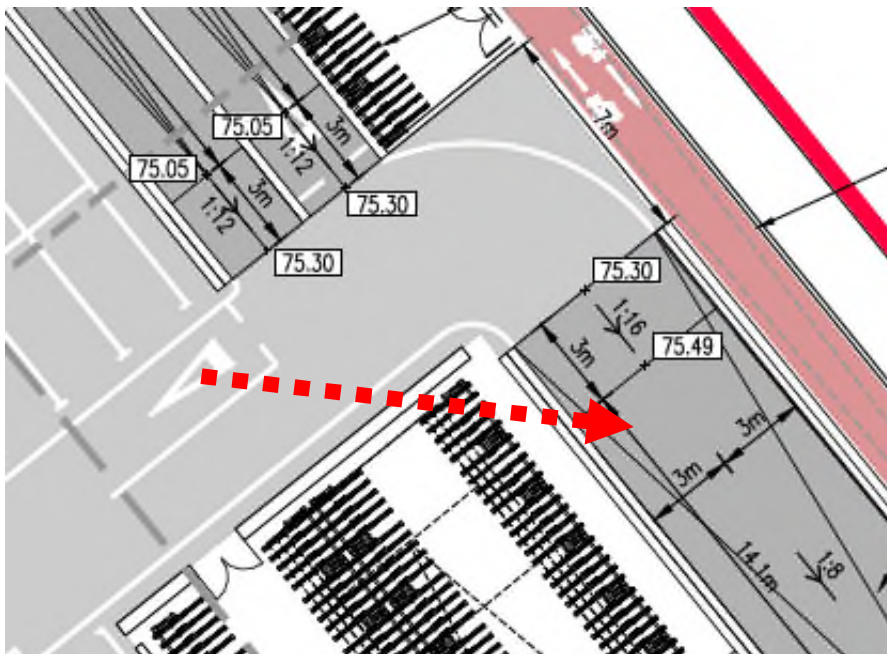
3.9 Problem

LOCATION

Drawing 170063-2101-P02, Basement level 1 Layout.

PROBLEM

Vehicles exiting the basement have to yield to vehicles entering the basement due to the tight horizontal bend. It is unclear if there will be sufficient visibility for drivers to see if a vehicle is coming down the ramp when at the yield line. Without adequate visibility this could result in head-on collisions or reversing leading to material damage.



RECOMMENDATION

It is recommended that a swept path analysis be carried out so that two vehicles can meet or that sufficient visibility is provided at the Yield line.

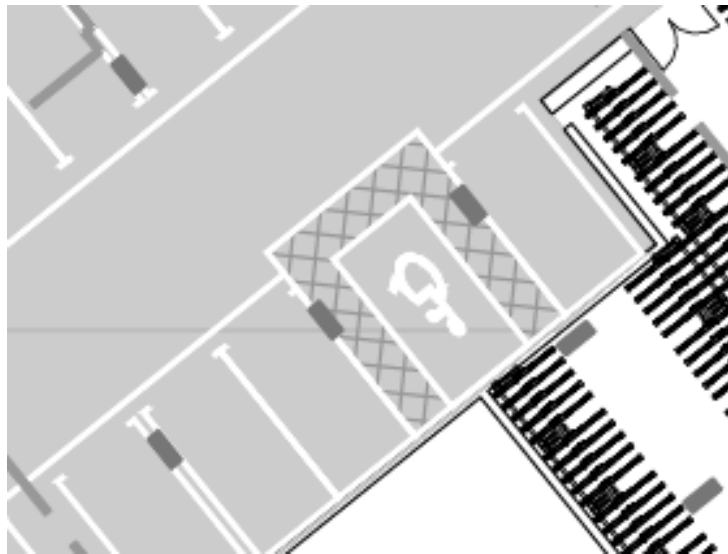
3.10 Problem

LOCATION

Drawing 170063-2101-P02, Basement level 1 Layout.

PROBLEM

The structural columns appear to be located in the buffer zone around the single disabled parking bay in the south eastern aisle. This could lead to accessibility issues for wheelchair users.



RECOMMENDATION

It is recommended that the buffer zone for disabled parking bays be kept free from obstacles.

3.11 Problem

LOCATION

Drawing 170063-2101-P02, Basement level 1 Layout.

PROBLEM

The electric vehicle charging spaces do not appear to be any larger than the standard parking spaces. This could lead to accessibility issues for users especially for side-entry charging. There is also a possibility of trips and falls due to the lack of space for cables between vehicles.



RECOMMENDATION

It is recommended that buffer zones be provided around electric changing spaces as per the guidance in the Traffic Signs Manual.

3.12 Problem

LOCATION

Drawing 170063-2101-P02, Basement level 1 Layout.

PROBLEM

It is unclear if drivers will be able to turn left to enter the ramp to Basement Level 2 without colliding with the median of the ramp or the wall of the ramp shaft due to the tight turn required.



RECOMMENDATION

It is recommended that a swept path analysis be carried out for the left turn into Basement level 2 and if it cannot be easily carried out in a single manoeuvre for a long car then the layout should be modified.

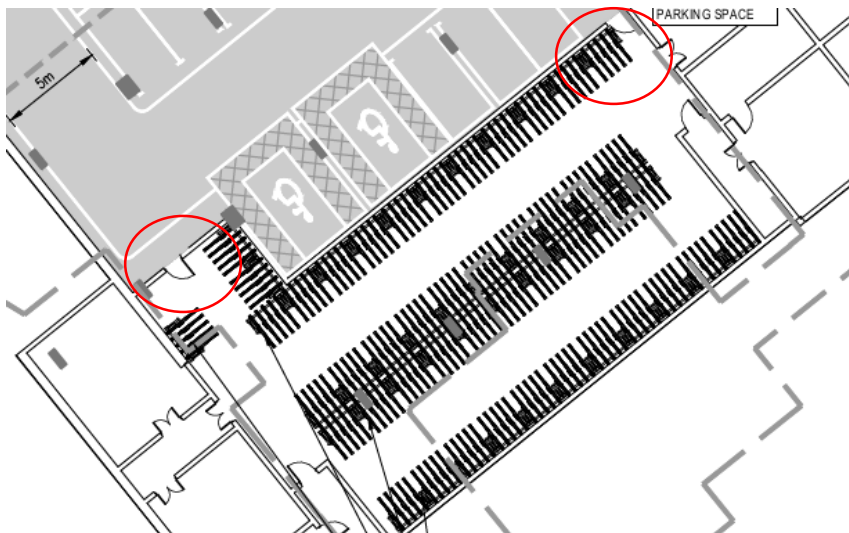
3.13 Problem

LOCATION

Drawing 170063-2101-P02, Basement level 1 Layout, bicycle park.

PROBLEM

There are two single doors for the large (450no.) bicycle parking area in basement No. 1. The lack of space at the doorways for a busy area could lead to damage of the door/frames and possible cyclist injury and discomfort/frustration.



RECOMMENDATION

It is recommended that double doors be used instead of single doors.

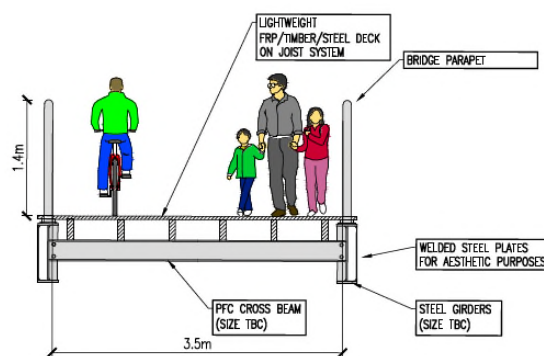
3.14 Problem

LOCATION

Drawing 170063-2110 & 2111-P02, Pedestrian Bridges.

PROBLEM

The pedestrian bridge cross sections show a cross sectional width of 3.5m. The cycle track and footpath have an overall cross section of 4.5m & 4.0m. A restriction in width could lead to collisions between cyclists and pedestrians.



TYPICAL BRIDGE CROSS SECTION
SCALE 1:50

RECOMMENDATION

It is recommended that the effective width of the bridge be the same as the general facility taking into account the reduction caused by the parapet upstands.

4.0 Observations

4.1 Observation

It is assumed that crossing specific public lighting will be provided at the Glenamuck Road toucan crossing.

4.2 Observation

It is assumed that the bridge parapet height will be 1.4m as indicated on the cross section and not 1.2m as indicated on the elevation to cater for the containment of cyclists.

4.3 Observation

It is unclear where and how refuse will be collected.

4.4 Observation

Trees should be placed so that they do not reduce the effective width of footpaths or cycle tracks and do not obscure visibility.

5.0 Quality Audit Statement

This quality Audit has been carried out in accordance with the guidance given in DMURS and takes into consideration the principles approaches and standards of that Manual.

The quality audit has been carried out by the persons named below who have not been involved in any design work on this scheme as a member of the Design Team.

Norman Bruton Signed: *Norman Bruton*
(Quality Audit Team Leader) Dated: 25/11/2020

Mark Kelly Signed: *Mark Kelly*
(Quality Audit Team Member) Dated: 25/11/2020

Appendix A

List of Material Supplied for this Quality Audit;

- Drawing 170063-2100-P2
- Drawing 170063-2101-P2
- Drawing 170063-2102-P2
- Drawing 170063-2110-P2
- Drawing 170063-2111-P1
- Drawing 90-950292 PL_P1010 Rev P2 (Henry J Lyons)
- Drawing C00112 L100 P00 (Cameo & Partners)

Appendix B

Feedback Form


QUALITY AUDIT FORM – FEEDBACK ON QUALITY AUDIT REPORT

Scheme: Residential Development Glenamuck Road
Quality Audit- Planning
Date Audit (site visit) Completed: 7/10/2020

Paragraph No. in Quality Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative measures accepted by Auditors (Yes/No)
3.1	Yes	Yes	We acknowledge the auditor’s concern and agree with the recommended measure, however the area is outside the control/ownership of the applicant and in the ownership of a DLRCC. We agree to notify DLRCC of the problem for their attention. Should DLRCC condition the applicant for its relocation and grant the necessary licenses then same will be facilitated.	Yes
3.2	Yes	Yes	We acknowledge the auditor’s concern and agree with the recommended measure, however the area is outside the control/ownership of the applicant and in the ownership of DLRCC. We agree to notify DLRCC of the problem for their attention. Should DLRCC condition the applicant for the recommendation and grant the necessary licenses then same will be facilitated.	Yes
3.3	Yes	Yes	We acknowledge the auditor’s concern and agree with the recommended measure, however the area is outside the control/ownership of the applicant and in the ownership of DLRCC. We agree to notify DLRCC of the problem for their attention. Should DLRCC condition the applicant for the recommendation and grant the necessary licenses then same will be facilitated.	Yes

Paragraph No. in Quality Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative measures accepted by Auditors (Yes/No)
3.4	Yes	Yes	We acknowledge the auditor's concern and agree with the recommended measure, however the area is outside the control/ownership of the applicant and in the ownership of DLRCC. We agree to notify DLRCC of the problem for their attention. Should DLRCC condition the applicant for the recommendation and grant the necessary licenses then same will be facilitated.	Yes
3.5	Yes	Yes	We acknowledge the auditor's concern regarding the horizontal bends on the internal cycle track, however it is intended to keep speeds low along the internal cycle track, especially approaching the proposed bridge. Where horizontal bends are tight, localised widening shall be provided during detailed designs as per the auditor's recommendations.	Yes
3.6	Yes	Yes		
3.7	Yes	Yes		
3.8	Yes	Yes	We acknowledge the auditor's concern and agree that a future bus stop along Golf Lane will be of benefit, however the area is outside the control/ownership of the applicant and in the ownership of a DLRCC. We agree to notify DLRCC of the problem for their attention. Should DLRCC condition the applicant for its relocation and grant the necessary licenses then same will be facilitated.	Yes

Paragraph No. in Quality Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative measures accepted by Auditors (Yes/No)
3.9	Yes	Yes	We acknowledge the auditor's concern and agree with the recommended measure. A swept path analysis has been carried out which reveals that two vehicles can meet. The obstacles impeding visibility at the yield line will be adjusted during detailed designs to provide sufficient visibility for vehicles.	Yes
3.10	Yes	Yes		
3.11	Yes	Yes	We agree with the recommended measure to provide buffer areas around EV parking spaces. The final locations of these parking spaces will be identified during the detailed design stages of the project in coordination with other services and utilities in the basement.	Yes
3.12	Yes	Yes		
3.13	Yes	Yes		
3.14	Yes	Yes		

Signed.....  Nick Fenner MEng (Hons) CEng MIEI, Associate **Date** 24/11/20
Design Team Leader

Signed.....  **Date:** 25/11/2020
Audit Team Leader

Appendix C

Problem Location Plan.



PARKING SCHEDULE		
	COURTYARD	BASEMENT
CAR PARKING	3	287
SET DOWN / LOADING	1	-
DISABLED CAR PARKING	-	12
MOTORCYCLE PARKING	-	12
LONG-SEW CYCLE PARKING	-	1000
SHORT-SEW CYCLE PARKING	240	-

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- NOTES:
1. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THE 10 SPECIFICATION FOR ROAD WORKS UNLESS OVERRIDDEN BY LOCAL OVERLAPPING AUTHORITY'S SIGNAGE.
 2. ALL ROAD MARKINGS & SIGNS SHALL COMPLY FULLY WITH THE TRAFFIC SIGNS MANUAL PUBLISHED BY THE DEPARTMENT OF TRANSPORT.
 3. SIGNS & MARKINGS: CONTRACTOR TO CONFIRM PRECISE SETTING OUT WITH SURVEYORS, RESPECIFYING PRIOR TO COMPLETION.
 4. ALL TRAFFIC MANAGEMENT TO COMPLY FULLY WITH THE PROVISIONS OF CHAPTER 8 OF THE TRAFFIC SIGNS MANUAL.
 5. ALL CO-ORDINATES ARE TO IRISH TRANSVERSE MERCATOR.
 6. ALL LEVELS ARE TO ORDNANCE DATUM AND ARE IN METRES.
 7. ALL PEDESTRIAN, CYCLE AND VEHICULAR ROUTES MUST BE RETAINED IN ACCORDANCE WITH APPROVED TRAFFIC MANAGEMENT PLAN.

LEGEND

	APPLICATION BOUNDARY
	PROPOSED CARPARKWAY
	PROPOSED FOOTPATH
	PROPOSED POOLING AREA DRAWING TO SLUDG ELEMENT (DRAINAGE - SIGNIFICANT PARKING)
	PROPOSED SHARED SURFACE
	PROPOSED PLANTING AREAS
	PROPOSED LAWN AREAS
	PROPOSED GRASS PAVED AREAS
	PROPOSED WILDFLOWER AREAS
	PROPOSED WETLAND AREAS
	EXISTING CARPARKWAY
	EXISTING FOOTPATH
	PROPOSED UNCONTROLLED FACILE PARKING
	ROAD MESH
	PROPOSED ROAD LEVELS
	PROPOSED ROAD GRADIENTS
	PROPOSED FALL DIRECTION
	BASEMENT OUTLINE
	PROPOSED CYCLE LANE
	PROPOSED RAMP CYCLE LANE
	PROPOSED ON-ROAD CYCLE LANE

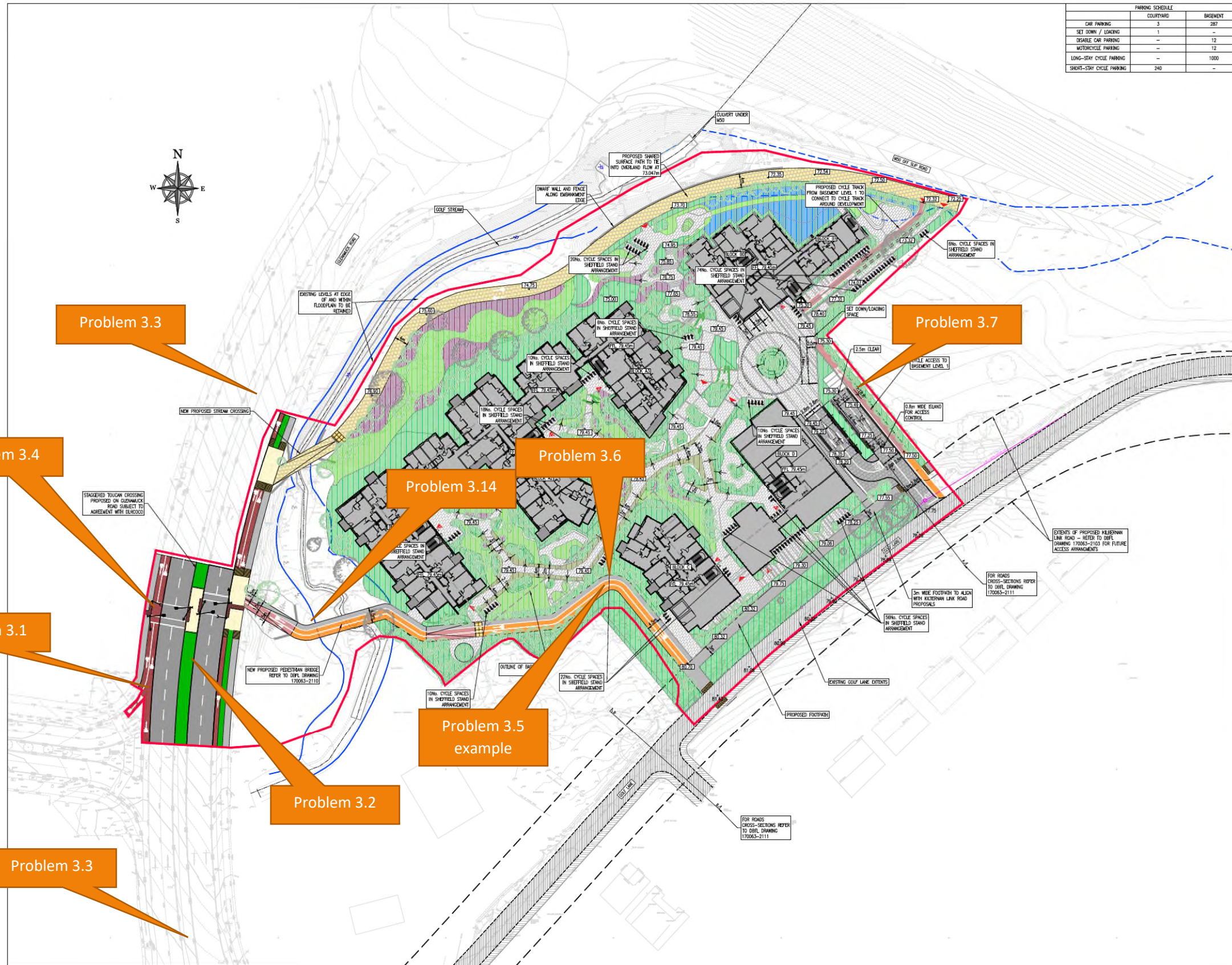
REV	DATE	DESCRIPTION	BY	CHECKED
01	08/11/20	PLANNING	BS	HPF
02	27/03/21	PRE-PLANNING	BS	HPF
03	01/04/21	DESCRIPTION	BS	HPF
04	01/04/21	DESCRIPTION	BS	HPF

client approval: A: Approved, B: Approved with comments, C: On release

INDUSTRY	SECTOR	PLANNING
SZ - INFORMATION	SECTOR	PLANNING

DBFL Consulting Engineers
Civil, Structural & Transportation Engineering
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PROJECT: RESIDENTIAL DEVELOPMENT AT GLENAMUCK ROAD
DRAWING TITLE: ROADS LAYOUT
DESIGNED BY: HENRY J. LYONS ARCHITECTS
DESIGNED BY: PCC, BS, SCALE: 1:500, SHEET NO: A1
DRAWING NO: 170063-2-100, P02



Problem 3.3

Problem 3.7

Problem 3.4

Problem 3.6

Problem 3.1

Problem 3.14

Problem 3.5 example

Problem 3.2

Problem 3.3