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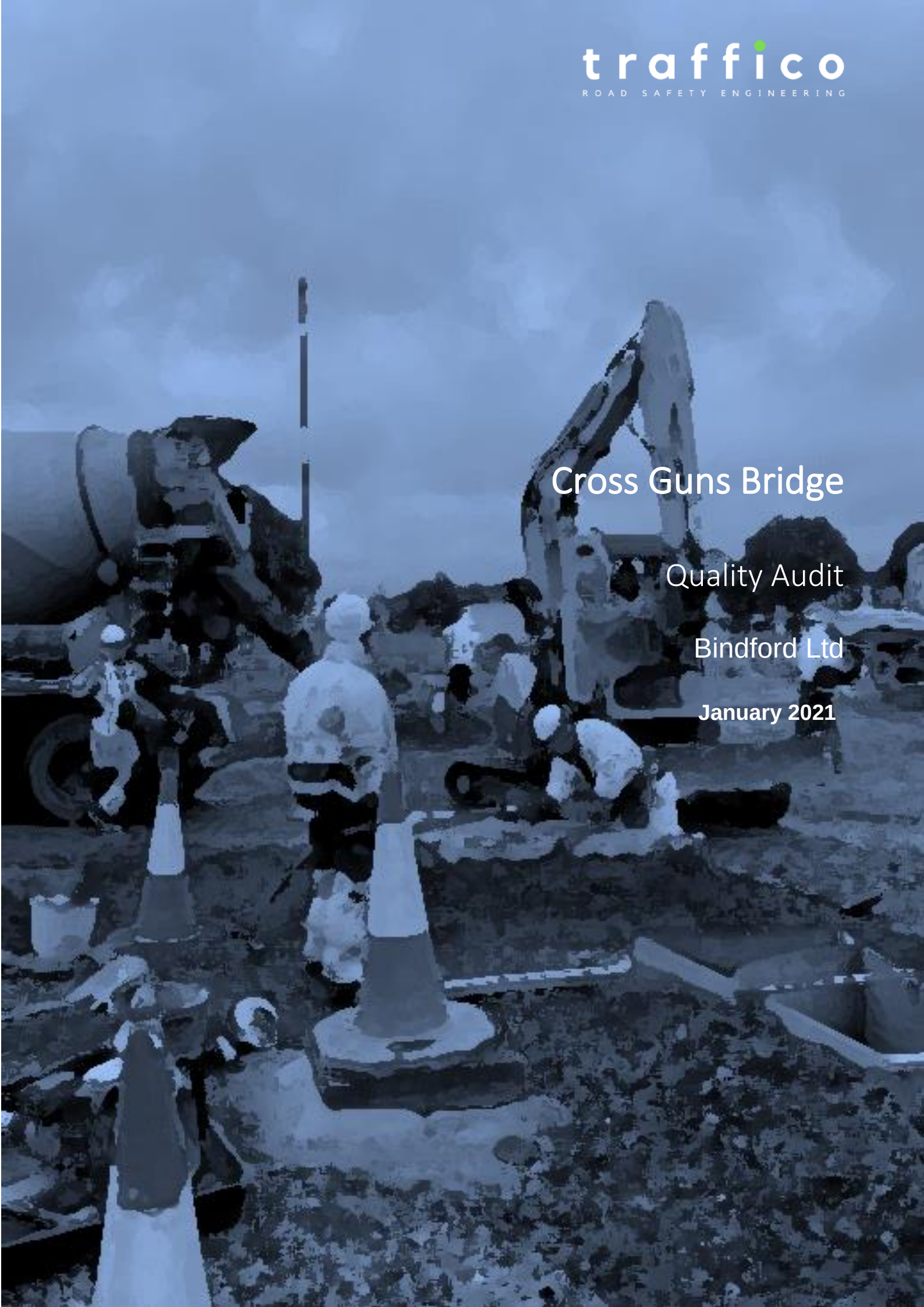
ROAD SAFETY ENGINEERING



Cross Guns Bridge

Quality Audit

Bindford Ltd

January 2021

traffico

Cross Guns Bridge

Quality Audit

January 2021

Notice

This document and its contents have been prepared and are intended solely for Bindford Ltd's information and use in relation to the proposed **Cross Guns Bridge**.

Traffico assumes no responsibility to any other party in respect of or arising out of or in connection with this document and / or its contents.

Document History

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Revision	Purpose Description	Originated	Checked	Reviewed	Authorised	Date

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1. Introduction

1.1 Report Context

This report describes the findings of a Quality Audit associated with the proposed **Cross Guns Bridge** project.

The Audit has been completed by Traffico Ltd. on behalf of Bindford Ltd.

1.2 Details of Site Inspection

Date	Daylight / Darkness	Weather & Road Conditions
Thursday 31 December 2020	Daylight	Light rain, roads wet.

Table 1.1 – Site Inspection Details

1.3 The Road Safety Audit Team

The members of the Road Safety Audit Team have been listed following:

- Team Leader: **Martin Deegan** BEng(Hons) MSc CEng MIEI
- Team Member: **Colin Prendeville** BEng(Hons) CEng MIEI CIHT
- Audit Trainee: NA

1.4 Drawings & Documents Examined as Part of the Audit Process

The following drawings and documents were examined as part of the Audit process:

Drawing No.	Drawing / Document Title	Revision
20-011 - P010	Proposed Site Location Map	-
20-011 - P100	Proposed Road Layout & Levels	-
20-011 - P130	Proposed Sightlines	-
20-011 - P150 to P152	Swept Path Analysis x 3	-
20-011 - P190	Typical Road Construction Details	-
20-011 - P195	Proposed Road Markings & Signage	-
20-011 - P200	Proposed Drainage Layout	-
20D04-DR-200	Landscape Plan	-
NA (document)	181220 Cross Guns DMURS Statement	Final Draft
NA (document)	181220 Cross Guns TTA&MMP	Final -Draft

Table 1.2 – Designers Drawing & Document List

1.5 Quality Audit Content and Compliance

Procedure and Scope for Quality Audit

This Quality Audit is undertaken in accordance with Section 5.4.2 of the Design Manual for Urban Roads and Streets. The UK Department for Transport Traffic Advisory Leaflet (TAL) 5/11 has also been referred to for additional guidance.

This Quality Audit consists of the following audit sections:

- Walking, Cycling and Access Audit – focusing on accessibility requirements of vulnerable road users (and in particular those with visual or mobility impairments), and on the movement and place function requirements of pedestrians and cyclists
- Road Safety Audit – focusing on issues relating directly to road safety

Procedure and Scope Specific to the Road Safety Audit

The Road Safety Audit has been carried out in accordance with the procedures and scope set out in TII publication number GE-STY-01024 - Road Safety Audit.

As part of the road safety audit process, the Audit Team have examined only those issues within the design which relate directly to road safety.

Compliance with Design Standards

The road safety audit process is not a design check, therefore verification or compliance with design standards has not formed part of the audit process.

Minimizing Risk of Collision Occurrence

All problems described in this report are considered by the Audit Team to require action in order to improve the safety of the scheme and minimise the risk of collision occurrence.

2. Walking, Cycling and Access Audit

2.1 Best Practice Guidance

This Quality Audit has been carried out in accordance with general best practice guidance set out within the following documents:

- The Disability Act 200
- British Standards Institute BS8300:2001
- Building Regulations 2000, Technical Guidance Document M – Access for People with Disabilities (Department of the Environment, Heritage and Local Government)
- Buildings for Everyone Access and use for all citizens (National Disability Authority)
- Access Auditing of the Built Environment Guidelines (National Disability Authority)
- Traffic Management Guidelines (Irish Government Publications 2003)
- Guidance on the use of Tactile Paving Surfaces: UK Department for Transport.

2.2 Objectives of the Walking, Cycling and Access Audit

The objectives of this Walking, Cycling and Access Audit are as follows:

- To ensure a high level of accessibility to the proposed development site for all vulnerable road users and in particular visually and mobility impaired user
- To ensure that the access infrastructure in relation to the external built environment is in accordance with current best practice
- To ensure that the current and future access needs within the scheme are recognised and developed
- To ensure that advantage is afforded to walkers and cyclists at every opportunity.

2.3 General Accessibility Recommendations

Following delivery of the Walking, Cycling and Access Audit, the design team should consider all issues raised herein for inclusion into the final design. It is less costly to make the changes now, pre-construction, than later after the scheme has been commissioned.

The client should consider setting up a dedicated access team for the project, responsible for the long-term management of universal access throughout the development.

This process should be facilitated by an Access Plan, which is a strategy for improving accessibility developed from the Audit and can ensure that access is an on-going concern and help identify opportunities for change.

The access plan should incorporate planned maintenance programmes, a schedule of works that has been devised to take into account the priority information in the Audit, processes to allow regular updating of the Audit information and links to maintenance and management procedures.

It should also set out procedures to ensure that when opportunities for access improvement arise, they are recognised.

2.4 Specific Walking, Cycling and Accessibility Recommendations

A summary of the design features, together with recommended actions to be taken during the relevant stage of the design or operation of the scheme have been detailed in the following table.

Table 2.1 - Walking, Cycling and Access Audit Summary Table

I.D.	Location	Feature	Action	When
01	Development Footpaths and Shared Surfaces	Pedestrian Provision	Ensure pedestrian environments are logical, clear to understand and consistent throughout the development. Gateway signage / road markings should be provided on entering all shared surface areas to make it clear to drivers that they must give way to vulnerable road users.	Design Stage
02	Shared Surfaces	Pedestrian Provision	Ensure consistency in the types of Shared Surface utilised, suitable for all development users. Where long stretches of shared street are proposed, provide refuge areas where possible for pedestrians to step into and seek shelter.	Design Stage
03	Development Footpaths and Shared Surfaces	Pedestrian Provision	Ensure continuity for pedestrians is provided at crossing points, and that crossings lead users to facilities on the opposite side of the carriageway.	Design Stage
04	Development Footpaths and Shared Surfaces	Pedestrian Provision	Ensure contrasting colours/materials are used to define areas which are meant for sole use by vulnerable road users.	Design Stage
05	Development Footpaths and Shared Surfaces	Pedestrian Provision	Ensure footpath edges are clearly defined.	Design Stage
06	Development Footpaths and Shared Surfaces	Pedestrian Provision	Ensure defined street furniture and clutter is kept out of footways to maximise the effective width.	Design & Operational Stages
07	Development Footpaths and Shared Surfaces	Pedestrian Provision	Ensure steps are legible and contrasting colour nosings are provided.	Design Stage
08	Development Footpaths and Shared Surfaces	Pedestrian Provision	Ensure footpaths and crossing points are located on all significant desire lines, where they are safe and convenient for all road users.	Design Stage
09	Development Footpaths	Pedestrian Provision	Ensure appropriate drop kerbs and tactile paving provided at crossing points.	Design Stage
10	Buildings	Building Entrances	Ensure the main building entrances are well defined and easily contrasted to the rest of the building façade.	Design Stage

I.D.	Location	Feature	Action	When
11	Public Footpaths	Pedestrian Provision	At access points through the site boundaries which connect with public thoroughfares, all internal footpaths should link seamlessly with external footpaths or walkways to accommodate pedestrian progression.	Design Stage
12	Buildings	Building Entrances	Ensure clear sight lines to the main pedestrian entrances are provided from all approaches to the buildings. Trees and street furniture should not block these.	Design Stage
13	Development Footpaths and Shared Surfaces	Street Lighting	Ensure street lighting is located where pedestrian movement decisions are required (i.e. at crossing points, entrances and in shared street areas).	Design Stage
14	General	Drainage	Ensure any break in surface or gap (such as a drainage gulley) is no greater than 10mm and is perpendicular to line of travel. Locate drainage features away from crossing points.	Design Stage
15	General	Drainage	Ensure access routes are laid with even and gentle falls to allow proper drainage and prevent the formation of puddles. The cross-fall gradient to any access route should not exceed 1 in 50, except when associated with a dropped-kerb.	Design Stage
16	Development Footpaths and Shared Surfaces	Provision of Street Furniture	Ensure furniture does not encroach on the clear width of pathways.	Design Stage
17	Development Footpaths and Shared Surfaces	Provision of Street Furniture	Ensure street furniture contrasts in colour with the surrounding pavement surfaces.	Design Stage
18	Development Footpaths and Shared Surfaces	Provision of Street Furniture	Ensure that any pedestal mounted items or emergency doors which open onto footpaths are fitted with a tapping rail 250mm above the ground, contrasting in colour with the pavement.	Design Stage
19	Car Parks	Car park provision	Ensure car parking is accessible, easy to use, and sufficient parking spaces are provided within a well-designed environment to meet the needs of all people expected to use them.	Design Stage
20	Car Parks	Car park provision	Ensure location of designated spaces for car users with disabilities are located as close as possible to the building access points.	Design Stage
21	Car Parks	Car park provision	Turning heads should be provided in cul de sacs to limit reversing activity.	Design Stage
22	Car Parks	Car park provision	Ensure that access to/from parked vehicles is not inhibited by boundary treatments, street furniture or structural features.	Design Stage

I.D.	Location	Feature	Action	When
23	Phibsboro Road	Direct Access	Afford advantage to pedestrian movement on the public footpath by maintaining existing concrete pavement and yielding vehicles in advance of rolling across the footpath.	Design Stage
24	External Landscaped areas	Cycle stands	To encourage use and safeguard security, position cycle stands away from isolated areas and close to building entrances which have natural passive surveillance. Consider providing cover over the cycle stands to protect cyclists from the elements where possible.	Design Stage
25	Development footpaths	Bin storage	Bin storage and collection can lead to obstruction of the footpaths and cycle facilities. The Designer should ensure the refuse truck access and turning, bin storage and bin collection are considered and comprehensively catered for within the development proposals.	Design Stage

3. Stage 1 Road Safety Audit Problems

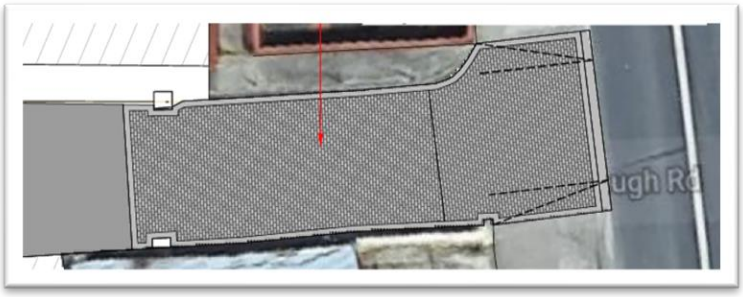
3.1 Problem: Conflict Between Emerging Vehicles & Pedestrians

Location: Footpath Fronting Access to Phibsborough Road

Several in-combination factors serve to place pedestrians at risk of vehicle strike at this location:

1. The height of the Third-Party garden boundary wall on the right-hand side of the access point for emerging vehicles, serves to limit visibility to pedestrians on the footpath.
2. The block paving material proposed for the access road extends beyond the adjacent boundary walls and through the public footpath onto Phibsborough Road. It extends to the edge of the adjacent traffic lane, suggesting priority for emerging vehicles over pedestrians walking on the footpath.
3. A stop line is proposed (on the engineering drawings) which encourages emerging drivers to 'roll through' the public footpath before stopping at the edge of the adjacent northbound traffic lane on Phibsborough Road.

Figure 1 – Proposed Access Treatment



Recommendation

The Designer should investigate if the Third-Party boundary wall can be lowered or adjusted by agreement. The concrete public footpath which passes the access should be retained (uninterrupted) to demonstrate that pedestrians have priority over vehicles and the stop line should be relocated to a position which requires drivers to stop in advance of crossing the footpath.

3.2 Problem: Driver Compliance / Inappropriate Speeds

Location: Shared Street Areas

Shared streets can be misinterpreted by drivers; especially delivery and maintenance vehicle drivers, as shared streets are a relatively new development concept in Ireland. This can lead to inappropriate vehicle speeds resulting in conflicts with vulnerable road users.

Recommendation

The Designer should provide a shared street gateway entry treatment in close proximity to the access serving Phibsborough Road. The gateway feature might include a combination of signage, road markings and a change in pavement type to make it unambiguously clear to all drivers that they are entering a shared street and should adjust their behaviour accordingly to give way to vulnerable road users.

3.3 Problem: Sharp Changes in Direction

Location: Main Shared Street Internal Access Road

A number of sharp or faceted changes in direction were identified within the horizontal alignment of the shared street. This could lead to drivers making unexpected steering corrections resulting in conflicts with vulnerable road users.

Figure 2 - Sharp Horizontal Changes in Direction

Recommendation

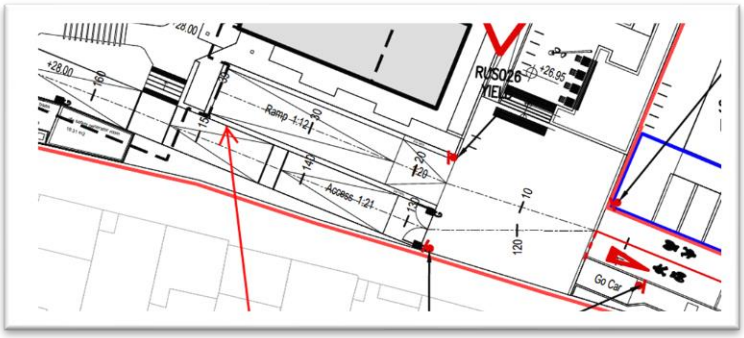
The Designer should ease the alignment by introducing smooth (tangential) reverse curves at these locations.

3.4 Problem: Side by Side Vehicle Conflicts

Location: Top of Ramp to Underground Car Park

Vehicles emerging from the internal public realm area and the underground car park ramp simultaneously could come into conflict as they attempt to merge and exit.

Figure 3 – Conflict at Top of Ramp



Recommendation

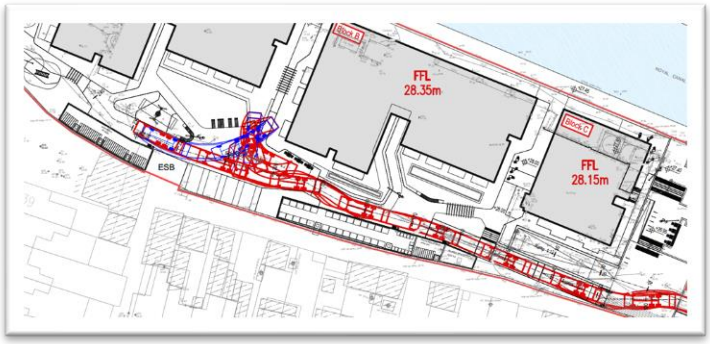
The Designer should ensure that the boundary treatment which will separate the emerging traffic streams permits intervisibility between dualling vehicles. The exit points should be staggered in a longitudinal sense and priority control measures should be prescribed to instruct (only) the lesser used arm using a stop or a yield provision.

3.5 Problem: Vehicle Conflicts with Vulnerable Road Users

Location: Internal Public Realm / Recreation Area

The long-term requirement for vehicles to manoeuvre, reverse and turn within the confined space allocated for shared use could lead to vehicle strikes on landscaping features and conflicts with vulnerable road users.

Figure 4 - Sharp Horizontal Changes in Direction



Recommendation

If the Designer cannot remove this risk at source, then a suite of mitigation measures should be developed. Such mitigation measures might include robust access control to physically prohibit unauthorized vehicle admission, mandating that service vehicle sizes are limited, management of service vehicle arrival times and the compulsory use of a banksman to accompany all service vehicles and oversee reversing manoeuvres.

4. Audit Team Statement

4.1 Certification & Purpose

We certify that we have examined the drawing listed in Chapter 1 of this Report.

Sole Purpose of the Road Safety Audit

The Road Safety Audit has been carried out with the sole purpose of identifying any features of the design which could be removed or modified to improve the road safety aspects of the scheme.

4.2 Implementation of RSA Recommendations

The problems identified herein have been noted in the Report together with their associated recommendations for road safety improvements.

We (the Audit Team) propose that these recommendations should be studied with a view to implementation.

Audit Team's Independence to the Design Process

No member of the Audit Team has been otherwise involved with the design of the measures audited.

4.3 Road Safety Audit Team Sign-Off

Martin Deegan
Audit Team Leader
Road Safety Engineering Team
traffico

Signed: 

Date: **11 January 2021**

Colin Prendeville
Audit Team Member
Road Safety Engineering Team
traffico

Signed: 

Date: **11 January 2021**

5. Responding to the Road Safety Audit

5.1 How the Designer Should Respond to the Road Safety Audit

The Designer should prepare an Audit Response for each of the recommendations using the Road Safety Audit Feedback Form attached in Appendix A.

When completed, this form should be signed by the Designer and returned to the Audit Team for consideration. See flow-chart following for further description.

Figure 5 - Road Safety Audit Sign-Off and Completion Process

5.2 Returning the Completed Feedback Form

The Designer should return the completed Road Safety Audit Feedback Form attached in Appendix A of this report to the following email address:

- Email address: martin@traffico.ie
- Telephone: 087 948 3535

The Audit Team will consider the Designer's response and reply indicating acceptance or otherwise of the Designers response to each recommendation.

Triggering the Need for an Exception Report

Where the Designer and the Audit Team cannot agree on an appropriate means of addressing an underlying safety issue identified as part of the audit process, an Exception Report must be prepared by the Designer on each disputed item listed in the audit report.

Appendix A

A.1 Road Safety Audit Feedback Form

Road Safety Audit Feedback Form

Scheme: **Cross Guns Bridge**.

Audit Stage: Stage 1 Road Safety Audit	**Audit Date:** 11 January 2021

Problem Reference (Section 2)	Designer Response Section			Audit Team Response Section
	Problem Accepted (yes / no)	Recommended Measure Accepted (yes / no)	Alternative Measures or Comments	Alternative Measures Accepted (yes / no)
3.1	Yes	Yes	The intention will be that cars exiting the premises will exit in a two-part stop fashion. The first stop will occur at the stop sign prior to the pedestrian crossing, with the second stop at road edge. The driver will be able to assess the pedestrian crossing and oncoming traffic in both cases in order to ensure it is safe to proceed. This two-part stop will ensure that the required sightlines are valid for the driver exiting the premises. The option of lowering the 3rd party wall will be investigated and may be lowered at a future date, if possible. The pedestrian footpath will not be affected by works proposed on the subject site as the paving lines will be retracted to behind the pedestrian crossing in order to ensure pedestrian priority. Lastly, there is a shared footpath located adjacent the entrance road of the subject site that can be used by pedestrian who might be uncomfortable with the surrounding vehicles.	Noted.
3.2	Yes	Yes	Please refer to Drawing 20-011-P195 Rev A which has been updated to show the required shared street entry sign which will serve to notify drivers to be	Noted.

Problem Reference (Section 2)	Designer Response Section			Audit Team Response Section
	Problem Accepted (yes / no)	Recommended Measure Accepted (yes / no)	Alternative Measures or Comments	Alternative Measures Accepted (yes / no)
			cognisant about the possible pedestrians on the premises.	
3.3	No	No	Due to the low speed and low traffic frequency environment, unexpected steering conditions are not expected. Additionally, the use of the refuge adjacent the roadway for pedestrians to step into will further help alleviate any concerns regarding unexpected steering. However, the alignment will be reviewed at design stage to assess the need for smooth reverse curves.	Yes.
3.4	Yes	Yes	Please refer to Drawing 20-011-P195 Rev A which shows the required treatment for the ramp area. Along with the respective stop – and yield signs proposed for the ramp area, there is also a gateway proposed at the start of the ramp leading up to the public realm. The wall separating the two ramps will be a low structural wall with a height of c. 250mm. Railings are proposed on top of the structural wall which do not block visibility, ensuring adequate vision for both drivers using the ramps. Due to the low speed and low traffic frequency environment, it can be concluded that the above-mentioned measures will suffice and that additional priority control measures would not be required.	Noted.
3.5	Yes	Yes	Refuse collection for the premises will occur at same time each week which would enable suitable planning for the refuse vehicle entering the subject site.	Noted.

Problem Reference (Section 2)	Designer Response Section			Audit Team Response Section
	Problem Accepted (yes / no)	Recommended Measure Accepted (yes / no)	Alternative Measures or Comments	Alternative Measures Accepted (yes / no)
			The refuse vehicle also has 2 additional staff members that can be instructed to act as banksman and direct the vehicle as required. The other abnormal vehicles that would enter the premises are emergency vehicles. Emergency vehicles would also have additional staff to act as banksman to ensure no vehicle strikes occurring on the premises. Additionally, emergency vehicles are fitted with flashing lights and sirens which would make their presence known to the pedestrians in close vicinity. In this regard, all risks pertaining to emergency vehicles would be adequately covered.	

**The Designer should complete the Designer Response Section above, then fill out the designer details below and return the completed form to the Road Safety Audit Team for consideration and signing.*

Designer's Name:	Sean Joyce	Designer's Signature:		Date:	2021/01/19
Audit Team's Name:	Martin Deegan	Audit Team's Signature:		Date:	19 Jan. 2021

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