# DRUID'S GLEN ROAD – PHASE 3 - CHERRYWOOD SDZ

## STAGE F (PART 1) ROAD SAFETY AUDIT

*15 April 2025*

Comhairle Contae County Council

Formerly JB Barry & Partners who became part of Egis in 2023.

# Document Information

## GENERAL INFORMATION

| | |
|---|---|
| **Client:** | Dún Laoghaire-Rathdown County Council |
| **Project Title:** | Druid's Glen Road – Phase 3 - Cherrywood SDZ |
| **Report Title:** | Stage F (Part 1) Road Safety Audit |
| **File Name:** | 24404-BTL-ZZ-XX-RP-CR-00003_Stage_F_Part1_RSA |

## HISTORY OF CHANGES

| DOCUMENT REVISION | | | DOCUMENT VERIFICATION | | | |
|---|---|---|---|---|---|---|
| Issue Date (DD/MM/YY) | Revision | Suitability | Author(s) | Reviewer(s) | Approver(s) | Peer Review (or N/A) |
| 15/04/2024 | P01 | S3 | TD/TDunne/SK | TDunne/SK | WL | N/A |
| 27/06/2025 | P02 | S3 | TDunne | TD/SK | WL | N/A |

**BIM Codes Definitions**

## SHARED (NON-CONTRACTUAL)

| Suitability /Status | Definition | Revision Code |
|---|---|---|
| S2 | Suitable for Information | Pnn (P=Preliminary) starting at P01 |
| S3 | Suitable for Review and Comment | |
| S4 | Suitable for Stage Approval | |

## PUBLISHED DOCUMENTATION (CONTRACTUAL)

| Suitability /Status | Definition | Revision Code |
|---|---|---|
| Approved and accepted as stage complete. | | Cnn (C=Contractual/Complete) starting at C01 |
| A1 | Phase 1 | |
| A2 | Phase 2 | |
| A3 | Phase 3 | |
| A4 | Phase 4 | |
| A5 | Phase 5 | |
| A6 | Phase 6 | |
| A7 | Phase 7 | |

## PUBLISHED FOR ASSET INFORMATION MODEL (AIM) ACCEPTANCE

| Suitability /Status | Definition | Revision Code |
|---|---|---|
| CR | As Constructed Record file | Cnn (C=Contractual/Complete) starting at C01 |

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# 1 INTRODUCTION

## 1.1 Background

This report results from Part 1 of a Stage F Road Safety Audit (RSA) of a proposal to construct a bridge and associated road infrastructure for Druid's Glen Road in Lehaunstown to cross over Carrickmines Stream at the location where Lehaunstown Lane currently crosses the stream. The proposed works also include the provision of a 3-arm signalised protected junction south of the bridge. The construction of this bridge is considered critical in addressing infrastructure deficits required to open-up land for development, and in particular housing. We refer to Figure 1.1 showing the site location.

Egis (formally JB Barry and Partners) were commissioned to prepare this Stage F (Part 1) RSA. A separate team in Egis (formally Barry Transportation) are in the process of preparing a Preliminary Options Assessment report and prepared the preliminary design drawings of 4 different bridge type options for Dún Laoghaire-Rathdown County Council.

Stage F audits are completed where a choice of routes or other options are available, A Stage F audit is carried out in two parts. Part 1 is a comparative assessment of the options from a road safety point of view. Once the option has been chosen, Part 2 of the audit shall be carried out on the chosen option, in the standard problem and recommendation format, and is normally completed prior to Preliminary Design.

The following options are considered viable and will be evaluated in more detail in conjunction with the scheme proposed road infrastructure:

- Option 1 – Three span bow string arch bridge
- Option 2 – Four span girder bridge
- Option 3 – Three span extradosed bridge
- Option 4 – Four span timber girder bridge

As the bridge will provide the missing link between the recently constructed Druid's Glen Road (DGR) phases of the approach roads to the bridge, a 'do nothing' option was not considered in this Stage F (Part 1) RSA.

A list of the drawings provided for this audit is contained in Appendix 1.


**FIGURE 1-1: PROPOSED BRIDGE LOCATION**

The audit has been prepared following the requirements of TII GE-STY-01024 (December 2017) - Road Safety Audit. The Audit Team has examined and reported on only the road safety implications of the design submitted by the Design Team and has not examined or verified the compliance of the design to any other criteria.

The members of the Road Safety Audit Team are independent of the Design Team. The Audit Team for the scheme is as follows.

**TABLE 1-1: AUDIT TEAM**

| AUDIT TEAM LEADER | AUDIT TEAM MEMBER | AUDIT TEAM MEMBER |
|---|---|---|
| Tim Delaney<br>BEng (Hons), CEng, MIEI, RSA Cert | Tristan Dunne<br>CEng BE MEngSc | Shane Kearns<br>MEng, BEng (Hons) MIEI, MTPS |
| Auditor ID: TD85307 | Auditor ID: TD266716 | Auditor ID: SK*364 |
| Egis (formally JB Barry & Partners Ltd)<br>3 Eastgate Road<br>Eastgate<br>Little Island<br>Co. Cork | Egis (formally JB Barry & Partners Ltd)<br>Classon House<br>Dundrum Business Park<br>Dundrum Road<br>Dublin 14 | Egis (formally JB Barry & Partners Ltd)<br>Classon House<br>Dundrum Business Park<br>Dundrum Road<br>Dublin 14 |

## 1.2 Site Visit

The Road Safety Audit site visit was carried out on Friday 4th of April 2025 during daylight hours. The weather was bright during the site visit and the ground surface was dry.

## 1.3 Road Traffic Collision Data Review

The Road Safety Authority (RSA) website was consulted in order to report on historical fatal, serious and minor injury collisions for the study area. However, the RSA are in the process of reviewing their road traffic collision (RTC) data sharing policies and procedures. Record-level RTC data cannot be shared until this review is complete.

## 1.4 Nominal Geometric Parameters

The cross-section adopted for the bridge is based on the road cross section for Druid's Glen Road, which can be seen in Table 1-2. A minimum cross-section of 17.5 m is proposed. The actual bridge cross section will vary slightly for different options as some options will require a wider bridge deck in order to accommodate bridge parapets, additional safety barriers and primary structural members above deck level.

**TABLE 1-2: PROPOSED CROSS-SECTION**

| ITEM | WIDTH (M) |
|---|---|
| Footway x2 | 3.0 |
| Cycleway x2 | 2.25 |
| Carriageway | 7.0 |

## 1.5 Bridge Type Options Considered

### 1.5.1 Option 1: Three span bow string arch bridge

Option 1 is a bow string arch bridge, consists of three main spans and has a total span length of 125 meters and consists of three main spans, with an overall bridge length of 147 meters. The width of the proposed bridge deck for Option 1 is 21.5m. A safety barrier is proposed between the cycle track and footpath, to protect the arch ribs and vertical hangers from potential vehicle collisions. This adds 3m in total to the width of the bridge for Option 1 compared to Options 2 and 4.

### 1.5.2 Option 2: Four span girder bridge

Option 2 is a four span girder bridge with a composite deck of steel girder and concrete slab. It has a total length of 121 m and spans 29 m, 29 m, 35 m, 28 m and an overall bridge length of 147 meters. The bridge deck is supported on three reinforced concrete piers and bank seat abutments. The width of the proposed bridge deck for Option 2 is 18.5m.

### 1.5.3 Option 3: Three span extradosed bridge

Option 3 is a three span extradosed bridge, featuring concrete girders and a cable stayed design with low pylons. The total span length is 125.7 meters and an overall bridge length of 147 meters. The larger central span has a length of 65.5m, while the two outer spans have lengths of 30.1m. The width of the proposed bridge deck for option 3 is 19.5m. The cable stayed design necessitates the addition of 1.0m in total to the minimum cross section of the bridge.

### 1.5.4 Option 4: Four span timber girder bridge

Option 4 utilises cross-laminated timber (CLT) girders and a timber deck in a four-span arrangement, similar to Option 2. It has a total length of 124 m and an overall bridge length of 147 meters The two central spans have a length of 35m, while the outer two spans are 27m in length. The width of the proposed bridge deck for Option 4 is 18.5m.

# 2 AUDIT ISSUES IDENTIFIED

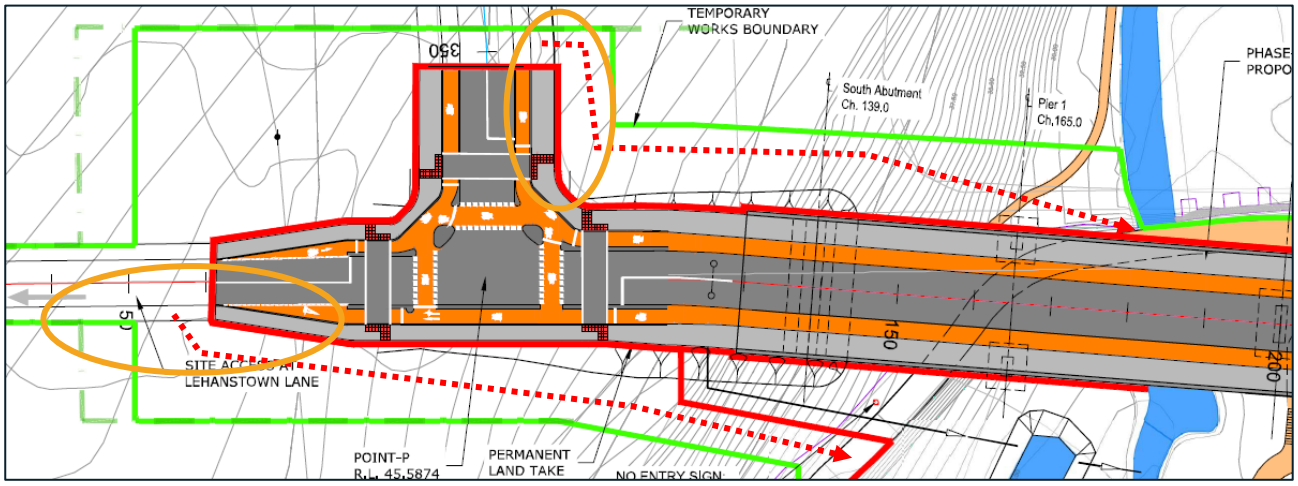
We note that the plan and cross sections of all 4 options are very similar. The cross section for Option 1 is slightly different from the other three options in so as it contains an additional low barrier between the footpath and the cycle track on both sides.

There was one problem identified which is unique to one bridge option. This problem is listed separately. The following three problems are common to all of the options considered in the Stage F (Part 1) RSA. The single option specific problem follows.

## 2.1 Problems Common to All Options

### 2.1.1 Problem: Unsafe short cut to Lehaunstown Lane

There does not appear be any fencing along the back of footpath to prevent a pedestrian taking a short cut along a natural desire line for access between the southern section of Druid's Glen Road and the proposed shared active travel path along the existing Lehaunstown Lane by walking on a steep embankment.

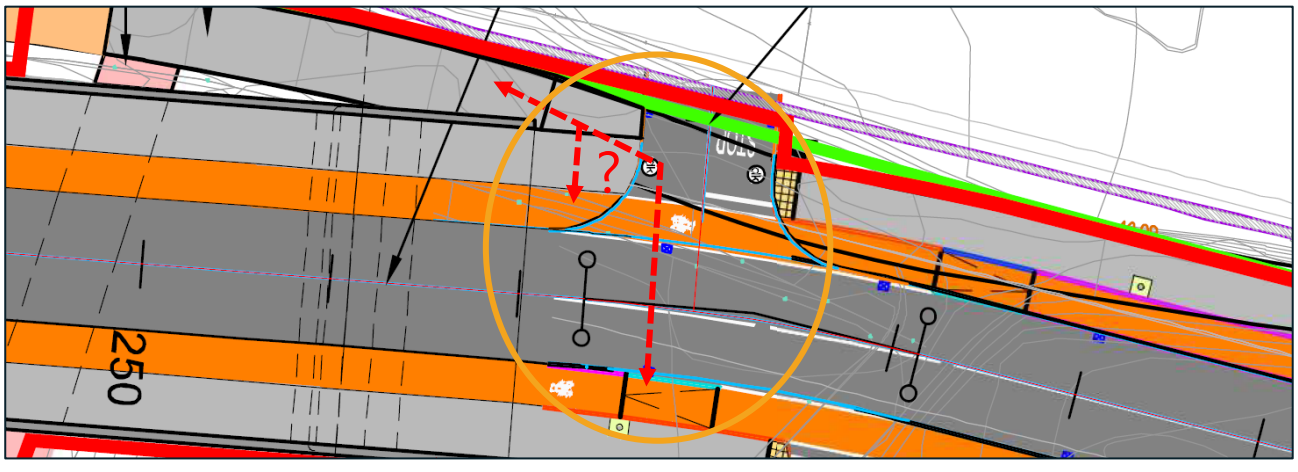



#### Hazard

A pedestrian could fall and injure themselves on the steep embankment on the southern side of the stream valley.

### 2.1.2 Problem: Safe regulated access provision to/from Lehaunstown Lane

There is no regulated provision for cyclists to safely access the proposed shared active travel path along the existing Lehaunstown Lane from the upper level adjacent to the bridge and vice versa, along a natural desire line.



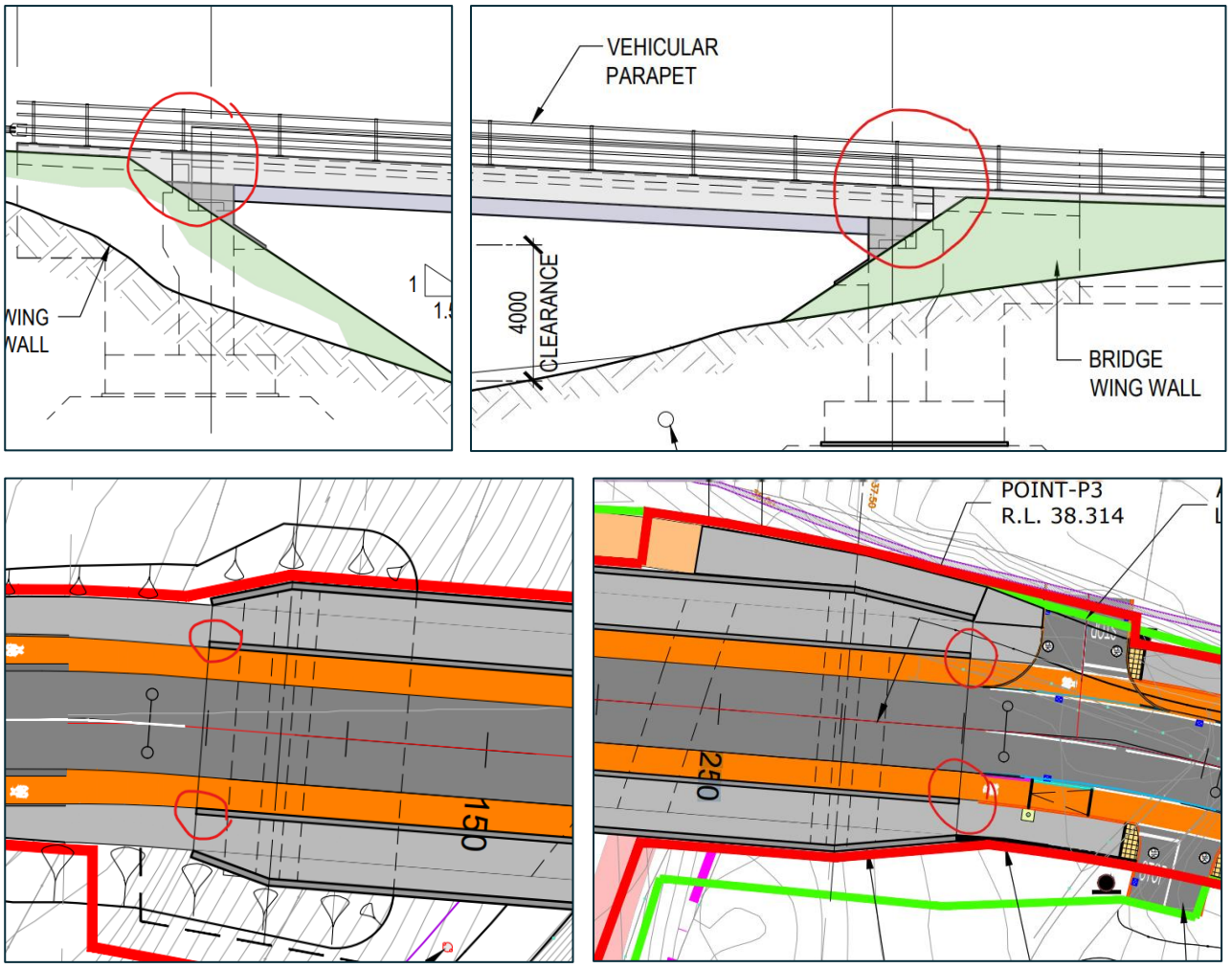
### Hazard

A collision could occur between a cyclist and a passing vehicle at the bridges or a pedestrian on the footpath when trying to access or egress the proposed shared active travel path along the existing Lehaunstown Lane.

## 2.2 Option Specific Problems

### 2.2.1 Problem: Exposed vertical ends of concrete barrier for Option 1

The ends of the proposed concrete barrier are indicated as terminating in a vertical face for Option 1.

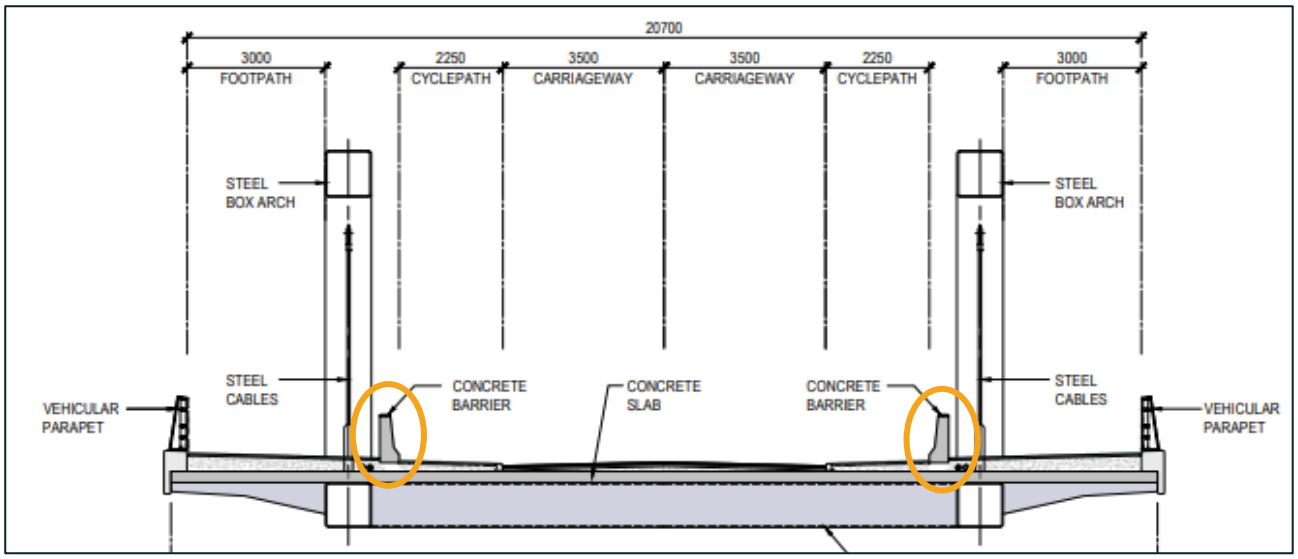



### Hazard

The vertical barrier ends represent a hazard to cyclists and motorists.

### 2.2.2 Problem: Cycle track alongside vertical feature for Option 1

The width of the cycle track does not allow for additional inside clearance where it runs alongside the adjacent concrete vertical barrier for Option 1. Furthermore, there is no proposed surface feature at the inside edge of the cycle track that would facilitate a safe redirection of a bicycle front wheel away from the concrete vertical barrier.




## Hazard

A cyclist's handlebar or pedal could strike the concrete barrier leading to them falling off their bike.

# 3 PREFERENCE OF DESIGN OPTIONS

All of the problems and hazards identified in Section 2.1 of this report are common to all 4 options. The plan design of each option is similar. The only significant difference in the cross section of each option is that there is segregation proposed between the footpath and the cycle track in Option 1 which we regard as a positive, making this option safer for pedestrians. However this option will have exposed face vertical barrier ends at the four corners of the bridge, which is a potential hazard, as identified in Section 2.2.

## 3.1 Ranking of Route Options

From Table 3-1 below, we can see that all options are relatively similar in terms of geometry.

**TABLE 3-1: GEOMETRIC COMPARISON TABLE**

| OPTION | BRIDGE TYPE | FOOTPATH WIDTH | CYCLE TRACK WIDTH | CARRIAGEWAY WIDTH | VERTICAL GRADIENT |
|---|---|---|---|---|---|
| 1 | Three span bow string arch bridge | 3.0m (min) x 2 (wider outside arch ribs) | 2.25m x 2 | 3.5m x 2 | 5% |
| 2 | Four span girder bridge | 3.0m x 2 | 2.25m x 2 | 3.5m x 2 | 5% |
| 3 | Three span extradosed bridge | 3.0m x 2 | 2.25m x 2 | 3.5m x 2 | 5% |
| 4 | Four span timber girder bridge | 3.0m x 2 | 2.25m x 2 | 3.5m x 2 | 5% |

As two of the problems identified are unique to Option 1, and all of the other problems identified are common to all 4 options, this places Option 1 last in the ranking with the remaining other 3 options in joint first place (refer to Table 3-2).

**TABLE 3-2: OPTION RANKING**

| OPTION | BRIDGE TYPE | RANK |
|---|---|---|
| 2 | Four span girder bridge | 1 |
| 3 | Three span extradosed bridge | 1 |
| 4 | Four span timber girder bridge | 1 |
| 1 | Three span bow string arch bridge | 2 |

# 4 AUDIT TEAM STATEMENT

We certify that we have examined the drawings and documents listed in the appendices to this report.

The examination and subsequent report were made with the sole purpose of identifying any features of the scheme that could be removed or modified in order to improve the safety of the proposals.

The problems identified have been noted in this report together with associated safety improvement suggestions, which we recommend should be studied for implementation.

No one on the Audit Team has been involved in the initial scheme design.

| **ASSESSMENT TEAM LEADER** | | |
|---|---|---|
| Name: | Mr. Tim Delaney<br>BEng CEng MIEI RSACert | Signed: |
| Position: | Service Provider | Date: 15.04.2025 |
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| **ASSESSMENT TEAM MEMBER** | | |
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# APPENDIX 1

## Drawings Provided For The Audit

**TABLE A1: LIST OF DRAWINGS PROVIDED FOR AUDIT**

| DRAWING TITLE | DRAWING NO. | REVISION |
|---|---|---|
| BRIDGE OPTION 1 PLAN | 24404-BTL-CW-XX-DR-CR-00201 | P02 |
| BRIDGE OPTION 2 PLAN | 24404-BTL-CW-XX-DR-CR-00203 | P02 |
| BRIDGE OPTION 3 PLAN | 24404-BTL-CW-XX-DR-CR-00205 | P02 |
| BRIDGE OPTION 4 PLAN | 24404-BTL-CW-XX-DR-CR-00207 | P03 |
| BRIDGE OPTION 1 EAST ELEVATION AND SECTION | 24404-BTL-CW-XX-DR-CR-00202 | P02 |
| BRIDGE OPTION 2 EAST ELEVATION AND SECTION | 24404-BTL-CW-XX-DR-CR-00204 | P02 |
| BRIDGE OPTION 3 EAST ELEVATION AND SECTION | 24404-BTL-CW-XX-DR-CR-00206 | P02 |
| BRIDGE OPTION 4 EAST ELEVATION AND SECTION | 24404-BTL-CW-XX-DR-CR-00208 | P02 |
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