

Guinness 'Silver' Bridge Conservation Works

Lower Road, Strawberry Beds, Lucan, Co Dublin

Presentation to South Dublin County Council
Lucan, Palmerstown, Fonthill Area Committee Meeting

26th May 2020
15.00 hours

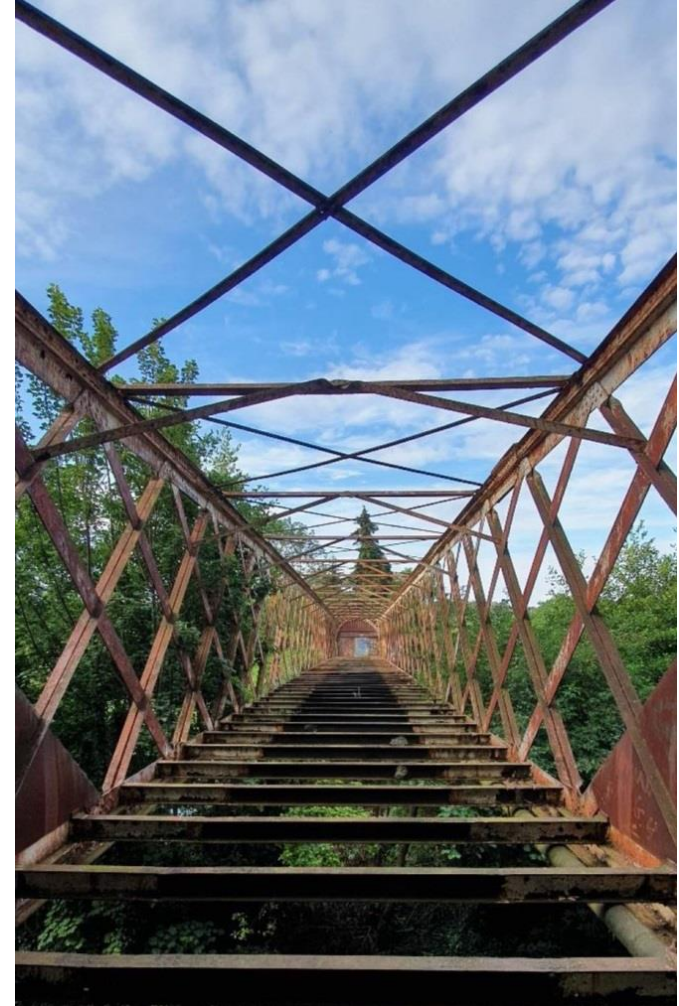
Lisa Edden
Chartered Engineer
BEng CEng MIStructE MIEI

CORA
CONSULTING ENGINEERS

lisa.edden@cora.ie

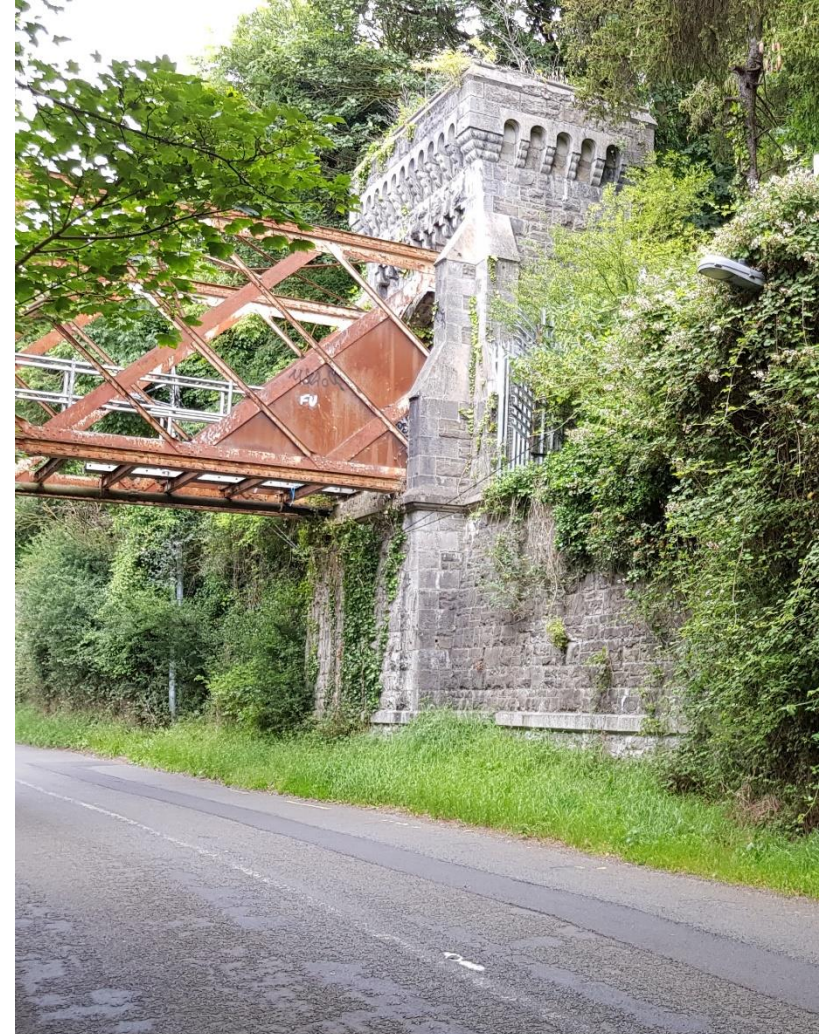
Guinness Bridge- Overview

- Single-span wrought-iron girder bridge over river Liffey, c.1870.
- Built by Guinness family to connect Farmleigh Estate to Palmerstown area.
- 54m long x 4.5 m wide Bridge spans the Liffey and Lower Road
- RPS No 754: Bridge & Bridge Lodge
- Bridge and northern abutment owned by Fingal Co Co – southern lands in private ownership adjoining Waterstown Park



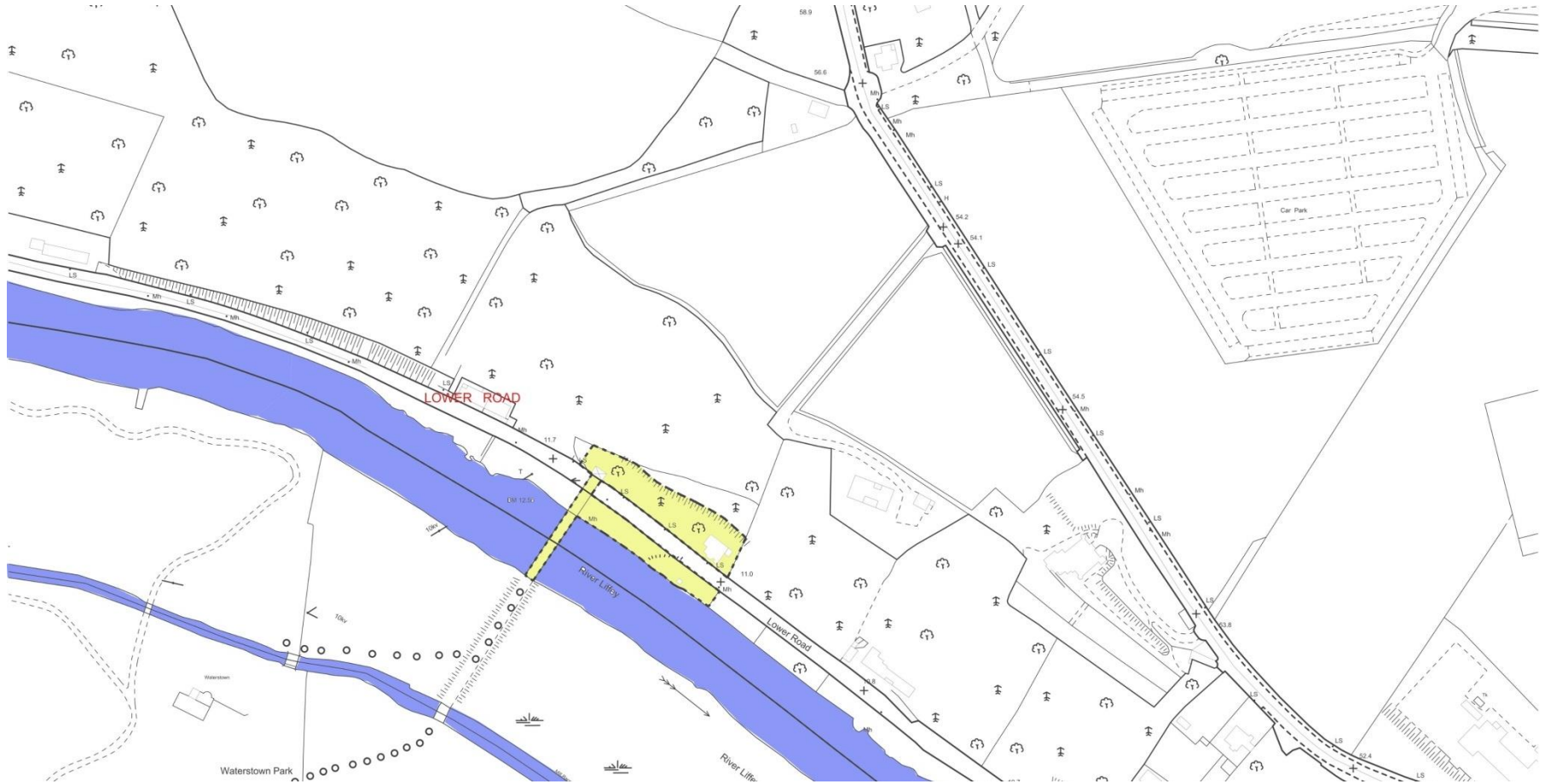
Guinness Bridge- Appraisal

- Conditions surveys were commissioned by FCC in 2006-07 and 2012 to inform safety and protection.
- In 2018 -19 South Dublin County Council sought information from FCC, including proposals for possible reuse.
- In late 2019 CORA Consulting Engineers were appointed (jointly funded by FCC and SDCC) to update previous reports, assess and plan for any urgent works and evaluate possible reuse of bridge.





Guinness Bridge Fingal County Council Landholding



Guinness Bridge- Overview of Site Location



Existing gate at south bank - external view



Existing gate at south bank - internal view with decorative arch visible

CORA Consulting Engineers

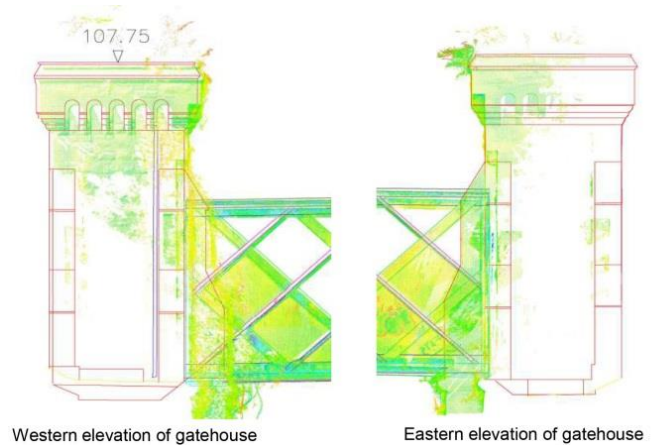
Survey Analysis & Reports

December 2019



Guinness Bridge Survey Report Methodology

- Some limited cutback of vegetation growth on FCC lands completed to allow for better visibility and access
- Drone and laser scans were completed to provide a digital record for comparison with baseline data from previous surveys



- Visual inspection and measurement by CORA engineers
- Desktop review of options for reuse including routes

Guinness Bridge

Key Report Findings

- Deterioration in structural condition was recorded between 2006 and 2019 in particular additional corrosion, and damage to cast-iron bearings and stonework. Paint coating virtually completely lost and notable deterioration to stone abutments on both sides.
- Serious overhaul of the bridge is required to preserve the bridge and abutments as they currently stand.
- **Deterioration is occurring and has reached a critical point.** If not sufficiently addressed in the immediate short term, the extent of repairs will escalate and potentially lead to significant loss of original fabric and more extensive repair contract.

Guinness Bridge Recommendations

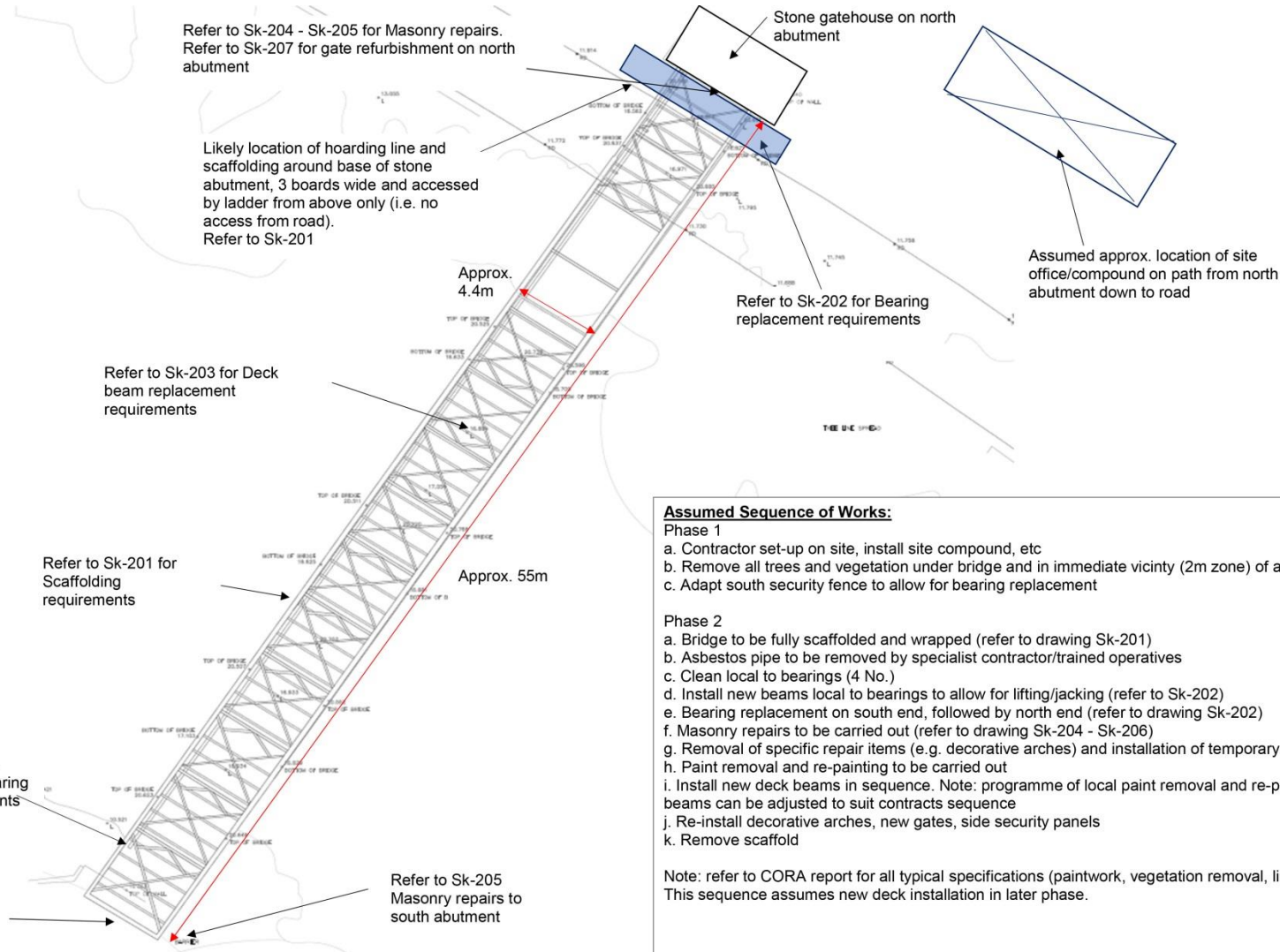
- URGENT- Vegetation containment is required in early 2020.
- At this stage there is no interim paint fix the deterioration has gone too far
- Scaffolding and wrapping of the bridge is required for protection during repair works.
- Replacement of damaged bearings, repair of masonry, new gates and full cleaning and protective coating of wrought iron structure.



Samples of shrink wrapped scaffolded bridges

Guinness Bridge

Overview of proposed works to conserve as is



Assumed Sequence of Works:

Phase 1

- Contractor set-up on site, install site compound, etc
- Remove all trees and vegetation under bridge and in immediate vicinity (2m zone) of abutments
- Adapt south security fence to allow for bearing replacement

Phase 2

- Bridge to be fully scaffolded and wrapped (refer to drawing Sk-201)
- Asbestos pipe to be removed by specialist contractor/trained operatives
- Clean local to bearings (4 No.)
- Install new beams local to bearings to allow for lifting/jacking (refer to Sk-202)
- Bearing replacement on south end, followed by north end (refer to drawing Sk-202)
- Masonry repairs to be carried out (refer to drawing Sk-204 - Sk-206)
- Removal of specific repair items (e.g. decorative arches) and installation of temporary beams
- Paint removal and re-painting to be carried out
- Install new deck beams in sequence. Note: programme of local paint removal and re-painting of beams can be adjusted to suit contracts sequence
- Re-install decorative arches, new gates, side security panels
- Remove scaffold

Note: refer to CORA report for all typical specifications (paintwork, vegetation removal, lime mortar).
 This sequence assumes new deck installation in later phase.

Plan View (extract from CWES drawing 19075-001)

Guinness Bridge proposed works south bank



Existing gate at south bank - internal view with decorative arch visible

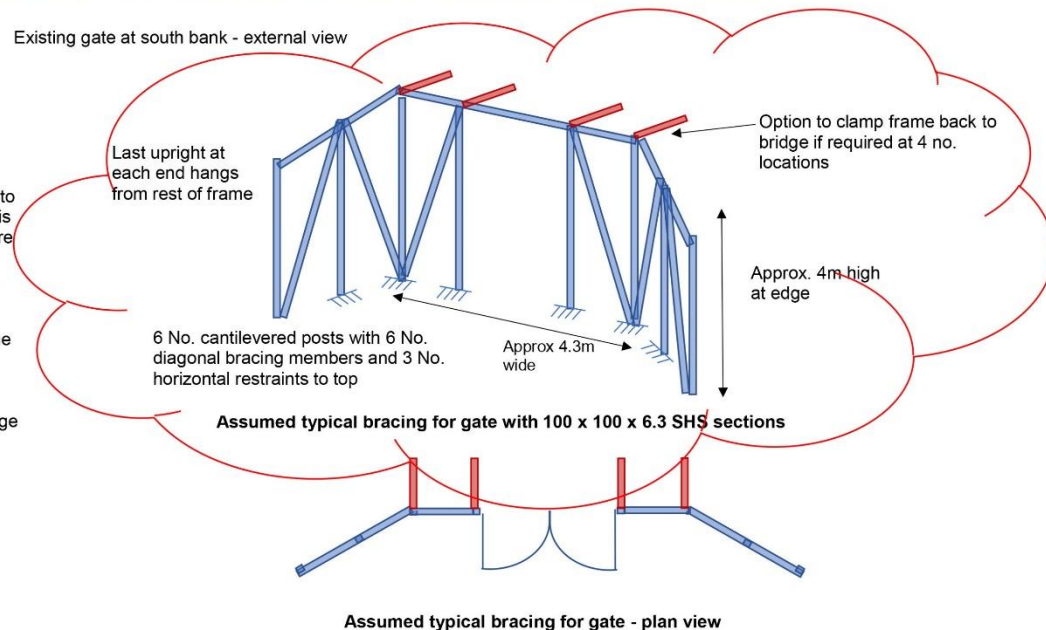


Existing gate at south bank - external view

Assumed sequence of works:

Note: Prior to gate replacement, the decorative arch on the south abutment will need to be repaired. To ensure lateral restraint to each side when the arches are removed, it is likely that a temporary tie will need to be installed from east to west at high level before the arch is removed. The temporary ties must remain in place for the entire time the arches are removed and repaired. It is likely that the original arch material can be cleaned, repaired and repainted by a specialist, before being re-installed.

- Allow for new secure gates on south side to prevent unauthorised access to the bridge and to replace damaged gate
- Allow for new security panels (to match existing) to both sides of gate
- Allow for new standalone galvanised box frame (see assumed shape adjacent) to support new gates with 100 x 100 x 6.3 SHS steel posts and ties, clear of all iron bridge structure



Guinness Bridge

Costs for Conservation

CORA appointed Carron & Walsh Quantity Surveyors to prepare an order of costs based on engineers recommendations

The current Development Budget Estimate for the project is €1,425,000.00 inclusive of VAT and is made up as follows:-

3.01	Preliminaries	506,000.00
3.02	Site Clearance / preparation	42,000.00
3.03	Treat existing steel bridge	143,000.00
3.04	Steelworks to bridge, including replacement of bearings in bridge	213,000.00
3.05	Specialist stone repairs	80,000.00
3.06	North abutment	9,000.00
3.07	South abutment	27,000.00
		<hr/>
3.08	<i>Construction Budget - Excluding VAT</i>	<i>1,020,000.00</i>
3.09	Add: Contingency @ 15% (<i>rounded</i>)	153,000.00
3.10	Add: Inflation until the end of 2020 (<i>rounded</i>)	83,000.00
3.11	Add Value Added Tax (<i>rounded</i>)	169,000.00
		<hr/>
3.12	Construction Budget - Including VAT	1,425,000.00

Guinness Bridge

Costs for Conservation

Carron & Walsh Quantity Surveyors exclusions from the Order of Costs

- Design Team Fees
- Restrictions not identified which may arise during ecological or Environmental Impact Assessment
- Any works to lands outside the immediate abutments and footprint of bridge
- Costs associated with reuse of bridge including new decking, lighting, paths to comply with regulations and additional land acquisitions
- Inflation beyond end of 2020
- Development charges and fees

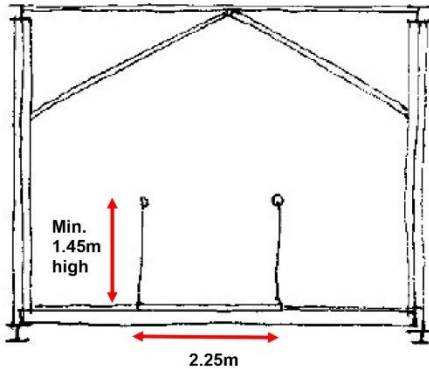


Eastern elevation of gatehouse

Reuse - Feasibility & Challenges

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Guinness Bridge Reuse Option Proposal

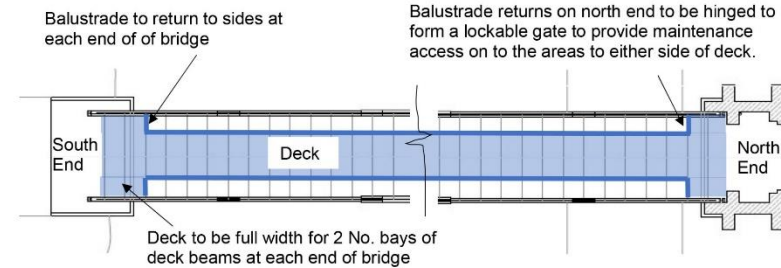


New bridge deck dimensions

As per the 2012 CORA report, a 2m wide deck is the maximum path width that the existing structure can support. According to TII guidelines, 2.25m is the desirable width for low volume traffic with edge constraint (wall/fencing). Refining the loading and assessment of the structure since 2012, and for costing purposes, a maximum deck width of 2.25m is proposed.

New lightweight metal bridge deck

It is proposed to install a new lightweight metal bridge deck for pedestrians/cyclists, e.g. Graepel metal deck. Metal deck to span onto new galvanised steel angles sitting on top of new galvanised deck beams each side of deck, spanning length of bridge (refer to Sk-210 for further details)



Plan at deck level

Balustrade to return to sides at each end of bridge. At north end of bridge, balustrade returns to be hinged to form a lockable gate to provide maintenance access on to the areas to either side of deck.



New balustrade

It is proposed to install a balustrade min. 1.45m high to either side of the deck within the bridge, similar to the bridge above.

It may be necessary to encase the deck and balustrade with netting (Jakob WebNet or similar) to prevent climbing over balustrade, similar to the image to the right.

For proposed details of deck, balustrade and security mesh, refer to Sk-210.



Guinness Bridge Challenges with Reuse

- Bridge wrought iron structure has engineering limitations and can only support a deck width of 2.25m.
- Ecological and Environmental Impact + requirement for EIA
- Lower Road is a narrow road with heavy traffic and introduction of additional pedestrians and cyclist traffic a safety concern.
- Constrained site requiring site purchase for any reuse option
- Agreements with landowner on southern side
- Cost for works: a new deck, safety handrails and mesh enclosure of the bridge, lighting on bridge, formation of approach routes and lighting and signage on approach routes.

Guinness Bridge Current Status

- Report findings presented to Fingal County Council Executive Management Team early 2020
- Report findings presented May 2020 to Local Area Committee in South Dublin County Council.
- Without external funding sources or delivering a strategic connection, the reuse option is not a current priority.
- Fingal Co Co are custodians of the bridge which is a protected structure.
- Fingal Co Co have committed to designing and tendering conservation works to protect the structure at an estimated cost of €1.4m. It is intended that this would be included in the 2021 Capital Programme.

Thank you for listening

Q & A

Lisa Edden
Chartered Engineer
BEng CEng MStructE MIEI

CORA
CONSULTING ENGINEERS

lisa.edden@cora.ie