PUNCH
CONSULTING ENGINEERS
a COWI company

# GPR Survey at Abbey Bridge, Limerick

## Volume A: Works Requirement

**252140-PUNCH-07-XX-SB-CS-0001**

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## Document Control

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# 1 Introduction

This document outlines the conditions of tender and works requirements of PUNCH Consulting Engineers (PUNCH) pertaining to the provision of a Ground Penetrating Radar (GPR) Survey of the main span of the Abbey Bridge located in Limerick city centre.

The primary objective of the GPR Survey is to produce a duct layout of the post tensioned main span of the bridge. It is expected the entire bridge deck will be scanned from the top.



**Figure 1. Abbey Bridge west elevation**

## 1.1 Location

Abbey Bridge is located on the River Abbey in Limerick City Centre, refer Figure 2 and Table 1 below.

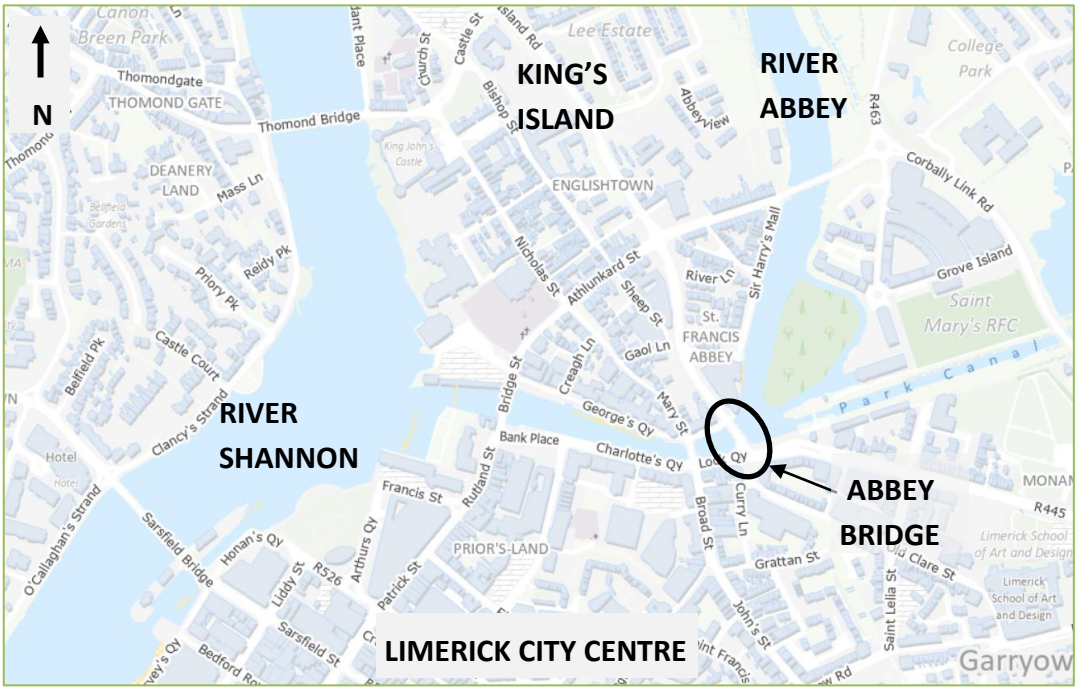



**Figure 2. Abbey Bridge location**

**Table 1. ITM Coordinates**

| Bridge | ITM Coordinates | |
|---|---|---|
| | ITM X | ITM Y |
| Abbey Bridge | 558109 | 657447 |

## 1.2 Bridge Form

For the purposes of this GPR survey, Abbey Bridge is defined as the single span bridge spanning over the River Abbey. The adjacent pedestrian subway to the north is excluded.

Abbey Bridge is a single span bridge with cast-in-situ post-tensioned concrete deck. Approximate plan dimensions are 30m length and 15m width. Total depth from deck soffit to Finished Road Level (FRL) at carriageway crown is 1.2m at bridge midspan. Structural depth is unknown.

The bridge has curved architectural facades, while the deck soffit is planar. The railings between carriageway and footpath are noted to be non-removable.

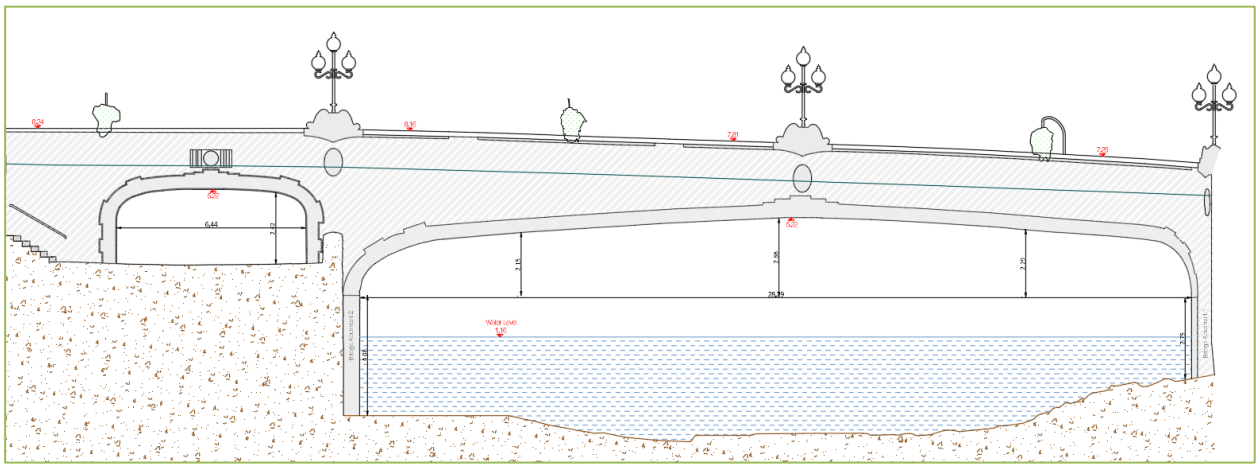


**Figure 3. West elevation including structurally separate pedestrian subway to the north**

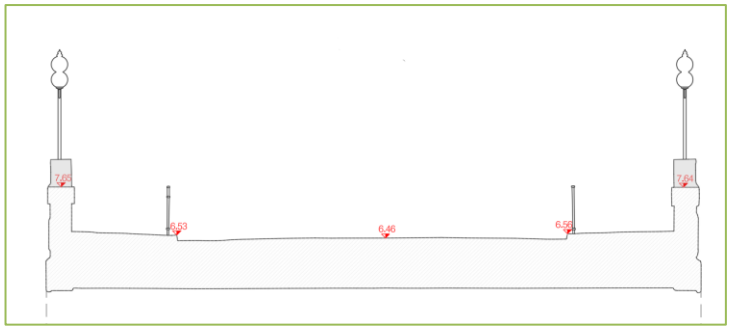


**Figure 4. Cross Section at midspan**



**Figure 5. Showing fixed railings**

# 2 General Requirements

## 2.1 Liaison with Statutory Authorities

The Contractor shall liaise with and comply with all relevant Authorities with regard to gaining access to and occupation of the proposed investigation points and occupying the site for the execution of the survey works.

## 2.2 Traffic Management

The Tenderer shall include in their tender price all costs associated with Traffic Management during the execution of the works. Alternating single lane closures of the bridge are anticipated, the cost of all related licencing/fees is to be borne by the contractor. The Contractor shall provide a project specific Temporary Traffic Management Plan (TTMP) to the Local Authority for approval and manage all communications with relevant stakeholders including the emergency services.

## 2.3 Benchmark and Accuracy

All surveys to be carried out to Malin Head datum and to and Irish Transverse Mercator (ITM) coordinates.

Surveys are to be provided at accuracy band C in accordance with the document 'RICS Measured Surveys of Land Buildings and Utilities (3rd edition)'

## 2.4 Health & Safety

The Contractor shall include in their price all costs associated with conformance with the Safety, Health and Welfare at Work Act 2005 and any subsequent Safety, Health and Welfare legislation, including the requirement to have a company Safety Statement.

The successful Contractor will be appointed Project Supervisor for the Construction Stage (PSCS) in accordance with the Safety, Health and Welfare at Work (Construction) Regulations.

The Contractor shall be required to complete a risk assessment of the proposed works in advance of commence works on site. A copy of this risk assessment shall be submitted to PUNCH in advance of commencing works on site.

## 2.5 Particular Site Constraints

In preparation of the tender the Tenderer shall visit the Survey Site and satisfy themselves as to any site-specific constraints, restrictions, hazards, or access requirements that may affect the execution of the works. The following Particular Risks are known to exist within the survey site:

- Works which put persons at risk of falling from a height
- Works near high voltage power lines
- Works exposing persons to the risk of drowning
- Works involving management and accommodation of road users including pedestrian, cyclist, vehicular
- Bridge carries public vehicular roadway

# 3 GPR Survey

## 3.1 Scope and Specification

GPR is used as an umbrella term for any non-destructive scan method. The GPR shall determine:

1. Reduced Level (RL) of top of concrete on bridge deck.
2. Arrangement of longitudinal ducts containing post-tensioning strands. This will require full coverage scan of the bridge deck as the ducts may drape longitudinally. It is accepted the scan may not be able to determine the presence or absence of grout nor of strands within the ducts.
3. The locations of the strand anchorages, anticipated to be at the ends of the ducts.
4. The presence or absence of void formers in the concrete.
5. The arrangement of all standard reinforcing bars within the bridge deck. It is accepted that destructive investigations may be recommended to calibrate the diameter of the bars, such destructive investigations are not included in this tender but may be procured at a later date.

## 3.2 Deliverables required

### 3.2.1 Survey Report

It is a requirement of this project that processing is completed to allow a report to be issued to the Employer's Representative within two weeks of the completion of site works. The survey report shall include the following:

- Introduction including a description of the site and purpose of the survey
- Description of survey equipment and methodology employed
- Data acquisition summary including date(s) of survey, weather conditions etc.
- Remarks on projected accuracy of results given site conditions
- Details of data processing procedures including quality checks
- Conclusion and Recommendations.

### 3.2.2 Drawings

Post-processed drawings of the survey findings are required in AutoCAD and pdf format. The number and layout of drawings shall be as required to clearly illustrate the requirements of Section 3.1.

## Appendix A PUNCH Risk Assessment

| No. | Hazard identified (SCHEDULE 1 PARTICULAR RISKS) | Applicable to project? | | Who is at risk? | | | Can it be | | Using "Principles of Prevention" what action is proposed to either <u>eliminate</u> or <u>control</u> risk? | Refer risk information onwards to: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Yes | No | | Yes | No | Eliminated | Controlled | | |
| 1 | Works which put persons at risk of falling from a height | ✓ | | Contractor | ✓ | | | ✓ | Contractor to have undertaken appropriate training on fall prevention | Contractor |
| | | | | Public | | ✓ | | | | |
| | | | | Maintenance | | ✓ | | | | |
| 2 | Working near high voltage power lines | ✓ | | Contractor | ✓ | | | ✓ | Contractor to positively confirm presence or absence of high voltage power lines | Contractor |
| | | | | Public | | ✓ | | | | |
| | | | | Maintenance | | ✓ | | | | |
| 3 | Works exposing persons to the risk of drowning | ✓ | | Contractor | ✓ | | | ✓ | Contractor to develop project specific approach to safety in proximity to water | Contractor |
| | | | | Public | | ✓ | | | | |
| | | | | Maintenance | | ✓ | | | | |
| 4 | Works involving management and accommodation of road users including pedestrian, cyclist, vehicular | ✓ | | Contractor | ✓ | | | ✓ | Contractor to prepare and execute detailed TTMP considering all road users as well as Contractor's own operatives | Contractor |
| | | | | Public | | ✓ | | | | |
| | | | | Maintenance | | ✓ | | | | |
| 5 | | | | Contractor | | | | | | |
| | | | | Public | | | | | | |
| | | | | Maintenance | | | | | | |