Cork City Council

Harley Street Pedestrian/Cycle Bridge

Pre Planning Application Coordination Package

Environmental Screening

Job Number: 253690-00

ARUP

Environmental Impact Assessment

Screening Report

Cork City Council

Harley Street Pedestrian/Cycle Bridge

Cork City Council

Harley Street Bridge

Environmental Impact Assessment – Information Required for Screening

253690-00/EIA/R2

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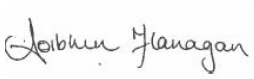
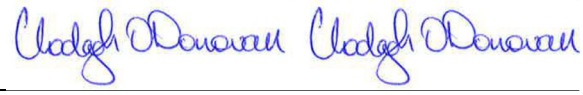
		Signature			
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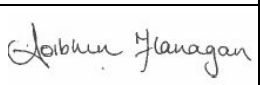
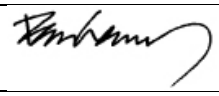
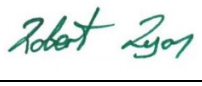
		Signature			
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1 Introduction

Arup has been appointed by Cork City Council (CCC) to prepare an Environmental Impact Assessment (EIA) screening report for the proposed Harley Street pedestrian/cycle bridge, hereafter referred to as the proposed development. The proposed development would be located over the River Lee between Brian Boru Bridge and St Patrick's Bridge in Cork's city centre.

This EIA screening report contains necessary information to enable the competent authority, in this case CCC, to undertake an EIA screening assessment and determine whether an EIA is required to support the proposed development. The findings of the EIA screening assessment are presented in this report.

It is the view of Arup that an EIA would not be required for the proposed development as construction and operation is unlikely to result in any significant effects on the environment.

2 Legislation and guidance

2.1 Introduction

This section describes the relevant European, national and local legislation for this EIA screening report.

2.2 Overview

The current requirements for EIA are set out by the European Union in Council Directive 2011/92/EU, as amended 2014/52/EU (EIA Directive). This legislation guides member states on the assessment of the effects of certain public and private projects on the environment.

The EIA Directive is in the process of being transposed into Irish legislation. In Ireland, the requirements for EIA in relation to planning consents are specified in Part X of the Planning and Development Act, 2000, as amended and in Part 10 of the Planning and Development Regulations, 2001, as amended. A review of this legislation was undertaken for the purpose of this EIA screening report.

The following guidance and consultation documents have also been considered during the preparation of this report:

- Department of the Environment, Community and Local Government (2013) *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*;
- Department of the Environment, Heritage and Local Government (2003) Environmental Effect Assessment (EIA) *Guidance for Consent Authorities regarding Sub-threshold Development*;
- Department of Housing, Planning, Community and Local Government (2017) *Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems*; and
- Department of Housing, Planning, Community and Local Government (2017) *Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive): Advice on the Administrative Provisions in Advance of Transposition*.
- Environmental Protection Agency (2002) *Guidelines on the Information to be contained in Environmental Impact Statements*;
- Environmental Protection Agency (2015) *Revised Guidelines on the Information to be contained in Environmental Impact Statements (Draft September 2015)*;
- Environmental Protection Agency (2003) *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements*;
- Environmental Protection Agency (2015) *Advice Notes for Preparing Environmental Impact Statements Draft September 2015*; and
- European Commission (2001) *Guidance on EIA Screening*.

2.3 Mandatory EIA

2.3.1 EIA Directive

The EIA Directive sets out the requirements of the EIA process, including screening the need for an EIA. Projects listed in Annex I of the EIA Directive require a mandatory EIA whilst projects listed in Annex II require screening to determine as to whether an EIA is required. The proposed development does not require a mandatory EIA under the provisions of the EIA Directive as it does not meet the development criteria outlined in Annex I and therefore a mandatory EIA is not required.

The proposed development may be classified as an 'urban development' under the provisions of Annex II and therefore assessment is required to determine the need for an EIA, i.e. through this screening report.

Articles 4(4) and 4(5) of the EIA Directive set out the requirements for EIA screening of Annex II projects as follows:

> *"4(4) Where Member States decide to require a determination for projects listed in Annex II, the developer shall provide information on the characteristics of the project and its likely significant effects on the environment. The detailed list of information to be provided is specified in Annex IIA. The developer shall take into account, where relevant, the available results of other relevant assessments of the effects on the environment carried out pursuant to Union legislation other than this Directive. The developer may also provide a description of any features of the project and/or measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment.*
>
> *4(5) The competent authority shall make its determination, on the basis of the information provided by the developer in accordance with paragraph 4 taking into account, where relevant, the results of preliminary verifications or assessments of the effects on the environment carried out pursuant to Union legislation other than this Directive. The determination shall be made available to the public and:*
>
> *(a) where it is decided that an environmental effect assessment is required, state the main reasons for requiring such assessment with reference to the relevant criteria listed in Annex III; or*
>
> *(b) where it is decided that an environmental effect assessment is not required, state the main reasons for not requiring such assessment with reference to the relevant criteria listed in Annex III, and, where proposed by the developer, state any features of the project and/or measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment."*

Annex IIA of the EIA Directive outlines a number of criteria that identify the information required from the developer to enable the competent authority to determine the need for an EIA. Table 1 identifies the criteria outlined in Annex IIA and demonstrates where these requirements have been addressed in this screening report.

Table 1: Information to be provided by the developer for the purpose of screening

Annex IIA requirements	Relevant section of this screening report
1. A description of the project, including in particular: (a) a description of the physical characteristics of the whole project and, where relevant, of demolition works; (b) a description of the location of the project, with particular regard to the environmental sensitivity of geographical areas likely to be affected.	Section 3 Section 4
2. A description of the aspects of the environment likely to be significantly affected by the project.	Section 4 and Section 5
3. A description of any likely significant effects, to the extent of the information available on such effects, of the project on the environment resulting from: (a) the expected residues and emissions and the production of waste, where relevant; (b) the use of natural resources, in particular soil, land, water and biodiversity.	Section 5

Discretion is given to member states in determining the need for an EIA, in respect of Annex II projects, therefore relevant Irish legislation and associated guidance is pertinent for this EIA screening report.

2.3.2 Planning and Development Act, 2000, as amended

As noted in Section 2.2, the current requirements for EIA in Ireland are outlined in Part X of the Planning and Development Act, 2000, as amended and in Part 10 of the Planning and Development Regulations, 2001, as amended.

Section 172 (1) of the Planning and Development Act, 2000, as amended states:

> *"Where a planning application is made in respect of a development or class of development referred to in regulations under section 176 , that application shall, in addition to meeting the requirements of the permission regulations, be accompanied by an environmental impact statement."*

The prescribed classes of development and thresholds that trigger the need for an EIA are set out in Schedule 5 of the Planning and Development Regulations, 2001, as amended. A review of the classes of development was carried out to determine whether the proposed development falls into any of the development classes which require an EIA.

It has been determined that the proposed development does not meet any of the classes described in Schedule 5 of the Planning and Development Regulations, 2001. The need for an EIA has therefore not been triggered under the requirements of the Planning and Development Regulations, 2001, as amended.

2.3.3 Roads Act

The Roads Act, 2007 as amended sets out the need to undertake EIA for road development, including new bridges and tunnels. Under Section 9 (1)(a) of the Roads Act, 2007 as amended:

> *"a road authority or the Authority shall prepare a statement of the likely effects on the environment ("Environmental Impact Statement") of any proposed road development consisting of;*
>
> *(i) the construction of a motorway,*
>
> *(ii) the construction of a busway,*
>
> *(iii) the construction of a service area, or;*
>
> *(iii) any prescribed type of proposed road development consisting of the construction of a proposed public road or the improvement of an existing public road."*

The thresholds that trigger the need for a mandatory EIA are set out in Part 5 of the Road Regulations, 1994:

> *"The prescribed types of proposed road development for the purpose of subsection (1)(a)(iii) of Section 50 of the Act shall be—*
>
> *(a) the construction of a new road of four or more lanes, or the realignment or widening of an existing road so as to provide four or more lanes, where such new, realigned or widened road would be eight kilometres or more in length in a rural area, or 500 metres or more in length in an urban area;*
>
> *(b) the construction of a new bridge or tunnel which would be 100 metres or more in length."*

The proposed development is a new bridge that would be 66m in length and therefore does not exceed the threshold for an EIA specified in the Roads Regulations, 1994.

2.4 Sub-threshold development

2.4.1 Overview

There is a requirement to undertake EIA for sub-threshold development where it is considered likely that the development would have 'likely significant effects' on the environment. The consideration of 'likely significant effects' should take into account the size, nature and location of a development. The information provided herein, to allow an assessment of the 'likely significant effects' to be undertaken, is in accordance with Annex IIA of the EIA Directive as described in Table 1.

2.4.2 European guidance

An examination has been made as to whether the proposed development would or would not, individually and in combination with other developments, be likely to have significant effects on the environment. This has been undertaken with reference to the criteria set out in Annex III of the EIA Directive. Annex III sets out the following criteria to determine whether sub-threshold developments should be subject to an EIA.

Table 2: Criteria for determining whether a development is likely to have significant effects on the environment (i.e. Annex III of the EIA Directive)

1. Characteristics of the project
The characteristics of projects must be considered, with particular regard to:
(a) the size and design of the whole project;
(b) cumulation with other existing and/or approved projects;
(c) the use of natural resources, in particular land, soil, water and biodiversity;
(d) the production of waste;
(e) pollution and nuisances;
(f) the risk of major accidents and/ or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge;
(g) the risks to human health (for example due to water contamination or air pollution).
2. Location of projects
The environmental sensitivity of geographical areas likely to be affected by projects must be considered, with particular regard to:
(a) the existing and approved land use;
(b) the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground;
(c) the absorption capacity of the natural environment, paying particular attention to the following areas: (i) wetlands, riparian areas, river mouths; (ii) coastal zones and the marine environment; (iii) mountain and forest areas; (iv) nature reserves and parks; (v) areas classified or protected under national legislation; Natura 2000 areas designated by Member States pursuant to Directive 92/43/EEC and Directive 2009/147/EC; (vi) areas in which there has already been a failure to meet the environmental quality standards, laid down in Union legislation and relevant to the project, or in which it is considered that there is such a failure; (vii) densely populated areas; (viii) landscapes and sites of historical, cultural or archaeological significance.
3. Type and characteristics of the potential effect
The likely significant effects of projects on the environment must be considered in relation to criteria set out in points 1 and 2 of this Annex, with regard to the effect of the project on the factors specified in Article 3(1), taking into account:
(a) the magnitude and spatial extent of the effect (for example geographical area and size of the population likely to be affected);
(b) the nature of the effect;

(c) the transboundary nature of the effect;
(d) the intensity and complexity of the effect;
(e) the probability of the effect;
(f) the expected onset, duration, frequency and reversibility of the effect;
(g) the cumulation of the effect with the effect of other existing and/or approved projects;
(h) the possibility of effectively reducing the effect

2.4.3 Irish guidance

The Guidance for Consent Authorities regarding Sub-threshold Development from the Department of the Environment, Heritage and Local Government provides guidance on the determination of likely 'significant effects' of a development in Ireland by way of criteria that aligns with EU policy. These criteria have been transposed into Irish legislation through the Third Schedule of the European Communities (Environmental Impact Assessment) (Amendment) Regulations (S.I. No. 93 of 1999) and Schedule 7 of the Planning and Development Regulations 2001, as amended.

The criteria in Schedule 7 of the regulations are grouped under the following three headings which are individually addressed in the following sections:

(i) Characteristics of proposed development (Section 3);

(ii) Location of proposed development (Section 4); and

(iii) Characteristics of potential effects (Section 5).

At the time of preparation of this report, the EIA Directive has not been transposed into Irish legislation and the criteria outlined in Schedule 7 of the guidance are based on the older EIA Directive (2011/92/EU). The most recent amendments to the EIA Directive has updated Annex III and included Annex IIA, therefore this screening report has prioritised the requirements of the EIA Directive (rather than older Irish guidance) in advance of transposition into Irish legislation.

3 The proposed development

3.1 Introduction

This section describes the physical characteristics of the proposed development with particular regard to the design, construction and operational elements of relevance to this EIA screening report.

3.2 Overview

It is proposed to develop a new single span bridge that would traverse the northern channel of the River Lee in central Cork city between the existing Brian Boru and St Patrick's bridges. The proposed development would extend for 66 metres (m), extending south from, and on axis with, Harley Street (as illustrated in Figure 1). The proposed development would incorporate ramps to ensure accessibility and benches in the central spine to encourage visitors to sit and enjoy the views of the River Lee from this central location.

Figure 1: The proposed development

The proposed development would serve pedestrians and cyclists crossing between St Patrick's Quay and Merchant's Quay and tie in with the existing transport network. The design would be sympathetic to the surrounding environment as well as the Lower Lee Flood Relief Scheme (FRS) works proposed by the Office of Public Works (OPW) on the adjoining quay walls.

3.3 Design elements

3.3.1 Scale, form and massing

The proposed development would comprise a shallow arched single span bridge approximately 66m in length. The cantilever design would incorporate an arched steel box girder and soffit shaped with a gentle semi-elliptical form across the water enabling a complete elliptical reflection on the water on a clear, calm day. There would be no piers required in the River Lee as the bridge would be supported by the abutments located behind the quay walls.

The centreline of the bridge would be centrally aligned on axis with Harley Street to optimise sight and desire lines from the proposed development leading up towards MacCurtain Street in the Victorian Quarter. There would be two shared paths on either side of the central spine beam and the width of the bridge would increase towards the centre to accommodate benches. Each of the paths would be 2.70m wide at the abutments, increasing to 3.60m wide at mid-span.

Figure 2: Visualisation of the proposed development

3.3.2 Landing areas, abutments and access

The proposed development would land on the existing quay walls and the ramps would be developed within the pavement of the existing footpaths. Orientated at right angles to the existing quay walls and parallel to the existing bridges, the position and orientation of the bridge would complement its surroundings. On the northern banks, the bridge would land immediately south of Harley Street on St Patrick's Quay whilst the southern landing would be approximately 30m west of Parnell Place on Merchant's Quay.

The existing level of the wall on St Patrick's Quay is approximately +2.85m above Ordnance Datum (mOD). The proposed development would set the bridge

abutment at +3.17mOD and provide flood defences for the River Lee as outlined in Section 3.3.5.1. The bridge would be accessed via fully compliant 1:20 ramps extending for approximately 6.4m along St Patrick's Quay in the short term until the Lower Lee FRS works are complete. The northern landing would incorporate a signalised traffic junction to facilitate movement across St Patrick's Quay.

The existing level of the wall on Merchant's Quay is marginally lower than the northern side at +2.75mOD, however the proposed FRS works and abutments would correspond with the proposals noted above. The abutments would also be set at +3.17mOD and accessed via fully compliant 1:20 ramps extending for approximately 8.4m along Merchant's Quay in the short term until the Lower Lee FRS works are complete. A barrier would be provided on the southern landing to prevent cyclists from merging with traffic on Merchant's Quay.

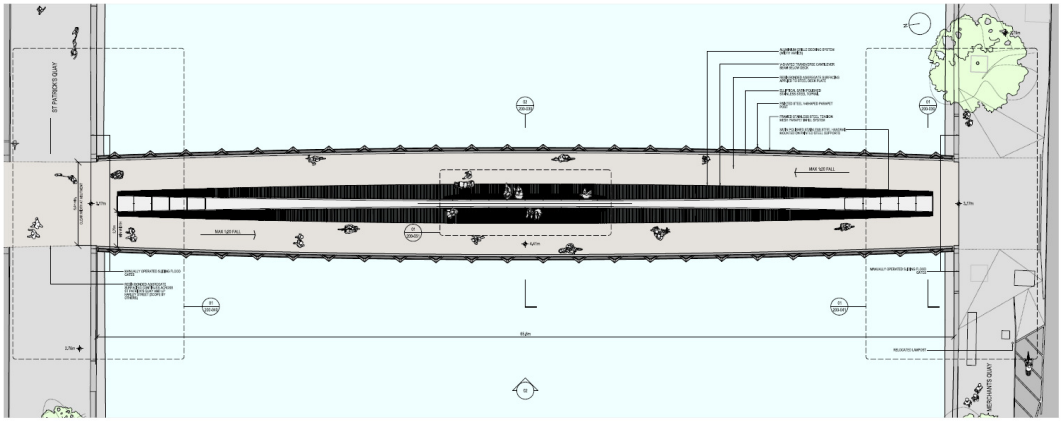

Figure 3: Proposed bridge plan and landings (not to scale)

3.3.3 Geotechnics

The proposed development would incorporate the foundation arrangement outlined in Figure 4 and Figure 5. The bridge abutments would be supported by eight auger piles located approximately 1.5m behind the existing timber toe piles in the quay walls. As outlined in Section 3.4.4, piling and excavation would be undertaken to a depth -0.5mOD and would not penetrate the bedrock and is unlikely to reach the groundwater table which lies between -0.5mOD and -0.9mOD.

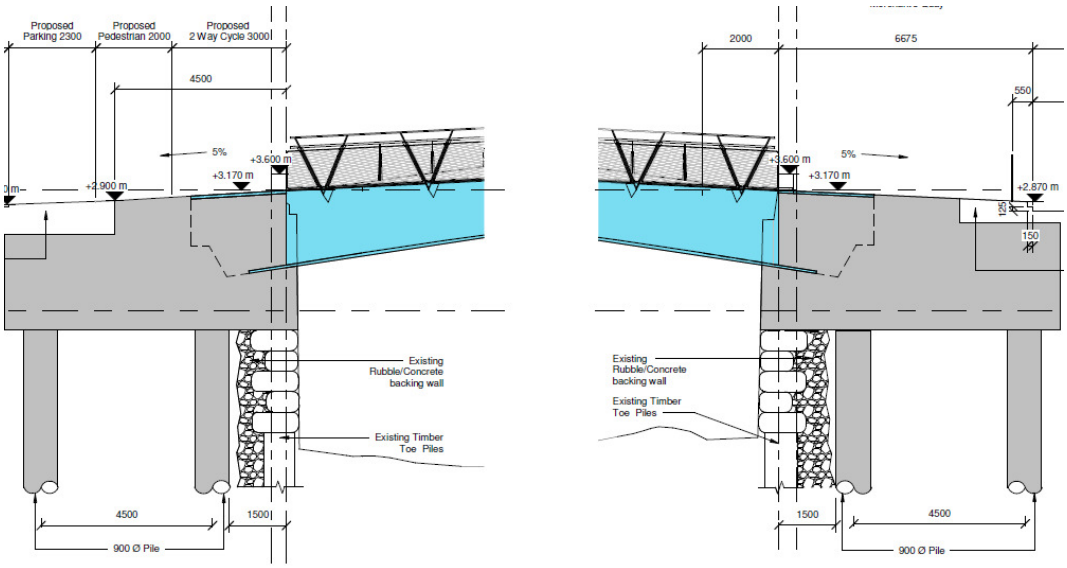

Figure 4: Preliminary foundation elevation (not to scale)

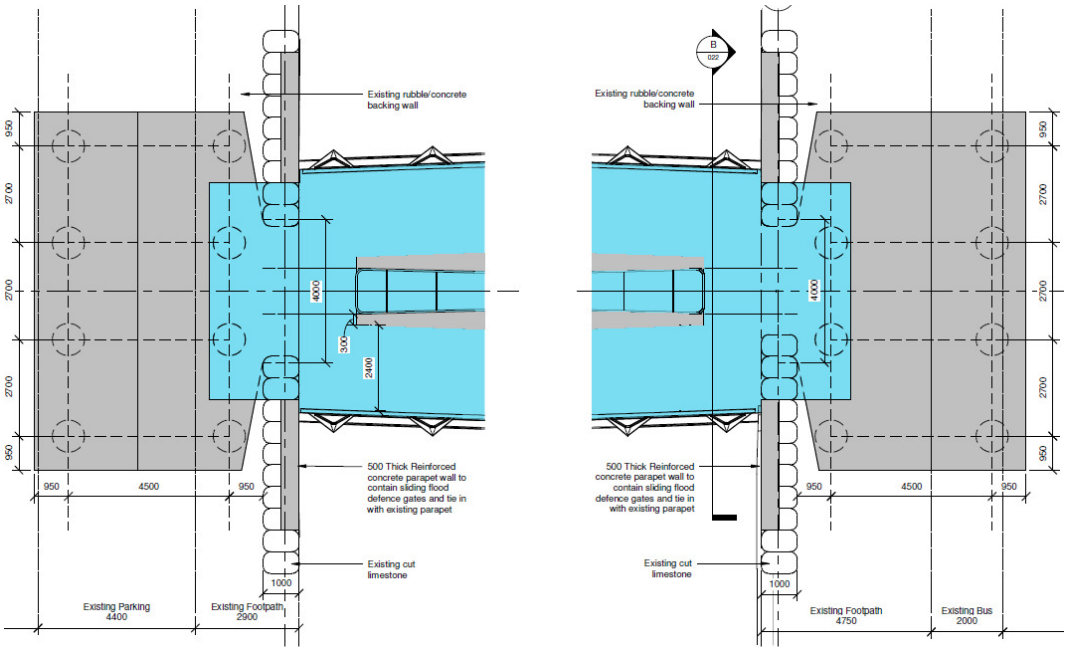

Figure 5: Preliminary foundation plan (not to scale)

3.3.4 Aesthetics

3.3.4.1 Lighting

The proposed development would incorporate functional and feature lighting to optimise safety in design and aesthetics as illustrated in Figure 6. All light fittings would be appropriate for the outdoor environment and rated IP66 or above.

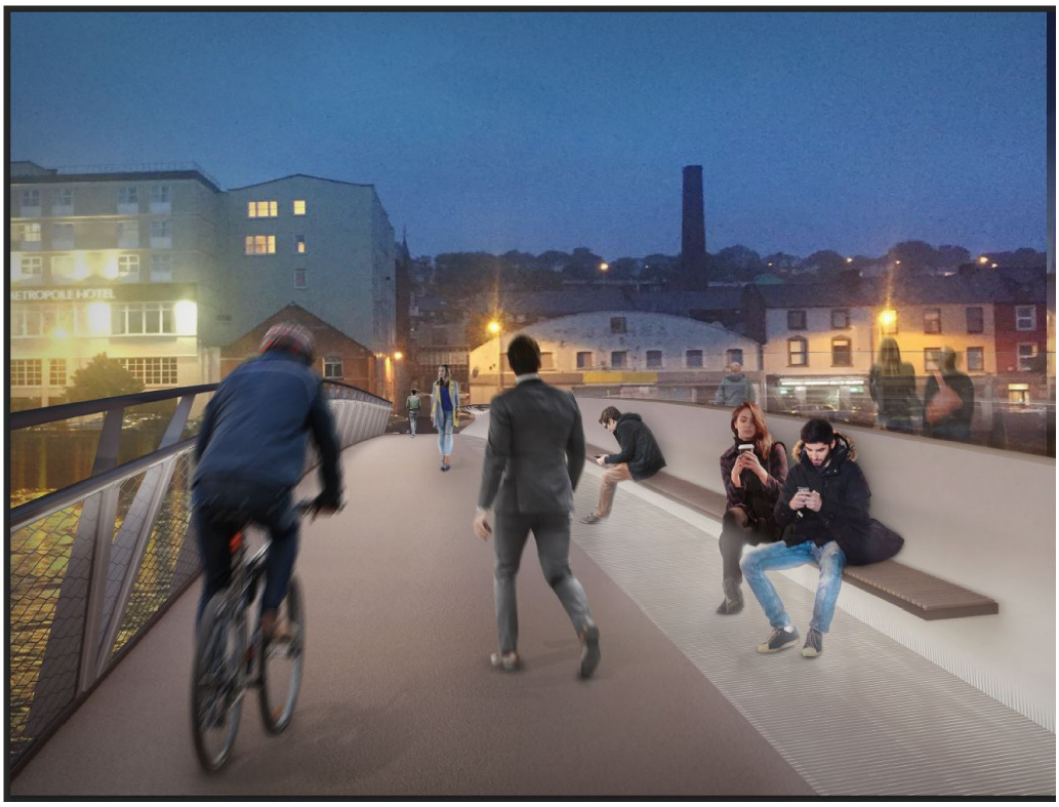

Figure 6: Night time visualisation of the proposed development

Functional lighting would be provided by discrete point source LED fittings recessed into the handrails at the edge of the bridge deck. This would introduce light across the bridge deck and provide a safe environment for users during the hours of darkness.

Feature lighting would be used to highlight the primary structural spine beam running centrally down the length of the bridge deck and improve the aesthetics of the bridge during the hours of darkness. The LED fittings would be mounted just below deck level to introduce a soft glow of light up the surface of the beam.

3.3.4.2 Surfacing

The surface of the bridge deck would be a resin bonded aggregate system with a central aluminium decking grille running through the centre. Colour contrast and texture would distinguish the surfaces on the bridge deck.

The aggregate system would provide a non-slip walking surface and waterproof layer over the steel bridge deck. The grille would provide a visual contrast indicating a central zone for slower movement whilst diverting those travelling at higher speeds (e.g. cyclists) away from the benches. The grille would also indirectly facilitate light penetration through the bridge deck during the hours of darkness and wash a soft light across the face of the central primary structure.

3.3.4.3 Rails and parapets

The proposed development would comprise an array of painted carbon steel flats in a V-shaped arrangement directed upwards to support two rails along the length of the bridge as illustrated in Figure 7. The posts would incline inwards and rise up to support a handrail and cycle rail at 1.1m and 1.4m above the bridge deck respectively.

Stainless steel tension mesh parapets would be provided along the length of the bridge. The tension mesh may be provided as panels or as a continuous run and it would be designed optimise transparency, passive lighting and reduce opportunities for climbing the bridge.

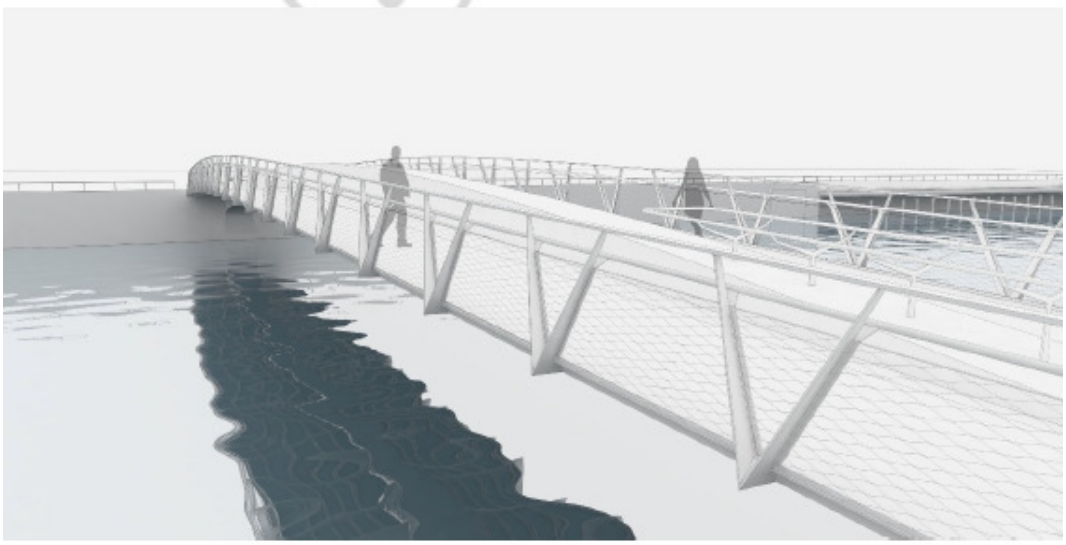

Figure 7: Proposed railings and parapets

3.3.5 Climatic considerations

3.3.5.1 Flood defence

The proposed development is located in an area with a long history of flooding and the design is cognisant of this flood risk and appropriate flood protection requirements. Specifically, the proposed development has been designed to accommodate the Lower Lee FRS and provide appropriate protection on the bridge deck from the 1 in 100 year fluvial and 1 in 200 year tidal flood events.

As noted in Section 3.3.2, the bridge deck level at the abutment would be +3.17mOD, therefore flood defences would be required as part of the proposed development to satisfy the error allowance or freeboard requirements. The flood defence would include a deployable flood barrier/flood gate at the northern and southern ends of the bridge deck.

The flood gate would comprise sliding gates recessed into the quay walls that can be slid into position and connected via a central post as required. It is envisaged that City Council officials would close the bridge and deploy the flood barrier prior to the onset of a flood event. The flood defence would be capable of raising to 450mm in order to accommodate freeboard.

3.3.5.2 Weather protection

There would be a localised glaze screen incorporated at the mid-span of the bridge to offer protection for patrons using the benches during inclement weather conditions. The screen would be approximately 1.6m above the level of the deck to provide shelter for those sitting down on the benches as illustrated in Figure 8.

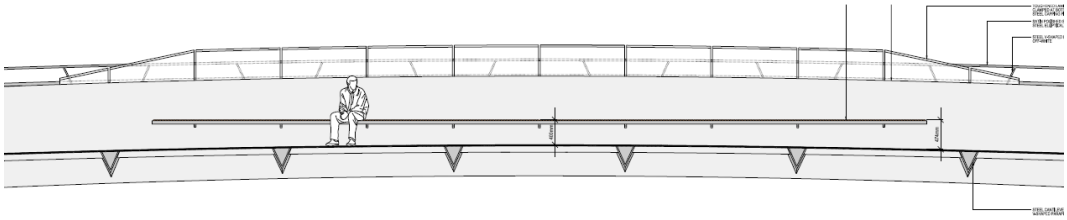

Figure 8: Proposed glazed screen around the benches at the mid-span (not to scale)

3.4 Construction elements

3.4.1 Overview

The construction methodology for the project would be finalised upon the completion of the detailed design and appointment of the contractor. At this stage, it is envisaged that construction is likely to commence in February 2018 and be completed by April 2019. The general activities to be carried out during construction would occur in sequence as outlined in Figure 9.

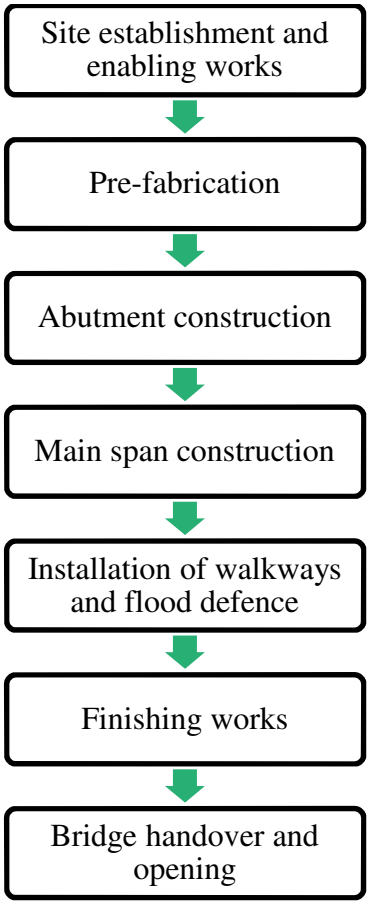

Figure 9: Indicative construction phasing

3.4.2 Site establishment and enabling works

The appointed contractor would be responsible for preparing and seeking approval for the relevant documentation prior to mobilisation on site. This would include the traffic management plan, construction environmental management plan and health and safety plan. Additionally, consent would be required from the OPW under Section 50 of the EU (Assessment and Management of Flood Risks) Regulations SI 122 of 2010 and Section 50 of The Arterial Drainage Act, 1945. The contractor would be required to prepare works programmes and method statements that provide a more detailed breakdown of the phasing of the construction works. It has been assumed that the contractor would apply best practice measures and construction would be undertaken with due regard to relevant environmental and health and safety legislation.

Site establishment would comprise the clearance of the landside portion of the site, erection of hoarding, removal of the bus stop on Merchant's Quay, installation of traffic management signage and barriers and the provision of appropriate welfare facilities, security measures around the site perimeter.

At this stage, it is likely that the construction compound(s) would be located on the quays within the site on both sides of the River Lee. The site would be 10m wide and 20m in length from the bridge abutments as illustrated in Figure 10. This would require the temporary removal of the bus lanes on Merchant's Quay and parking bays on St Patrick's Quay.

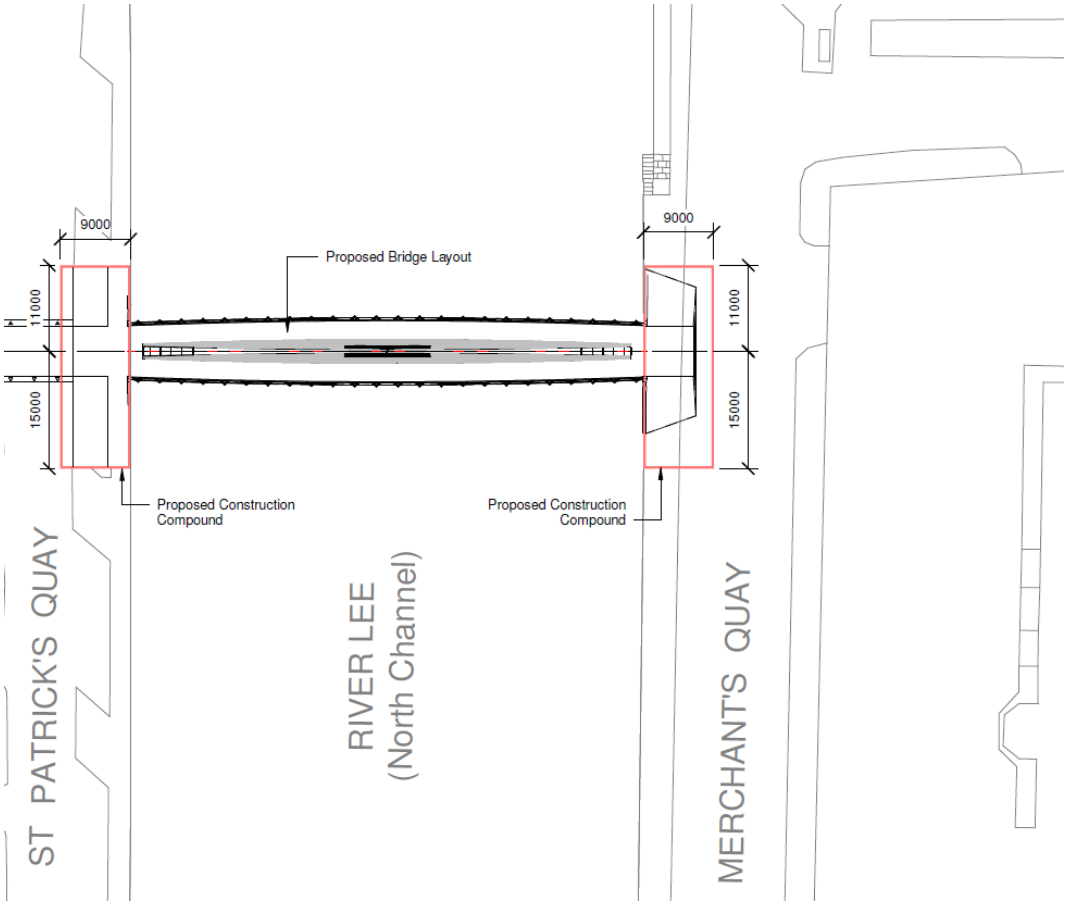

Figure 10: The proposed site layout during construction

No demolition works are envisaged as part of the proposed development and the majority of construction would occur behind the existing quay walls. The construction works areas would be enclosed behind both quay walls and a temporary sheet pile or equivalent on the river side of the quay wall. Further, the existing pavements and road networks would be retained and the area required for the ramps would be minimised.

3.4.3 Pre-fabrication

It is proposed that key elements of the bridge superstructure would be pre-fabricated off site. The central spine beam would consist of three steel sections. The central section would be fabricated off site, transported to Anderson or Penrose Quay and subsequently transferred to the site via water borne vessel that would float on the River Lee to avoid impacts on fauna passing through the site. The outer spans would be constructed in situ. This would reduce the need for Heavy Goods Vehicles (HGVs) accessing the site via the city centre road network.

3.4.4 Abutment construction

A three-sided cofferdam would be installed and sheet piling retaining wall would be erected on each of the quays to support the construction of the bridge abutments. A temporary piling platform would be installed to facilitate eight flight auger piles on each of the quays. Fluid stabilisation would not be used. A pump would be installed within the cofferdam enclosure to maintain a dry working

environment and the water would be pumped either back to the river or into the main surface water drainage system.

Excavation would be undertaken to a depth of -0.5 mOD (approximately 3.3m below ground level) within the sheet pile cofferdam. The quay wall would be broken down locally to allow the beam to slot in and a temporary shutter would be installed. It should be noted that the existing cut limestone blocks from the quay wall would be retained for reuse.

The reinforcement for the abutments would be fixed to allow the first span of the spine to be held in place by temporary steel frame support. The concrete pile cap would be cast, cladding would be installed around the exposed concrete face and pressure grouting would be undertaken behind the quay wall to provide reinforcement. The abutments would be constructed behind the quay walls in the cofferdam and the outer spans of the bridge would be lifted onto the abutment seating plate immediately afterwards. All construction debris would be enclosed within this area and removed prior to removal of the temporary sheet piling.

The construction of the abutments would require extensive traffic planning and management along St Patrick's and Merchant's quays. It is likely that the bus lanes on Merchant's Quay and parking bays on St Patrick's Quay would be removed temporarily to facilitate the construction of the abutments. It is likely that some of those works may occur during night time to minimise impacts on the traffic network. All night time works would be agreed in advance and advertised in advance in order to minimise nuisance for stakeholders.

3.4.5 Main span construction

The central spine beam would consist of three steel sections that provide the main span of the bridge. The outer segments of the spine beam would be lifted onto the abutment seating plate by mobile cranes located on each of the quays. As outlined in Section 3.4.3, the central span would be prefabricated and transported to the site on barges. The central span would be lifted into place from the floating barge via a hoist located on the tips of the abutment sections.

All welding would be undertaken within fully encapsulated enclosure(s) and all debris would be removed prior to the disassembly of the cofferdam enclosure. Disturbance to silt in the river bed during piling cannot be fully eliminated, however strict construction methodology specifications will be outlined to lessen discharge during the removal of the cofferdam and the tidal cycle of the river will ensure negligible impacts on the River Lee.

The construction of the main span would be carried out during the night time to allow for partial road closures along St Patrick's and Merchant's quays. The construction of the central span would be dependent on the tides. Appropriate traffic management measures would be put in place and advance notice to stakeholders would be provided to minimise nuisance.

3.4.6 Installation of walkways and flood defence

Once the abutments and bridge span are in place, the decking and surfacing for the cantilever walkways, the flood gates and parapets would be installed from platforms supported by the central spine beam. In parallel to these works the

ramps from street level on the quays would be installed to tie the proposed development in with the surrounding public realm. This would incorporate the provision of the signalised junction on St Patrick's Quay.

3.4.7 Finishing works

Upon completion of the bridge construction the final design elements would be installed on the bridge including surfacing finishes, landscaping, and lighting. Once construction is complete the site would be cleaned up. This would include the removal of all plant and equipment, site hoarding, waste materials and reinstatement of the site to ensure seamless tie in between the proposed development and the surrounding environment.

3.4.8 Bridge handover and opening

Upon completion of construction and clean up on the site, the proposed development would be handed over to CCC, commissioned and opened to the general public. At this stage, it is likely that the proposed development would opened by April 2019.

3.5 Operational elements

The proposed development would operate as a two way bridge for pedestrians and cyclists from April 2019 onwards. The bridge would tie in with the existing networks and contribute towards improving the quality of the active transport network and public realm in Cork's city centre.

The bridge would be open 24 hours a day, 365 days a year. CCC would be responsible for maintaining the pavements, railings and parapets on the bridge and deploying the flood defence gates during flood events.

4 Site and surrounds

4.1 Introduction

This section describes the location of the proposed development with particular regard to environmental sensitivities on site and in the surrounding area.

4.2 Overview

The site for the proposed development is located in the northern channel of the River Lee in central Cork city between the existing Brian Boru and St Patrick's bridges. The site incorporates the permanent footprint of the bridge and associated works including the bridge landings and abutments as well as the land required for construction works.

The site is approximately 300 m^2 in size and the footprint of the bridge is approximately 150m^2. The site is surrounded by highly urbanised development within the commercial centre of Cork city. There are a number of features of interest in the surrounding area as illustrated in Figure 11.

Figure 11: The site of the proposed development and surrounding area (not to scale)

4.3 Receiving environment

The proposed development would be constructed in a built up area in Cork's city centre traversing the northern channel of the River Lee. The River Lee flows from western County Cork eastwards and splits in two for a short distance, creating an island on which Cork's city centre is built. The River Lee enters Cork Harbour

downstream and is hydrologically connected to two Natura 2000 sites as described in detail in Section 5.3.

To the north of the proposed development St Patrick's Quay runs east – west and houses a number of commercial premises (as illustrated in Figure 12). St Patrick's Quay runs parallel to and connects with MacCurtain Street which is a busy hospitality, retail and entertainment destination for the city. The proposed development would connect to MacCurtain Street and the popular Metropole Hotel via Harley Street.

Figure 12: View towards St Patrick's Quay

Merchant's Quay to the south of the River Lee also runs east-west and accommodates a number of commercial premises including the Merchant's Quay Shopping Centre (as illustrated in Figure 13). The Parnell Place bus station which provides intercity and regional bus connections lies to the south-east of the proposed development.

Figure 13: View towards Merchant's Quay

There are a number of heritage designations in the area as described in Section 5.4 and the surrounding area is part of the Medieval Historic Core. Given this central location, the receiving environment experiences relatively high levels of pedestrian and vehicular traffic and there is a range of land, material and amenity assets associated with this central, waterfront, urbanised location.

4.4 Land use

The site for the proposed development is located in a dense urban area within the commercial centre of Cork. The land use within the area is designated under the Cork City Development Plan 2015-2021 (Development Plan) which prescribes land zones and development objectives to ensure that appropriate development is undertaken within the city.

The River Lee has been designated as 'River/waterbodies protection' in order to protect and provide for the appropriate recreational/amenity and transport use of the waterway. The land immediately to the north and south of the river is designated as city centre retail areas which provide protection for and promote the development of higher order retailing. Additionally, the Development Plan identifies a number of relevant objectives promoting active transport, improvements to the public realm and establishes the need for the provision of a new pedestrian/cycle bridge at this location as outlined in Table 3.

Table 3: Selected objectives from the Development Plan and their relevance to the proposed development

Objective	Statement	Relevance to the project
5.11 - Pedestrian and Cycling Infrastructure	a. Provision of a new pedestrian/cycle bridge from Parnell Place to Harley Street	The proposed development would be serve as the required bridge
8.4 – River/City Island	To work with Fáilte Ireland and other stakeholders to promote the development of a network of cultural and tourist attractions in an around the City Centre island supported by public realm improvements, walking trails and navigation aids.	The proposed development would provide a new cross-river walking trail and improve the public realm at this waterfront location
8.7 – Public Realm	Identify and implement public realm improvement projects for the city's waterfront areas as part of the network to link the major cultural tourism attractions and amenity areas. Initial focus will be on developing proposals for the south facing quays on the South Channel.	The proposed development would serve as an improvement to the public realm and provide a new connection between Parnell Place and the MacCurtain Street area.
13.1 – Strategic Objectives City Centre and Docklands	It is a strategic objective of Cork City Council to: h. To continue to enhance the quality of the city's public realm and improve access into and within the City Centre for all the city's users and ensure that the City Centre is attractive to all age groups including children, young people and families; i. To facilitate the safe, efficient and sustainable movement of people to, from and within the City Centre.	The proposed development would improve the public realm and provide an accessible route into the city centre for all age groups. The proposed development would facilitate sustainable movement by providing a new cross-river active transport route for the city centre.

13.17 – Strategic Pedestrian Linkages	To upgrade and provide new strategic pedestrian linkages where required in the City Centre to increase permeability through key development sites, reflect pedestrian desire lines between key areas and to strengthen connections between the City Centre and the Docklands. This will be achieved through the implementation of the City Centre Movement Strategy, public realm upgrades, the upgrading of key pedestrian junctions and the provision of new pedestrian linkages as part of the redevelopment of strategic sites.	The proposed development would be a new strategic pedestrian linkage that would increase permeability in the surrounding area and improve connectivity across the northern channel of the River Lee.

The proposed development would be in keeping with the existing land use and associated objectives outlined in the Development Plan. Further, the provision of a new bridge would improve connectivity between the retail areas to the north and south of the River Lee and meet those objectives of the Development Plan outlined in Table 3.

4.5 Natural resources

The site consists of the River Lee and adjoining pavements and properties which are limited in natural resources as the natural soils have been highly modified as Cork city has developed.

The River Lee is a transitional water body with moderate water quality and amenity value for Cork city. The River Lee has a tidal range between -2.344m at low tide and +1.486m at high tide. The mean high water tide is -0.429m.The River Lee was designated as a Salmonid river under the EU Council Directive 2006/44/EC (Freshwater Fish Directive) at the location of the proposed development. Species of fish found along the river include Brook and Sea Lamprey (*Lampetra planeri* and *Petromyzon marinus*), Brown Trout (*Salmo truta*), European Eel (*Anguilla anuguilla)* and Atlantic Salmon (*Salmo salar*). Additionally Dipper (*Cinclus hibernicus*), Grey Wagtail (*Matacilla cinerea*), Grey Heron (*Andea cinerea*), Comorant (*Phalacrocorax carbo*), Peregrine Falcon (*Falco peregrinus)*, Otter (*Lutra lutra*) and bats and seals are known to occur along the city centre waterway. Invasive species such as Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*) and others have also gained a foothold in the riverine environment and have become part of the city flora.

The River Lee is bounded by the existing quay walls at the location of the proposed development and this is surrounded by existing hardstanding. There are no mud or sand flats in the vicinity of the site. The flora of the quay walls is relatively diverse in places upstream of the site, however nationally protected plant species have not been identified on the quay walls in the city.

The natural resources within the site are considered to be insignificant in the context of the relative abundance of natural resources in the wider area. However, the site is hydrologically linked to protected biodiversity and heritage sites downstream. The Cork Harbour Special Protection Area (SPA) and Great Island Special Area of Conservation (SAC) are located approximately 3km and 9km to the east of the site respectively. Further, the Douglas River Estuary proposed

Natural Heritage Area (pNHA) lies approximately 3km south-east of the proposed development.

4.6 Absorption capacity

The River Lee is identified as a transitional water body and designated as part of the Lee (Cork) Estuary Upper. The water at this location is nutrient sensitive and has been designated a Water Framework Directive risk score of 'at risk of not achieving good status'.

The site also incorporates the adjoining quays which constitute a highly developed, populated urban location. Existing geotechnical information indicates that the ground is expected to comprise of made ground, alluvial deposits, fluvial gravels, glacial gravels and boulder clays. It is likely that the bedrock lays approximately 40m below ground level, however currently available borehole information is limited to a depth of 25m. There is a history of inundation during flood events, however the pavements and underlying ground have illustrated relatively good absorption capacity by recovering from those events.

4.7 Cumulation with other projects

Other developments can lead to an elevated effect on the environment, therefore information has been sought on projects that have submitted applications for planning or have been recently approved in the site and surrounding area. Other developments need to be of a sufficient scale or proximity to the development being assessed for cumulative effects to be likely, therefore the following projects have been identified as relevant:

- Metropole Hotel Redevelopment on Harley Street; and
- Lower Lee FRS works in the vicinity of the River Lee.

It is noted that a planning application is due to be submitted to support the expansion and redevelopment of the nearby Metropole Hotel to the north-west of the proposed development. Coordination between the design teams for both projects is ongoing to ensure consistent public realm design for St Patrick's Quay and Harley Street and the optimisation of construction phasing for both projects. This development is unlikely to cause cumulative effects given the nature and scale of the proposal and the ongoing coordination.

The Lower Lee FRS may have the potential to result in cumulative effects given its direct interaction with the proposed development. The OPW is advancing the Lower Lee FRS as part of the National Flood Risk Management programme. The Lower Lee FRS is currently undergoing detailed design to provide protection for properties within the Lee catchment area and construction is likely to commence in early 2018, however works at the site would occur later than this as they are part of the third phase of the works. The proposed development would be constructed in advance of the Lower Lee FRS works occurring at this location.

The flood defence level protection presented during the public exhibition is outlined in Figure 14 and Figure 15. As outlined in Section 3.3.5.1, the proposed development has been designed to accommodate and satisfy the flood protection requirements of the Lower Lee FRS proposals. Engagement would continue as the detailed design of both projects progresses and the construction environmental

management plan and works methods statement for the proposed development would be prepared with due regard to the Lower Lee FRS in order to mitigate any potential cumulative effects.

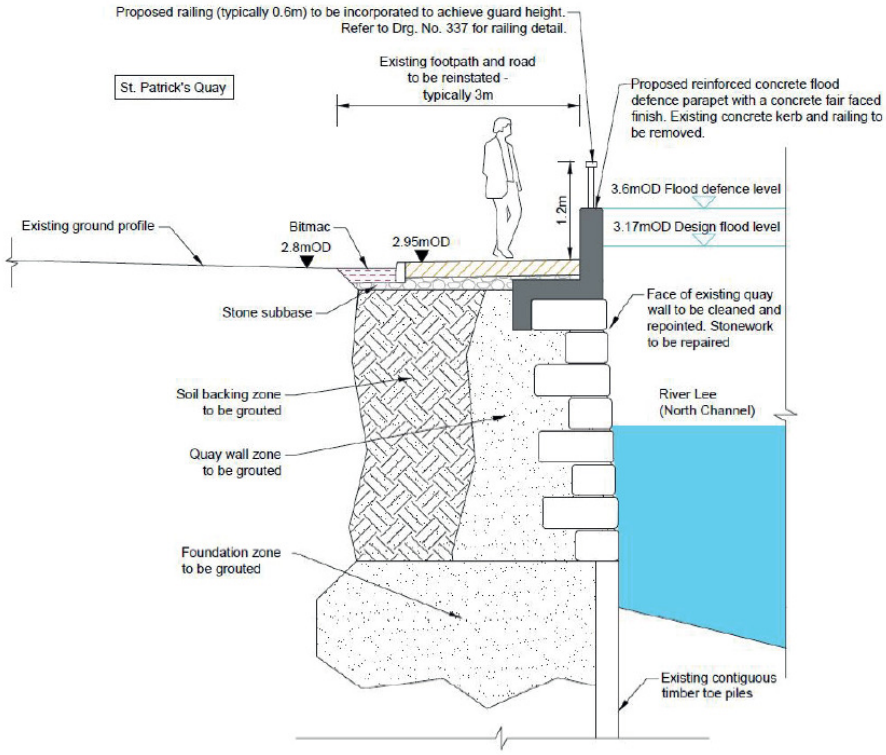

Figure 14: Proposed flood relief works on St Patrick's Quay (Source: OPW)

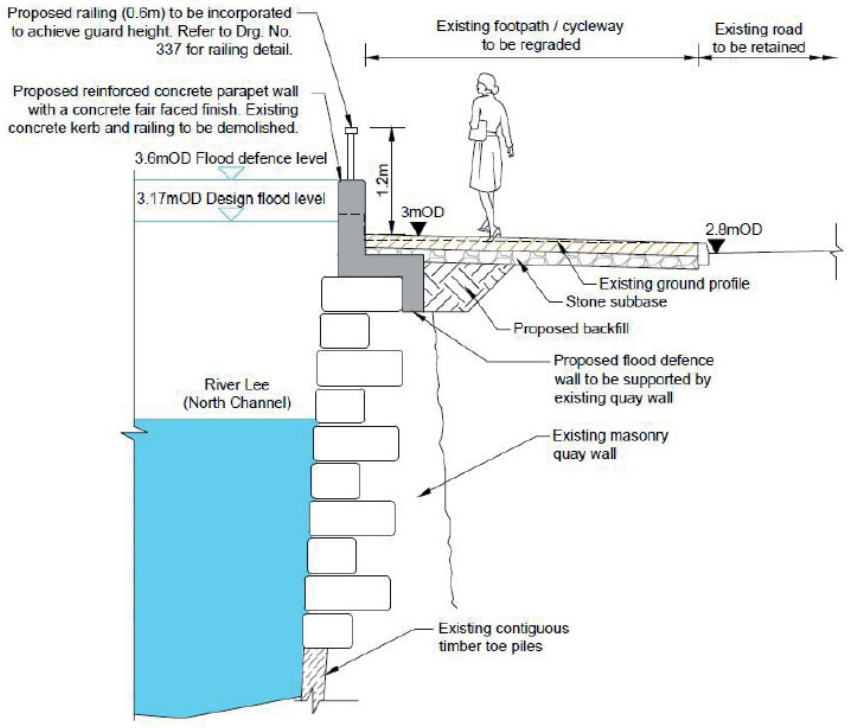

Figure 15: Proposed flood relief works on Merchant's Quay (Source: OPW)

5 Characteristics of potential effects

5.1 Introduction

This section describes any aspects of the environment likely to be significantly affected by the proposed development and where possible outlined any likely significant effects arising from the proposed development.

An initial screening of the characteristics of the proposed development against potential interactions with the environment has been to identify likely significant effects arising from the proposed development. Environmental aspects of relevance to the proposed development include:

- Air quality and climate;
- Biodiversity;
- Cultural heritage, architecture and archaeology;
- Land and material assets;
- Landscape and visual;
- Major accidents and natural disasters;
- Noise and vibration;
- Population and human health;
- Soils and geology;
- Traffic and transportation;
- Water;
- Waste and resource management; and
- Interactive effects of those topics noted above.

It is unlikely that there would be any cumulative effects (Refer to Section 4.7) and transboundary effects are unlikely to arise from the proposed development given the nature and scale of the proposed development.

5.2 Air quality and climate

There is the potential for dust emissions arising during construction, particularly during dry and/or windy weather conditions. Dust emissions may also be exacerbated by the presence of dry surfaces and uncovered stockpiles during the construction of the abutments. The quantity of dust is likely to be relatively small and dust emissions would be temporary in nature. Dust effects are likely to create nuisance in the immediate locale rather than significant environmental effects. Best practice mitigation measures will be put in place to minimise adverse effects.

There is the potential for emissions arising from the exhausts of construction plant, machinery, equipment and transport vehicles. These emissions would be elevated during construction, temporary in nature and marginal in the context of existing traffic levels and pollutant levels in Cork's city centre. Exhaust emissions

are not expected to be significant and would be controlled through the implementation of best practice construction mitigation measures.

There would be no direct emissions from the proposed development during operation. The proposed development has the potential to reduce car dependency and shift some users from private vehicle to walking and/or cycling and thus lower emissions. This may be beneficial for air quality but is not be expected to have a significant effect.

The proposed development would not significantly affect nor be significantly affected by the climate. Flooding may be exacerbated by climate change, however the proposed development has been designed to accommodate the 1 in 100 year fluvial and 1 in 200 year tidal flood events and has taken account of the proposed Lower Lee FRS as part of the design. Further, localised screening has been provided to protect against inclement weather conditions.

5.3 Biodiversity

Protected sites - Natura 2000 designations

Table 4 identifies the relevant features of interest in those designated Natura 2000 sites protected under the obligations of Council Directive 92/43/EEC (Habitats Directive) and Council Directive 79/409/EEC (Birds Directive). The relevant Natura 2000 sites for the proposed development are the Cork Harbour SPA and Great Island Channel SAC. The potential for likely significant effects on Natura 2000 sites has been detailed separately in the screening report for Appropriate Assessment.

Table 4: Features of interest of Natura 2000 sites of relevance to the proposed development

Site code	Designation	Site name	Distance from site	Features of interest
004030	SPA	Cork Harbour SPA	Around 3km at its nearest point	Little Grebe (*Tachybaptus ruficollis*) [A004] Great Crested Grebe (*Podiceps cristatus*) [A005] Cormorant (*Phalacrocorax carbo*) [A017] Grey Heron (*Ardea cinerea*) [A028] Shelduck (*Tadorna tadorna*) [A048] Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Red-breasted Merganser (*Mergus serrator*) [A069] Oystercatcher (*Haematopus ostralegus*) [A130] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141]

				Lapwing (*Vanellus vanellus*) [A142] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Common Gull (*Larus canus*) [A182] Lesser Black-backed Gull (*Larus fuscus*) [A183] Common Tern (*Sterna hirundo*) [A193] Wetland and Waterbirds [A999]
001058	SAC	Great Island Channel SAC	Around 8.5km at its nearest point	Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]

In summary, the proposed development is not directly connected with or necessary to the management of any Natura 2000 sites. Further, no habitat loss would occur within the Natura 2000 sites as a result of the proposed development. The proposed development is hydrologically connected to the Cork Harbour SPA and Great Island Channel SAC. Based on the information provided in the Appropriate Assessment screening report and by applying the precautionary principle, it is the view of Arup that it is possible to rule out the potential for any likely significant effects on Natura 2000 sites.

General ecology

As outlined in Section 4.3, there is a range of habitats, flora and fauna evident in and around the city waterways. There are no mud or sand flats in the vicinity of the site and the terrestrial environment is highly urbanised with no significant habitats or flora species evident in close proximity to the site. The flora of the quay walls is relatively diverse in places upstream of the site, however nationally protected plant species have not been identified on the quay walls in the city. Further, there is no evidence of any rare or protected fauna species being present within the site.

No habitats, flora or fauna would be affected by the proposed development and appropriate arrangements would be outlined in the works method statements and construction environmental management plan to contain the construction works within the enclosures and protect the River Lee from any accidental discharges therefore mitigating any likely significant effects on the river and downstream biodiversity. Further, appropriate measures will be outlined in the construction environmental management plan to manage any unexpected encounters of protected or invasive species and ensure that appropriate conservation and biosecurity measures would be in place prior to the commencement of construction.

5.4 Cultural heritage, architecture and archaeology

There are no recorded archaeological sites or recorded protected structures (RPS) within the site, however the quay walls on both St Patrick's Quay and Merchant's Quay are listed on the National Inventory of Architectural Heritage (NIAH) as being of regional significance. As noted in Section 4.3, the proposed development is located 200m to the east of the Zone of Archaeological Potential for the historic city of Cork as listed in the Record of Monuments and Places (RMP) for County Cork and in the Sites and Monuments Record (SMR) database and is in close proximity to a number of sites of heritage interest as identified in Figure 16.

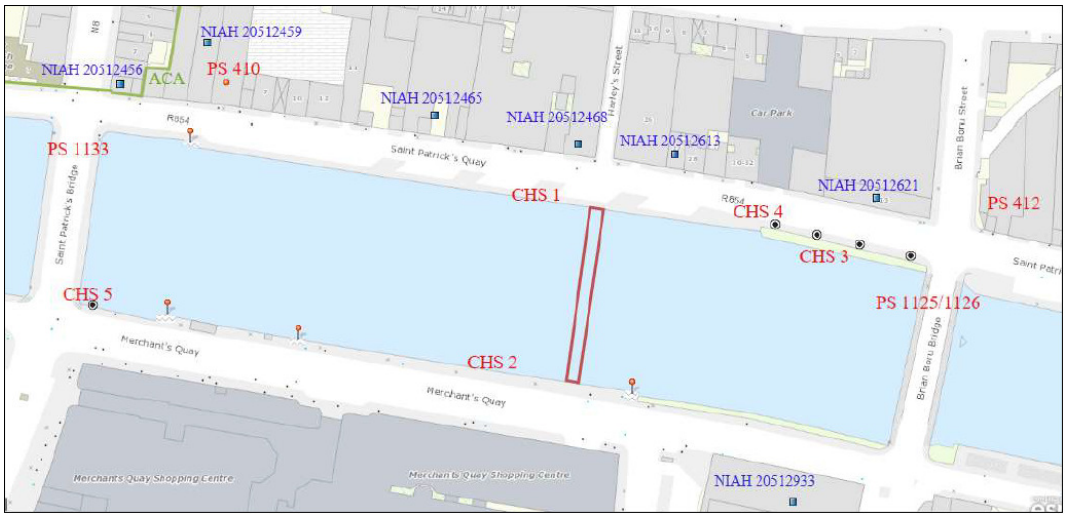

Figure 16: Relevant quayside structures (CHS), recorded protected structures (PS) and buildings listed on the NIAH and their proximity to the proposed development (in red) (Source: Lane Purcell Archaeology) (not to scale)

The installation of a cofferdam and piling works behind the quay walls during construction has the potential to impact on the river channel bed, associated deposits and original riverine mud deposits during construction. These works would occur behind the quay wall in an area that may contain unrecorded subsurface riverine features. It is expected that this would be managed through mitigation measures outlined in the works method statement, construction environmental management plan and that likely effects identified would be expected given the nature of works.

The proposed development has the potential to create minor effects on those sites of heritage interest outlined in Table 5. The part of the quay wall that would be removed is a reasonably small portion and visual impacts on listed heritage assets would be considered minor in the context of the surrounding landscape character and other development in this urban setting (as noted in Section 5.6). A detailed archaeological, architectural and cultural heritage appraisal of the proposed development will be undertaken and submitted with the statutory consent application. This will identify any appraise any likely effects, as well as proposing suitable mitigation, where required.

There are no likely significant effects on cultural heritage, architecture and archaeology associated with the proposed development.

Table 5: Likely cultural heritage, architectural and archaeological effects associated with the proposed development

Site	Value	Project activity	Description of relevant works
St Patrick's Quay wall	Listed on the NIAH (Item: 20512612)	Abutment construction	Part of the quay wall would be removed to support the construction of the bridge abutments
Merchant's Quay wall	Listed on the NIAH (Item: 20513136)	Abutment construction	Part of the quay wall would be removed to support the construction of the bridge abutments
No. 5 St Patrick's Quay	Recorded Protected Structure (Item: 410)	Main span construction / operation	The existence of the bridge may partially obstruct the view from eastwards along the river channel
Brian Boru Bridge	Recorded Protected Structure (Item: 1125/1126)	Main span construction / operation	The existence of the bridge may partially obstruct the view upstream to the St Patrick's Bridge
St Patrick's Bridge	Recorded Protected Structure (Item: 1133)	Main span construction / operation	The existence of the bridge may partially obstruct the view downstream to the Brian Boru Bridge
Former Postal Sorting Office at 37 St Patrick's Quay	Listed on the NIAH (Item: 20512621)	Main span construction / operation	The existence of the bridge may partially obstruct the view from the building over the quay
Lennox Hearing Care Clinic at 27 St Patrick's Quay	Listed on the NIAH (Item: 20512613)	Main span construction / operation	The existence of the bridge may partially obstruct the view from the building over the quay
Metropole Hotel at 25 St Patrick's Quay	Listed on the NIAH (Item: 20512468)	Main span construction / operation	The existence of the bridge may partially obstruct the view from the building over the quay
Everyman Palace Theatre at 13 St Patrick's Quay	Listed on the NIAH (Item: 20512465)	Main span construction / operation	The existence of the bridge may partially obstruct the view from the building over the quay
The Village Hall at 4 St Patrick's Quay	Listed on the NIAH (Item: 20512459)	Main span construction / operation	The existence of the bridge may partially obstruct the view from the building over the quay
Irish Ferries at 9 Bridge Street	Listed on the NIAH (Item: 20512456)	Main span construction / operation	The existence of the bridge may partially obstruct the view from the building over the quay
Cork Bus Station at Anderson's Quay	Listed on the NIAH (Item: 20512933)	Main span construction / operation	The existence of the bridge may partially obstruct the view from the building over the quay

5.5 Land and material assets

Land use zoning in the area would remain unchanged during construction and operation and would not be impacted by the proposed development. The land use would be in keeping with the zoning and objectives prescribed in the Development Plan (Refer to Section 4.4). Further, the provision of this new bridge would improve connectivity between the retail areas on either side of the River Lee and enhance the public realm on the waterfront.

It is unlikely that the proposed development would cause significant effects on material assets during construction or operation. No properties, occupied premises or intrinsic resources would be affected by the proposed development and appropriate arrangements would be made to protect subsurface utilities and services prior to the commencement of construction. At this stage the only utilities to conflict with the proposed development are communications conduits and watermain running east - west on both quays. The contractor would contact the relevant authorities to arrange for their relocation and/or protection where necessary prior to the commencement of construction on site.

5.6 Landscape and visual

The proposed development would alter the streetscape of the quays and the visual landscape of St Patrick's and Brian Boru bridges. Some views along the river channel and from buildings on the quays may be slightly obscured during construction and operation, but the urban setting has brought about constant changes to the streetscape, setting and landscape character as the city has developed.

The proposed development is in keeping with the riverside setting and the bridge would provide a visual contrast to both St Patrick's Bridge with its curving limestone arches and the heavy steel and concrete structure that is Brian Boru Bridge. The proposed development would not have an effect on visual amenity, would improve the public realm and the design of the structure (no in-river piers, the single curved span and low level lighting on the bridge during the night time) would maintain prospects and the viewing corridor on the River Lee and provide new views to and from the proposed development.

It is unlikely that there would be significant landscape and visual effects during the construction and operation of the proposed development.

5.7 Major accidents and natural disasters

There is the potential for major accidents and natural disasters which may be exacerbated by and impact on the proposed development. Evaluating the risk of accidental events and natural disasters involves the identification of credible scenarios, identification of vulnerabilities in the environment, evaluation of the likelihood of incidents and the assessment of consequences.

Construction would be undertaken in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 and best practice measures would be outlined in the construction environmental management plan for mitigating and reacting to credible scenarios. It is envisaged that the risk of

accidents would be very low and appropriate management measures would be in place for any conceivable events during construction.

The design has been undertaken in accordance with the relevant standards to ensure structural soundness of the bridge and reduce the likelihood of pedestrian, cyclist and vehicle collisions during operation.

From a natural disaster perspective, the most likely risk for the proposed development and would be associated with extreme flood events. As noted in Sections 3.3.5 and 4.7, the proposed development has been designed to accommodate the Lower Lee FRS and likely flooding scenarios at this location. Further, the cofferdam installed during the construction of the bridge abutments would maintain the existing levels of flood protection.

It is unlikely that there would be significant effects associated with major accident or natural disasters during the construction and operation of the proposed development.

5.8 Noise and vibration

There is the potential for noise and vibration effects arising from the construction activities such as excavation and piling as well as construction road traffic. However, the site is located in a central, dense urban location along the quays that is subject to relatively high ambient noise conditions associated with significant levels of traffic along both quays. There are few sensitive receptors in the local area and all night time construction works would be approved and advertised prior to the commencement of works. Any adverse noise and vibration would be temporary in nature and controlled by the implementation of best practice construction mitigation measures. As such, it is unlikely that the proposed development would lead to significant noise and vibration effects during construction.

It is unlikely that there would be any significant noise and vibration effects during the operation of the proposed development. The pedestrian and cyclists using the bridge would not constitute a significant noise source when compared against the current usage levels along the St Patrick's and Merchant's quays.

5.9 Population and human health

There may be some disruption to local residents, businesses road users and pedestrians during the 14 month construction period. There is the potential for temporary nuisance on the wider population associated with the diversion of utilities and traffic and elevated air and noise emissions during construction. Best practice measures would be applied to keep within the required limits and mitigate nuisance and adverse interactive effects that may impact on population and human health.

The proposed development would be constructed with due regard to occupational health and safety. During construction appropriate measures would be outlined in the work method statements and construction environmental management plan to manage and protect any potentially hazardous or polluting substances required on site.

The proposed development would have a positive effect on the local population and human health in that it would increase opportunities for active transport and improve connectivity within Cork city centre. The proposed development would provide the population with an alternative sustainable mode of transport that meets the needs of the City as outlined in the Development Plan.

5.10 Soils and geology

Potential effects associated with soils and geology may arise during temporary subsurface construction activities. A works method statement and construction environmental management plan would be prepared and submitted prior to the commencement of construction to detail and agree the construction methodology and provision of appropriate measures for soils and geology.

At this stage it is unlikely that there is any contamination in the vicinity of the proposed development (Refer to Section 4.6). Further, all subsurface works including piling and the construction of abutments would be undertaken above the bedrock. Where possible any excavated material would be retained and reused within the proposed development. Inert and excess excavation waste would be removed offsite by a licensed contractor and taken to a licensed waste facility. Construction of the proposed development is unlikely to have a significant effect on soils and geology.

The end use of the proposed development is relatively insensitive and ground disturbance would be minimal. It is therefore unlikely that the proposed development would have a significant effect on soils and geology during operation.

5.11 Traffic and transportation

With regards to traffic and transportation, effects may be associated with temporary construction activities that require changes to the road network on Merchant's and St Patrick's quays. A works method statement and traffic management plan would be prepared and submitted prior to the commencement of construction to detail and agree appropriate traffic management measures for night-time works, diversions and/or alterations to the surface access network. At this stage it is envisaged that the bus lane on Merchant's Quay and parking bays on St Patrick's Quay may be removed during the construction of the abutments. Further, the existing bus stop on Merchant's Quay would be permanently relocated to accommodate the proposed development. Any potentially significant effects would be managed through the traffic management plan and construction environmental management plan, therefore construction of the proposed development is unlikely to have a significant effect on traffic and transportation.

The operation of the development would have a positive effect on traffic and transportation as it would increase opportunities for active transport across the River Lee. Further, the proposed development would improve accessibility to public transport hubs including the nearby Cork Kent railway station and Parnell Place bus station.

5.12 Water

The potential effects of the proposed development on the water environment are associated with the River Lee and downstream Natura 2000 sites (the Cork Harbour SPA and Great Island Channel SAC). It is unlikely that there would be any significant effects on water quality, groundwater or hydrogeology during the construction or operation of the proposed development.

There would be no abstractions, discharges, deposition or in-stream works undertaken during construction. All construction would be undertaken from floating barges, behind the quay walls and/or from the bridge itself as it is developed. Best practice measures would be implemented to protect the construction compound and minimise any risk of pollution or accidental runoff associated with the construction works undertaken on the waterfront.

The abutments of the bridge would be located on the land side of the quay walls to ensure that there is no operational effect on the hydrology of the River Lee (by maintaining the hydraulic area under the bridge). The proposed development has also been designed to satisfy the requirements of the Lower Lee FRS and provide appropriate flood protection measures to reduce the risk of pluvial and fluvial flooding. As such, it is unlikely that there would be any significant effects on water during operation of the proposed development.

5.13 Waste and resource management

The potential effects of the proposed development on waste and resource management are associated with the design and construction of the proposed development. Prefabrication of the bridge superstructure and coordination with the Lower Lee FRS would minimise the extent of excavation and demolition waste being produced during construction. Further, the volume of waste likely to be generated from the proposed development would be relatively small in the context of Cork City.

The majority of waste is expected to be ‘clean’ material and appropriate mitigation measures would be defined in the construction environmental management plan to promote reuse, recycling and diversion from landfill – e.g. it is expected that the limestone blocks from the quay walls would be reused on site. Any materials that cannot be reused would be removed offsite by a licensed contractor. Inert waste generated during construction will be disposed of at a suitable licensed facility.

Waste generated during operation would be comparable to current operations along the waterfront. The production and disposal of waste will be managed in accordance with the relevant waste legislation. If deemed appropriate CCC would incorporate additional waste bins on the bridge and manage waste in accordance with their obligations as a local authority.

5.14 Interactive effects

Interactive effects occur when a receptor is impacted by multiple effects. Where appropriate, likely interactive effects have been detailed in Sections 5.2 - 5.14. Potential interactive effects on the environment include:

- Concurrent landscape and visual and cultural heritage impacts on amenity associated with the erection of hoarding and presence of plant and equipment on site for the duration of the construction works;
- Elevated dust and noise emissions may exacerbate nuisance and perceived impacts temporarily during the construction of the abutments and main span of the bridge (particularly during night time works);
- Potential traffic, pedestrian and utilities diversions on site during construction;
- Elevated risk of accidental discharge to soil, water bodies, drainage networks and/or groundwater associated with the storage of plant, equipment during construction
- Permanent improvements to the public realm and streetscape and enhanced connectivity for pedestrians and cyclists once operational.

Any likely adverse interactive effects would be temporary in nature and are expected to be managed effectively through the implementation of the mitigation measures outlined in the works method statements and construction environmental management plan.

6 Conclusions

6.1 Screening checklist

The likely significant environmental effects associated with the construction and operation of the proposed development have been outlined in Sections 5.2 - 5.14. The European Guidance on EIA Screening provides a checklist to assist with the decision of whether an EIA is required based on the characteristics of a project and its environment. This screening checklist is presented in Table 6.

Table 6: Screening Checklist to determine if EIA is required based on the characteristics of a project and its environment

Brief project description		**Is this likely to result in a significant impact?** **Yes/No - Why**
1. Will construction, operation or decommissioning of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in waterbodies, etc.)?	Yes	No. The proposed development would create a new route for pedestrians and cyclists across the River Lee. The bridge would be incorporated behind the existing quays walls and tie in with the surrounding surface access network and land use zoning to improve connectivity. The proposed development would therefore not result in physical changes in the locality.
2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?	Yes	No. The proposed development would occur primarily on existing hard standing and require small quantities of natural resources. Standard construction materials would be used as part of the proposed development and the quantity of natural resources used would be relatively small given the scale of the proposed development.
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?	Yes	No. Standard construction materials for a new bridge would be used during construction, however it is unlikely that this would include any quantity of materials that could be harmful to human health or the environment. Best practice construction would be implemented through the construction environmental management plan to protect human health and the environment.
4. Will the Project produce solid wastes during construction or operation or decommissioning?	Yes	No. Small quantities of domestic waste may be produced during construction and operation. This would be managed in accordance with relevant waste legislation and all waste would be removed by the site by a licensed contractor and disposed of at licensed facilities.

5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?	Yes	No. It is expected that dust and emissions from construction vehicles, plant and equipment may be released temporarily during construction. Best practice construction practices will be incorporated in the construction environmental management plan to minimise emissions and prevent discharge. All emissions will be kept within standard air quality limits outlined in the relevant legislation.
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?	Yes	No. It is expected that noise and vibration may occur temporarily during construction. Best practice construction practices will ensure that all activities will be kept within standard noise limits outlined in the relevant legislation.
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater, coastal wasters or the sea?	Yes	No. All potential polluting substances would be stored and managed appropriately by the contractor to reduce the risk of accidental spillages and/or discharges. There will be no discharge to surface water, groundwater, coastal waters or the sea and appropriate measures to ensure effective incident control would be outlined in the construction environmental management plan and works method statements.
8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?	Yes	No. Construction activities would be undertaken with due regard to occupational health and safety. The site manager would be responsible for the management of health and safety on site during construction. The proposed design has been developed in accordance with the standards to reduce the risk of accidents during operation.
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?	Yes	No. The proposed development would encourage people to cycle and walk safely across the River Lee, however this is generally considered to be a positive lifestyle change for the population given the health and environmental benefits associated with active transport. Demography, traditional lifestyles and employment would not be affected by the proposed development.
10. Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?	Yes	No. The design of the proposed development has been undertaken with due regard to the Lower Lee FRS works. Specifically, the bridge deck level at the abutment satisfies the maximum flood level (+3.17mOD) and flood gates have been provided to mitigate potential flood risk on the bridge and adjoining quays.

11. Are there any areas on or around the location which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project?	Yes	No. Refer to Sections 5.3 and 5.4 for details. The nearest sites are the Cork Harbour SPA and Great Island Channel SAC which are unlikely to be affected by the proposed development.
12. Are there any other areas on or around the location which are important or sensitive for reasons of their ecology e.g. wetlands, watercourses or other waterbodies, the coastal zone, mountains, forests or woodlands, which could be affected by the project?	Yes	No. Refer to Section 5.3 for details. The ecological value within and around the site is considered to be insignificant in the context of the relative abundance of natural resources in the wider area.
13. Are there any areas on or around the location which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project?	Yes	No. Refer to Section 5.3 for details. There are no mud or sand flats in the vicinity of the site to support wintering birds and the terrestrial environment is highly urbanised with no significant habitats or flora species evident in close proximity to the site. Further, there is no evidence of any rare or protected fauna species being present within the site.
14. Are there any inland, coastal, marine or underground waters on or around the location which could be affected by the project?	Yes	No. The proposed development would not result in any in-stream works or direct impacts on the River Lee, downstream waterbodies and associated biodiversity. Works on the banks of the river would be undertaken in accordance with best practice measures outlined in the construction environmental management plan to minimise the risk of any accidental or indirect impacts on the aquatic environment.
15. Are there any areas or features of high landscape or scenic value on or around the location which could be affected by the project?	Yes	No. Refer to Section 5.6 for details. There are no areas or features of high landscape or scenic value on or around the location which could be affected by the project.
16. Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?	Yes	No. The proposed development would be developed along the waterfront in Cork's city centre. The traffic management plan detail appropriate measures to maintain public access along St Patrick's and Merchant's Quays.
17. Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected by the project?	Yes	No. A traffic management plan would be implemented for the duration of construction works in order to minimise any disruption to traffic and transportation on the road network around the site.
18. Is the project in a location where it is likely to be highly visible to many people?	Yes	No. The proposed development would be located in a prominent location on the waterfront in Cork city centre, however construction works are commonplace in this urban

		environment. Fit for purpose hoarding/fencing would be installed for the duration of construction and appropriate measures would be outlined in the construction environmental management plan to optimise visual amenity. The proposed development would contribute to the public realm and the design would be viewed as a positive contribution to the waterfront environs.
19. Are there any areas or features of historic or cultural importance on or around the location which could be affected by the project?	Yes	No. Refer to Section 5.4 for details. There is the potential for minor physical effects on the quay walls and visual impacts on sites of heritage interest, however this is expected to be minor and insignificant in the context of the urban setting and designated cultural heritage, architecture and archaeology values in the wider area.
20. Is the project located in a previously undeveloped area where there will be loss of greenfield land?	No	No.
21. Are there existing land uses on or around the location e.g. homes, gardens, other private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying which could be affected by the project?	Yes	No. There may be some minor inconvenience and nuisance for adjoining properties temporarily during construction. Any construction activities that may impact on local properties would be communicated in advance and managed through measures outlined in the construction environmental management plan and traffic management plan.
22. Are there any plans for future land uses on or around the location which could be affected by the project?	No	No.
23. Are there any areas on or around the location which are densely populated or built-up, which could be affected by the project?	Yes	No. The proposed development is located in a densely populated, built environment within Cork's city centre. The contractor would employ 'good housekeeping' and outline appropriate measures in the construction environmental management plan, traffic management plan and works methods statement to minimise impacts on the population.
24. Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities, which could be affected by the project?	No	No.
25. Are there any areas on or around the location which contain important, high quality or scarce resources e.g. groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, which could be affected by the project?	No	No.

26. Are there any areas on or around the location which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?	No	No.
27. Is the project location susceptible to earthquakes, subsidence, landslides, and erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	Yes	No. The site is susceptible to flooding, however the proposed development has been designed to accommodate the 1 in 100 year fluvial and 1 in 200 year tidal flood events. All construction works would cease during flood events and appropriate measures would be outlined in the construction environmental management plan to ensure that flood risk is managed safely throughout construction.

6.2 Conclusion

On the basis of the information provided in this screening assessment, it is the view of Arup that significant environmental effects are unlikely to arise from the proposed development. It has therefore been concluded that an EIA should not be required for the proposed development.

The information provided in this screening report should be used by the competent authority, CCC, to support its determination of the need or otherwise for an EIA for the proposed Harley Street pedestrian/cycle bridge.

6.3 Next steps

In the event that CCC determines that an EIA is not required, approval for the proposed development would pursued in accordance with Part 8 of the Planning and Development Act, 2000, as amended.

The Part 8 approval submission would be supported by an Environmental Report that would consider the implications of the proposed development on environmental sensitivities of relevance and a Cultural Heritage Assessment that would consider the implication of the proposed development on cultural heritage, architecture and archaeology.

7 References

Cork City Council (2015) *Cork City Development Plan 2015 – 2021. Volume 1: Written Statement*

Department of the Environment, Heritage and Local Government (2003) *Environmental Impact Assessment (EIA) Guidance for Consent Authorities regarding Sub-threshold Development*

Department of the Environment, Community and Local Government (2013) *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.*

Department of the Environment, Community and Local Government (2015) *Planning and Development Regulations 2001 – 2015 (Unofficial consolidation)*

Department of Housing, Planning, Community and Local Government (2017) *Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems (Department of Housing, Planning, Community and Local Government*

Department of Housing, Planning, Community and Local Government (2017) *Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive): Advice on the Administrative Provisions in Advance of Transposition*

Environmental Protection Agency (2002) *Guidelines on the Information to be contained in Environmental Impact Statements*

Environmental Protection Agency (2003) *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements*

Environmental Protection Agency (2015) *Revised Guidelines on the Information to be contained in Environmental Impact Statements (Draft September 2015)*

Environmental Protection Agency (2015) *Advice Notes for Preparing Environmental Impact Statements Draft September 2015*

European Commission (2001) *Guidance on EIA Screening*

Office of Public Works (2016) *Lower Lee (Cork City) Flood Relief Scheme: Environmental Impact Statement – Main Report.* [Available from http://www.lowerleefrs.ie/assets/lee_valley/docs/Main%20Report.pdf – Accessed on 23 May 2017]

Office of Public Works (2017) *Lower Lee (Cork City) Flood Relief Scheme: Project Information.* [Available from http://www.lowerleefrs.ie/index.php/site/project - Accessed on 28 May 2017]

Appropriate Assessment

Screening Report

Cork City Council

Harley Street Pedestrian/Cycle Bridge

Cork City Council

Harley Street Bridge

Appropriate Assessment – Information Required for Screening

253690/AA/Rev2

Issue | 6 July 2017

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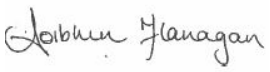
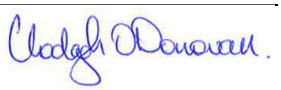
		Signature			
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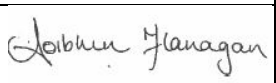
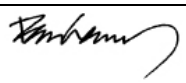
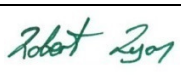
		Signature			
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1 Introduction

Cork City Council (CCC) propose to develop the Harley Street pedestrian/cycle bridge, hereafter referred to as the proposed development. The proposed development will be located over the north channel of the River Lee between Brian Boru Bridge and St Patrick's Bridge in Cork's city centre.

This report for screening for Appropriate Assessment (AA) contains the necessary information required for the competent authority, in this case CCC, to undertake screening for AA of the proposed development.

The aims of this report are to:

- Provide information on, and assess the potential for the proposed development to significantly impact on designated Natura 2000 sites;
- Determine whether the proposed development is directly connected with, or necessary to the conservation management of any designated Natura 2000 sites; and
- Determine whether the proposed development, alone or in combination with other projects, is likely to have significant effects on designated Natura 2000 sites.

An Arup ecologist has prepared this report. This report has been prepared without the inclusion or consideration of mitigation measures.

It is the opinion of Arup that it is possible to rule out likely significant impacts on any Natura 2000 sites. Therefore, it is the opinion of Arup that any further stages of AA is not necessary for the proposed development.

2 Legislative Background

2.1 Overview

Member states within the European Union are required to establish a network of Natura 2000 sites under the obligations of Council Directive 92/43/EEC (Habitats Directive) and Council Directive 79/409/EEC (Birds Directive). The Natura 2000 network comprises designated sites selected to protect important biodiversity including rare and threatened habitats and species.

The Natura 2000 network includes Special Areas of Conservation (SACs, including candidate SACs) protected under the provisions of the Habitats Directive and Special Protection Areas (SPAs, including proposed SPAs) protected under the provisions of the Birds Directive. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex II birds and other regularly occurring migratory birds and their habitats.

The Annex habitats and species for which each site is selected and designated, are recognised as the qualifying interests of the Natura 2000 site. Conservation objectives for all designated sites are defined for these qualifying interests.

2.2 Legislation

The Habitat and Birds Directives require that the effects of any plan or project, alone, or in combination with, other plans or projects, on the Natura 2000 site network, should be assessed before any decision is made to allow that plan or project to proceed. This process is known as Appropriate Assessment (AA).

The obligation to undertake AA derives from Articles 6(3) and 6(4) of the Habitats Directive. Article 6(3) is concerned with the strict protection of sites, while Article 6(4) is the procedure for allowing derogation from this strict protection in certain restricted circumstances.

Article 6(3) of the Habitats Directive states:

> *"Any plan or project not directly connected with, or necessary to, the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public".*

Article 6(4) states:

> *"If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."*

There are a number of steps and tests in place that should be undertaken sequentially and documented by competent authorities in order to make decisions on the approval or refusal of a plan or project that may impact on the Natura 2000 network. Article 6(3) and 6(4) of the Habitats Directive requires the following to be undertaken:

- **Stage 1 – Screening for Appropriate Assessment:** To assess, in view of best scientific knowledge, if a development, individually or in combination with another plan or project is likely to have a significant effect on any Natura 2000 site.
- **Stage 2 – Appropriate Assessment:** This is required if it cannot be excluded, on the basis of objective information, that the development, individually or in combination with other plans or projects, is likely to have a significant effect on a Natura 2000 site. The appropriate assessment must include a final determination by the competent authority as to whether or not a proposed development would adversely affect the integrity of a Natura 2000 site. In order to reach a final determination, the consenting authority must undertake examination, analysis and evaluation, followed by findings, conclusions and a final determination. The appropriate assessment must contain complete, precise and definitive findings and conclusions, and may not have lacunae or gaps.
- **Stage 3 – Assessment of alternative solutions:** The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site.
- **Stage 4 - Assessment where no alternative solutions exist and where adverse impacts remain:** An assessment where no alternative solutions exist and where adverse impacts remain – an assessment of compensatory measures where, in light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed.

2.3 Guidance

This report has been prepared with regard to the following guidance documents:

- *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC*[1];
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodical Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*[2]
- *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC*[3];
- *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities*[4];
- *Circular NPW 1/10 and PSSP 2/10: Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities*[5]; and
- *Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive*[6].

[1] European Communities (2000) *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC*
[2] EC Environment Directorate-General (2000) *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.*
[3] European Commission (2007) *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC.*
[4] Department of Environment, Heritage and Local Government (2010) *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities.*
[5] Department of Environment, Heritage and Local Government (2010) *Circular NPW1/10 & PSSP 2/10 Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities*
[6] International Workshop on Assessment of Plans under the Habitats Directive (2011) *Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive.*

3 Methodology

3.1 Scope of appraisal

This report contains the information required for the CCC to undertake screening for AA for the construction and operation of the proposed Harley Street pedestrian/cycle bridge. This report is based on a desk study undertaken in June 2017.

In order to address the requirements for AA screening, the following information is presented in this report:

- Overview of the proposed development and its receiving environment (Section 4 and Section 5);
- Description of the existing ecological environment at the site (Section 6);
- Identification of relevant Natura 2000 sites which may be within the zone of influence of the proposed development (Section 6.1);
- Description of other projects and plans which may have the potential for having significant effects on Natura 2000 sites (Section 6.4);
- Identification of potential effects of the proposed development on the Natura 2000 sites (Section 7);
- Assessment of likely significant effects on Natura 2000 sites (Section 7.3); and
- Screening statement and conclusions (Section 8 and Appendix A).

3.2 Location of the proposed development

The proposed development is located in Cork's city centre. The proposed works would be carried out adjacent to the River Lee, therefore this assessment has considered any potential impacts within the 15km radius around the site of the proposed development (as illustrated in Figure 1) in accordance with best practice and precedence from other AA screening reports. Any direct, indirect or cumulative impacts which could arise from the proposed development in relation to SACs and SPAs within this study area are considered in further detail.

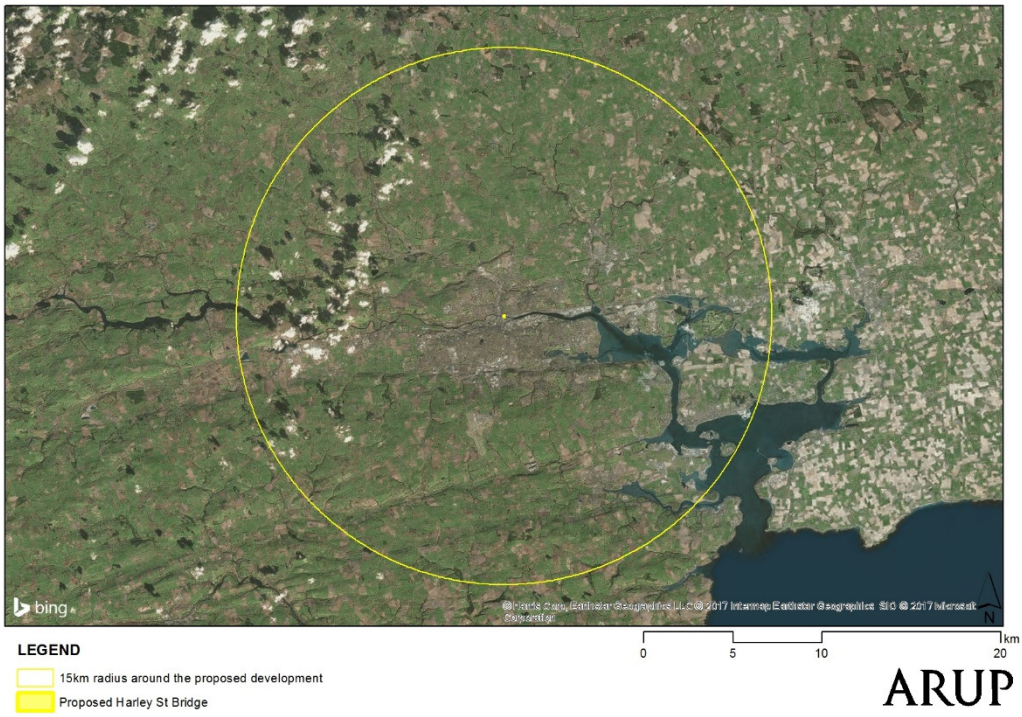

Figure 1: Study area for the purpose of AA screening (not to scale)

3.3 Desktop study

This report is based on a desktop study undertaken in June 2017. The desktop study reviews the nature of the proposed development (construction and operational aspects) and potential impacts of the proposed development on Natura 2000 sites and their qualifying interests. The desktop study also identifies potential in-combination impacts on the Natura 2000 network, if any.

The following sources of information were used to collect relevant data on the Natura 2000 network and support the desktop study:

- Bing Maps aerial photography[7];
- Online mapping and data on protected sites from the National Parks and Wildlife Service [8];
- Information on environmental quality data available from the EPA[9];
- Status of EU protected habitats in Ireland provided by the National Parks and Wildlife Service[10];

[7] Bing Maps in ArcGIS - Accessed 1 June 2017
[8] National Parks and Wildlife Service (2017) *Boundary data for protected sites:* https://www.npws.ie/maps-and-data/designated-site-data/download-boundary-data - Accessed 1 June 2017
[9] Environmental Protection Agency (2017) *Envision Online Environmental Map Viewer:* http://gis.epa.ie/Envision – Accessed 1 June 2017
[10] National Parks and Wildlife Service (2017) *NPWS Protected sites in Ireland:* https://www.npws.ie/protected-sites - Accessed 1 June 2017

- National Biodiversity Centre Data Centre database[11]; and
- Relevant information from the Lower Lee Flood Relief Scheme (FRS) Environmental Impact Statement[12].

[11] National Biodiversity Data Centre (2017) *Biodiversity Maps:* http://maps.biodiversityireland.ie/ - Accessed 1 June 2017

[12] Ryan Hanley & McCarthy Kettle O'Sullivan (2016) *Lower Lee Flood Relief Scheme Environmental Impact Statement:* http://www.lowerleefrs.ie/index.php/site/environmental - Accessed 7 June 2017

4 The proposed development

4.1 Overview

It is proposed to develop a new single span bridge that traverses the northern channel of the River Lee in Cork's city centre between the existing Brian Boru Bridge and St Patrick's Bridge. The proposed development would be 66 metres (m) in length, extending south from and on axis with Harley Street as illustrated in Figure 2.

Figure 2: The proposed development

The proposed development will serve pedestrians and cyclists crossing between St Patrick's Quay and Merchant's Quay and tie in with the existing transport network. The design is sympathetic to the surrounding environment as has had regard to the design of the Lower Lee Flood Relief Scheme (FRS) works proposed by the Office of Public Works (OPW) on the adjoining quay walls. The proposed development will incorporate ramps to ensure accessibility and benches in the central spine to encourage visitors to sit and enjoy the views of the River Lee from this central location.

4.2 Design

The proposed development would comprise a shallow arched single span bridge approximately 66m in length. The cantilever design would incorporate an arched steel box girder and there would be no piers required in the River Lee as the bridge would be supported by the abutments located behind the quay walls.

The centreline of the bridge would be centrally aligned on axis with Harley Street. There would be two shared paths on either side of the central spine beam and the width of the bridge would increase towards the centre to accommodate the benches. Each of the paths would be 2.70m wide at the abutments, increasing to 3.60m wide at mid-span.

Figure 3: Visualisation of the proposed development

The proposed development would land on the existing quay walls. On the northern banks, the bridge would land immediately south of Harley Street on St Patrick's Quay whilst the southern landing would be approximately 30m west of Parnell Place on Merchant's Quay.

The abutments of the bridge would be set at +3.17m above ordnance datum (mOD) and the bridge landings would be accessed via 1:20 compliant ramps on both quays. The northern landing would incorporate a signalised traffic junction to facilitate movement across St Patrick's Quay. A barrier would be provided on the southern landing to prevent cyclists from merging with traffic on Merchant's Quay.

The proposed development would incorporate functional and feature lighting to optimise safety in design and aesthetics. All light fittings would be appropriate for the outdoor environment and minimise light spill to the surrounding area. Functional lighting would be provided by discrete point source LED fittings recessed into the handrails at the edge of the bridge deck. This would introduce light across the bridge deck and provide a safe environment for users during the hours of darkness. Feature lighting would be used to highlight the primary structural spine beam running centrally down the length of the bridge deck and improve the aesthetics of the bridge during the hours of darkness. The LED fittings would be mounted just below deck level to introduce a soft glow of light up the surface of the beam.

The proposed development has been designed to accommodate the Lower Lee FRS and provide appropriate protection on the bridge deck from the 1 in 100 year fluvial and 1 in 200 year tidal flood events. Flood defences would be provided in the form of a sliding gate recessed into the quay walls that can be slid into position and connected via a central post as required. It is envisaged that CCC would close the bridge and deploy the flood barrier prior to the onset of a flood

event. The flood defence would be capable of raising to 450mm in order to accommodate freeboard.

4.3 Construction

4.3.1 Overview

The construction methodology for the project would be finalised upon the completion of the detailed design and appointment of the contractor. At this stage, it is envisaged that construction is likely to commence in February 2018 and be completed by April 2019. The general activities to be carried out during construction would occur in sequence as outlined in Figure 4.

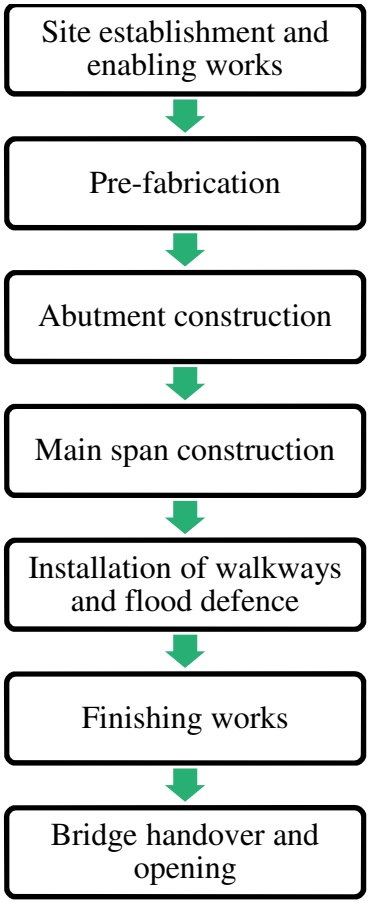

Figure 4: Indicative construction phasing

4.3.2 Site establishment and enabling works

Site establishment would comprise the clearance of the landside portion of the site, erection of hoarding, removal of the bus stop on Merchant's Quay, installation of traffic management signage and barriers and the provision of appropriate welfare facilities, security measures around the site perimeter.

At this stage, it is likely that the construction compound(s) would be located within the site on both sides of the River Lee. The site would be 10m wide and 20m in length from the bridge abutments as illustrated in Figure 5. This would

require the temporary removal of the bus lanes on Merchant's Quay and parking bays on St Patrick's Quays.

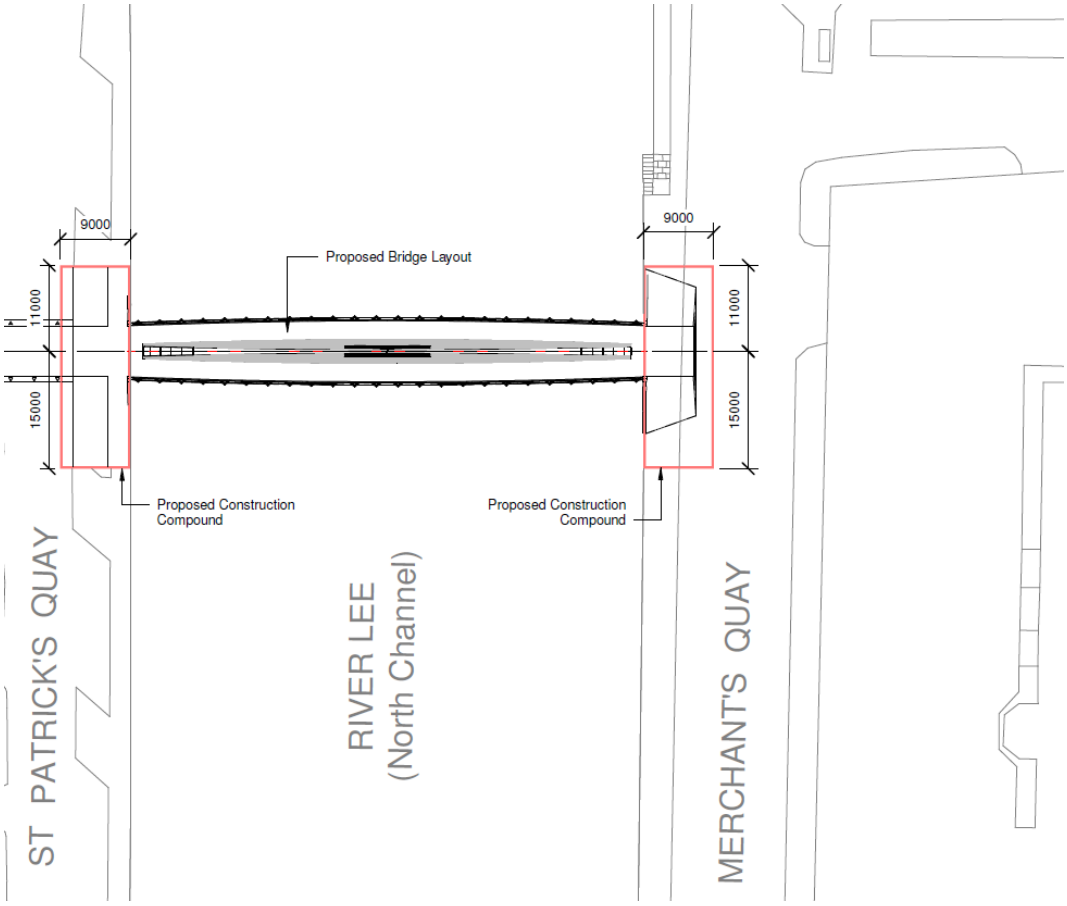

Figure 5: Proposed site layout during construction (not to scale)

No demolition works are envisaged as part of the proposed development and the majority of construction would occur behind the existing quay walls. The construction works areas would be enclosed behind both quay walls and a temporary sheet pile or equivalent on the river side of the quay wall. Further, the existing pavements and road networks would be retained and the area required for the ramps would be minimised.

4.3.3 Pre-fabrication

It is proposed that key elements of the bridge superstructure would be pre-fabricated off site. The central spine beam would consist of three steel sections. The central section would be fabricated off site, transported to Anderson or Penrose Quay and subsequently transferred to the site via a water borne vessel that would float in the River Lee to avoid impacts on fauna passing through the site. The outer spans would be constructed in situ.

4.3.4 Abutment construction

A three-sided cofferdam would be installed and sheet piling retaining wall would be erected on each of the quays to support the construction of the bridge abutments. A temporary piling platform would be installed to facilitate eight flight auger piles on each of the quays. Fluid stabilisation would not be used. A pump

would be installed within the cofferdam enclosure to maintain a dry working environment and the water would be pumped either back to the river or into the main surface water drainage system. This water would be treated prior to discharge in order to remove any sediments or silt in the water column.

Excavation would be undertaken to a depth of -0.5 mOD (approximately 3.3m below ground level) within the sheet pile cofferdam. The quay wall would be removed locally to allow the beam to slot in and a temporary shutter would be installed.

The reinforcement for the abutments would be fixed to allow the first span of the spine to be held in place by temporary steel frame support. The concrete pile cap would be cast, cladding would be installed around the exposed concrete face and pressure grouting would be undertaken behind the quay wall to provide reinforcement. The abutments would be constructed behind the quay walls and the outer spans of the bridge would be lifted onto the abutment seating plate immediately afterwards. All construction debris would be enclosed within this area and removed prior to removal of the temporary sheet piling.

4.3.5 Main span construction

The central spine beam would consist of three steel sections that provide the main span of the bridge. The outer segments of the spine beam would be lifted onto the abutment seating plate by mobile cranes located on each of the quays. As outlined in Section 4.3.3, the central span would be prefabricated and transported to the site on barges. The central span would be lifted into place from the floating barge via a hoist located on the tips of the abutment sections.

All welding would be undertaken within fully encapsulated enclosure(s) and all debris would be removed prior to the disassembly of the cofferdam enclosure. Silt disturbance in the river bed during piling cannot be fully eliminated, however strict construction methodology specifications will be outlined to lessen discharge during the removal of the cofferdam and the tidal cycle of the river will ensure negligible impacts on the River Lee. The construction of the main span would be carried out during the night time to allow for partial road closures along St Patrick's and Merchant's quays. The construction of the central span would be dependent on the tides.

4.3.6 Installation of walkways and flood defence

Once the abutments and bridge span are in place, the decking and surfacing for the cantilever walkways, the flood gates and parapets would be installed from platforms supported by the central spine beam. In parallel to these works the ramps from street level on the quays would be installed to tie the proposed development in with the surrounding public realm. This would incorporate the provision of the signalised junction on St Patrick's Quay.

4.3.7 Finishing works

Upon completion of the bridge construction, the final design elements would be installed on the bridge including surfacing finishes, landscaping, and lighting. Once construction is complete the site would be cleaned up. This would include the removal of all plant and equipment, site hoarding, waste materials and

reinstatement of the site to ensure seamless tie in between the proposed development and the surrounding environment.

4.3.8 Bridge handover and opening

Upon completion of construction and clean-up of the site, the proposed development would be handed over to CCC, commissioned and opened to the general public. At this stage, it is likely that the proposed development would opened by April 2019.

4.4 Operation

The proposed development would operate as a two way bridge for pedestrians and cyclists from April 2019 onwards. The bridge would tie in with the existing networks and contribute towards improving the quality of the active transport network and public realm in Cork's city centre.

The bridge would be open 24 hours a day, 365 days a year. CCC would be responsible for maintaining the pavements, railings and parapets on the bridge and deploying the flood defence gates during flood events.

5 Receiving environment

The site for the proposed development is located in the northern channel of the River Lee in central Cork city between the existing Brian Boru and St Patrick's bridges. The site incorporates the permanent footprint of the bridge and associated works including the bridge landings and abutments as well as the area required for construction works.

The site is approximately 300 m2 in size and the footprint of the bridge is approximately 150m^2. The site surrounded by highly urbanised development within the commercial centre of Cork city. There are a number of features of interest in the surrounding area as illustrated in Figure 6.

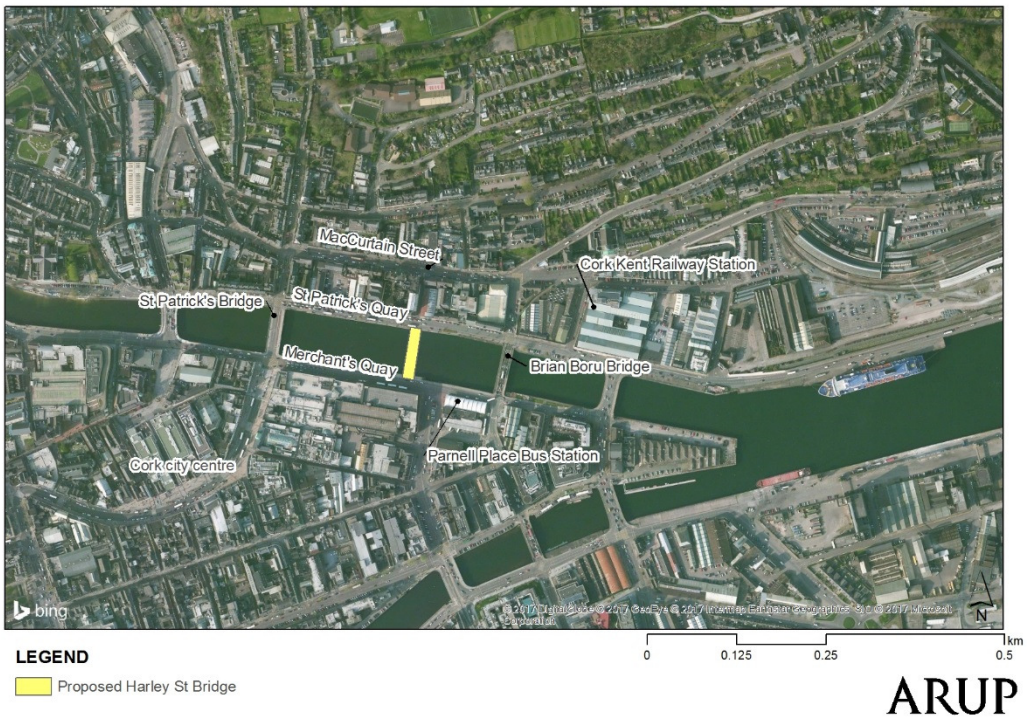

Figure 6: The site of the proposed development and surrounding area (not to scale)

The River Lee flows from western County Cork eastwards and splits in two for a short distance, creating the island on which Cork's city centre is built. The River Lee flows east towards Lough Mahon, onto Cork Harbour and into the Celtic Sea. The site is therefore hydrologically connected to two Natura 2000 sites (Cork Harbour Special Protection Area and Great Island Special Area of Conservation) which are located downstream of the proposed development site. The total catchment area of the River Lee covers approximately 2,000km^2 and the river is identified as a transitional water body that is subject to tidal influence. The River Lee is nutrient sensitive with moderate water quality and a Water Framework Directive risk score of 'at risk of not achieving good status'.

The River Lee was designated as a Salmonid river under the EU Council Directive 2006/44/EC (Freshwater Fish Directive) at the location of the proposed development. Species of fish found along the river include Brook and Sea Lamprey (*Lampetra planeri* and *Petromyzon marinus*), Brown Trout (*Salmo truta*), European Eel (*Anguilla anuguilla)* and Atlantic Salmon (*Salmo salar*).

Additionally Dipper (*Cinclus hibernicus*), Grey Wagtail (*Matacilla cinerea*), Grey Heron (*Andea cinerea*), Comorant (*Phalacrocorax carbo*), Peregrine Falcon (*Falco peregrinus)*, Otter (*Lutra lutra*) and bats and seals are known to occur along the city centre waterway. Invasive species such as Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*) and others have also gained a foothold in the riverine environment and have become part of the city flora.

The River Lee is bounded by the existing quay walls at the location of the proposed development and this is surrounded by existing hardstanding. There are no mud or sand flats in the vicinity of the site. The flora of the quay walls is relatively diverse in places upstream of the site, however nationally protected plant species have not been identified on the quay walls in the city.

To the north St Patrick's Quay runs east – west and houses a number of commercial premises. St Patrick's Quay runs parallel to and connects with MacCurtain Street which is a busy hospitality, retail and entertainment destination for the city. The proposed development would provide access to MacCurtain Street and the popular Metropole Hotel via Harley Street. Merchant's Quay to the south also runs east-west and accommodates the Merchants Quay Shopping Centre as well the Parnell Place bus station which provides intercity and regional bus connections.

Given this central location, the receiving environment experiences relatively high levels of pedestrian and vehicular traffic and there is a range of land assets and infrastructure at this urbanised waterfront.

Figure 7: Overview of the site facing westwards from the Brian Boru Bridge

The land use within the area is designated under the Cork City Development Plan 2015-2021 (Development Plan) which prescribes the following land zones:

- The River Lee has been designated as 'River/waterbodies protection' in order to protect and provide for the appropriate recreational/amenity and transport use of the waterway.

- The land immediately to the north and south of the river is designated as city centre retail areas which provide for the protection of and promote the development of higher order retailing.

Additionally, the Cork City Development Plan 2015-2021 identifies numerous objectives promoting active transport, improvements to the public realm and the provision of this bridge.

6 Ecological overview

6.1 Identification of Natura 2000 sites which may be within the zone of influence of the proposed development

The proposed development is not directly connected with, or necessary for, the management of any Natura 2000 site. No habitat loss will occur within any Natura 2000 site as a result of this proposed development.

Natura 2000 sites are only at risk from significant effects where a source-pathway-receptor link exists between a proposed development and a Natura 2000 site(s). This can take the form of a direct impact within the boundary of a Natura 2000 site(s) (e.g. where the proposed development and/or associated construction works are located within the boundary) or an indirect impact where impacts outside of the Natura 2000 site(s) affect ecological receptors within (e.g. impacts to water quality which can affect riparian habitats at a distance from the impact source).

Considering the Natura 2000 sites present in the region, their Qualifying Interests and conservation objectives, and any potential impact pathways that could link those sites to the proposed development area, a distance of 15km was considered appropriate to encompass all Natura 2000 sites potentially within the Zone of Influence of the proposed development.

The zone of influence comprises the area within which the proposed development may potentially affect the conversation objectives or qualifying interests of a Natura 2000 site. There is no recommended zone of influence and guidance from the National Parks and Wildlife Service recommends that the distance should be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects.

Consideration is therefore given to the source-pathway-receptor linkage and associated risks between the proposed development and Natura 2000 sites. For a significant effect to occur there needs to be a risk associated with pollutant linkages whereby a source (i.e. contaminant or pollutant arising from construction activities) affects a particular receptor (i.e. Natura 2000 site) through a particular pathway (e.g. a watercourse which connects the proposed development with the Natura 2000 site).

The identification of risk does not automatically mean that an effect will occur, nor that it will be significant. The identification of these risks means that there is a possibility of environmental or ecological damage occurring. The level and significance of the effect depends upon the nature of the consequence, likelihood of the risk and characteristics of the receptor. The precautionary principle is applied for the purposes of screening to ensure that consideration and pre-emptive action is undertaken where there is a lack of scientific evidence

As a general rule of thumb, it is often considered appropriate to examine all European sites within 15km as a starting point. In some instances, where there are hydrological connections, a whole river catchment or a groundwater aquifer may

need to be included. Taking this into account, as a starting point all European sites within 15km of the proposed development were examined. This distance was considered to be sufficient for the purposes of this assessment as any European sites outside of the 15km distance either do not have any hydrological or any other linkages to the proposed development site, or are located at such distance from the proposed development site that no significant effects would occur.

The North Channel of the River Lee discharges into Cork Harbour, areas of which are designated as an SAC (Great Island Channel) and SPA (Cork Harbour). Consultation of NPWS online data identified two Natura 2000 sites located within 15km of the site which are of relevance for the proposed development. The sites identified are listed below and indicated on Figure 8. The study area lies approximately 3km (as the crow flies) to the north and west of the Cork Harbour SPA (site code 004030) (located in Cork Harbour) and approximately 8.5km to the west of the Great Island Channel SAC (site code 001058) (located in Cork Harbour).

Table 1 identifies the relevant features of interest and site synopses is available in Appendix B.

Table 1: Features of interest of Natura 2000 sites within the study area

Site code	Designation	Site name	Distance from site	Features of interest
004030	SPA	Cork Harbour SPA	Around 3km at its nearest point (Approx. 4.5km downstream)	Little Grebe (*Tachybaptus ruficollis*) [A004] Great Crested Grebe (*Podiceps cristatus*) [A005] Cormorant (*Phalacrocorax carbo*) [A017] Grey Heron (*Ardea cinerea*) [A028] Shelduck (*Tadorna tadorna*) [A048] Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Red-breasted Merganser (*Mergus serrator*) [A069] Oystercatcher (*Haematopus ostralegus*) [A130] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Black-headed Gull (*Chroicocephalus ridibundus*) [A179]

				Common Gull (*Larus canus*) [A182] Lesser Black-backed Gull (*Larus fuscus*) [A183] Common Tern (*Sterna hirundo*) [A193] Wetland and Waterbirds [A999]
001058	SAC	Great Island Channel SAC	Around 8.5km at its nearest point	Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]

There is a potential indirect pathway via the North Channel as it discharges into Cork Harbour, therefore the location of the proposed development is hydrologically connected to both of these Natura 2000 sites.

6.2 Other designated conservation areas

There are 17 proposed Natural Heritage Areas (pNHAs) within the study area. Of these, the pNHAs identified in Table 2 are relevant for the proposed development as they are located downstream and hydrologically connected to the proposed development.

Table 2: Proposed Natural Heritage Areas of relevance

Site code	Site name	Distance from site
001046	Douglas River Estuary pNHA	Around 4km at its nearest point
001082	Dunkettle Shore pNHA	Around 5km at its nearest point
001074	Rockfarm Quarry, Little Island pNHA	Around 8km at its nearest point
001058	Great Island Channel pNHA	Around 8.5km at its nearest point
001979	Monkstown Creek pNHA	Around 10.5km at its nearest point
001066	Lough Beg pNHA	Around 14.5km at its nearest point

6.3 Sites within the zone of influence

For the purpose of this assessment, the hydrological connection to the Cork Harbour SPA and Great Island Channel SAC illustrates a source-pathway-receptor linkage. Both Natura 2000 sites are therefore considered to be within the zone of influence for the proposed development. The Natura 2000 sites of relevance are illustrated in Figure 8.

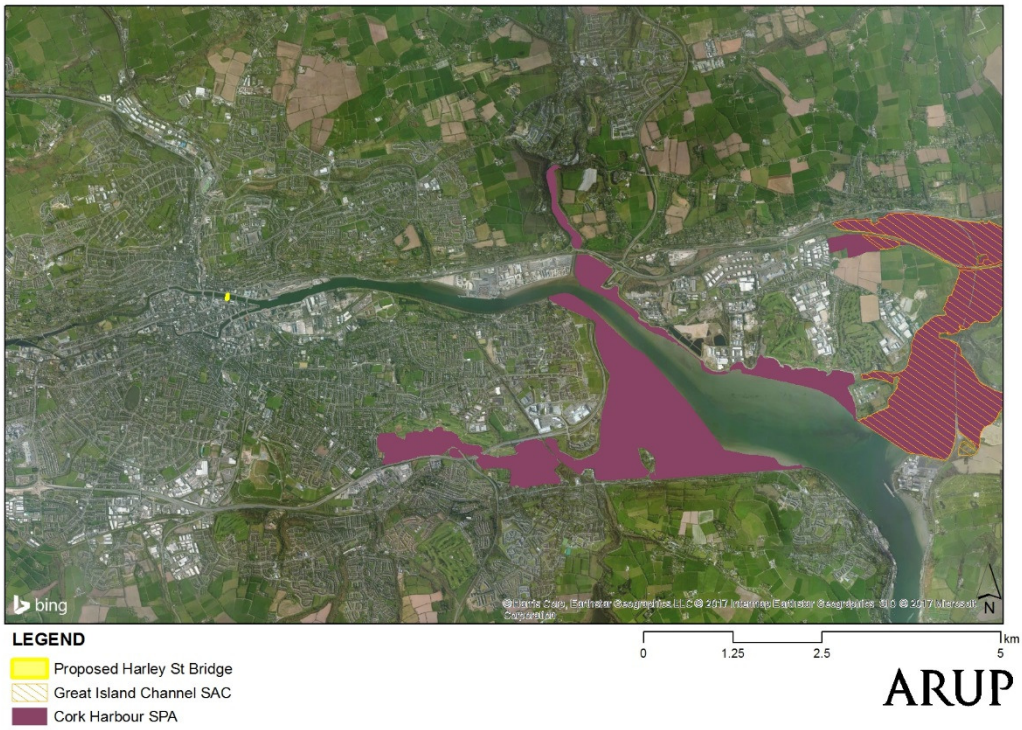

Figure 8: Natura 2000 sites within the zone of influence of the proposed development (not to scale)

Additionally, Dunkettle Shore, the Douglas River Estuary and Rockfarm Quarry, Little Island pNHAs are considered to be within the zone of influence (Refer to Figure 9) as there is the potential for protected species to move from the Natura 2000 sites to the pNHAs which are closer to the proposed development and further upstream than the Cork Harbour SPA and Great Island Channel SAC.

Figure 9: pNHAs within the zone of influence of the proposed development (not to scale)

6.4 Cumulative effects

Other developments can lead to an elevated effect on Natura 2000 sites, therefore information has been sought on projects that have been recently approved in the site and surrounding area. Other developments need to be of a sufficient scale or proximity to the development being assessed for cumulative effects to be likely.

The Lower Lee FRS may have the potential to result in cumulative effects on downstream Natura 2000 sites. No other developments were identified that would be likely to exacerbate effects or introduce further receptors adjacent to the site. It is noted that the Metropole Hotel is being expanded and redeveloped, however this has been designed to tie in and integrate with the surfacing and public realm aspects of the proposed development.

The Lower Lee FRS is being advanced by the Office of Public Works (OPW) as part of the National Flood Risk Management programme. The flood defence level protection presented during the public exhibition is outlined in Figure 10 and Figure 11.

The Lower Lee FRS is currently undergoing detailed design to provide protection for properties within the Lee catchment area and construction is likely to commence in early 2018. The phasing of works outlined in the Environmental Impact Statement indicate that works would commence in the southern channel of the River Lee and move towards the west of the city prior to the commencement of any city centre works in the vicinity of the proposed development. At this stage, it is expected that the proposed development would be constructed in advance of the Lower Lee FRS works occurring at this location and that there would be no overlap between the projects on site.

The AA screening for the Lower Lee FRS has concluded that the project will have no potential adverse effect on the integrity of Natura 2000 sites and as such returns a conclusion that there is no potential for significant effects on Natura 2000 sites arising from the Lower Lee FRS.

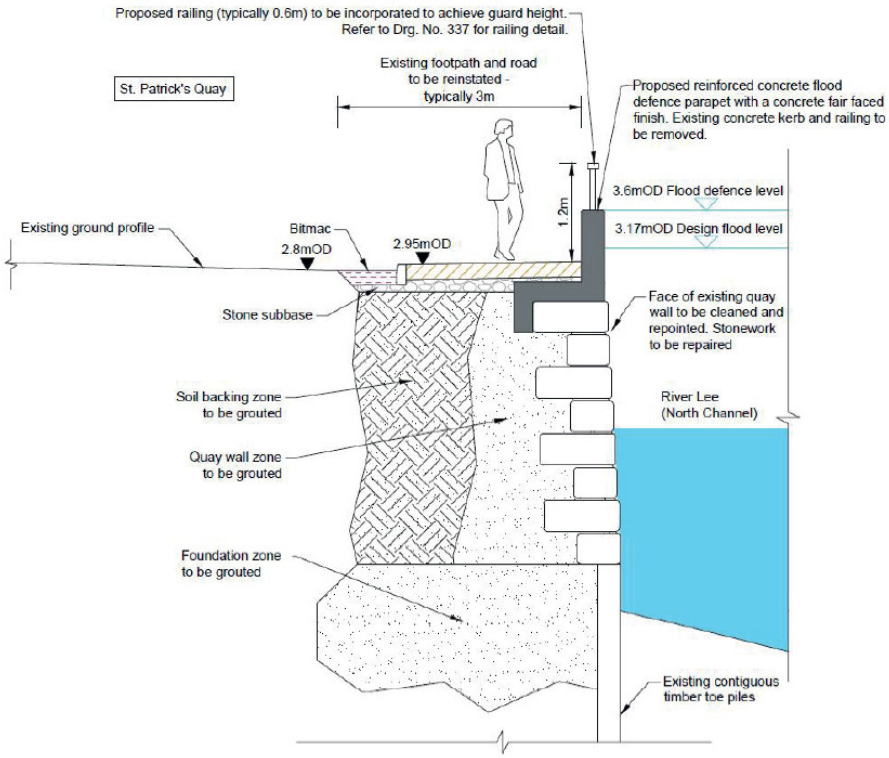

Figure 10: Proposed flood relief works on St Patrick's Quay (Source: OPW)

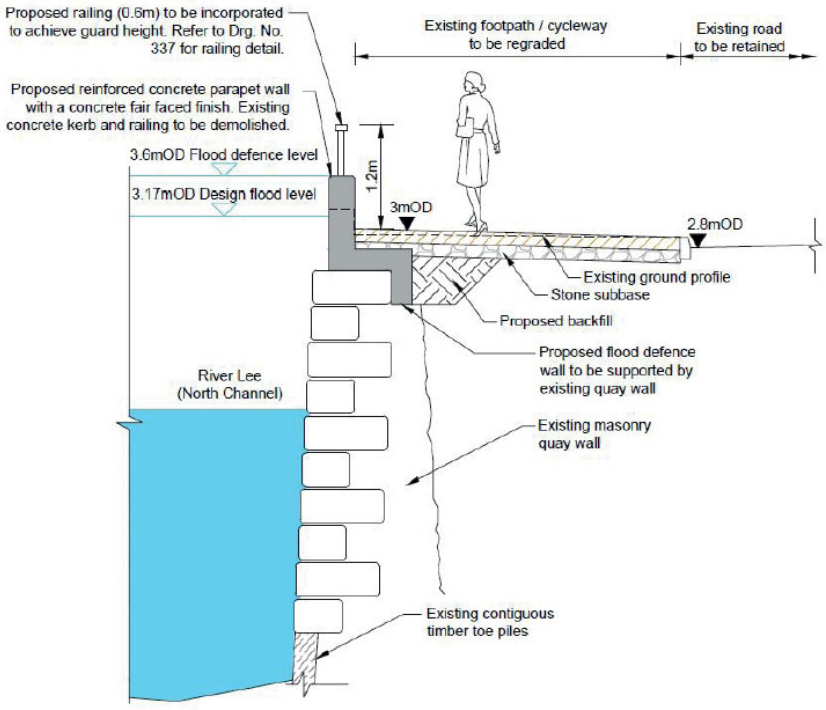

Figure 11: Proposed flood relief works on Merchant's Quay (Source: OPW)

7 Potential effects on Natura 2000 sites

7.1 Potential effects of the proposed development on Natura 2000 sites

The primary interest from an ecological perspective is that adverse effects on designated conservation sites are effectively prevented. This may comprise direct or indirect effects on qualifying interests or conservation objectives of the Cork Harbour SPA and Great Island Channel SAC.

There would be no direct or indirect impacts from the proposed development on any Qualifying Interest habitats and species of the Cork Harbour SPA and Great Island Channel SAC. Furthermore, the site of the proposed development is not of ecological interest for any of the transient species of the Cork Harbour SPA and Great Island Channel SAC as the site does not contain the typical habitats to support these species. As such, it is unlikely that the any of the species listed in Table 1 would travel to the site to forage or nest.

There are no in-stream works proposed and all works on the quays would be undertaken with due regard to best practice construction management and industry standards. Emissions to ground and to surface water will therefore be controlled during construction using standard proven construction methodologies and significant impacts on downstream receptors are not predicted. Emissions to ground and/or to surface water would not arise from the proposed development during operation.

Given the scale, type, duration and location of the proposed development, it can be concluded by the authors of this report that the proposed development is unlikely to have an effect on the integrity of the Cork Harbour SPA and/or Great Island Channel SAC. Further, there would be no direct or indirect effects from the proposed development on any qualifying interests of the Cork Harbour SPA and Great Island Channel SAC.

7.2 Potential cumulative effects on Natura 2000 sites

Given the limited area and extent of the proposed development and phasing of the Lower Lee FRS, it is unlikely that the proposed development in combination with other development(s) would have a significant cumulative effect on the integrity of any Natura 2000 sites.

7.3 Assessment of likely significant effects

This assessment concludes that the proposed development is unlikely to have any significant adverse (direct or indirect) effects on Natura 2000 sites, their conservation objectives and/or qualifying interests. This judgement has been made on the following basis:

- No works will take place within the Natura 2000 sites and there would be no encroachment on, or fragmentation of the habitats in the Cork Harbour SPA or Great Island SAC.

- There will be no disturbance to the qualifying interests of the Natura 2000 sites and no direct effect on population density of species likely to occur at the Natura 2000 sites and/or pNHAs within the zone of influence.
- There are no typical habitats at the site of the proposed development that support transient species moving to/from the Natura 2000 sites. Further, the site is located in a highly urbanised area where any wintering birds passing through will be accustomed to relatively high levels of noise and traffic. As such, works undertaken during the wintering bird season should not result in any adverse effects on qualifying interests.
- There is a potential source-pathway-receptor linkage between the proposed development and the Natura 2000 sites downstream, however there are no in-stream works required for construction. Further, all works on the quays would be undertaken with due regard to best practice construction management and industry standards to prevent discharge and emissions to water courses or via groundwater pathways. There would be no effect on water resources or water quality associated with the proposed development as there would be no in-stream works, no discharges to the River Lee, no changes to the hydrology of the River Lee and the diluting capacity of Cork Harbour is relatively good. A Construction Environmental Management Plan would be implemented by the contractor as standard during the works and all staff working on site would be given a briefing that emphasises the precautionary measures to be implemented as well as the sensitive nature of the River Lee and downstream Natura 2000 sites.
- No difficulties in implementing standard construction environmental protection measures (i.e. prevention of siltation or hydrocarbon contamination in surface water run-off) under the supervision of site engineers is envisaged. Thus significant impacts on the receiving environment and in particular the North Channel of the River Lee which discharges into Cork Harbour are not predicted to occur.

8 Screening statement and conclusions

The screening assessment has identified that the Cork Harbour SPA and Great Island Channel SAC are within the study area and zone of influence of the proposed development. There is an indirect pathway to the Natura 2000 sites as they are hydrologically connected to the site of the proposed development.

Based on the information provided in this screening report and by applying the precautionary principle, it is the view of Arup that it is possible to rule out any likely significant effects on Natura 2000 sites. As such, it is not necessary to undertake any further stage of the AA process.

Refer to Appendix A for further detail in the Finding of No Significant Effects Report.

Appendix A

Findings of no significance report

Finding of no significance report

Name of Project:

Harley Street pedestrian/cycle Bridge

Names of Natura 2000 Sites within 15km of site:

Site Name	Site Code
Cork Harbour SPA	004030
Great Island Channel SAC	001058

Both the Great Island Channel SAC (site code 001058) and the Cork Harbour SPA (site code 004030) are of relevance to the proposed development.

Is the project or plan directly connected with or necessary to the management of the sites?

No.

Are there other projects or plans that together with the project or plan being assessed could affect the site?

No cumulative effects predicted.

THE ASSESSMENT OF SIGNIFICANCE OF EFFECTS

Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 sites.

The proposed development will not result in any significant effects on Natura 2000 sites.

Explain why these effects are not considered significant.

This assessment concludes that the proposed development is unlikely to have any significant adverse (direct or indirect) effects on Natura 2000 sites, their conservation objectives and/or qualifying interests. This judgement has been made on the following basis:

- No works will take place within the Natura 2000 sites and there would be no encroachment on, or fragmentation of the habitats in the Cork Harbour SPA or Great Island SAC.
- There will be no disturbance to the qualifying interests of the Natura 2000 sites and no direct effect on population density of species likely to occur at the Natura 2000 sites and/or pNHAs.
- There are no typical habitats at the site of the proposed development that support transient species moving to/from the Natura 2000 sites. Further, the site is located in a highly urbanised area where any wintering birds passing through will be accustomed to relatively high levels of noise and traffic. As such, works undertaken during the wintering bird season should not result in any adverse effects on qualifying interests.

- There is a potential source-pathway-receptor linkage between the proposed development and the Natura 2000 sites downstream, however there are no in-stream works required for construction. Further, all works on the quays would be undertaken with due regard to best practice construction management and industry standards to prevent discharge and emissions to water courses or via groundwater pathways. There would be no effect on water resources or water quality associated with the proposed development as there would be no in-stream works, no discharges to the River Lee, no changes to the hydrology of the River Lee and the diluting capacity of Cork Harbour is relatively good. A Construction Environmental Management Plan would be implemented by the contractor as standard during the works and all staff working on site would be given a briefing that emphasises the precautionary measures to be implemented as well as the sensitive nature of the River Lee and downstream Natura 2000 sites.
- No difficulties in implementing standard construction environmental protection measures (i.e. prevention of siltation or hydrocarbon contamination in surface water run-off) under the supervision of site engineers is envisaged. Thus significant impacts on the receiving environment and in particular the North Channel which discharges into Cork Harbour are not predicted to occur.

DATA COLLECTED TO CARRY OUT THE ASSESSMENT

Who carried out the assessment?

The assessment was carried out by Arup.

Sources of Data -

Sources of data included:

- *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC* (EC Environment Directorate-General, 2000); [hereafter referred to as MN2000].
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodical Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission Environment Directorate-General, 2001).
- *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC.* (European Commission, 2007).
- *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities* (Department of Environment, Heritage and Local Government, 2010 revision).
- *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10.*
- *Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive* (International Workshop on Assessment of Plans under the Habitats Directive, 2011).

Sources of information that were used to collect data on the Natura 2000 network of sites and on the existing ecological environment are listed below:

- Bing Maps aerial photography[13];
- Online mapping and data on protected sites from the National Parks and Wildlife Service [14];
- Information on environmental quality data available from the EPA;[15]
- Status of EU protected habitats in Ireland provided by the National Parks and Wildlife Service[16];
- National Biodiversity Centre Data Centre database[17]; and
- Relevant information from the Lower Lee Flood Relief Scheme (FRS) Environmental Impact Statement[18].

OVERALL CONCLUSIONS

Based on the information provided in this screening report and by applying the precautionary principle, it is the view of Arup that it is possible to rule out any likely significant effects on Natura 2000 sites. As such, it is not necessary to undertake any further stage of the Appropriate Assessment process.

[13] Bing Maps in ArcGIS- Accessed 1 June 2017
[14] https://www.npws.ie/maps-and-data/designated-site-data/download-boundary-data - Accessed 1 June 2017
[15] Envision Online Environmental Map Viewer: http://gis.epa.ie/Envision – Accessed 1 June 2017
[16] NPWS Protected sites in Ireland : https://www.npws.ie/protected-sites - Accessed 1 June 2017
[17] http://maps.biodiversityireland.ie/ - Accessed 1 June 2017
[18] http://www.lowerleefrs.ie/index.php/site/environmental - Accessed 7 June 2017

Appendix B

Site synopses

B1

SITE SYNOPSIS

Site Name: Great Island Channel SAC

Site Code: 001058

The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats
[1330] Atlantic Salt Meadows

The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi, Nereis diversicolor* and *Corophium volutator*. Green algal species occur on the flats, especially *Ulva lactua* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly.

The saltmarshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Lax-flowered Sea-lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Sea Mayweed (*Matricaria maritima*) and Red Fescue (*Festuca rubra*).

The site is extremely important for wintering waterfowl and is considered to contain three of the top five areas within Cork Harbour, namely North Channel, Harper's Island and Belvelly-Marino Point. Shelduck is the most frequent duck species with 800-1,000 birds centred on the Fota/Marino Point area. There are also large flocks of Teal and Wigeon, especially at the eastern end. Waders occur in the greatest density

north of Rosslare, with Dunlin, Godwit, Curlew and Golden Plover the commonest species. A population of about 80 Grey Plover is a notable feature of the area. All the mudflats support feeding birds; the main roost sites are at Weir Island and Brown Island, and to the north of Fota at Killacloyne and Harper's Island. Ahanesk supports a roost also but is subject to disturbance. The numbers of Grey Plover and Shelduck, as given above, are of national importance.

The site is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports. Overall, Cork Harbour regularly holds over 20,000 waterfowl and contains internationally important numbers of Black-tailed Godwit (1,181) and Redshank (1,896), along with nationally important numbers of nineteen other species. Furthermore, it contains large Dunlin (12,019) and Lapwing (12,528) flocks. All counts are average peaks, 1994/95 – 1996/97. Much of the site falls within Cork Harbour Special Protection Area, an important bird area designated under the E.U. Birds Directive.

While the main land use within the site is aquaculture (oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments.

The site is of major importance for the two habitats listed on Annex I of the E.U. Habitats Directive, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.

B2

SITE SYNOPSIS

SITE NAME: CORK HARBOUR SPA

SITE CODE: 004030

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poulnabibe inlets.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially *Ulva* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Some shallow bay water is included in the site. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Mallard, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl. Of particular note is that the site supports internationally important populations of Black-tailed Godwit (1,896) and Redshank (2,149) - all figures given are five year mean peaks for the period 1995/96 to 1999/2000. Nationally important populations of the following 19 species occur: Little Grebe (57), Great Crested Grebe (253), Cormorant (521), Grey Heron (80), Shelduck (2,009), Wigeon (1,791), Teal (1,065), Mallard (513), Pintail (57), Shoveler (103), Red-breasted Merganser (121), Oystercatcher (1,809), Golden Plover (3,342), Grey Plover (95), Lapwing (7,569), Dunlin (9,621), Bar-tailed Godwit (233), Curlew (2,237) and Greenshank (46). The Shelduck population is the largest in the country (over 10% of national total). Other species using the site include Mute Swan (38), Whooper Swan (5), Pochard (72), Gadwall

(6), Tufted Duck (64), Goldeneye (21), Coot (53), Ringed Plover (73), Knot (26) and Turnstone (113). Cork Harbour is an important site for gulls in winter and autumn, especially Black-headed Gull (3,640), Common Gull (1,562) and Lesser Black-backed Gull (783), all of which occur in numbers of national importance. Little Egret and Mediterranean Gull, two species which have recently colonised Ireland, also occur at this site.

A range of passage waders occurs regularly in autumn, including such species as Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter.

Cork Harbour has a nationally important breeding colony of Common Tern (102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower. The birds are monitored annually and the chicks are ringed.

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA is a Wildfowl Sanctuary.

Environmental Report

Cork City Council

Harley Street Pedestrian/Cycle Bridge

Cork City Council

Harley Street Bridge

Environmental Report

253690-00/ER/R2

Issue | 6 July 2017

Job number 253690-00

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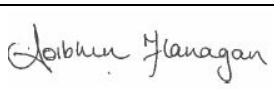
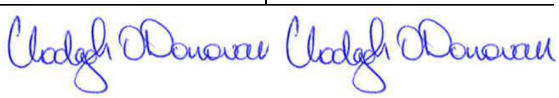
		Signature			
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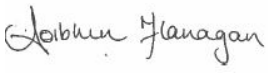
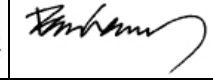
		Signature			
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1 Introduction

1.1 Overview

Arup has been appointed by Cork City Council (CCC) to prepare this environmental report for the proposed Harley Street pedestrian/cycle bridge, hereafter referred to as the proposed development. The proposed development would comprise a new 66 metre (m) bridge located over the River Lee between Brian Boru Bridge and St Patrick's Bridge in Cork City as illustrated in Figure 1.

Figure 1: Location of the proposed development

Screening has been undertaken separately for Environmental Impact Assessment (EIA) and Appropriate Assessment (AA) in accordance with the requirements of Council Directive 2011/92/EU, as amended by 2014/52/EU (EIA Directive), Council Directive 92/43/EEC (Habitats Directive) and Council Directive 79/409/EEC (Birds Directive). The EIA and AA screening reports have been prepared separately by Arup. On the basis of the work undertaken, it is the view of Arup that the proposed development is unlikely to cause any significant effects on the environment and/or any designated Natura 2000 sites and that neither an EIA or AA is required. CCC, as the competent authority, will make the final determination in this regard, when it undertakes the EIA and AA screening assessments.

Although it is considered that an EIA is not required for this proposed development, this environmental report has been prepared to appraise any likely environmental effects associated with the proposed development. Where appropriate, measures have been outlined to minimise any likely adverse effects. This report has been prepared to support CCC with the Part 8 consultation and approval process for the proposed development.

1.2 Background

In September 2016, CCC proposed a new bridge that would traverse the northern channel of the River Lee between the existing Brian Boru Bridge and St. Patrick's Bridge in Cork's city centre. The new bridge is intended to improve pedestrian and cycle connectivity between St. Patrick's Quay and Merchant's Quay, thereby improving the links between the city centre, MacCurtain Street, Kent Railway Station and the surrounding area.

The general requirements for the bridge include:

- Safe and attractive pedestrian and cycle passage across the north channel of the River Lee through a common pedestrian/cyclist area;
- Minimum clear parapet-to-parapet width of 4.5m;
- An elegant and attractive solution that is appropriate for and sympathetic to its environment and topographical setting;
- Cost effective design;
- Allowance for floodwater levels in accordance with the Lower Lee (Cork City) Flood Relief Scheme, with a minimum quay wall opening level of +3.5m above ordnance datum (mOD) or the provision of an alternative suitable flood defence proposal;
- Protection bollards or similar to restrict access to pedestrians and cyclists only;
- Wind protection;
- Aesthetically-pleasing night-time illumination;
- High quality detailing and execution;
- Design and construction methods that minimise social and environmental impacts
- Minimised impacts on the river view;
- Maintain the current navigation passage along the river;
- Embrace current developments and practice in sustainable development; and
- Provide for a sustainable and cost effective solution that minimises future maintenance.

1.3 Approvals process

The proposed development has been proposed by and would require approval from the local authority, i.e. CCC in this instance. The proposed development would therefore require consent in accordance with the requirements of Part 8 of the Planning and Development Regulations, 2001, as amended.

This report has been prepared to support the public consultation process and provide the necessary environmental information for the competent authority, CCC, to make a determination with regard to the application for consent for the proposed development.

1.4 Structure of this report

This environmental report has been structured as outlined below:

- Section 2 describes the proposed development that is the subject of this environmental report;
- Section 3 describes the legislative context and consistency with relevant European, national and local legislation and policy;
- Sections 4 - 13 describe the likely significant effects that might reasonably be expected to be associated with the proposed development and the plans proposed for ameliorating or preventing adverse effects on the environment; and
- Section 14 describes whether effects may be exacerbated due to interaction between topics (e.g. concurrent noise and air quality impacts) or whether any effects may be elevated due to the combined impacts of the proposed development with other developments in the area.

2 The proposed development

2.1 Introduction

This section describes the physical characteristics of the proposed development with particular regard to the design, construction and operational elements of relevance to this environmental report.

2.2 Overview

It is proposed to develop a new single span bridge that would traverse the northern channel of the River Lee in central Cork City between the existing Brian Boru and St Patrick's bridges. The proposed development would extend for 66 metres (m), extending south from and on axis with Harley Street (as illustrated in Figure 2). The proposed development would incorporate ramps to ensure accessibility and benches in the central spine to encourage visitors to sit and enjoy the views of the River Lee from this central location.

Figure 2: The proposed development

The proposed development would serve pedestrians and cyclists crossing between St Patrick's Quay and Merchant's Quay and would tie in with the existing transport network. The design would be sympathetic to the surrounding environment as well as the proposed developments in the area including the Metropole Hotel redevelopment and the Lower Lee Flood Relief Scheme (FRS) works proposed by the Office of Public Works (OPW) on the adjoining quay walls (Further detail available in Section 14.1.3).

2.3 Design elements

2.3.1 Scale, form and massing

The proposed development would comprise a shallow arched single span bridge approximately 66m in length. The cantilever design would incorporate an arched steel box girder and soffit shaped with a gentle semi-elliptical form across the water enabling a complete elliptical reflection on the water on a clear, calm day. There would be no piers required in the River Lee as the bridge would be supported by new abutments to be constructed behind the quay walls.

The centreline of the bridge would be centrally aligned on axis with Harley Street to optimise sight and desire lines from the proposed development leading up towards MacCurtain Street in the Victorian Quarter. There would be two shared paths on either side of the central spine beam and the width of the bridge would increase towards the centre to accommodate benches. Each of the paths would be 2.70m wide at the abutments, increasing to 3.60m wide at mid-span.

Figure 3: Visualisation of the proposed development

2.3.2 Landing areas, abutments and access

The proposed development would land on the existing quay walls and the ramps would be developed within the pavement of the existing footpaths. Orientated at right angles to the existing quay walls and parallel to the existing bridges, the position and orientation of the bridge would complement its surroundings. On the northern banks, the bridge would land immediately south of Harley Street on St Patrick's Quay whilst the southern landing would be approximately 30m west of Parnell Place on Merchant's Quay.

The existing level of the wall on St Patrick's Quay is approximately +2.85mOD and the OPW has proposed regrading this (to +3.60mOD) as part of the Lower Lee FRS works. The proposed development would set the bridge abutment at +3.17mOD and provide flood defences for the River Lee as outlined in Section 2.3.5.1. The bridge would be accessed via fully compliant 1:20 ramps extending for approximately 6.4m along St Patrick's Quay in the short term until the Lower Lee FRS works are complete. The northern landing would incorporate a signalised traffic junction to facilitate movement across St Patrick's Quay.

The existing level of the wall on Merchant's Quay is marginally lower than the northern side at +2.75mOD, however the proposed FRS works and abutments would correspond with the proposals noted above. The abutments would also be set at +3.17mOD and accessed via fully compliant 1:20 ramps extending for approximately 8.4m along Merchant's Quay in the short term until the Lower Lee FRS works are complete. A barrier would be provided on the southern landing to prevent cyclists from merging with traffic on Merchant's Quay.

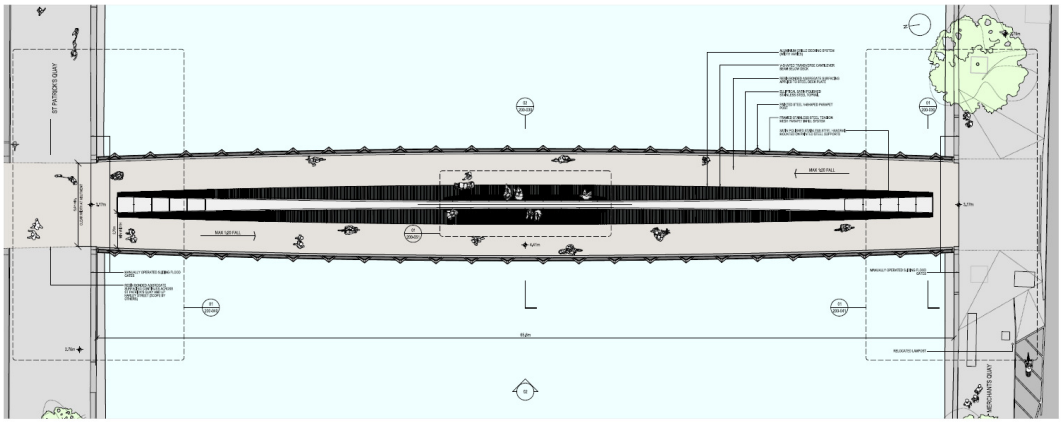

Figure 4: Proposed bridge plan and landings (not to scale)

2.3.3 Geotechnics

The proposed development would incorporate the foundation arrangement outlined in Figure 5 and Figure 6. The bridge abutments would be supported by eight auger piles located approximately 1.5m behind the existing timber toe piles in the quay walls. As outlined in Section 2.4.4, piling and excavation would be undertaken to a depth -0.5mOD and would not penetrate the bedrock and is unlikely to reach the groundwater table which lies between -0.5mOD and -0.9mOD.

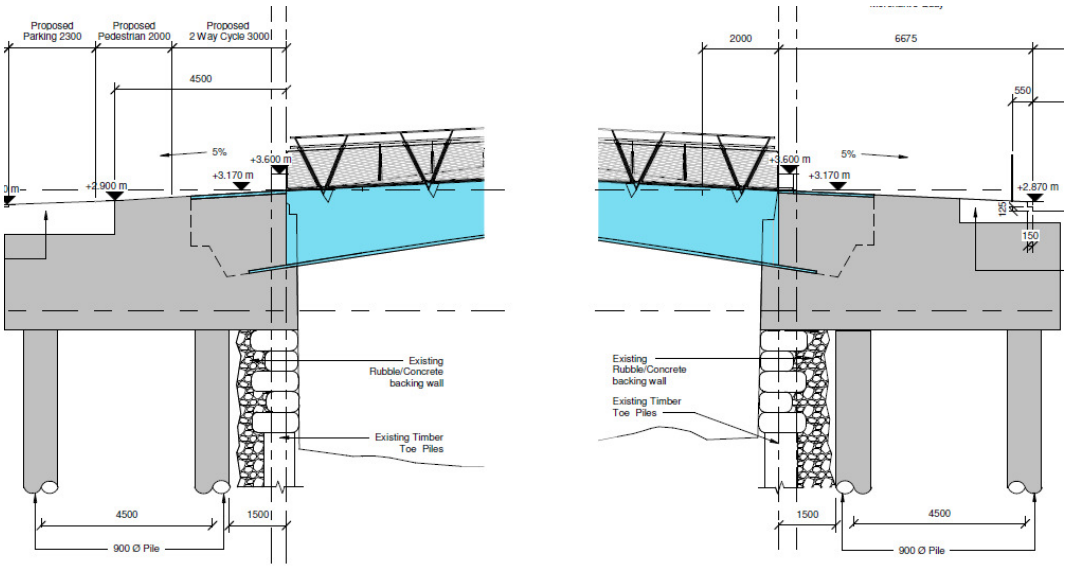

Figure 5: Preliminary foundation elevation (not to scale)

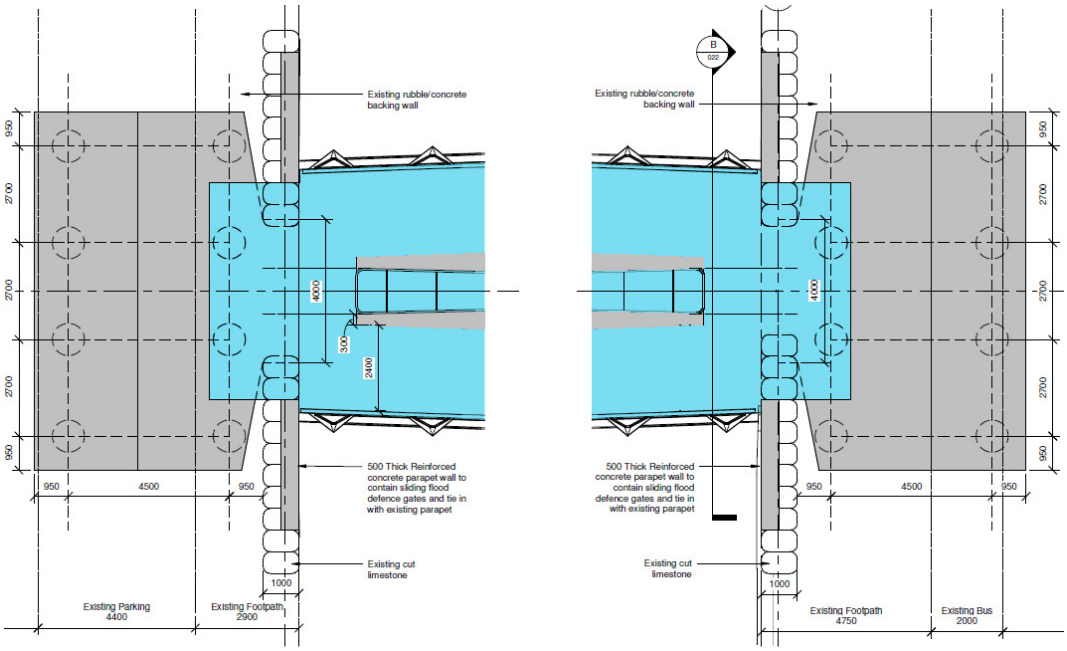

Figure 6: Preliminary foundation plan (not to scale)

2.3.4 Aesthetics

2.3.4.1 Lighting

The proposed development would incorporate functional and feature lighting to optimise safety in design and aesthetics as illustrated in Figure 7. All light fittings would be appropriate for the outdoor environment and rated IP66 or above.

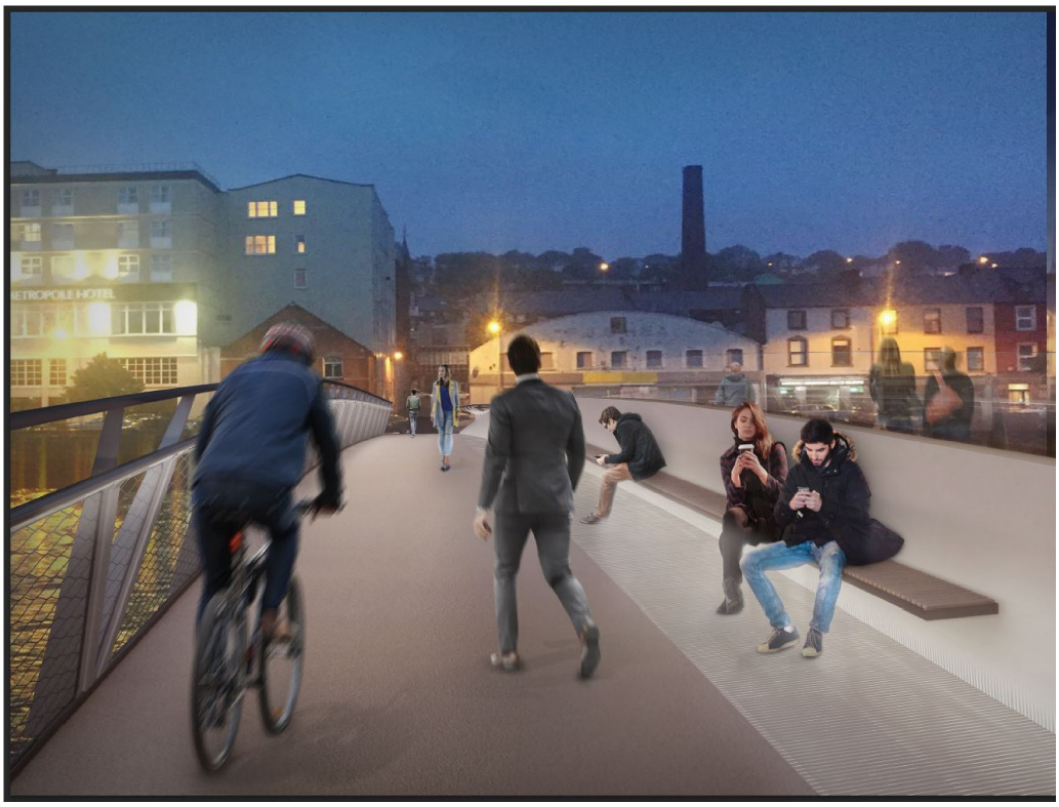

Figure 7: Night time visualisation of the proposed development

Functional lighting would be provided by discrete point source LED fittings recessed into the handrails at the edge of the bridge deck. This would introduce light across the bridge deck and provide a safe environment for users during the hours of darkness.

Feature lighting would be used to highlight the primary structural spine beam running centrally down the length of the bridge deck and to improve the aesthetics of the bridge during the hours of darkness. The LED fittings would be mounted just below deck level to introduce a soft glow of light up the surface of the beam.

2.3.4.2 Surfacing

The surface of the bridge deck would be a resin bonded aggregate system with a central aluminium decking grille running through the centre. Colour contrast and texture would distinguish the surfaces on the bridge deck.

The aggregate system would provide a non-slip walking surface and waterproof layer over the steel bridge deck. The grille would provide a visual contrast indicating a central zone for slower movement whilst diverting those travelling at higher speeds (e.g. cyclists) away from the benches. The grille would also indirectly facilitate light penetration through the bridge deck during the hours of darkness and wash a soft light across the face of the central primary structure.

2.3.4.3 Rails and parapets

The proposed development would comprise an array of painted carbon steel flats in a V-shaped arrangement directed upwards to support two rails along the length of the bridge as illustrated in Figure 8. The posts would incline inwards and rise up to support a handrail and cycle rail at 1.1m and 1.4m above the bridge deck respectively.

Stainless steel tension mesh parapets would be provided along the length of the bridge. The tension mesh may be provided as panels or as a continuous run and it would be designed optimise transparency, passive lighting and reduce opportunities for climbing the bridge.

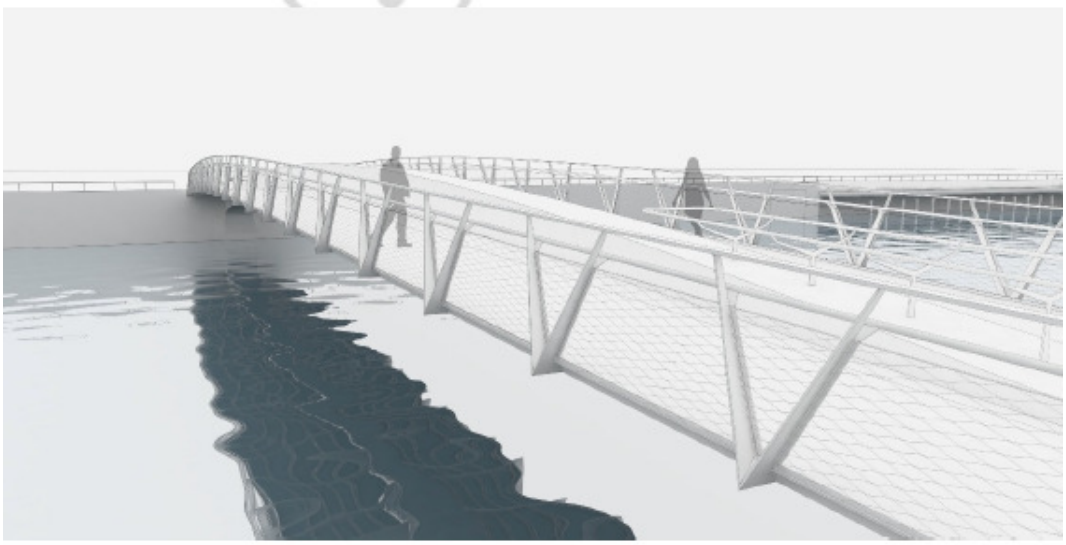

Figure 8: Proposed railings and parapets

2.3.5 Climatic considerations

2.3.5.1 Flood defence

The proposed development is located in an area with a long history of flooding and the design is cognisant of this flood risk and appropriate flood protection requirements. Specifically, the proposed development has been designed to accommodate the Lower Lee FRS and provide appropriate protection on the bridge deck from the 1 in 100 year fluvial and 1 in 200 year tidal flood events.

As noted in Section 2.3.2, the bridge deck level at the abutment would be +3.17mOD, therefore flood defences would be required as part of the proposed development to satisfy the error allowance or freeboard requirements. The flood defence would include a deployable flood barrier/flood gate at the northern and southern ends of the bridge deck.

The flood gate would comprise sliding gates recessed into the quay walls that can be slid into position and connected via a central post as required. It is envisaged that City Council officials would close the bridge and deploy the flood barrier prior to the onset of a flood event. The flood defence would be capable of raising to 450mm in order to accommodate freeboard.

2.3.5.2 Weather protection

There would be a localised glazed screen incorporated at the mid-span of the bridge to offer protection for patrons using the benches during inclement weather conditions. The screen would be approximately 1.6m above the level of the deck to provide shelter for those sitting down on the benches as illustrated in Figure 9.

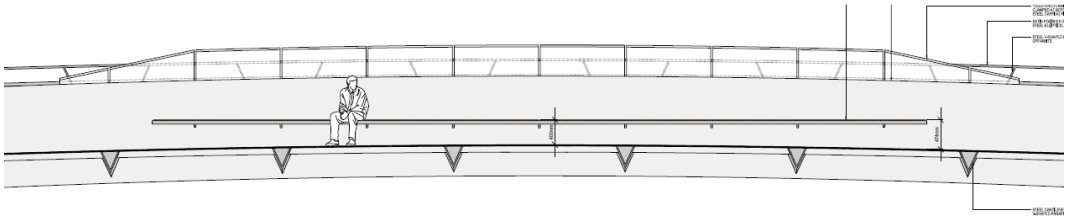

Figure 9: Proposed glazed screen around the benches at the mid-span (not to scale)

2.4 Construction elements

2.4.1 Overview

The construction methodology for the project would be finalised upon the completion of the detailed design and appointment of the contractor. At this stage, it is envisaged that construction is likely to commence in February 2018 and be completed by April 2019. The general activities to be carried out during construction would occur in sequence as outlined in Figure 10.

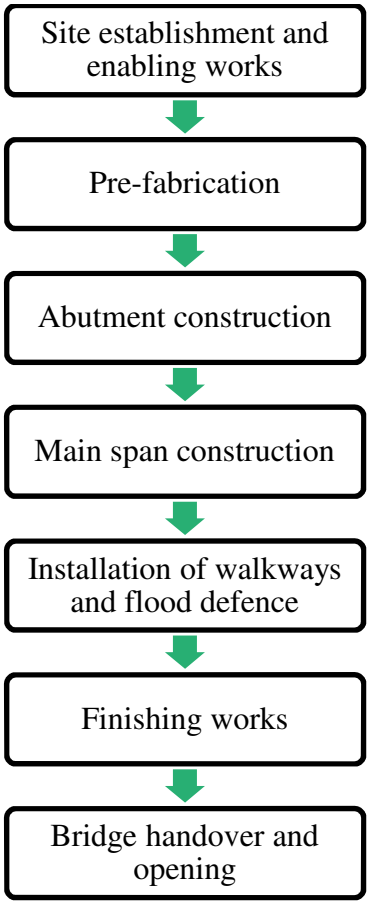

Figure 10: Indicative construction phasing

2.4.2 Site establishment and enabling works

The appointed contractor would be responsible for preparing and seeking approval for the relevant documentation prior to mobilisation on site. This would include the traffic management plan, construction environmental management plan (CEMP) and health and safety plan. Additionally, consent would be required from the OPW under Section 50 of the EU (Assessment and Management of Flood Risks) Regulations SI 122 of 2010 and Section 50 of The Arterial Drainage Act, 1945. The contractor would be required to prepare works programmes and method statements that provide a more detailed breakdown of the phasing of the construction works. It has been assumed that the contractor would apply best practice measures and construction would be undertaken with due regard to relevant environmental and health and safety legislation.

Site establishment would comprise the clearance of the landside portion of the site, erection of hoarding, relocation of the bus stop on Merchant's Quay, installation of traffic management signage and barriers and the provision of appropriate welfare facilities, as well as security measures around the site perimeter.

At this stage, it is likely that the construction compound(s) would be located on the quays within the site on both sides of the River Lee. The site would be 10m wide and 20m in length from the bridge abutments as illustrated in Figure 11. This would require the temporary removal of the bus lanes on Merchant's Quay and parking bays on St Patrick's Quay.

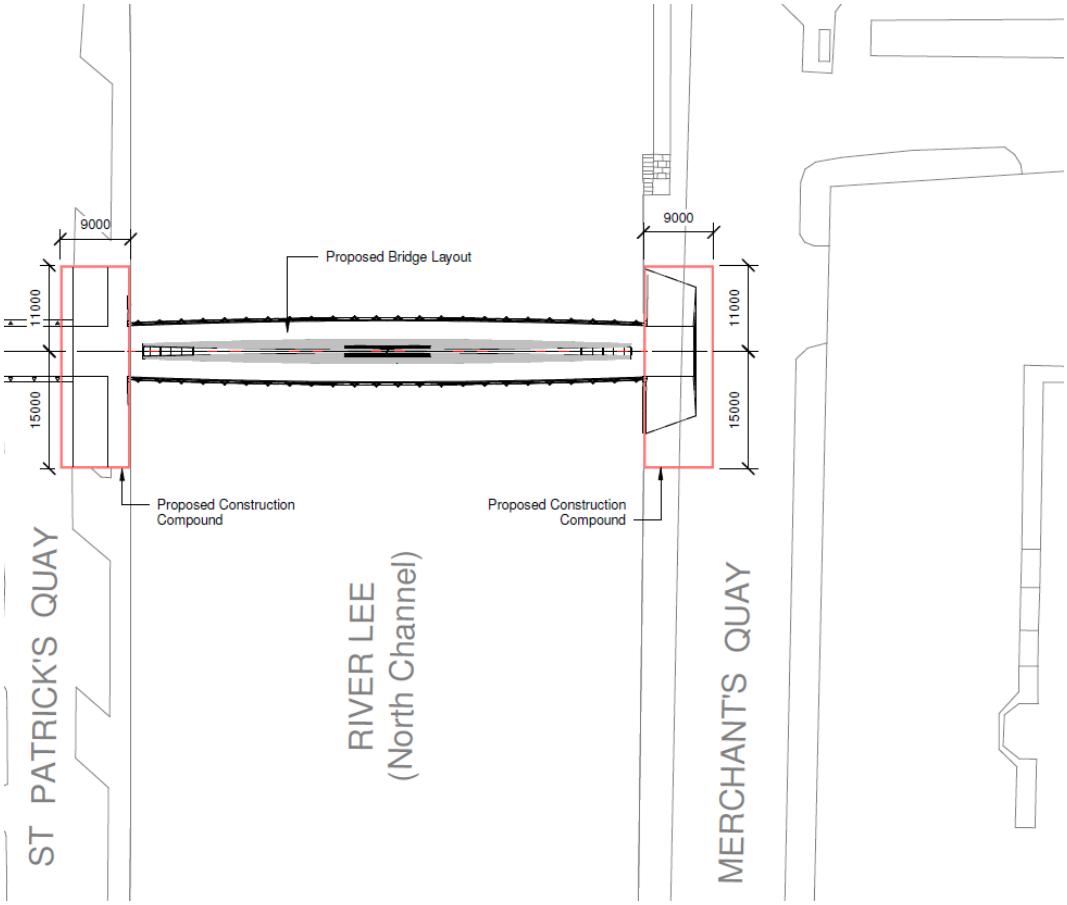

Figure 11: The proposed site layout during construction (not to scale)

No demolition works are envisaged as part of the proposed development and the majority of construction would occur behind the existing quay walls. The construction works areas would be enclosed behind both quay walls and a temporary sheet pile or equivalent on the river side of the quay wall. Further, the existing pavements and road networks would be retained and the area required for the ramps would be minimised.

2.4.3 Pre-fabrication

It is proposed that key elements of the bridge superstructure would be pre-fabricated off site. The central spine beam would consist of three steel sections. The central section would be fabricated off site, transported to Anderson or Penrose Quay and subsequently transferred to the site via water borne vessel that would float on the River Lee. The outer spans would be constructed in situ. This would reduce the need for Heavy Goods Vehicles (HGVs) accessing the site via the city centre road network.

2.4.4 Abutment construction

A three-sided cofferdam would be installed and a sheet piling retaining wall would be erected on each of the quays to support the construction of the bridge abutments. A temporary piling platform would be installed to facilitate eight flight auger piles on each of the quays. Fluid stabilisation would not be used. A pump would be installed within the cofferdam enclosure to maintain a dry working

environment and the water would be pumped either back to the river or into the main surface water drainage system. Silt in the river bed during piling cannot be fully eliminated, however strict construction methodology specifications will be outlined to lessen discharge during the removal of the cofferdam and the tidal cycle of the river will ensure negligible impacts on the River Lee.

Excavation would be undertaken to a depth of -0.5 mOD (approximately 3.3m below ground level) within the sheet pile cofferdam. The quay wall would be broken down locally to allow the beam to slot in and a temporary shutter would be installed. It should be noted that the existing cut limestone blocks from the quay wall would be retained for reuse.

The reinforcement for the abutments would be fixed to allow the first span of the spine to be held in place by a temporary steel frame support. The concrete pile cap would be cast, cladding would be installed around the exposed concrete face and pressure grouting would be undertaken behind the quay wall to provide reinforcement. The abutments would be constructed behind the quay walls in the cofferdam and the outer spans of the bridge would be lifted onto the abutment seating plate immediately afterwards. All construction debris would be enclosed within this area and removed prior to removal of the temporary sheet piling.

The construction of the abutments would require extensive traffic planning and management along St Patrick's and Merchant's quays. It is likely that the bus lanes on Merchant's Quay and parking bays on St Patrick's Quay would be removed temporarily to facilitate the construction of the abutments. It is likely that some of those works may occur during night time to minimise impacts on the traffic network. All night time works would be agreed and advertised in advance in order to minimise nuisance for stakeholders.

2.4.5 Main span construction

The central spine beam would consist of three steel sections that provide the main span of the bridge. The outer segments of the spine beam would be lifted onto the abutment seating plate by mobile cranes located on each of the quays. As outlined in Section 2.4.3, the central span would be prefabricated and transported to the site on barges. The central span would be lifted into place from the floating barge via a hoist located on the tips of the abutment sections.

All welding would be undertaken within fully encapsulated enclosure(s) and all debris would be removed prior to the disassembly of the cofferdam enclosure.

The construction of the main span would be carried out during the night time to allow for partial road closures along St Patrick's and Merchant's quays. The construction of the central span would be dependent on the tides. Appropriate traffic management measures would be put in place and advance notice to stakeholders would be provided to minimise nuisance.

2.4.6 Installation of walkways and flood defence

Once the abutments and bridge span are in place, the decking and surfacing for the cantilever walkways, the flood gates and parapets would be installed from platforms supported by the central spine beam. In parallel to these works the ramps from street level on the quays would be installed to tie the proposed

development in with the surrounding public realm. This would incorporate the provision of the signalised junction on St Patrick's Quay.

2.4.7 Finishing works

Upon completion of the bridge construction the final design elements would be installed on the bridge including surfacing finishes, landscaping, and lighting. Once construction is complete the site would be cleaned up. This would include the removal of all plant and equipment, site hoarding, waste materials and reinstatement of the site to ensure seamless tie in between the proposed development and the surrounding environment.

2.4.8 Bridge handover and opening

Upon completion of construction and clean up on the site, the proposed development would be handed over to CCC, commissioned and opened to the general public. At this stage, it is likely that the proposed development would be opened by April 2019.

2.5 Operational elements

The proposed development would operate as a two way bridge for pedestrians and cyclists from April 2019 onwards. The bridge would tie in with the existing networks and contribute towards improving the quality of the active transport network and public realm in Cork's city centre.

The bridge would be open 24 hours a day, 365 days a year. CCC would be responsible for maintaining the pavements, railings and parapets on the bridge and deploying the flood defence gates during flood events.

3 Planning and policy context

This section provides an overview of the relevant policies and planning objectives at a regional and local level for the proposed development.

3.1 National policy context

3.1.1 National Spatial Strategy 2002 – 2020

The National Spatial Strategy 2002 – 2020 (NSS) is a strategic 20 year planning framework for Ireland. The NSS aims to achieve a better balance of social, economic and physical development across Ireland, supported by more effective planning. In order to drive development in the regions, the NSS proposes that areas of sufficient scale and critical mass will be built up through a network of 'gateways' and 'hubs'.

Cork is identified as a 'gateway' and gateways have a strategic location, nationally and relative to their surrounding areas, and provide national scale social, economic infrastructure and support services. Cork is also identified as an established tourism area as it contains premier international tourism destination and highly developed tourism districts, such as the Victoria Quarter to the north of the site.

The NSS outlines that Cork should be pursuing rejuvenation in central Cork City and identifies a number of priorities to be implemented through identified actions and objectives outlined in the regional and local planning policy.

3.1.2 Ireland 2040 Plan: National Planning Framework

The Department of Housing, Planning, Community and Local Government is currently preparing the Ireland 2040 Plan: National Planning Framework (NPF) which is proposed to replace the NSS. It is intended that the NPF will be a high-level document that provides the framework for future development and investment in Ireland.

The NPF will be the overarching document guiding regional and local development plans. The NPF generally supports the provision of infrastructure and place-making initiatives and it supports the continued growth of Cork City.

3.2 Regional policy context

3.2.1 South West Regional Planning Guidelines 2010 – 2022

The South West Regional Planning Guidelines 2010 – 2022 (Regional Planning Guidelines) is a strategic policy document to steer the future growth of the south west of Ireland over the medium to long term. The Regional Planning Guidelines aim to implement the strategic planning frameworks set out in the National Spatial Strategy.

Section 1.3.27 of the Regional Planning Guidelines identifies the need for continued investment in the encouragement of walking and cycling and identifies the following:

> *"Although there has been some recent success in providing new cycling facilities assisted by recent Government funding initiatives, many parts of the region's urban areas and its rural settlements still lack basic facilities that would allow many local journeys to be made conveniently by these modes.*

Further, walking and cycling has been outlined as a key issue for the urban areas in the south west as outlined below:

> *"Significant improvement of public transport services as well as walking and cycling facilities is envisaged to be a critical component in the future development of urban areas."*

The proposed development aligns with the objectives of the Regional Planning Guidelines and the overall policy as it would provide a sustainable, convenient mode of transport for pedestrians and cyclists in the city centre.

3.3 Local policy context

The Cork City Development Plan 2015 – 2021 (Development Plan) is the strategic planning policy document guiding the future development of the city to 2021. The Development Plan came into effect on 20 April 2015 and aims to do the following:

- Provides a vision for the development and improvement of the city;
- Sets out the priorities for investment on infrastructure over the plan period; and
- Is the main reference point in determining planning applications for new development.

Goal 4 of the Development Plan promotes sustainable modes of transport and the integration of land use and transportation by outlining the following:

> *"At the national level there is a mandate to reduce emissions caused by fossil-fuelled transport, to reduce use of the private car for commuting and to increase journeys by public transport, walking and cycling. These objectives are central to the land-use and transport strategies in this plan and as well as having the significant societal benefits of a better quality environment can also give health benefits and cost-savings to the individual citizen. Achieving national targets is a long term objective which will require a move to more sustainable land use planning and a significant upgrade to public transport in the greater city area."*

The proposed development would improve the pedestrian and cycle network and enhance surface access to public transport hubs including Cork Kent railway station and Parnell Place bus station. Further, the proposed development would integrate land use by linking two areas zoned as 01-City Centre Retail Areas on

either side of the River Lee. The objective of retail areas is to protect, upgrade and expand retailing (particularly higher order retail) and supporting uses in the city centre. The proposed development would also cross the River Lee which is zoned as 19-River Water Bodies/Protection in order to provide for appropriate recreation, amenity and transport uses. The proposed development would support these land use zoning objectives as it would enhance connectivity for pedestrians and cyclists in the central retail area.

Section 5.11 of the Development Plan highlights the personal and societal benefits associated with active transport and Objective 5.11 Pedestrian and Cycling Infrastructure identifies the need for a new pedestrian/cycle bridge from Parnell Place to Harley Street. The proposed development is in accordance with this objective.

Objective 8.4 River City / City Island identifies the need to work with Fáilte Ireland to promote cultural and tourist attractions and support public realm improvements, walking trails and navigation aids around the city centre island. The proposed development would support this objective as it would provide a new walking trail across the River Lee and improve the public realm along the quays.

Objective 8.7 Public Realm recognises the need to improve the city waterfront as part of the network to link the major cultural tourism attractions and amenity areas. The proposed development would support this objective by improving the public realm on the city waterfront and linking the attractions and amenity areas located around MacCurtain Street and the city centre.

Objective 11.13 Amenity Routes promotes the development of a network of high quality amenity routes, particularly along waterways that link existing and proposed parks and public open spaces. Further, this objective identifies the need to work with CCC and stakeholders to improve linkages subject to Ecological Assessment and Appropriate Assessment Screening. The proposed development would improve linkages along the waterway and link with public open spaces. As outlined in Section 1.1, EIA and AA screening assessment reports have been prepared for the proposed development, to assist CCC, as the competent authority, in undertaking an EIA and AA screening assessment. The conclusions of Arup, in preparing these reports, is that neither EIA nor AA is required for the proposed development. The proposed development would therefore support this objective.

Objective 13.1 Strategic Objectives – City Centre and Docklands outlines the relevant objectives for CCC to ensure continued success for Cork's city centre. The relevant strategic objectives include:

> *"…h. To continue to enhance the quality of the city's public realm and improve access into and within the City Centre for all the city's users and ensure that the City Centre is attractive to all age groups including children, young people and families;*
>
> *i. To facilitate the safe, efficient and sustainable movement of people to, from and within the City Centre."*

The proposed development is aligned with these strategic objectives as it provides opportunity for sustainable movement of people to, from and within the city centre whilst enhancing the public realm and providing a new accessible transport link across the northern channel of the River Lee.

Objective 13.15 Priority Public Realm Improvement Projects identifies the need for a pedestrian bridge linking Merchant's Quay to St Patricks' Quay. The proposed development is in accordance with this objective.

Objective 13.17 Strategic Pedestrian Linkages and Objective 13.18 Developing Cycling in the City Centre recognises the need for additional pedestrian and cycle routes to improve connectivity and opportunities for active transport throughout the city centre. The proposed development would enhance the pedestrian and cycling network and encourage active transport by improving connectivity in this central location.

Objective 13.20 Pedestrian Priority Core prioritises pedestrians at the heart of the city centre and aims to reinforce Cork city centre as a desirable destination for pedestrians. The proposed development would prioritise pedestrian movement across the River Lee and therefore support this objective.

4 Air quality and climate

4.1 Introduction

This chapter describes the baseline air quality and climate conditions at the site and provides an assessment of the likely significant effects of the proposed development on air quality and climate. The assessment considers the likely significant effects of construction activities on ambient air quality and odour. Operational activities are not likely to have a significant effect on air quality or odour. A project of this scale would not have a significant effect on climate and the proposed development is not expected to be impacted by climate change. The likely significant effects of the proposed development on flood risk have been considered as part of water resources as described in Section 13.

Air quality standards for the protection of human health and the environment have been developed at the European level[1] and transposed into Irish legislation through guidance from the Environmental Protection Agency (EPA). The Air Quality Standards Regulations 2011[2] set limit values for ground level concentrations of certain substances over the short and long term.

4.2 Existing environment

The proposed development is located in a dense, urbanised area of the Cork conurbation (Zone B for the purposes of EPA observations). EPA monitoring undertaken as part of the Air Quality Index for Health[3] describes the air quality at the site as 'good'. The ambient air quality is comparable to any city centre location and there is general compliance with the set limit values for pollutants.

4.3 Likely significant effects

Exhaust emissions associated with construction plant and equipment, machinery and vehicles may be slightly elevated during construction. There is also the potential for dust associated with excavation, the temporary, partial demolition of the quay wall, earth moving and trackout (i.e. the movement of construction vehicles leading to dirt or debris on paved roads). The exhaust and dust emissions would be temporary in nature and a minor nuisance for the duration of construction when considered in the context of the dense urban environment.

The proposed development is designed for pedestrians and cyclists (rather than motorised vehicles) and therefore there would be no additional sources of vehicular emissions or effects on air quality during operation. In fact, the proposed development may reduce reliance on vehicles by improving the pedestrian and cycle network in the city centre location.

[1] European Union (2008) *Ambient Air Quality and Cleaner Air for Europe Directive 2008/50/EC.*
[2] Environmental Protection Agency (2011) *Air Quality Standards Regulations 2011.* S.I. No. 180 of 2011.
[3] Environmental Protection Agency (2016) *Air Quality Index for Health.* [Available from http://www.epa.ie/air/quality/ Accessed 23 May 2017]

No odour emissions are envisaged as part of the construction or operation of the proposed development.

4.4 Mitigation measures

It is considered that standard mitigation measures included herein and in the CEMP to avoid and mitigate potential dust and/or emissions will suffice to address any potential impacts on air quality. This will include and is not limited to the following measures:

- Prioritisation of low energy, electrical / battery powered equipment and low emission vehicles where practicable;
- Non-road mobile machinery will use ultra-low sulphur diesel where practicable;
- All machinery and equipment used at the site will be operated in accordance with manufacturers guidelines and maintained to relevant standards to reduce emissions to as low as possible;
- All construction vehicles and plant will be switched off and secured when not in use;
- Access routes and vehicle wheels will be cleaned regularly to prevent the spread of dirt on roads surrounding the site;
- All staff working on site must undertake a site-specific environmental induction which outlines the need for contractors to prevent excess dust emissions and minimise the use of vehicles, machinery, plant and equipment where practicable; and
- Dust generation will be minimised through the implementation of good housekeeping, soil/road dampening where required during dry weather conditions, proper storage, handling operations and covering of loose materials during transport.

No mitigation measures will be required for air quality during the operational phase of the proposed development.

4.5 Conclusion

The likely effects of the proposed development on air quality during construction are expected to be temporary in nature and managed effectively through the implementation of the mitigation measures outlined herein.

There are no likely significant adverse effects on air quality or climate during construction or operation of the proposed development. There is the potential outcomes for air quality associated with the mode shift from vehicles to walking or cycling once the proposed development becomes operational

5 Biodiversity

5.1 Introduction

This chapter describes the baseline ecological conditions at the site and provides an assessment of the likely significant effects of the proposed development on biodiversity. The assessment considers the likely significant effects of the construction of the proposed development on habitats and their respective flora and fauna and invasive species. Operational activities are not expected to have any significant impact on biodiversity.

A screening report for AA (Stage I of the AA process) has been prepared to assist in the determination if there would be any likely significant effects on the integrity of any Natura 2000 sites as a result of the proposed development. The AA screening report (included as Appendix A) concludes that it is possible to rule out any likely significant direct, indirect or cumulative effects on Natura 2000 sites (such as Special Areas of Conservation or Special Protection Areas) as a result of the proposed development. It is therefore not considered necessary to undertake any further stage of the AA process, however CCC, as the competent authority, will make the final determination in this regard.

5.2 Existing environment

5.2.1 Designated conservation areas

As outlined in Table 1 there are two Natura 2000 sites and three proposed Natural Heritage Areas of relevance to the proposed development. All of these sites lie downstream of the proposed development and are hydrologically connected to the site. The qualifying interests of the Natura 2000 sites are described in detail in Appendix A.

Table 1: Designated biodiversity sites

Site code	Designation	Site name	Distance from site
004030	Special Protection Area	Cork Harbour SPA	Around 3km at its nearest point (Approx. 4.5km downstream)
001058	Special Area of Conservation	Great Island Channel SAC	Around 8.5km at its nearest point
001046	Proposed Natural Heritage Area	Douglas River Estuary pNHA	Around 4km at its nearest point
001082	Proposed Natural Heritage Area	Dunkettle Shore pNHA	Around 5km at its nearest point
001058	Proposed Natural Heritage Area	Rockfarm Quarry, Little Island pNHA	Around 8km at its nearest point

5.2.2 Habitats and flora

The River Lee flows from western County Cork and splits in two for a short distance, creating the island on which Cork's city centre is built. The River Lee flows east towards Lough Mahon, onwards to Cork Harbour and into the Celtic Sea. The total catchment area of the River Lee covers approximately 2,000km^2 and the river is identified as a transitional water body that is subject to tidal influence at the location of the proposed development. The River Lee is nutrient sensitive with moderate water quality and a Water Framework Directive risk score of 'at risk of not achieving good status'.

There are no mud or sand flats in the vicinity of the site. The terrestrial environment is highly urbanised with no significant habitats or flora species evident in close proximity to the site. The flora of the quay walls is relatively diverse in places upstream of the site, however nationally protected plant species have not been identified on the quay walls in the city in the vicinity of the proposed development.

5.2.3 Fauna

The River Lee was designated as a Salmonid river under the EU Freshwater Fish Directive (2006/44/EC) at the location of the proposed development. Species of fish found along the river include Brook and Sea Lamprey (*Lampetra planeri* and *Petromyzon marinus*), Brown Trout (*Salmo truta*), European Eel (*Anguilla anuguilla)* and Atlantic Salmon (*Salmo salar*). Additionally Dipper (*Cinclus hibernicus*), Grey Wagtail (*Matacilla cinerea*), Grey Heron (*Andea cinerea*), Comorant (*Phalacrocorax carbo*), Peregrine Falcon (*Falco peregrinus)*, Otter (*Lutra lutra*) and bats and seals are known to occur along the city centre waterway.

5.2.4 Invasive species

Invasive species such as Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*) and others have gained a foothold in the riverine environment and have become part of the city flora. No invasive species have been recorded within the site.

5.3 Likely significant effects

5.3.1 Direct effects

As outlined in Appendix A, the proposed development is unlikely to have any direct effect on Natura 2000 sites, their conservation objectives and/or qualifying interests. The works would not occur in a designated conservation site and there would be no encroachment and/or fragmentation of Natura 2000 sites or pNHAs. Further, there would be no disturbance to the qualifying interests of the Natura 2000 sites and no direct effect on population density of species likely to occur at the Natura 2000 sites and/or pNHAs.

There are no typical habitats at the site that support transient species moving to/from the Natura 2000 sites. It is noted that the proposed development is located in a highly urbanised area where any wintering birds passing through would be

accustomed to relatively high levels of noise and traffic. As such, works undertaken during the wintering bird season should not result in any adverse effects.

There would be no effect on water resources, water quality and thus aquatic ecology associated with the proposed development as there would be no in-stream works, no discharges to the River Lee, no changes to the hydrology of the River Lee under normal conditions and the diluting capacity of Cork Harbour is relatively good. Further, all works on the quays would be undertaken with due regard to best practice construction management and industry standards to prevent discharge and emissions to water courses or via groundwater pathways.

5.3.2 Indirect effects

There is a potential source-pathway-receptor linkage between the proposed development and the Natura 2000 sites and pNHAs downstream as they are hydrologically connected. However, there are no in-stream works and all works on the quays would be contained within the site and/or cofferdam as appropriate. Construction would be undertaken with due regard to best practice construction management and industry standards to prevent discharge and emissions to water courses or via groundwater pathways. Further, measures would be outlined in the CEMP and implemented by the contractor as standard during the works to protect biodiversity and biosecurity.

5.4 Mitigation measures

It is considered that standard mitigation measures included herein and in the CEMP will avoid and mitigate the potential for any direct and indirect effects on biodiversity. This will include and is not limited to the following measures:

- Biodiversity including flora, fauna and habitats will not be intentionally harmed;
- Erect temporary fencing, secure the cofferdam and install appropriate erosion and sediment control measures (including sediment netting along the waterfront) to avoid unnecessary discharge to the River Lee and potential disturbance to terrestrial and aquatic biodiversity;
- Procedures will be adopted in the event of an unexpected protected species and/or important habitat being encountered;
- Soft piling techniques will be preferred and any activities likely to generate noise or vibration in the water column or through transmission via the riverbed (e.g. drilling, dredging) will be programmed outside fish migratory periods where practicable;
- Appropriate procedures for the discovery of invasive, non-native species and weeds will be developed and implemented for the treatment/control of such species; and
- All staff working on site must undertake a site-specific environmental induction which outlines the need to protect the River Lee and minimise the potential for infestation from vermin and pests.

No mitigation measures will be required for biodiversity during the operational phase of the proposed development.

5.5 Conclusion

The likely effects of the proposed development on biodiversity during construction are expected to be temporary in nature and managed effectively through the implementation of the mitigation measures outlined herein.

There are no likely significant adverse effects on biodiversity during construction or operation of the proposed development.

6 Cultural heritage, architecture and archaeology

6.1 Introduction

This chapter describes the baseline cultural heritage, architectural and archaeological conditions at the site and provides an assessment of the likely significant effects of the proposed development on cultural heritage, architecture and archaeology. The assessment considers the likely significant effects of the construction and operation of the proposed development on cultural heritage, architecture and archaeology.

An assessment has been undertaken by Lane Purcell Archaeology of the likely significant effects on archaeology, cultural and architectural heritage as a result of the proposed development. This report (included as Appendix B) identifies likely significant effects during construction and operation and outlines appropriate recommendations to manage such effects.

6.2 Existing environment

There are no recorded archaeological sites or recorded protected structures within the site. The closest recorded archaeological site to the proposed development is the 18-19th century house which lies around 300m to the south-west of the site. The closest protected structures are the Brian Boru and St Patrick's bridges which lie 120m and 185m away respectively. There are two recorded protected structures on St Patrick's Quay:

- No.5 - the Victoria Sporting Club (PS 410) which lies approximately 135m to the west; and
- No 38 - a warehouse (PS 412) which lies approximately 145m to the east.

The site lies 200m to the east of the Zone of Archaeological Potential for the historic city of Cork (CO074-034001) as listed in the Record of Monuments and Places for County Cork and in the Sites and Monuments Record Database of the Archaeological Survey of Ireland.

The quay walls on both St Patrick's Quay and Merchant's Quay are listed on the National Inventory of Architectural Heritage (NIAH) as being of regional significance. The ashlar limestone quay walls were constructed early in the 19th century of bonded rubble masonry faced with 0.6m average thickness cut limestone blocks. There are also a number of steps upstream on St Patrick's Quay and in both directions on Merchant's Quay as well as cast iron mooring posts outside of the site that are listed on the NIAH. The quayside structures are notable for their civil engineering value and for their skill and craftsmanship.

Additional NIAH listed items located in close proximity to the site include:

- Former Postal Sorting Office at 37 St Patrick's Quay: Listed on the NIAH (Item: 20512621) for regional significance and located approximately 85m downstream on St. Patrick's Quay

- Lennox Hearing Care Clinic at 27 St Patrick's Quay: Listed on the NIAH (Item: 20512613) for regional significance and located 30m downstream on St Patrick's Quay
- Metropole Hotel at 25 St Patrick's Quay: Listed on the NIAH (Item: 20512468) for regional significance and located 18m opposite the proposed development on St Patrick's Quay
- Everyman Palace Theatre on 13 St Patrick's Quay: Listed on the NIAH (Item 201512468) for regional significance and located 66m upstream on St. Patrick's Quay
- The Village Hall at 4 St Patrick's Quay: Listed on the NIAH (Item: 201512459) for regional significance and located 150m upstream on St. Patrick's Quay
- Irish Ferries at 9 Bridge Street: Listed on the NIAH (Item: 201512459) for regional significance and located 175m upstream on St Patrick's Quay
- Cork Bus Station at Anderson's Quay : Listed on the NIAH (Item: 20512933) for regional significance and located 60m downstream on Merchant's Quay

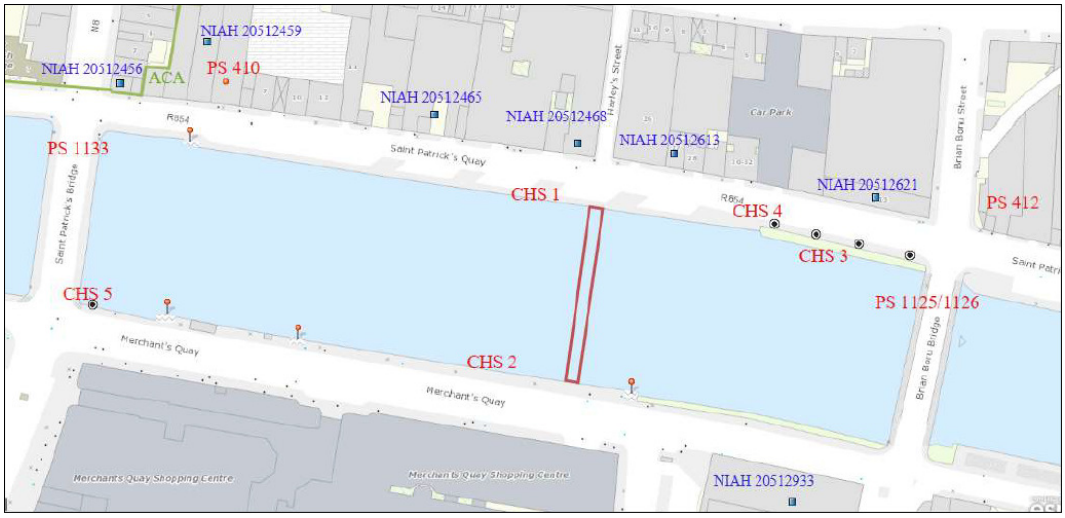

Figure 12: Relevant quayside structures (CHS), protected structures (PS) and buildings listed on the NIAH and their proximity to the proposed development (red outline) (Source: Lane Purcell Archaeology) (not to scale)

6.3 Likely significant effects

The proposed development is likely to cause effects on those listed heritage items identified in Table 2. The portion of the quay wall to be removed is relatively small and the visual impacts on listed heritage items are minimal given the urban setting and extensive development in the area that has preceded the proposed development. It is noted that the urban setting has brought constant changes and modifications to the surrounding streetscape, the addition of the bridge will be another change that is in keeping with the riverside setting and will not reduce the visual amenity of the streetscape or the listed heritage structures.

The construction of the bridge abutments requires the installation of a cofferdam and piling works behind the quay walls which may impact on the river channel bed, associated deposits, original riverine mud deposits and undiscovered subsurface items found behind the quay wall during construction.

Table 2: Likely cultural heritage, architectural and archaeological effects associated with the proposed development

Site	Value	Project activity	Nature of impact	Likely effect
St Patrick's Quay wall	Listed on the NIAH (Item: 20512612)	Abutment construction	Direct physical impact	Removal of part of the quay wall to support the construction of the bridge abutments
Merchant's Quay wall	Listed on the NIAH (Item: 20513136)	Abutment construction	Direct physical impact	Removal of part of the quay wall to support the construction of the bridge abutments
No. 5 St Patrick's Quay	Recorded Protected Structure (Item: 410)	Main span construction	Visual impact	Construction and existence of the bridge would partially obstruct the view from eastwards along the river channel
Brian Boru Bridge	Recorded Protected Structure (Item: 1125/1126)	Main span construction	Visual impact	Construction and existence of the bridge would partially obstruct the view upstream to the St Patrick's Bridge
St Patrick's Bridge	Recorded Protected Structure (Item: 1133)	Main span construction	Visual impact	Construction and existence of the bridge would partially obstruct the view downstream to the Brian Boru Bridge
Former Postal Sorting Office at 37 St Patrick's Quay	Listed on the NIAH (Item: 20512621)	Main span construction	Visual impact	Construction and existence of the bridge would partially obscure the view from the building over the quay
Lennox Hearing Care Clinic at 27 St Patrick's Quay	Listed on the NIAH (Item: 20512613)	Main span construction	Visual impact	Construction and existence of the bridge would partially obscure the view from the building over the quay
Metropole Hotel at 25 St Patrick's Quay	Listed on the NIAH (Item: 20512468)	Main span construction	Visual impact	Construction and existence of the bridge would partially obscure the view from the building over the quay
Everyman Palace Theatre at 13 St Patrick's Quay	Listed on the NIAH (Item: 20512465)	Main span construction	Visual impact	Construction and existence of the bridge would partially obscure the view from the building over the quay
The Village Hall at 4 St Patrick's Quay	Listed on the NIAH (Item: 20512459)	Main span construction	Visual impact	Construction and existence of the bridge would partially obscure the view from the building over the quay
Irish Ferries at 9 Bridge Street	Listed on the NIAH (Item: 20512456)	Main span construction	Visual impact	Construction and existence of the bridge would partially obscure the view from the building over the quay
Cork Bus Station at Anderson's Quay	Listed on the NIAH (Item: 20512933)	Main span construction	Visual impact	Construction and existence of the bridge would partially obscure the view from the building over the quay

6.4 Mitigation measures

It is considered that standard mitigation measures included herein and in the CEMP will avoid and mitigate the potential for any direct and indirect effects on cultural heritage, architecture and archaeology. This will include and is not limited to the following measures:

- Full written and photographic evidence of physical impacts on the quay walls will be documented in advance of the commencement of construction;
- Listed heritage items will not be intentionally damaged and efforts will be made to maintain the integrity of listed heritage items, their setting and the wider historic environment;
- Erect temporary fencing, secure the cofferdam and install appropriate protection measures to avoid potential damage to the river channel bed (and associated deposits), original riverine mud deposits and any undiscovered subsurface items during the construction of the abutments;
- An unexpected finds procedure will be prepared and disseminated to staff in the event of discovering unexpected subsurface heritage items during earthworks. Specifically the following will occur:
    - Works in the area will immediately cease;
    - The Site Manager, Environmental Manager and Project Manager will be notified;
    - The site will be secured and protected;
    - The appointed archaeologist will determine appropriate measures in consultation with CCC.
- A suitably qualified archaeological professional will be appointed during construction to monitor the construction and removal of the cofferdam and any associated excavation works on the quays. Any archaeological features identified during archaeological monitoring will be fully resolved to professional standards of archaeological practice. Such material will be preserve in situ or preserve by record, as appropriate, as outlined in the relevant guidelines;
- All staff working on site must undertake a site-specific environmental induction which describes the unexpected finds procedures, identifies all known heritage items and outlines appropriate management practices to enact in the vicinity of those heritage items.

6.5 Conclusion

The likely effects of the proposed development on cultural heritage, architecture and archaeology during construction are expected to be minor and will be managed effectively through the implementation of the mitigation measures outlined herein. There are no likely significant adverse effects on cultural heritage, architectural heritage and archaeology during construction or operation of the proposed development.

7 Land and material assets

7.1 Introduction

This chapter describes the existing land and material assets at the site and provides an assessment of the likely significant effects of the proposed development on land and material assets. The assessment considers the likely significant effects during the construction and operation of the proposed development on land and material assets.

Traffic and transportation infrastructure, biodiversity and cultural heritage assets have been discussed separately in other sections of this report.

7.2 Existing environment

The site is located in a dense urban area within the commercial centre of Cork City and all land within the site is owned by CCC. As discussed in Section 3.3, the land use within the area is designated under the Development Plan. The River Lee has been designated as 'River/waterbodies protection' in order to protect and provide for the appropriate recreational/amenity and transport use of the waterway. The land immediately to the north and south of the river is designated as 'City centre retail areas' which provide for the protection of and promote the development of higher order retailing. There are a range of objectives in the Development Plan that support the need for the proposed development as outlined in Section 3.3.

Material assets located within the site include the River Lee itself, adjoining quay walls, hardstanding along St Patrick's and Merchant's quays and the subsurface utilities. At this stage the only utilities known to conflict with the site are the communications conduits and watermain running east - west on both quays.

7.3 Likely significant effects

Land ownership and land use zoning in the area would remain unchanged and would not be impacted by the proposed development. The land use would be in keeping with the zoning and objectives prescribed in the Development Plan. Further, the provision of the new bridge would satisfy numerous objectives by improving connectivity between the retail areas on either side of the River Lee and enhancing opportunities for active transport and the quality of the public realm on the waterfront.

The proposed development is unlikely to cause significant effects on material assets during construction or operation. The only direct effects on material assets are the partial removal of the quay wall and relocation of services to facilitate construction which is to be expected given the nature of the proposed development. The removal of the quay wall would safeguard the superstructure and indirectly mitigate flood risk as the levels of the quay wall would be raised to accommodate the Lower Lee FRS. Appropriate arrangements would be made to reduce risk and protect subsurface utilities and services prior to the commencement of construction. The contractor would contact the relevant authorities to arrange for the relocation and/or protection of the communications

conduits and watermains where necessary prior to the commencement of construction on site.

No properties, occupied premises or intrinsic resources would be affected by the proposed development. The proposed development would be developed using best practice methodologies and the efficient use of resources would be prioritised to minimise waste, optimise water and energy use and avoid impacts on surrounding properties during construction and operation.

7.4 Mitigation measures

It is considered that standard mitigation measures included herein and in the CEMP to avoid and mitigate potential effects on land and material assets will suffice to address any potential impacts. This will include and is not limited to the following measures:

- Works method statements and a traffic management plan will be developed by the contractor and approved prior to the commencement of any construction works on site;
- Exclusion zones will be put in place to limit the extent of works in the vicinity of material assets;
- Emergency response procedures would be developed and implemented for any incidents that might lead to impacts on land and material assets in the vicinity of the proposed development;
- High risk construction activities such as earthworks and the removal of the quay wall will not be undertaken immediately before or during inclement weather conditions; and
- All staff working on site must undertake a site-specific environmental induction which outlines the need to avoid unnecessary risk to land and material assets and optimise resource use whilst on site.

No mitigation measures will be required for land and material assets during the operational phase of the proposed development.

7.5 Conclusion

There are no likely significant adverse effects on land and material assets during the construction or operation of the proposed development.

The proposed development would improve accessibility and connectivity in the Cork's city centre and meet a number of objectives outlined in the Development Plan, positively impacting the land on site and in the surrounding area.

8 Landscape and visual

8.1 Introduction

This chapter describes the baseline landscape and visual conditions at the site and provides an assessment of the likely significant landscape and visual effects of the proposed development. The assessment considers the likely significant landscape and visual effects of the construction and operation of the proposed development.

The photomontages to support this assessment are included in Appendix C. Possible landscape and visual impacts from an Archaeological, cultural and architectural heritage perspective have been discussed separately in Section 6 of this report.

8.2 Existing environment

8.2.1 Baseline conditions

The Development Plan defines areas of scenic value in the city and outlines objectives in relation to the preservation of landscape and visual assets. The Development Plan defines eight landscape character areas (LCAs) within Cork City and landscape character is protected through the designation of Areas of High Landscape Value (ALHV) and Land Preservation Zones (LPZ). Additionally there are a number of views and prospects identified in the Development Plan of special amenity value to the city.

The existing landscape is an urban streetscape that fronts onto the River Lee between the existing St Patrick's and Brian Boru bridges. The location of the site is between two zones of the Historic Urban Core LCA on either side of the River Lee whilst the river itself is part of the Estuarine/River LCA. The proposed development is not located within a LPZ or AHLV and there are no protected views or prospects that span the site as illustrated in Figure 13.

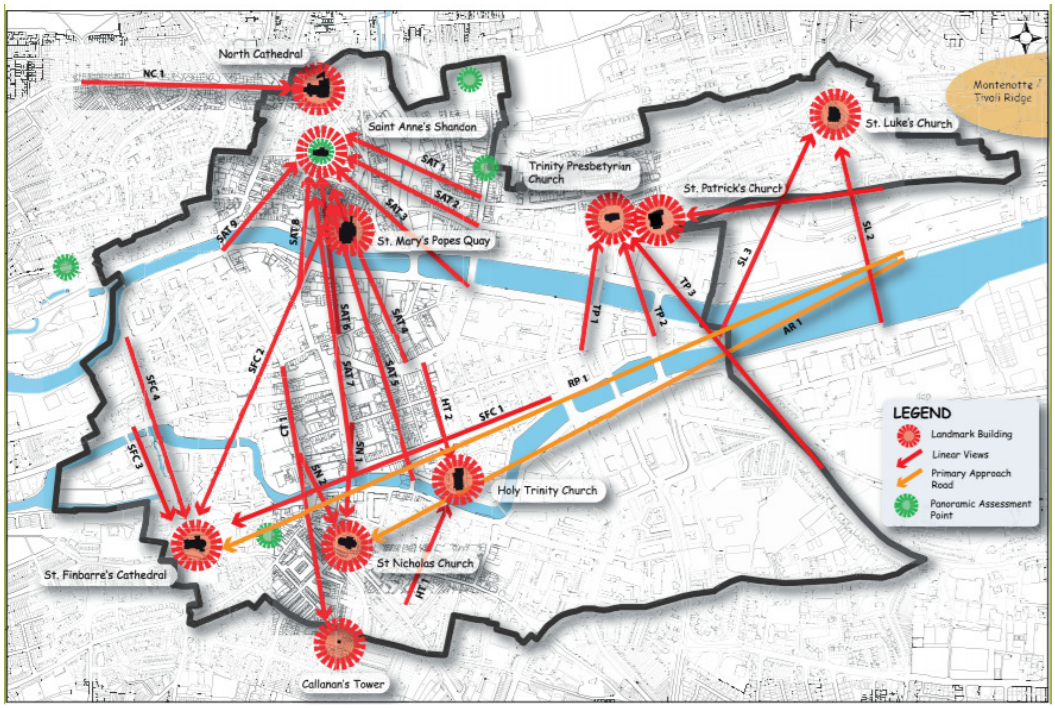

Figure 13: Views and prospects in the city centre and docklands as per the Development Plan (Source: CCC | not to scale)

8.2.2 Architectural context

Harley Street Bridge comprises a simple, yet elegant, shallow arched bridge. The low key form of the bridge resides in its setting with the single span gentle arch form across the water providing a sharp visual contrast with the adjacent St Patrick's and Brian Boru bridges. The uninterrupted single span from between the quays results in a clear body of water over which the bridge appears to hover in keeping with the riverside setting.

The design refrains from having dramatic above deck structure so as to fit in with the surrounding area. The central spine beam structure that transitions from below deck to above deck allows the slender arch form to be achieved while maximising the access to the water. The simple form offers a muted calm, allowing users to enjoy a moment of solace on their journey and inviting them to rest while taking in the stunning views of St Patrick's Bridge, the distant northern suburbs and the Church of the Ascension, while Shandon Bells casts its eye over the flow of Cork City.

When seen from above, the width of the walkways either side of the central spine beam increases in width from 2.35m clear at the abutments, increasing to 3.10m clear at mid-span for each of the two paths. The increased width at mid-span accommodates a timber bench on each side of the central beam where bridge users are encouraged to sit and enjoy the views of the surrounding area.

Located on axis with Harley Street, the design of the proposed development offers clear sight lines up Harley Street to enhance the connectivity between the city centre island and MacCurtain Street. Orientated at right angles to the existing quay walls and parallel to the existing bridges, the position and orientation of the bridge complements its existing surroundings. To enhance the connectivity with MacCurtain Street it is proposed to continue the surface treatment of the bridge up

Harley Street and coordinate the public realm treatment of Harley Street and St Patrick's Quay in front of the Metropole Hotel which will be undergoing renovation.

8.3 Likely significant effects

Construction works would be visible in this prominent location, however construction is a common feature in the city, therefore the assessment has been undertaken in this context. The presence of the construction compounds, plant, equipment and site hoarding may obscure and impact on the landscape character and views along the waterfront during construction. This would be temporary in nature and construction activities would not cause any effects on any AHLV, LPZs, protected views or prospects. Any landscape and visual effects during construction would be inherent given the nature and location of the development and as such they would be a minor nuisance when considered in the context of the urban environment. Any likely significant effects would be controlled through the implementation of best practice construction mitigation measures outlined herein and to be detailed in the works method statements and CEMP.

Some views along the river channel and from buildings on the quays may be slightly obscured during operation, but the urban setting has brought about constant changes to the streetscape, setting and landscape character as the city has developed. The proposed development is in keeping with the riverside setting and the bridge would provide a sharp visual contrast to both St Patrick's Bridge with its curving limestone arches and the heavy steel and concrete structure of Brian Boru Bridge. The proposed development would not have a significant effect on visual amenity, would improve the public realm and the design of the structure (no in-river piers, the single curved span and low level lighting on the bridge during the night time) would maintain prospects and the viewing corridor on the River Lee and provide new views to and from the proposed development.

8.4 Mitigation measures

It is considered that standard mitigation measures included herein to avoid and mitigate potential landscape and visual effects will suffice to address any potential impacts. This will include and is not limited to the following measures:

- Seek to maintain the landscape character and avoid physical impacts on existing assets and infrastructure where practicable;
- Potential work sites, including construction areas and compounds will be managed to minimise visual effects, including appropriate storage of equipment, screening and arrangements for the storage and removal of rubbish and waste material;
- Fit for purpose screening, fencing and hoarding around the site will provided and maintained to minimise visual impacts;
- Site lighting and signage will be provided with the minimum luminosity sufficient for safety and security purposes to minimise the potential for light spill;
- All working areas both within and outside the site and accesses will be reinstated as work proceeds and on completion of the construction works. All plant, materials, temporary buildings and fencing, vehicles will be removed

and the surface of the ground restored as near as practicable to its original condition;

- Minor cosmetic damage may, on occasion, occur as a consequence of construction. Where this is the case, provision will be made for repairing any material damage to assets;
- All staff working on site must undertake a site-specific environmental induction which describes the need to minimise the construction footprint and prevent light spill.

The key mitigation from an operational landscape and visual perspective is to provide high quality, attractive bridge design that is sympathetic to and appropriate for the local environment. As described in Section 8.2.2, good environmental design management has been prioritised throughout the design process to ensure that the existence of the bridge would complement the existing environment and bring about positive landscape and visual effects once operational.

8.5 Conclusion

There are no likely significant adverse effects on landscape and visual during the construction or operation of the proposed development.

9 Noise and vibration

9.1 Introduction

This chapter describes the ambient acoustic conditions at the site and provides an assessment of the likely significant effects of the proposed development on noise and vibration. The assessment considers the likely significant effects of the construction of the proposed development on noise and vibration. Operational activities are not likely to have a significant effect on noise and vibration.

There are no mandatory limits for construction noise in Ireland and current best practice for linear infrastructure projects is achieved by demonstrating compliance with the National Roads Authority Guidelines[4,5].

9.2 Existing environment

The site is located in a dense urban environment with relatively high levels of traffic and associated noise. The published noise maps from the EPA[6] indicate relatively high ambient noise levels as follows:

- L_{Day}: Estimated at 70 – 74dB on the water and greater than 75dB along the quays; and
- L_{Night}: Estimated at 60-64dB on the River Lee and 65-69dB along the quays.

There are no sensitive receptors within the site and relatively few residential dwellings in the surrounding area.

9.3 Likely significant effects

There is the potential for temporary noise and vibration effects arising from construction activities such as excavation, piling, breaking of the quay wall and hard standing as well as increased volumes of construction traffic (on the road network and on the river). However, the site is subject to relatively high ambient noise and there are no sensitive receptors in the immediate vicinity of the proposed development. Construction works (including night-time works) would be subject to prior approval and stakeholders would be notified prior to the commencement of works. Any adverse noise and vibration effects would be temporary in nature and controlled by the implementation of best practice construction mitigation measures outlined herein and in the works method statements, traffic management plan and CEMP.

Pedestrians and cyclists using the bridge would not constitute a source of additional noise or vibration during operation when compared against the existing

[4] National Roads Authority (2004) *National Roads Authority Guidelines for the Treatment of Noise and Vibration in National Roads Schemes.*
[5] National Roads Authority (2014) *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes*
[6] Environmental Protection Agency (2012) Round 2 Noise Mapping: Roads - http://www.epa.ie/monitoringassessment/noisemapping/ [Accessed 8 June 2017]

ambient noise levels in this dense, urban environment. Therefore, there would be no additional sources of noise or vibration and thus no effects during operation.

9.4 Mitigation measures

It is considered that standard mitigation measures included herein and in the CEMP to mitigate potential noise and vibration will suffice to address any potential impacts. This will include and is not limited to the following measures:

- Prioritisation of works methods that are less intrusive for piling and excavation;
- Careful planning for construction traffic so that activities and construction routes that may generate significant noise are planned with regard to sensitive receptors;
- All machinery and equipment used at the site will be operated in accordance with manufacturers guidelines and maintained to relevant standards[7] to reduce noise as much as feasibly practicable;
- Plant, machinery and equipment will be carefully selected, suitably sited (away from sensitive receptors) and where appropriate silencers will be used for combustion or pneumatic powered machinery;
- Where appropriate hoarding, noise screens and enclosures will be erected at an appropriate height and extent to achieve noise attenuation and screening from sensitive receptors;
- The use of radios, stereos, public address systems, shouting and slamming vehicle doors and dropping materials from height will be avoided;
- All construction vehicles, plant equipment and machinery will be switched off when not in use and regularly maintained;
- All staff working on site must undertake a site-specific environmental induction which outlines the need for good housekeeping including the prevention of excess noise and vibration; and
- Noise generation will be minimised through the implementation of good housekeeping including the noise attenuation for sensitive receptors, prioritisation of non-audible warning systems and proactive engagement with the local community on noise management.

No mitigation measures will be required for noise and vibration during the operational phase of the proposed development.

9.5 Conclusion

The likely effects of the proposed development on noise and vibration during construction are expected to be temporary in nature and managed effectively through the implementation of the mitigation measures outlined herein.

There are no likely significant adverse effects on noise and vibration during construction or operation of the proposed development.

[7] British Standards (2009) *BS 5228-1: 2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites*

10 Population and human health

10.1 Introduction

This chapter describes the baseline conditions of the human environment at the site and provides an assessment of the likely significant effects of the proposed development on population and human health. The assessment considers the likely significant effects of the construction and operation of the proposed development on population and human health. The main areas examined in this section are:

- **Demographics and settlements –** Statistics and trends that show lifestyle, social and pre-determined factors (such as age and genetic makeup) within a population that can be indicative of potential vulnerabilities to effects;
- **Local employment and economic activity –**Statistics and trends that illustrate the socio-economic conditions and associated vulnerabilities within a population;
- **Tourism –**Statistics and trends that indicate the contribution of the tourism industry to socio-economic conditions within a population;
- **Accessibility –** A determinant of health that estimates whether people can access key services and facilities at a reasonable cost, in reasonable time with reasonable ease; and
- **Amenity** – A determinant of health that considers environmental, social and neighbourhood influences that can be beneficial for the health and wellbeing of a population.

Noise and vibration, traffic and transport, air quality, land and material assets, heritage, landscape and visual which may also be considered as part of the human environment have been discussed separately in other sections of this report.

10.2 Existing environment

10.2.1 Demographics and settlement

The 2016 Census[8] shows that Cork City and its suburbs are home to 208,669 residents of which 675 live in the small areas[9] adjoining the site of the proposed development. There is a slightly higher proportion of males than females in the small areas adjoining the site (around 57% male) which is slightly higher than the national average. The following demographic and settlement trends were also identified[8] in the local area:

- Relatively high average age in Cork City (38.7 years) in comparison to the national average (36.1 years);

[8] Central Statistics Office (2017) *2016 Census Results* – Available from: http://www.cso.ie/en/census/ [Accessed 15 June 2017]
[9] Small areas are the smallest defined geographical area in the 2016 Census for which demographic data is available. They were designed as the lowest level for the compilation of statistics in line with data protection guidelines and typically contain between 50 and 200 dwellings.

- The population grew relatively fast in Cork City when compared against the national average during 2011 – 2016 (5.4% and 4.4% respectively);
- Relatively high proportion of the population was born overseas (around 50%);
- Relatively low average number of children per family (1.18);
- Relatively high proportion of homes are rented and there is a low proportion of owner occupation; and
- Relatively high proportion of the dwellings are flats/apartments.

10.2.2 Local employment and economic activity

Cork City is the second largest urban conurbation in Ireland which provides a range of employment opportunities and supports high levels of economic activity. Cork attributed early economic development to its location as a port city on Europe's largest natural harbour, however high tech manufacturing and services have been prominent industries in recent years.

The 2016 Census[8] depicts Cork City by a population that is predominantly of an economically active age (between 15 – 64 years) and the attainment of formal education is relatively high around the site. Population growth and inward migration has been relatively high in recent years and unemployment levels are relatively low. Further, it is evident that there is a relatively high proportion of professional workers, managers and those employed in managerial and technical officials and relatively low levels of unskilled workers.

The area therefore provides attractive employment opportunities for locals and confidence is high for sustained, positive economic activity in the city. The key commercial properties surrounding the site of the proposed development are the Merchant's Quay Shopping Centre to the south and the Metropole Hotel to the north.

10.2.3 Tourism

Tourism is a significant industry in Cork that attracts domestic and international visitors year round. In 2016 Cork Airport handled more than 2.2 million passengers[10] and it is estimated that 1.5 overseas tourists visited County Cork in 2015[11].

Significant number of tourists visit the local area, particularly during the tourist season. Most of who visit Cork City would pass the site given the central location of the proposed development, proximity to the waterfront, public transport hubs, Victorian Quarter, Metropole Hotel and city centre island.

10.2.4 Accessibility

There are many transport networks and accessibility for pedestrians, cyclists and vehicles to the site is good as described in Section 12.2. There is no open space, social infrastructure or homes in the immediate vicinity of the site, however accessibility to the River Lee is good.

[10] DAA (2017) *2016 Annual Report*.
[11] Fáilte Ireland (2016) *Regional Tourism Performance in 2015*.

10.2.5 Amenity

The River Lee is the primary source of amenity in this dense urban area. Social cohesion is indiscernible given the lack of residences and neighbourhoods in the immediate vicinity of the site. Based on the information outlined in other sections of this report, it is generally considered that the quality of the local environment, given its urban environment (including ambient air quality, noise levels, heritage, landscape and visual conditions) is relatively good.

10.3 Likely significant effects

10.3.1 Demographics and settlement

No changes to demographics or settlement are envisaged as part of the construction or operation of the proposed development. However, the proposed development would encourage sustainable travel and increase opportunities for active transport which may improve the health and wellbeing of the population.

10.3.2 Local employment and economic activity

The construction of the proposed development would generate opportunities for employment and training in the construction industry. Employment opportunities are likely to be qualified construction personnel employed through the contractor due to the nature of construction contracts. Any adverse effects on local businesses during construction would be temporary in nature and controlled by the implementation of best practice construction mitigation measures outlined herein and in the works method statements, traffic management plan and CEMP.

There would be no changes to local employment opportunities and/or economic activities during operation. It is therefore unlikely that there would be any effects on local employment and economic activity during the operation of the proposed development.

10.3.3 Tourism

It is unlikely that there would be any effects on tourism during the construction of the proposed development.

The provision of a new bridge would bring about positive outcomes for tourism by providing a new, attractive cross-river link. The proposed development would improve the public realm on the waterfront, enhance connectivity between tourist attractions, public transport hubs and the city centre and provide a new cross-river trail for visitors of all ages once operational.

10.3.4 Accessibility

The construction and operation of the proposed development is not anticipated to result in community severance or impact on access to open space, social infrastructure or homes. However the provision of a new, accessible cross-river bridge for pedestrians and cyclists would improve generally improve equitable accessibility within Cork City as described in Section 12.3.

10.3.5 Amenity

The potential effects of the proposed development on air quality, noise, traffic and transport and potential cumulative effects has been discussed separately in other sections of this report. Any adverse effects on amenity during construction would be temporary in nature and controlled by the implementation of best practice construction mitigation measures outlined herein and in the works method statements, traffic management plan and CEMP. It is unlikely that there would be any additional effects on amenity during the construction or operation of the proposed development.

10.4 Mitigation measures

There are no likely significant effects on the population and human health during construction of the proposed development, however standard mitigation measures are included herein and should be included in the CEMP to define minimum standards of construction practice required by the contractor. These measures will include and are not limited to the following measures:

- Local employment and procurement will be prioritised via the local employment centres, community centres and media;
- Appropriate health, safety and welfare facilities and support services will be provided for staff working on site;
- Temporary access arrangements and diversions will provide equal access for all population groups including those with disabilities and the elderly;
- Site audits will be regularly undertaken to ensure that there is no risk to the health and safety of staff working on site or the general public;
- Design out crime risk and nuisance activities by maintaining lines of sight and active frontages, providing appropriate lighting to support natural surveillance and reducing opportunities for anti-social behaviour by securing the site;
- All staff working on site must undertake a site-specific environmental induction which identifies the core working hours on site, emergency and incident response procedures, site constraints and outlines best practice behaviour to be adopted to prevent impacts on the general public; and
- Risks to the population and human health will be minimised through the implementation of good housekeeping at all times on site to maintain a clean, safe environment that minimises nuisance for local residents.

No mitigation measures will be required for population and human health during the operational phase of the proposed development.

10.5 Conclusion

There are no likely significant adverse effects on population and human health during the construction of the proposed development.

The provision of the new bridge would generally bring about positive effects for the population and for human health associated with improved connectivity and enhanced opportunities for active transport once the proposed development becomes operational.

11 Soils and geology

11.1 Introduction

This chapter describes the baseline subsurface conditions at the site and provides an assessment of the likely significant effects of the proposed development on soils and geology. The assessment considers the likely significant effects of the construction of the proposed development on soils and geology. Operational activities are not likely to have a significant effect on soils and geology.

11.2 Existing environment

Existing geotechnical information indicates that the ground level is approximately +2.7mOD on Merchant's Quay and +2.9mOD on St Patrick's Quay. The ground is expected to comprise of made ground, alluvial deposits, fluvial gravels, glacial gravels and boulder clays.

It is likely that the bedrock lies approximately 40m below ground level, however currently available borehole information is limited to a depth of 25m. The bedrock geology of the site contains the Gyleen Formation to the north, which comprises sandstone with mudstone and siltstone and the Cuskinny Member (or Kinsale Formation) to the south which comprises falser-bedded sandstone and mudstone.

11.3 Likely significant effects

It is unlikely that there will be any effects on bedrock during construction given its depth. Soils will be excavated on both sides of the River Lee to facilitate the piling and installation of the bridge abutments. Soils will be disturbed as a result of these excavations raising the potential for mobilised sediment, erosion and/or hydrogeological impacts. Any likely significant effects would be controlled through the implementation of best practice construction mitigation measures outlined herein and in the works method statements and CEMP.

No effects on soils and geology are envisaged during the operation of the proposed development.

11.4 Mitigation measures

It is considered that standard mitigation measures included herein and in the CEMP to avoid and mitigate potential soils and geology effects will suffice to address any potential impacts. This will include and is not limited to the following measures:

- Prioritisation of works methods that are less intrusive for piling and excavation;
- All earthworks will be monitored by suitably qualified and experienced geotechnical personnel on site;
- The bridge abutments will be constructed within the cofferdam which will be designed, constructed and deconstructed using best practice methodologies;

- No soils or infill materials will be brought onto the site unless they have been satisfactorily proven to be uncontaminated and present no risks to human health, property and the environment;
- All soil removed from site will be handled and disposed of by a licensed contractor;
- Spill kits and sealed, bunded containers will be used to site for potentially polluting materials to minimise spillages to soils;
- Topsoils will be replaced in a timely manner to prevent potential erosion or impacts to soils;
- Emergency response procedures would be developed and implemented for any incidents that might lead to release of pollutants into soils;
- High risk soil and erosion activities such as earthworks will not be undertaken immediately before or during high rainfall or wind events;
- All staff working on site must undertake a site-specific environmental induction which identifies emergency response procedures, outlines monitoring and storage procedures of all potentially polluting materials and outlines best practice behaviour to be adopted to prevent impacts; and
- Risks to soils and geology will be minimised through the implementation of good housekeeping including the provision of monitoring and storage procedures for all potentially polluting materials and best practice behaviour to be adopted by employees to prevent impacts.

No mitigation measures will be required for soils and geology during the operational phase of the proposed development.

11.5 Conclusion

The likely effects of the proposed development on soils and geology during construction are expected to be managed effectively through the implementation of the mitigation measures outlined herein.

There are no likely significant adverse effects on soils and geology during construction or operation of the proposed development.

12 Traffic and transport

12.1 Introduction

This chapter describes the existing traffic levels and transportation networks at the site and provides an assessment of the likely significant effects of the proposed development on traffic and transport. The assessment considers the likely significant effects of the construction and operation of the proposed development on traffic and transport.

12.2 Existing environment

There is an extensive transport infrastructure network within the site and surrounding area comprising road infrastructure, cycle lanes, pedestrian footpaths and public transport connections. Relatively high levels of traffic are present around the site given the central, waterfront location of the proposed development.

There is a comprehensive network of roads surrounding the site of the proposed development. St Patrick's Quay and Merchant's Quays are busy routes that link with the nearby St Patrick's and Brian Boru bridges as well the north-south roads that lead to the strategic national road network. Additionally, there are pedestrian footpaths on both sides of St Patrick's Quay and Merchant's Quay and public car parking is provided at St Patrick's Bridge and Merchant's Quay Shopping Centre.

St Patrick's Quay is a three lane westbound (only) route that carries relatively high levels of traffic accessing the strategic national road network from the east of the city. The road connects with the N8 via Bridge Street, the N20 via Camden Place and with the N27 via Penrose Quay. Parking is permitted on the north side of St Patrick's Quay whilst a portion of the southern side provides parking for coach and regional bus services.

Merchant's Quay is four lanes wide, with three westbound lanes (including a bus lane), one eastbound lane and an additional eastbound cycle lane on the quay side. The road lies on the N8 and carries significant levels of traffic from all directions. Parking is not permitted, however there is a local loading area in front of the main entrance of Merchant's Quay Shopping Centre that is used as a set down/pick up area.

The area surrounding the proposed development is well served by public transport as illustrated in Figure 14. There are five bus stops on Merchant's Quay serving seven local bus routes (202, 203, 205, 207, 207a, 208 and 209). Additionally, the terminus for the regional and inter-city bus routes and coach services is located at Parnell Place around 100m to the east of the site. In the surrounding area St Patrick's Street, Camden Place and MacCurtain Street support a number of local bus routes and stops whilst the terminus for the inter-city rail services (Cork Kent Station) is located around 800m to the north-west.

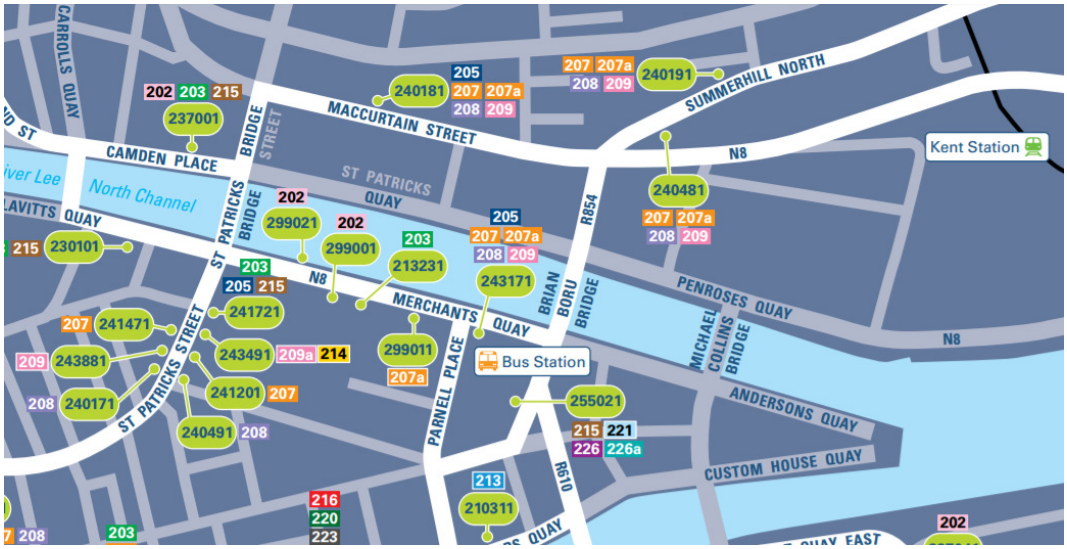

Figure 14: Existing public transport (Source: Transport for Ireland | not to scale)

12.3 Likely significant effects

The construction of the proposed development would require some temporary lane closures and diversions to support the construction of the abutments and presence of the construction compounds respectively. At this stage, it is likely that the bus lane on Merchant's Quay and parking bays on St Patrick's Quay may be removed at night during the construction of the abutments whilst one of the existing bus stops on Merchant's Quay would be permanently relocated.

This may lead to short delays for users, however a works method statement and traffic management plan would be prepared and submitted prior to the commencement of construction to detail and agree appropriate phasing and traffic management measures for night-time works, diversions and alterations to the surface access network. Any likely significant effects would be controlled through the implementation of best practice construction mitigation measures outlined herein and in the works method statements and CEMP.

The operation of the development would be beneficial for traffic and transport as it would improve the pedestrian and cycle network and increase opportunities for active transport across the River Lee. Further, pedestrian and cyclist accessibility to public transport hubs would be enhanced given the proximity of the proposed development to the nearby Cork Kent railway station and Parnell Place bus station.

12.4 Mitigation measures

It is considered that standard mitigation measures included herein and in the CEMP to avoid and mitigate potential traffic and transport effects will suffice to address any potential impacts. This will include and is not limited to the following measures:

- A Traffic Management Plan will be developed by the contractor and agreed with CCC and implemented prior to the commencement of construction;
- Directional signage and line marking would be used to direct and guide vehicles around the site. This would be supplemented by traffic controllers,

variable message signs, if appropriate, to advise drivers of any hazards, potential delays or traffic diversions;

- Temporary access arrangements and pedestrian diversions will provide equal access for all population groups including those with disabilities and the elderly;
- Where practicable existing transport access and routes will be maintained;
- Preference will be given to locally sourced material to minimise transportation required to support construction;
- Any damage to road surfaces, pavements and signage that may be caused during construction would be made good following the completion of construction;
- Consideration will be given to any other ongoing developments in the vicinity to minimise conflict and congestion associated with construction vehicles;
- All staff working on site must undertake a site-specific environmental induction which identifies all traffic management procedures and outlines best practice behaviour to be adopted by construction staff to prioritise road safety for the public and staff and prevent impacts on the site or surrounding network;
- Risks to traffic and transportation will be minimised through the implementation of good housekeeping including advance notice of diversions and closures, maintenance of pedestrian and cyclist access where practicable and maintenance of access to properties and parking.

12.5 Conclusion

The likely effects of the proposed development on traffic and transport during construction are expected to be managed effectively through the implementation of the mitigation measures outlined herein, which includes the requirement for a traffic management plan to be prepared by the contractor and approved by CCC in advance of construction.

There are no likely significant adverse effects on traffic and transport during construction or operation of the proposed development.

The provision of the new bridge would generally bring about positive effects for pedestrians and cyclists associated with improved connectivity and enhanced opportunities for active transport once the proposed development becomes operational.

13 Water resources

13.1 Introduction

This chapter describes the existing hydrology, hydrogeology and flood risk at the site and provides an assessment of the likely significant effects of the proposed development on water resources. The assessment considers the likely significant effects of the construction and operation of the proposed development on water resources.

13.2 Existing environment

13.2.1 Hydrology

The proposed development would be located over the northern channel of the River Lee in Cork's city centre. The land within the site on both sides of the River Lee consists of impermeable surfaces that convey runoff into the drainage network.

The total catchment area of the River Lee covers approximately 2,000km^2 and the river is joined by a number of tributaries in Cork City including the Curraheen, Glasheen and Kiln Rivers. Downstream, the River Lee discharges into Cork Harbour, areas of which are designated for biodiversity value (as noted in Section 5.2.1). The River Lee is identified as a transitional water body that is subject to tidal influence at the location of the proposed development. The River Lee has a tidal range between -2.344m at low tide and +1.486m at high tide whilst the mean high water tide is -0.429m. The water body at this location is nutrient sensitive and has been designated a Water Framework Directive risk score of 'at risk of not achieving good status'.

13.2.2 Hydrogeology

At this stage, a site specific ground investigation has not been undertaken. Based on past experience and existing information, it is evident that the groundwater table lays between -0.5mOD and -0.9mOD. The groundwater body in the area is the Lee Valley Gravels.

The groundwater vulnerability for the site is classified as 'High' whilst there is an area of 'Extreme' vulnerability around 30m to the north of the site. This is likely in the vicinity of the Ballinhassig East aquifer which is of local importance. The recharge map for the area indicates that there is an average recharge value of between 100 and 150mm per year for groundwater across the site.

13.2.3 Flood risk

Flood risk is relatively high in the region and Cork City has a long history of fluvial and pluvial flooding. Flooding in the city has generally been less severe since the construction of the dams in the 1950s, however there has been relatively frequent flooding of land, roads and properties. There is a range of existing flood

defence assets and infrastructure in Cork City which are currently being upgraded as part of the Lower Lee FRS.

The Lower Lee FRS has been proposed by the OPW to mitigate and improve flood risk management within the environs of Cork City and within the townlands of Curraghbeg, Garravagh, Coolroe, Great Island, Coolyduff, Lackenshoneen, Coolymurraghue, Carrigrohane, Inchigaggin and Mount Desert, County Cork. The Lower Lee FRS would provide protection from the 1 in 100 year fluvial and 1 in 200 year pluvial flood events through a number of measures including flood forecasting and warning systems, direct defences such as improved walls and embankments, demountable flood gates at some bridges and the provision of drainage infrastructure and designated flood plains.

13.3 Likely significant effects

13.3.1 Hydrology

There would be no abstractions, discharges, deposition or in-stream works undertaken during construction and construction would occur outside of the river channel behind the quay walls. There would therefore be no effects on existing river flows or the river bed during construction.

Piling and excavation (to support the construction of the bridge abutment) may create the potential for impacts on water quality. All piling and excavation works would be undertaken within the cofferdam with appropriate protection and management implemented throughout construction to reduce the likelihood of accidental discharge of pollutants or silt. Any likely significant effects would be controlled through the implementation of best practice construction mitigation measures outlined herein and in the works method statements and CEMP.

The hydraulic area under the bridge would be maintained and the river channel would not be reduced during operation as the bridge abutments would be located behind the quay walls. Further, there would be no potential impacts on water quality and no discharge, abstraction or deposition within the River Lee associated with operations. It is therefore unlikely that there would be any effects on hydrology during the operation of the proposed development.

13.3.2 Hydrogeology

There would be no discharge to groundwater during construction or operation. It is therefore unlikely that there would be any effects on hydrogeology during construction or operation of the proposed development.

13.3.3 Flood risk

The construction of the proposed development would require excavation, piling and the partial removal of the quay wall which has the potential to impact on flood risk. The contractor will be obligated to construct and maintain the cofferdam to ensure that flood protection is sustained to predefined limits. All construction aspects would need to ensure that there is no increase of flood risk at the site and in surrounding areas. Any likely significant effects would be controlled through

the implementation of best practice construction mitigation measures outlined herein.

The proposed development has been designed to accommodate the Lower Lee FRS and provides appropriate protection from likely flood events. As outlined in Section 2.3.5.1, the proposed development provides protection on the bridge deck from the 1 in 100 year fluvial and 1 in 200 year tidal flood events. The bridge deck level is set at the maximum flood level (+3.17mOD) and additional flood defence would be provided in the form of flood gates that can be slid into position and raised during flood events to satisfy the freeboard requirements. No effects on flood risk are envisaged during the operation of the proposed development as appropriate flood defence has been incorporated into the design.

13.4 Mitigation measures

It is considered that standard mitigation measures included herein and in the CEMP to avoid and mitigate potential soils and geology effects will suffice to address any potential impacts. This will include and is not limited to the following measures:

- All hoarding, fencing, cofferdams and silt protection measures should be fit for purpose and appropriately maintained throughout construction;
- The bridge abutments will be constructed entirely within the cofferdam which will be designed, constructed and deconstructed using best practice methodologies to maintain flood defence levels;
- Spill kits and sealed, bunded containers will be used to site for potentially polluting materials to minimise spillages to surface or groundwater;
- Emergency response procedures will be developed and implemented for any incidents that might lead to release of pollutants into surface or groundwater;
- High risk activities such as earthworks will not be undertaken immediately before or during high rainfall or wind events;
- All staff working on site must undertake a site-specific environmental induction which identifies emergency response procedures, water resources and outlines best practice behaviour to be adopted to prevent impacts; and
- Risks to water resources will be minimised through the implementation of good housekeeping including the prevention of accidental spillages/discharge to water, avoidance of physical impacts on the quay walls, provision of monitoring and storage procedures for all potentially polluting materials and best practice behaviour to be adopted by employees to prevent impacts.

No mitigation measures will be required for water resources during the operational phase of the proposed development.

13.5 Conclusion

The likely effects of the proposed development on water resources during construction are expected to be managed effectively through the implementation of the mitigation measures outlined herein.

There are no likely significant adverse effects on water resources during construction or operation of the proposed development.

14 Cumulative and interactive effects

14.1 Cumulative effects

14.1.1 Overview

Cumulative effects arise when there is an overlap of multiple developments that exacerbates impacts on local receptors and the surrounding environment. Information has been sought on projects that have been recently proposed and/or approved in the site and surrounding area. Other developments need to be of a sufficient scale or proximity to the development being assessed for cumulative effects to be likely, therefore the following projects have been identified:

- Metropole Hotel Redevelopment on Harley Street; and
- Lower Lee FRS works in the vicinity of the River Lee.

14.1.2 Metropole Hotel redevelopment

A planning application is due to be submitted seeking approval for the expansion and redevelopment of the Metropole Hotel to the north of the site. The proposal would expand the Metropole Hotel at a new site across the road and provide a linking glass balustrade bridge that would span Harley Street. The proposal would deliver three boutique retail units, a seventh-floor penthouse, an elevated rooftop bar, upgraded spa facilities and function rooms, an additional 140 new bedrooms and 43 bedroom suites and meeting rooms.

Coordination between the design teams of the proposed development and proposed Metropole Hotel development is ongoing. Discussions and engagement have focused on the delivery of a consistent public realm design on St Patrick's Quay and Harley Street and the optimisation of construction for both projects.

14.1.3 Lower Lee FRS

As outlined in Section 13.2.3, the Lower Lee FRS is being advanced by the OPW as part of the National Flood Risk Management programme. The Lower Lee FRS would provide protection from the 1 in 100 year fluvial and 1 in 200 year pluvial flood events through a number of initiatives including raising the quay wall as outlined in Figure 15 and Figure 16.

The Lower Lee FRS is currently undergoing detailed design to improve flood protection in the River Lee catchment area. Construction is likely to commence in early 2018, however works at the site would occur later as they are part of the third phase of the works. It is envisaged that the proposed development would be constructed in advance of the Lower Lee FRS works occurring at this location.

The proposed development has been designed to accommodate and satisfy the flood protection requirements of the Lower Lee FRS. Engagement is ongoing and will continue as the detailed design of both projects progresses. The bridge design, CEMP and works methods statement for the proposed development would be prepared with due regard to the Lower Lee FRS in order to mitigate any potential cumulative effects.

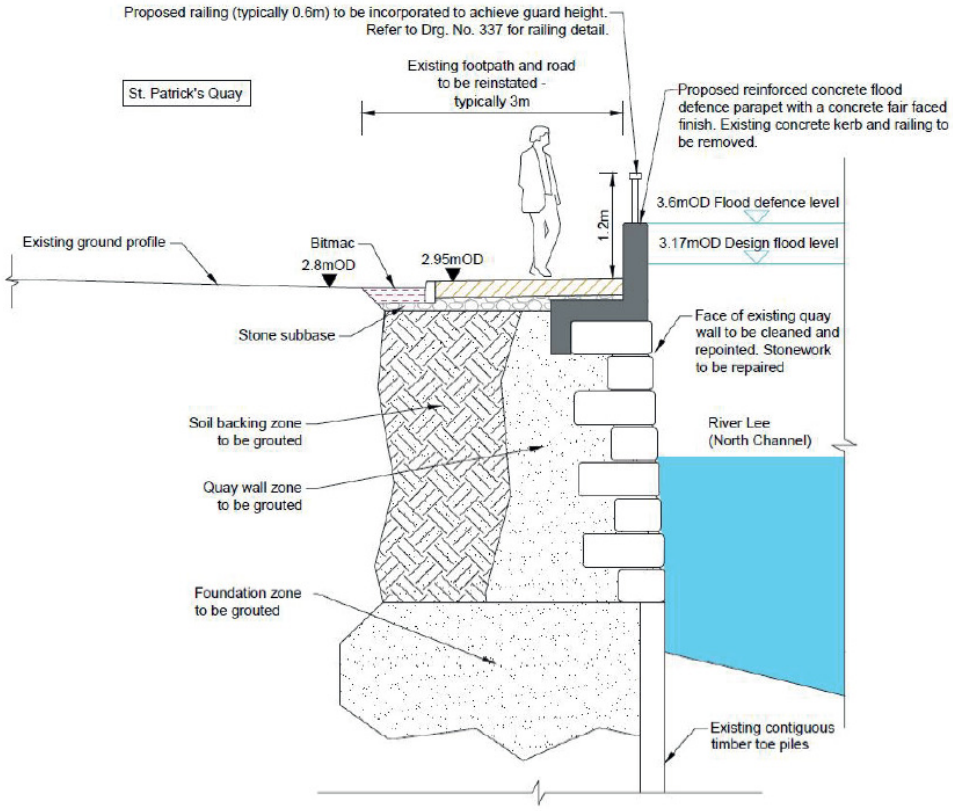

Figure 15: Proposed flood relief works on St Patrick's Quay (Source: OPW)

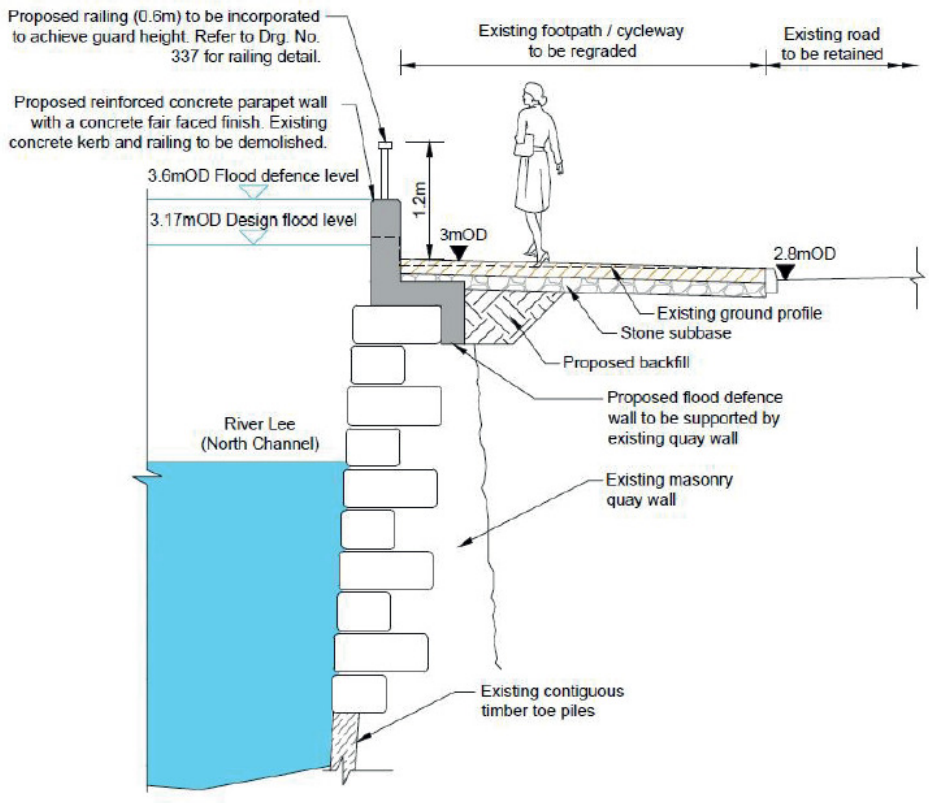

Figure 16: Proposed flood relief works on Merchant's Quay (Source: OPW)

14.1.4 Likely cumulative effects

A review of those projects likely to give rise to cumulative effects has been undertaken. Given the scale, type, duration and phasing of those projects it is unlikely that any cumulative effects will arise. It is anticipated that engagement will continue going forward and that any potential cumulative effects will be sufficiently addressed through the mitigation measures outlined herein, together with the negotiation and/or the provision of appropriate management measures in the works method statements and CEMPs of the proposed development, Metropole Hotel and Lower Lee FRS.

14.2 Interactive effects

14.2.1 Overview

Interactive effects occur when a receptor is impacted by multiple effects. Significant effects can occur in isolation (as described in Sections 4 - 13) or in-combination. Therefore, consideration needs to be given to those interactive effects which may exacerbate impacts on receptors (e.g. excessive noise and increased traffic during the peak construction phase impacting on the amenity of landowners or local residents).

14.2.2 Likely interactive effects

The likely interactive effects during the construction of the project include:

- Concurrent landscape and visual and cultural heritage impacts on amenity associated with the erection of hoarding and presence of plant and equipment on site for the duration of the construction works;
- Elevated dust and noise emissions may exacerbate nuisance and perceived impacts temporarily during the construction of the abutments and main span of the bridge (particularly during night time works);
- Potential concurrent traffic, pedestrian and utilities diversions on site during construction; and
- Elevated risk of accidental discharge to soil, water bodies, drainage networks and/or groundwater associated with the construction works and storage of plant, equipment during construction.

The likely interactive effects of the proposed development on during construction are expected to be managed effectively through the implementation of the mitigation measures outlined herein.

The likely interactive effects during the operation of the project include:

- Permanent improvements to the public realm and provision of an aesthetically pleasing design and streetscape that is sympathetic to the surrounding environment;
- Improved safety, enhanced connectivity to the public transport hubs and increased permeability across the River Lee for cyclists and pedestrians; and
- Delivery of a new river crossing that will maintain the riverine prospects, hydrological conditions and the aquatic ecology within the River Lee.

References

British Standards (2009) *BS 5228-1: 2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites*

Central Statistics Office (2017) *2016 Census Results* – Available from: http://www.cso.ie/en/census/ [Accessed 15 June 2017]

Cork City Council (2015) *Cork City Development Plan 2015 – 2021. Volume 1: Written Statement*

DAA (2017) *2016 Annual Report.*

Department of the Environment, Community and Local Government (2013) *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.*

Department of the Environment, Community and Local Government (2015) *Planning and Development Regulations 2001 – 2015 (Unofficial consolidation)*

Department of Housing, Planning, Community and Local Government (2017) *Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems (Department of Housing, Planning, Community and Local Government*

Department of Housing, Planning, Community and Local Government (2017) *Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive): Advice on the Administrative Provisions in Advance of Transposition*

Environmental Protection Agency (2011) *Air Quality Standards Regulations 2011. S.I. No. 180 of 2011*

Environmental Protection Agency (2012) *Round 2 Noise Mapping: Roads - http://www.epa.ie/monitoringassessment/noisemapping/ [Accessed 8 June 2017]*

Environmental Protection Agency (2015) *Revised Guidelines on the Information to be contained in Environmental Impact Statements (Draft September 2015)*

Environmental Protection Agency (2015) *Advice Notes for Preparing Environmental Impact Statements Draft September 2015*

Environmental Protection Agency (2016) *Air Quality Index for Health.* [Available from http://www.epa.ie/air/quality/ Accessed 23 May 2017]

European Union (2008) *Ambient Air Quality and Cleaner Air for Europe Directive 2008/50/EC.*

Fáilte Ireland (2016) *Regional Tourism Performance in 2015.*

Office of Public Works (2016) *Lower Lee (Cork City) Flood Relief Scheme: Environmental Impact Statement – Main Report.* [Available from http://www.lowerleefrs.ie/assets/lee_valley/docs/Main%20Report.pdf – Accessed on 23 May 2017]

Office of Public Works (2017) *Lower Lee (Cork City) Flood Relief Scheme: Project Information*. [Available from http://www.lowerleefrs.ie/index.php/site/project - Accessed on 28 May 2017]

National Roads Authority (2004) *National Roads Authority Guidelines for the Treatment of Noise and Vibration in National Roads Schemes*

National Roads Authority (2014) *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes*

Appendix A

Screening Report for
Appropriate Assessment

Cork City Council

Harley Street Bridge

Appropriate Assessment – Information Required for Screening

253690/AA/Rev2

Issue | 6 July 2017

Job number 253690-00

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Draft 1	13 June 2017	**Description**	First draft	
			Prepared by	Checked by	Approved by
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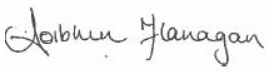
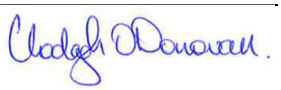
		Signature			
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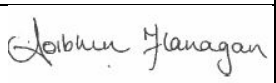
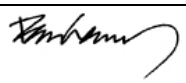
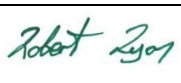
		Signature			
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1 Introduction

Cork City Council (CCC) propose to develop the Harley Street pedestrian/cycle bridge, hereafter referred to as the proposed development. The proposed development will be located over the north channel of the River Lee between Brian Boru Bridge and St Patrick's Bridge in Cork's city centre.

This report for screening for Appropriate Assessment (AA) contains the necessary information required for the competent authority, in this case CCC, to undertake screening for AA of the proposed development.

The aims of this report are to:

- Provide information on, and assess the potential for the proposed development to significantly impact on designated Natura 2000 sites;
- Determine whether the proposed development is directly connected with, or necessary to the conservation management of any designated Natura 2000 sites; and
- Determine whether the proposed development, alone or in combination with other projects, is likely to have significant effects on designated Natura 2000 sites.

An Arup ecologist has prepared this report. This report has been prepared without the inclusion or consideration of mitigation measures.

It is the opinion of Arup that it is possible to rule out likely significant impacts on any Natura 2000 sites. Therefore, it is the opinion of Arup that any further stages of AA is not necessary for the proposed development.

2 Legislative Background

2.1 Overview

Member states within the European Union are required to establish a network of Natura 2000 sites under the obligations of Council Directive 92/43/EEC (Habitats Directive) and Council Directive 79/409/EEC (Birds Directive). The Natura 2000 network comprises designated sites selected to protect important biodiversity including rare and threatened habitats and species.

The Natura 2000 network includes Special Areas of Conservation (SACs, including candidate SACs) protected under the provisions of the Habitats Directive and Special Protection Areas (SPAs, including proposed SPAs) protected under the provisions of the Birds Directive. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex II birds and other regularly occurring migratory birds and their habitats.

The Annex habitats and species for which each site is selected and designated, are recognised as the qualifying interests of the Natura 2000 site. Conservation objectives for all designated sites are defined for these qualifying interests.

2.2 Legislation

The Habitat and Birds Directives require that the effects of any plan or project, alone, or in combination with, other plans or projects, on the Natura 2000 site network, should be assessed before any decision is made to allow that plan or project to proceed. This process is known as Appropriate Assessment (AA).

The obligation to undertake AA derives from Articles 6(3) and 6(4) of the Habitats Directive. Article 6(3) is concerned with the strict protection of sites, while Article 6(4) is the procedure for allowing derogation from this strict protection in certain restricted circumstances.

Article 6(3) of the Habitats Directive states:

> *"Any plan or project not directly connected with, or necessary to, the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public".*

Article 6(4) states:

> *"If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."*

There are a number of steps and tests in place that should be undertaken sequentially and documented by competent authorities in order to make decisions on the approval or refusal of a plan or project that may impact on the Natura 2000 network. Article 6(3) and 6(4) of the Habitats Directive requires the following to be undertaken:

- **Stage 1 – Screening for Appropriate Assessment:** To assess, in view of best scientific knowledge, if a development, individually or in combination with another plan or project is likely to have a significant effect on any Natura 2000 site.
- **Stage 2 – Appropriate Assessment:** This is required if it cannot be excluded, on the basis of objective information, that the development, individually or in combination with other plans or projects, is likely to have a significant effect on a Natura 2000 site. The appropriate assessment must include a final determination by the competent authority as to whether or not a proposed development would adversely affect the integrity of a Natura 2000 site. In order to reach a final determination, the consenting authority must undertake examination, analysis and evaluation, followed by findings, conclusions and a final determination. The appropriate assessment must contain complete, precise and definitive findings and conclusions, and may not have lacunae or gaps.
- **Stage 3 – Assessment of alternative solutions:** The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site.
- **Stage 4 - Assessment where no alternative solutions exist and where adverse impacts remain:** An assessment where no alternative solutions exist and where adverse impacts remain – an assessment of compensatory measures where, in light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed.

2.3 Guidance

This report has been prepared with regard to the following guidance documents:

- *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC*[1];
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodical Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*[2]
- *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC*[3];
- *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities*[4];
- *Circular NPW 1/10 and PSSP 2/10: Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities*[5]; and
- *Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive*[6].

[1] European Communities (2000) *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC*
[2] EC Environment Directorate-General (2000) *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.*
[3] European Commission (2007) *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC.*
[4] Department of Environment, Heritage and Local Government (2010) *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities.*
[5] Department of Environment, Heritage and Local Government (2010) *Circular NPW1/10 & PSSP 2/10 Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities*
[6] International Workshop on Assessment of Plans under the Habitats Directive (2011) *Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive.*

3 Methodology

3.1 Scope of appraisal

This report contains the information required for the CCC to undertake screening for AA for the construction and operation of the proposed Harley Street pedestrian/cycle bridge. This report is based on a desk study undertaken in June 2017.

In order to address the requirements for AA screening, the following information is presented in this report:

- Overview of the proposed development and its receiving environment (Section 4 and Section 5);
- Description of the existing ecological environment at the site (Section 6);
- Identification of relevant Natura 2000 sites which may be within the zone of influence of the proposed development (Section 6.1);
- Description of other projects and plans which may have the potential for having significant effects on Natura 2000 sites (Section 6.4);
- Identification of potential effects of the proposed development on the Natura 2000 sites (Section 7);
- Assessment of likely significant effects on Natura 2000 sites (Section 7.3); and
- Screening statement and conclusions (Section 8 and Appendix A).

3.2 Location of the proposed development

The proposed development is located in Cork's city centre. The proposed works would be carried out adjacent to the River Lee, therefore this assessment has considered any potential impacts within the 15km radius around the site of the proposed development (as illustrated in Figure 1) in accordance with best practice and precedence from other AA screening reports. Any direct, indirect or cumulative impacts which could arise from the proposed development in relation to SACs and SPAs within this study area are considered in further detail.

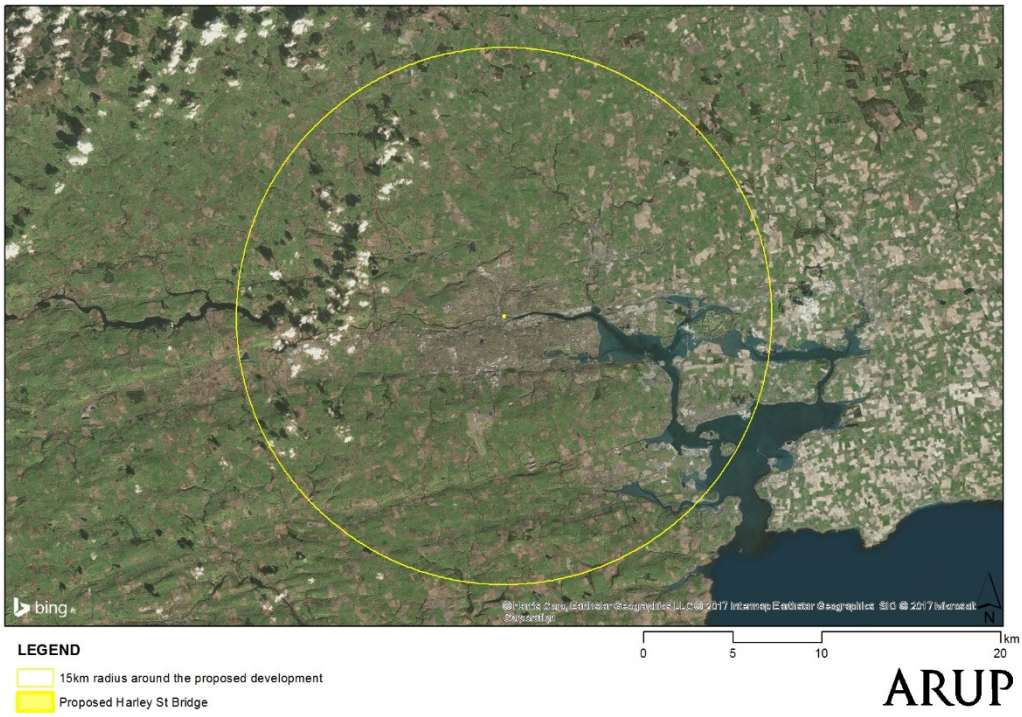

Figure 1: Study area for the purpose of AA screening (not to scale)

3.3 Desktop study

This report is based on a desktop study undertaken in June 2017. The desktop study reviews the nature of the proposed development (construction and operational aspects) and potential impacts of the proposed development on Natura 2000 sites and their qualifying interests. The desktop study also identifies potential in-combination impacts on the Natura 2000 network, if any.

The following sources of information were used to collect relevant data on the Natura 2000 network and support the desktop study:

- Bing Maps aerial photography[7];
- Online mapping and data on protected sites from the National Parks and Wildlife Service [8];
- Information on environmental quality data available from the EPA[9];
- Status of EU protected habitats in Ireland provided by the National Parks and Wildlife Service[10];

[7] Bing Maps in ArcGIS - Accessed 1 June 2017
[8] National Parks and Wildlife Service (2017) *Boundary data for protected sites:* https://www.npws.ie/maps-and-data/designated-site-data/download-boundary-data - Accessed 1 June 2017
[9] Environmental Protection Agency (2017) *Envision Online Environmental Map Viewer:* http://gis.epa.ie/Envision – Accessed 1 June 2017
[10] National Parks and Wildlife Service (2017) *NPWS Protected sites in Ireland:* https://www.npws.ie/protected-sites - Accessed 1 June 2017

- National Biodiversity Centre Data Centre database[11]; and
- Relevant information from the Lower Lee Flood Relief Scheme (FRS) Environmental Impact Statement[12].

[11] National Biodiversity Data Centre (2017) *Biodiversity Maps:* http://maps.biodiversityireland.ie/ - Accessed 1 June 2017

[12] Ryan Hanley & McCarthy Kettle O'Sullivan (2016) *Lower Lee Flood Relief Scheme Environmental Impact Statement:* http://www.lowerleefrs.ie/index.php/site/environmental - Accessed 7 June 2017

4 The proposed development

4.1 Overview

It is proposed to develop a new single span bridge that traverses the northern channel of the River Lee in Cork's city centre between the existing Brian Boru Bridge and St Patrick's Bridge. The proposed development would be 66 metres (m) in length, extending south from and on axis with Harley Street as illustrated in Figure 2.

Figure 2: The proposed development

The proposed development will serve pedestrians and cyclists crossing between St Patrick's Quay and Merchant's Quay and tie in with the existing transport network. The design is sympathetic to the surrounding environment as has had regard to the design of the Lower Lee Flood Relief Scheme (FRS) works proposed by the Office of Public Works (OPW) on the adjoining quay walls. The proposed development will incorporate ramps to ensure accessibility and benches in the central spine to encourage visitors to sit and enjoy the views of the River Lee from this central location.

4.2 Design

The proposed development would comprise a shallow arched single span bridge approximately 66m in length. The cantilever design would incorporate an arched steel box girder and there would be no piers required in the River Lee as the bridge would be supported by the abutments located behind the quay walls.

The centreline of the bridge would be centrally aligned on axis with Harley Street. There would be two shared paths on either side of the central spine beam and the width of the bridge would increase towards the centre to accommodate the benches. Each of the paths would be 2.70m wide at the abutments, increasing to 3.60m wide at mid-span.

Figure 3: Visualisation of the proposed development

The proposed development would land on the existing quay walls. On the northern banks, the bridge would land immediately south of Harley Street on St Patrick's Quay whilst the southern landing would be approximately 30m west of Parnell Place on Merchant's Quay.

The abutments of the bridge would be set at +3.17m above ordnance datum (mOD) and the bridge landings would be accessed via 1:20 compliant ramps on both quays. The northern landing would incorporate a signalised traffic junction to facilitate movement across St Patrick's Quay. A barrier would be provided on the southern landing to prevent cyclists from merging with traffic on Merchant's Quay.

The proposed development would incorporate functional and feature lighting to optimise safety in design and aesthetics. All light fittings would be appropriate for the outdoor environment and minimise light spill to the surrounding area. Functional lighting would be provided by discrete point source LED fittings recessed into the handrails at the edge of the bridge deck. This would introduce light across the bridge deck and provide a safe environment for users during the hours of darkness. Feature lighting would be used to highlight the primary structural spine beam running centrally down the length of the bridge deck and improve the aesthetics of the bridge during the hours of darkness. The LED fittings would be mounted just below deck level to introduce a soft glow of light up the surface of the beam.

The proposed development has been designed to accommodate the Lower Lee FRS and provide appropriate protection on the bridge deck from the 1 in 100 year fluvial and 1 in 200 year tidal flood events. Flood defences would be provided in the form of a sliding gate recessed into the quay walls that can be slid into position and connected via a central post as required. It is envisaged that CCC would close the bridge and deploy the flood barrier prior to the onset of a flood

event. The flood defence would be capable of raising to 450mm in order to accommodate freeboard.

4.3 Construction

4.3.1 Overview

The construction methodology for the project would be finalised upon the completion of the detailed design and appointment of the contractor. At this stage, it is envisaged that construction is likely to commence in February 2018 and be completed by April 2019. The general activities to be carried out during construction would occur in sequence as outlined in Figure 4.

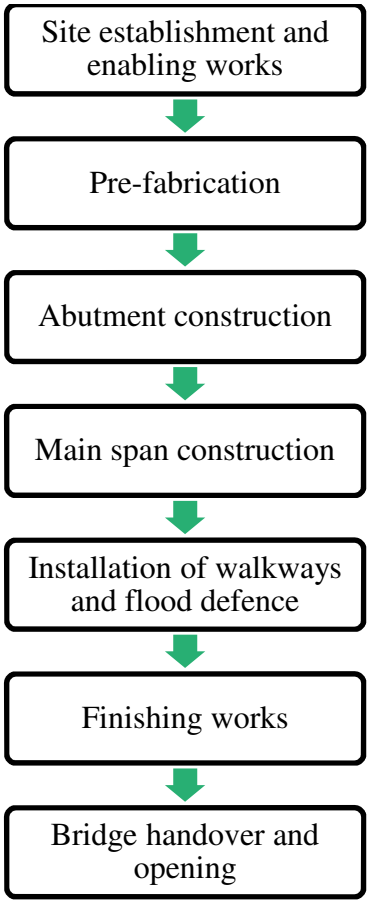

Figure 4: Indicative construction phasing

4.3.2 Site establishment and enabling works

Site establishment would comprise the clearance of the landside portion of the site, erection of hoarding, removal of the bus stop on Merchant's Quay, installation of traffic management signage and barriers and the provision of appropriate welfare facilities, security measures around the site perimeter.

At this stage, it is likely that the construction compound(s) would be located within the site on both sides of the River Lee. The site would be 10m wide and 20m in length from the bridge abutments as illustrated in Figure 5. This would

require the temporary removal of the bus lanes on Merchant's Quay and parking bays on St Patrick's Quays.

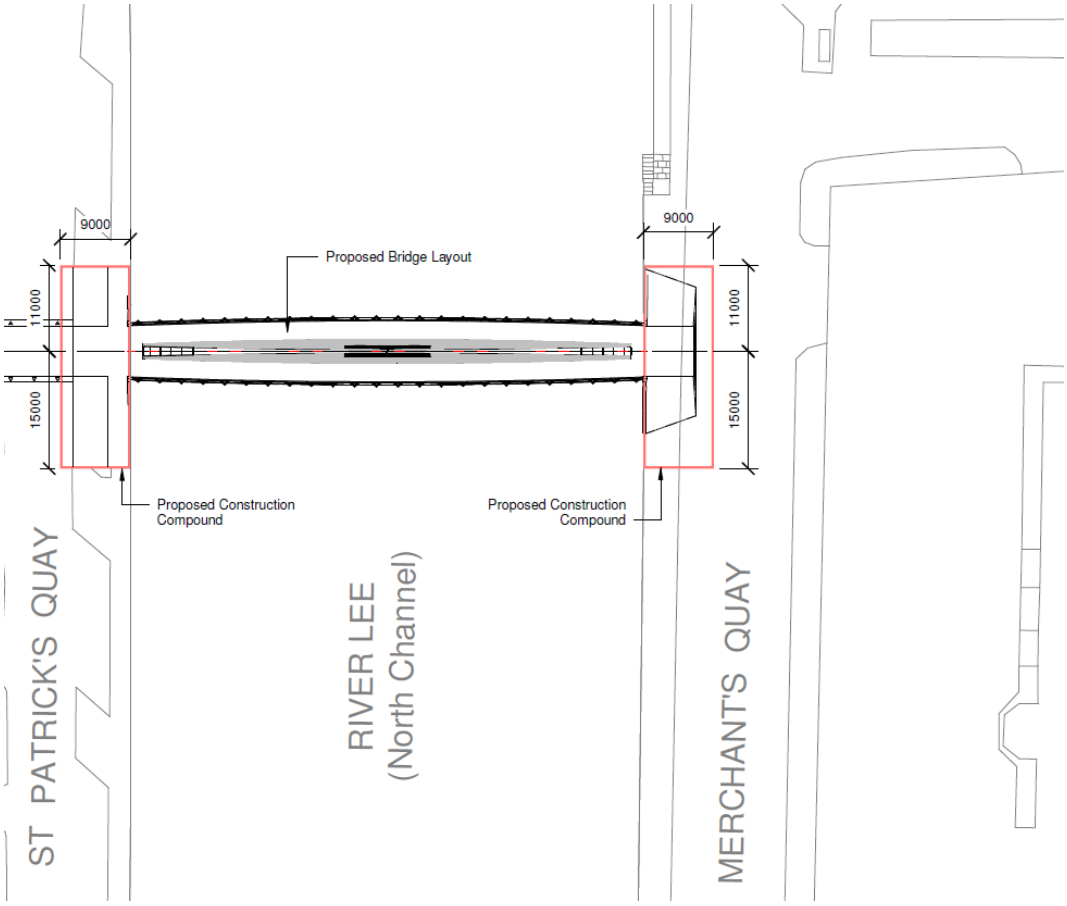

Figure 5: Proposed site layout during construction (not to scale)

No demolition works are envisaged as part of the proposed development and the majority of construction would occur behind the existing quay walls. The construction works areas would be enclosed behind both quay walls and a temporary sheet pile or equivalent on the river side of the quay wall. Further, the existing pavements and road networks would be retained and the area required for the ramps would be minimised.

4.3.3 Pre-fabrication

It is proposed that key elements of the bridge superstructure would be pre-fabricated off site. The central spine beam would consist of three steel sections. The central section would be fabricated off site, transported to Anderson or Penrose Quay and subsequently transferred to the site via a water borne vessel that would float in the River Lee to avoid impacts on fauna passing through the site. The outer spans would be constructed in situ.

4.3.4 Abutment construction

A three-sided cofferdam would be installed and sheet piling retaining wall would be erected on each of the quays to support the construction of the bridge abutments. A temporary piling platform would be installed to facilitate eight flight auger piles on each of the quays. Fluid stabilisation would not be used. A pump

would be installed within the cofferdam enclosure to maintain a dry working environment and the water would be pumped either back to the river or into the main surface water drainage system. This water would be treated prior to discharge in order to remove any sediments or silt in the water column.

Excavation would be undertaken to a depth of -0.5 mOD (approximately 3.3m below ground level) within the sheet pile cofferdam. The quay wall would be removed locally to allow the beam to slot in and a temporary shutter would be installed.

The reinforcement for the abutments would be fixed to allow the first span of the spine to be held in place by temporary steel frame support. The concrete pile cap would be cast, cladding would be installed around the exposed concrete face and pressure grouting would be undertaken behind the quay wall to provide reinforcement. The abutments would be constructed behind the quay walls and the outer spans of the bridge would be lifted onto the abutment seating plate immediately afterwards. All construction debris would be enclosed within this area and removed prior to removal of the temporary sheet piling.

4.3.5 Main span construction

The central spine beam would consist of three steel sections that provide the main span of the bridge. The outer segments of the spine beam would be lifted onto the abutment seating plate by mobile cranes located on each of the quays. As outlined in Section 4.3.3, the central span would be prefabricated and transported to the site on barges. The central span would be lifted into place from the floating barge via a hoist located on the tips of the abutment sections.

All welding would be undertaken within fully encapsulated enclosure(s) and all debris would be removed prior to the disassembly of the cofferdam enclosure. Silt disturbance in the river bed during piling cannot be fully eliminated, however strict construction methodology specifications will be outlined to lessen discharge during the removal of the cofferdam and the tidal cycle of the river will ensure negligible impacts on the River Lee. The construction of the main span would be carried out during the night time to allow for partial road closures along St Patrick's and Merchant's quays. The construction of the central span would be dependent on the tides.

4.3.6 Installation of walkways and flood defence

Once the abutments and bridge span are in place, the decking and surfacing for the cantilever walkways, the flood gates and parapets would be installed from platforms supported by the central spine beam. In parallel to these works the ramps from street level on the quays would be installed to tie the proposed development in with the surrounding public realm. This would incorporate the provision of the signalised junction on St Patrick's Quay.

4.3.7 Finishing works

Upon completion of the bridge construction, the final design elements would be installed on the bridge including surfacing finishes, landscaping, and lighting. Once construction is complete the site would be cleaned up. This would include the removal of all plant and equipment, site hoarding, waste materials and

reinstatement of the site to ensure seamless tie in between the proposed development and the surrounding environment.

4.3.8 Bridge handover and opening

Upon completion of construction and clean-up of the site, the proposed development would be handed over to CCC, commissioned and opened to the general public. At this stage, it is likely that the proposed development would opened by April 2019.

4.4 Operation

The proposed development would operate as a two way bridge for pedestrians and cyclists from April 2019 onwards. The bridge would tie in with the existing networks and contribute towards improving the quality of the active transport network and public realm in Cork's city centre.

The bridge would be open 24 hours a day, 365 days a year. CCC would be responsible for maintaining the pavements, railings and parapets on the bridge and deploying the flood defence gates during flood events.

5 Receiving environment

The site for the proposed development is located in the northern channel of the River Lee in central Cork city between the existing Brian Boru and St Patrick's bridges. The site incorporates the permanent footprint of the bridge and associated works including the bridge landings and abutments as well as the area required for construction works.

The site is approximately 300 m2 in size and the footprint of the bridge is approximately 150m^2. The site surrounded by highly urbanised development within the commercial centre of Cork city. There are a number of features of interest in the surrounding area as illustrated in Figure 6.

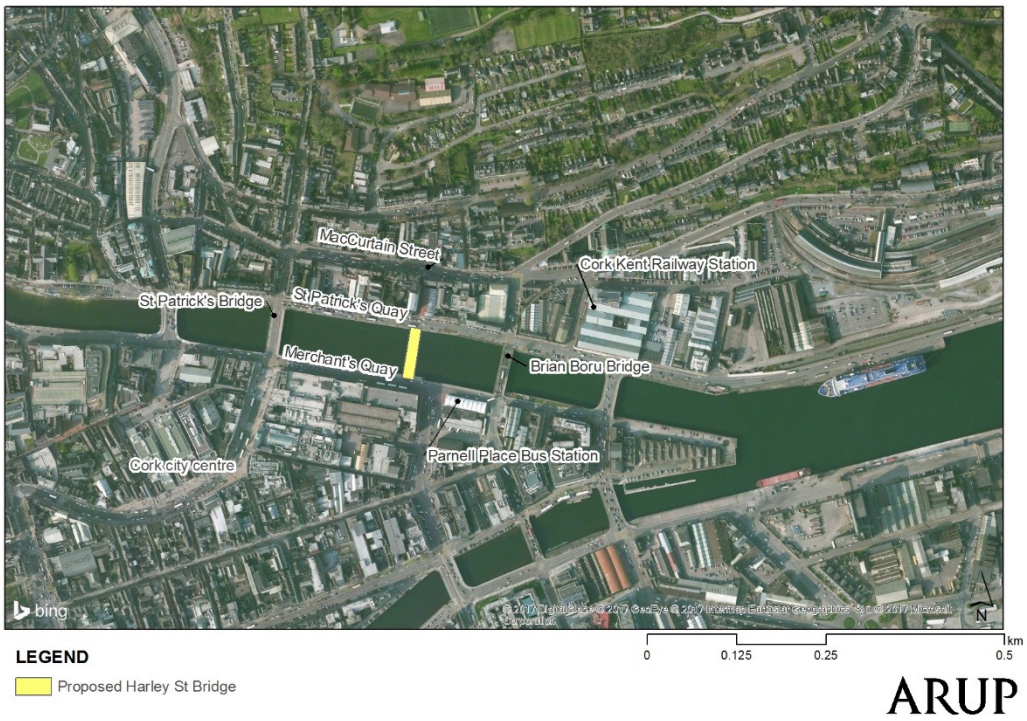

Figure 6: The site of the proposed development and surrounding area (not to scale)

The River Lee flows from western County Cork eastwards and splits in two for a short distance, creating the island on which Cork's city centre is built. The River Lee flows east towards Lough Mahon, onto Cork Harbour and into the Celtic Sea. The site is therefore hydrologically connected to two Natura 2000 sites (Cork Harbour Special Protection Area and Great Island Special Area of Conservation) which are located downstream of the proposed development site. The total catchment area of the River Lee covers approximately 2,000km^2 and the river is identified as a transitional water body that is subject to tidal influence. The River Lee is nutrient sensitive with moderate water quality and a Water Framework Directive risk score of 'at risk of not achieving good status'.

The River Lee was designated as a Salmonid river under the EU Council Directive 2006/44/EC (Freshwater Fish Directive) at the location of the proposed development. Species of fish found along the river include Brook and Sea Lamprey (*Lampetra planeri* and *Petromyzon marinus*), Brown Trout (*Salmo truta*), European Eel (*Anguilla anuguilla)* and Atlantic Salmon (*Salmo salar*).

Additionally Dipper (*Cinclus hibernicus*), Grey Wagtail (*Matacilla cinerea*), Grey Heron (*Andea cinerea*), Comorant (*Phalacrocorax carbo*), Peregrine Falcon (*Falco peregrinus)*, Otter (*Lutra lutra*) and bats and seals are known to occur along the city centre waterway. Invasive species such as Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*) and others have also gained a foothold in the riverine environment and have become part of the city flora.

The River Lee is bounded by the existing quay walls at the location of the proposed development and this is surrounded by existing hardstanding. There are no mud or sand flats in the vicinity of the site. The flora of the quay walls is relatively diverse in places upstream of the site, however nationally protected plant species have not been identified on the quay walls in the city.

To the north St Patrick's Quay runs east – west and houses a number of commercial premises. St Patrick's Quay runs parallel to and connects with MacCurtain Street which is a busy hospitality, retail and entertainment destination for the city. The proposed development would provide access to MacCurtain Street and the popular Metropole Hotel via Harley Street. Merchant's Quay to the south also runs east-west and accommodates the Merchants Quay Shopping Centre as well the Parnell Place bus station which provides intercity and regional bus connections.

Given this central location, the receiving environment experiences relatively high levels of pedestrian and vehicular traffic and there is a range of land assets and infrastructure at this urbanised waterfront.

Figure 7: Overview of the site facing westwards from the Brian Boru Bridge

The land use within the area is designated under the Cork City Development Plan 2015-2021 (Development Plan) which prescribes the following land zones:

- The River Lee has been designated as 'River/waterbodies protection' in order to protect and provide for the appropriate recreational/amenity and transport use of the waterway.

- The land immediately to the north and south of the river is designated as city centre retail areas which provide for the protection of and promote the development of higher order retailing.

Additionally, the Cork City Development Plan 2015-2021 identifies numerous objectives promoting active transport, improvements to the public realm and the provision of this bridge.

6 Ecological overview

6.1 Identification of Natura 2000 sites which may be within the zone of influence of the proposed development

The proposed development is not directly connected with, or necessary for, the management of any Natura 2000 site. No habitat loss will occur within any Natura 2000 site as a result of this proposed development.

Natura 2000 sites are only at risk from significant effects where a source-pathway-receptor link exists between a proposed development and a Natura 2000 site(s). This can take the form of a direct impact within the boundary of a Natura 2000 site(s) (e.g. where the proposed development and/or associated construction works are located within the boundary) or an indirect impact where impacts outside of the Natura 2000 site(s) affect ecological receptors within (e.g. impacts to water quality which can affect riparian habitats at a distance from the impact source).

Considering the Natura 2000 sites present in the region, their Qualifying Interests and conservation objectives, and any potential impact pathways that could link those sites to the proposed development area, a distance of 15km was considered appropriate to encompass all Natura 2000 sites potentially within the Zone of Influence of the proposed development.

The zone of influence comprises the area within which the proposed development may potentially affect the conversation objectives or qualifying interests of a Natura 2000 site. There is no recommended zone of influence and guidance from the National Parks and Wildlife Service recommends that the distance should be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects.

Consideration is therefore given to the source-pathway-receptor linkage and associated risks between the proposed development and Natura 2000 sites. For a significant effect to occur there needs to be a risk associated with pollutant linkages whereby a source (i.e. contaminant or pollutant arising from construction activities) affects a particular receptor (i.e. Natura 2000 site) through a particular pathway (e.g. a watercourse which connects the proposed development with the Natura 2000 site).

The identification of risk does not automatically mean that an effect will occur, nor that it will be significant. The identification of these risks means that there is a possibility of environmental or ecological damage occurring. The level and significance of the effect depends upon the nature of the consequence, likelihood of the risk and characteristics of the receptor. The precautionary principle is applied for the purposes of screening to ensure that consideration and pre-emptive action is undertaken where there is a lack of scientific evidence

As a general rule of thumb, it is often considered appropriate to examine all European sites within 15km as a starting point. In some instances, where there are hydrological connections, a whole river catchment or a groundwater aquifer may

need to be included. Taking this into account, as a starting point all European sites within 15km of the proposed development were examined. This distance was considered to be sufficient for the purposes of this assessment as any European sites outside of the 15km distance either do not have any hydrological or any other linkages to the proposed development site, or are located at such distance from the proposed development site that no significant effects would occur.

The North Channel of the River Lee discharges into Cork Harbour, areas of which are designated as an SAC (Great Island Channel) and SPA (Cork Harbour). Consultation of NPWS online data identified two Natura 2000 sites located within 15km of the site which are of relevance for the proposed development. The sites identified are listed below and indicated on Figure 8. The study area lies approximately 3km (as the crow flies) to the north and west of the Cork Harbour SPA (site code 004030) (located in Cork Harbour) and approximately 8.5km to the west of the Great Island Channel SAC (site code 001058) (located in Cork Harbour).

Table 1 identifies the relevant features of interest and site synopses is available in Appendix B.

Table 1: Features of interest of Natura 2000 sites within the study area

Site code	Designation	Site name	Distance from site	Features of interest
004030	SPA	Cork Harbour SPA	Around 3km at its nearest point (Approx. 4.5km downstream)	Little Grebe (*Tachybaptus ruficollis*) [A004] Great Crested Grebe (*Podiceps cristatus*) [A005] Cormorant (*Phalacrocorax carbo*) [A017] Grey Heron (*Ardea cinerea*) [A028] Shelduck (*Tadorna tadorna*) [A048] Wigeon (*Anas penelope*) [A050] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Red-breasted Merganser (*Mergus serrator*) [A069] Oystercatcher (*Haematopus ostralegus*) [A130] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Lapwing (*Vanellus vanellus*) [A142] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Black-headed Gull (*Chroicocephalus ridibundus*) [A179]

				Common Gull (*Larus canus*) [A182] Lesser Black-backed Gull (*Larus fuscus*) [A183] Common Tern (*Sterna hirundo*) [A193] Wetland and Waterbirds [A999]
001058	SAC	Great Island Channel SAC	Around 8.5km at its nearest point	Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]

There is a potential indirect pathway via the North Channel as it discharges into Cork Harbour, therefore the location of the proposed development is hydrologically connected to both of these Natura 2000 sites.

6.2 Other designated conservation areas

There are 17 proposed Natural Heritage Areas (pNHAs) within the study area. Of these, the pNHAs identified in Table 2 are relevant for the proposed development as they are located downstream and hydrologically connected to the proposed development.

Table 2: Proposed Natural Heritage Areas of relevance

Site code	Site name	Distance from site
001046	Douglas River Estuary pNHA	Around 4km at its nearest point
001082	Dunkettle Shore pNHA	Around 5km at its nearest point
001074	Rockfarm Quarry, Little Island pNHA	Around 8km at its nearest point
001058	Great Island Channel pNHA	Around 8.5km at its nearest point
001979	Monkstown Creek pNHA	Around 10.5km at its nearest point
001066	Lough Beg pNHA	Around 14.5km at its nearest point

6.3 Sites within the zone of influence

For the purpose of this assessment, the hydrological connection to the Cork Harbour SPA and Great Island Channel SAC illustrates a source-pathway-receptor linkage. Both Natura 2000 sites are therefore considered to be within the zone of influence for the proposed development. The Natura 2000 sites of relevance are illustrated in Figure 8.

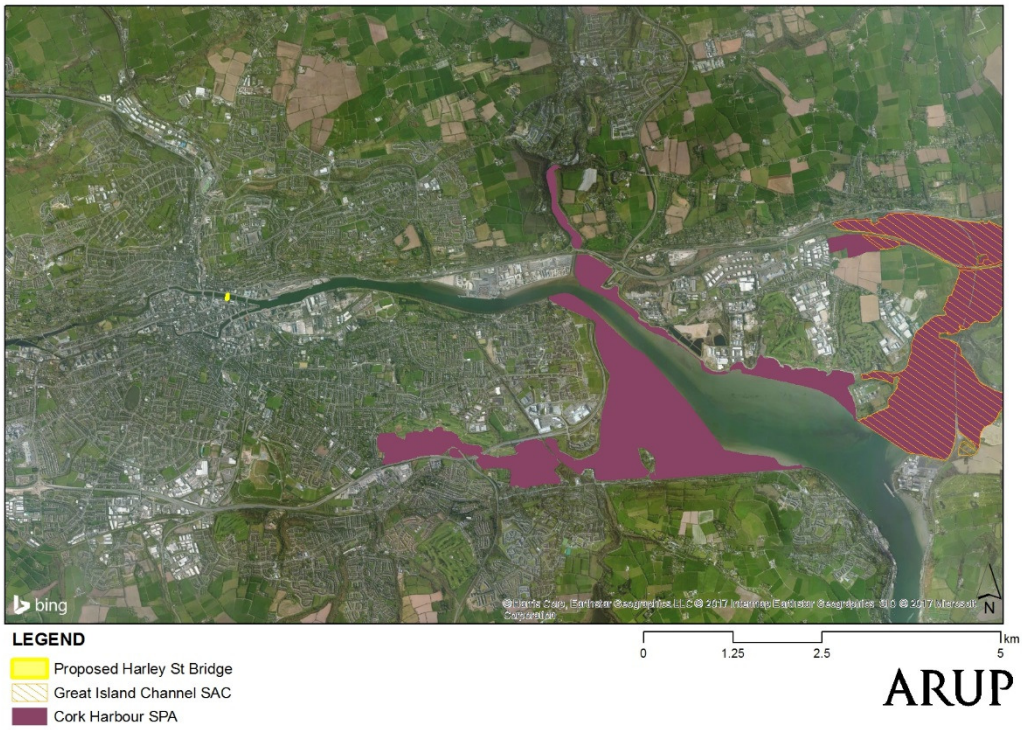

Figure 8: Natura 2000 sites within the zone of influence of the proposed development (not to scale)

Additionally, Dunkettle Shore, the Douglas River Estuary and Rockfarm Quarry, Little Island pNHAs are considered to be within the zone of influence (Refer to Figure 9) as there is the potential for protected species to move from the Natura 2000 sites to the pNHAs which are closer to the proposed development and further upstream than the Cork Harbour SPA and Great Island Channel SAC.

Figure 9: pNHAs within the zone of influence of the proposed development (not to scale)

6.4 Cumulative effects

Other developments can lead to an elevated effect on Natura 2000 sites, therefore information has been sought on projects that have been recently approved in the site and surrounding area. Other developments need to be of a sufficient scale or proximity to the development being assessed for cumulative effects to be likely.

The Lower Lee FRS may have the potential to result in cumulative effects on downstream Natura 2000 sites. No other developments were identified that would be likely to exacerbate effects or introduce further receptors adjacent to the site. It is noted that the Metropole Hotel is being expanded and redeveloped, however this has been designed to tie in and integrate with the surfacing and public realm aspects of the proposed development.

The Lower Lee FRS is being advanced by the Office of Public Works (OPW) as part of the National Flood Risk Management programme. The flood defence level protection presented during the public exhibition is outlined in Figure 10 and Figure 11.

The Lower Lee FRS is currently undergoing detailed design to provide protection for properties within the Lee catchment area and construction is likely to commence in early 2018. The phasing of works outlined in the Environmental Impact Statement indicate that works would commence in the southern channel of the River Lee and move towards the west of the city prior to the commencement of any city centre works in the vicinity of the proposed development. At this stage, it is expected that the proposed development would be constructed in advance of the Lower Lee FRS works occurring at this location and that there would be no overlap between the projects on site.

The AA screening for the Lower Lee FRS has concluded that the project will have no potential adverse effect on the integrity of Natura 2000 sites and as such returns a conclusion that there is no potential for significant effects on Natura 2000 sites arising from the Lower Lee FRS.

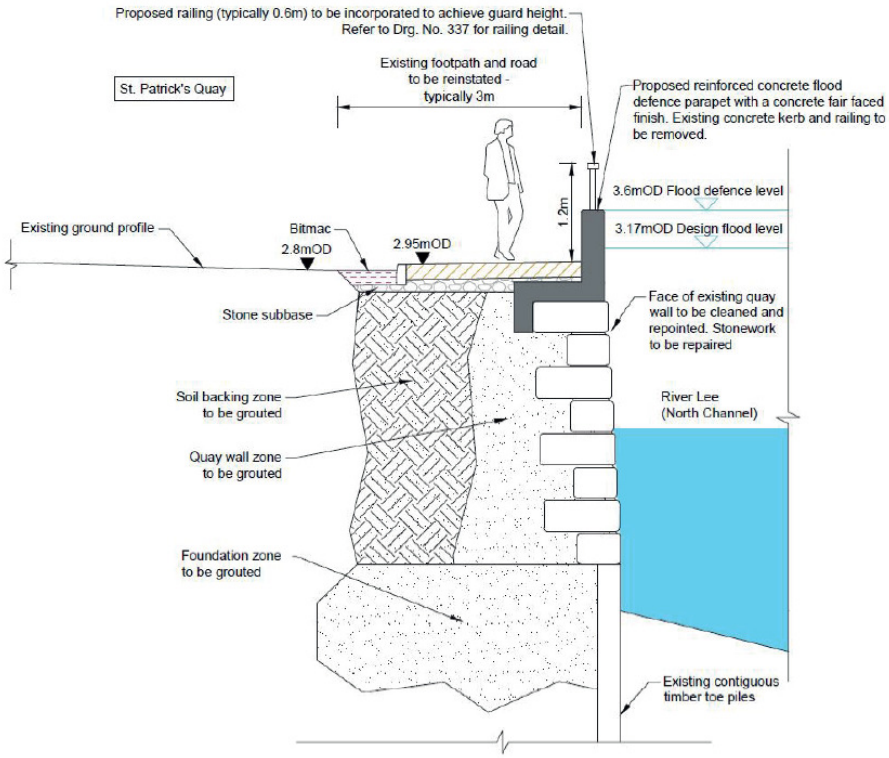

Figure 10: Proposed flood relief works on St Patrick's Quay (Source: OPW)

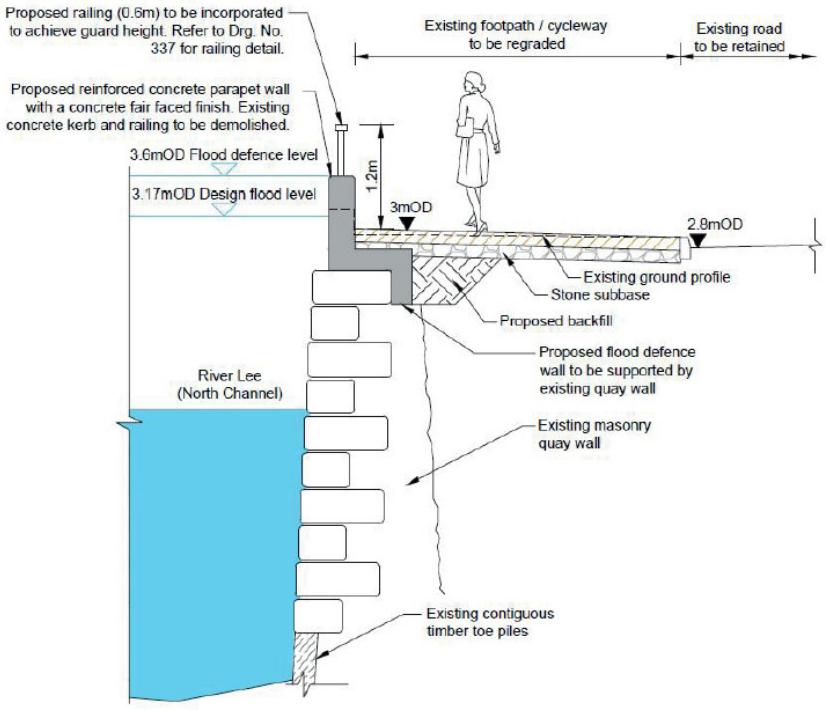

Figure 11: Proposed flood relief works on Merchant's Quay (Source: OPW)

7 Potential effects on Natura 2000 sites

7.1 Potential effects of the proposed development on Natura 2000 sites

The primary interest from an ecological perspective is that adverse effects on designated conservation sites are effectively prevented. This may comprise direct or indirect effects on qualifying interests or conservation objectives of the Cork Harbour SPA and Great Island Channel SAC.

There would be no direct or indirect impacts from the proposed development on any Qualifying Interest habitats and species of the Cork Harbour SPA and Great Island Channel SAC. Furthermore, the site of the proposed development is not of ecological interest for any of the transient species of the Cork Harbour SPA and Great Island Channel SAC as the site does not contain the typical habitats to support these species. As such, it is unlikely that the any of the species listed in Table 1 would travel to the site to forage or nest.

There are no in-stream works proposed and all works on the quays would be undertaken with due regard to best practice construction management and industry standards. Emissions to ground and to surface water will therefore be controlled during construction using standard proven construction methodologies and significant impacts on downstream receptors are not predicted. Emissions to ground and/or to surface water would not arise from the proposed development during operation.

Given the scale, type, duration and location of the proposed development, it can be concluded by the authors of this report that the proposed development is unlikely to have an effect on the integrity of the Cork Harbour SPA and/or Great Island Channel SAC. Further, there would be no direct or indirect effects from the proposed development on any qualifying interests of the Cork Harbour SPA and Great Island Channel SAC.

7.2 Potential cumulative effects on Natura 2000 sites

Given the limited area and extent of the proposed development and phasing of the Lower Lee FRS, it is unlikely that the proposed development in combination with other development(s) would have a significant cumulative effect on the integrity of any Natura 2000 sites.

7.3 Assessment of likely significant effects

This assessment concludes that the proposed development is unlikely to have any significant adverse (direct or indirect) effects on Natura 2000 sites, their conservation objectives and/or qualifying interests. This judgement has been made on the following basis:

- No works will take place within the Natura 2000 sites and there would be no encroachment on, or fragmentation of the habitats in the Cork Harbour SPA or Great Island SAC.

- There will be no disturbance to the qualifying interests of the Natura 2000 sites and no direct effect on population density of species likely to occur at the Natura 2000 sites and/or pNHAs within the zone of influence.
- There are no typical habitats at the site of the proposed development that support transient species moving to/from the Natura 2000 sites. Further, the site is located in a highly urbanised area where any wintering birds passing through will be accustomed to relatively high levels of noise and traffic. As such, works undertaken during the wintering bird season should not result in any adverse effects on qualifying interests.
- There is a potential source-pathway-receptor linkage between the proposed development and the Natura 2000 sites downstream, however there are no in-stream works required for construction. Further, all works on the quays would be undertaken with due regard to best practice construction management and industry standards to prevent discharge and emissions to water courses or via groundwater pathways. There would be no effect on water resources or water quality associated with the proposed development as there would be no in-stream works, no discharges to the River Lee, no changes to the hydrology of the River Lee and the diluting capacity of Cork Harbour is relatively good. A Construction Environmental Management Plan would be implemented by the contractor as standard during the works and all staff working on site would be given a briefing that emphasises the precautionary measures to be implemented as well as the sensitive nature of the River Lee and downstream Natura 2000 sites.
- No difficulties in implementing standard construction environmental protection measures (i.e. prevention of siltation or hydrocarbon contamination in surface water run-off) under the supervision of site engineers is envisaged. Thus significant impacts on the receiving environment and in particular the North Channel of the River Lee which discharges into Cork Harbour are not predicted to occur.

8 Screening statement and conclusions

The screening assessment has identified that the Cork Harbour SPA and Great Island Channel SAC are within the study area and zone of influence of the proposed development. There is an indirect pathway to the Natura 2000 sites as they are hydrologically connected to the site of the proposed development.

Based on the information provided in this screening report and by applying the precautionary principle, it is the view of Arup that it is possible to rule out any likely significant effects on Natura 2000 sites. As such, it is not necessary to undertake any further stage of the AA process.

Refer to Appendix A for further detail in the Finding of No Significant Effects Report.

Appendix A

Findings of no significance report

Finding of no significance report

Name of Project:

Harley Street pedestrian/cycle Bridge

Names of Natura 2000 Sites within 15km of site:

Site Name	Site Code
Cork Harbour SPA	004030
Great Island Channel SAC	001058

Both the Great Island Channel SAC (site code 001058) and the Cork Harbour SPA (site code 004030) are of relevance to the proposed development.

Is the project or plan directly connected with or necessary to the management of the sites?

No.

Are there other projects or plans that together with the project or plan being assessed could affect the site?

No cumulative effects predicted.

THE ASSESSMENT OF SIGNIFICANCE OF EFFECTS

Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 sites.

The proposed development will not result in any significant effects on Natura 2000 sites.

Explain why these effects are not considered significant.

This assessment concludes that the proposed development is unlikely to have any significant adverse (direct or indirect) effects on Natura 2000 sites, their conservation objectives and/or qualifying interests. This judgement has been made on the following basis:

- No works will take place within the Natura 2000 sites and there would be no encroachment on, or fragmentation of the habitats in the Cork Harbour SPA or Great Island SAC.
- There will be no disturbance to the qualifying interests of the Natura 2000 sites and no direct effect on population density of species likely to occur at the Natura 2000 sites and/or pNHAs.
- There are no typical habitats at the site of the proposed development that support transient species moving to/from the Natura 2000 sites. Further, the site is located in a highly urbanised area where any wintering birds passing through will be accustomed to relatively high levels of noise and traffic. As such, works undertaken during the wintering bird season should not result in any adverse effects on qualifying interests.

- There is a potential source-pathway-receptor linkage between the proposed development and the Natura 2000 sites downstream, however there are no in-stream works required for construction. Further, all works on the quays would be undertaken with due regard to best practice construction management and industry standards to prevent discharge and emissions to water courses or via groundwater pathways. There would be no effect on water resources or water quality associated with the proposed development as there would be no in-stream works, no discharges to the River Lee, no changes to the hydrology of the River Lee and the diluting capacity of Cork Harbour is relatively good. A Construction Environmental Management Plan would be implemented by the contractor as standard during the works and all staff working on site would be given a briefing that emphasises the precautionary measures to be implemented as well as the sensitive nature of the River Lee and downstream Natura 2000 sites.
- No difficulties in implementing standard construction environmental protection measures (i.e. prevention of siltation or hydrocarbon contamination in surface water run-off) under the supervision of site engineers is envisaged. Thus significant impacts on the receiving environment and in particular the North Channel which discharges into Cork Harbour are not predicted to occur.

DATA COLLECTED TO CARRY OUT THE ASSESSMENT

Who carried out the assessment?

The assessment was carried out by Arup.

Sources of Data -

Sources of data included:

- *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC* (EC Environment Directorate-General, 2000); [hereafter referred to as MN2000].
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodical Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission Environment Directorate-General, 2001).
- *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC.* (European Commission, 2007).
- *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities* (Department of Environment, Heritage and Local Government, 2010 revision).
- *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10.*
- *Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive* (International Workshop on Assessment of Plans under the Habitats Directive, 2011).

Sources of information that were used to collect data on the Natura 2000 network of sites and on the existing ecological environment are listed below:

- Bing Maps aerial photography[13];
- Online mapping and data on protected sites from the National Parks and Wildlife Service [14];
- Information on environmental quality data available from the EPA;[15]
- Status of EU protected habitats in Ireland provided by the National Parks and Wildlife Service[16];
- National Biodiversity Centre Data Centre database[17]; and
- Relevant information from the Lower Lee Flood Relief Scheme (FRS) Environmental Impact Statement[18].

OVERALL CONCLUSIONS

Based on the information provided in this screening report and by applying the precautionary principle, it is the view of Arup that it is possible to rule out any likely significant effects on Natura 2000 sites. As such, it is not necessary to undertake any further stage of the Appropriate Assessment process.

[13] Bing Maps in ArcGIS- Accessed 1 June 2017
[14] https://www.npws.ie/maps-and-data/designated-site-data/download-boundary-data - Accessed 1 June 2017
[15] Envision Online Environmental Map Viewer: http://gis.epa.ie/Envision – Accessed 1 June 2017
[16] NPWS Protected sites in Ireland : https://www.npws.ie/protected-sites - Accessed 1 June 2017
[17] http://maps.biodiversityireland.ie/ - Accessed 1 June 2017
[18] http://www.lowerleefrs.ie/index.php/site/environmental - Accessed 7 June 2017

Appendix B

Site synopses

B1

SITE SYNOPSIS

Site Name: Great Island Channel SAC

Site Code: 001058

The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats
[1330] Atlantic Salt Meadows

The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi, Nereis diversicolor* and *Corophium volutator*. Green algal species occur on the flats, especially *Ulva lactua* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly.

The saltmarshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Lax-flowered Sea-lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Sea Mayweed (*Matricaria maritima*) and Red Fescue (*Festuca rubra*).

The site is extremely important for wintering waterfowl and is considered to contain three of the top five areas within Cork Harbour, namely North Channel, Harper's Island and Belvelly-Marino Point. Shelduck is the most frequent duck species with 800-1,000 birds centred on the Fota/Marino Point area. There are also large flocks of Teal and Wigeon, especially at the eastern end. Waders occur in the greatest density

north of Rosslare, with Dunlin, Godwit, Curlew and Golden Plover the commonest species. A population of about 80 Grey Plover is a notable feature of the area. All the mudflats support feeding birds; the main roost sites are at Weir Island and Brown Island, and to the north of Fota at Killacloyne and Harper's Island. Ahanesk supports a roost also but is subject to disturbance. The numbers of Grey Plover and Shelduck, as given above, are of national importance.

The site is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports. Overall, Cork Harbour regularly holds over 20,000 waterfowl and contains internationally important numbers of Black-tailed Godwit (1,181) and Redshank (1,896), along with nationally important numbers of nineteen other species. Furthermore, it contains large Dunlin (12,019) and Lapwing (12,528) flocks. All counts are average peaks, 1994/95 – 1996/97. Much of the site falls within Cork Harbour Special Protection Area, an important bird area designated under the E.U. Birds Directive.

While the main land use within the site is aquaculture (oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments.

The site is of major importance for the two habitats listed on Annex I of the E.U. Habitats Directive, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.

B2

SITE SYNOPSIS

SITE NAME: CORK HARBOUR SPA

SITE CODE: 004030

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poulnabibe inlets.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially *Ulva* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Some shallow bay water is included in the site. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Mallard, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl. Of particular note is that the site supports internationally important populations of Black-tailed Godwit (1,896) and Redshank (2,149) - all figures given are five year mean peaks for the period 1995/96 to 1999/2000. Nationally important populations of the following 19 species occur: Little Grebe (57), Great Crested Grebe (253), Cormorant (521), Grey Heron (80), Shelduck (2,009), Wigeon (1,791), Teal (1,065), Mallard (513), Pintail (57), Shoveler (103), Red-breasted Merganser (121), Oystercatcher (1,809), Golden Plover (3,342), Grey Plover (95), Lapwing (7,569), Dunlin (9,621), Bar-tailed Godwit (233), Curlew (2,237) and Greenshank (46). The Shelduck population is the largest in the country (over 10% of national total). Other species using the site include Mute Swan (38), Whooper Swan (5), Pochard (72), Gadwall

(6), Tufted Duck (64), Goldeneye (21), Coot (53), Ringed Plover (73), Knot (26) and Turnstone (113). Cork Harbour is an important site for gulls in winter and autumn, especially Black-headed Gull (3,640), Common Gull (1,562) and Lesser Black-backed Gull (783), all of which occur in numbers of national importance. Little Egret and Mediterranean Gull, two species which have recently colonised Ireland, also occur at this site.

A range of passage waders occurs regularly in autumn, including such species as Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter.

Cork Harbour has a nationally important breeding colony of Common Tern (102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower. The birds are monitored annually and the chicks are ringed.

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA is a Wildfowl Sanctuary.

Appendix B

Archaeological Impact Assessment Report

1 Introduction

1.1 It is proposed to construct a pedestrian /cycle bridge in Cork city centre. The proposed location of the bridge is from St. Patricks Quay to Merchants Quay, crossing the River Lee (North Channel) between Patrick's Bridge and Brian Boru Bridge on axis with Harley Street (**Appendix 1; Fig. 1**).

1.2 The purpose of this assessment is to evaluate the potential impact the proposed development will have on the archaeology, architecture and cultural heritage of the development site and surrounding area.

1.3 There are no recorded archaeological sites within the proposed development area. The proposed bridge site lies 200m to the east of the Zone of Archaeological Potential for the historic city of Cork (CO074-034001) as listed in the Record of Monuments and Places (RMP) for Co. Cork and in the Sites and Monuments Record (SMR) Database of the Archaeological Survey of Ireland (Appendix 1; Fig. 2). The closest recorded archaeological site to the proposed development is an 18th/19th century house (CO074-108), situated *c.* 300m to the southwest of the proposed bridge location. There are seven recorded archaeological sites within 400m of the bridge site, they include the following; the current custom house downstream (CO074-118) and the older custom house upstream (CO074-057) of the proposed bridge location, Albert Road Railway Station (CO074-11902), Albert Quay Railway Station (CO074-119001), a graveyard (CO074-111), an 18th/19th century house (CO074-107) and a designed landscape (CO074-082)**.**

1.4 There are no protected structures within the proposed development area. The closest protected structures to the proposed development are as follows; Brian Boru Bridge (PS 1125/1126), *c.* 120m downstream, to the east and St. Patrick's Bridge (PS 1133), *c.* 200m upstream to the west. On St. Patrick's Quay there are two protected structures, No. 5, the Victoria Sporting Club (PS 410), *c.* 135m to the west and No. 38 a warehouse downstream of Brian Boru Bridge (PS 412), *c.* 145m to the east (Appendix 1; Fig.1).

1.5 The National Inventory of Architectural Heritage (NIAH) lists the Ashlar limestone quay walls and steps on Patricks Quay (20512612) and the Ashlar limestone quay walls and steps on Merchants Quay (20513136) as being of Regional Significance. Both historic quay walls and their associated steps are referred to as Cultural Heritage Sites in this report; St. Patricks

Quay Wall and one set of steps (CHS 1) and Merchants Quay Wall and three sets of steps (CHS 2). Sections of both the quay walls are within the development area and will be directly impacted by the proposed development. The access steps to the river along St Patricks Quay (CHS 1) and the three sets of access steps to the river along Merchants Quay (CHS 2) are outside the development area and will not be impacted. The NIAH also lists four cast iron mooring posts (CHS 4) which are located, 58m downstream of the proposed bridge location on St Patricks Quay. The timber Warf (CHS 3) along St. Patrick's quay is situated, 55m downstream of the proposed bridge location, while a culvert (CHS 5) along Merchants Quay and adjacent to St. Patricks Bridge is situated *c.* 170m upstream. Both of these structures and the mooring posts will not be impacted by the proposed bridge (Appendix 1; Fig.1).

1.6 Some terms used in this report are explained hereunder;

Archaeological Heritage

Archaeological heritage can be described as the study of past human societies through their material remains and artefactual assemblages. The Valetta Treaty (or the European Convention on the Protection of the Archaeological Heritage, 1992) defines archaeological heritage as "all remains and objects and any other traces of humankind from past times" this includes "structures, constructions, groups of buildings, developed sites, moveable objects, monuments of other kinds as well as their context, whether situated on land or under water".

Architectural Heritage

Architectural heritage is defined in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 as structures and buildings together with their settings and attendant grounds, fixtures and fittings, groups of such structures and buildings, and sites, which are of architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest.

Cultural Heritage

Cultural Heritage is an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions and values. Cultural Heritage is often expressed as either Intangible or Tangible Cultural Heritage (ICOMOS, 2002). Environmental Protection Agency Guidelines (2003), define cultural heritage as including archaeological heritage, architecture, history,

landscape and garden design, folklore and tradition, geological features, language and dialect, religion, settlements, inland waterways (rivers), and place names.

Study Area

In order to obtain a comprehensive assessment of the archaeological, architectural and cultural heritage environment, the following study area was examined;

Archaeology: Known recorded archaeological sites (RMP) within a 1km radius of the proposed bridge location were examined.

Architecture: All structures listed in the Record of Protected Structures (PS) and all buildings listed in the NIAH within proximity of the bridge location; i.e. along St. Patrick's Quay and Merchant's Quay were examined and photographed. In addition, a selection of PS and buildings listed in the NIAH within a 1km radius of the proposed bridge location were examined.

Cultural Heritage: All Cultural Heritage Sites (CHS) within proximity of the bridge location; i.e. within and adjacent to the river channel were included in this assessment. In addition, an overview of the cultural heritage of the Study Area is included in the Existing Environment section of the assessment.

2 Methodology

2.1 The methodology used to complete this assessment comprised the following:

- A review of the relevant Legislation and Guidelines
- A desktop assessment of the proposed development site and Study Area
- A survey or inspection of the proposed development site.
- An evaluation of the likely impacts of the proposed development on the archaeological and cultural heritage of the proposed development site and study area.
- Proposed mitigation measures to be undertaken to prevent or reduce any potential impacts on the archaeological, architectural and cultural heritage.

2.2 Legislation and Guidelines

In Ireland, the primary means of protecting cultural heritage assets are the National Monument (Amendments) Acts 1930 to 2004, the Heritage Act 1995, the relevant provisions of the National Cultural Institutions Act 1997, the Architectural Heritage (National Inventory) and Historic Monuments (Misc. Provisions) Act 1999 and the Local Government (Planning and Development) Act 2000. Policies for both the archaeological and architectural heritage are relayed in a series of specific published guidelines. This report is prepared having regard to the following guidelines:

- Guidelines on the information to be contained in Environmental Impact Statements, 2002 (Environmental Protection Agency) and Draft Revised Guidelines, 2015.
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, 2003 (Environmental Protection Agency) and Draft Revised Advice Notes, 2015.
- Framework & Principles for the Protection of the Archaeological Heritage, 1999 (Department of Arts, Heritage, Gaeltacht & the Islands).
- Policy & Guidelines on Archaeological Excavation, 1999 (Department of Arts, Heritage, Gaeltacht & the Islands).
- Architectural Heritage Protection, Guidelines for Planning Authorities, 2004. (Department of the Environment, Heritage and Local Government)

Comprehensive guidelines on the treatment of the archaeological and architectural heritage during the planning and design of national road schemes were published by the National

Roads Authority in 2005. These were also used as a guide in the compilation of this assessment .

- Guidelines for the assessment of Archaeological Heritage Impacts of National Road Schemes, 2005a (NRA).

2.3 Desktop Study

The desktop study provided a cultural heritage overview of the proposed development site and study area and used the following sources.

Record of Monuments and Places (RMP)

This record was established under Section 12 (1) of the National Monuments (Amendment) Act 1994. It lists all monuments and places believed to be of archaeological importance in the County. The numbering system consists of two parts: the first part is the county code (CO for Cork) followed by the Ordnance Survey map number (six-inch to the mile scale); the second part is the number of a circle surrounding the site on the RMP map, e.g. CO074-108 refers to circle 108 on OS sheet 74 for County Cork. The circle is intended to show the recorded monument or place and is sometimes referred to as the z*one of archaeological potential or zone of notification* but the circles do not define the exact extent of the monument or place. The diameter of the circle can vary depending on the size and shape of the site but it averages out at *circa* 180m. The RMP for County Cork was published in 1998.

Sites and Monuments Database of the Archaeological Survey of Ireland at the NMS

The purpose of the Archaeological Survey of Ireland (ASI) is to compile a base-line inventory of the known archaeological monuments in the State. The archive and database resulting from the survey are being continually updated. Archaeological sites which are added to the database are proposed to be included in the next published edition of the RMP and will then be afforded its protection. Sites previously listed in the RMP which, following investigation, are now considered to be of no archaeological potential are de-listed from the database and generally described as redundant records. This database, complete with maps is now available for consultation via the NMS website at www.archaeology.ie

Archaeological Inventory

The inventories for each county are follow-ons by the Archaeological Survey of Ireland to the RMPs. They give a written description of each archaeological site in the county. The Archaeological Inventory of County Cork - East and South Cork, Volume 2 (Power, Byrne, Egan, Lane and Sleeman) was published in 1994 and a follow up volume, Volume 5 (Ronan, Egan and Byrne), was published in 2009.

National Inventory of Architectural Heritage (NIAH) - The work of the National Inventory of Architectural Heritage (NIAH) involves identifying and recording the architectural heritage of Ireland, from 1700 to the present day, in a systematic and consistent manner. It is divided into two parts; The Building Survey and Historic Garden Survey. The main function of both is to provide a source of guidance for the selection of architectural heritage for protection and to supply data to local authorities, which helps them to make informed judgments on the significance of building stock in their functional area. The Building and Historic Garden Survey for Cork City is available online (www.buildingsofireland.ie).

Files of the National Monuments Service

The NMS was consulted to retrieve information on lists of RMP sites that have been afforded added protection such as;

- National Monuments in the ownership or guardianship of the state – None in the study area.
- National Monuments in the ownership of the local authority – None in the study area.
- Monuments subject to Preservation Orders and Temporary Preservation Orders – Two in the Study Area
  -Religious House/Dominican Friars (CO074-037) in Convent Place/Crosses Green – PO number 3/193 (1km southwest of the proposed bridge location)
  -Skiddy's Almshouse (CO074-105) in St. Anne's Shandon – PO number 2/1968 (0.6km northwest of the proposed bridge location).
- Monuments listed in the Register of Historic Monuments – None in the Study Area.

The Archaeological Survey of Ireland; Post Medieval Survey – The Cork Archaeological Survey was established in 1982 to carry out a preliminary survey of all known archaeological monuments in the county. Included in this survey was a selection of Post Medieval Monuments. This Post Medieval Survey is accessible in the Cork County Library. It was consulted to retrieve information on sites where no information was available on the Sites and Monuments Database. Information on some sites on the Post Medieval Survey was very limited.

The National Museum of Ireland Archives

These files were consulted for townlands within the study area. The topographical files contain the reports, including correspondence, present location and occasionally,

illustrations of archaeological material recovered throughout the country (full details of material found in the Study Area is given in **Appendix** 4.

Underwater Archaeological Assessment carried out by ADCO

An Underwater Archaeological Impact Assessment was carried out by the Archaeological Diving Company Ltd (ADCO) for the River Lee Cork City Drainage Scheme. The in-water archaeological assessment comprised a *c.* 7km stretch of the River Lee which included both channels of the river as they flow through the centre of Cork. *The assessment recorded riverbed topography and provided a detailed account of the existing riverside environment. On-site work comprised systematic non-disturbance underwater and waded inspection of the river channels, their attendant quayside structures, and any associated riverine features, including bridge structures (piers and foundations), weirs, culverts, river-walling, and any natural features encountered*. The dive survey includes the proposed bridge site and so information and the results from this survey were used in this report.

Cork City Development Plan (2015)

The Cork City Development Plan (2015) outlines Cork City Council's objectives with regard to the preservation of the archaeological, architectural and cultural heritage of the City. The Plan outlines the Council's objectives regarding the protection of the archaeological heritage, including the protection of monuments listed in the Sites and Monuments Record and Record of Monuments and Places, by preservation *in situ*, or in exceptional cases, preservation by record. It aims to safeguard 'sites and settings, features and objects of archaeological interest generally'. The zones of archaeological potential identified in the RMP are to be protected, as are underwater archaeology and historic towns. The City Development Plan states that the significance of medieval archaeology, industrial and post medieval archaeology, battlefield and siege sites, as well as structures shown on the 1st and 2nd edition Ordnance Survey 6 inch maps are to be assessed prior to any development. The Plan states that where development may have an impact on the archaeological heritage, an archaeological assessment will be required, and appropriate mitigation measures shall be put in place.

The Plan states that preservation *in situ* is the preferred option, and that there must be compelling reasons to justify preservation by record. Development that does not compromise sub-surface archaeological remains will be encouraged, and development that

does not have a visual or physical impact on the setting of a monument will be favoured. According to the plan, previously unidentified archaeological sites that are uncovered during construction works must be investigated and recorded.

The rich and varied architectural heritage of the city is protected through the inclusion of buildings in the Record of Protected Structures (RPS), as required in the Planning and Development Act 2000 (Part IV). According to the Cork City Development Plan, *A Protected Structure is a structure which is considered to be of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social, or technical point of view. The Record of Protected Structures (RPS) is a list of the buildings held by a Local Authority which contains buildings considered to be of special interest in its operational area.* This designation is to ensure that changes or alteration to the included buildings or their settings will be carried out in such a way that their existing special character and setting is retained and enhanced. A list of all Protected Structures within the city is given in Appendix 3 of the Plan.

The County Development Plan includes an objective to preserve the character of a place, area, group of structures or townscape if it is necessary for the preservation of the character of that area. This is designated an Architectural Conservation Area (ACA) and defined as a place, area, group of structures or townscape that is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or contributes to the appreciation of protected structures. The objectives of the Council for the ACA include the protection of the features and elements of the ACA from demolition and non-sympathetic alterations, to promote sensitive re-use and rehabilitation of buildings and sites in the ACAs, to ensure new development with or nearby is sympathetic and of high quality. Encourage repair and re-use of traditional shop fronts and high quality architectural design within the ACA, ensure that new signage etc is appropriate and that open spaces are protected and that appropriate material are uses during public infrastructure projects. The closest ACA to the proposed bridge location is the Coburg Street and Saint Patrick's Hill ACA. This is located north of the North Channel, starting at the westernmost extent of St. Patricks Quay at St. Patrick's Bridge, on rising south- and west-facing ground.

Database of Irish Excavation Reports (www.excavations.ie)

This web site provides a database of summary accounts of archaeological excavations and investigations undertaken in Ireland between 1970 and 2015. Until 2010, these accounts

were also published in book form. The database was queried for any investigations undertaken in the proposed development site and Study Area. A number of archaeological investigations were undertaken in the Study Area and are discussed below, none of which has been undertaken within the proposed development area itself.

Site-specific publications

All available published information on the Study Area was consulted. This included historical journals, local history publications etc., all of which are listed in the bibliography.

Cartographic Sources

The following maps were consulted:

- Ordnance Survey 6-inch maps: the three editions of the 6-inch to one mile scale maps were consulted, the first edition published in 1841-1842, the second edition published in 1902, and the third edition published in 1934 onto which the RMP was superimposed in 1998.
- The 25-inch to one mile scale map, from which the second edition 6-inch map was derived in 1902.
- Historic Maps: Historic maps are available for consultation at Cork City Library. These maps chart the development of Cork City from the 16th to the 20th century. The proposed development site is not depicted on the following early historic maps; Pacata Hibernia (1585-1600), George Carew (*c*. 1601) and John Carty (1726).
  The earliest representations of the proposed development site are Rocque's map of Cork (1759).

Aerial Photographs

Ordnance Survey of Ireland online aerial photographs (dated 1995, 2000 and 2005) (www.osi.ie) and Google maps online aerial photographs are available for viewing (www.google.ie). These were examined to identify any previously unrecorded features of archaeological/cultural heritage significance that may only be visible from the air. No archaeological features were apparent on the photographs.

Consultations

During the compilation of the EIS the following was consulted;

Ms. Joanne Hughes, acting City Archaeologist for Cork.

2.4 Site Inspection

The primary purpose of a site inspection is to assess the physical environment in which the proposed development will take place and identify any possible features of cultural heritage significance which have not been previously recorded. The proposed development site was visited on the 4th and 9th of June 2017, in dry weather conditions and at both mid and low tide.

3. The Proposed Development

3.1 It is proposed to construct a pedestrian /cycle bridge from St. Patricks Quay to Merchants Quay, crossing the river Lee (North Channel) between Patrick's Bridge and Brian Boru Bridge on axis with Harley Street **(Appendix 1; Fig. 4).**

3.2 The works will include a number of specific elements as follows;

- Quay wall to Quay wall – 63m span and 68.5m steel structure span
- Bridge width from parapet to parapet of 4.5m plus 10m either side. Total width 25m
- A coffer dam will be constructed on both banks of the river to facilitate bridge construction
- A section of quay wall on both sides will be removed to accommodate the bridge
- Piles will be driven behind the quay wall to support the bridge structure

4 Existing Environment – Archaeology, Architecture and Cultural Heritage

4.1 The proposed location of the pedestrian/cycle bridge is from St. Patricks Quay to Merchants Quay, crossing the river Lee (North Channel) between Patrick's Bridge to the west and Brian Boru Bridge to the east, on axis with Harley Street (Appendix 1; Fig. 1). There are no recorded archaeological sites within the proposed development area. The closest recorded archaeological site to the proposed development is an 18th/19th century house (CO074-108), situated *c.* 300m to the southwest of the proposed bridge location. The bridge lies 200m to the east of the Zone of Archaeological Potential for the historic city of Cork (CO074-034001) as listed in the Record of Monuments and Places (RMP) for Co Cork and in the Sites and Monuments Record (SMR) Database of the Archaeological Survey of Ireland (Appendix 1; Fig. 2).

4.2 There are no protected Structures within the development area. The closest protected structures to the proposed development are as follows; Brian Boru Bridge (PS 1125/1126), *c.* 120m downstream to the east and St. Patrick's Bridge (PS 1133), *c.* 185m upstream to the west . On St. Patrick's Quay there are two protected structures, No.5 the Victoria Sporting Club (PS 410), *c.* 135m to the west and No 38 a warehouse (PS 412), *c.* 145m to the east (Appendix 1; Fig.1).

4.3 The National Inventory of Architectural Heritage (NIAH) lists the Ashlar limestone quay walls and steps on St Patricks Quay (20512612) and the Ashlar limestone quay walls and steps on Merchants Quay (20513136) as being of Regional Significance. Both historic quay walls, referred to as Cultural Heritage Sites in this report, are within the development area (CHS 1 and CHS 2) and will be impacted by the proposed development. The steps upstream on St Patricks Quay (CHS 1), the two sets of steps upstream on Merchants Quay (CHS 2) and the one set of steps downstream along Merchants Quay are outside the development area and will not be impacted. The NIAH also lists four cast iron mooring posts (CHS 4) which are located 58m to the east and outside of the proposed bridge location. The timber Warf (CHS 3) along St. Patrick's quay is situated, 55m east of the proposed bridge location, while a culvert (CHS 5) along Merchants Quay and adjacent to St. Patricks Bridge is situated *c.* 170m upstream to the west. These structures will not be impacted by the proposed development (Appendix 1; Fig.1).

4.4 There are 65 recorded archaeological sites listed in the RMP and SMR database for the 1km study area (**Appendix 1: Fig. 3 and Appendix 2: Table 1**).

The following account of the archaeological and cultural heritage of the Study Area is assessed chronologically. The archaeological timescale can be divided into two major periods, each with a number of sub-sections:

The prehistoric period: Mesolithic - (*circa* 7000 to 4000 BC); Neolithic - (*circa* 4000 to 2400 BC); Bronze Age (*circa* 2400 to 500 BC) – Iron Age (*circa* 500 BC to AD 400)

The medieval period: Early medieval 5th – 12th century, high medieval 12th century – *circa* 1400, late medieval *circa* 1400 – 16th century'

Post Medieval Period: 17th century onwards

Prehistoric Period

The earliest evidence for human colonisation and settlement in Ireland can be dated to 7000 BC, the Mesolithic Period. The people of this era were hunter-gatherers, entirely dependent on what food could be obtained through hunting and gathering. They used flint and other hard stone to manufacture their tools, and their presence can often be identified by scatters of these discarded stone tools in ploughed fields. The transition of these early settlers from hunting and gathering to farming in the Neolithic Period was revolutionary. It led to more permanent settlements and substantial houses, the construction of monumental megalithic structures for the dead, and a more complex and structured social hierarchy.

There are no known archaeological sites dating to the Mesolithic or Neolithic periods within the Study Area. The lack of sites does not, however, mean that such early settlement and occupation were unknown to the region. Many archaeological sites from the early prehistoric period leave little or no surface evidence on the landscape. In many cases they only come to light during archaeological testing/monitoring in association with industrial, residential and infrastructural development and this is particularly the case in riverine environments and was the case at North Wall Quay in Dublin in 2004. During archaeological monitoring of deep excavation works for basement foundations at North Wall, Late Mesolithic fish-traps were identified. These were largely of hazel construction and dated to as early as 6090 – 5840 BC (McQuade 2004). In 2007 further investigations were undertaken and identified additional Mesolithic fish traps and also structures dating to the Middle Neolithic 3630 – 3370 BC, again the structures were mostly of Hazel construction (McQuade 2007). Therefore, the potential for finding archaeological sites from the prehistoric period can never be overlooked and

there is always the possibility of finding sites of prehistoric date below ground in the course of development.

The evidence for early prehistoric activity in the Cork area is predominantly found in the estuarine and harbour areas to the east of the city. Within the inner reaches of Cork Harbour, approximately 4.7km to the southeast of the development site, Neolithic settlement activity (CO074-130) was revealed during development at Ballinure on the Mahon peninsula (Purcell 2005). At Foaty on Fota Island approximately 11.3km to the east (CO075-077), an extensive area partially excavated, revealed late Neolithic activity (Rutter and O'Connell 1992 in Power et al. 1994, 365). Within the broader area of Cork harbour, there are a number of Neolithic sites, including a simple megalith in Rostellan (CO088-101) on the modern shoreline, approximately 18km to the southeast. Just outside and to the east of the mouth of Cork harbour there are a number of flint scatters some of which date to the later Mesolithic period spread across the townlands of Lahard, Ballintra West, Inch and Ballybranagan approximately 20km to the southeast.

The Irish Bronze Age is characterised by the introduction of metallurgy to the island of Ireland. With this technological change came changes in material culture, such as pottery styles and burial traditions. Population growth also followed this technological innovation. The predominant burial rite in the Bronze Age was either cremation or inhumation in simple subterranean pits or stone-lined cists with no above ground expression, although the megalithic monuments of the Neolithic period continued to be used as well.

The transition from bronze to iron-working marked the onset of the Iron Age. Iron-working was a significant technological innovation that had a major impact on agricultural efficiency and productivity, thus having an effect on society as a whole. During this period, the La Tene style of art, practiced by the Celtic peoples of Europe, was adopted in Ireland.

Like the preceding Mesolithic and Neolithic, there are no known sites dating to the Bronze or Iron Age within the Study Area. However, in 1909 the 'Cork horns' were accidentally discovered south of the south jetties in the Victoria Road area of the city, *c.* 600m to the south of proposed development site (O'Kelly 1961, 2). Three cones of bronze with typical La Tène motif decoration were found and subsequently dated to the 1st century AD. These would have formed part of a leather headset (Rynne 1993, 17). The discovery of these artefacts demonstrates the potential to find archaeological sites/artefacts from the prehistoric period and can never be overlooked.

Medieval Period

The earliest beginnings of cork city as an established settlement can be traced to the monastic foundation of St. Fin Barre, in the 6th/early 7th century (Gwynn and Hadcock 1970, 66) on the site of the present St. Finbarr's Cathedral and graveyard (CO074-038002- and CO074-038001-), 1.1km to the southwest of the proposed bridge location. Historical references place a Viking settlement in Cork from 846AD, probably located on the south bank of the River Lee opposite South Gate Bridge (CO074-03412-) www.archaeology.ie after Jefferies 1985, 15). The initial Viking settlement in Cork was on the south bank of the south channel of the river, and later expanded on marshy islands as far as the north river channel. Cork City was walled before the end of the 12th century and there are numerous records of repairs to the city's defences being carried out up to the late 17th century. The proposed development area lies 200m to the east of the Zone of Archaeological Potential for the historic city of Cork (CO074-034001) as listed in the Record of Monuments and Places (RMP) for Co Cork and in the Sites and Monuments Record (SMR) Database of the Archaeological Survey of Ireland (**Appendix 1; Fig.2**).

In the 13th and 14th centuries, Cork 's position as a major port of southwest Ireland bestowed wealth to the city and its inhabitants. Between 1276 and 1333, the customs returns for Irish Ports, indicate that, after New Ross and Waterford, Cork was Ireland's most important port and accounted for 17% of all Irish trade (Graham 1977, 41; after Bradley *et al* 1985). Agricultural produce such as hides, wool, skins, grain and beef from Cork's hinterland were the principal exports at this time and Cork's port and connecting river channels were a hive of activity bringing great fortune to the city and beyond. This prosperity facilitated the growth and development of Cork City and by the 13th century the Augustinians (CO074-041), the Dominicans (CO074-037) and Franciscans (CO074-028001) all set up establishments in the city within the Study Area. In addition, there are eleven churches, most with associated graveyards within the Study Area. Among them is the site of the parish church of St. Peter (CO074-034005-), c. 800m to the west of the development site, within the Medieval Core of Cork City. The church was first referred to in decretal letter of 1199 but 'it is not until 1306 that there is a clear reference to it as a parish church' (Bradley et al. 1985, 76). According to Henchion (1988, 110), Hardiman's map of c. 1601 depicts a single-naved structure without aisles, transepts or tower in this area. The church was demolished 1782 and the present church was built in 1785-8 and a tower added in 1838 at the eastern end (*ibid*, 110). The remains of the associated graveyard (CO074-034004-) lie to the west of the church which is now in use as a gallery. Another medieval parish church, *c.* 600m to the southwest of the

development site and also within the Medieval Core, is that of Holy Trinity (CO074-034009-). The church was listed among possessions of diocese of Cork in decretal letter of 1199 (Bradley et al. 1985, 57-65). The church is depicted on Hardiman's map (*c.* 1601) as a large structure consisting of nave with northern and southern aisles and a square tower at the western end. This older church was demolished in 1717 to make way for the present church, built in 1720. The remains of the graveyard (CO074-034008) are to the east of the church www.archaeology.ie .

During the Siege of Cork by the Williamite forces in 1690, the city wall was breached, the suburbs burned and many of the city's buildings destroyed (Bradley et al 1985, 15-26). The medieval walls (CO074-034002) enclosed a sub-rectangular area (*c.* 654m N-S; *c*. 225m E-W). Sixteen mural towers existed along the wall and at least two major gate ways. The South Gate Bridge (CO074-034012) stands at the southern entrance into the old walled city and is the oldest surviving bridge in the city (www.archaeology.ie). The Pacata Hibernia map of cork (*c.* 1600) depicts the city enclosed by walls with numerous round mural towers and bridges at the north and south of the walled city (Appendix 1; Fig. 5).

Excavations over the years have uncovered parts of the medieval wall at St. Peter's Market (Hurley 1986); Christ Church Lane (Twohig 1978, 21; Twohig 1974; Twohig 1977), Bishop Lucey Park (Hurley 1985; Hurley 1989; Hurley 1990), Tuckey Street (Hurley and Power 1981), Grand Parade Hotel (Hurley and Power 1981), 81-83 Grand Parade (Wren 1992), Grattan Street (Power 1992), Beamish and Crawford brewery (Cleary 1988) & Kyrl's Quay (Hurley 1992) (www.archaeology.ie). This walled medieval city (present day North and South Main Streets) lies approximately 700m to the southwest of the proposed development site.

Outside the city walls, suburbs developed and the northern suburb at Shandon, 1km to the northwest of the development site, was documented as a medieval borough in a deed of 1223-30 (Bradley, Halpin and King 1985, 94 and Bradley and Halpin 1993, 35). The suburbs of Cork, burned in 1374-6 and in 1462 were described as wasted and destroyed (presumably this included the suburb of Shandon) (Bradley and Halpin 1993, 35-6). From the middle of the 14th century through the 15th, 16th and much of the 17th centuries growth and development in the city ceased, largely due to unstable political events and associated wars as well as plague and famine. The city did not extend beyond its walls and it is unlikely that the suburbs returned to their 13th and early 14th century level.

Post Medieval Period

After the Williamite victory there followed in Ireland a period of relative stability and the need for walled defences around cities like Cork lessened. It was during this period that Cork city began to grow and this included its expansion eastwards and westwards into the marshes. The wealthier citizens left behind the overcrowded, cramped city centre and built spacious houses set within generous estates but still within easy reach of the city. The Blackrock/Ballintemple area and the hills on the northern side of the river in Montenotte proved very popular locations for these "merchant princes" and many attractive country houses which still stand today were built at that time. There are two such houses (CO074-083 and CO074-085) within the Study Area in the townland of Ballinamought West listed in the RMP. The NIAH and the Cork City Development Plan (2009), however, list numerous, houses, gardens and public buildings in the Study Area that are associated with this time and later. In the second half of the 17th century, with a growth in the overseas provisions trade, the economy of the city began to grow rapidly and the reclamation of the marshes to the east and west began. Maritime trade in the city increased and a series of quays were established along the North Channel to facilitate the increase in commerce. Rocque' s map of 1759 (Appendix 1; Fig. 6) depicts 'Marsham Quay' present day Merchants Quay among several other quays that developed mainly along the south side of the North Channel in response to an increase in trade. The customs house (CO074-057) on the west side of Emmet Place was originally set along King's dock facing a small harbour, 300m upstream of the development area. This original customs house was built in 1724 but vacated in 1814 when the new customs house (CO074-057) was built, 300m downstream opposite Penrose Quay.

The proposed bridge location is situated *c.* 300m downstream of the Kiln River close to its confluence with the River Lee. The Kiln River was an important transport route from Blackpool to the city until the first St Patricks Bridge was built in 1789 (Cooke 1999, 206 and Appendix 3; Plate 1). It was finally culverted in 1987 in order to construct a thoroughfare, the N29 North City Link Road, and the two bridges which traversed it, Carroll's Bridge and Punche's Bridge, were demolished *(ibid*. 212). The significance of the watercourse is difficult to realise within the context of the post medieval and modern city, however, the water power of the Kiln River powered much of the industrial development of the area. Industries such as tanning, distilling and textile manufacture thrived in Blackpool from the eighteenth

to the twentieth centuries. An impressive example of this industrial heritage within the Study Area is the watercourse distillery complex (CO074-116), 950m to the northwest of the development area. The distillery was in operation by 1794 and was one of a collection of distilleries in Cork by the end of the 18th century, making Cork an important distilling centre at this time www.buildingsofireland.ie . Its imposing size, eleven-bay three –storey structure of random rubble stone walling is an impressive example of Corks recent industrial past (www.buildingsofireland.ie). The land on the eastern bank of the Kiln was a marsh known as the Green Marsh, although it is not specifically named as such on the 17th century cartographic sources. In 1760 the marsh came into the ownership of Abraham Devonsher, a Quaker banker from Rathcormac, and it was reclaimed during the 1770s and laid out with thoroughfares. In 1782 one of these thoroughfares was named Devonshire St after the marshes owner (Cook 1999, 200).

The proposed development site on historic maps

The development of Cork can be traced through the numerous early historic maps that depict the Medieval City of Cork and show its development from 1545 to the larger, expansive city of the late 19th century. One of the first cartographic representations of the city of Cork is the Pacata Hibernia (*c.* 1600). The map depicts the city within the River Lee estuary, on two islands to the north and south, separated by the river channel that flows through the middle of the settlement. Marshland occupies the areas to the east and west of a city that is enclosed by walls with numerous round mural towers and bridges at the northern and southern extremity of the walled city. Boats are depicted navigating the river channels that enclose the city while suburban development outside the city walls is illustrated by the depiction of *Ye L. Barris Castell* (Shandon Castle; CO074-032) the North and the *Cathedral Church of old Corke* (St. Finbarr's Cathedra; CO074-038002) to the south (Appendix 1; Fig.5). The proposed bridge location lies outside the extent of this early map and most of the earlier historic maps.

One of the earliest depictions of the development site is Rocque's map of 1759 (Appendix 1; Fig.6). This mid-18th century representation of the development area depicts the North Channel of the River Lee and the development that has occurred along its banks. Merchants Quay on the south side of the channel is depicted as 'Marsham Quay', while St. Patrick's Quay on the north side of the channel has not yet been established. There is no bridge evident at the site of the current St. Patrick's Bridge, upstream to the west of the

development area. Large masted sailing vessels are shown on the North Channel, a reflection of the busy maritime trade that was part of the very core the city. Rocque's later map of 1773, shows very little change in the area of the proposed development, other than 'Marsham Quay' has now become Merchants Quay, although the map isn't very clear. The North Channel is again depicted as a busy thoroughfare with large masted sailing boats in the North Channel (Appendix 1; Fig. 7).

The development area is shown on O'Connor's map of 1774 and clearly depicts 'Marsham Quay' as Merchants Quay. There is no evidence of either St. Patricks Bridge to the west or a bridge to the east in the location of Brian Boru Bridge and St. Patrick's Quay on the north side of the channel has not yet been established (Appendix 1; Fig. 8). The first St Patrick's Bridge, designed by architect Michael Shanahan, was built in 1788. While still under construction, much of the bridge was destroyed by a flood on the 17th of January 1789. Under the supervision of Michael Shanahan and an architect from London, named Hargrave, the new bridge was opened on 29 September 1789 (corkpastandpresent.ie and Appendix 3; Plate 1). St. Patricks Bridge is depicted on William Beauford's map of Cork dating to 1801. It is described in the NIAH as follows; *Triple-arch ashlar limestone road bridge over river, built 1861. Carved archivolts to arches with carved keystones of St. Patrick, St. Bridget, Neptune and three sea goddess. Engaged pilasters having V-shaped cut-waters to up streams and down stream elevations. Carved limestone balustrade with plaques to parapet walls, having some concrete baluster replacements. Four cast-iron lamp standards with paired lanterns set on parapet walls*.

St. Patrick's Quay has been established by the mid-19th century and is depicted on Thomas Holt's map of Cork from 1832 (Appendix 1; Fig. 10). The ashlar limestone quay, walls and steps that form the quay walls of the North Channel on both St. Patrick's Quay and Merchants Quay were built *c.* 1820. The quay/warf is described in the NIAH as follows; *Built at the beginning of the nineteenth century, these ashlar limestone quays, walls and steps form part of an interesting group of harbour related structures with similar nineteenth century schemes on both sides of the north channel of the river Lee. These quay side structures are notable for their civil engineering value, and also for the skill and craftsmanship which were involved in their construction*. The north side of the North Channel takes on its modern appearance in Holt's map. By the mid-19th century through to start of the 20th century, the development area and its surrounding streetscape begin to take on a

modern appearance and is very similar to what it looks like today, though some street names such as ‘Kings Street’ (modern day McCurtain Street) have been changed (Appendix 1; Fig. 11 and12).

5 Site Inspection

5.1 The primary purpose of the site inspection is to assess the physical environment in which the development is proposed. The proposed development site was inspected on the 4th and 8th of June 2017 in dry weather conditions at both mid and low tide.

5.2 There are no recorded archaeological sites within the proposed development area. The proposed bridge site lies 200m to the east of the Zone of Archaeological Potential for the historic city of Cork (CO074-034001) as listed in the Record of Monuments and Places (RMP) for Co Cork and in the Sites and Monuments Record (SMR) Database of the Archaeological Survey of Ireland.

5.3 The proposed development site spans the north channel of the River Lee and the north side of the channel, along St. Patrick's Quay and the south side of the channel, along Merchants Quay. Both quay areas consist of a public footpath, railings and ashlar limestone quay walls. The area between the two bridges, St. Patrick's Bridge at the west and Brian Boru Bridge at the east was inspected via walkover (Appendix 3; Plates 2 and 3). The proposed location of the bridge is from St. Patrick's Quay to Merchants Quay, crossing the North Channel of the River Lee on apex with Harley Street to the opposing Merchants Quay (Appendix 3; Plates 4 to 8).

5.4 The following Cultural Heritage Sites were identified;

- **CHS 1: St. Patrick's Quay Wall and one set of access steps to the river**

St. Patricks Quay wall runs along the north side of the North Channel of the River Lee from St. Patricks Bridge at the west to the Michael Collins Bridge at the east. The section of quay wall as far as Brian Boru Bridge is the historic section that was constructed in the early 19th century. This section of historic quay wall lies within the development area (Appendix 3; Plate 9). The steps down to the river along St. Patricks Quay are located 145m upstream at the western end of the quay, 30m from St. Patrick's Bridge (Appendix 3; Plate 10).

NIAH Description: (20512612) Regional Importance

Ashlar limestone quay, walls and steps, built c. 1820. Tooled limestone steps to water front elevation, with cast-iron hand rails.

Built at the beginning of the nineteenth century, these ashlar limestone quays, walls and steps form part of an interesting group of harbour related structures with similar nineteenth

century schemes on both sides of the north channel of the river Lee. These quay side structures are notable for their civil engineering value, and also for the skill and craftsmanship which were involved in their construction.

- **CHS 2: Merchants Quay Wall and three sets of access steps to the river**

Merchants Quay Wall runs along the south side of the North Channel of River Lee from St. Patricks Bridge at the west to the Brian Boru Bridge at the east. The historic section of quay wall was constructed in the early 19th century and lies within the development area (Appendix 3; Plate 11). The first set of steps down to the river along Merchants Quay are located 145m upstream at the western end of the quay, 30m from St. Patricks Bridge (Appendix 3; Plate 12). The second set of steps along Merchants Quay are located 95m upstream to the west of the development area (Appendix 3; Plate 13). The third set of steps along Merchants Quay are located 12m downstream of the development area (Appendix 3; Plates 14 and 15).

NIAH Description: (20513136) Regional Importance

Ashlar limestone quay, walls and steps, built c. 1820. Tooled limestone steps to water front elevation, with cast-iron hand rails. Partly rebuilt, concrete added to walls, and metal railings added, c. 1985.

Built at the beginning of the nineteenth century, these ashlar limestone quays, walls and steps form part of an interesting group of harbour related structures with similar nineteenth century schemes on both sides of the north channel of the river Lee. These quayside structures are notable for their civil engineering value, and also for the skill and craftsmanship of their construction

Both quay walls along St. Patrick's Quay and Merchants quay' *were constructed of bonded rubble masonry faced with 0.6m average thickness cut limestone blocks. The walls are typically 5m high and 1.5m thick and are founded on timber toe piling at approximately low water spring tides'* (Arup 2017, 24).

- **CHS 3: Timber Warf along St. Patrick's Quay**

The timber Warf along St. Patrick's quay is located 55m downstream from the proposed development (Appendix 3; Plates 16 and 17)

It is described by ADCO, 2016 as follows; *Timber Warf inset into the quayside on the upstream side of Brian Boru Bridge. The structure measures 63.4m in length x 3.6m in width. Concrete and timber bracing has been used to consolidate St. Patricks Quay, where the quay wall has been impacted to accommodate the insertion of the timber wharf. The timber wharf is of early twentieth-century construction and is most likely associated with the insertion of Brian Boru Bridge in 1911* (ADC0, 2016)

- **CHS 4: Cast Iron Mooring Posts along St. Patrick's Quay**

There are four cast iron mooring posts situated on the footpath along St. Patricks Quay. The posts are positioned along the footpath at intervals of *c.* 15/17m from west to east. The closest post is located 58m to the east of the development area (Appendix 3; Plate 18)

NIAH Description: (20512623) Regional Importance

Group of four cast-iron mooring posts, c. 1860, now disused. These mid nineteenth-century mooring posts form part of an interesting group of harbour related structures with the early nineteenth-century ashlar limestone quays, walls and steps, which were built on both sides of the north channel of the river Lee. This group of mooring posts is a physical reminder of the former industrial heritage of this area of the city, and makes a notable addition to the streetscape.

- **CHS 5: Culvert adjacent to St. Patrick's Bridge along Merchants Quay**

There is a culvert along Merchants Quay wall, 170m upstream from the development site (Appendix 3; Plate 19)

The culvert is described by ADCO 2016 as follows; *A large arched-culvert located immediately downstream of St. Patrick's Bridge. The culvert measures 5.40m in width and 3.50m in height. This culvert is a contemporary build to St. Patrick's Bridge, being inset into the bridge's downstream buttress wall. This culvert is likely a discharge point for water-flow from the waterway that once ran the length of St. Patrick's Street; the waterway being culverted and reclaimed in the late 1700s* (ADCO, 2016).

5.5 The following Protected structures are within proximity of the bridge location

- **PS 410**: N**umber 5, St. Patrick's Quay (Victoria Sporting Club)**

  Appendix 3; Plate 20

  NIAH Description: 20512621 Regional Significance
  Terraced gable-fronted three-bay three-storey former warehouse, built c.1900, now in use as amusement arcade. Pitched slate roof with limestone copings and finial. Arcade to ground floor with carved limestone engaged columns and voussoirs, having rendered walls above, up to sill level of first floor. Red brick walls with ashlar limestone string courses to first and second floors. Paired square-headed openings to first floor, and Venetian-style window arrangement to second floor, with ashlar limestone sills, lintels and voussoirs. Replacement uPVC windows to upper floors. Fixed timber windows and door to ground floor.

  This building is of apparent architectural design and detail, and makes a positive and notable addition to the quayside. The materials utilised in it's construction, such as the red brick and ashlar limestone, add colour and textural interest to the streetscape, and articulate the façade of the building. The carved capitals of the engaged limestone columns were clearly executed by skilled craftsmen.

- **PS412 Warehouse Frontage – Offices and car park, St. Patrick's Quay**

  Appendix 3; Plates 21

  NIAH Description: (2050635): Regional Significance
  Twelve-bay two-storey brick commercial premises, built 1881, having a four-bay limestone frontispiece with false pediment. Slate pitched roof to two storey blocks with corrugated asbestos sheet pitched roofs to rear double-height warehouse to rear. One section in use as car park.

  A large building in a prominent position facing onto the quays, this warehouse was constructed to a high standard using brick and cut limestone with a distinctive polychromatic use of sandstone and limestone to the window openings.

- **PS 1125/1126: Brian Boru Bridge**

  Appendix 3; Plate 22

  NIAH Description: (20506355) Regional Significance

Scherzer rolling lift bascule bridge, erected 1911; 232 feet long, four span (opening span of 62 feet) bridge resting on six concrete filled steel caissons with cast-iron parapets; bridge reconstructed in 1987; no longer operational.

Well preserved Scherzer bridge having many decorative cast iron features. Although no longer opening, the bridge is an important reminder of the history of the river and quays.

- **PS 1133: St. Patrick's Bridge**

  Appendix 3; Plate 23

  NIAH Description: (20513133) Regional Significance
  Triple-arch ashlar limestone road bridge over river, built 1861. Carved archivolts to arches with carved keystones of St. Patrick, St. Bridget, Neptune and three sea goddess. Engaged pilasters having V-shaped cut-waters to up streams and down stream elevations. Carved limestone balustrade with plaques to parapet walls, having some concrete baluster replacements. Four cast-iron lamp standards with paired lanterns set on parapet walls.

  This fine bridge is a significant contributor to the architectural heritage of the city. Built in the mid nineteenth century, this bridge is representative of design, construction and materials utilised at that time. Following the laying of the foundation stone by the Earl of Carlisle, Lord Lieutenant of Ireland, over one hundred skilled stone cutters and masons were employed in the execution of this bridge, which was designed by Joseph Hargrave. This bridge retains many interesting features, such as the carved keystones and cast-iron lamp standards.

5.5 The following buildings are listed in the NIAH within proximity of the bridge location

- **NIAH 20512621: Former Postal Sorting Office, 37 St. Patrick's Quay**

  Appendix 3; Plate 24

  NIAH Description: Regional Significance
  Corner-sited end-of-terrace thirteen-bay three-storey former postal sorting office, built c. 1905, with a pair of blocked integral carriage arches. Now in use as flats and having attic addition. Red brick parapet, decorative eaves course, and red brick chimneystacks set in gablets with round-headed windows. Tile clad attic addition with dormer windows. Red brick walls with red brick string courses. Carved limestone aprons and segmental pediments to first floor openings. Timber sash windows, some having limestone sills.

Oriel windows to first floor. Ashlar limestone dressings to former carriage openings, with timber fixed windows and timber glazed doors.

This former postal sorting office makes a notable and positive addition to the streetscape, due to the scale and form of the building. Of apparent architectural design and detail, the form of this building contrasts with the more regular facades along the quayside. The façade is articulated by the moulded red brick eaves courses, red brick string courses, carved limestone aprons and carved limestone segmental pediments. Building apparently truncated when Brian Boru Street was created c.1910.

- **NIAH 20512613: Lennox Hearing Care Clinic, 27 St. Patrick's Quay**

  Appendix 3; Plate 25

  NIAH Description: Regional Significance
  Terraced two-bay three-storey former house, built c. 1850, now in use as public house. Pitched tile roof with rendered chimneystack. Rendered walls with raised render surrounds to upper floors openings. Carved timber shopfront, c. 1910, comprising of consoles with fascia and cornice, over single and pair of timber panelled doors with toplights, and timber fixed window. Replacement uPVC windows to upper floors.

  This former house makes a positive addition to the streetscape, due to the scale and form of the building. This building and the adjoining houses to the east are an interesting group as these former houses are reminders of the residential character which was once associated with the quay, following the expansion of the city when the industry moved further east along the harbour. The early twentieth-century shopfront, which retains fine carved details, is a notable feature of this building, and was clearly executed by skilled craftsmen.

- **NIAH 20512468: Metropole Hotel, 25 St. Patrick's Quay**

  Appendix 3; Plate 26

  NIAH Description: Regional Significance
  Corner-sited end-of-terrace three-bay three-storey former commercial building, built c. 1900, now in use as hotel. Pitched tile roof with ashlar limestone copings. Red brick walls with ashlar limestone string courses, and having recessed blind arches with yellow brick plinth mouldings to ground floor openings. Segmental-arched openings to ground floor and first floor, and round-headed opening to second floor, with ashlar limestone voussoirs and sills. Timber panelled door with toplight, and timber fixed windows having limestone sills. Pair of timber sash windows to first floor with render surround and having render panels above, and timber sash window to second floor.

  This building is of apparent architectural design and detail, and makes a positive addition to the quayside. The scale and form of the building is particularly notable, as it contrasts with the towering late twentieth-century block to west. The materials utilised in it's construction, such as the red brick and ashlar limestone, add colour and textural interest to the streetscape, and articulate the façade of the building.

- **NIAH 20512465: Everyman Palace Theatre, 13 St. Patrick's Quay**

  Appendix 3; Plate 27

  NIAH Description: Regional Significance
  Terraced former industrial building, built c. 1895, comprising of three-bay three-storey recessed central block, flanked by two-bay three-storey blocks to the east and west, with two-bay four-storey terminating block to the west. Pitched and hipped tile roofs. Red brick walls to upper floors, and having rendered walls to ground floor with cast-iron lettering. Timber sash, casement and fixed windows to upper floors, with louvred metal fittings to recessed central bay. Pair of round-headed integral carriage arches to ground floor, with raised render surrounds. Western carriage arch now blocked and in use as retail outlet. Cast-iron wheel guards to eastern carriage arch. Square-headed openings to ground floor with replacement doors.

  Though now altered and poorly presented, this group of former industrial buildings is a significant reminder of the industrial heritage of this part of the city. The scale and form of the group make it a notable and positive addition to the quayside. This group retains many interesting features and materials, such as the cast-iron lettering, cast-iron wheel guards and red brick walls.

- **NIAH 20512459: The Village Hall, 4 St. Patrick's Quay**

  Appendix 3; Plate 28

  NIAH Description: Regional Significance
  Terraced three-bay two-storey commercial building, built c. 1910, with decorative rendered parapet and having oriel window flanked by paired round-headed windows to first floor. Rendered wall with decorative render entablature to eaves course, moulded render surrounds and string course over first floor windows, and having decorative render detail to oriel projection. Square-headed door opening with moulded render surround, timber panelled door and toplight. Fixed aluminium window and glazed doors to ground floor. Pair of timber sash windows and pair of replacement casement windows to first floor openings. Display sign additions to upper floors.

  Though the façade of this building is now obscured by the addition of display signs, this building is of apparent architectural design and detail. The render detail enlivens and articulates the façade and was clearly executed by skilled craftsmen. The oriel window, paired round-headed openings, and decorative parapet are notable features of the building.

- **NIAH 20512456: Irish Ferries, 9 Bridge Street**

  Appendix 3; Plate 29

  NIAH Description: Regional Significance
  Corner-sited end-of-terrace two-bay four-storey former house over basement, built c. 1810, as part of a terrace of four with the adjoining buildings to the north. Now in use as offices. Hipped tile roof with rendered chimneystack and parapet. Red brick walls with recessed blind arches having limestone imposts to first floor openings, ashlar limestone

quoins, and ashlar limestone continuous sill to second floor. Replacement uPVC window to upper floors, and fixed aluminium window and door set in tile cladded walls, c. 1975, to ground floor.

Built as part of a group of four with the adjoining three buildings to the north, this group forms a well designed piece in the streetscape, comprising of a central pair flanked by recessed buildings to the north and south. The ashlar limestone quoins, string courses and imposts articulate the façade of this notable group, which is of apparent architectural design and detail.

- **NIAH 20512933: Bus Station, Anderson's Quay**
  Appendix 3; Plate 30

  NIAH Description: Regional Significance
  Detached multiple-bay two-storey bus station, built c. 1960. Comprising of fourteen-bay two-storey block, with nine-bay two-storey block to the west, and having U-shaped canopy to the east. Flat roof. Rendered walls with decorative tile and mosaic work. Metal casement windows with raised reveals to upper floors. Fixed timber windows and timber glazed doors to ground floor. Column with mosaic cladding supporting concrete and glass brick canopy. Incorporating nineteenth-century stone wall to south elevation.

  This bus station is of apparent architectural form and design and is an interesting addition to the quayside in Cork. Designed by architect Mary Fitzgibbon of Boyd Barret architects, this colourful building contrasts with the more monotone buildings along the river side and is notable for it's scale and form. The building is representative of architectural design in the 1960s in Ireland, and retains many original features and materials, such as the metal casement windows, interior fixtures and fittings, and the decorative mosaic and tile details which enliven and enhance the building.

6 Construction Impact and Mitigation

6.1 There are no recorded archaeological sites within the proposed development area. The closest recorded archaeological site to the proposed development is an 18th/19th century house (CO074-108), situated *c.* 300m to the southwest of the proposed bridge location. This will not be impacted by the proposed development.

6.2 Construction of the bridge will involve a tie in to the existing quay walls (CHS 1 and 2). This will involve impacting the walls on both sides of the channel. The quay walls and steps are not protected structures and are not RMP sites but are listed in the NIAH as being of regional significance and in this report as features of cultural heritage significance.

Recommendation:

Full written and photographic record of the section of quay walls to be impacted. This is to be carried out in advance of construction.

6.3 Construction of the bridge will involve impacting on the river channel bed and deposits adjacent to the quay wall where the coffer dam will be inserted for the construction process. Original riverine muds may be impacted during construction works.

Recommendation:

Archaeological monitoring of construction and removal of the coffer dam and any associated excavation works at both quays will be carried out. Any archaeological features identified during archaeological monitoring will be fully resolved to professional standards of archaeological practice. Such material will be preserve *in situ* or preserve by record, as appropriate, as outlined in the Policy and Guidelines on Archaeological Excavation – Department of Arts, Heritage, Gaeltacht and the Islands (1999).

6.4 Piled foundation for the bridge will be inserted behind the quay wall on both banks of the river. The excavation for the pile caps will involve ground reduction possibly within the level of riverine muds behind the quay wall. Original riverine muds may be impacted during construction works.

Recommendation:

Archaeological monitoring of construction and removal of the coffer dam and any associated excavation works at both quays will be carried out. Any archaeological features identified during archaeological monitoring will be fully resolved to professional standards of archaeological practice. Such material will be preserve *in situ* or preserve by record, as appropriate, as outlined in the Policy and Guidelines on Archaeological Excavation – Department of Arts, Heritage, Gaeltacht and the Islands (1999).

6.4 Summary of Impacts

6.4.1 The following table (1-3) lists all CHS, PS and buildings listed on the NIAH within proximity to the proposed bridge location, the distance is give and the impact is assessed.

CHS	Site Type	Distance	Impact
CHS 1	Quay wall and one set of steps along St Patrick's Quay	Quay wall - 0M Steps – 145m upstream	Direct – removal of part of quay wall No Impact
CHS 2:	Quay wall and three sets of steps along Merchants Quay	Quay wall – 0m Steps (a) – 140m upstream Steps (b) – 90m upstream Steps (c) – 12m downstream	Direct -removal of part of quay wall No Impact No Impact No Impact
CHS 3:	Timber Warf along St. Patrick's Quay	55m downstream	No Impact
CHS 4:	Cast Iron Mooring Posts along St. Patrick's Quay	58m downstream	No Impact
CHS 5:	Culvert along Merchants Quay	170m upstream	No Impact

Table 1: Summary of CHS and impacts

RPS	Site Name	Distance	Impact
410	No. 5 St Patrick's Quay	135m	Visual; will impact on view from the building over the quay
412	No. 38 St Patrick's Quay	145m	No impact
1125/1126	Brian Boru Bridge	120 downstream	Visual; will impact on view from bridge upstream to St. Patricks Bridge
1133	St. Patricks Bridge	185 upstream	Visual; will impact on view from bridge downstream to Brian Boru Bridge

Table 2: Summary of impact on Protected Structures within proximity of the development area

NIAH	Site Name	Distance	Impact
20512621	Former Postal Sorting Office, 37 St. Patrick's Quay	85m downstream on St. Patrick's Quay	Visual; will impact on view from the building over the quay
20512613	Lennox Hearing Care Clinic, 27 St. Patrick's Quay	30m downstream on St. Patrick's Quay	Visual; will impact on view from the building over the quay
20512468	Metropole Hotel, 25 St. Patrick's Quay	18m opposite development on St. Patricks's Quay	Visual; will impact on view from the building over the quay

20512465	Everyman Palace Theatre, 13 St. Patrick's Quay	66m upstream on St. Patrick's Quay	Visual; will impact on view from the building over the quay
20512459	The Village Hall, 4 St. Patrick's Quay	150m upstream on St. Patrick's Quay	Visual; will impact on view from the building over the quay
20512456	Irish Ferries, 9 Bridge Street	175m upstream on St. Patrick's Quay	Visual; will impact on view from the building over the quay
20512933	Cork Bus Station, Anderson's Quay	60m downstream on Merchants Quay	Visual; will impact on view from the building over the quay

Table 3: Summary of impact on buildings listed in the NIAH within proximity of the development area

6.4.2 Visual Impact

The construction of the bridge will alter the streetscape of both quays and the visual landscape of both St Patricks Bridge and Brian Boru Bridge, in particular the inter-visibility between the bridges will be significantly diminished. The view from the protected structure No 5 St Patricks Quay will be altered by the bridge's construction which will partially obstruct the view east along the river channel. This visual impact will be reduced by the bridge spanning the river with no in-river piers or supports. The view from the protected structure No. 38 St Patricks Quay will be slightly obscured to the west, however, this impact will be minimal as this view is partially obscured by Brian Boru Bridge. The views from the buildings located in closer proximity to the proposed new bridge will be more significantly impacted and the new structure will be a more prominent element of the landscape, this will be particularly the case with No 25 St Patricks Quay (Metropole Hotel) located on the western corner of Harley Street. The urban setting of these buildings has brought constant changes and modifications to the surrounding streetscape, the addition of the bridge will be another change but this is in keeping with the riverside setting and will not reduce the visual amenity of the streetscape or the protected structures.

Both quays will be altered by the addition of the bridge and a small portion of them will be removed, however, the bridge is in keeping with the riverfront streetscape and will enhance views of both quays. The bridge will link the quays and will be a sharp visual contrast to both St Patricks Bridge with its curving limestone arches and the heavy steel and concrete structure that is Brian Boru Bridge. The visual impact on the quays will be minimised by the nature of the new bridge which has no in-river piers or supports and spans the river in a single arch.

Bibliography

Arup Consulting Engineers 2017. *Harley Street Pedestrian/Cycle Bridge*, Cork Options Report, Unpublished Report.

Bradley et al. 1985. *Urban Archaeological Survey of Cork*,

Cork City Council. 2015-2021 Cork City Development Plan

Database of Irish Excavation Reports **Error! Hyperlink reference not valid.**

Department of Arts, Heritage, Gaeltacht & the Islands, 1999*. Framework & Principles for the Protection of the Archaeological Heritage*

Department of Arts, Heritage, Gaeltacht & the Islands, 1999. *Policy & Guidelines on Archaeological Excavation*

Department of the Environment, Heritage and Local Government, 2004*. Architectural Heritage Protection, Guidelines for Planning Authorities.*

Dúchas National Monuments and Historic Properties Service (1998). Record of Monuments and Places, County Cork, Volumes 1 and 2.

EPA 2002 Guidelines on Information to be contained in an Environmental Impact Statement EPA March 2002.

EPA 2003 Advice Notes on Current Practice (in preparation of Environmental Impact Statements) EPA, September 2003.

General Alphabetical Index to The Townlands and Town, Parishes and Baronies of Ireland (2000) (original 1861), Genealogical Publishing Co. Inc.

Gwynn, A. and Hadcock, R. N. 1970. *Medieval Religious Houses: Ireland*. London.

Jefferies, H. A (1985). 'The History and Topography of Viking Cork'. Journal of the Cork Historical and Archaeological Society. Vol. XC249.Cork.

Lane S. & Purcell A. 2013 Fota house & Gardens, Foaty Island, Co Cork. Unpublished report

McQuade, M. 2004. Building C, Spencer Dock, North Wall Quay, Dublin in www.excavations.ie

McQuade, M. 2007. Spencer Dock, North Wall Quay, Dublin in www.excavations.ie

National Inventory of Architectural Heritage *www.buildingsofireland.ie*

National Monuments Service (in progress) Sites and Monuments Database of the Archaeological Survey of Ireland (*www.archaeology.ie*). Department of Arts Heritage and the Gaeltacht.

O'Kelly M. 1961 The Cork Horns, the Petrie Crown and the Bann Disc. *Journal of the Cork Historical and Archaeological Society* Vol LXVI No. 203

Purcell A. 2005 *Archaeological Excavation Ballinure*, Mahon Peninsula, Cork. Unpublished report by Sheila lane & Associates

Rutter and O'Connell 1992, in Power, D., Byrne, E., Egan, U., Lane, S. and Sleeman, M. 1994 Archaeological Inventory of County Cork Volume 2: East and South Cork. Dublin.

Ronan, S., Egan, U., Byrne, E., et al. (2009). Archaeological Inventory of County Cork, Volume 5. The Stationery Office, Dublin

Rynne, C. 1999 *The Industrial Archaeology of Cork City and its Environs*, Stationary Office, Dublin.

Rynne C. 2005 Connecting Cork in Crowley J.S., Devoy R.J.N., Linehan D. &O'Flanagan P. *Atlas of Cork City*. Cork University Press

APPENDIX 1

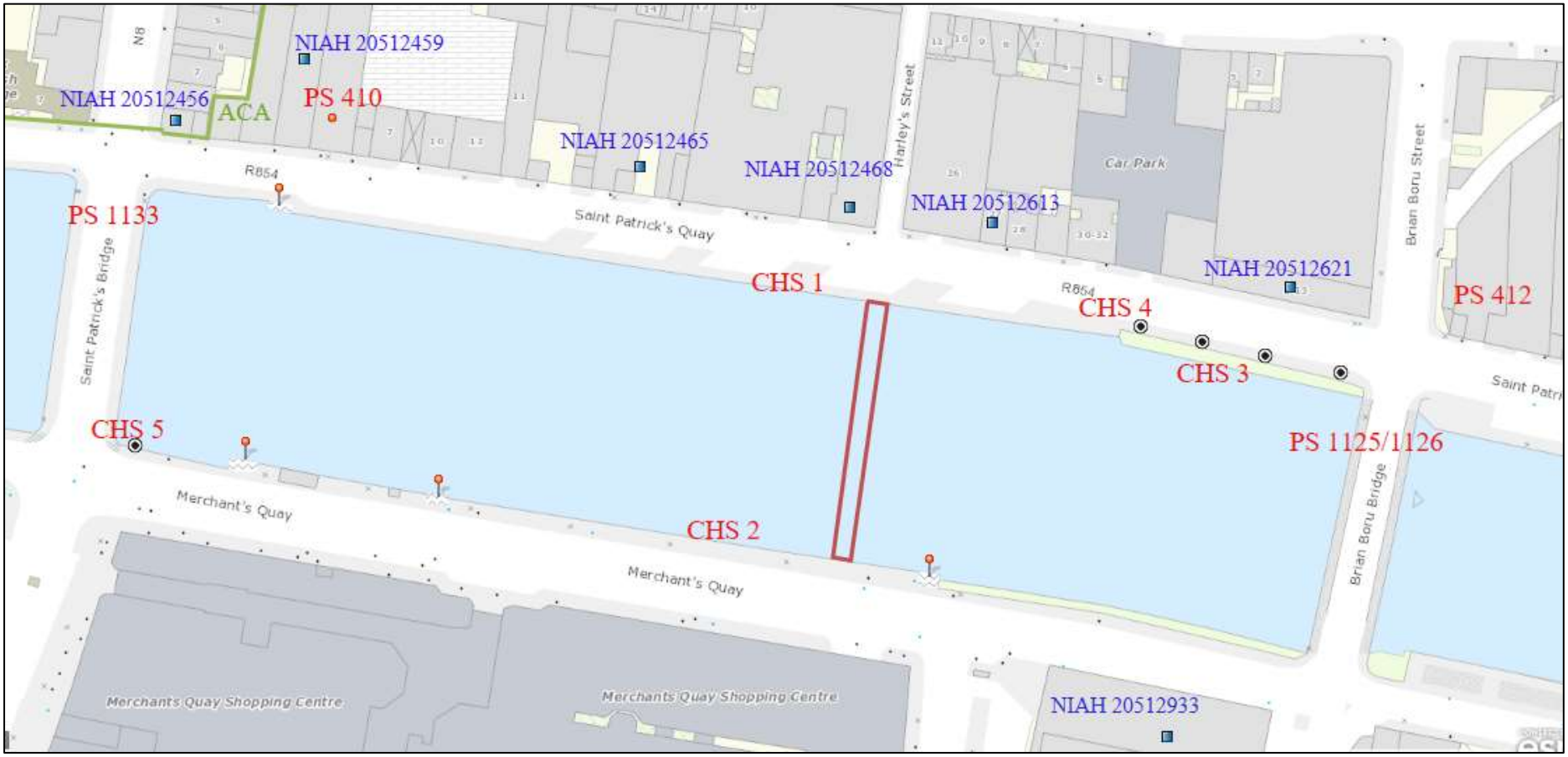

Fig. 1: Proposed bridge site with Cultural Heritage Sites (CHS), Protected Structures (PS) and buildings listed in the National Inventory of Architectural Heritage (NIAH), on OS map www.archaeology.ie

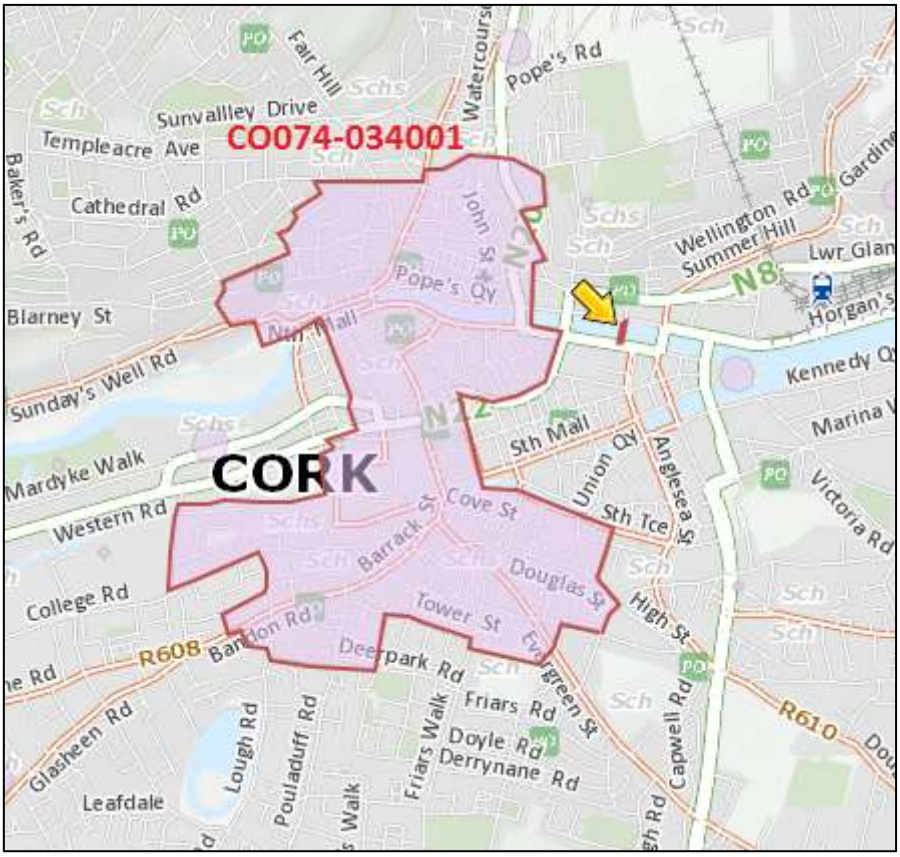

Fig. 2: Proposed bridge site on OS RMP map to the east of ZAP for the city of Cork (CO074-034001) (www.archaeology.ie)

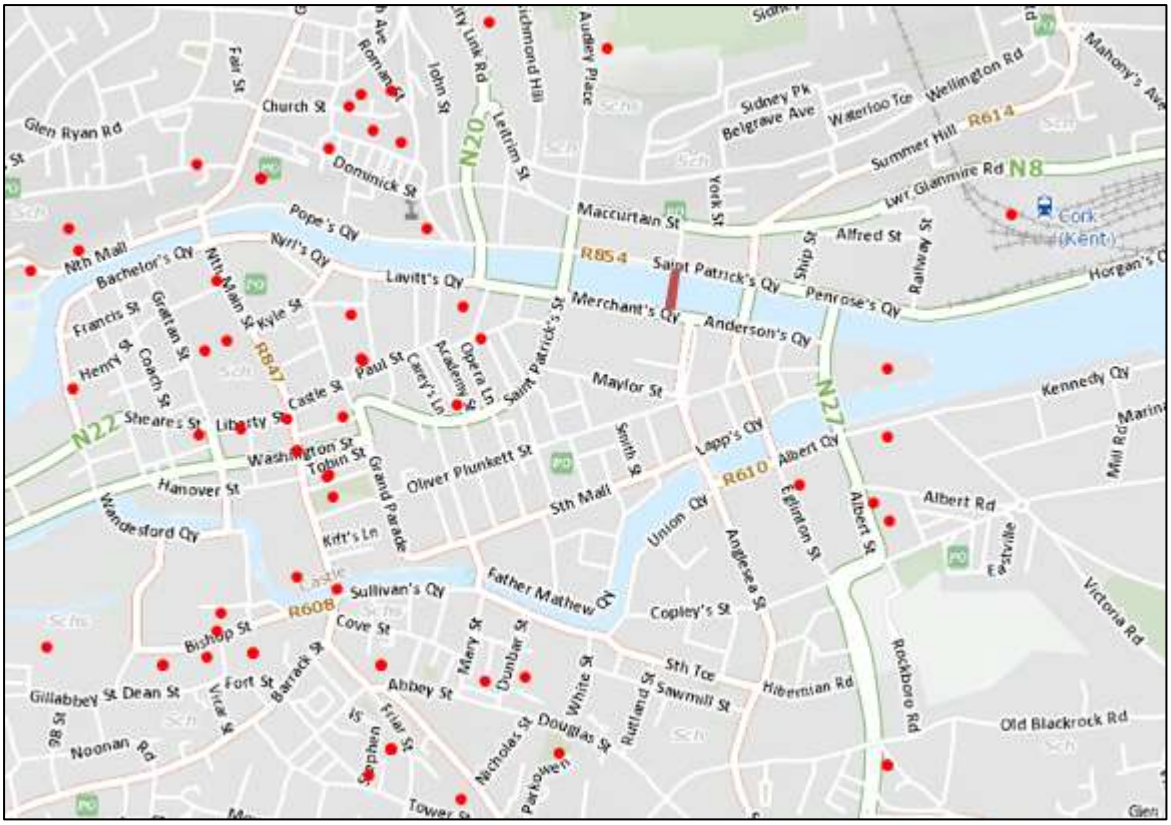

Fig. 3: Proposed development site on OS RMP map with RMP detail www.archaeology.ie

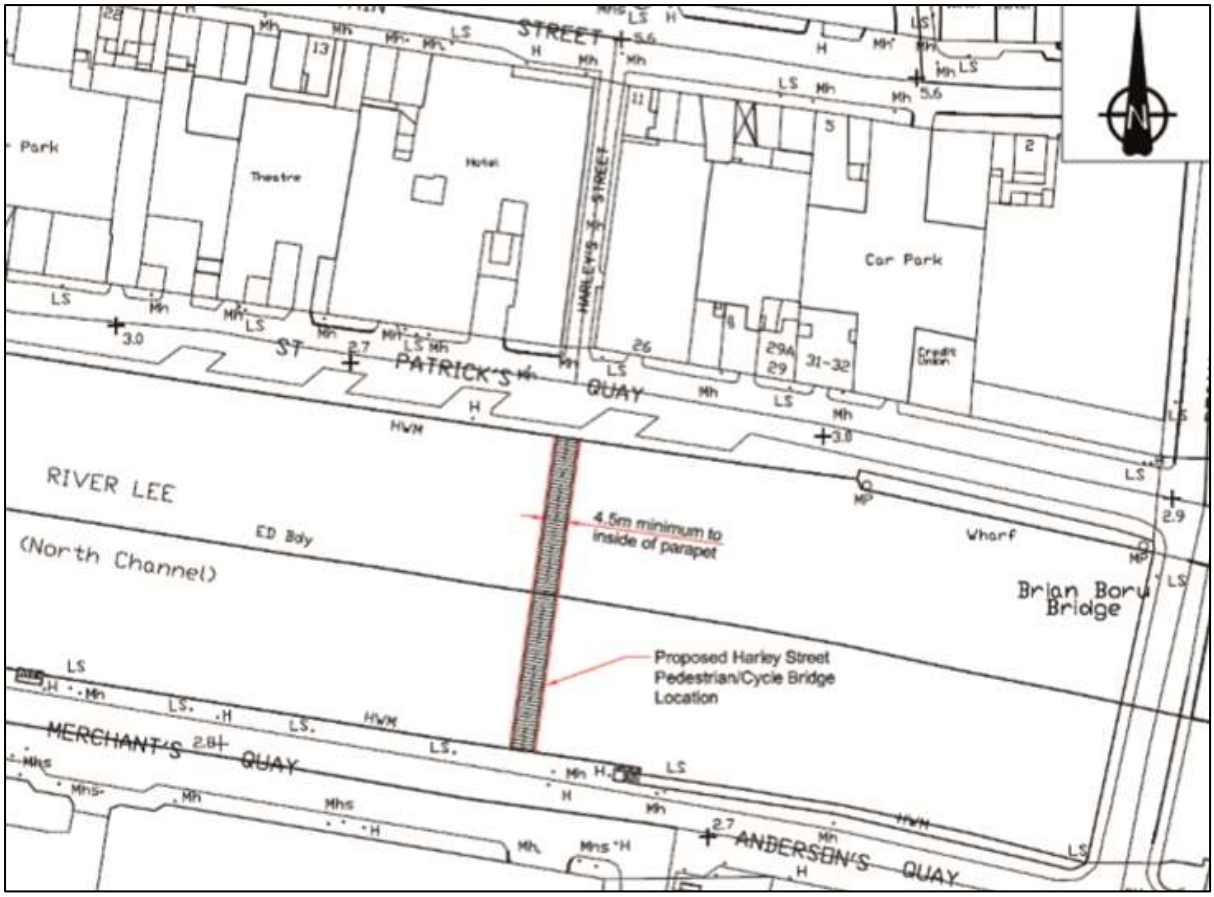

Fig. 4: Proposed bridge location

HISTORIC MAPS

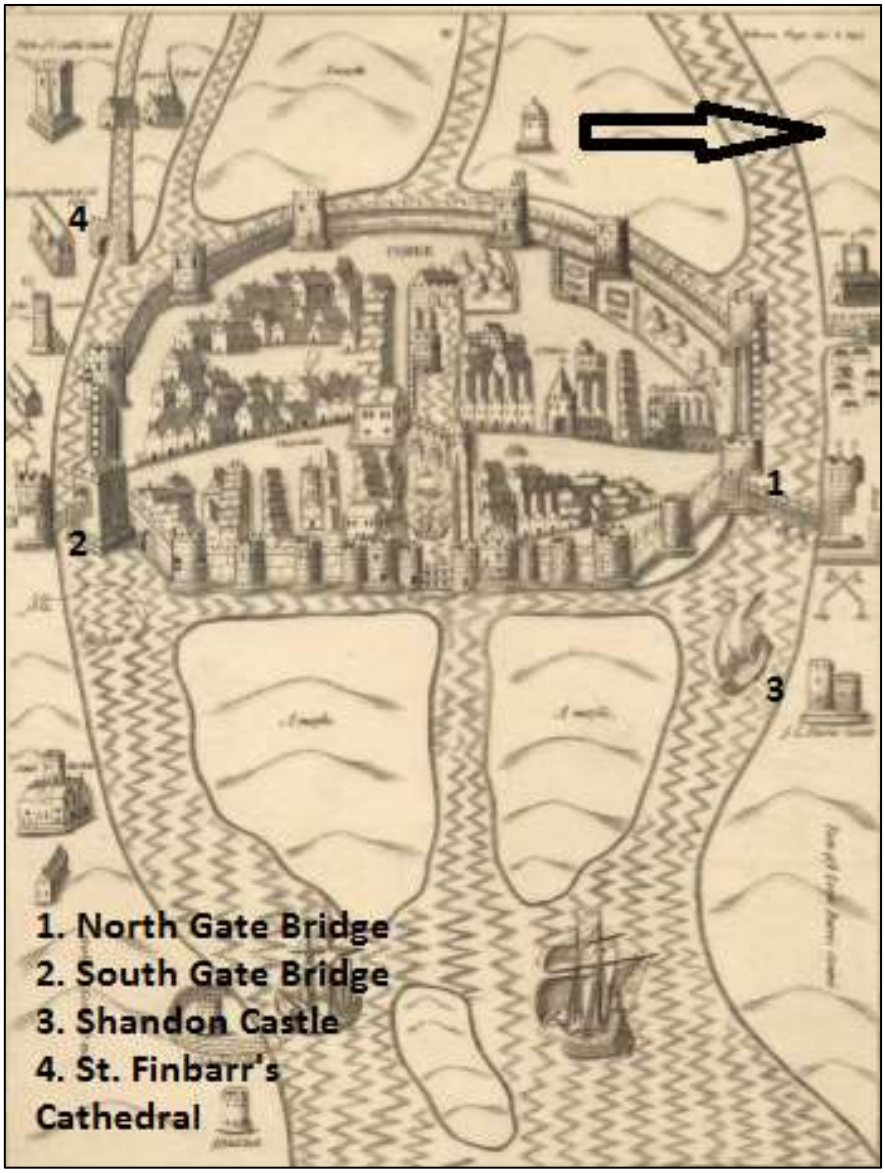

Fig. 5: Pacata Hibernia (1585-1600) one the earliest cartographic representations of Cork City

www.corkpastandpresent.ie

Fig. 6: Rocque's map of Cork (1759) showing approximate bridge site location
www.corkpastandpresent.ie

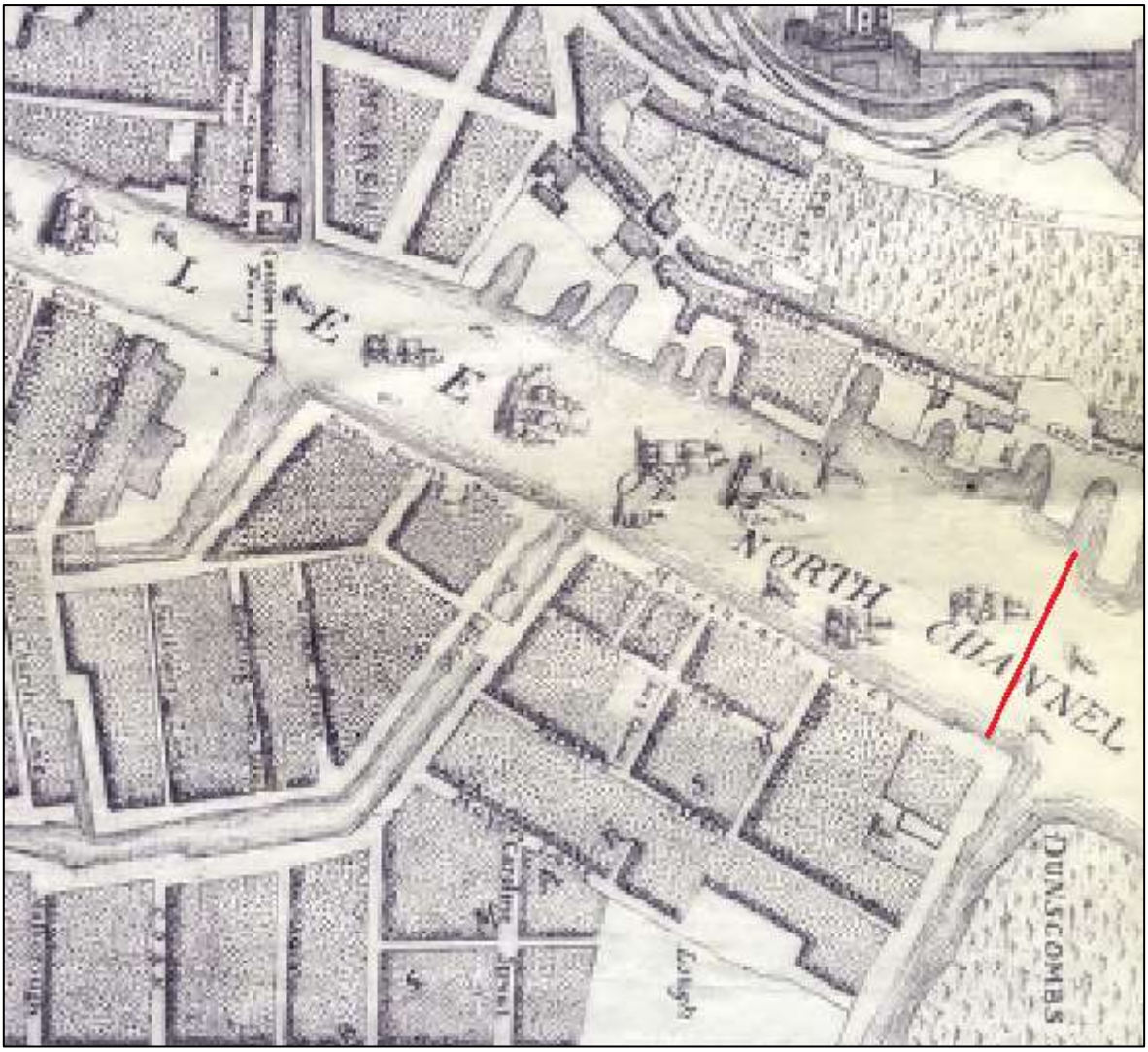

Fig. 7: Rocque's map of Cork (1773) showing approximate bridge location
www.corkpastandpresent.ie

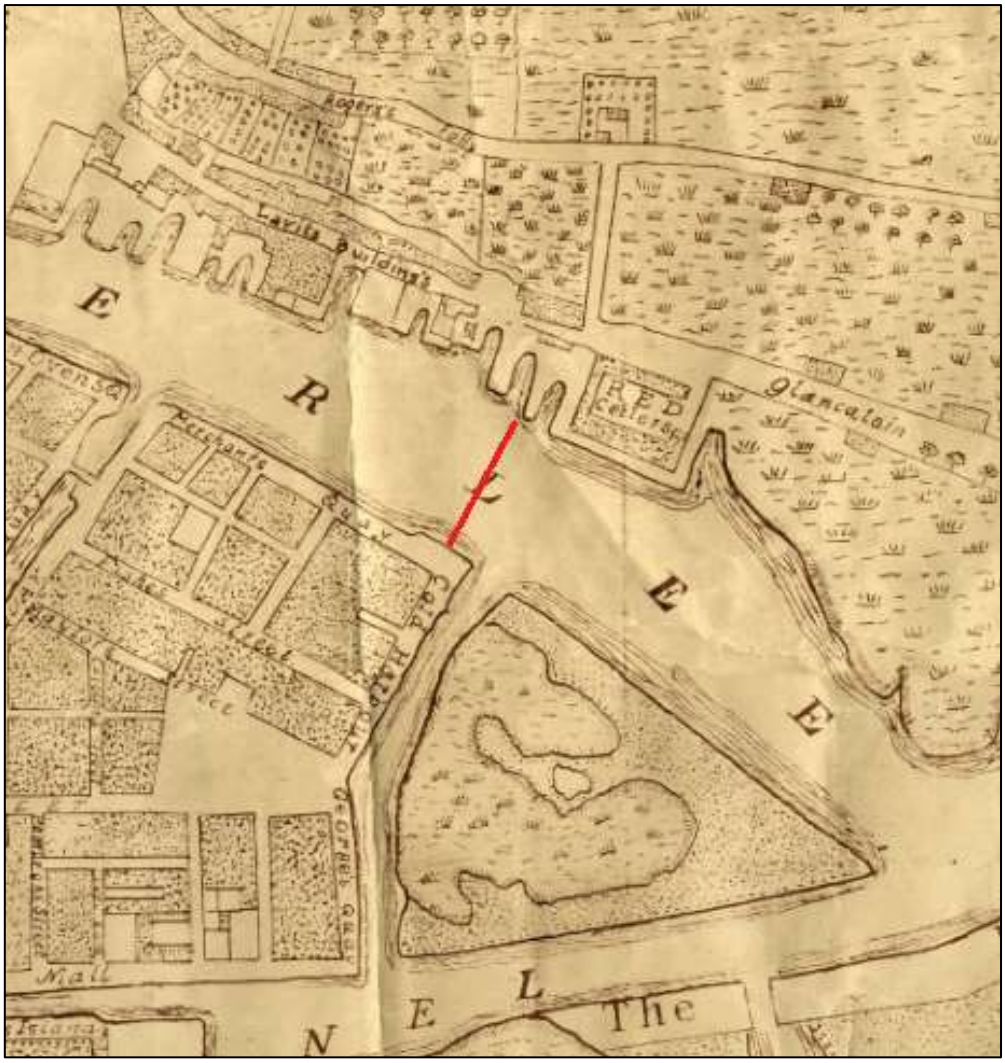

Fig.8: Connor's map of 1774 showing approximate bridge location

www.corkpastandpresent.ie

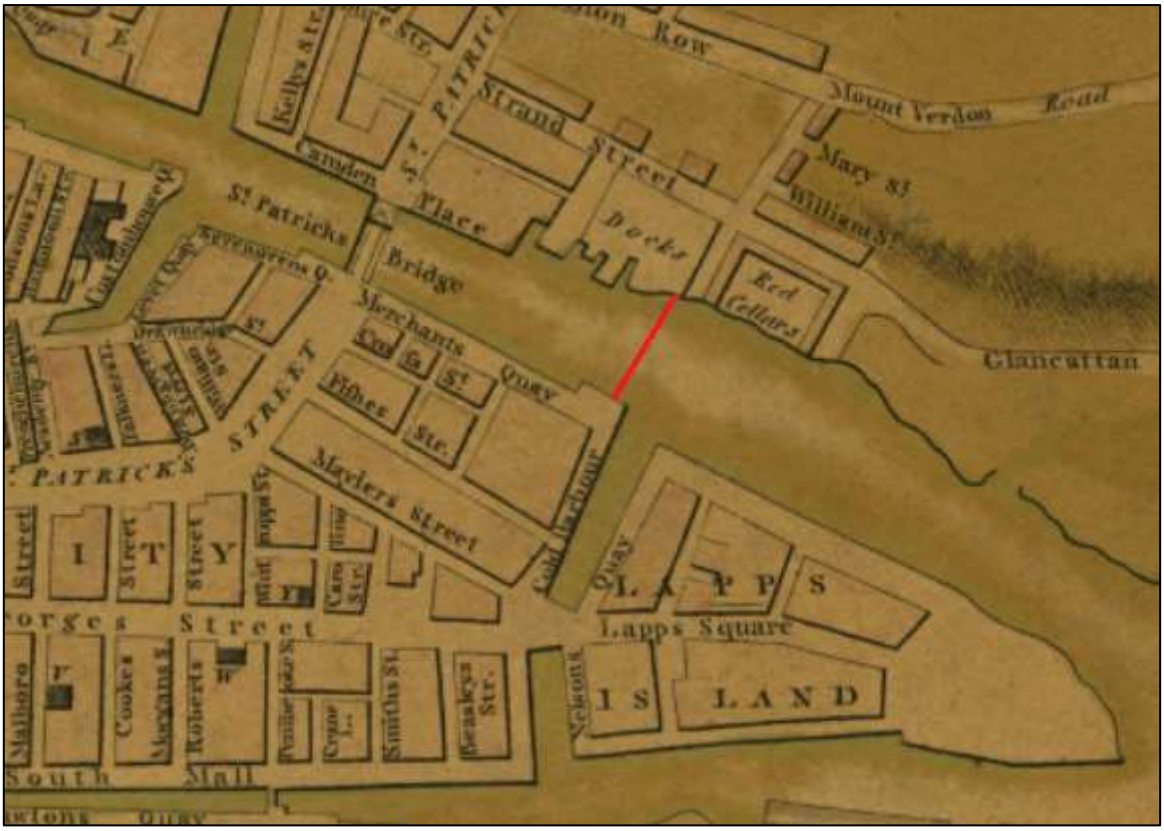

Fig.9: William Beauford's map of 1801 showing general location of bridge site

www.corkpastandpresent.ie

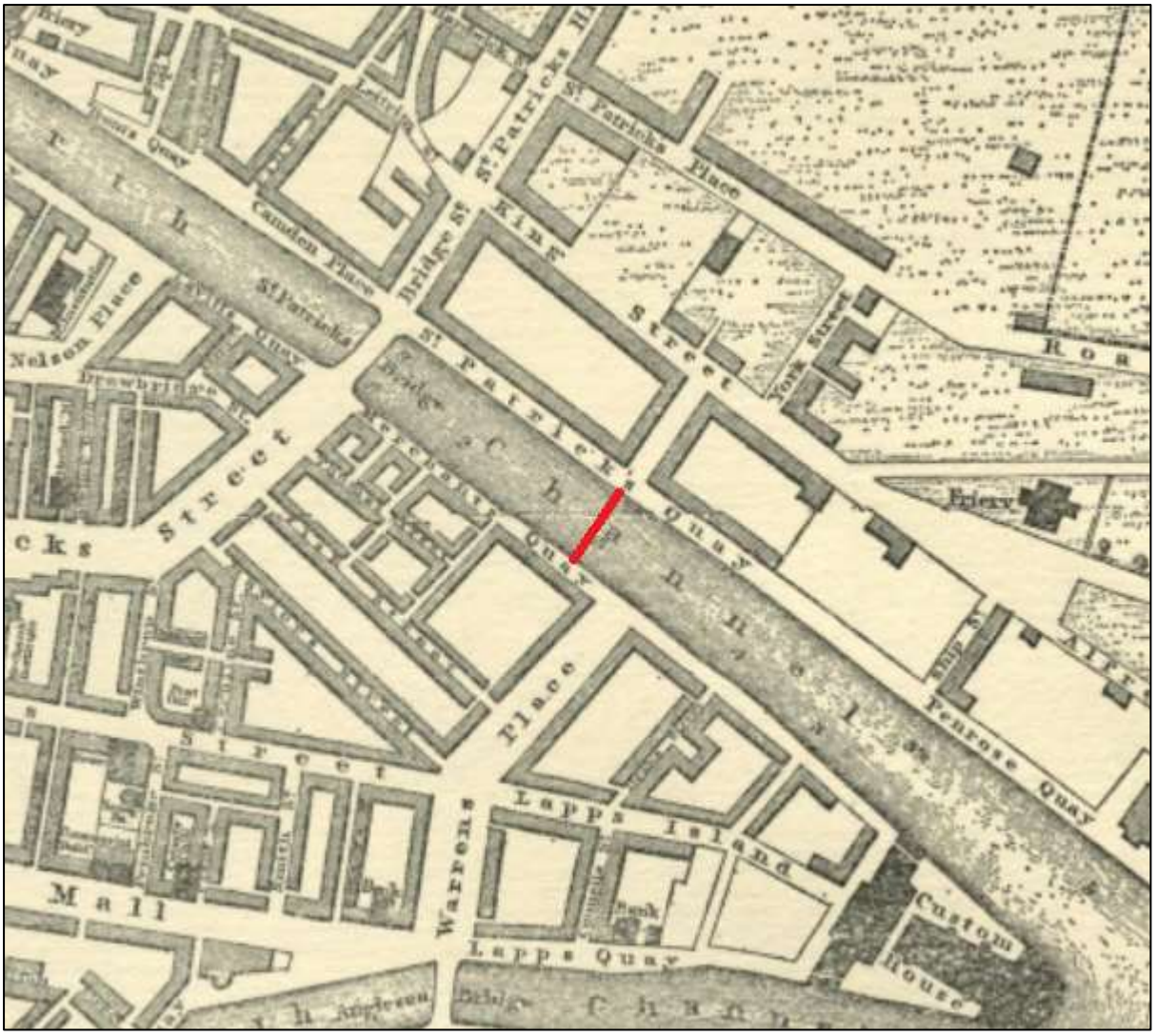

Fig. 10: Thomas Holt's map of cork 1832 shows the proposed bridge location

www.corkpastandpresent.ie

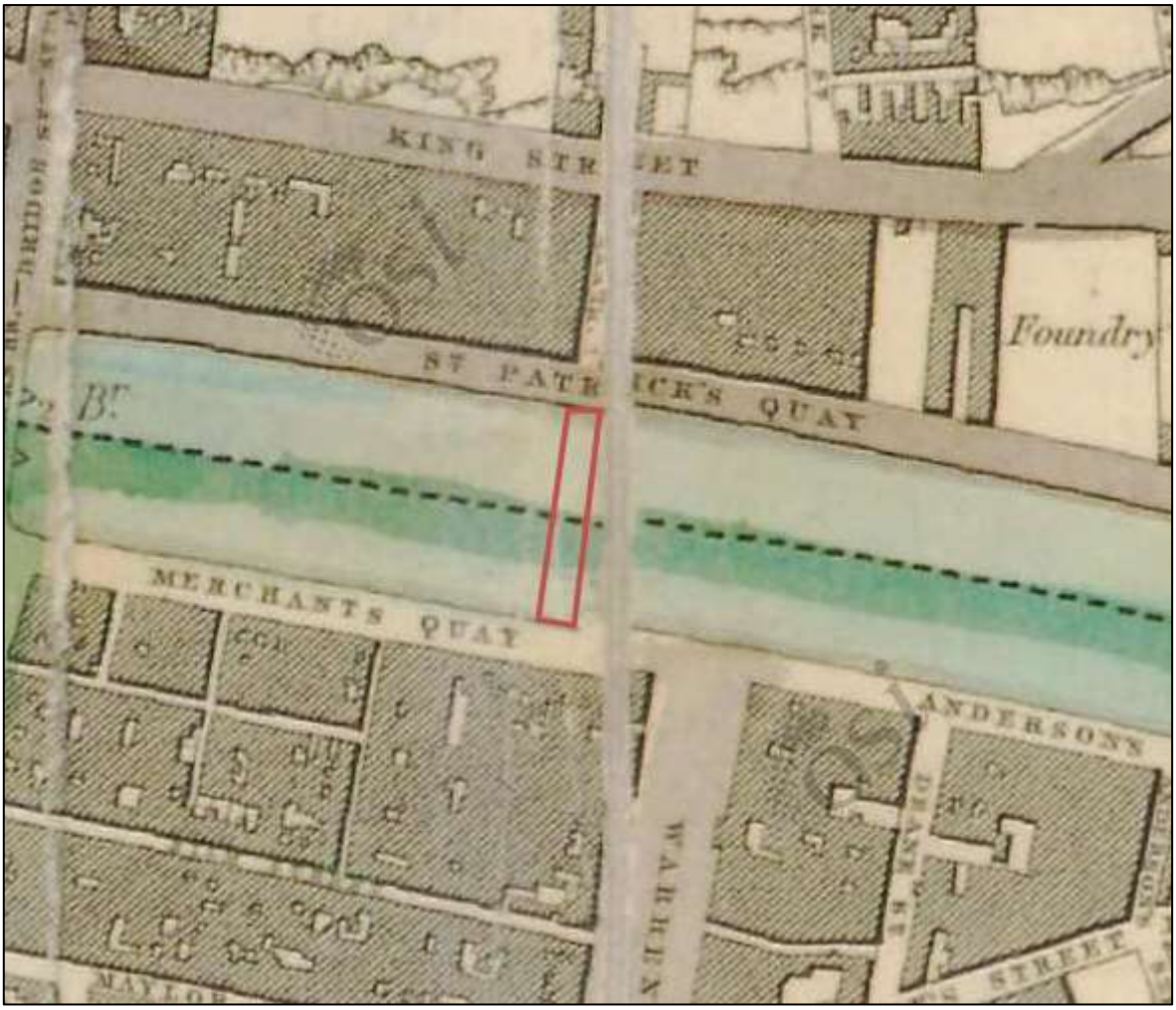

Fig. 11: Proposed development site on 1841 OS map (www.archaeology.ie)

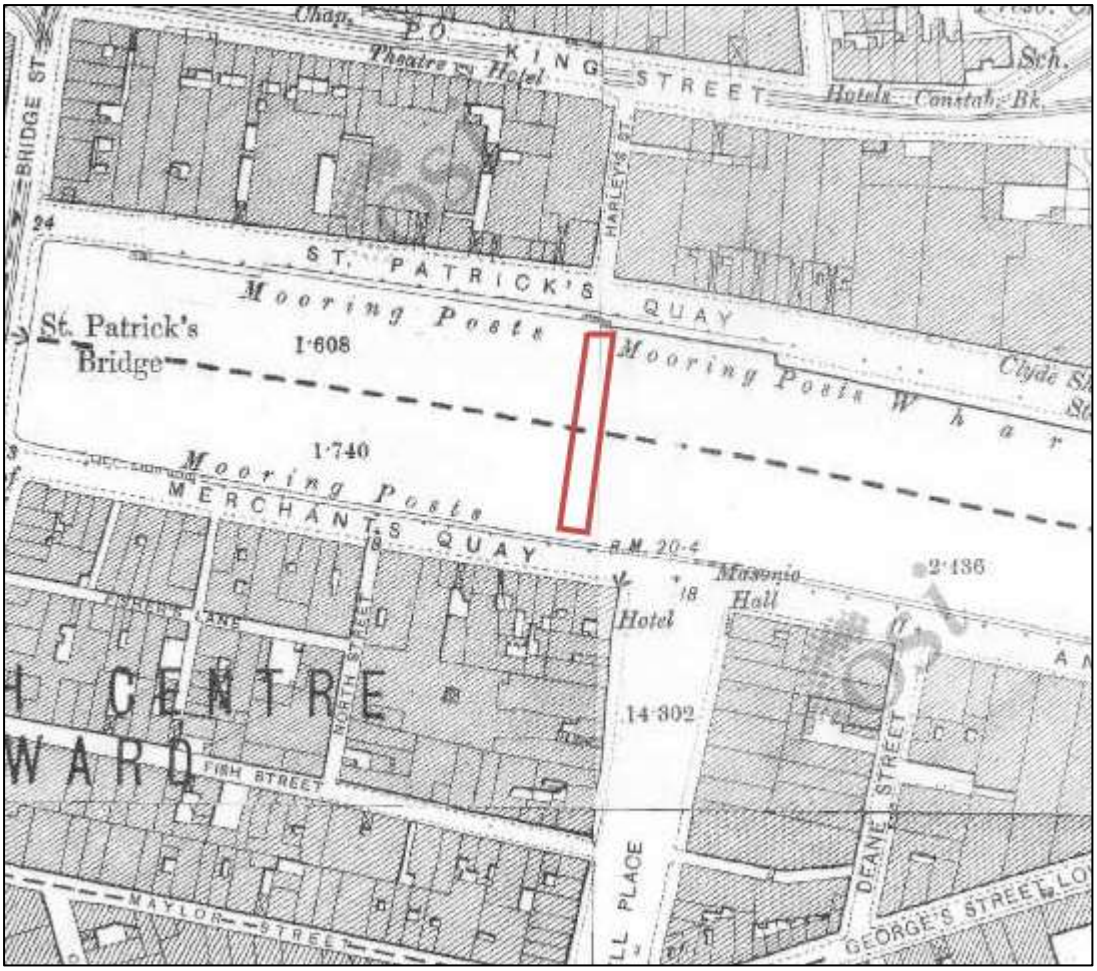

Fig. 12: Proposed development site on 1901 OS map (www.archaeology.ie)

APPENDIX 2

RECORDED ARCHAEOLOGICAL SITES WITHIN 1km of the bridge

RMP	SITE TYPE	TOWNLAND
CO074-028001-	Ritual site – holy well	CORK CITY
CO074-028002-	Religious house – Franciscan friars	CORK CITY
CO074-030001-	Castle – unclassified	CORK CITY
CO074-031001	Graveyard	CORK CITY
CO074-031002	Church	CORK CITY
CO074-032	Castle – tower house	CORK CITY
CO074-033001-	Graveyard	CORK CITY
CO074-033002-	Graveyard	CORK CITY
CO074-033003-	Church	CORK CITY
CO074-033004-	Leper hospital	CORK CITY
CO074-034001-	Historic town	CORK CITY
CO074-034002-	Town defences	CORK CITY
CO074-034003-	Castle - tower house	CORK CITY
CO074-034004-	Graveyard	CORK CITY
CO074-034005-	Church	CORK CITY
CO074-034006-	Redundant record	CORK CITY
CO074-034007-	Mill - unclassified	CORK CITY
CO074-034008-	Graveyard	CORK CITY
CO074-034009-	Church	CORK CITY
CO074-034010-	College	CORK CITY
CO074-034011-	Church	CORK CITY
CO074-034012-	Bridge	CORK CITY
CO074-034013-	Armorial plaque (present location)	CORK CITY
CO074-035001-	Graveyard	CORK CITY
CO074-035002-	Church	CORK CITY
CO074-037	Religious house – Dominican friars	CORK CITY
CO074-038001	Graveyard	CORK CITY
CO074-038002	Cathedral (St. Finbarrs)	CORK CITY
CO074-038003	Round tower	CORK CITY
CO074-038004	Leper hospital	CORK CITY
CO074-039001	Bastioned fort	CORK CITY
CO074-039002	Church	CORK CITY
CO074-040001-	Graveyard	CORK CITY
CO074-040002-	Church	CORK CITY
CO074-041----	Religious house - Augustinian friars	CORK CITY
CO074-042----	Church	CORK CITY
CO074-044----	Church	CORK CITY
CO074-045001	Leper hospital	CORK CITY
CO074-045002	Church	
CO074-057----	Custom house	CORK CITY
CO074-062----	Ritual site - holy well	CORK CITY
CO074-067001-	Boundary stone	KNOCKREA
CO074-067002-	Boundary stone	KNOCKREA
CO074-072	Fortification	Cork city
CO074-073	Fortification	CORK CITY

CO074-074	Ritual site – holy well	CORK CITY
CO074-082----	Designed landscape - belvedere	CORK CITY
CO074-083----	Country house	BALLINAMOUGHT WEST
CO074-085---	Country house	BALLINAMOUGHT WEST
CO074-105	Alms house	CORK CITY
CO074-106----	Meeting-house	CORK CITY
CO074-107----	House - 18th/19th century	CORK CITY
CO074-108----	House - 18th/19th century	CORK CITY
CO074-109	House - 18th/19th century	CORK CITY
CO074-110	Mansion House	CORK CITY
CO074-111----	Graveyard	CORK CITY
CO074-114----	Burial ground	CORK CITY
CO074-116	Distillery	Cork city
CO074-117----	Railway station	BALLINAMOUGHT WEST
CO074-118----	Custom house	CORK CITY
CO074-119001-	Railway station	CORK CITY
CO074-119002-	Railway station	CORK CITY
CO074-119003-	Tram depot	CORK CITY
CO074-119004-	Electricity generating station	CORK CITY
CO074-180	Burial (present location)	Cork city

Table 1: Archaeological sites included in the RMP and SMR database within a 1km radius of the proposed development site

APPENDIX 3

PLATES

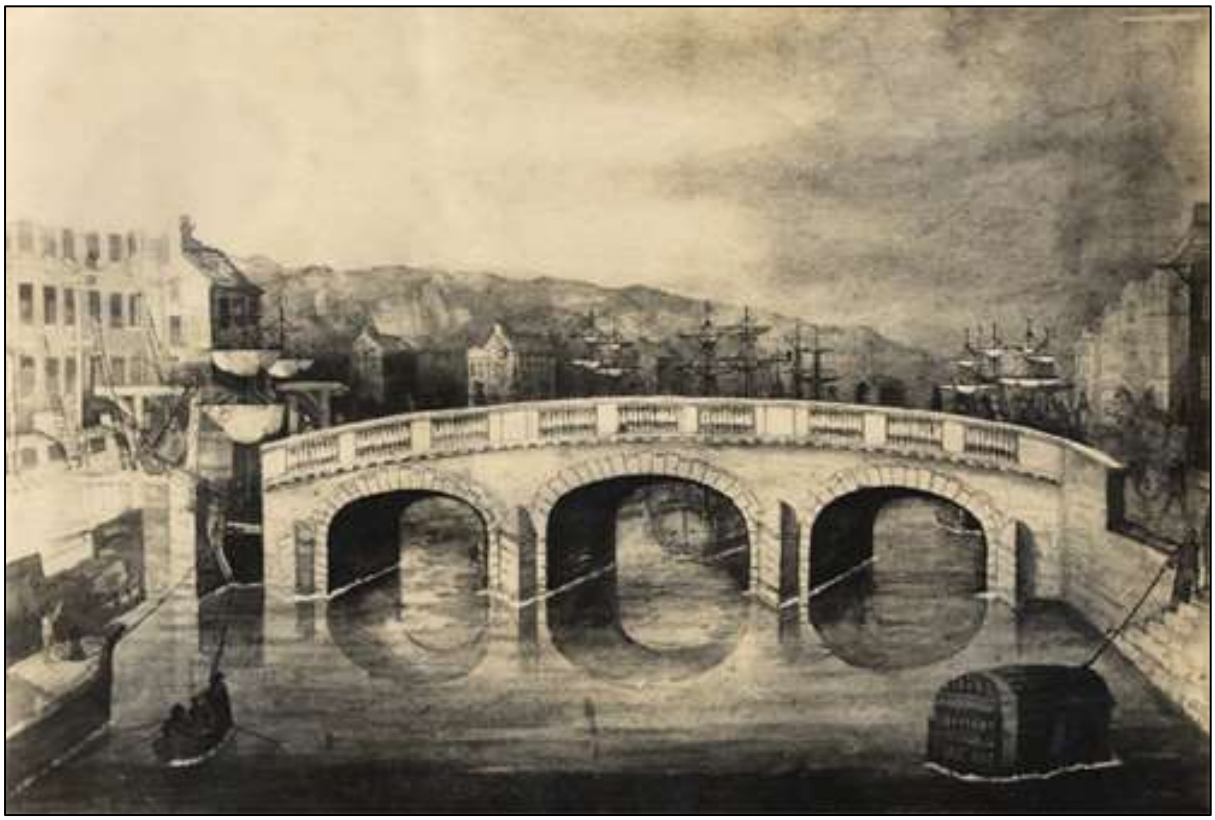

Plate 1: A drawing of the first St. Patrick's Bridge in 1789

www.corkpastandpresent.ie

Plate 2: View downstream from St. Patrick's bridge (PS 1133) looking east towards Brian Boru Bridge in the distance

Plate 3: View upstream from Brian Boru Bridge (PS 1125/1126) looking west at St. Patrick's Bridge in the distance, looking west

Plate 4: St. Patrick's Quay at bridge crossing point, looking south at Merchants Quay

Plate 5: Merchants Quay crossing point, looking north at St. Patrick's Quay

Plate 6: Harley Street, looking north

Plate 7: Footpath and railing on St. Patrick's Quay at bridge crossing point, looking south

Plate 8: Footpath and railing on Merchants Quay at bridge crossing point, looking northeast

Plate 9: St. Patrick's Quay Wall (CHS 1), looking north

Plate 10: Access steps to the river along St. Patrick's Quay (CHS 1), looking northeast

Plate 11: Merchants Quay Wall (CHS 2), looking south

Plate 12: Access steps to river along Merchants Quay (CHS 2), looking west

Plate 13: Access steps to river along Merchants Quay (CHS 2), looking east

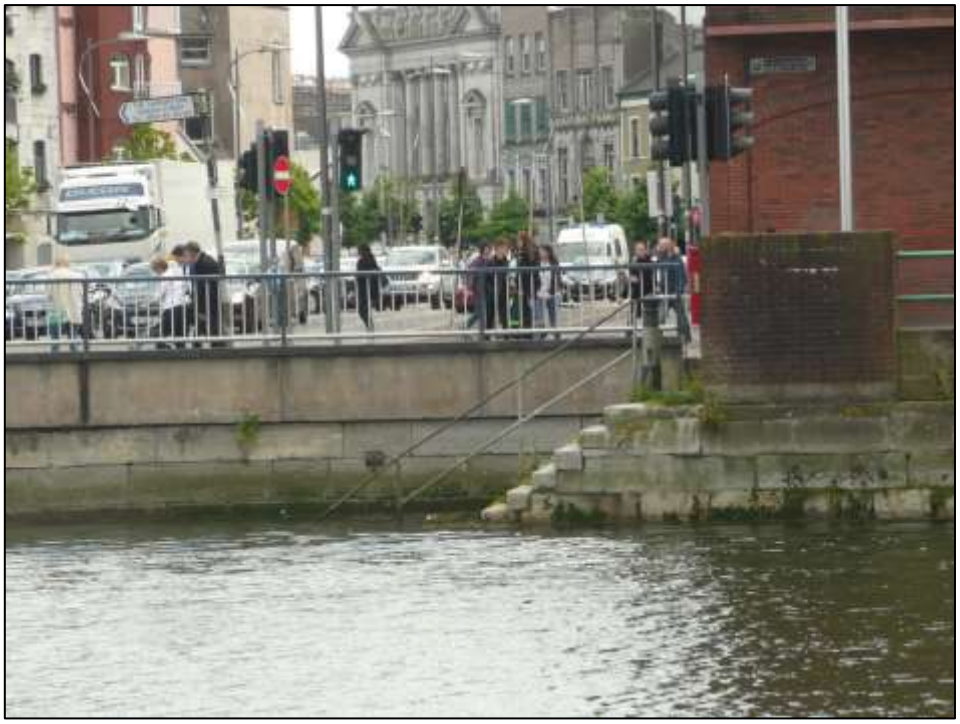

Plate 14: Access steps to river along Merchants Quay (CHS 2), looking south

Plate 15: Steps going down to river along Merchants Quay (CHS 2), looking west

Plate 16: Timber Warf (CHS 3) along St. Patrick's Quay looking north

Plate 17: Timber Warf (CHS 3) on St. Patrick's Quay, looking east towards Brian Boru Bridge

Plate 18: One of the four Cast Iron Mooring Posts along St. Patrick's Quay (CHS 4), looking west

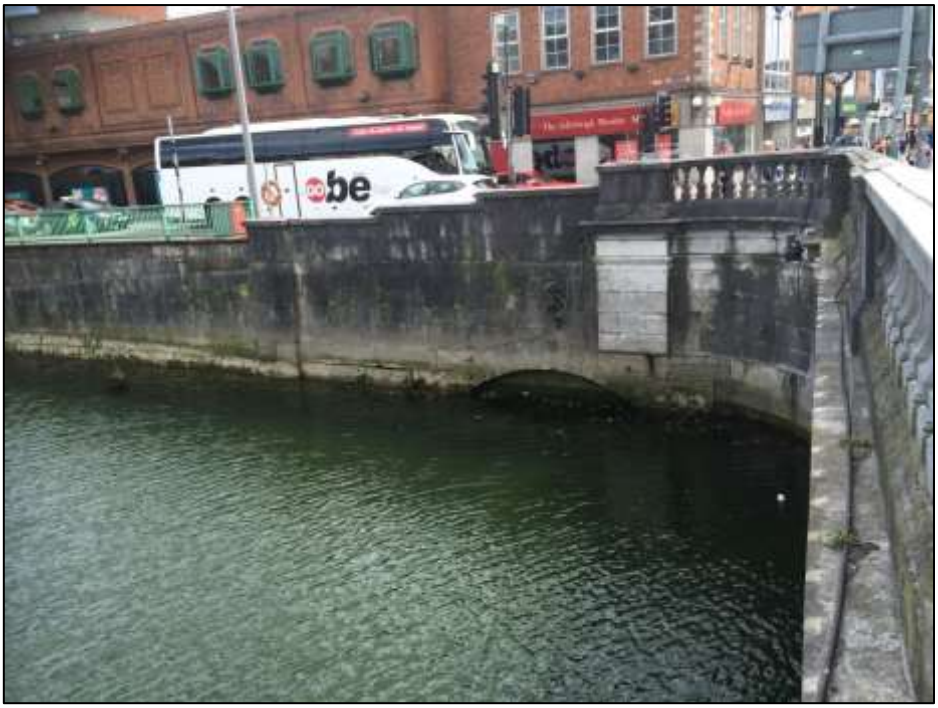

Plate 19: Culvert (CHS 5) adjacent to Patrick's Bridge on Merchants Quay, looking south

Plate 20: PS 410 Victoria Sports Club, 5 St. Patrick's Quay

Plate 21: PS412 Warehouse Frontage, St. Patrick's Quay

Plate 22: PS 1125/1126 Brian Boru Bridge

Plate 23: PS 1133: St. Patrick's Bridge

Plate 24: NIAH 20512621Former Postal Sorting Office, 37 St. Patrick's Quay

Plate 25: NIAH 20512613 Lennox Hearing Care Clinic, 27 St. Patrick's Quay

Plate 26: NIAH 20512468 Metropole Hotel, 25 St. Patrick's Quay

Plate 27: NIAH 20512465 Everyman Palace Theatre, 13 St. Patrick's Quay

Plate 28: NIAH 20512459 The Village Hall, 4 St. Patrick's Quay

Plate 29: NIAH 20512456 Irish Ferries, 9 Bridge Street

Plate 30: NIAH 20512933 Bus Station, Anderson's Quay

APPENDIX 4

FILES OF NATIONAL MUSEUM OF IRELAND (NMI)

The Files of the NMI were consulted for townlands within the study area. These topographical files contain the reports, including correspondence, present location and occasionally, illustrations of archaeological material recovered throughout the country

Townland: Cork City 1927:100

Bronze ring money, purchased 1927 from Spink & Son, London. Specimen found in Co. Cork ' ca. '1 mile north of Cork City in 1850'. 'Ring money of Ireland - the perfect ring and similar to Egyptian ancient ring money'.

Diam : ¾" T: ¼"

Bit unclear what the object actually is but it has no exact provenance anyway.

Townland: Cork City 2001:101- bone pin or needle

Bought at collector's fair in Clonmel from vendor who was told the object had been found at a site in Cork City. Polished bone pin with undifferentiated head and cross-hatch decoration on head and around perforation. Rect in section. In letter to vendor (23/1/2001) M. Cahill writes that, based on the decoration, the pin is 'of later medieval (ca. 15th/16th century) rather earlier date (ref IA/198/2000.

Townland: Cork City 1990: 1 - 1990.39

Burial Ground: CO074-075

All of the following human remains / objects were found by the house owner during the extension of a garden at 6 St. Patrick's Terrace, Greenmount, Cork. Described as found during extension /excavation, so there may have been some follow up 'excavation'?. File card says acquired by Stella Cherry. - Yes excavated - see excerpt from archaeology.ie

Site is catalogued as 'Burial Ground' on NMI card index & has SMR no. CO074:075. No corresponding paper files in Topographical Files - Nessa notes it was a Ned Kelly file so she'll look through an unprocessed heap of 'Ned Kelly' files. Just looked up archaeology.ie - much more info there than in NMI so there must be a file somewhere in NMI. Greenmount is near the Lough - so not 'northside.' All the following information is taken from the online database. No dating info but presence of clay pipe & musket ball suggest late med/post-med date.

1990: 30-38 incl. Human remains comprising misc. human bones contained in a mound. Appear to represent the fragmenterd and jumbled remains of several individuals. It was impossible to separate out into complete skeletons. Bones examined by Laureen Buckley.
1990: 39.1 - 9 incl. Pottery. Glazed pottery including some rim sherds
1990: 39.10 Unglazed tile fragment
1990: 39.11 Clay pipe fragment
1990: 39.12 Musket ball, stone

Description of site (CO074-075) on NMS DATABASE www.archaeology.ie

Mass grave discovered when old ground level was lowered to enlarge existing garden at rear of private residence in Greenmount. Excavated by Stella Cherry (NMI), July 1990. Remains of at least fifteen individuals, 1m to 1.5m below ground level, were removed. All bones were disarticulated, many were broken and in most cases stacked into neat piles with skulls lying close by and could not represent original placement of bodies. No trace of delimiting pit evident. Until latter half of 19th century this area known as 'Gallows Green' (1842 OS 6-inch map). (Cherry 1991, 20)

Appendix C

Photomontages of the proposed development

01 PERSPECTIVE VIEW FROM BRIAN BORU BRIDGE
NTS

Rev	Date	Description	By	Chkd
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Do not Scale. Use figured dimensions only. All dimensions to be checked on site

All drawings to be read in conjunction with the Engineers' drawings.
Any discrepancies between consultants drawings to be reported to the Architect before any work commences.

The Contractor's attention is drawn to the Health & Safety matters Identified in the Health & Safety plan as being otentially hazardous.
These items should not be considered as a complete and final list.
The Work Package Contractor's normal Health and Safety obligations still apply when undertaking construction operations both on and off site.

Issue Status

DRAFT

Client

Cork City Council

ARUP

WilkinsonEyre

Wilkinson Eyre Architects
33 Bowling Green Lane, London
EC1R 0BJ, United Kingdom

+44 (0) 20 7608 7900 T
+44 (0) 20 7608 7901 F
www.wilkinsoneyre.com

Project
Harley Street Pedestrian/Cycle Bridge

Drawing Title
Perspective View from Brian Boru Bridge

Scale at A1	Drawing and CAD File Number	Rev
NTS	253690-B-200-060	-

01 PERSPECTIVE VIEW FROM BRIDGE APPROACH
NTS

Rev	Date	Description	By	Chkd
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Do not Scale. Use figured dimensions only. All dimensions to be checked on site

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DRAFT

Client
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Project
Harley Street Pedestrian/Cycle Bridge

Drawing Title
Perspective View From Bridge Approach

Scale at A1	Drawing and CAD File Number	Rev
NTS	253690-B-200-061	-

01 PERSPECTIVE VIEW OF BRIDGE AT NIGHT
NTS

Rev	Date	Description	By	Chkd
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

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Issue Status

DRAFT

Client

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www.wilkinsoneyre.com

Project
Harley Street Pedestrian/Cycle Bridge

Drawing Title
Perspective View of Bridge at Night

Scale at A1	Drawing and CAD File Number	Rev
NTS	253690-B-200-062	-

01 AERIAL PERSPECTIVE VIEW OF BRIDGE
NTS

Rev	Date	Description	By	Chkd
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Do not Scale. Use figured dimensions only. All dimensions to be checked on site

All drawings to be read in conjunction with the Engineers' drawings.
Any discrepancies between consultants drawings to be reported to the Architect before any work commences.

The Contractor's attention is drawn to the Health & Safety matters Identified in the Health & Safety plan as being otentially hazardous.
These items should not be considered as a complete and final list.
The Work Package Contractor's normal Health and Safety obligations still apply when undertaking constructional operations both on and off site.

Issue Status

DRAFT

Client

Cork City Council

ARUP

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Project
Harley Street Pedestrian/Cycle Bridge

Drawing Title
Aerial Perspective View of Bridge

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