

# Construction Methodology and Phasing Management Plan

Project Opera

Limerick City & County Council

March 2019



Prepared for:

Limerick City & County Council

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# 1. Introduction

## 1.1 Purpose of this document

The objectives of this Construction Methodology and Phasing Management Plan (CMPP) are to:

- Establish specific control measures to minimise the impact of construction works on the environment; and,
- To ensure that consistent standards of environmental protection are established and maintained throughout the project works.

## 2. Overview of the Proposed Development

AECOM have been commissioned by Limerick City and County Council (herein referred to as LCCC) to prepare a CMPP for the site known as the Opera site.

The Opera site comprises an urban block located in Limerick's historic city centre, situated on the south side of the River Abbey at the confluence with the River Shannon, adjacent to the Hunt Museum and Arthur's Quay Shopping Centre (see figure 1 below for site location). The site is largely in public ownership.

The site is located at the northern end of Limerick's Georgian Quarter and its perimeter composed of largely intact Georgian terraces to Ellen St., Patrick St. and Rutland St. There are a number of existing buildings on the site with varying levels of heritage value. These include 3 no. structures listed on the Record of Protected Structures, and a further 8 no. structures which are included on the National Inventory of Architectural Heritage (NIAH). A number of the existing buildings are currently vacant. Frontage to Bank Place comprises the northern end of the Granary Building, a 1960s building formerly occupied by Cahill May Roberts, and a terrace of three Georgian buildings at 7-9 Bank Place which are currently not part of the development site ownership.

The Opera site is a brownfield site located in the centre of Limerick City Centre in the functional area of LCCC. The site occupies the majority of a city block bounded to the west by Patrick Street and Rutland Street, to the north by Bank Place, to the east by Michael Street and to the south by Ellen Street.

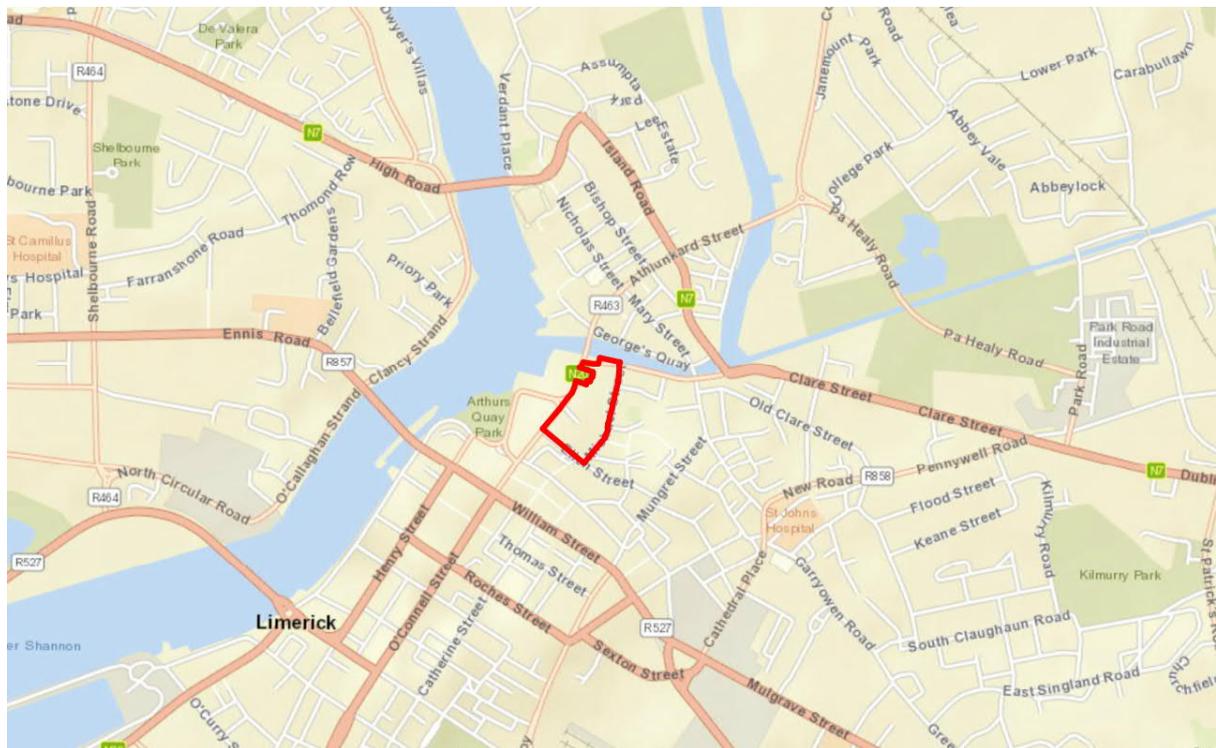


Figure 1 Site Location (site occurs within the red line)

## 2.1 The Proposed Development

The proposed development comprises the demolition of the following:

- Existing industrial/warehouse/workspace buildings at Bogues Yard and Watch House Lane towards the centre of the site;
- The former Cahill May Roberts office building fronting Bank Place;
- Modern additions/extensions to the rear of the Granary Building (a Protected Structure) and to the rear of heritage structures fronting onto Rutland Street, Patrick Street and Ellen Street, respectively;
- The existing Ellen Street surface car park;
- Nos. 6 & 7 Rutland Street<sup>1</sup>, Nos. 6 & 7/8 Patrick Street, and No. 3 Ellen Street; and
- The structure adjoining to the south of the former Town Hall (In order to facilitate widening of the existing east-west access route into the site).

The proposed development will also comprise the construction of;

- A new 6-storey office building on the corner of Michael Street and Ellen Street (Parcel 1) replacing the existing car park, the proposed new building ranges in height from 4-6 storeys with roof level plant and comprises office, retail and restaurant/café/bar uses at ground floor level and office use on upper levels, providing c. 12,111sq m office use and c. 1,444sq m non-office uses (excluding basement accommodation);
- An apart-hotel on the corner of Patrick Street and Ellen Street (Parcel 2A) replacing No. 6-8 Patrick Street and No. 3 Ellen Street) of 5 storeys with roof level plant and extending to the rear from ground floor level to 4th floor level including a café/bar/restaurant at ground floor. Nos. 4–6 Ellen Street are to be refurbished and modified as required, with retail at ground and basement floor levels of c. 1,014m<sup>2</sup>. Upper levels, will comprise apart-hotel units and will be linked by bridge access from the new apart-hotel building, providing a total floor area for the apart-hotel (including new build and refurbished areas) of c. 4,710sq m;
- Refurbishment and modification of No. 9 Ellen Street (Parcel 2B) for the provision of bar/restaurant/café uses at all floor levels, comprising 1,260sq m excluding basement;
- A new City Library within the exiting Town Hall and adjoining structures (Parcel 3A & 3A4) comprising renovation and adaption of the Town Hall (a Protected Structure) and No. 8/9 Rutland Street, replacement of building extensions to the rear with a full height glazed atrium, and connection with new-build structures replacing 6 & 7 Rutland Street, extending and stepping-up to the rear over 4/5 no. floor levels with roof plant (providing a total floorspace of c. 5,460 sq m including renovation and new-build areas). A café/restaurant is also proposed at the basement level of the library (c. 250sq m). The new-build structure to the rear is split, providing for commercial office floor space over 4-5 storeys (Parcel 3A4 providing c. 2,581sq m);
- ;
- Refurbishment and adaptive re-use of 9 no. Georgian terraced houses (3no. NIAH) at Nos. 7-8 Ellen Street, Nos. 1-5 Patrick Street and Nos. 4-5 Rutland Street, respectively, to provide for retail use at ground and basement levels (comprising a total of 1,167.59sq m retail floor space) and residential use on upper levels (c. 1,878.70sq m). A total of 16 no. residential units are proposed; 3 no. 1 bed apartments, 9 no. 2 bed apartments, 1 no. 2 bed townhouses, 1no. three bed townhouse and 2 no. 4 bed townhouses. Private open space is proposed to be provided in new balconies to the rear or ground/podium level private gardens as appropriate.
- To the north of the site fronting Bank Place, is a proposed landmark building of 11–14 storeys, comprising 13,264sq m office floorspace (Parcel 5);
- The existing 4-storey Granary Building (a Protected Structure) is proposed to be retained in office/restaurant/licenced premises use, with the addition of a circulation core to the rear in place of the former (modern) library structure (providing a total floorspace of c. 2,715sq m);

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<sup>1</sup> The doorway currently located within the façade of No. 6 Rutland Street does not form a part of the demolition works.

- A significant new public square/plaza is proposed at the centre of the site (c. 4,013sq m) linked by east-west connections to Michael Street/Patrick Street, to the south via the existing archway connecting to Ellen Street (under no. 7 Ellen Street), and to the north via a new north-south public space to the rear of the Granary Building ('the Granary Courtyard', c. 778sq m), which links with an enhanced public space at Bank Place (c. 1,775sq m);
- A basement car park, accessed from Michael Street, will be provided with parking for 155 no. cars and 311 no. secure bicycle spaces, together with shower and changing facilities and ancillary plant, attenuation, storage, refuse management and associated areas.
- The proposed development also includes environmental improvement works to the adjacent public streets, hard and soft landscaping changes, signage and flagpoles, lighting, change in level, substations, diversion of underground services, set-down areas, and all related site development and excavation works above and below ground.
- The Bruce House Doorway, Rutland Street (a protected Structure) will be relocated to the internal gable of No. 8 Rutland Street within the new library building atrium.

The contractor will hire an environmental co-ordinator, who will be responsible for ensuring that this CMPP is implemented correctly. The Environmental Co-ordinators details are in Table 1.

**Table 1 Contact Details**

Contractors Details		Mobile	
		e-mail	
Env Co-ordinator		Mobile	
		e-mail	
Ecological Clerk of Works			
Waste Manager		Mobile	
		Email	
Client Contact Details:			
Ambulance			

### 3. Site Working Hours

Working hours on site shall be between the hours of 08:00-18:00 Monday to Friday, and 08:00-13:00 on Saturdays. There shall be no working on Sundays or bank holidays.

Any allowance for night time working or out of hours working must be agreed on a case by case basis with LCCC.

### 4. Legal and Other Requirements

The CMPP is an iterative document and will require periodic update once a contractor has been appointed to identify how site works will take place and if necessary introduce further measures to minimise environmental effects, along with those proposed. The CMPP will be updated in accordance with the following requirements:

- Project specific contract requirements
- Planning permission

- Legislative requirements
- Contractors EMP/ EMS

The contractor will carry out any detailed design and construction in accordance with relevant guidance and standards (Information on guidance and standards is given in Appendix A).

The CMPP will be updated with all temporary work required to secure the integrity of the existing historical assets left on the site and the quality of temporary works will be inspected periodically (to be agreed with the conservation architect) to ensure all temporary works are functioning to the standard which protects the retained historic buildings.

Amongst other requirements, the contractor will ensure the following permits are in place prior to construction on site:

1. Waste collection permit;
2. Waste facility license;
3. Waste water discharge permit; and,
4. Discharge license to sewer (if required).

#### 4.1.1 Site Compound/Office location

It is expected in the first instance that the construction compound proposed will be located in the proposed area outlined in blue in Figure 4. As the proposed development progresses into demolition and further building, it is expected the construction compound will migrate around the site, to give the contractor storage space and areas to move around the proposed development.

It is expected the site office and facilities will be initially placed within this area, it will be the main visitor entrance to the site and where site inductions will be held.

#### 4.1.2 Control of Documents and Records

The Environmental co-ordinator shall ensure that all project environmental documents and records are maintained to demonstrate conformance to the environmental legal and contract requirements and shall include the following:

1. Environmental Management Plan (EMP) with appendices;
2. Waste records;
3. Details of sub contracted environmental specialists;
4. Training records;
5. Audits;
6. Complaints;
7. Environmental incidents; and,
8. Environmental monitoring records including the following:
  - a. Monthly reports
  - b. Noise and vibration monitoring
  - c. Air quality monitoring
  - d. Water quality monitoring

## 5. Construction Phasing

### 5.1 Sequence of Works

The sequence of structural works will be as follows;

- Condition schedules and baseline monitoring surveys. Survey monitoring will be required at all stages through to project completion.
- Install temporary works to buildings to be retained.
- Provide the new surface and wastewater sewers in Michael Street and connections to existing combined sewers networks.
- Carefully demolish structures to be removed.
- Commence the repair works to the retained structures.
- Install earthworks support to the basement perimeter.
- Excavate basement area.
- Construct new basement.
- Construct new buildings.
- Complete the development service connections.
- Complete public realm and landscaping.

## 5.2 Phasing of the Construction Works

The development will be broken into phases given its size and demand for completion of plots at various stages in the programme. The phasing is discussed in the context of the enabling works elements and then the new build elements. Figure 2 provides information about the building to be retained (and be subject to work during enabling phase), the buildings on the site to be demolished (in red) and the proposed location of construction compounds (in blue) prior to the construction works.

### 5.2.1 Enabling works

This phase of the works will take place across the site contain the following:

- Condition schedules and baseline monitoring surveys;
- Install temporary works to buildings to be retained;
- Provide the new surface and wastewater sewers in Michael Street and connections to existing combined sewer networks;
- Carefully demolish structures to be removed;
- Commence the repair works to the retained structures;
- Install earthworks support to the basement perimeter; and,
- Excavate basement area.

The repair works to all the existing retained structures will proceed as part of the enabling works while the interfaces of the new build to the existing structures will not be complete in this phase.



Figure 2 Existing Site Plan with proposed demolition in red, indicative areas for construction compounds in blue and building which will be subject to work in the enabling stage as black outlines.

### 5.2.2 Basement Construction

The basement construction will commence after the enabling works are complete. These works will include the drainage and other service works within the basement footprint. The design of the development contains a basement to facilitate carparking, storage, shower and welfare facilities and plant areas. The construction of the basement is considered with regard to the existing structures and services to be retained. During the basement construction, monitoring of the adjacent structure and vibration levels as outlined in section 6.1.2 will continue.

### 5.2.3 Temporary Earthworks Support

The basement is to be constructed to the rear of the retained structures and to excavate the basement safely temporary earthworks support will be required. These temporary earthworks support will be required to resist loads from the existing buildings to maintain their stability and ensure the basement excavation does not adversely affect the adjacent structures or services.

The method of earthworks support recommended is a secant piled wall about the perimeter of the basement. The site investigations indicate that rock is expected to be encountered at 3-4 m below existing ground level. To install stable piles and reduce water ingress into the basement excavation the piles would be bored into the rock for a minimum of 2.5 m using a rotary boring piling rig. The piles would be installed with a 1.2 m clearance to existing structures to facilitate piling rig access. Refer to Figure 3 for the view of a typical secant piles in elevation and section.

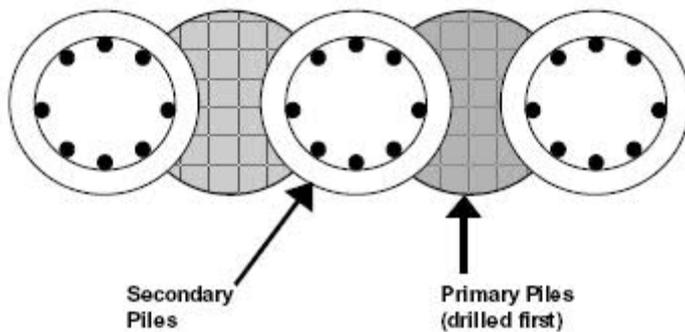


Figure 3 Sample Secant Piles Construction

### 5.3 Permanent Basement Construction

The permanent basement will be constructed with a reinforced concrete basement slab, retaining walls and podium slab and suitable measures to resist water and gas ingress. A grade 2 basement construction is anticipated with additional internal drained cavity construction in welfare and other areas which may be classed as habitable. A detailed contractor method statement will be required in advance of any works.

#### 5.3.1 New Build Structures

The construction of the new build structures is broken into two phases (see Figure 3). The development will proceed from northern end at Bank Place with suitable basement access provided through phase 2.

The completion of phase 1 will conclude the works adjacent the nearest residential neighbours on Rutland Street at the north western corner of the development.

The construction of the proposed development is scheduled to commence in 2019. It is envisaged that the development will be constructed over a period of approximately 5 years.

- An indicative construction programme has been set out in Table 2. Indicative Construction Programme

and illustrated in Figure 4.

Table 2. Indicative Construction Programme

	During
Enabling works (Demolitions and Site Clearance)	Start by Q3 2019
Phase 1 Northern Site Development (Parcel 3A, 3B, 4, 5, & 6)	Completion by Q2 2022
Phase 2 Southern Site Development (Parcel 1, 2A & 2B)	Completion by Q1 2024



**Figure 4 Construction Phasing**

Prior to the construction phase beginning, the site will have to be prepared for construction. The phases of site preparation and construction have been identified as follows:

- Conservation works to the existing structures – which includes monitoring of existing and neighbouring structures, temporary works, permanent works;
- Demolition of existing structures – isolation from retained structures; weathering of exposed gables; disposal of demolition material;
- Basement construction – temporary earthworks support;
- Permanent basement construction; and,
- Construction phasing; sequence of works.

## 6. Sensitive receptors on site

A non exhaustive list of sensitive receptors within and close to the site are shown below:

Address	Receptor Type	Type of Receptor
Rutland House, Rutland Street	Residential	Noise and Vibration/Air Quality
The Hunt Museum, Rutland Street	Museum	Noise and Vibration
Scarsfield House, Francis Street	Offices	Noise and Vibration
16-19 Ellen Street	Retail. Assumed residential above.	Noise and Vibration/Air Quality
Westgate House, Michael Street	Residential	Noise and Vibration/Air Quality
1 – 6 Michael Street	Offices	Noise and Vibration/Air Quality
Limerick School of Art and Design, George's Quay	Educational	Noise and Vibration/Air Quality
7 Bank Place	Offices	Noise and Vibration/Air Quality
2-3 Rutland Street	Retail. Assumed residential above.	Noise and Vibration/Air Quality
1 George's Quay	Bar. Assumed residential above.	Noise and Vibration/Air Quality
The Granary	Offices (to be refurbished)	Noise and Vibration/Air Quality
	Limerick City Development Plan 2010 – 2016 Record of Protected Structures (No. 272)	Architectural Heritage
	National Inventory of Architectural Heritage (NIAH) Reg. No. 21513017	Architectural Heritage
9-11 Patrick Street	Retail/commercial. Assumed residential above	Noise and Vibration/Air Quality
9 Rutland Street	Bat roost	Biodiversity
	NIAH Reg. No. 21513007	Architectural Heritage
Abbey River	Part of the Lower Shannon Special Area of Conservation	Biodiversity/Air Quality
Former Town Hall	Limerick City Development Plan 2010 – 2016 Record of Protected Structures (No. 014)	Architectural Heritage

Address	Receptor Type	Type of Receptor
	NIAH Reg. No. 21513006	Architectural Heritage
Georgian doorway reused in 6 Rutland Street	Limerick City Development Plan 2010 – 2016 Record of Protected Structures (No. 317) NIAH Reg. No. 21513008	Architectural Heritage
5 Rutland Street	NIAH Reg. No. 21513009	Air Quality / Architectural Heritage
4 Patrick Street	NIAH Reg. No. 21513005	Air Quality / Architectural Heritage
5 Patrick Street	NIAH Reg. No. 21513069	Air Quality / Architectural Heritage
9 and 9a Ellen Street	NIAH No. 21513018	Air Quality / Architectural Heritage

## 6.1 Key performance indicators

The Key Environmental Performance indicators (KPI's) for this project will be set between the Contractor and LCCC and will include the following topics:

1. Water consumption (m<sup>3</sup>/ 100k turnover);
2. Waste generated, re-used/ recycled and landfilled / incinerated;
3. Environmental complaints and incidents (including response and close out timeframe);
4. Breaches of legal / planning and EIAR requirements;
5. Noise and vibration monitoring and reporting and breaches of limits; and,
6. Air quality reporting and breaches of limits.

## 6.1 Environmental Risk Assessment

The environmental risk assessment contained in Appendix B will be updated periodically by the Contractor to ensure all environmental risks are captured and minimised on site.

### 6.1 Conservation work to the existing structures

#### 6.1.1 Monitoring of Existing and Neighbouring Structures

There are existing structures to be retained on site along with adjacent and neighbouring structures to the proposed development. Baseline condition schedules of the buildings to be retained and neighbouring structures will be necessary along with surveys to monitor level and alignment of these structures before during and after the development. Figure 4 shows the structures to be demolished in red and the structures to be retained in black.

## 6.1.2 Vibration Monitoring

It will be necessary to monitor vibrations continuously at predetermined locations on the site before and during the critical construct periods. Vibration trigger levels with appropriate corrective action or cessation of construction activity will be required.

BS 5228-2 'Code of practice for noise and vibration control on construction and open sites. Vibration' (BSI, 2014c) provides comparable 'best practice' for vibration control, including guidance on the human response to vibration and building damage. BS 5228-2: 2009+A1: 2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites - Vibration' provides data on measured levels of vibration for various construction works, with particular emphasis on piling. Impacts are considered for both damage to buildings and annoyance to occupiers. Tables 3 and 4 provide information on the magnitude of vibration impacts and transient vibration guide values for cosmetic damage.

**Table 3 Magnitude of Construction Vibration Impacts**

Vibration level ppv $\text{mms}^{-1}$	Effect		Magnitude of Impact
10	Vibration is likely to be intolerable for any more than a brief exposure at this level.	Intolerable	High
1	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.	Complaints likely	Medium
0.3	Vibration might just be perceptible in residential environments	Just perceptible	Low
0.14	Vibration may be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.	Complaints unlikely	Negligible

With regards to building damage, the threshold values for construction vibration are classified within Table B.2 in BS 5228-2 (taken from BS7385:1993). These threshold values are given in Table 4.

**Table 4 Threshold values for construction vibration**

Building type	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures	50 $\text{mms}^{-1}$ at 4 Hz and above	50 $\text{mms}^{-1}$ at 4 Hz and above
Industrial and heavy commercial buildings		
Unreinforced or light framed structure	15 $\text{mms}^{-1}$ at 4 Hz increasing to 20 $\text{mms}^{-1}$ at 15 Hz	20 $\text{mms}^{-1}$ at 15 Hz increasing to 50 $\text{mms}^{-1}$ at 40 Hz and above
Residential or light commercial buildings		
Reinforced or framed structures	50 $\text{mms}^{-1}$ at 4 Hz and above	50 $\text{mms}^{-1}$ at 4 Hz and above
Industrial and heavy commercial		

buildings

Note 1: Values referred to are at the base of the building.

Note 2: For unreinforced or light framed structures and residential or light commercial buildings, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

The guidance presented in BS 7385 states that for intermittent vibration the probability of cosmetic damage occurring tends to zero at a level of 12.5 mms<sup>-1</sup> ppv.

All measurement equipment will be calibrated to relevant standards. Records of same will be maintained by the Environmental Coordinator. Calibration records relating to each instrument must be retained within project files.

### 6.1.3 Noise Monitoring

Table 5 provides an overview of the construction noise thresholds at residential dwellings.

**Table 5 Construction Noise Thresholds and Residential Dwellings**

Assessment Category and Threshold Value Period	Threshold Value L <sub>Aeq,T</sub> dB(A) – free-field		
	Category A (a)	Category B (b)	Category C (c)
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends (d)	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

NOTE 1: A potential significant effect is indicated if the L<sub>Aeq,T</sub> noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total L<sub>Aeq,T</sub> noise level for the period increases by more than 3 dB due to site noise.

NOTE 3: Applies to residential receptors only.

(a) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

(b) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.

(c) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.

(d) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.

The contractor will carry out noise monitoring at the site boundary during construction phase to clarify noise emissions during the construction phase of development.

During the operational phase, noise monitoring will be completed post introduction of bespoke mitigation strategies for each of the retained historic buildings to ensure they have an acceptable internal noise level.

### 6.1.4 Dust Monitoring

It is recommended that procedures to assess deposition of dust are undertaken on site. Due to the proximity of human and ecological receptors, measurement data should be obtained from at least three points on the site boundary. A sampling campaign, including baseline measurements (prior to construction), of sticky pads will consist of a suitable approach to collecting a catalogue of emitted dust particles.

### 6.1.5 Dust management and suppression

Prior to actual demolition of any of the buildings on site, to minimise dust creation, the inside of buildings should be soft stripped before demolition (retaining walls and windows in the rest of the building, where possible to provide a screen against dust).

Any biological material found in the buildings to be demolished should be bagged and removed or damped down to minimise dust creation.

Haul routes to and from the proposed development site would also be established to take material from and to the site. The following routes are proposed going south and north.

Construction vehicles arriving from the south will access the site via the following route:

- M7 exit at junction 29 before continuing northwest on the R527 Ballysimon Road;
- From the R527 onto the R509 Childers Road;
- R509 onto the R445 Dublin Road;
- R445 onto Michael Street; and,
- Michael Street into the development site.

Construction vehicles arriving from the north will access the site via the following route:

- M18 exit at junction 4 before continuing southeast onto the R445 Ennis Road;
- R445 Ennis Road to R445 Northern Ring Road;
- Across Thomond Bridge;
- R445 Castle Street to Island Road onto Straid Seamus O Cinneide;
- Across Abbey Bridge onto the R445 Charlotte's Quay
- Charlotte's Quay onto Michael Street; and,
- Michael Street into the development site.

To ensure that contractor traffic stays on these routes, it is proposed that haul trucks are numbered and if they are spotted by the public, they can be reported to LCCC and the contractor can be fined for deviating from course.

### 6.1.6 Construction Workers on Site

While there are different phases to the proposed development, it is expected there will be maximum of 200 workers per day on the site during phase 1, however this worker estimate may be adapted by the appointed contractor and the CMPP will be updated accordingly.

### 6.1.7 Construction Vehicles

During the demolition phase, it is expected there will be increased traffic movements to remove spoil. The removal of spoil from the site will occur during the early stage of the construction. Spoil removal would be undertaken by rigid HGVs, similar in size to the concrete delivery vehicles (Table 6, shows the assumptions and results of calculations). It has been assumed that 4 axle rigid trucks (30 tonne) will be used to remove spoil.

**Table 6 Anticipated Traffic for Spoil Removal**

Parameter	Unit	Assumptions
Volume of spoil from Basement	40,000m <sup>3</sup> (96,400 metric tonnes)	
Number of months	7 from start in Q3 2019	
Metric tonnes per month	13,771	7-month programme
Number of trucks per month	459	30 tonne 4 axle rigid trucks

Number of trucks per day one way	23	20 working days per month
Number of trucks per hour one way	2.3	10 hour working days
Number of truck movements per hour	4.6	Arrives empty leaves full

As shown above there is a forecast that there will be a maximum of 24 daily deliveries to the site during the Enabling and Phase 1 construction period. This will result in 48 two-way HGV trips over the construction working day on the surrounding highway network. The Enabling and Phase 1 is considered to be the worst case impact of the construction phases.

### 6.1.8 Discharge licences

Discharge licences will be required from LCCC and other parties to facilitate the proposed discharge resulting from changes to surface water drainage as a result of the proposed development.

### 6.1.9 Community Liaison

A single point of contact will be identified to liaise with the community, to deal with any queries or complaints.

A Complaints Register for internal communication and for receiving, documenting and responding to environmental complaints from external parties will be established by the contractor.

When a complaint is received, the following information must be taken:

- Date and time of the complaint are recorded;
- Name of complainant (if provided); and,
- Nature of complaint.

All complaints received from external sources must be reported to the Environmental Co-ordinator and Senior Site Project Manager

After a complaint is received the following action will be taken:

- Complaints will be investigated on site as soon as possible after the complaint has been received;
- Remedial action will be taken to ensure the complaint is closed out (plant or equipment removed from site, works in particular areas ceased, etc.);
- All environmental complaints will be recorded in the Complaints Register; and,
- Other relevant authorities/third parties required per construction contract.

During construction, temporary signage and alternative route consideration (for pedestrians and cyclists) should be provided pre construction. As the nature of the proposed development is a mixed use development with construction and operational phase jobs and major retail opportunities, no further mitigation measures are required.

### 6.1.10 Health and Safety

Both public health and safety and contractor health and safety legislation and guidance will be complied with. All site staff and visitors will be fully inducted onto site and where necessary visitors will be escorted around the site to minimise potential for incidences. The contractor will keep an appropriate number of first aid boxes and first aiders on site at all times to ensure there is adequate coverage for first aid on site at all times. The site is located in a city centre location and suitable protection to passing pedestrians must be provided. The following general principles will apply:

- Watertight toe boards provided;
- No lifting of materials over live footpaths or roadways;
- A sloped fan provided at second floor level to protect against falling objects;
- Debris netting provided for a full scaffolded perimeter; and,

- Fully recorded inspections carried out of any scaffolding for the full duration of construction.

## 7. Environmental Auditing

Planned and documented audits will be carried out to evaluate the conformance of the project. Any deficiencies identified during the audits shall be documented and actioned

## 8. Demolition of Existing Structures

### 8.1 Isolation from Retained Structures

The structures which are to be demolished will require isolation from the adjoining structures which will remain post demolition. In the cases of ground bearing slabs or floor slabs on party walls this is necessary to reduce the pathways for demolition related vibration or forces to reach the structures to be retained.

Demolition using hand held tools will be necessary at critical interfaces and method statement for the demolition works are expected to be agreed between the design team and contractor.

### 8.2 Weathering of Exposed Gables

In all cases exposed gable will require installation of measures to prevent water ingress to the retained structures through exposed gables.

### 8.3 Disposal of Demolition Material

It is a requirement that all construction waste is separated and sorted. Where possible material will be salvaged for reuse in the conservation works to the retained structures.

Material will be recycled or reused on site with unsuitable material being disposed off-site in licenced facilities.

#### 8.3.1 Use of hoarding

The proximity of the development to historic townscapes and sensitive visual receptors has further influenced the design with the townscape and visual context influencing the development of the scheme particularly in terms of consideration of mass, scale and use of building and surface materials. During the demolition and construction works of each, measures such as site hoardings and cleaning roads to remove any track out will be undertaken to reduce temporary effects on visual amenity. No additional mitigation is proposed further to that incorporated into the design.

#### 8.3.2 Construction hours compliance

Compliance with normal construction working hours of 08:00-18:00 Monday to Friday, 08:00-13:00 on Saturdays, with no working on Sundays or bank holidays.

Any allowance for night time working or out of hours working must be agreed on a case by case basis with LCCC.

#### 8.3.3 Covered Vehicles

Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.

## 8.4 Further Mitigation Measures

The construction phase mitigation measures proposed within the EIAR have been collated in Appendix C and are listed in relation to the environmental issues they address. All of these mitigation measures will be fully incorporated in to the construction management of the proposed development.

## **Appendix A Example List of Relevant Guidance**

Area	Publication
Advanced Works	<ul style="list-style-type: none"> <li>Control of Water Pollution from Construction Site. Guidance for consultants and contractors (C532), CIRIA</li> <li>Environmental good practice on site guide (C741), CIRIA</li> <li>National Monuments Legislation (1930-1994)</li> <li>Policy Guidelines on Archaeological Excavation, 1999, Department of Arts, Heritage, Gaeltacht and the Islands</li> <li>The Essential Guide to Travel Planning, 2008, Department for Transport (Dft)</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>Environmental Protection Agency. (2010) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)</li> <li>Environmental Protection Agency. (2014) Air Quality in Ireland 2013: Key Indicators of Ambient Air Quality</li> </ul>
Archaeology & Cultural Heritage	<ul style="list-style-type: none"> <li>National Monuments Act, 1930, as amended in 1954, 1987, 1994, 2004 and 2012 (S.I. 249 of 2012)</li> <li>Planning and Development Act, 2018, as amended</li> <li>Department of Arts, Heritage, Gaeltacht and Islands (1999a), Framework and Principles for the Protection of the Archaeological Heritage</li> <li>Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999</li> <li>Architectural Heritage Protection Guidelines (2004)</li> </ul>
Biodiversity	<ul style="list-style-type: none"> <li>EU Birds Directive 2009/147/EEC;</li> <li>EU Habitats Directive 92/43/EEC (as amended)</li> <li>European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (as amended)</li> <li>Planning and Development Act 2010 (as amended)</li> <li>Wildlife Acts 1976 to 2012 (as amended)</li> <li>Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London</li> <li>Kelleher, C. &amp; Marnell, F. (2006). Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>Control of water pollution from construction sites: guidance for consultants and contractors (C532), CIRIA</li> <li>Control of Water Pollution from Linear Construction Projects (C648), CIRIA</li> <li>Control of water pollution from linear construction projects (C649), CIRIA</li> <li>Environmental Good Practice (C962), CIRIA</li> <li>R164 Design of Containment Systems for the Prevention of Water Pollution from Industrial Accidents, CIRIA</li> <li>Greater Dublin Strategic Drainage Study ,2004, Regional Policies , Volume 2, New Development</li> <li>Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, 2007, National Roads Authority (NRA)</li> </ul>
Noise and Vibration	<ul style="list-style-type: none"> <li><i>Guidelines for the Treatment of Noise and Vibration in National Road Schemes</i>, 2005, National Roads Authority</li> <li>Limerick City and County Council's draft Noise Action Plan</li> <li>BS 5228: 1992, Noise and vibration control on construction and open sites. Code of practice for noise and vibration control applicable to piling operations</li> <li>BS 5228: 2009, Code of practice for noise and vibration control on construction and open sites, Part 1: Noise and Part 2: Vibration.</li> <li>BS 6472: 2008, Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting</li> <li>BS 7385:1993, Evaluation and measurement for vibration in buildings. Guide to damage levels from ground borne vibration</li> <li>Environmental Good Practice (C962), CIRIA</li> <li>Guidelines for Community Noise, 2003, World Health Organisation (WHO)</li> <li>Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, National Roads Authority (NRA)</li> </ul>

Area	Publication
Traffic Management Plan	<ul style="list-style-type: none"> <li>• Environmental good practice on site guide (C741), CIRIA</li> <li>• Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, 2007, National Roads Authority (NRA)</li> <li>• The Essential Guide to Travel Planning, 2008, Department for Transport (Dft)</li> </ul>
Waste Management Plan	<ul style="list-style-type: none"> <li>• Southern Region Waste Management Plan 2015 – 2021;</li> <li>• EPA, Waste Classification, List of Waste &amp; Determining if Waste is Hazardous or Non-hazardous, June 2015;</li> <li>• Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects, 2006, Department of Environment, Community and Local Government</li> <li>• Environmental Good Practice on Site (C962), CIRIA</li> <li>• European Waste Catalogue (EWC) Codes</li> <li>• Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan, 2007, National Roads Authority (NRA)</li> <li>• Paper Tool of the Procedure for the Identification of the Hazardous Components of Waste, 2004, Clean Technology Centre</li> <li>• WRAP Northern Ireland</li> </ul>
Working Hours/Periods	<ul style="list-style-type: none"> <li>• Environmental good practice on site guide (C741), CIRIA</li> </ul>

The appointed Contractor must also comply and implement all relevant Irish and EU safety, health and environmental legislation. The Contractor shall be responsible for ensuring that any developments or changes to regulation and environmental legislation are complied with, even if they are not noted within this iteration of CMPP.

The key pieces of environmental legislation relevant to Project are, but not limited to:

- Environmental Protection Agency Act (1992);
- Protection of the Environment Act (2003);
- Environmental (Miscellaneous Provisions) Act (2011);
- Waste Management Acts (1996 to 2011);
- Air Pollution Acts (1987 and 2011);
- European Communities (Environmental Liability) Regulations (2008 – 2011) (Environmental Liability Regulations);
- Local Government (Water Pollution) Acts (1977 – 1990);
- Water Services Acts (2007 – 2012);
- National Monuments Act, 1930, as amended in 1954, 1987, 1994, 2004 and 2012 (S.I. 249 of 2012);
- The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006, 2010 amended;
- Planning and Development Act, 2000, as amended;
- EU Birds Directive 2009/147/EEC;
- EU Habitats Directive 92/43/EEC (as amended);
- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (as amended);
- Planning and Development Act 2018 (as amended); and,
- Wildlife Acts 1976 to 2012.

Primary legislation forms the framework, with regulations made by the Minister under the legislation setting out the detail of regulatory requirements. The legislation and important regulations are listed at [www.irishstatutebook.ie](http://www.irishstatutebook.ie) and [www.environ.ie](http://www.environ.ie).

## Policy & Guidance

This iteration of the CMPP makes reference to various industry standard best practice guidance and policy documents that can be used to address significant environmental risks.

Guidance outlined within, for example, Construction Industry Research and Information Association (CIRIA) best practice guidance should be complied with during the construction phase. In particular, the fourth edition of CIRIA's '*Environmental good practice on site guide*' (C741) provides practical guidance about managing construction sites to control environmental impacts and how to deliver sustainable construction on site by effectively managing a range of environmental issues. At a minimum, the Contractor shall adhere to this guidance.

It will be the responsibility of contractor to ensure future iterations of this CMPP conform to the latest relevant guidance and policy and the level to which the guidance and policy should be adopted.

## **Appendix B Environmental Risk Assessment**

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
				1	Construction	Exceedances of noise or vibration levels detailed in the Works Requirements  <b>Normal Conditions</b>		Noise pollution  Vibration – Nuisance and/or structural damage to historic buildings	4	4				
1a	Exceedances of noise or vibration levels detailed in the Works Requirements <b>Abnormal/emergency Conditions</b>	N/A	N/A	N/A		N/A	N/A				N/A	N/A	N/A	
		Generation and disposal of non-hazardous waste material  <b>Normal Conditions</b>					Wastes treated as per the works specific CMPMP  Wastes collected in clearly labelled designated waste receptacles.					Site Inspections & Audits  Daily inspections by the Site Supervisor (Waste Representative)		

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
				2	Construction	Generation and disposal of non-hazardous waste material <b>Abnormal/emergency Conditions</b>		Waste management impacts, visual impact, litter and waste disposal impacts	4	3				
2a	4	4	16	Controls as above plus Emergency Response Plan and Emergency Response Team in place			2		3	6	No	Controls as above plus Emergency Response Plan and Emergency Response Team in place		
3	Construction	Generation of dust and particulate matter <b>Normal Conditions</b>	Air quality pollution	4	3	12	Compliance with Dust Management procedures  Daily visual dust level checks to be made by the Contractor  Dampening down of construction site and wheel wash at exits	3	3	9	Yes	Controls as stipulated in the Dust Management Plan.  Site support and assistance from an Environmental Coordinator	Contractor	Active
3a				4	4	16	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	3	6	No	Controls as above plus Emergency Response Plan and Emergency Response		
4		Storage and use of materials		3	3	9	All works to be carried out as per CMPMP  All persons working for or on behalf of the Contractor shall be made aware of material storage arrangements at induction and through the use of toolbox talks.	2	2	4	No	N/A		

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
4a	Construction	Normal Conditions	Visual Impact, waste management and housekeeping impacts				Materials shall be stored in a designated area in an organised manner so as to protect them from damage, deterioration and loss.  Off cuts and left over materials shall be re-used where possible.				No	N/A	Contractor	Active
		Storage and use of materials		Abnormal/emergency Conditions	4	4		16	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2				
5a	Construction	Normal Conditions	Emissions to atmosphere and, depletion of natural resources	3	3	9	All works to be carried out as per the CMPMP  All persons working for or on behalf of the Contractor shall be made aware of plant and equipment environmental controls at induction and through the use of toolbox talks.  Fuel only to be stored in double skinned containers Site Inspections & Audits	2	2	4	No	N/A	Contractor	Active
		Use of diesel fuel to power the plant and equipment		Abnormal/emergency Conditions	4	4		16	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2				
Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
		Discharge of contaminated water – pumping water from excavations												

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
				6	Construction	Normal Conditions		Ground contamination & water pollution	3	4				
6a	Discharge of contaminated water – pumping water from excavations  Abnormal/emergency Conditions	4	5	20		Controls as above plus Emergency Response Plan and Emergency Response Team in place	2		3	6	No	N/A		
7	Construction	Wash and cleaning of equipment  Normal Conditions	Ground contamination & water pollution	4	4	16	All works to be carried out as per CMPMP  All persons working for or on behalf of the Contractor shall be made aware of environmental controls at induction and through the use of toolbox talks.  Site Inspections & Audits	3	3	9	Yes	Daily Site Inspections by the Site Supervisor.  Support and assistance from the Environmental Co-ordinator as required.  Environmental Awareness Training and Toolbox talks	Contractor	Active
7a		Wash and cleaning of equipment  Abnormal/emergency Conditions		4	5	20	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	3	6	No	Controls as above plus Emergency Response Plan and Emergency Response Team in place		
		Discharges to the environment as a result of an environmental incident or during an emergency situation.				All works to be carried out as per CMPMP					Environmental Emergency Response Awareness Training and Toolbox talks			

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
				9	Construction	Normal Conditions		Risk of environmental pollution	4	4				
9a	Discharges to the environment as a result of an environmental incident or during an emergency situation.  Abnormal/emergency Conditions	4	4	16		Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	3	6	No	Controls as above plus Emergency Response Plan and Emergency Response Team in place			
11	Construction	Discharge of contaminated materials  Normal Conditions	Ground contamination & water pollution	3	4	12	All works to be carried out as per CMPMP All persons working for or on behalf of the Contractor shall be made aware of water management controls at induction and through the use of toolbox talks. Site Inspections & Audits Groundwater baseline survey at beginning of contract Control of works, material storage arrangements and waste management practices in the vicinity of the Abbey River. Site Inspections & Audits LCCC Licence/permission to discharge as required.	2	3	6	No	N/A	Contractor	Active

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
11a		Discharge of contaminated materials  <b>Abnormal/emergency Conditions</b>		4	5	20	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	3	6	No	N/A		
Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
12		Generation and disposal of hazardous waste material:  <ul style="list-style-type: none"> <li>used spill kits</li> <li>Lead-acid batteries from plant servicing</li> <li>Waste oils from plant servicing</li> <li>Waste filters from plant servicing</li> <li>Waste household batteries</li> <li>Waste light bulbs/fluorescent tubes</li> <li>Waste spray paint cans</li> <li>WEEE</li> </ul> <b>Normal Conditions</b>	Ground contamination & water pollution.  No impact under correct storage conditions.	5	4	20	All works to be carried out as per the CMPMP.  Control of works, material storage arrangements and waste management practices in the vicinity of the Abbey River.  Construction of an appropriate hazardous waste storage facility.  Supply and clear signage of suitable storage containers for various waste types  Clear availability of MSDS sheets  Work Inspections & Audits	4	3	12	Yes	Environmental Awareness Training and Toolbox talks  Site Inspections & Audits  Construction of an appropriate hazardous waste storage facility.  Supply and clear signage of suitable storage containers for various waste types Appointment of suitably licenced waste contractor Register of chemicals stored Library of MSDS sheets	Contractor	Active
12a		Generation and disposal of hazardous waste material: <ul style="list-style-type: none"> <li>used spill kits</li> <li>Lead-acid batteries from plant servicing</li> <li>Waste oils from plant servicing</li> <li>Waste filters from plant servicing</li> <li>Waste household batteries</li> <li>Waste light bulbs/fluorescent tubes</li> </ul>		5	5	25	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	3	6	No	Controls as above plus Emergency Response Plan and Emergency Response Team in place		

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
						<ul style="list-style-type: none"> <li>Waste spray paint cans</li> <li>WEEE</li> </ul> <b>Abnormal/emergency Conditions</b>								
13		Storage of hazardous materials: <ul style="list-style-type: none"> <li>oils</li> <li>fuels</li> <li>building chemicals</li> </ul> <b>Normal Conditions</b>	Ground contamination & water pollution.  No impact under correct storage conditions.	5	4	20	All works to be carried out as per the CMPMP.  Control of works, material storage arrangements and waste management practices in the vicinity of the Abbey River.  Construction of an appropriate hazardous waste storage facility.  Supply and clear signage of suitable storage containers for various waste types  Clear availability of MSDS sheets  Work Inspections & Audits	4	3	12	Yes	Environmental Awareness Training and Toolbox talks  Site Inspections & Audits  Construction of an appropriate hazardous waste storage facility.  Supply and clear signage of suitable storage containers for various waste types Appointment of suitably licenced waste contractor Register of chemicals stored Library of MSDS sheets	Contractor	Active
13a		Storage of hazardous materials: <ul style="list-style-type: none"> <li>oils</li> <li>fuels</li> <li>building chemicals</li> </ul> <b>Abnormal/emergency Conditions</b>		5	5	25	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	3	6	No	Controls as above plus Emergency Response Plan and Emergency Response Team in place		
14		Contaminated land  <b>Normal Conditions</b>	Ground contamination & water pollution.  No impact under correct management conditions.	4	4	16	All works to be carried out as per the CMPMP.  Works to be carried out in accordance with Contaminated Land Plan  Work Inspections & Audits	3	3	9	Yes	Daily Site Inspections by the Site Supervisor. Support and assistance from an Environmental Co-ordinator as required. Environmental Awareness Training and Toolbox talks Site Inspections & Audits Services of an Emergency Response Contractor will be required.	Contractor	Active

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
14a		Contaminated land									This subcontractor will facilitate clean up in a controlled and compliant manner in the event of an emergency situation.			
		<b>Abnormal/emergency Conditions</b>		5	5	25		Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	3				6
15		Waste (sewage) from welfare facilities	Ground contamination & water pollution.  No impact under correct management conditions.				All works to be carried out as per the CMPMP.  Use of sealed tanks and licenced contractor for disposal  Or  connection to local sewer by agreement with LCCC. Work Inspections & Audits				Yes	Daily Site Inspections by the Site Supervisor. Support and assistance from an Environmental Co-ordinator as required. Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active
		<b>Normal Conditions</b>		4	4	16		3	3	9				
15a		Waste (sewage) from welfare facilities		5	5	25	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	3	6	No	N/A		
16		Excavation waste:  <ul style="list-style-type: none"> <li>• surplus soil</li> <li>• broken concrete</li> <li>• broken tarmac</li> <li>• old ducting/pipes</li> </ul> (contaminated soil dealt with elsewhere)  <b>Normal Conditions</b>	Ground contamination & water pollution.  No impact under correct management conditions.				All works to be carried out as per the CMPMP.  All waste from excavations to be dealt with in accordance with waste management plan  Appointment of permitted contractors only  Use of licenced facilities only  Work Inspections & Audits				No	Daily Site Inspections by the Site Supervisor. Support and assistance from an Environmental Co-ordinator as required. Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active
		<b>Abnormal/emergency Conditions</b>		5	3	15		4	2	8				
16a		Excavation waste:  <ul style="list-style-type: none"> <li>• surplus soil</li> <li>• broken concrete</li> <li>• broken tarmac</li> <li>• old ducting/pipes</li> </ul>		5	5	25	Controls as above plus Emergency Response Plan and Emergency Response Team in	2	2	4	No	N/A		

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
						(contaminated soil dealt with elsewhere) <b>Abnormal/emergency Conditions</b>								
17		Use of concrete:  • Concrete wash out facilities  <b>Normal Conditions</b>	Ground contamination & water pollution.  No impact under correct management conditions.	5	3	15	All works to be carried out as per the CMPMP.  Construction of suitable concrete wash out facilities  Work Inspections & Audits	4	2	8	No	Daily Site Inspections by the Site Supervisor. Support and assistance from an Environmental Co-ordinator as required. Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active
17a		Use of concrete: • Concrete wash out facilities <b>Abnormal/emergency Conditions</b>		5	5	25	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	2	4	No	N/A		
18		Use of electricity  <b>Normal Conditions</b>	Contributes towards Global warming from emissions of Carbon dioxide (CO2) and Acid Rain from emissions of Sulphur dioxide and oxides of nitrogen. Use of finite resources (fossil fuel). Resources - bulbs, fluorescent tubes, air conditioning, refrigeration, equipment and machinery.	5	2	10	All works to be carried out as per the CMPMP. Reliance on training & personal behaviour.  Some automated actions– photo stats/ timers on outdoor lighting.  Facilities maintenance,  Monitoring records. Log onto SMARTwaste  Work Inspections & Audits	4	2	8	No	Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active
18a		Use of electricity  <b>Abnormal/emergency Conditions</b>		5	3	15	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	2	4	No	N/A		
19		Use and disposal of water  <b>Normal Conditions</b>	Use of a natural resource,  Minimal impact under correct management conditions.	5	2	10	All works to be carried out as per the cMPMP.  Regular inspection & maintenance of welfare facilities.  Push button taps Push button urinals Dual flush or Eco cisterns Taps on all pipes used on site	4	2	8	No	Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
19a		Use and disposal of water					Work Inspections & Audits							
		<b>Abnormal/emergency Conditions</b>		5	3	15	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	2	4	No	N/A		
20		Storage of diesel	Ground contamination & water pollution No impact under correct storage conditions.				All works to be carried out as per the CMPMP. Use of bunded and tested/certified facilities and containers					Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active
20a		<b>Abnormal/emergency Conditions</b>		4	4	16	Work Inspections & Audits	2	4	8	No			
21		Transfer of diesel	Ground contamination & water pollution No impact under correct management conditions.				All works to be carried out as per the CMPMP.					Daily Site Inspections by the Site Supervisor. Support and assistance from the Environmental Co-ordinator as required. Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active
21a		<b>Abnormal/emergency Conditions</b>		5	4	20	Work Inspections & Audits	4	3	12	Yes			
22		Loss of containment or spillage (including bursting hydraulic pipes)	Ground contamination & water pollution Oil is a highly visible form of pollution. It harms plants and animals, damages rivers, groundwater and the soil, and can destroy natural habitats				All works to be carried out as per CMPMP.					Daily Site Inspections by the Site Supervisor. Support and assistance from the Environmental Co-ordinator as required. Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active
		<b>Normal Conditions</b>		3	5	15	Work Inspections & Audits	3	4	12	Yes			

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
22a		Loss of containment or spillage (including bursting hydraulic pipes)  <b>Abnormal/emergency Conditions</b>		5	5	25	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	4	8	No	N/A		
23		Use of company vehicles for work  <b>Normal Conditions</b>	Air pollution, noise and use of finite fossil fuels. Resources depletion, contributes to global climate change	5	3	15	All works to be carried out as per the CMPMP.  Regular inspection  Maintenance schedules  Work Inspections & Audits	5	2	10	Yes	Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active
23a		Use of company vehicles for work  <b>Abnormal/emergency Conditions</b>		5	4	20	Controls as above plus Emergency Response Plan and Emergency Response Team in place	2	2	4	No	N/A		
24		Use of vehicles (sub-contract) for work  <b>Normal Conditions</b>	Air pollution, noise and use of finite fossil fuels. Resources depletion, contributes to global climate change	5	3	15	All works to be carried out as per the CMPMP.  Insistence on contractor environmental practices complying with CMPMP Regular inspection Maintenance schedules  Work Inspections & Audits of S/Cs	5	2	10	Yes	Environmental Awareness Training and Toolbox talks  Weekly Site Inspections Audits	Contractor	Active
25		Use of personal/company/sub-contract vehicles - travel to work  <b>Normal Conditions</b>	Air pollution, noise and use of finite fossil fuels. Resources depletion, contributes to global climate change	5	3	15	Indirect impact that company can influence  Relies on staff training and personal practices	5	2	10	Yes	Environmental Awareness Training and Toolbox talks Audits	Contractor	Active
26		Air travel for college business  <b>Normal Conditions</b>	Air pollution, noise and use of finite fossil fuels. Resources depletion, contributes to global climate change	4	3	12	Both direct and indirect impact that company can influence. Travel policy	4	2	8	No	N/A	Contractor	Active

**Positive Impacts**

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)	Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Positive Risk Level (with controls)	Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
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Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
				28		Rail travel for business purposes  <b>Normal Conditions</b>		Reduce air pollution, noise and use of finite fossil fuels. Reduce resources depletion, Reduce contribution to global climate change	4	2				
29		Cycle to work  <b>Normal Conditions</b>	Reduces local air pollution, noise, resource depletion and co2. Improves physical and mental wellbeing and is socially beneficial.	4	2	8	Both direct and indirect impact that company can influence.  Cycle to work scheme	5	5	25	No	Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active
30		Recycling of paper and cardboard waste  <b>Normal Conditions</b>	Reduces waste to landfill, reduces greenhouse gas emissions, and reduces use of virgin materials.	5	2	10	All waste activity to be carried out as per the Waste Management plan (WMP). Recycling containers/skips located throughout the site Work Inspections & Audits	5	5	25	No	Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active
31		Recycling of plastic bottles  <b>Normal Conditions</b>	Reduces waste to landfill, reduces greenhouse gas emissions, and reduces use of virgin materials.	5	2	10	All waste activity to be carried out as per the Waste Management plan (WMP). Recycling containers/skips located throughout the site Work Inspections & Audits	5	5	25	No	Environmental Awareness Training and Toolbox talks Weekly Site Inspections Audits	Contractor	Active
32		Recycling of toner cartridges  <b>Normal Conditions</b>	Reduces waste to landfill, reduces greenhouse gas emissions, and reduces use of virgin materials.	5	2	10	All waste activity to be carried out as per the Waste Management plan (WMP). Recycling containers located in the offices – collect sufficient quantity for commercially feasible collection Work Inspections & Audits	5	5	25	No	Environmental Awareness Training and Toolbox talks  Weekly Site Inspections Audits	Contractor	Active
33		Recycling of computer equipment  <b>Normal Conditions</b>	Reduces waste to landfill, reduces greenhouse gas emissions, and reduces use of virgin materials and hazardous waste materials. Social benefit from equipment re-use.	5	2	10	All waste activity to be carried out as per the Waste Management plan (WMP). Recycling containers located in the offices – collect sufficient quantity for commercially feasible collection Work Inspections & Audits	5	5	25	No	Environmental Awareness Training and Toolbox talks  Weekly Site Inspections Audits	Contractor	Active
34		Recycling of oil waste (motor vehicle and catering)  <b>Normal Conditions</b>	Reduces hazardous waste, reduces consumption of natural resources, reduces use of finite resources	5	2	10	All waste activity to be carried out as per the Waste Management plan (WMP). Recycling containers located in the compound – collect sufficient quantity for commercially feasible collection Work Inspections & Audits	5	5	25	No	Environmental Awareness Training and Toolbox talks	Contractor	Active
		Recycling of tyres	Reduces hazardous waste.				All waste activity to be carried out as per the Waste Management plan (WMP).					Environmental Awareness Training and Toolbox talks		

Ref.	Work Activity	Environmental Aspect	Environmental Impact before Controls	Initial Risk Level (without controls)			Risk Control Measures: Design action taken, record of decision process including option considered, design constraints and justification for options/actions not taken	Residual Risk Level (with controls)			Is there a "significant" residual risk to be passed on? (Y/N)	Actions necessary to control the risk – comments, recommendations	Responsibility	Status (Active/Closed)
				Likelihood (L)	Severity (S)	Significance Rating (C)		Likelihood (L)	Severity (S)	Significance Rating (C)				
35		Normal Conditions	reduces consumption of natural resources, reduces use of finite resources	5	2	10	Storage area in compound – collect sufficient quantity for commercially feasible collection Work Inspections & Audits	5	5	25	No	Weekly Site Inspections Audits	Contractor	Active
36		Recycling of metal waste  Normal Conditions	Reduces consumption of natural resources, reduces impact from quarrying, reduces greenhouse gas emissions	5	2	10	All waste activity to be carried out as per the Waste Management plan (WMP). Recycling containers/skips located throughout the site – collect sufficient quantity for commercially feasible collection Work Inspections & Audits	5	5	25	No	Environmental Awareness Training and Toolbox talks  Weekly Site Inspections Audits	Contractor	Active

## Appendix C List of Mitigation

EIAR TOPIC	PROPOSED IMPACT	CONSTRUCTION
Population and Human Health	Effects on pedestrians and cyclists	<p>During construction, temporary signage and alternative route consideration (for pedestrians and cyclists) shall be provided pre construction. As the nature of the proposed development is a mixed use development with construction and operational phase jobs and major retail opportunities, no further mitigation measures are required.</p>
Lands, Soils, Geology and Groundwater	Requirements of Construction Methodology and Phasing Management Plan	<p>The Construction Methodology and Phasing Management Plan (CMPP) (which accompanies this application) establishes specific control measures to minimise the impact of construction works on the environment as part of the implementation of the mitigation measures and to ensure that consistent standards of environmental protection are established and maintained throughout the project works.</p> <p>During the early stages of construction, site clearance and excavation of made ground and subsoil to facilitate construction of basements, laying of foundations and realignment of drainage channels etc. will be undertaken.</p>
	Management of Excavation	<p>Controlling working practices will avoid repetitive handling of excavated made ground and subsoils, minimise vehicle movements, limit the size of stockpiles and will reduce the compaction and erosion of material and generation of dust. The location of plant and materials and the implementation of a construction traffic management plan will minimise compaction and erosion of soil.</p> <p>If temporary storage of excavated made ground and subsoils is required it will be managed to prevent potential negative impact on the receiving environment and the stockpiled material will be covered and stored away from any surface water drains. It will be necessary to designate areas within the site where stockpiles will be established in order to facilitate the efficient transfer of material within the site. It will be necessary to position spoil and temporary stockpiles in locations which are at least 15 m distant from drainage systems.</p> <p>All excavated materials will be inspected for signs of possible contamination, such as staining or strong odours. Should any unusual staining or odour be noticed, this made ground / subsoil will be segregated and samples analysed for the presence of possible contaminants in order to determine an appropriate disposal outlet. Excavated made ground and subsoil will be disposed to licensed / permitted waste management facilities, as appropriate for the waste classification of the material, see also Chapter 14.</p> <p>Excavation shall be restricted in times of high winds and heavy rainfall to minimise the potential for dust generation or uncontrolled sediment movement. Good construction practices will also be used</p>

EIAR TOPIC	PROPOSED IMPACT	CONSTRUCTION
		during the construction phase, such as wheel washers and dust suppression on site roads (to be captured within the proposed sustainable urban drainage system (SUDS), and at site access points.
	Importation of fill to site	The source of aggregate, fill material and topsoil imported to site will be carefully selected and vetted in order to ensure that it is of a reputable origin and that it is “clean” (i.e. will not contaminate the environment).
	Management of spills and leaks	<p>Due to the presence of a locally important aquifer beneath the site, shallow groundwater, adjacent surface water bodies, the presence of surface water drainage and nearby rivers which are designated as an SAC, mitigation measures at the construction site will be employed in order to prevent spillages to ground of fuels, and to prevent consequent soil or groundwater quality impacts such that:</p> <ul style="list-style-type: none"><li>• No oils/fuels will be stored on the proposed development site for the purpose of refuelling on the site;</li><li>• General maintenance and refuelling of plant, will be restricted to impermeable bunded areas with a minimum 110% storage capacity and away from surface waters or areas where any spillages could easily reach surface water;</li><li>• Leaking or empty oil drums shall be removed from site immediately and disposed of via an appropriately licensed waste disposal contractor;</li><li>• All hazardous substances on-site shall be controlled within enclosed storage compounds that shall be fenced-off and locked when not in use to prevent theft and vandalism;</li><li>• Refuelling of plant and machinery shall take place at least 15 m away from drains or dewatering points using a mobile fuel bowser and restricted to designated areas on hard standing; only double-bunded fuel bowsers shall be used; vehicles shall not be left unattended during refuelling operations; road vehicles will not be refuelled at the site;</li><li>• Fixed plant shall be self-bunded; mobile plant shall be in good working order, kept clean, fitted with drip trays where appropriate and subject to regular inspection; water runoff from designated refuelling areas shall be channelled to an oil-water separator, or an alternative treatment system, prior to discharge;</li><li>• Spill kits and oil absorbent material shall be carried with mobile plant and located at vulnerable locations around the site to reduce risk of spillages entering the sub-surface or groundwater</li></ul>

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environment; booms shall be held on-site for works near drains or dewatering points; and

- Operatives will be trained in the proper handling of materials, the sensitive nature of the wider drainage system, and the consequences of accidental spillage.

Management of concrete on site

Measures for protection of soil and groundwater from wet concrete will include measures to prevent discharge of alkaline wastewaters or wash water to the surface water drainage system or to the underlying subsoil and groundwater, such that:

- Ready mixed concrete will be brought to the proposed development site by truck;
- Concrete pouring will take place within a designated area to prevent concrete runoff in soil and groundwater; and
- Washout of concrete transporting vehicles shall take place at an appropriate facility; off-site or where on-site wash out will be captured for disposal off-site.

Water Quality Management

Mitigation measures in the water quality management plan shall minimise impacts and monitor effects upon the water environment during construction.

Mitigation measures within the water quality management plan will include:

- Procedures for investigating environmental incidents and incident notification procedures;
- Assessment of earthworks that are likely to give rise to sediment-laden run-off, the routes this is likely to take, and the methods to prevent silt entering the Shannon and Abbey Rivers;
- Procedures for dewatering the site during construction works, including licensing requirements, monitoring requirements, discharge points and maintenance requirements of water treatment plant;
- Establishment of contingency measures to cater for impacts to unknown services underlying the construction site (for example, old sewers, culverts);
- How mud and dust will be controlled and the frequency for road cleaning and dust suppression required at different times of the year;
- How shallow groundwater and the bedrock aquifer will be protected from potential contamination through the implementation of measures to prevent impact from spills and leaks; and

EIAR TOPIC	PROPOSED IMPACT	CONSTRUCTION
		<ul style="list-style-type: none"> <li>Identify whether shallow groundwater monitoring wells on site will be maintained and protected during construction works; decommissioned; or removed completely as part of excavation works, to prevent them from acting as direct pathways for contamination to enter the groundwater body beneath the site.</li> </ul>
	Provision of training	<p>Induction training shall be provided to site construction personnel to inform them of their responsibilities and liabilities with reference to water quality and contamination issues, for example, workshops prior to commencement of site works, environmental toolbox talks during the works, and by use of notice boards in site offices to display important information.</p>
Water	Requirements of Construction Methodology and Phasing Management Plan	<p>The Contractor will take all precautions to prevent the pollution or silting of watercourses from the construction of the proposed development.</p> <p>The Contractor will apply following mitigation:</p> <ul style="list-style-type: none"> <li>Prior to excavation of the basement, the proposed foul and storm water sewers in Michael Street will be laid and commissioned to allow the existing combined sewer to be diverted. During the construction of the new sewers, surface water arising from the development will continue to discharge to the combined sewer. Surface water collected will be treated by sedimentation prior to discharge to the existing combined sewer. Total Suspended Solids (TSS) and colour will be monitored daily by a hand held multi parameter sonde.</li> <li>Maintain and monitor the performance of the surface water drainage network throughout the construction of the proposed development noting that the proposed storm sewer will include a permanent hydrocarbon separator which will treat runoff from Michael Street.</li> <li>Cover all temporary stockpiles generated during construction to minimise run-off.</li> <li>Locate spoil and temporary stockpiles in locations which are at least 15 m from drainage systems.</li> <li>Neither ground water or surface water runoff from the working areas will be permitted to discharge directly to the Abbey River or Shannon River. Run off generated within the site during construction will be filtered and treated to remove hydrocarbons and sediment. Total Suspended Solids (TSS), pH/EC and colour will be monitored daily by a hand held multi parameter sonde. In addition, the outlet from the sedimentation pond will incorporate a turbidity monitor with alarm at high level. In the event of surface water failing to meet the required standards, as set out in the discharge licence, water will be recirculated to the inlet of the</li> </ul>

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sediment pond to provide further time for settlement. A penstock will be provided on the outlet from the sediment pond to control discharge from the site. In the event of surface water failing to meet the required standards, as set out in the discharge licence, water will be recirculated to the inlet of the sediment pond to provide further time for settlement. A penstock will be provided on the outlet from the sediment pond to control discharge from the site.

- Avoid direct or indirect discharges of untreated surface or ground water generated during the proposed development, to any surface water.
- Dewater all working areas at the end of each working day, if necessary, using pumping and transport of water off site in tankers if volumes prevent effective treatment prior to discharge.
- Where the Contractor utilises pumping to drain works areas, a backup pump and generator must be provided on site for use in the event of the primary pump failing.
- Use wheel washers and dust suppression on site roads (to be captured within the proposed SUDS system) and undertake daily plant maintenance checks and corrective actions where required.
- Establish contingency measures to cater for impacts to unknown services underlying the construction site (for example, old sewers or culverts).
- Identify whether shallow groundwater monitoring wells on site will be maintained and protected during construction works; decommissioned; or removed completely as part of excavation works, to prevent them from acting as direct pathways for contamination to enter the groundwater body beneath the site.
- Ready mixed concrete will be brought to the proposed development site by truck.
- The pouring of concrete shall take place within a designated area to prevent concrete runoff into the soil/ground water media.
- Proposed surface water drainage network outfall:
  - Outfall construction will avoid the pouring of concrete.
  - The proposed pipe will be installed by coring through the quay wall.
  - The Contractor's method statement for the works will be reviewed by a suitably qualified ecologist.

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- The works to provide the outfall will be supervised by the suitably qualified ecologist to advise and direct the Contractor on compliance with the method statement.
- Washout of concrete transporting vehicles shall take place at an appropriate facility, offsite or where onsite wash out will be captured, for disposal off-site.

All design and construction will be carried out in accordance with the Construction Industry Research and Information Association (CIRIA) C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors.

Daily monitoring of the excavation/earthworks, the water treatment and pumping system will be completed by a suitably qualified person during the demolition / basement excavation and construction phases. Preventative measures will be implemented to ensure no entrained sediment, or deleterious matter directly into any drains or watercourses.

If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied.

The primary flood risk to the site is associated with coastal flooding. The Contractor will provide a ramp to the development site as a mitigation measure to prevent any flood waters to enter the main structure or the underground structure during the Construction Stage.

As coastal flooding is somewhat predictable (usually 24-36 hours in advance) the Contractor shall take note of when coastal flooding warnings are issued for the Limerick City area. In the event that a flood warning is issued, all plant and construction materials must be moved and stored in parts of the site that are located within Flood Zone C or above the estimated 1 in 1000 year return period coastal flood event (CFRAM). Therefore, in the event of floodwaters inundating the site, no materials will be washed from the site into nearby watercourses.

Requirements for Spill Control Measures

No oils/ fuels will be stored on the proposed development site for the purpose of refuelling on the site.

On-site plant will be refuelled by an external Contractor who will call to site as required. Road vehicles will not be refuelled at the site. Minor spills and leaks may occur from road vehicles and the

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onsite excavator. Any oils or fuels onsite will be removed by an experienced and authorised contractor.

Fixed plant shall be self-bunded; mobile plant shall be in good working order, kept clean, fitted with drip trays where appropriate and subject to regular inspection.

Spill kits and oil absorbent material shall be carried with mobile plant and located at vulnerable locations around the site to reduce the risk of spillages entering the sub-surface or groundwater environment; booms shall be held on site for works near drains or dewatering points.

The Contractor will train all operatives in the proper handling of materials, the sensitive nature of the wider drainage system, and the consequences of accidental spillage.

The following steps provide the procedure to be followed by the Contractor(s) in the event of any significant spill or leak:

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers;
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident;
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill;
- If possible, cover or bund off any vulnerable areas where appropriate such as drains or watercourses;
- If possible, clean up as much as possible using the spill control materials;
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited;
- Notify the Contractor immediately giving information on the location, type and extent of the spill so that they can take appropriate action and further investigate the incident to ensure it has been contained adequately;
- Verify if necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring, where necessary proposing additional the necessary; and,

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- The Contractor will notify LCCC and (if LCCC deem it appropriate) Inland Fisheries Ireland.

Water Quality Monitoring Requirements

The Contractor will produce and commence a Water Quality Monitoring Programme (WQMP) at least one month in advance of the construction programme including any enabling works to establish a baseline dataset, and continue throughout construction. The regularity of, and specification for water quality monitoring in this section has been agreed following consultation with IFI during EIAR production.

The baseline water quality dataset will include sampling at low tide, sampling at high tide, and (where possible should such events overlap with the pre-construction monitoring period) periods of elevated rainfall.

The WQMP will sample surface water discharge upstream and downstream from the proposed outfall to the Abbey River, in similar habitat and flow conditions, to enable siltation and other contaminants from the proposed development to be detected and distinguished from 'background' levels (including natural and man-made activities).

The WQMP will include relevant parameters from the European Communities (Quality of Salmonid Waters) Regulations, 1988 S.I. No. 293 as amended including Suspended Solids, pH, Dissolved Oxygen, Biochemical Oxygen Demand, hydrocarbons, Nitrites, Nitrates and heavy metals.

Testing for pH, turbidity and/or Total Suspended Solids will be carried out daily in-situ using a calibrated multi-parameter sonde (to 0.1 NTU accuracy), and fortnightly for all other parameters.

The WQMP will inform the Contractor's adaptive management of the temporary construction-phase drainage works, having regard for any consents or planning conditions.

The Contractor will provide WQMP results to the Ecologist and LCCC at least fortnightly (but immediately after a known silt release or other pollution incident), along with a record of any corrective actions taken by the Contractor to improve or repair performance of silt fencing or other surface water protection measures.

Highest standards of site management will be maintained and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the site and surrounding environment during construction. A named person will be given the task of overseeing the pollution prevention measures.

EIA TOPIC	PROPOSED IMPACT	CONSTRUCTION
	Construction Phase Materials Handling and Storage	Materials will be stored within the site compound and outside of areas identified as being at risk of flooding.
	Disposal of Materials	<p>All material to be disposed of off-site will be disposed of to a disposal facility licensed in accordance with Irish Waste Management Legislation. Where material is to be stockpiled on site prior to disposal, the contractor will control all run-off to prevent contamination of surrounding watercourses.</p> <p>Contaminated soil will be assessed to determine its constituents and disposed of offsite in accordance with Irish Waste Management Legislation.</p>
	Control of Concrete in relation to Water Quality	<p>Ready-mixed concrete will be brought to the Proposed Development site by truck. Measures for protection of watercourses from wet concrete shall be included in the CMPP. This will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil / groundwater or nearby surface watercourses.</p> <p>The pouring of concrete shall take place within a designated area to prevent concrete runoff into the soil / groundwater media. Washout of concrete transporting vehicles shall take place at an appropriate facility, offsite where possible, alternatively, where wash out takes place on-site, it shall be carried out in carefully managed on- site wash out areas.</p>
	Foul sewer controls	<p>Foul sewage arising from temporary toilets and sanitary facilities on the Proposed Development site will initially be discharged to an on-site receptacle which will be emptied by tanker on a regular basis for disposal. This arrangement will be in place until the construction of on-site facilities connected to the existing Irish Water wastewater network.</p> <p>It is anticipated that due to the scale of the Proposed Development that a canteen will be provided on site during construction. Provisions will be made for a grease trap at the canteen drain outlet and this drain will connect to the on-site receptacle and later to the foul sewer. Drumming of waste cooking oil within the canteen will also be provided.</p>
Air Quality and Climate	Fugitive emissions of dust	Demolition, earthworks and construction activities have been defined as a medium risk, while trackout activities have been defined as a small risk of dust impacts. IAQM guidance specifies that the highest category of risk should be applied to all activities when assigning mitigation measures to reduce dust emission from each of these four activities to low/negligible level. Procedures to assess deposition of dust shall undertaken on site. Due to the proximity of human and ecological receptors, measurement data shall be obtained from at least three points on the site boundary. A sampling

EIAR TOPIC	PROPOSED IMPACT	CONSTRUCTION
		<p>campaign, including baseline measurements (prior to construction), of sticky pads will consist of a suitable approach to collecting a catalogue of emitted dust particles. In addition to this the following section describes measures for the purpose of dust suppression that will be included in the CMPP which are considered standard practice.</p>
	<p>Measures Specific to Demolition (medium risk):</p>	<p>Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust);</p> <p>Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as water can be directed to where it is needed;</p> <p>Avoid explosive blasting, using appropriate manual or mechanical alternatives; and</p> <p>Bag and remove biological debris or damp down such material before demolition.</p>
	<p>Measures Specific to Earthworks:</p>	<p>Ensure excavated soil is stored in appropriate areas and removed from site as soon as practicable</p> <p>Use Hessian, mulches or tackifiers where it is not possible to cover with topsoil, as soon as practicable; and</p> <p>Only remove the cover in small areas during work and not all at once.</p>
	<p>Measures Specific to Construction:</p>	<p>Avoid scabbling (roughening of concrete surfaces)</p> <p>Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;</p>
	<p>Measures Specific to Trackout:</p>	<p>Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site;</p> <p>Avoid dry sweeping of large areas;</p> <p>Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; and</p> <p>Implement a wheel washing system to dislodge accumulated dust and mud prior to leaving the site</p>

EIAR TOPIC	PROPOSED IMPACT	CONSTRUCTION
		where reasonably practicable.
	Carbon reduction mitigation	Mitigation measures to reduce the impact which the proposed development may have on climate change will include the measures which are consistent with good practice regarding sustainable building design, safe bicycle storage and electric car charge points.
Noise and Vibration	Best Practical Means for noise reduction during construction.	<p>The contractor will follow Best Practicable Means (BPM) to reduce the noise and vibration impact on the local community, including:</p> <ul style="list-style-type: none"> <li>• Fixed and semi-fixed ancillary plant such as generators, compressors etc. to be positioned so as to cause minimum noise disturbance. If necessary, acoustic barriers or enclosures to be provided for specific items of fixed plant;</li> <li>• Use of site boundary acoustic barriers/hoarding to screen neighbouring receptors;</li> <li>• All plant used on site will comply with the EC Directive on Noise Emissions for Outdoor Equipment (2000/14/EC), where applicable;</li> <li>• Operation of plant in accordance with the manufacturer's instructions;</li> <li>• All major compressors to be 'sound reduced' models fitted with properly lined and sealed acoustic covers which are kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools to be fitted with mufflers or silencers of the type recommended by the manufacturers;</li> <li>• All plant used on site will be regularly maintained, paying particular attention to the integrity of silencers and acoustic enclosures;</li> <li>• Machines in intermittent use to be shut down in the intervening periods between work or throttled down to a minimum;</li> <li>• Drop heights of materials from lorries and other plant will be kept to a minimum;</li> <li>• Adherence to the codes of practice for construction working and piling given in BS 5228 and the guidance given therein for minimising noise emissions from the site;</li> <li>• Provision of rest periods during any prolonged noisy activities;</li> <li>• prohibition of the use of stereos and radios on site;</li> <li>• Compliance with normal construction working hours of 08:00-18:00 Monday to Friday, 08:00-</li> </ul>

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		<p>13:00 on Saturdays, with no working on Sundays or bank holidays, however if out of hours work is deemed necessary, it is subject to approval by LCCC; and</p> <ul style="list-style-type: none"> <li>Keeping local residents informed and provision of a contact name and number for any queries or complaints.</li> </ul>
	Use of site hoarding	<p>The site perimeter will have site hoarding which will provide some attenuation of noise to receptors on lower floors (first floor and below). Such hoarding will provide a conservative reduction of approximately 5dB.</p> <p>During particularly noise works, consideration shall be given to the implementation of mobile noise barriers. As with site hoarding, mobile noise barriers will only provide attenuation of noise at lower floor levels. With the use of such barriers, noise levels at lower floor levels of NSRs could be reduced by up to 10 dB. With the use of mobile noise barriers, noise levels during the majority of construction activities will be reduced to below the threshold values. Where the threshold values are exceeded, this shall not be by more than 6 dB (during the construction of access roads/car parking).</p>
	Vibration	<p>Consideration will be given to the times of day and duration of piling works to reduce potential annoyance as far as possible. Prior notification of piling works, along with information on anticipated durations and the negligible likelihood of damage to property, will provide reassurance to nearby residents.</p>
Landscape and visual	Inherent design mitigation	<p>The principal mitigation for the proposed development is inherent in the design of its architecture, public realm and open space, which has evolved through an iterative process of assessment and consultation. There are no operational management measures required in respect of townscape and visual issues.</p>
	Construction methods to reduce effects on visual amenity	<p>During the demolition and construction works of each, measures such as site hoardings and cleaning roads to remove any track out will be undertaken to reduce temporary effects on visual amenity. No additional mitigation is proposed further to that incorporated into the design.</p>
Traffic and Transport	The Construction Traffic Management Plan	<p>The plan provides:</p> <ul style="list-style-type: none"> <li>Location of site and materials compound;</li> <li>Location of areas for construction site offices and staff facilities;</li> </ul>

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- Details of site hoarding and security;
- Construction traffic will be limited to certain routes and times of the day, with the aim of keeping disruption to pedestrians, cyclist, general traffic and public transport to a minimum;
- During peak network hours (0800 – 0900 and 1700-1800) construction traffic movements will be discouraged;
- The daily construction programme will be planned to minimise the number of disruptions to the local highway network by staggering HGV movements to avoid site queueing;
- Measures to prevent spillage of spoil or materials on the public highway including the use of on-site wheel washing facilities and street cleaning measures;
- Any traffic management plans that may be required for a road closure or pedestrian footpath closure, including appropriate signage advance public notice procedures;
- monitoring and mitigation measures to minimise noise, dust and vibration impacts on any identified sensitive receptors;

Waste

In developing the C&D WMP, the contractor shall also take into account the requirements of Limerick 2030 Strategic Developments and Environmental Policy requirements, which includes minimising the quantity of waste and, in particular, eliminating waste disposed to landfill.

Construction will comply with the objectives of the SRWMP, including incorporating a system for the management of wastes in accordance with the waste management hierarchy that prioritises waste prevention and minimisation, followed by waste reuse and recycling. Disposal of waste shall only be considered as a last resort. The contractor will incorporate the reuse and recycling target of 70% for construction and demolition waste (excluding soil and stones) contained within the SRWMP.

Prior to the transfer of a waste off-site under a particular EWC Code for the first time, the contractor shall advise LCCC or its representatives of the proposed classification and shall only transfer the waste following agreement from LCCC or its representatives.

The contractor shall ensure that waste materials generated during the works are clearly identified as either hazardous or non-hazardous wastes, with reference to guidance from the Environmental Protection Agency where required and shall establish waste storage areas for the different types of waste that may arise. For each waste stream identified by the contractor, and for each additional waste stream that may arise during the course of the works, the contractor shall identify the

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following:

- The appropriate EWC Code;
- A suitable waste collection contractor in possession of a valid waste collection permit for the collection of the particular waste within Limerick city;
- The waste recovery or disposal site, including the transfer station where the waste may be transferred to upon leaving the site in possession of a valid Waste Facility Permit or Waste Licence, as appropriate; and
- The recovery or disposal method for the waste.

Only waste contractors in possession of a valid Waste Collection Permit shall collect wastes from the site. The contractor responsible for the waste shall ensure that the waste collection contractor:

- Is permitted to collect the particular waste;
- Is permitted to collect waste within Limerick City;
- Uses a waste collection vehicle identified on the waste collection permit; and
- Transfers the waste to a waste facility identified on the waste collection permit.

Prior to the commencement of the project, the contractor shall determine the quantity of waste expected to arise from its works, and LCCC or its representatives shall be advised accordingly.

Asbestos Removal

Following risk assessment, a number of demolition options for the safe cleaning and removal of ACMs prior to demolition of the buildings were identified.

A specialist asbestos removal contractor, whose staff are trained in asbestos removal as required under the Safety Health and Welfare at Work (Exposure to Asbestos) regulations 2006 (S.I. No. 386 of 2006), will remove ACMs as far as reasonably practicable, prior to demolition or refurbishment works commencing. ACM waste to be removed from site for disposal will be in sealed bags/containers and labelled appropriately.

Excavated material management

The contractor shall develop a Soil Management Plan (SMP) set out within the C&D WMP. The SMP shall outline proposals for the management and reuse of excavated materials from the site, where permitted in accordance with the relevant legislation; and, provided that the reuse meets

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engineering requirements, for material used within the works.

Where the contractor proposes to maximise the reuse of excavated soil in order to minimise the generation of waste, it shall set out how it proposes to manage and document this reuse to the satisfaction of LCCC or its representatives. This shall include the following:

- Identification and recording of the location from where the material was excavated;
- Delineation of areas where excavated soil is intended for disposal as waste, and where it is intended for reuse (where permitted);
- Delineation of areas of contaminated and uncontaminated soil (if present);
- Sampling of excavated soil (the number and location of soil samples);
- Details of the proposed laboratory to carry out the testing;
- The suite of parameters for which the soil is to be tested; and
- The criteria for assessing whether the soil is contaminated or uncontaminated.

The contractor shall establish the controls necessary to manage the generation, handling and storage of waste at the site.

These controls may rely on other plans within the CMPP, for example: the protection of stockpiles of contaminated soil against rainwater ingress and leachate runoff; the bunding of hazardous waste storage areas containing liquids (e.g. oils, paints); and the management of waste collection vehicles both within the site and when leaving the site (dust and noise).

The SMP shall indicate waste soil classifications to enable LCCC or appointed contractor to identify appropriate disposal/transfer routes for proposed excavated material, based on the nature of the material i.e. made ground or natural soil.

Service clearance, foundation excavation and pile arisings will/may be generated during the works. These shall be segregated, stockpiled on site and sampled. Soil waste classification shall be completed on these materials in order to identify an appropriate waste receiving facility.

Prior to the transfer of material from the site for export or to a specific waste permitted/licensed site, the appropriate waste classification data shall be submitted to the permit/licence holder to confirm

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the suitability of the material in writing for transfer to their facility.

In order to control off-site soil movements and undertake appropriate waste disposal/recovery, a comprehensive docketing system shall be detailed in the site construction waste management plan and implemented on site. A daily record (including preparing and reconciling waste transfer notes) of soil excavation at the site shall be maintained by the appointed contractor.

Documentation to be maintained in relation to soil wastes includes the following:

- The names of the agent(s) and the transporter(s) of the wastes;
- The name(s) of the person(s) responsible for the ultimate recovery or disposal of the wastes;
- The ultimate destination(s) of the wastes;
- Written confirmation of the acceptance and recovery or disposal of any hazardous waste consignments;
- The tonnages and EWC (European Waste Catalogue) Code for the waste soil materials;
- Details of each individual consignment dispatched from site:
  - Description of waste (grid cell number, stockpile number or type and origin of soil)
  - Date and time of dispatch from site
  - Name of haulage company
  - Details of Contractor and Haulier docket numbers
  - Vehicle registration number and driver name
  - Volume/weight of waste removed
  - Name of waste receiving facility
  - Date and time of arrival at waste receiving facility
  - Details of any rejected consignments
- The Waste Transfer Forms for hazardous soil wastes transferred from the site (stamped at receiving facility);

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- The Trans-frontier Shipment of Waste forms for hazardous soil wastes transferred abroad; and
- The results of any analysis conducted on excavated soil.

Waste transfer notes will be issued in triplicate. On dispatch, the note shall be signed by the issuing operative and one copy retained at the site office. The remaining two copies shall accompany the load and signed or stamped by the receiving facility. One of these signed copies shall be returned to the site office for reconciliation. It is noted that a suitably licensed hauler shall be appointed to transfer waste soil from site.

Material Assets

Services continuity during construction

All services are maintained unless this is agreed in advance with the relevant service provider and LCCC.

There may be some power outages required when making new connections. These will be facilitated in out of hour times to minimise impact on existing buildings and infrastructure.

All works in the vicinity of services apparatus will be carried out in ongoing consultation with the relevant utility company and/or LCCC and will be in compliance with any requirements or guidelines they may have.

Where new services are required, the contractor will apply to the relevant utility company for a connection permit where appropriate and will adhere to their requirements.

Biodiversity

Requirement for Method Statements

The Contractor shall produce site-specific Method Statements for review and agreement with the Ecologist and Inland Fisheries Ireland, to demonstrate adherence to specific, tried-and-tested pollution control measures .

Other Pollution Control Measures

The Contractor shall take all necessary precautions to prevent the pollution or silting of watercourses from the construction of the proposed development. The Contractor will take the following mitigation:

- Prior to excavation of the basement, the proposed foul and storm water sewers in Michael Street will be laid and commissioned to allow the existing combined sewer to be diverted. During the construction of the new sewers, surface water arising from the development will continue to discharge to the combined sewer. Surface water collected will be treated by

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sedimentation prior to discharge to the existing combined sewer. Total Suspended Solids (TSS) and colour will be monitored daily by a hand held multi parameter sonde.

- Neither ground water or surface water runoff from the working areas will be permitted to discharge directly to the Abbey River or Shannon River. Run off generated within the site during construction will be filtered and treated to remove hydrocarbons and sediment. Total Suspended Solids (TSS), pH/EC and colour will be monitored daily by a hand held multi parameter sonde. In addition, the outlet from the sedimentation pond will incorporate a turbidity monitor with alarm at high level. In the event of surface water failing to meet the required standards, as set out in the discharge licence, water will be recirculated to the inlet of the sediment pond to provide further time for settlement. A penstock will be provided on the outlet from the sediment pond to control discharge from the site.
- No pouring of concrete will occur during the construction of the outfall, albeit localized grouting would be required (see Section 16.5.1.2).
- Maintain and monitor the performance of the surface water drainage network throughout the construction of the proposed development (as per monitoring is set out under **Error! Reference source not found.**), noting that the proposed storm sewer will include a permanent hydrocarbon separator which will treat runoff from Michael Street.
- In the event of surface water failing to meet the required standards, as set out in the discharge licence, water will be recirculated to the inlet of the sediment pond to provide further time for settlement. A penstock will be provided on the outlet from the sediment pond to control discharge from the site.
- Where the Contractor utilises pumping to drain works areas, a back-up pump and generator shall be provided on site for use in the event of the primary pump failing.
- Cover all temporary stockpiles generated during construction to minimise run-off;
- Locate spoil and temporary stockpiles in locations which are at least 15 m from drainage systems, the Abbey River and the River Shannon'
- Avoid direct or indirect discharges of untreated surface or ground water generated during the proposed development, to any surface water;
- Dewater all working areas at the end of each working day, if necessary using pumping and transport of water off-site in tankers if volumes prevent effective attenuation and treatment

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prior to discharge; and,

- Use wheel washers and dust suppression on site roads (to be captured within the proposed SUDS system) and undertake daily plant maintenance checks and corrective actions where required.
- Establish contingency measures to cater for potential impacts to unknown services underlying the construction site (for example, old sewers, culverts)
- Identify whether shallow groundwater monitoring wells on site will be maintained and protected during construction works; decommissioned; or removed completely as part of excavation works, to prevent them from acting as direct pathways for contamination to enter the groundwater body beneath the site
- Excavation:
  - All excavated materials will be inspected for signs of possible contamination, such as staining or strong odours;
  - Should any unusual staining or odour be noticed, this made ground / subsoil will be segregated and samples analysed for the presence of possible contaminants in order to determine an appropriate disposal outlet; and,
  - Excavated made ground and subsoil will be disposed to licensed / permitted waste management facilities, as appropriate for the waste classification of the material.
- Importation of fill:
  - The Contractor will vet the source of aggregate, fill material and topsoil imported to site in order to ensure that it is of a reputable origin and that it is “clean” (i.e. it will not contaminate the environment).
  - The Contractor and/or LCCC will implement procurement procedures to ensure that aggregate, fill material and topsoil are acquired from reputable sources with suitable environmental management systems as well as regulatory and legal compliance.
- Disposal of materials
  - All material to be disposed of off-site to a facility licensed having regard for Irish Waste management legislation. Where material is to be stockpiled on site prior to disposal, the

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		<p>Contractor will control all run-off to prevent contamination of surrounding watercourses.</p> <ul style="list-style-type: none"> <li>• Contaminated soil will be assessed to determine its constituents and disposed of offsite having regard for Irish waste management legislation; and,</li> <li>• The Contractor will dispose of all alkaline wastewaters and contaminated storm water off-site having regard for Irish waste management legislation.</li> <li>• Control of concrete: <ul style="list-style-type: none"> <li>• Ready-mixed concrete will be brought to the proposed development site by truck.</li> <li>• The pouring of concrete shall take place within a designated area to prevent concrete runoff into the drainage network, watercourses, or soil / groundwater media.</li> <li>• During construction no pouring of concrete will occur during the construction of the outfall. Works to locally grout and otherwise repair Charlotte Quay, following installation of the proposed outfall will be supervised by the Ecologist or other suitably experienced ecologist who will advise and direct the Contractor such that contaminated surface water does not enter the Abbey River.</li> <li>• Washout of concrete transporting vehicles shall take place at an appropriate facility, offsite or where onsite wash out will be captured, for disposal off-site.</li> </ul> </li> </ul>
	<p>Minimising pollution risks associated with flooding</p>	<p>The Contractor will provide a ramp to the development site as a mitigation measure to prevent any flood waters to enter the main structure or the underground structure during the Construction Stage.</p> <p>As coastal flooding is somewhat predictable the Contractor shall take note of when coastal flooding warnings are issued for the Limerick City area (usually c. 24-36 hours in advance). In the event that a flood warning is issued, all plant and construction materials must be moved and stored within areas only at risk from the 1 in 0.1% AEP coastal flood event (i.e. areas within 'Flood Zone C' as defined by OPW and DoEHLG (2009), which includes parts of Patrick Street, Ellen Street and Rutland Street). In this way, in the event of floodwaters inundating the site, no materials will be washed from the site into nearby watercourses.</p>
	<p>Spill Control Measures</p>	<p>No oils/fuels will be stored on the proposed development site for the purpose of refuelling on the site.</p> <p>On-site plant will be refuelled by an external Contractor who will call to site as required. Road</p>

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vehicles will not be refuelled at the site. Minor spills and leaks may occur from road vehicles. Any oils or fuels onsite will be removed by an experienced and authorised contractor.

Fixed plant shall be self-bunded; mobile plant shall be in good working order, kept clean, fitted with drip trays where appropriate and subject to regular inspection. Drip trays will be covered, and the Contractor will empty their contents regularly as required, and dispose of off-site having regard for relevant waste legislation.

Spill kits and oil absorbent material shall be carried with mobile plant and located at vulnerable locations around the site to reduce risk of spillages entering the sub-surface or groundwater environment; booms shall be held on-site for works near drains or dewatering points

The Contractor will train all operatives in the proper handling of materials, the sensitive nature of the River Shannon, Abbey River (and the drainage system which is hydrologically connected to these Rivers), and the consequences of accidental spillages.

The following steps provide the procedure to be followed by the Contractor(s) in the event of any significant spill or leak.

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers;
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident;
- Contain the bulk of the spill immediately using a spill kit before placing the contaminated absorbent material and the contaminated soil in a stockpile outside the 1% Annual Exceedance Probability (AEP) floodplain (and at least 10 m from, and downslope of any drainage system or The Abbey River or River Shannon),
- Place all contaminated material on and cover with plastic to prevent leachate generation, until such time as it can be removed off-site by an appropriately licensed waste management company;
- If possible, cover or bund off any vulnerable areas where appropriate such as drains;
- Notify a fully licensed waste Contractor immediately giving information on the location, type and extent of the spill so that they can take appropriate action to further investigate the incident to ensure it has been contained adequately, and so that the fully licensed waste Contractor can, subject to the appropriate permits, dispose of the contamination off-site having

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regard for relevant legislation; and,

- Notify LCCC and (if LCCC deem it appropriate) Inland Fisheries Ireland (IFI).

Emergency Response and Environmental Training

The Contractor will produce an Emergency Response Plan (ERP) based on the Contractor's own Risk Assessment, which will be reviewed by the Employer's Representative Team, Including the Ecologist. The ERP will include:

- The Contractor's proposed training of relevant staff, including cover staff, in the implementation of the ERP and the use of spill kits;
- Details of procedures to be undertaken by the Contractor in the event of the release of any sediment into a watercourse, or any spillage of chemicals, fuel or other hazardous wastes, non-compliance incidents with any permit or licence, or other such risks that could lead to a pollution incident, including flood risks;
- Confirmation of the number and specification of spill kits which shall be carried by the Contractor;
- Information on clean-up procedures as specified above under 'Spill Control Measures'.

Minimising habitat loss in protected sites

A Mobile Elevated Working Platform (MEWP), parked on Charlotte's Quay, will allow Contractors to access the limestone wall from the Abbey River side of the existing quay wall, whilst avoiding instream works. The Contractors will use a coring method (i.e. drilling from north to south), which will avoid any material from entering the Abbey River. This will avoid any disturbance to QI bryophyte communities located c.1 m below the proposed outfall location. There will be no pouring of concrete for the installation of the proposed outfall, albeit Contractors will be permitted to locally grout the finished outfall.

The Ecologist will review and input to the method statement produced by the Contractor to ensure the method statement contains the specific measures identified in the previous paragraph.

The Ecologist or other similarly experienced ecologist will then supervise the works to Charlotte Quay and direct or advise the Contractor as appropriate, to ensure the method statement and mitigation are implemented, and bryophyte communities and water quality of the Lower River Shannon SAC are protected.

Minimising effects of construction on

**Bats (Roosting)**

The mitigation will be compiled into a derogation licence application and submitted to the Wildlife

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specific species.

Licensing Unit (WLU) of the NPWS. The licence application will take account of any comments by relevant parties including the NPWS received in the course of An Bord Pleanála determination, and any relevant planning conditions. The mitigation in the derogation licence application will have regard for relevant guidance including the NPWS Bat Mitigation Guidelines for Ireland (Kelleher & Marnell, 2006). All measures in the derogation licence application will be subject to change having regard for the requirements of the NPWS including any licence conditions.

Prior to construction, the Ecologist will notify the Contractor, who in turn shall make all site personnel aware of, the structure to the rear of 9 Rutland Street known to contain roosting bats. The Ecologist will also notify the Contractor of the strict legal protection applicable to bats and their roosts, and input to the construction programme including phasing of structural works, having regard for relevant licence conditions.

A notice will be erected at 9 Rutland Street to identify it as a legally protected bat roost to ensure no works take place unless clear instruction is given from the Ecologist that it is safe and legally compliant to do so.

Contractors will receive training by the Ecologist to advise them what to do in the event that bats (whether live or dead) are discovered in structures during works (i.e. stop works when it is safe to do so and contact the Ecologist).

Subject to any licence conditions, any works to 9 Rutland Street will be carried out outside the summer months (i.e. from 1<sup>st</sup> September to 1<sup>st</sup> May only). This has been determined to be appropriate for a summer roost, which is not a proven maternity site, having regard for NPWS guidance (Kelleher & Marnell, 2006). This timeline may change subject to the requirements of the NPWS and conditions of any derogation licence issued by them. The Contractor(s) will be informed of any such changes to timelines.

Even when carried out during the recommended season, works to 9 Rutland Street will be completed with the expectation that bats may be found, and having regard for any licence conditions. Caution will be exercised during the removal of any roofing material from 9 Rutland Street as bats may be underneath even in winter. Where required, the Contractor will remove tiles of 9 Rutland Street by hand. If bats are found, all works will cease, until the Ecologist has been contacted, and the Ecologist has in turn contacted the NPWS WLU.

As shown in Figure 16.3 (and Drawing OPRA-ACM-Z3B-ZZ-DR-AR-13001), a total of 1 no. 'bat

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brick' to the specification of "Habibat Bat Box - Custom Brick Facing<sup>2</sup>" or equivalent and 1 no. 'bat tile' to the specification of Habibat Bat Access slate<sup>3</sup> or equivalent have been included in the design of 4 and 5 Rutland Street respectively, which is located close to the existing roost site in 9 Rutland Street.

The bat brick and tile have been incorporated into 4 and 5 Rutland Street in a location where there is no obstruction to bat flight. Uplighting will be excluded from the façade of these structures.

Prior to commencement of construction, the Ecologist will be consulted regarding the phasing of demolition of the roost at 9 Rutland Street. Where the Ecologist deems it necessary, or as per any licence requirements, provision may be made for a temporary roosting structure in the vicinity of 9 Rutland Street (e.g. bat box to appropriate specification), to ensure continuity of roosting provision until the (permanent) bat brick and tile are installed.

As annotated on Figure 16.3 (and Drawing OPRA-ACM-Z3B-ZZ-DR-AR-13001), Breathable Roofing Membranes (BRMs) will not be installed into the roof of 4 or 5 Rutland Street. Only bituminous roofing felt that does not contain polypropylene filaments, or similar to be agreed with a bat ecologist, will be used. For example, bitumen felt type 1F, which is reinforced hessian.

Water tanks sited within roof spaces will be permanently covered to prevent future accidental drowning of bats.

### **Bats (Foraging)**

No planting is proposed in addition to that in the landscape planting plan which includes, in Bank Place, native Alder trees and some flowering plants (e.g. *Salvia nemorosa*) would provide nectar for bees and insects. These in turn, would provide food for birds and bats.

Mitigation to minimise the potential impacts of lighting on foraging and roosting bats is proposed in Section **Error! Reference source not found.**

### **Nesting Birds (including Swifts)**

Structural works to building exteriors will not be carried out between March and August inclusive, unless otherwise agreed with the Ecologist. Where the construction programme does not allow this

<sup>2</sup> Available from: <http://www.nhbs.com/title/183578/habibat-bat-box-custom-brick-facing> . Accessed December 2018.

<sup>3</sup> Available from <http://www.nhbs.com/title/192461/habibat-bat-access-slate>. Accessed December 2018.

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seasonal restriction to be observed, buildings will be surveyed by a suitably experienced ecologist for the presence of nesting birds prior to commencement of demolition works.

In the case of roof-nesting gulls, a Mobile Elevated Working Platform may be required to visually inspect roofs, if adequate views are not available from ground level or adjacent buildings. Nesting bird surveys will follow the species-specific guidance in the British Trust for Ornithology's Field Guide to Monitoring Nests (Ferguson et al, 2011).

Where nests are found within structures to which works are proposed, or within the potential Zol of indirect disturbance as determined by a suitably experienced ecologist, the suitably experienced ecologist will advise the Contractor(s) if a licence is required from the NPWS to permit disturbance and/or removal of any nests, or if works must be delayed until nesting has been shown to have finished, following survey by a suitably experienced ecologist.

Structural works to buildings found not to contain nests, shall be completed within three days of bird surveys, or repeat nesting surveys will be required.

**Nesting Swifts (Additional Measures)**

As shown in Figure 16.3 (and Drawing OPRA-ACM-Z3B-ZZ-DR-AR-13001), one swift brick with starling barrier to the specification of 16S Schwegler Swift Box (with Starling Barrier)<sup>4</sup> or equivalent has been incorporated into the design of the façade of No. 5 Rutland Street.

Grids will be installed on any ventilation holes on the building exterior, and this must be implemented from September to April inclusive during the non-breeding season to avoid unwanted occupation by birds of other sites in buildings during the breeding season.

Role of the Ecologist

The Employer's Representative (ER) Team shall engage a suitably experienced ecologist (the Ecologist). The Ecologist will be a full member of a relevant professional institute such as the Chartered Institute of Ecology and Environmental Management (CIEEM), have relevant experience in the management of ecological constraints during construction, and hold or have held a protected species licence (s) in the Republic of Ireland.

The Ecologist shall be appointed sufficiently in advance of construction to arrange for any mitigation requirements (including licensing) to be incorporated into the Contractor's site-specific Method

<sup>4</sup> Available from <http://www.nhbs.com/title/177997/16s-schwegler-swift-box-with-starling-barrier> Accessed 31st May 2017.

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Statements and programme.

The Contractor will accommodate the Ecologist, whose role will be to:

- Communicate relevant findings to LCCC, and other stakeholders as relevant;
- Advise the Contractor on phasing of relevant works (including structural works in relation to nesting birds and roosting bats);
- Review Contractor Method Statements for compliance with the mitigation in this EIAR, and any licenses to avoid damage or disturbance to designate sites or protected species; and,
- Attend site meetings and input to Contractor toolbox talks prior to commencement of construction.

Archaeological and Cultural Heritage

Identifying archaeology under buildings once demolished.

A targeted programme of archaeological test trenching will be carried out following the demolition of structures proposed for removal and prior to any invasive enabling works, including the insertion of the secant piled walled around the perimeter of the site. The programme of testing will allow for an assessment of the presence, location, extent, value and sensitivity of potential archaeological remains at the site. This work will be carried out by a qualified archaeologist, under licence from the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.

Archaeological mitigation, such as monitoring or excavation, may be required dependant on the results of this investigation. Full provision will be made available for the resolution of any archaeological remains, both on site and during the post excavation process, should this be deemed the appropriate manner in which to proceed.

Architectural Heritage

Mitigation for Parcel 3B – 4 and 5 Rutland Street

The shopfront and limestone door case to No. 5 to be retained and restored to best conservation practice. The modern shopfront to No. 4 will be replaced. Removal of the existing shopfront to be monitored to ascertain whether earlier joinery is retained behind.

Limestone window sills to the front elevation of No. 4 to be retained. Rear return to No. 5 to be retained. Balconies to be glazed to rear elevation of No. 5 to minimise visual impacts.

Aluminium and uPVC windows to be replaced with multiple pane timber sash windows.

All surviving historic internal fittings to No. 5 Rutland Street to be retained, including in particular the

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	<p>staircase (to be repaired), architraves, dado rails and ceiling plasterwork.</p> <p>The proposed new doorways off the landings of the staircase in to No. 4 are proposed in order to allow for the retention of the original floor plan of No. 5 to each floor level.</p>
<p>Building specific mitigation for Parcel 3A/4 – 8 and 9 Rutland Street, Town Hall (Protected Structure)</p>	<p>The buildings will be interconnected at ground and third floor levels only where existing levels allow, in order to retain the original floor levels of all three buildings.</p> <p>The main rooms of the town hall will be restored with later partitions removed and the floor plan retained. The existing open well staircase and vaulted cellars to the basement of the town hall will be also be retained.</p> <p>The staircases to Nos. 8 and 9 will be retained as will existing floor levels which will maintain the relationship to the windows of the front elevation.</p>
<p>Building specific mitigation for Parcel 2B (9 Ellen Street)</p>	<p>Best conservation practice will be followed for the repair of stonework, roofs and other external fabric.</p> <p>Timber sash windows to the Ellen Street elevation will help to restore the historic character of the building and will have a positive impact on the streetscape.</p> <p>The large internal spaces will be retained with little subdivision or partition which will retain the character of the building internally. Surviving features such as columns, colonnade, existing panelled doors and flagged basement area etc. will be retained.</p>
<p>Building specific mitigation for Parcel 6 (The Granary – Protected Structure)</p>	<p>Proposed works will avoid any physical impact on the vaulted ceiling over the ground floor, carriage arch to Bank Place, or main street elevations.</p> <p>The proposed new external staircase to the courtyard shall be designed to minimise loss of existing fabric to the west elevation and to require minimal intervention to the walls of the granary for construction.</p> <p>Best conservation practice shall be followed for any works carried out to the historic building, including to its structure, roof and external stonework.</p> <p>Landscaping materials for the proposed works to the courtyard of the granary shall be sensitive to</p>

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the character of the historic building.

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General mitigation associated with  
historic buildings on the Opera site

An accredited Conservation Architect will be appointed to oversee all works on the site and should be present from the commencement of the project. No works, including opening up, stripping out or demolition works shall be carried out to the existing buildings on the site without the appointment of a Conservation Architect.

All existing records and documentation of the existing buildings shall be updated by the findings of opening up and stripping out works. There may be some instances where the scope of recording work will be widened to include detailed record drawings and some material and finishes analysis. Only once these inspections and records have been completed shall the contractor continue with any demolition work as allowed in the planning permission.

Prior to commencement of works, a method statement will be provided by the Conservation Architect for the recording and dismantling of the doorcase at 6 Rutland Street to include details for safe storage and reinstatement in location indicated on the planning drawings.

Other items and features of architectural heritage value to be removed from site will be recorded in detail prior to dismantling. This to include the area to the rear of the Town Hall and the gateway adjacent to the Granary Building.

Prior to the commencement of works, a detailed methodology will be prepared by the Conservation Architect and Structural Engineer appointed to the project for the existing buildings on the site, during and after demolition works, from damage caused by vibration, construction traffic, water ingress and other factors which may accelerate their deterioration in condition.

With the exception of No. 6 Patrick Street, all existing Georgian buildings will be retained to the Opera Site. Areas of physical impact on the existing buildings in the form of demolition are concentrated in a small number of areas, principally to the rear elevations where additions and alterations to the original buildings have accumulated over the years.

The principal elevations of the historic buildings will be repaired using best conservation practice. The external stone work and brick work of the historic buildings will be repaired and repointed as necessary, using a suitable mortar mix as per Conservation Architect's instruction.

The historic roofscapes of all existing buildings are to be retained, including brick parapets, pitched roofs and brick/stone chimney stacks. All proposed new building elements are designed to the rear

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of these buildings and will not necessitate alterations to the historic roofs.

There are a small number of surviving historic timber sashes to the buildings. These sashes will be repaired where possible and the surviving glazing bars used to provide suitable profiles for replacement sash windows for the front elevations of the Georgian terraced buildings.

The existing historic buildings to the site (with the exception of the granary building) are in poor, or extremely poor, repair with regard to their structure and/or historic fabric. All buildings have been carefully inspected, and those found to retain significant historic internal fabric have been recorded and will be repaired in a sensitive manner, with internal fittings and fabric reused where condition allows.

Existing floor levels to all historic buildings are to be retained, allowing for a meaningful relationship internally between the floor plans, individual rooms and the historic fenestration pattern.

All historic buildings will retain small retail uses to the ground floor, having active shopfronts, and will retain independent access from the street to the upper floors, regardless of whether the buildings have been integrated with new buildings to the rear. Where historic shopfronts, or elements of shopfronts, survive, these will be retained and repaired.

Existing laneways and carriage arches from the streets to the interior of the site will be maintained and remain open to provide access to the buildings and public plaza within the site. Historic fabric found to these laneways, such as cobblestones or setts, wheel guards, decorative grills or other street furniture should be preserved and reused in situ.

All new buildings are designed in a contemporary manner and will allow the existing historic buildings to be easily read within the new streetscapes. Proposed alterations to the rears of historic buildings will have a light touch, minimising damage to the historic fabric of the rear elevations, and with maximum glazing to allow views of the original rear elevations.

The proposed materials for the new buildings reference the existing historic building fabric on the site without attempting to reproduce any architectural details of the historic buildings, allowing the Georgian buildings to retain their own character and significance. The variety of materials used in the construction of the historic buildings which includes ashlar limestone, rubble stone and brick is reflected in the contemporary materials proposed as finished to the new structures.

Detailed fabric analysis and recording of the historic fabric of the individual buildings should be

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carried out prior to the commencement of work in order to establish the nature and location of significant surviving fabric and architectural features. These records shall include drawings (elevations, plans and sections) at appropriate scales and in addition to recording historic fabric should detail condition issues such as deflections in brickwork, cracking to masonry (internal and external), fissures in ceilings and faults to flooring. These records shall be supplemented by photographs illustrating the issues. This detailed analysis of the condition of the buildings will supplement the existing structural condition reports and assist in determining the extent of historic fabric which can be retained and in pricing remedial works.

## **Appendix D Ecology Figures referenced in Mitigation and Monitoring Table**



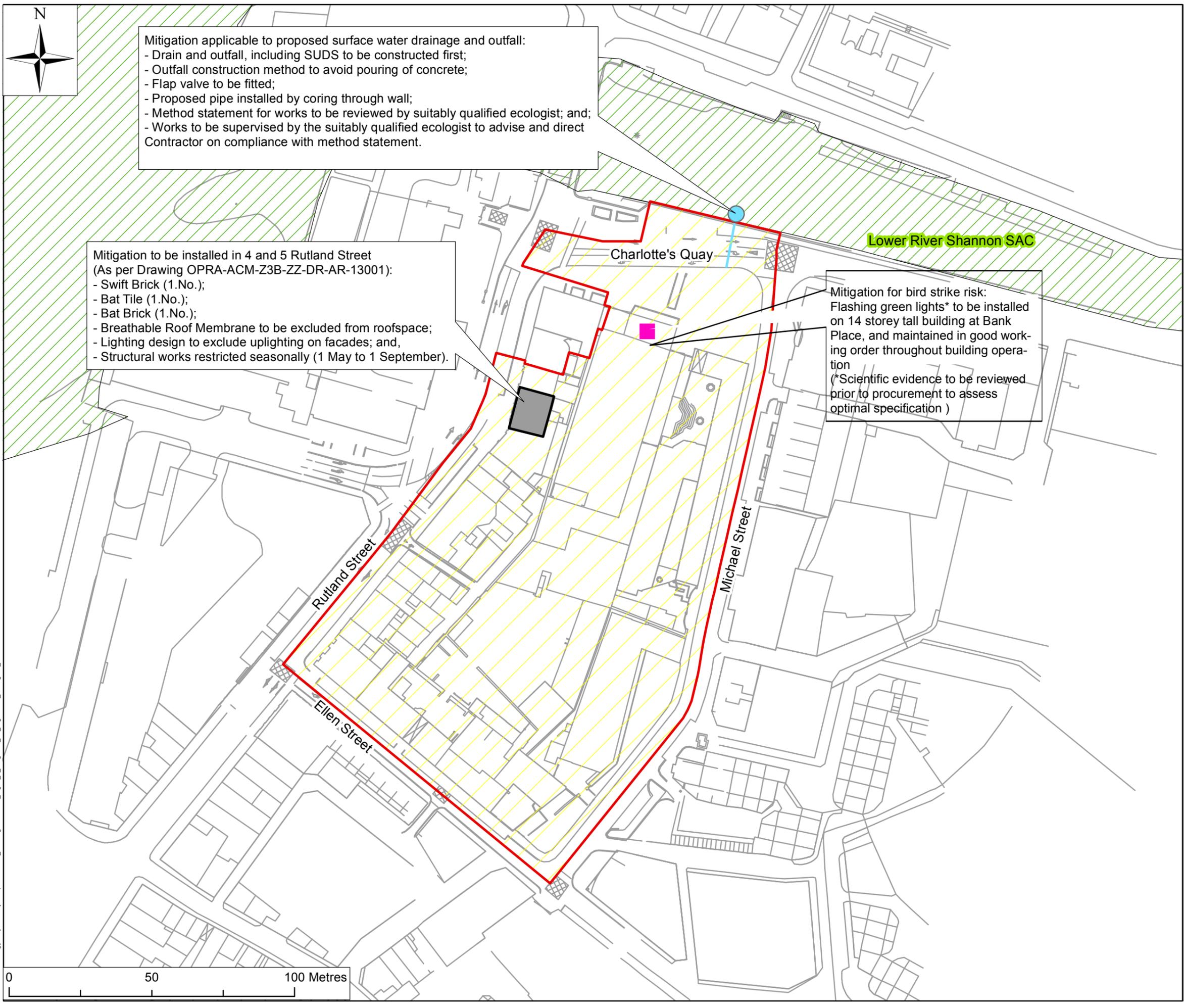
Mitigation applicable to proposed surface water drainage and outfall:

- Drain and outfall, including SUDS to be constructed first;
- Outfall construction method to avoid pouring of concrete;
- Flap valve to be fitted;
- Proposed pipe installed by coring through wall;
- Method statement for works to be reviewed by suitably qualified ecologist; and;
- Works to be supervised by the suitably qualified ecologist to advise and direct Contractor on compliance with method statement.

Mitigation to be installed in 4 and 5 Rutland Street (As per Drawing OPRA-ACM-Z3B-ZZ-DR-AR-13001):

- Swift Brick (1.No.);
- Bat Tile (1.No.);
- Bat Brick (1.No.);
- Breathable Roof Membrane to be excluded from roofspace;
- Lighting design to exclude uplighting on facades; and,
- Structural works restricted seasonally (1 May to 1 September).

Mitigation for bird strike risk: Flashing green lights\* to be installed on 14 storey tall building at Bank Place, and maintained in good working order throughout building operation (\*Scientific evidence to be reviewed prior to procurement to assess optimal specification )



**LEGEND**

- Proposed Development Site
- Proposed Surface Water Drainage
- Special Area of Conservation (SAC)
- 4 and 5 Rutland Street
- Buildings potentially containing nesting birds; seasonal works triggered
- Strobe light location (Proposed Tower: Bank Place)

**Notes:**

- Refer to Chapter 16 for full suite of biodiversity mitigation.
- Other pollution mitigation during construction related to flood risk, phasing and drainage works is detailed in Chapter 8 of EIAR.

**AECOM Internal Project No:**  
 60568520

**Drawing Title:**  
 FIGURE. 16.3. MITIGATION FOR SIGNIFICANT ECOLOGICAL FEATURES

**Scale at A3:** 1:1,250  
**Date:**  
 08/03/19

**Drawn: Chk'd: Ver'd App'd:**  
 SW KM RF RF

Filename: X:\Ecology Projects\Opera\GIS\07\_Working\20190130\_Fig16\_3\_Mitigation\_for\_Significant\_ecological\_features.v11.mxd

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