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1 INTRODUCTION & BACKGROUND TO PROJECT

1.1 BACKGROUND

Ryan Hanley in partnership with McCarthy Keville O'Sullivan has been commissioned by the OPW to prepare a Stage 1 Appropriate Assessment (AA) Screening Report for the River Bride (Blackpool) Certified Drainage Scheme. The AA Screening report assesses Site Investigation works, construction works and the operational stage of the proposed drainage scheme. The preferred option for the drainage scheme comprises of a combination of flood walls, culverting a section of channel, bridge replacement and other minor works. The preferred option will be designed to cater for the 1% Annual Exceedance Probability (AEP) flood event (also known as the 100 year flood event). The design of the proposed works is adaptable for future climate change in accordance to office of Public Works guidance in relation to climate change and also includes an allowance for freeboard.

The purpose of the AA screening is to determine the effects, if any, that the proposed works will have on Natura 2000 sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA)), within the potential zone of influence of the works.

This report constitutes Appropriate Assessment Screening for proposed works for the River Bride (Blackpool) Certified Drainage Scheme. in accordance with Article 6.3 of the EU Habitats Directive (92/43/EEC).

1.2 THE REQUIREMENT FOR APPROPRIATE ASSESSMENT

The requirement for Appropriate Assessment is set out in the EU Habitats Directive (92/43/EEC) in Article 6 (3) which states:

> *"Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives."*

The Habitats Directive is transposed in Ireland by the European Communities (Birds and Natural Habitats) Regulations, 2011 (consolidating the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats) (Control of Recreational Activities) Regulations 2010, as well as addressing transposition failures identified in recent CJEU Judgements) (hereafter referred to as the Habitats Regulations) and the Planning and Development (Amendment) Act, 2010.

1.3 THE AIM OF THIS REPORT

This Screening for Appropriate Assessment (Stage 1) has been prepared in accordance with current guidance and provides the information required in order to establish whether or not the proposed development is likely to have a significant impact on the Natura sites in the context of their conservation objectives and specifically on the habitats and species for which the Natura 2000 sites have been designated.

By undertaking the ecological impact assessment in a step by step manner in relation to the habitats and species of the Natura 2000 sites, this report seeks to inform the screening process required as the first stage of the process pursuant to Article 6.3 of the EU Habitats Directive.

2 THE APPROPRIATE ASSESSMENT PROCESS

2.1 GUIDANCE

Article 6(3) of the EU Habitats Directive (92/43/EEC) defines the requirement for Appropriate Assessment of certain plans and projects. In order to inform the requirements of this Screening Report the following guidance documents have been referred to:

- DoEHLG Circular NPWS 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities.
- DoEHLG Circular L8/08 Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments. Department of Environment, Heritage and Local Government.
- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environmental Heritage and Local Government.
- European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.
- European Commission (2000) Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg. European Commission.
- European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC
- European Commission (2006) Nature and biodiversity cases: Ruling of the European Court of Justice. Office for Official Publications of the European Communities, Luxembourg.
- European Commission (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/49/EEC; clarification of the concepts of: Alternative solutions, Imperative reasons of overriding public interest, Compensatory Measures, Overall Coherence, Opinion of the Commission.
- European Commission (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/49/EEC; clarification of the concepts of: Alternative solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission. Office for Official Publications of the European Communities, Luxembourg.
- European Commission (2013). Interpretation Manual of European Union Habitats. Version EUR 28. European Commission
- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No.477 of 2011).
- Ryan Hanley (2014a) Stage 1: Appropriate Assessment Screening Methodology for the Maintenance of Arterial Drainage Schemes. Prepared by Ryan Hanley on behalf of the Office of Public Works.
- Ryan Hanley (2014b) OPW Drainage Maintenance Categories Source » Pathway » Receptor Chains for Appropriate Assessment. Prepared by Ryan Hanley on behalf of the Office of Public Works

2.2 STAGES OF ARTICLE 6 ASSESSMENT

The European Commission's guidance promotes a staged process, as set out below, the need for each being dependent upon the outcomes of the preceding stage.

(1) Screening

(2) Appropriate Assessment

(3) Assessment of Alternative Solutions

(4) Assessment where no alternative solutions remain and where adverse impacts remain.

- The "IROPI test" (Imperative Reasons of Over-riding Public Interest) and compensatory measures.

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures.

Stage 1 of the process is intended to identify whether the project is 'likely to have a significant effect' upon a European site, referred to as 'Screening for Appropriate Assessment'.

If the screening process identifies effects to be significant, potentially significant or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). Screening is undertaken without the inclusion of mitigation, unless potential impacts clearly can be avoided though the modification or redesign of the plan or project, in which case the screening process is repeated on the altered plan or project. The greatest level of evidence and justification will be needed in circumstances when the process ends at screening stage on grounds of no impact.

Section 177U of the Planning and Development Act 2010 states that; "*the competent authority shall determine that an appropriate assessment of the proposed development is not required if it can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will not have a significant effect on a European site.*"

Stage 2 of the process considers any potential impacts in greater detail including whether further mitigation measures are required. If an adverse impact upon the site's integrity cannot be ruled out then Stage 3 will need to be undertaken to assess whether alternative solutions exist. If no alternatives exist that have a lesser effect upon the Natura 2000 site/s in question, the project can only be implemented if there are 'imperative reasons of overriding public interest', as detailed in Article 6(4). In essence, the work at Stage 1 will determine whether further stages of the process are required.

This report includes the testing required under Stage 1: Screening for Appropriate Assessment.

2.3 REPORT FORMAT

In complying with the obligations under Article 6(3) and to be consistent with the Guidance for Planning Authorities, this report has been structured as follows:

- Description of the Plan/Project;
- Identification of Natura 2000 sites, and the associated Conservation Objectives, which may be potentially affected;
- Identification and description of individual and cumulative impacts likely to result from the Plan/Project;
- Assessment of the significance of the impacts identified above on site integrity.
- Exclusion of site where it can be objectively concluded that there will be no significant effects.

3 DESCRIPTION OF THE PROJECT

3.1 STUDY AREA

The study area for the Blackpool Flood Relief Project encompasses three major watercourses: the Bride (North), the Glenamought and the Glen (Figure 3.1). The total catchment area upstream of Blackpool Village is 41.7 km2. The Bride (North) rises in the townland of Ballycannon, near Healy's Bridge, before flowing in an easterly direction towards Cork City. The Glenamought River rises in Whitechurch and flows in a southerly direction before making an abrupt right-turn in the townland of Ballincrokig. The Bride (North) and the Glenamought meet each other in a culverted system at the North Point Business Park on the N20. The Glen River flows in a westerly direction from Mayfield, through the Glen River Park, before entering a culvert under Spring Lane. It then merges with the Bride (North) in a large culvert junction under Madden's Buildings, 100m downstream of Blackpool Church. Downstream of the confluence of the Bride (North) and the Glen, the watercourse has traditionally been known as the Kiln River. The Kiln River discharges to the River Lee at Christy Ring Bridge. The culverted system in Blackpool has been incrementally constructed since the early the 1980s as part of the Glen-Bride-Kiln River Improvement Scheme which was commissioned by Cork Corporation in 1981. The topography of the entire catchment varies between 188mOD at Whitechurch and 25mOD in the Blackpool river valley. The location of the proposed works is in a largely urbanised area . The upper reaches of the Bride(north), close to its confluence with the Glenamought River and within the vicinity of North Point Business Park are the least urbanised sections of the river. This section of the river is short and features a riparian zone containing Scrub (WS1), open grassy areas categorised as Dry meadow and grassy verge (GS2), amenity grassland (GA2), improved agricultural grassland (GA1), hedgerow (WL1) and buildings and artificial surfaces (BL3) and Mature treelines (WL2).

Downstream of Commons Inn, the river flows through a series of operational and derelict industrial areas and is typically retained by flood walls. Riparian species here are more typical of wasteground. Further downstream habitats adjacent to the Bride (north) within the works area include recreational parkland including scattered trees and amenity grassland categorised as scattered trees and parkland (WD5). A small section of mixed broadleaved woodland (WD1) is also present on the western bank of the river to the south of Common's Inn. Scrub (WS1) is present on the eastern bank of the river. Narrow strips of dry meadow and grassy verge (GS2) are also present along the river within this section.

Between Fitz's Boreen and Blackpool Retal Park the Bride (north) is heavily industrialised and flows through largely built areas categorised as buildings and artificial surfaces (BL3). A narrow strip of dry meadow and grassy verge (GS2) is present on the river margin of the eastern bank which is bordered by flood walls. Short treelines (WL2) are also present along the river banks within this section on the eastern and western banks of the channel. A Japanese knotweed stand (approx 10m long) is present along the treeline on the eastern bank of the river close to Sunbeam Industrial Estate.

The Bride (North) downstream of the culvert near Blackpool Retail Park flows through an area of scattered trees and parkland (WD5) and amenity grassland (GA2). Narrow strips of amenity grassland within the vicinity of Blackpool Retail Park are interspersed with planted areas of Flower beds and borders (BC4) and ornamental non-native shrub (WS3) along the river banks.

Downstream of Blackpool retail park the riverside habitats consist of mature dense treelines (WL2), an area of mown amenity grassland (GA2), Scattered trees and parkland (WD5) and buildings and artificial surfaces (BL3). Large stands of Japanese knotweed are present along both banks of the river in Orchard Court, close to where the river is culverted underground. The river between Orchard Court and Watercourse Road where

the works are located is all culverted underground. This area is largely built land categorised as buildings and artificial surfaces. (BL3)

The Glenamought River is a less modified river than the Bride (North), flowing through rural areas for much of its length. The river downstream of the Glenamought viaduct flows through an area of Mixed broadleaved woodland (WD1), Amenity grassland (GA2) and built land (BL3). Areas of maintained amenity grassland are associated with private dwellings and business parks. Mature Treelines (WL2) are present on both banks of the river close to its confluence with the Bride (north).

A number of non-native species are present along the Bride (North), including montbretia (*Crocosmia x crocosmiiflora*), snowberry (*Symphoricarpos albus*).

Small localised stands of Ranunculus sp. with very low cover, Fontanalis moss with low cover and Calitriche sp. with low cover were recorded as present on the River Bride and the Glenamought River. No pondweeds were recorded. While these examples of Floating River Vegetation habitat exist, the percentage cover is low and therefore they are not considered good examples of the habitat. Along the middle reaches of the Bride, these stands of FRV alternate along the margins of the river. At Oldcourt, where the river is to be culverted the moss species Fontinalis antipyretica (more nutrient tolerant moss) occurs.

Within the Bride (North) and Glenamought rivers the Floating River Vegetation was not of Annex I habitat quality given the extent of fragmentation.

Two invasive species, Japanese knotweed and giant rhubarb, were recorded in the works area for the Blackpool Certified Drainage Scheme, Japanese knotweed is common along the Bride (north) and Glenamought river channel. A single giant rhubarb plant was present.

A low diversity and abundance of fish species was recorded from the study area River Lamprey, listed on Annex II of the EU Habitats Directive was recorded in low numbers in both the Bride River (North) and The Glenamought River. Brown Trout was the most frequently recorded species throughout the Bride (north) and the Glenamought River. European eel was recorded in the Bride (north) in low numbers.

In addition, the river and surrounding vegetation provide habitat for two further species that are protected under European legislation. These are Otter (Annex II, Habitats Directive) and Kingfisher (Annex I, Birds Directive). Kingfisher was recorded on the Glenamought River, whereas Otter was recorded along the Bride (North). All bat species are protected under Annex IV of the EU Habitats Directive and are likely to use the area for foraging. Species and habitats of conservation interest but not related any European Site that is potentially impacted by the proposed scheme are discussed as part of the EIS for the River Bride (Blackpool) Certified Scheme.

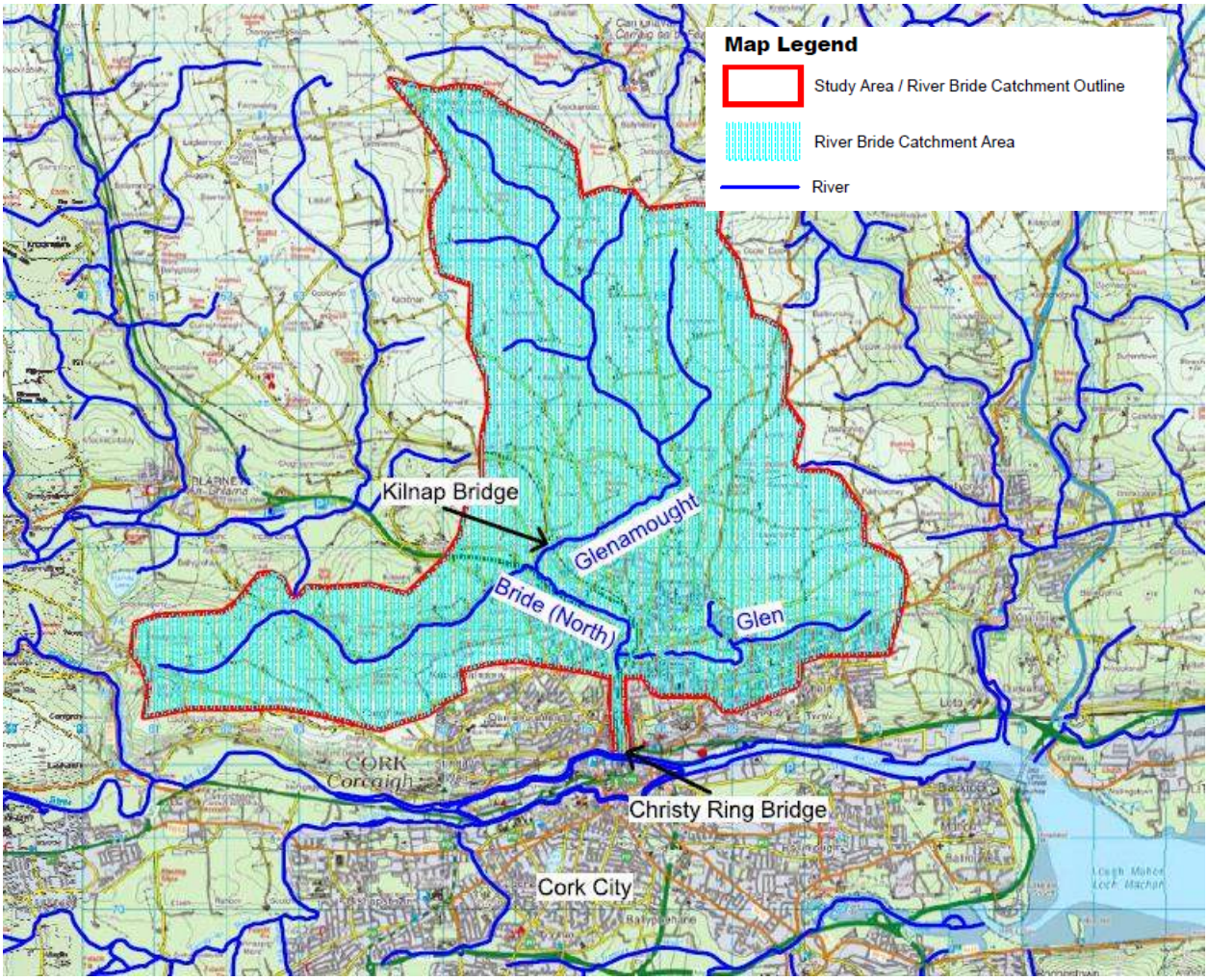

Fig 3.1: Study area and catchment rivers

3.2 PROPOSED WORKS

The proposed works for the River Bride (Blackpool) Drainage Scheme will comprise the following:

- Site investigation,
- Construction of new culverts,
- Replacement of existing bridges/ culverts,
- Construction of new flood walls/ earthen embankments,
- Constructing bridge parapets,
- Local channel widening of the River Bride (referred to as a 'Winter Channel' on the scheme drawings in Appendix 3A),
- Construction of a sedimentation trap on the left bank of the River Bride,
- Removal of approximately 100m of existing culvert and restoration of open channel (River Bride) at this location,
- Construction of a new trash screen and roughing screens, and removal of existing trash screens on the River Bride, and the Glen and Glenamought Rivers,
- Modifications to the existing foul and surface water collection networks in the vicinity of the proposed works, including construction of pumping stations, in order to prevent flooding,

- Removal of an existing sluice structure in the channel of the River Bride to the rear of the Dulux factory,
- Localised regrading of ground levels, erection of fencing and access gates, to facilitate pedestrian/ vehicular access to and around flood defences, or to redirect overland surface water flow paths,
- Filling in an existing open watercourse,
- Introduction of a flow control structure on the entrance to the Brewery culvert on the River Bride and the Spring Lane culverted branch of the River Glen, and
- Regular maintenance of the river channel and pumping stations.

3.2.1 Site Investigation

A detailed site investigation will take place in advance of the construction works to inform the detailed design of the drainage scheme. Trial pits, slit trenches, boreholes, rotary core boreholes and dynamic probes will be carried out along the footprint of the proposed works, in addition to utility identification.

3.2.2 Culverts

The scheme will include construction of new culverts at the following locations:

- 342m of new reinforced concrete culvert (approximate internal dimensions 5.5m x 2.1m) commencing downstream of the Blackpool bypass (N20 Commons Road) at Orchard Court and terminating under the Old Commons Road to the North of Blackpool Church.
- Replacement and slight realignment of 7m of existing culvert (approximate internal dimensions 5.5m x 2.1m) on Old Commons Road upstream of Blackpool Church.
- Rehabilitation of 26m of existing culvert on Old Commons Road upstream of Blackpool Church and 163m of existing culvert on Watercourse Road upstream of Madden's Buildings.
- Replacement and slight realignment of 69m of existing culvert at Blackpool Church commencing on Old Commons Road and terminating on Watercourse Road. This will also involve culverting a open section of channel outside the Church.
- Replacement and slight realignment of 62m of existing culvert at Madden's Buildings commencing on Watercourse Road and terminating on the North City Link Road (N20). This will involve construction of a flow control strucrture at the entrance to the 'Brewery' culvert, which runs under Watercourse Road.

The culverts will consist of reinforced concrete structures and in general will be constructed on the footprint of the existing river channel (within only minor realignment). The one exception will be the culvert at the northern end of Orchard Court, which will be constructed off the line of the existing channel. This is required in order improve the efficiency of the culvert system and thereby increase the capacity of the river channel.

A concrete blockwork boundary wall will be constructed along the property boundaries on the right bank of the new Orchard Court culvert.

3.2.3 Bridge Replacement

The scheme will include replacement of four existing bridges/ culverts at the following locations:

- Two existing bridges/ culverts on the Glenamought River will be replaced with new reinforced concrete bridges between Sweeney's Hill and the North Point Business Park.
- Two existing bridges/ culverts on the River Bride will be replaced with new reinforced concrete bridges between the North Point Business Park and Commons Road (N20).
- Two pedestrian bridges at Blackpool Retail Park will be removed and replaced by a new crossing point approximately 120m and 10m to the North of the two bridges respectively.

The purpose of the replacement is to increase the conveyance capacity of the River Bride at these four locations. It will also be necessary to limit vehicular and pedestrian access points across the river during construction stage to facilitate the construction of the new culvert. These access points will be fully restored on construction of the works, the bridge effectively being replaced by the new culvert.

3.2.4 Flood Walls/ embankments

The scheme will include construction of new flood walls/ earthen embankments at the following locations:

- 137m of earthen embankment at Woodview (Glenamought River), downstream of the railway viaduct on the Cork-Limerick railway line,
- 122m of flood wall adjacent to the Lower Killeens Road (River Bride),
- 31m of flood wall and 105m of earthen embankment to the North and West of the Commons Inn Hotel,
- 74m of flood wall on the right bank of the Fairhill Stream to the rear of Bride Villas,
- 244m of flood wall on the right bank of the River Bride between the Bride Villas and the 'Topaz' filling station,
- 244m of flood wall on the right bank of the River Bride between the Dulux factory and the Sunbeam Industrial Estate (raising existing wall),
- 387m of flood wall on the left bank of the River Bride between the Dulux factory and the Sunbeam Industrial Estate (raising existing wall),
- 343m of flood wall on the left bank of the River Bride between the Dulux factory and the Sunbeam Industrial Estate (new wall),
- 115m of earthen embankment along the left bank of the River Bride at the location of a new crossing point and trash screen,
- 212m of flood wall on the left bank of the River Bride alongside to the Blackpool Retail Park/ Heron Gate and River House, and
- 45m of flood wall on the left bank of the River Bride between the Commons Road (N20) and the carpark of the Blackpool Shopping Centre.

The purpose of the flood walls and embankments is to prevent overtopping of the river banks and subsequent flooding that would result from overtopping. The locations and heights of flood walls and

embankments have been chosen based on a hydrological and hydraulic analysis of the River Bride, topographical data, the 1% Annual Exceedance Probability (AEP) flood event (also known as the 100 year flood event), and allowance for freeboard.

Where space is available, flood defences will consist of earthen embankments. In most cases, space constraints in the vicinity of the urbanised catchment of the River Bride in the vicinity of Blackpool means that flood walls will be required. In some locations, such as to the rear of the Dulux Paints factory, the new flood walls will replace existing walls or will consist of extensions to existing reinforced concrete retaining walls.

3.2.5 Bridge Parapets

It will be necessary to carry out works to bridge/ culvert parapets at the locations shown on the Scheme Drawings contained in Appendix 3A of the EIS in order to contain flood waters within the river channel. The four existing bridges/ culverts in question are located between the North Point Business Park and Commons Road (N20) as shown on the Scheme Drawings in Appendix 3A. Works will consist of repairs to existing parapets where they exist, replacement of existing parapets where repairs are not practical or cannot deliver the required level of protection, construction of new parapets where existing parapets do not exist, or where existing parapets are not of a sufficient height to contain flood waters.

3.2.6 Winter Channel

A series of sharp bends in the Bride channel contribute to elevated flood levels along the Commons Road (N20). This is because the water velocity is abruptly slowed at each of these bends. It is proposed to introduce a 'winter channel' to the existing channel to help with high flows by cutting a secondary flow route into the existing bank. In normal flow conditions, the river would be confined to the 'low-flow' or 'summer channel', however during periods of high flow the winter channel would provide additional capacity.

The winter channel will consist of an excavation of the right bank (looking downstream). The left bank will be undisturbed. The width of the cut will vary from 0m at the upstream/downstream ends, to maximum 7-10m at the apex of the river bend. The formation level of the cut will be at approximately 1.2m above the channel invert (approx. 18.7mOD). This will leave the existing low flow channel substantially undisturbed apart from cutting back vegetation. The total length of the cutting will be approximately 50m on plan, measured along the bank line.

The slope of the new cutting will match the existing bank slope. The surface of the new cut slope will be covered with a biodegradable membrane, which will protect the exposed soil from erosion while vegetation is re-established over a number of months following the works.

3.2.7 Sedimentation Management

It is proposed to construct a sediment trap at the upstream end of the Sunbeam Industrial Estate.

The purpose of the sediment trap at the Sunbeam Industrial Estate is to capture fluvial sediments (primarily small cobble sized material), to help minimise the risk of large sediments settling in the Blackpool culvert system, which would reduce hydraulic capacity. A sediment trap is an online pond which increases local width and depth of the channel and reduces flow velocity. This promotes the settlement of suspended solids, and the deposition of coarser bedload. Sediment traps require regular maintenance to remove sediment and will no longer function when full.

On this basis, the sediment trap would be sized within the region of approximately 25m wide x 63m long. It will most likely be constructed of reinforced concrete or sheet pile walls with shallow rock weirs constructed

at 20m centres. It will be constructed by excavating an area of the existing channel to make it wider and deeper. The inlet and outlet structures will have the same invert level and approximate dimensions as the existing channel in those locations, to minimise impact on upstream and downstream water levels. The bed level of the basin will be approximately 1.5m below the existing bed level.

The sediment trap will also incorporate a ramp along the left bank to allow access for a JCB/excavator to remove accumulated sediment and will also require a slight realignment of the river channel at the downstream end of the sedimentation trap. It will also be necessary to slightly realign local access routes to the north of the sediment trap.

A second potential sedimentation area has been identified upstream of the Common's Inn hotel and this has provisionally been identified on the scheme drawings, if following detailed design or operation of the primary sediment trap, it becomes apparent that the addition of this area would provide an overall benefit to the management of sediment within this reach.

This trap would be located upstream of the Commons Inn Hotel and its purpose will be to naturalise and reconnect the floodplain at this location. Flood scalping and lowering of the inside channel bends along a gently meandering section of river channel have the potential to enhance natural sediment controls upstream of the sediment trap at Sunbeam. In addition to regrading ground levels, this sediment management feature may incorporate instream geomorphic features, such as riffles. The potential inclusion of this feature in the scheme will be subject to review following detailed geotechnical investigations, detailed design and at a later point during the scheme operation.

3.2.8 Open Channel

The scheme will include removal of approximately 100m of existing culvert to the rear of the Sunbeam Industrial Estate, and restoration of open channel (River Bride) at this location. This work will be done in combination with construction of a sedimentation trap, a new pumping station, regrading of ground levels and construction of flood walls at the same location (described separately in this chapter).

3.2.9 Screen

The scheme will include construction of a new trash screen within the channel of the River Bride at the Blackpool Retail Park and three new roughing screens upstream of the Viaduct on the Glenamought River, upstream of Rose Cottage on the River Bride (North) and upstream of the existing Spring Lane trash Screen on the River Glen. The existing trash screens on the River Bride (North) (two existing screens) and the River Glen at Spring Lane will then be removed. The purpose of the roughing screens and trash screen will be to remove large debris from the river channel, which could potentially cause a blockage in the almost entirely culverted channel downstream of this Blackpool Retail Park.

Trash screens will be designed in accordance with the UK Environment Agency "Trash and Security Screen Guide 2009" and CIRIA guidance document C689 "Culvert Design and Operation Guide". The EA guidance states that only mature salmon species could be discouraged by a screen. Other fish species are unlikely to be affected by bars with a minimum clear spacing of 140 mm. For the Blackpool screen, the minimum bar spacing will be no less than 150mm in accordance with the CIRIA guidance document.

3.2.10 Drainage Works

Flooding in Blackpool is primarily fluvial (i.e. flood waters flow directly from the River Bride, however restricting the river channel by constructing hard flood defences will also restrict pluvial flow - surface water

run off during rainfall events which coincides with high river levels. There are existing surface water and combined foul and surface water collection networks in Blackpool.

In order to prevent pluvial flooding, particularly during flood events, it will be necessary to upgrade the surface water and combined drainage network in the town. Initially, existing outfalls will need to be sealed against backflow from rising flood waters, where this has not already taken place.

Pumping stations will be required so that pluvial flood flows can be pumped to the river channel during flood events and on occasions when the new non-return valves malfunction. Seven pumping stations are proposed at the following locations:

- Bride Villas (Commons Road)
- Fitz's Boreen
- Two pumping stations to the rear of the Dulux factory, one on either bank of the River Bride
- Open area at North end of Orchard Court
- Old Commons Road (at entrance to Orchard Court)
- Blackpool Church/ Thomas Davis Street.

New collector drains will be required to connect the new and old collection networks. Surface water will be pumped into the river channel/ new culvert at these locations through new rising mains fitted with non-return valves.

3.2.11 Maintenance Regime

A rigorous and organised channel maintenance programme will be required throughout the reach of the channel impacted by the proposed works. The channel maintenance programme will include the following stretches of river/ stream channel:

- The Glenamought River from the new roughing screen upstream of the Viaduct to its confluence with the River Bride (517m),
- The River Bride from the new roughing screen upstream of Rose Cottage to Blackpool Church (2,623m),
- The River Bride (Kiln culvert branch) from Blackpool Church to the confluence of the Kiln Branch and the Kiln Brewery Branch (946m, running under Watercourse Road and the N20 Blackpool Bypass),
- The River Bride (Kiln Brewery culvert branch) between its bifurcation with the Kiln culvert branch at its upstream end to its confluence with the Kiln culvert branch at its downstream end (740m, running under Watercourse Road and the Heineken Brewery),
- The Glen River (Spring Lane culvert branch) from its confluence with the new culvert on the River Bride to the proposed sluice structure at the head of this channel section (333m),
- The Glen River (mainly open channel) from the proposed sluice structure referred to above to the existing culvert under the North Ring Road (230m),
- The Glen River (Back Watercourse culvert branch) from the proposed sluice structure referred to above to its confluence with the (Kiln Watercourse culvert branch) outside Madden's Buildings (542m, running mainly under the N20 Blackpool Bypass),

- The Rathpeacon Stream from its confluence with the River Bride for a distance of 193m upstream, and
- The Fairhill Stream from its confluence with the River Bride for a distance of 108m upstream,

The channel maintenance programme will pay particular attention to locations where silt, gravel and debris are likely to accumulate, such as at structures, sharp bends, culvert inlets, etc.

The new trash screen and roughing screens will require regular maintenance, as will the proposed surface water pumping stations. The surface water pumping stations will require regular maintenance and it will be necessary to jet the surface water sewers to maintain hydraulic capacity to drain flood waters.

Other measures will include regular inspections of flood walls and embankments, regular scheduled maintenance of the river channel and pruning of trees (including removal of tress where necessary), planning and control measures. The inspection regime will ensure than there is no deterioration in the structural integrity of the defences which may occur as a result of a collision for example. It is expected that the flood defences will be relatively maintenance free otherwise. The extents of channels/culverts to be maintained will be shown on the drawings contained in Appendix 3A. In general, maintenance activities will consist of the following:

- The channels and structures will be monitored by means of a walkover survey from the banks on a regular basis (likely quarterly, and also following a flood event). The walkover surveys would aim to identify issues with implications for flood risk (e.g. fallen trees, excessive vegetation build-up, overgrown trees, illegal dumping, accumulation of granular deposits, etc.). In-channel debris will typically be removed by JCB. Excessive overhanging vegetation will typically be pruned back or removed by hand using a cherrypicker, depending on access.
- Culverts will be inspected by means of man-entry on an annual basis, or following a significant flood event. Any debris present in the culvert will be cleared by hand. A full CCTV survey and clearing of silt/sediment from the culvert is expected to take place approximately every 5 years.
- The optimum frequency of cleaning of the sediment trap and trash screen will evolve over time based on experience. However, initially it is proposed to carry out cleaning generally on a quarterly basis, and also following a significant flood event. Water level monitoring and alarms will also be installed at the trash screen to alert maintenance staff of a screen blockage.

3.3 ANTICIPATED CONSTRUCTION METHODS

Construction of new culverts will form the most significant aspect of the new scheme. Approximately 480m of new culvert will be constructed in Blackpool, some of which will be constructed along the route of the River Bride. Construction of the new culvert will take place as follows:

- The works area will be isolated and traffic management set up as required. Temporary road closures will be required for the culvert replacement in the vicinity of Blackpool Church and Madden's Buildings. Alternative access routes may be required for Orchard Court during construction works if it does not prove possible to maintain one lane of the existing bridge open at all times/ maintain access in the vicinity of the existing bridge.
- Temporary works will be put in place, including silt barrages, and flow diversions/ over pumping where in stream works are required at Blackpool Church and between the Old Commons Road and

the N20 culvert (upstream of Orchard Court). Service diversions will also be required in advance of culvert construction, particularly at Blackpool Church and Madden's Buildings.

- The foundations will be excavated down to formation level. Utilities and drainage pipes will be diverted as required. Excavated material will be transported off site to a licenced facility or stored for reuse on site. Blinding will be poured.
- Reinforced concrete culverts will be placed in position. Utilities and drainage pipes will be diverted into permanent positions as required.
- The excavation will be backfilled, the area reinstated, and the works area reopened. In the case of culverts constructed under the public road, permanent reinstatement may be required approximately six months following reopening of the road.

3.3.1 Bridge Replacement

The replacement of existing bridges is likely to comprise the following proposed works:

- The works area will be isolated and traffic management set up as required. Temporary road closures may be required if it does not prove possible to maintain one lane of the existing bridge open at all times/ maintain access in the vicinity of the existing bridge, or if an alternative convenient access route is available.
- Temporary works will be put in place, including silt barrages, and flow diversions/ over pumping. Service diversions may also be required in advance of culvert construction.
- The existing bridge/ culvert structure will be dismantled/ demolished and removed off site.
- The foundations will be excavated down to formation level. Excavated material will be transported off site to a licenced facility or stored for reuse on site. Blinding will be poured.
- The new bridge/culvert will be constructed using either precast units or reinforced concrete placed in situ. Utilities and drainage pipes will be diverted into permanent positions as required during/ following construction. Construction of an in-situ reinforced concrete bridge would involve
    - Fixing of reinforcement for abutments and piers,
    - Placing of formwork for abutments and piers,
    - Placing of cast in-situ concrete for abutments and piers,
    - Stripping of formwork,
    - The placing and fixing of a precast concrete bridge deck, and
    - Construction of bridge parapets.
- The excavation will be backfilled, the area reinstated, and the works area reopened. Permanent reinstatement of road surfaces may be required approximately six months following reopening of the road.

3.3.2 Bridge Parapets

New/ upgraded bridge parapets will be constructed as follows:

- Isolation of works area, including traffic management.

- One lane of the bridge will be closed at a time where possible. Where sufficient space is not available to accommodate a working area and live traffic, a road closure will be acquired and alternative access put in place.
- The existing bridge parapet/ railings will be removed where these exist.
- The underlying concrete will be scabbled and starter bars dowelled into the concrete.
- Formwork will be set up from the bridge deck for the construction of the reinforced concrete bridge parapet.
- Scaffolding will be set up as required. The parapet will be poured following steel fixing. Once the concrete has cured, the formwork will be stripped and the scaffolding removed.
- The lane will be opened, the second lane closed and the plant and equipment will be relocated to the location of the second parapet.

3.3.3 Flood Defence Walls

The construction of the reinforced concrete flood defence walls is likely to be carried out by traditional methods comprising the following activities:

- isolation of works area, including traffic management where the work area will overlap with a public road/ pedestrianised area,
- temporary works including silt barrages where in stream works are required,
- excavation for foundations,
- blinding of formation,
- fixing of reinforcement,
- placing of formwork,
- placing of concrete,
- stripping of formwork, and
- reinstatement of works area.

In certain locations, where there is a possibility of flood water passing underneath the flood defence wall foundations, either sheet piles or grouting techniques will be required to provide a cut-off. The sheet piles may be metal or plastic and will be driven to the required depth using a piling hammer or similar.

3.3.4 Earthen Embankments

The construction of the earthen flood defence embankments is likely to comprise the following activities:

- Temporary works,
- Excavation for formation,
- Placing and compaction of suitable clay material,
- Stripping of formwork, and
- Reinstatement of area, including grass seeding.

3.3.5 Drainage Works

The drains/ surface water sewers will be constructed by one of two methods as follows:

- Where the trench does not overlap with the footprint of the excavation for the flood wall, the trench of the drainage pipe will be set out. Where the trench is located in a road, the road will be saw cut. Where the trench is located in a grassed area, the topsoil will be removed and stored in close proximity to the trench. The trench will then be excavated to the required depth. Excavated material unsuitable for use as backfill material will be disposed of to an approved waste management facility. Pipe bedding will be placed, followed by the pipe and granular pipe surround. Trenches in roads will be backfilled with granular material or lean mix concrete, depending on its location in accordance with the Guidelines for Managing Openings in Public Roads. Trenches in grassed areas will be backfilled with suitable excavated material, following which the original topsoil will be replaced. The trench will be left to consolidate for approximately six months, following which the surface layer will be removed is necessary, the backfill material will be supplemented and the trench reinstated.
- Where the trench overlaps with the footprint of the excavation for the flood wall, the steps outlined above will be taken. The order of excavation, pipelaying, backfilling and reinstatement will depend on the sequence of construction of the retaining wall and the proximity of the proposed retaining wall to the pipe trench. The pipe may be laid and partially backfilling prior to pouring of concrete for the wall. Pipelaying may alternatively take place following pouring of the base of the wall or following construction of the wall.

3.3.6 Pumping Stations

The footprint of the pumping station will be set out. Where the proposed excavation is located in a paved area, the pavement will be saw cut. Where the proposed excavation is located in a grassed area, the topsoil will be removed and stored in close proximity to the excavation. The excavation will take place to the required depth. Excavated material unsuitable for use as backfill material will be disposed of to an approved waste management facility. Lean mix concrete blinding will be placed, followed by formwork and steel fixing. Once concrete has been poured and has cured, the formwork will be stripped and the area outside the pumping station will be backfilled. Excavations in grassed areas will be backfilled with suitable excavated material, following which the original topsoil will be replaced. Excavations in paved areas will be backfilled with granular material and reinstated to their original condition. Mechanical and electrical fit out of pumping stations will take place following backfilling.

3.3.7 Other Instream Works

Other proposed works which would be carried out partially or wholly instream include:

- Local channel widening of the River Bride (referred to as a 'Winter Channel' on the scheme drawings in Appendix 3A),
- Construction of a sedimentation trap on the left bank of the River Bride,
- Construction of roughing screens and a new trash screen,
- Removal of existing trash screens on the River Bride (North) and Glen River, and

- Removal of an existing sluice structure in the channel of the River Bride to the rear of the Dulux factory,

In general, these works will involve:

- Isolation of works area, and temporary works including silt barrages, flow diversions or over-pumping,
- Dismantling/ demolition and removal of the existing structure (in the case of sluice structure at Dulux and the screens on the River Glen and Bride North) and removal off site,
- Excavations,
- Blinding of formation (as required),
- Construction of sedimentation trap/ screen, following which
- The excavation will be backfilled, the area reinstated, flow redirected, and the works area reopened.

4 NATURA 2000 SITES

4.1 DESIGNATED SITES IN THE VICINITY OF THE PROJECT

Section 3.2.3 of the Guidance for Planning Authorities states that the approach to screening can be different for different plans and projects and will depend on the scale and the likely effects of the project. A key variable that will determine whether or not a particular Natura 2000 site is likely to be negatively affected is its physical distance from the project site.

Furthermore UK guidance (Scott Wilson et al., 2006) state that a distance of 15km is currently recommended in the case of plans. For projects, the distance could be much less than 15km and in some cases less than 100m, but this must be evaluated on a case-by-case basis.

Given the nature of this project and the proposed construction methodology it is considered for the purpose of this screening exercise that the likely zone of impact is the zone immediately around the site of construction and both upstream and downstream of the site for a distance of 5km. All Natura 2000 sites within 5km downstream in freshwaters and within 3km downstream in marine environment should be assessed in accordance with DoEHLG Circular L8/08 due to the potential for likely significant effects on surface water dependant habitats and species as a result of the proposed Project e.g. from silt laden waters, hydrocarbon spillage and abstraction processes.

A review of the National Parks and Wildlife Service database has identified the following Natura 2000 sites as potentially impacted by the proposed project, being in proximity, upstream or downstream of the works (See Figure 4.1):

- 004030 Cork Harbour SPA

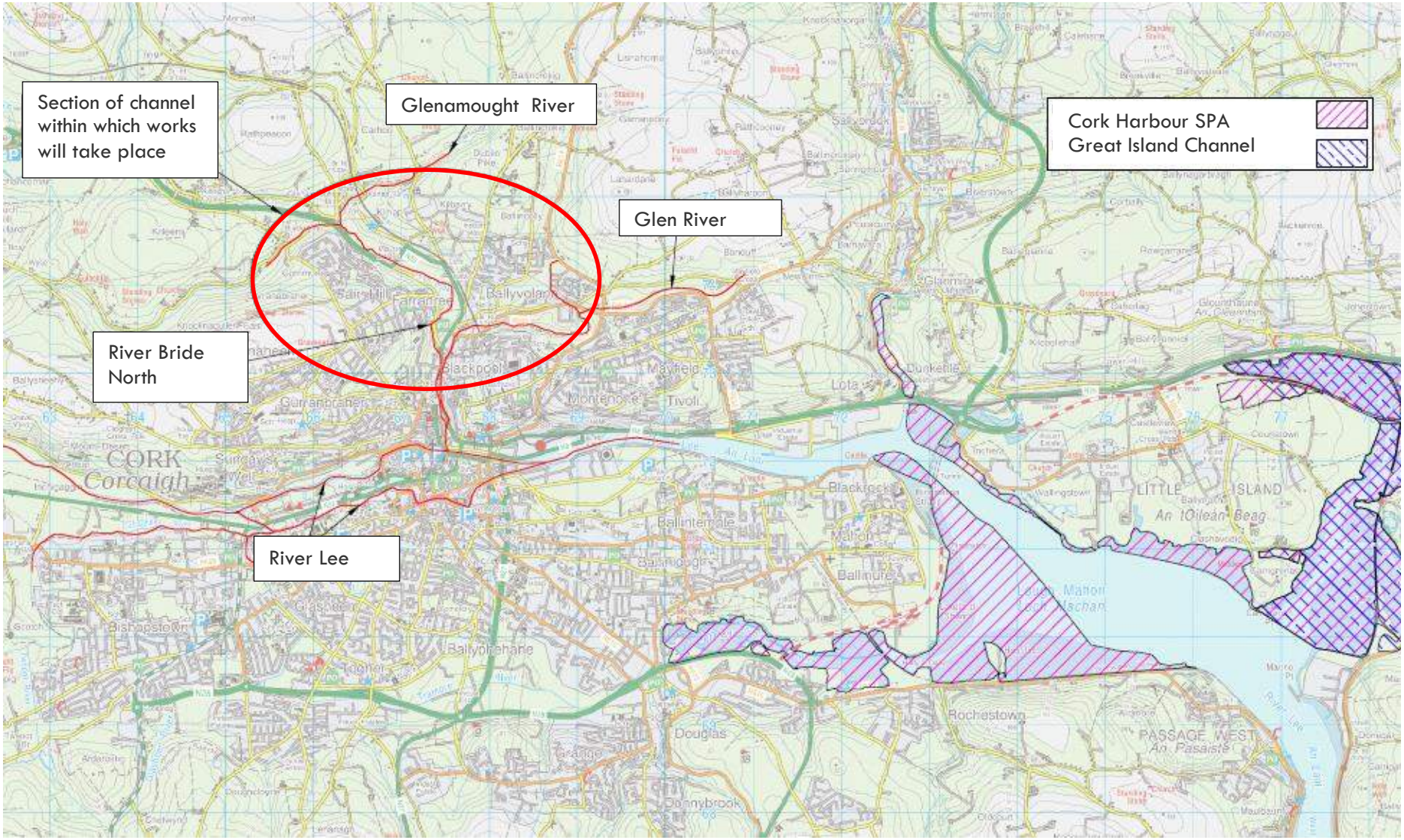

Figure 4.1: Location of Natura 2000 sites in relation to works

4.2 DESCRIPTION OF NATURA 2000 SITES AND CURRENT TRENDS IN THE ABSENCE OF THE PROPOSED SCHEME.

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The Cork Harbour SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel (north of Great Island), the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay and the Rostellan and Poulnabibe inlets (NPWS, 2008).

Interdial flats are often muddy in character as a result of sheltered conditions but described principally as 'mixed sediment to sandy mud with polychaetes and oligochaetes' (NPWS, 2014a). These muds support a range of macro-invertebrates. Green algae are a common occurrence on the mudflats while Common Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places. Salt marshes are scattered through the site and these provide high tide roosts for waterbirds.

Cork Harbour SPA is an internationally important wetland site regularly supporting over 20,000 wintering waterbirds. In addition to the total number of winter waterbirds it supports, Cork Harbour is internationally important for its populations of black-tailed godwit (*Limosa laponica*) and redshank (*Tringa totanus*) and of national importance for populations of 18 other species. The shelduck (*Tadorna tadorna*) population is the largest in the country with over 10% of the national total. Cork Harbour SPA also supports a nationally important breeding colony of common tern (*Sterna hirundo*). Three of the species of Special Conservation Interest are also listed on Annex I of the EU Birds Directive; golden plover (*Pluvalis apricaria*), black-tailed godwit (*Limosa laponica*) and common tern (*Sterna hirundo*). Other Annex I species which occur regularly are whooper swan and ruff.

The wetland habitats contained within Cork Harbour SPA are identified of conservation importance for non-breeding (wintering) migratory waterbirds and are therefore a Special Conservation Interest for Cork Harbour SPA.

Extensive areas of estuarine habitat have been reclaimed since the 1950s for industrial, port-related and road projects, and further reclamation remains a threat to the SPA. As Cork Harbour is adjacent to a major urban centre and a major industrial centre, water quality is variable and the estuary of the River Lee and parts of the Inner Harbour are somewhat eutrophic. However according to the NPWS site synopsis, the polluted conditions may not be having significant impacts on the bird populations. Oil pollution from shipping in Cork Harbour is a general threat. Recreational activities in some areas of the harbour such as jet skiing which causes disturbance to roosting birds are also a threat.

In closest roosting sites in proximity to the proposed River Bride (North) Certifiied Drainage Scheme are at the mouth of the Glashaboy River/Rathcoursey. This area supports roosting birds at low tide. The Glashaboy River is an erosive river with signfiicnat quantiteies of scour and sediment deposition at the mouth of the River/Rathcoursey.

As Part of this screening assessment each conservation objective has been examined in turn to determine its zone of influence regarding the level of work proposed as part of the project and the nature of the conservation objective. With this consideration, conservation objects can be screened out at an early stage of development to allow for a focused Natura Impact Statement (if required) assessing the impact on those conservation objectives that are screened in. See Table 4.1 a list of the conservation objectives and identification of zones of influence for the Cork Harbour SPA. The boundary of Cork Harbour SPA overlaps with the boundary of Great Island Channel SAC, which is located approximately 10km downstream of the

proposed works. According to the conservation objectives document for Cork Harbour SPA, the conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate. The conservation objectives for Great Island Channel SAC are therefore also listed in Table 4.1 below, however none of the habitats of qualifying interest are present within the zone of influence of the proposed works and are unlikely to be impacted by the proposed works.

Table 4.1 Natura 2000 Sites and their Conservation Objectives, Treats and zone of influence of the proposed works

Site Name	Code	Conservation Objectives	Principal supporting habitat within SPA	Zone of Influence	Threats to SPA (NPWS)
004030 Cork Harbour SPA	A004	To maintain the favourable conservation condition of little grebe *(Tachybaptus ruficollis)* in Cork Harbour SPA	Sheltered & shallow subtidal	Any suitable roosting or foraging habitat in the works area	**Negative impacts** <u>High ranking threats</u> • Urbanised areas, human habitation (outside) • Roads, motorways (outside) • Port areas (outside) • Industrial or commercial areas (outside) • Marine & freahwater aquaculture <u>Medium ranking threats</u> • Walking, horse riding & non-motorisedvehicles (inside) • Skiing, off-piste (inside) • Shipping lanes (inside) • Fertilisation (outside) • Nautical sports (inside) • Leisure fishing (inside) <u>Low ranking threats</u> • Dispersed habitation (outside)
	A005	To maintain the favourable conservation condition of great crested grebe *(Podiceps cristatus)* in Cork Harbour SPA	Sheltered & shallow subtidal over sand flats	Any suitable roosting or foraging habitat in the works area	
	A017	To maintain the favourable conservation condition of cormorant *(Phalacrocorax carbo)* in Cork Harbour SPA	Sheltered & shallow subtidal	Any suitable roosting or foraging habitat in the works area	
	A028	To maintain the favourable conservation condition of grey heron *(Ardea cinerea)* in Cork Harbour SPA	Sheltered & shallow subtidal; coastal lagoons	Any suitable roosting or foraging habitat in the works area	
	A048	To maintain the favourable conservation condition of shelduck *(Tadorna tadorna)* in Cork Harbour SPA	Intertidal mud and sand flats, shallow subtidal	Any suitable roosting or foraging habitat in the works area	

Site Name	Code	Conservation Objectives	Principal supporting habitat within SPA	Zone of Influence	Threats to SPA (NPWS)
	A050	To maintain the favourable conservation condition of wigeon *(Anas penelope)* in Cork Harbour SPA	Intertidal mud and sand flats, shallow subtidal	Any suitable roosting or foraging habitat in the works area	**Positive Impacts** <u>High ranking</u> • Dispersed habitation (outside) <u>Medium ranking</u> • Shipping lanes (inside) • Leisure fishing (inside) • Nautical sports (inside) <u>Low ranking</u> • Dispersed habitation (outside)
	A052	To maintain the favourable conservation condition of teal *(Anas crecca)* in Cork Harbour SPA	Intertidal mud and sand flats, shallow subtidal	Any suitable roosting or foraging habitat in the works area	
	A054	To maintain the favourable conservation condition of pintail *(Anas acuta)* in Cork Harbour SPA	Intertidal mud and sand flats, shallow subtidal	Any suitable roosting or foraging habitat in the works area	
	A056	To maintain the favourable conservation condition of shoveler *(Anas clypeata)* in Cork Harbour SPA	Sheltered & shallow subtidal and lagoons	Any suitable roosting or foraging habitat in the works area	
	A069	To maintain the favourable conservation condition of red-breasted merganser *(Mergus serrator)* in Cork Harbour SPA	Sheltered & shallow subtidal	Any suitable roosting or foraging habitat in the works area	

Site Name	Code	Conservation Objectives	Principal supporting habitat within SPA	Zone of Influence	Threats to SPA (NPWS)
	A130	To maintain the favourable conservation condition of oystercatcher *(Haematopus ostralegus)* in Cork Harbour SPA	Intertidal mud and sand flats	Any suitable roosting or foraging habitat in the works area	
	A140	To maintain the favourable conservation condition of golden plover *(Pluvialis apricaria)* in Cork Harbour SPA	Intertidal mud and sand flats	Any suitable roosting or foraging habitat in the works area	
	A141	To maintain the favourable conservation condition of grey plover *(Pluvialis squatarola)* in Cork Harbour SPA	Intertidal mud and sand flats	Any suitable roosting or foraging habitat in the works area	
	A142	To maintain the favourable conservation condition of lapwing *(Vanellus vanellus)* in Cork Harbour SPA	Intertidal mud and sand flats	Any suitable roosting or foraging habitat in the works area	
	A149	To maintain the favourable conservation condition of dunlin *(Calidris alpina)* in Cork Harbour SPA	Intertidal mud and sand flats	Any suitable roosting or foraging habitat in the works area	

Site Name	Code	Conservation Objectives	Principal supporting habitat within SPA	Zone of Influence	Threats to SPA (NPWS)
	A156	To maintain the favourable conservation condition of black-tailed godwit *(Limosa limosa)* in Cork Harbour SPA	Intertidal mud and sand flats	Any suitable roosting or foraging habitat in the works area	
	A157	To maintain the favourable conservation condition of bar-tailed godwit *(Limosa lapponica)*in Cork Harbour SPA	Intertidal mud and sand flats	Any suitable roosting or foraging habitat in the works area	
	A160	To maintain the favourable conservation condition of curlew *(Numenius arquata)* in Cork Harbour SPA	Intertidal mud and sand flats	Any suitable roosting or foraging habitat in the works area	
	A162	To maintain the favourable conservation condition of redshank *(Tringa totanus)* in Cork Harbour SPA	Intertidal mud and sand flats	Any suitable roosting or foraging habitat in the works area	
	A164	To maintain the favourable conservation condition of greenshank in Cork Harbour SPA	Information not available	Any suitable roosting or foraging habitat in the works area	

Site Name	Code	Conservation Objectives	Principal supporting habitat within SPA	Zone of Influence	Threats to SPA (NPWS)
	A179	To maintain the favourable conservation condition of black-headed gull *(Chroicocephalus ridibundus)* in Cork Harbour SPA	Intertidal flats & sheltered & shallow subtidal	Any suitable roosting or foraging habitat in the works area	
	A182	To maintain the favourable conservation condition of common gull *(Larus canus)* in Cork Harbour SPA	Intertidal mud and sand flats & sheltered & shallow subtidal	Any suitable roosting or foraging habitat in the works area	
	A183	To maintain the favourable conservation condition of lesser black-backed gull *(Larus fuscus)* in Cork Harbour SPA	Intertidal flats & sheltered & shallow subtidal	Any suitable roosting or foraging habitat in the works area	
	A193	To maintain the favourable conservation condition of common tern *(Sterna hirundo)* in Cork Harbour SPA	N/A	Any suitable roosting or foraging habitat in the works area	
	A999	To maintain the favourable conservation condition of the wetland habitat in Cork Harbour SPA as a resource for the regularly-occurring	N/A	Any suitable roosting or foraging habitat in the works area	

Site Name	Code	Conservation Objectives	Principal supporting habitat within SPA	Zone of Influence	Threats to SPA (NPWS)
		migratory waterbirds that utilise it			
001058 Great Island Channel SAC	1140	To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC	N/A	5km downstream	**Negative impacts** <u>High ranking</u> • Roads/motorways (inside) • Urbanised areas, human habitation (outside) • Marine & freshwater aquaculture (inside) • Reclamation of land from sea, estuary or marsh (inside) <u>Medium ranking</u> • Grazing (inside) • Fertilisation (inside) • Eutrophication (inside) **Positive impacts** <u>Medium ranking</u> • Grazing (inside)
	1130	To restore the favourable conservation condition of Atlantic salt meadows (GlaucoPuccinellietalia maritimae) in Great Island Channel SAC	N/A	5km downstream	

5 POTENTIAL IMPACTS ON NATURA 2000 SITES

In order to determine whether the project is likely to have a significant impact then the project and its potential impacts are assessed and followed by a determination of whether there is a risk that the effects identified could be significant. If the effects of a proposal are deemed to be significant, potentially significant or uncertain, or if the screening process becomes overly complicated then the process must proceed to a full Appropriate Assessment and the provision of a Natura Impact Statement

There are a number of potential source » pathway » receptor chains, which could impact on the conservation objectives within the zone of influence of the proposed works.

There will be no direct habitat loss within a Natura 2000 site as a result of the River Bride (Blackpool) Certified Drainage Scheme Site Investiation and construction works as the nearst Natura 2000 site, i.e Cork Harbour SPA is located > 5km downstream of the proposed works. Similarly there will be no disturbance to the wintering and breeding bird species which are Special Conservation Interests for Cork Harbour SPA. Known foraging and roosting sites for these species are located >5km downstream of the proposed works. Although bird species may utilise foraging and roosting sites within the nearby area outside of the SPA, no known suitable sites are present within the footprint of the proposed works.

In assessing the proposed project the following general potential impact have been considered with regard to the screening for impact on the conservation objectives of the Natura 2000 sites:

- Runoff or water quality impact due to site investigation and construction phase works, including construction of new culverts, replacement of existing bridges/culverts, construction of new flood walls/earthen embankments, channel widening of the River Bride, construction of a sedimentation trap on the bank of the River Bride, culvert removal and channel restoration, construction of a new trash screen on the Glen River, removal of existing sluice structure on the River Bride and localised regarding of ground levels; and general maintenance activites;
- Spread of invasive species downstream as a result of disturbance during site investigation and construction works, and maintenance activities during the operational stage;
- Reduction in sediment load into the intertidal zone of the River Lee and subsequent release of sediment to roost as a result of sediment traps and maintenance of the River Bride (North).

5.1 CUMULATIVE IMPACTS WITH OTHER PLANS/PROJECTS

In order to fully assess the potential impact of the proposed development on Natura 2000 sites, the project must be assessed alone or in combination with existing activities and proposed plans for the region. Myplan.ie and Cork City Development Plan 2015 - 2021 were consulted in order to determine if there were any other plans or projects in the area which could result in cumulative impacts.

The River Bride (Blackpool) Certificed Drainage Scheme previously formed part of the larger Lower Lee Flood Relief Scheme, which is now divided into two Schemes: the Lower Lee and the River Bride (Blackpool) Schmes. The Lower Lee Flood Relief Scheme is currently at pre planning phase with construction expected to commence in 2017. This scheme is outside of any Natura 2000 site and flood protection currently being consdiered are not likely to have a cumulative impact on the River Bride (Blackpool) Certified Drainage Scheme. The Lower Lee Flood Relief Scheme will be subject to Screening for Approprite Assessment as the design progresses.

The Lower Lee Flood Relief Scheme is identified within the Cork City Devleopment Plan in order to address the flooding in the lower reaches of the River Lee and specifically the River Bride in Blackpool and Ballyvolane. The Plan has been subject to Flood Risk Assesssment and Approprite Assessment Screening.

An AA Screening report was prepared for the Cork City Development Plan which identified the following potential impacts on the Cork Harbour SPA as a result of the implementation of the development plan:

- Direct loss of habitat from construction of new residential and other developments to cater for an increasing population within Cork's administrative area;
- Reduction in water quality due to new WWTP;
- Damage / Degradation of Habitats and Disturbance to Species due to construction and development activities in close proximity to Cork Harbout SPA;
- Reduction in water flows ;
- Spread of invasive alien species disturbed during construction activities.

No developments within the Cork City Development Plan development plan are proposed for within the boundaries of Cork Harbour SPA, therefore no direct loss of habitat through land take or fragmentation is anticipated. There are no plans for the construction of any major infrastructure. According to the AA Screening report "*it is the aim of the Council to ensure that the EU Water Framework Directive is implemented. This objective is to ensure that development would not have an unacceptable impact on water quality and quantity, which includes surface water, ground water, designated source protection areas, river corridors and associated wetlands, estuarine waters, coastal and transitional waters. Such water quality objectives will ensure that the River Lee, its tributaries, Cork Harbour and the SPA and Great Island Channel SAC are protected, and therefore, will not result in any indirect impacts on the Natura 2000 sites*". Measures to control and prevent the introduction and establishment of ecologically damaging alien invasive species, such as good site hygene practices for the movement of materials into, out of and around the site and ensuring that imported soil is free of seeds and rhizomes of invasive plant species, will also be implemented as part of the development plan. The AA Screening concluded that there would be no negative impacts on Cork Harbour SPA (or Great Island Channel SAC) as a result of the development plan.

A separate Local Area Plan, (LAP) exists for the North Blackpool area of the city which provides for the development and rejuvenation of the north Blackpool area over the six year LAP timeframe but also sets out the longer term strategic development framework for the area. The plan study area includes the former Sunbeam site and adjoining lands, Blackpool Shopping Centre and Retail Park, the Kilbarry rail site and Kilbarry IDA industrial estate, extending northwards along Old Whitechurch Rd, southwards to the North City Link Rd 'fly-over,' eastwards to Ballyvolane Rd, and west/northwest to Commons Rd and Fitz's Boreen. An AA Screening report was prepared for the project which concluded that further appropriate assessment was not required and that the Blackpool Local Area Plan was unlikely to have a significant negative impact on Cork Harbour SPA. Given that Cork Harbour SPA is located > 5km downstream of the proposed River Bride (Blackpool) Certified Drainage Scheme and the scale of the project; there is unlikely to be any cumulative impacts as a result of the proposed works considered in combination with the Blackpool Local Area Plan 2001-2015.

Other plans and projects within the region include:

- Regional Planning Guidelines for the South-West Region 2010-2022;
- South-Western River Basin Management Plan 2009-2015;
- Cork County Development Plan 2015-2021;

- Cork Area Strategic Plan Update 2008;
- Draft Mahon Local Area Plan 2014-2020
- South Docks Local Area Plan 2008-2018;
- Farranferris Local Area Plan 2009-2015;
- North-West Regeneration Masterplan2011;
- Water Services Investment Programme;
- IPPC Programme;
- Local Authority Discharge;
- Groundwater Pollution Reduction Programmes;
- Surface Water Pollution Reduction Programmes;
- Draft Lee Catchment Flood Risk Assessment and Management Study.

The plans identified above include policies and objectives aimed at protecting the natural environment, including Natura 2000 sites and all projects likely to have a significant effect on Natura 2000 sites will be subject to Appropriate Assessment Screening and projects will only be approved if they comply with the Habitats Directive. No other pathway has been identified by which any of the plans and programmes identified could have a significant 'in combination' effect on any of the Natura 2000 sites identified.

Furthermore project/site specific best practice measures will be implemented for the site investigation and construction works and operational stage of the River Bride (Blackpool) Certified Drainage Scheme in order to avoid pollution and/or sedimentation of watercourses as a result of run-off from construction activites. Measures will also be put in place to ensure non-native invasive species within the works area are not disturbed and spread as a result of the proposed works. Where required, strategic invasive species management plans will be prepared in order to eradicate existing invasive species infestations. Therefore no "in-combination" effect on any Natura 2000 site is anticipated as a result of the proposed project.

In consideration of Natura 2000 sites identified in Section 4.1 of this report, their qualifying interests and/or special conservation interests, trends, threats and pressures to the site and the nature of the proposed development, Table 5.1 below provides an assessment of the potential impact of the development on Natura 2000 sites and their conservation objectives in order to "Screen out the development from further assessment or determine the need for Natura Impact Assessment.

Table 5.1: Assessment of potential impacts on Natura 2000 sites

Qualifying Interest (Conservation Objective)	Presence within the SPA/Zone of influence	Potential Impact	In combination Impact	Screened for Appropriate Assessment (Natura Impact Statement)
Little grebe *(Tachybaptus ruficollis)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Great crested grebe *(Podiceps cristatus)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works. No likely impact from reductions in sediment release to area available for	None anticipated	Screened out
Cormorant *(Phalacrocorax carbo)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out

Qualifying Interest (Conservation Objective)	Presence within the SPA/Zone of influence	Potential Impact	In combination Impact	Screened for Appropriate Assessment (Natura Impact Statement)
Grey heron *(Ardea cinerea)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Shelduck *(Tadorna tadorna)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Wigeon *(Anas penelope)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Teal *(Anas crecca)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known	None anticipated	Screened out

Qualifying Interest (Conservation Objective)	Presence within the SPA/Zone of influence	Potential Impact	In combination Impact	Screened for Appropriate Assessment (Natura Impact Statement)
		roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.		
Pintail *(Anas acuta)*	Roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Shoveler *(Anas clypeata)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Red-breasted merganser *(Mergus serrator)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out

Qualifying Interest (Conservation Objective)	Presence within the SPA/Zone of influence	Potential Impact	In combination Impact	Screened for Appropriate Assessment (Natura Impact Statement)
Oystercatcher *(Haematopus ostralegus)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Golden plover *(Pluvialis apricaria)*	Roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Grey plover *(Pluvialis squatarola)*	Roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Lapwing *(Vanellus vanellus)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known	None anticipated	Screened out

Qualifying Interest (Conservation Objective)	Presence within the SPA/Zone of influence	Potential Impact	In combination Impact	Screened for Appropriate Assessment (Natura Impact Statement)
		roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.		
Dunlin *(Calidris alpina)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Black-tailed godwit *(Limosa limosa)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Bar-tailed godwit *(Limosa lapponica)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out

Qualifying Interest (Conservation Objective)	Presence within the SPA/Zone of influence	Potential Impact	In combination Impact	Screened for Appropriate Assessment (Natura Impact Statement)
Curlew *(Numenius arquata)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Redshank *(Tringa tetanus)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Greenshank (*Tringa nebularia*)		No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Although species may use nearby habitats outside of the SPA as foraging or roosting sites, suitable foraging and roosting sites are not present within the zone of influence of the proposed works.	None anticipated	Screened out
Black-headed gull *(Chroicocephalus ridibundus)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predited impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Although species may use nearby habitats outside of the SPA as foraging or roosting sites, suitable foraging and roosting	None anticipated	Screened out

Qualifying Interest (Conservation Objective)	Presence within the SPA/Zone of influence	Potential Impact	In combination Impact	Screened for Appropriate Assessment (Natura Impact Statement)
		sites are not present within the zone of influence of the proposed works.		
Common gull *(Larus canus)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Although species may use nearby habitats outside of the SPA as foraging or roosting sites, suitable foraging and roosting sites are not present within the zone of influence of the proposed works.	None anticipated	Screened out
Lesser black-backed gull *(Larus fuscus)*	Foraging and roosting sites > 5km downstream within the SPA. No known suitable habitat within the zone of influence of the works.	No predicted impact. Known foraging and roosting sites are located > 5 km downstream of the proposed works. Reductions in sediment release not considered significant at known roosting sties. No suitable foraging or roosting habitat within the zone of influence of the proposed works.	None anticipated	Screened out
Common tern *(Sterna hirundo)*	102 breeding pairs recorded within the SPA, > 5km downstream of works area in 1995	No predicted impact. Known breeding colonies are located > 5km downstream within the SPA. Reductions in sediment release not considered significant at known roosting sties. No known breeding pairs within the zone of influence of the proposed works.	None anticipated	Screened out

Qualifying Interest (Conservation Objective)	Presence within the SPA/Zone of influence	Potential Impact	In combination Impact	Screened for Appropriate Assessment (Natura Impact Statement)
Wetlands	Wetland habitat present > 5km downstream	Impact is unlikely. No wetland habitat present within the works area.	None anticipated	Screened out
Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC	Not present within the zone of influence of the proposed works	Impact unlikely. No habitat present within the works area. Known habitat is present > 10km downstream of the works.	None anticipated	Screened out
Atlantic salt meadows (GlaucoPuccinellietalia maritimae) in Great Island Channel SAC	Not present within the zone of influence of the proposed works	Impact unlikely. No habitat present within the works area. Known habitat is present > 10km downstream of the works.	None anticipated	Screened out

6 CONCLUSIONS

Potential impacts during the proposed River Bride (Blackpool) Certified Drainage Scheme Construction and Operational Stage have been considered in the context of Cork Harbour SPA and its Conservation Objectives.

The evaluation undertaken has identified that there will be no significant impact on any Special Conservation Interests and their conservation objectives, either alone or in-combination with any other plans and projects, for Cork Harbour SPA, given its distance downstream of the proposed works.

Therefore, as a result of the assessment carried out, it is considered that the conservation objectives for the Natura 2000 site will not be compromised by the works, nor will the works have any significant impact on the designated species for which it has been designated.

As a result of the assessment carried out, it is the considered view of the author that the site investigation works, construction works and operational stage of the River Bride (Blackpool) Certified Drainage Scheme will have no adverse effect on the integrity of any of the Natura 2000 sites listed, and as such this report returns a conclusion that there is no potential for significant effects on a Natura 2000 site. As such the works can be screened out under the Habitats Directive as not requiring a Stage 2 Appropriate Assessment

Appendix 6A
Quarry Location Map

Quarry Location

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DRAWING STATUS
☐ PRELIMINARY ☐ CONTRACT ☐ TENDER ☐ CONSTRUCTION
☐ FOR APPROVAL ☐ FOR YOUR INFORMATION ☐ AS CONSTRUCTED ☐ DRAFT

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CLIENT

PROJECT
River Bride (Blackpool) Drainage Scheme

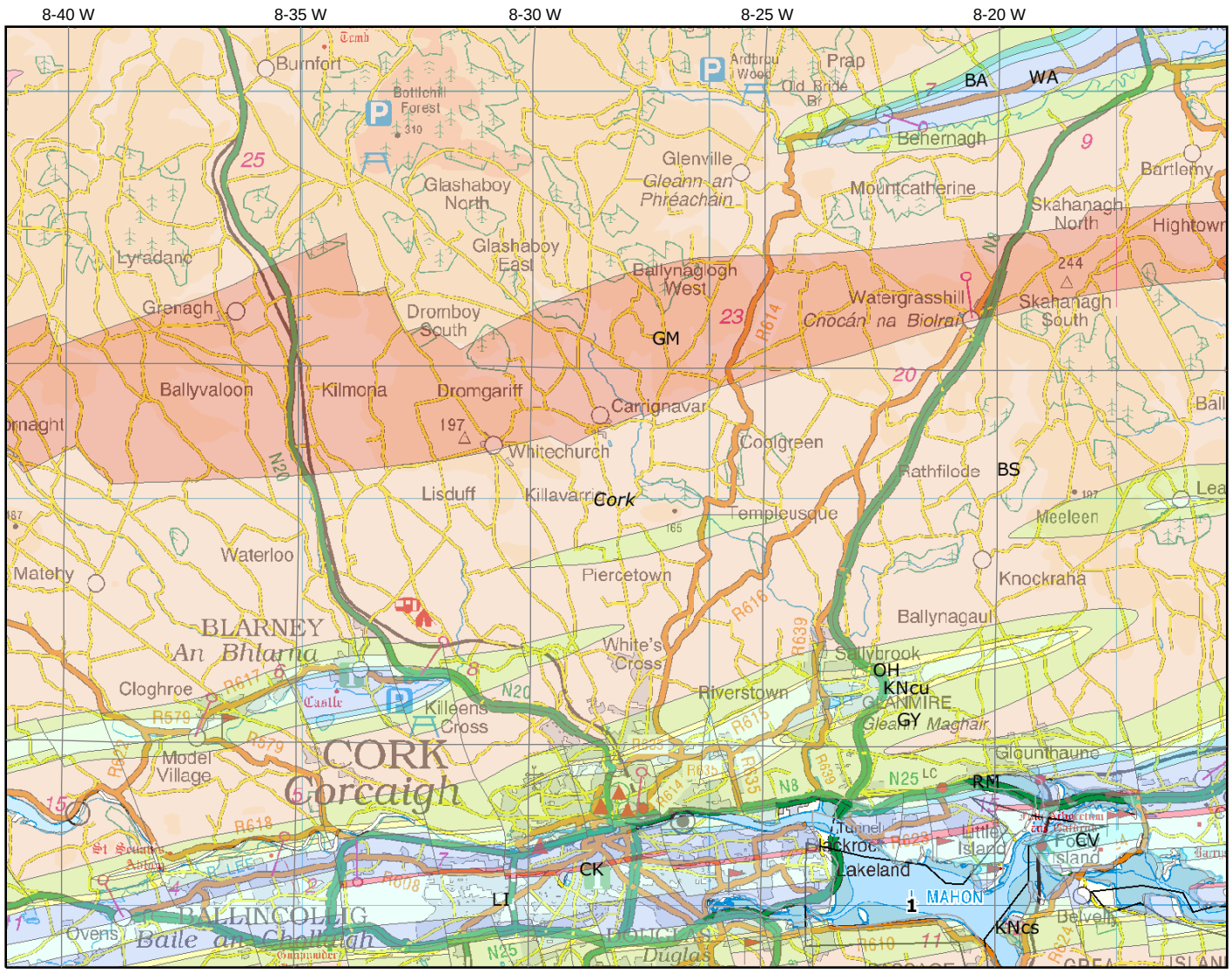
TITLE
Quarry Location

SCALE	DATE	DRAWN	CHECKED	APPROVED
NTS	10/15	KC	JR	JR

JOB No.	CAD FILE PATH	DRAWING No.	REV.
2317		SG001	

Appendix 6B
Bedrock Geology and Subsoil Maps

Bedrock Geology



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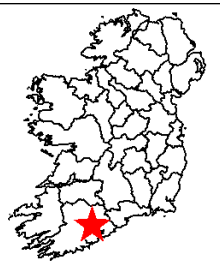


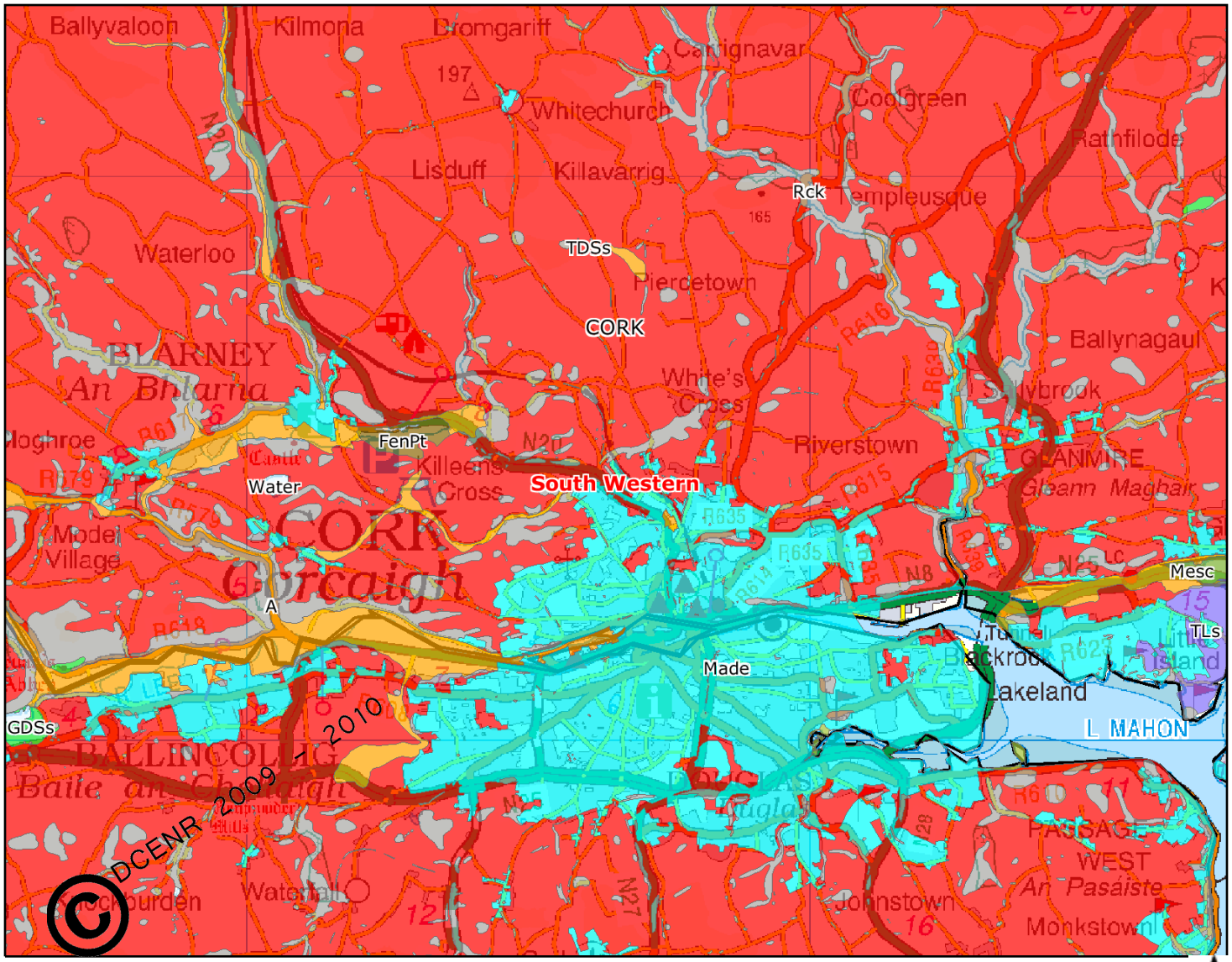
Legend

Bedrock 100k Solid Geology

- AA - Aille and Barney Fms (undifferentiated)
- AA - Allen Andesite Formation
- AAwp - Westport Oolite
- AB - South Achillbeg Formation
- ABcg - Achillbeg Conglomerate Member
- ABps - Achillbeg Lighthouse Psammite Member
- ABsl - Achillbeg School Black Slate Member
- AD - Aghaward Formation
- AD - Ardagh Shale Formation
- AD - Ardenagh Formation
- AD - Ashleam Bridge Dolomitic Formation
- AE - Aghamore Formation
- AE - Ardane Formation
- AG - Addergoole River Formation
- AG - Aghfarrell Formation
- AG - Aghmacart Formation
- AGdh - Dowery Hill Member
- AGdo - Aghmacart Formation
- AH - Achill Head Formation
- AH - Arklow Head Formation
- AHfv - in Arklow Head Formation
- Al - Aille Limestone Formation
- AK - Askingarran Formation
- AL - Altan Limestone Formation
- AL - Annascaul Formation
- AL - Argillaceous Limestones (Visean)
- ALmk - in Argillaceous Limest (Visean)
- AN - Anaffrin Formation
- AN - Annabella Formation
- ANgm - Glennamong Member
- ANrd - Old Road Member
- AP - Ards Pelite Formation
- AP - Ashleam Head Formation

Scale: 1:161,858

Subsoil Map



0 3 6 9 km.

Map center: 166594, 74585

N

Legend

RBD Subsoils

- Alluvium
- Beach sands and gravels
- Bedrock outcrop and subcrop
- Esker sands and gravels
- Glaciofluvial sands and gravels
- Lake sediments
- Made ground
- Marine/estuarine silts and clays
- Marsh
- Peat
- Scree
- Till derived chiefly from Devonian sandstones
- Till derived chiefly from Lower Palaeozoic rocks
- Till derived chiefly from Namurian rocks
- Till derived chiefly from granite
- Till derived chiefly from limestone
- Till derived chiefly from metamorphic rocks
- Till derived from metamorphic rocks
- Till derived from mixed Devonian and Carboniferous rocks
- Water
- Windblown sands
- RBD Boundaries
- County Boundaries

Scale: 1:112,714

Snapshot Date: 14-Aug-2015

Appendix 8A
Noise Glossary

Appendix 8A: Noise glossary

Ambient	Total noise environment at a location, including all sounds present.
A-weighting	Weighting or adjustment applied to sound level to approximate non-linear frequency response of human ear. Denoted by suffix A in parameters such as $L_{Aeq\ T}$, $L_{AF10\ T}$, etc.
Background level	A-weighted sound pressure level of residual noise exceeded for 90 % of time interval T. Denoted $L_{AF90\ T}$.
Decibel (dB)	Unit of noise measurement scale. Based on logarithmic scale so cannot be simply added or subtracted. 3 dB difference is smallest change perceptible to human ear. 10 dB difference is perceived as doubling or halving of sound level. Examples of decibel levels are as follows: 20 dB: very quiet room; 30-35 dB: night-time rural environment; 55-65 dB: conversation; 80 dB: busy pub; 100 dB: nightclub. **Throughout this report noise levels are presented as decibels relative to 20 µPa**.
Fast response	0.125 seconds response time of sound level meter to changing noise levels. Denoted by suffix F in parameters such as $L_{AF10\ T}$, $L_{AF90\ T}$, etc.
Free field	Noise environment away from all surfaces other than ground ie. outside near field.
Frequency	Number of cycles per second of a sound or vibration wave. Low frequency noise may be perceived as hum, while whine represents higher frequency. Range of human hearing approaches 20-20,000 Hertz.
Hertz (Hz)	Unit of frequency measurement.
Impulse	Noise which is of short duration, typically less than one second, sound pressure level of which is significantly higher than background.
Interval	Time period T over which noise parameters are measured at position. Denoted by T in $L_{Aeq\ T}$, $L_{AF90\ T}$, etc.
L_{AE}	Sound exposure level. Measure of noise level of an event, standardised to interval of one second, and containing same acoustical energy as actual event.
$L_{Aeq\ T}$	Equivalent continuous sound pressure level during interval T, effectively representing average A-weighted noise level of ambient noise environment.
$L_{AF10\ T}$	Sound pressure level exceeded for 10% of interval T, usually used to quantify traffic noise.
$L_{AF90\ T}$	Sound pressure level exceeded for 90% of interval T, usually used to quantify background noise. May also be used to describe noise level from continuous steady or almost-steady source, particularly where local noise environment fluctuates.
L_{Amax}	Maximum A-weighted sound pressure level occurring during measurement interval.
L_{Amin}	Minimum A-weighted sound pressure level occurring during measurement interval.

Masking	The rendering inaudible of one noise source by another noise source(s) which may be louder, or may contain significant acoustic energy in the same part of the frequency spectrum. In the latter case, any tone(s) in the original source emissions may become inaudible.
Near field	Noise levels recorded near walls or other surfaces, artificially increased due to reflections. Levels near walls may be increased by up to 3 dB, and up to 6 dB near corners. Free field conditions may be achieved by maintaining separation distance of at least 3.5 m from walls.
Noise sensitive location	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires absence of noise at nuisance levels.
Peak particle velocity (PPV)	Rate of change of displacement of particles in solid medium due to vibration, measured as mm/s. Usually used to assess vibration in relation to activities such as blasting as correlates well with human perception of vibration and property damage.
Residual level	Noise level remaining when specific source is absent or does not contribute to ambient.
Specific level	$L_{Aeq\ T}$ level produced by specific noise source under consideration during interval T, measured directly or by estimation or calculation.
Tone	Character of noise caused by dominance of one or more frequencies which may result in increased noise nuisance.

Appendix 8B
Survey Details

Appendix 8B: Survey details

Event	Period	Daytime
	Date	22.10.15
	Day	Thursday
	Time	0800-1630
	Operator	Damian Brosnan BSc MIOA MIEI
Conditions	Cloud cover	Varying 70-100 %
	Precipitation	0 mm
	Temperature	13 rising to 16 °C
Wind	Direction	W
	Speed	0-2 m/s
	Measurement	Anemo anemometer 2 m above ground level
Sound level meter	Instrument	Bruel & Kjaer Type 2250-L
	Instrument serial no.	2566801
	Microphone serial no.	2571655
	Application	BZ7130 Version 2.0
	Bandwidth	Broadband & 1/3 octaves
	Max. input level	142.66 dB
	Broadband weightings	Time: Fast Frequency: AC
	Spectrum weightings	Time: Fast Frequency: Z
	Windscreen correction	UA1404 outdoor kit
	Sound field correction	Free-field
	UKAS calibration	13.01.15
	Calibrating laboratory	Bruel & Kjaer Denmark
	Calibration certificate	Available on request
Onsite calibration	Time	22/10/2015 07:57:01
	Type	External
	Sensitivity	43.58 mV/Pa
	Post survey check	93.9 dB
Onsite calibrator	Instrument	Bruel & Kjaer Type 4231
	Instrument serial no.	2342544
	UKAS calibration	13.01.15
	Calibrating laboratory	Bruel & Kjaer Denmark
	Calibration certificate	Available on request
Methodology	Standards	ISO 1996 (2003 & 2007)
	Exceptions	-
	Intervals	15 min logging at 10 s

Appendix 8C
Ambient Noise Data

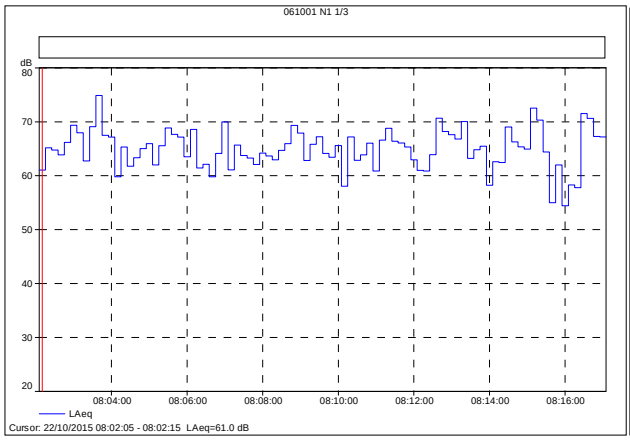
Appendix 8C: Ambient noise data

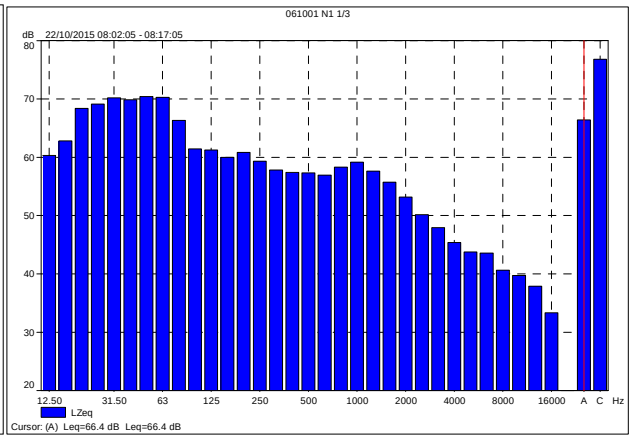
Station	Time	$L_{Aeq\ 15\ min}$ dB	$L_{AF10\ 15\ min}$ dB	$L_{AF90\ 15\ min}$ dB	L_{AFmax} dB	L_{AFmin} dB	Noise audible
N1	0802-0817	66	70	59	78	52	Watercourse Rd traffic dominant continuously, moving in waves caused by traffic lights. N20 traffic also clearly audible during local traffic lulls. Intermittent vehicle movements through adjacent T&A carpark audible. Crows.
	1112-1127	66	70	58	83	54	
	1357-1412	66	69	58	81	53	
N2	0821-0836	63	66	57	81	52	Traffic through local junction dominant, moving in traffic light waves. During lulls, distant traffic continuously audible. Crow calls, and occasional pedestrian voices. 2nd interval terminated 90 s early due to local manoeuvring vehicles.
	1132-1146	64	67	57	90	53	
	1417-1432	62	64	55	83	51	
N3	0839-0854	55	57	49	73	46	Road traffic on surrounding streets clearly audible and dominating noise environment, although significantly screened by buildings and walls, allowing other sources to be more audible, chiefly birdsong, crow calls, aircraft, local vehicle movements in square, and pedestrian voices in surrounding areas. During 2nd and 3rd intervals, occasional emissions audible from auto shop at 30 m (wheel nut removal tool).
	1148-1203	55	57	46	75	43	
	1436-1451	51	54	47	66	44	
N4	0900-0915	56	59	52	70	48	N20 Blackpool bypass traffic continuously clearly audible and dominant, masking Old Commons Rd traffic (latter screened in any case by OCR terrace). Sporadic local car movements at this end of Orchard Court. No other noise audible apart from local birdsong.
	1206-1221	56	58	52	70	47	
	1456-1511	58	60	53	72	48	
N5	0956-1011	55	58	52	64	48	N20 traffic continuously dominating noise environment. Occasional car movements through local carpark. Traffic also audible on Old Mallow Rd. Bird song/calls and aircraft. Sporadic dog barking audible at rear of nearest dwelling during 2nd and 3rd intervals.
	1243-1258	56	58	52	68	49	
	1520-1535	55	58	52	66	48	

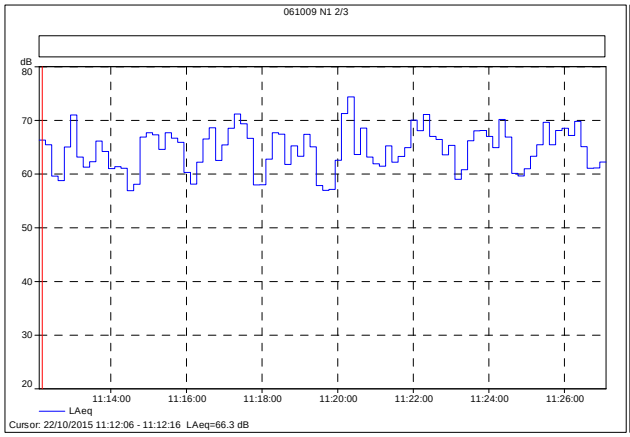
N6	1026-1041	65	69	54	86	48	Intermittent traffic through adjacent junction dominant when present. Otherwise, N20 traffic continuously clearly audible. Crow calls and aircraft.
	1306-1321	65	68	54	86	48	
	1541-1556	65	69	57	81	52	
N7	1048-1103	51	52	49	67	48	Water flow in nearby river clearly audible continuously, co-dominant with continuously audible N20 traffic noise. Bird song/calls and aircraft. During 2nd interval, occasional dog barking at approx. 100 m. During 3rd interval, local voices clearly audible at 1611.
	1326-1341	52	53	50	60	48	
	1601-1616	51	52	49	66	48	

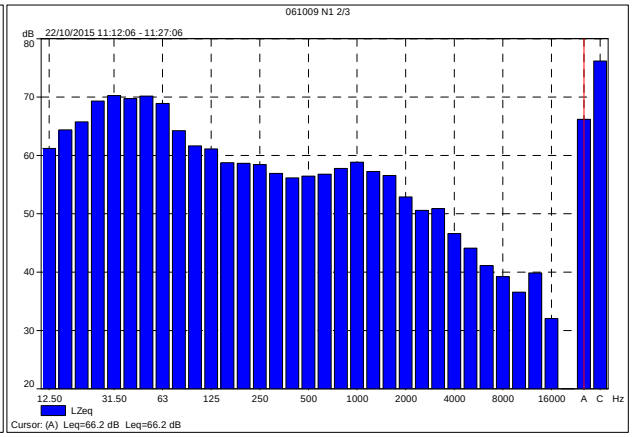
Appendix 8D
Profiles and Spectra

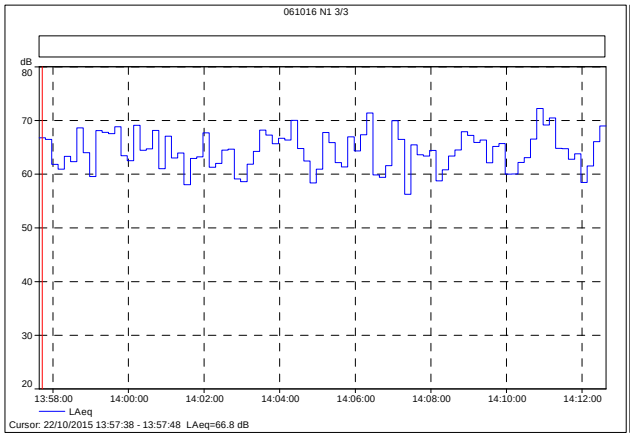
Appendix 8D: Profiles & spectra

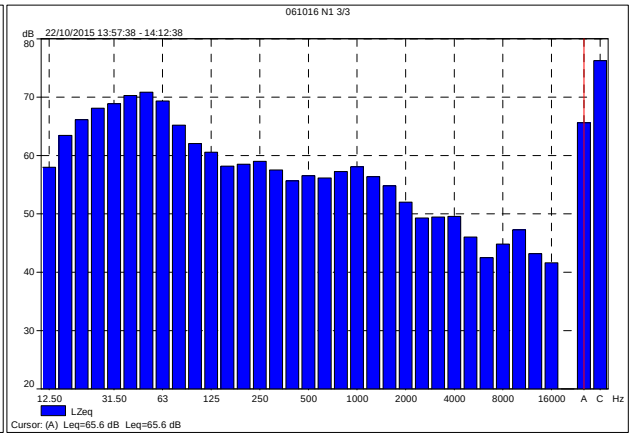


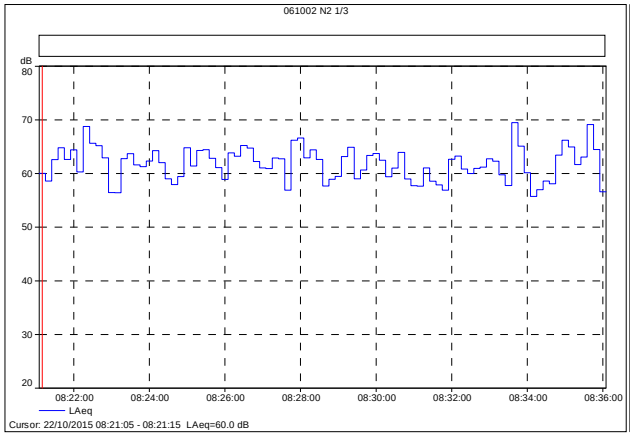








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dB
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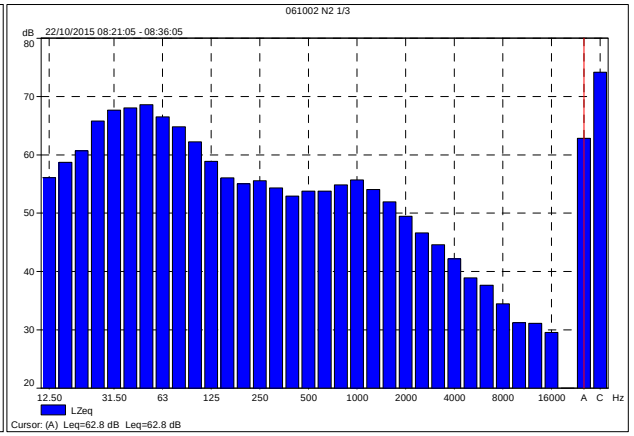
70
60
50
40
30
20
08:22:00
08:24:00
08:26:00
08:28:00
08:30:00
08:32:00
08:34:00
08:36:00
LAeq
Cursor: 22/10/2015 08:21:05 - 08:21:15 LAeq=60.0 dB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dB
22/10/2015 08:21:05 - 08:36:05
80
70
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30
20
12.50
31.50
63
125
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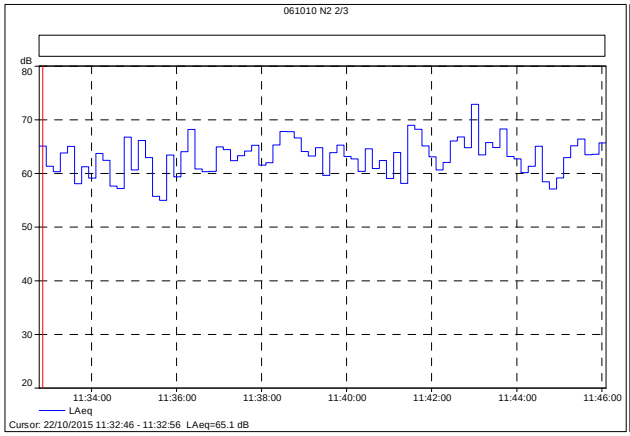
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=62.8 dB Leq=62.8 dB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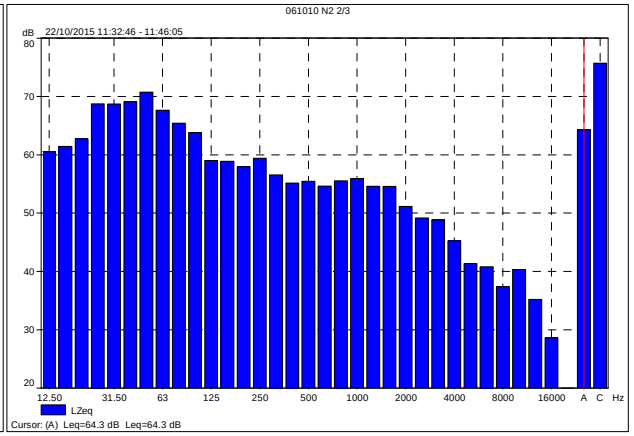
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22/10/2015 11:32:46 - 11:46:05
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70
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30
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12.50
31.50
63
125
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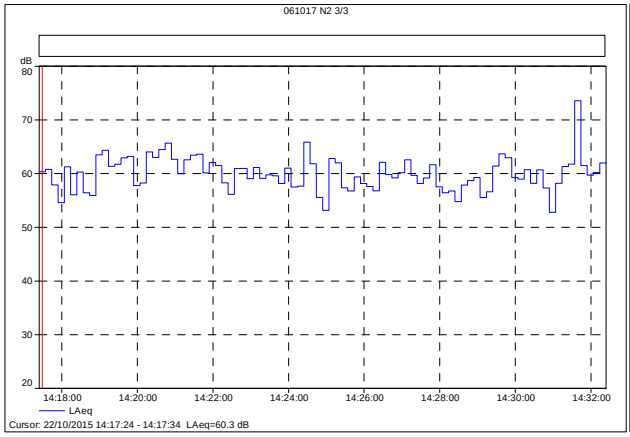
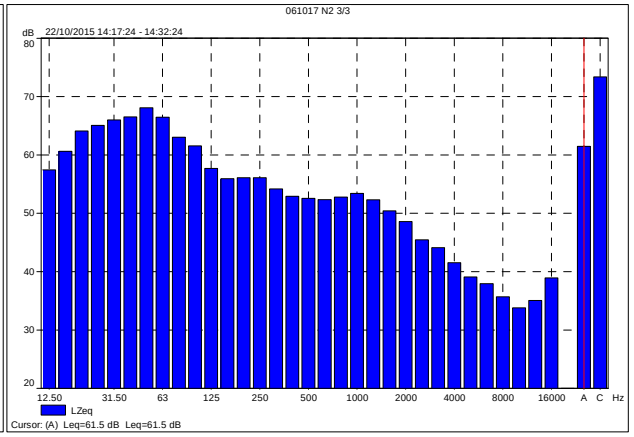
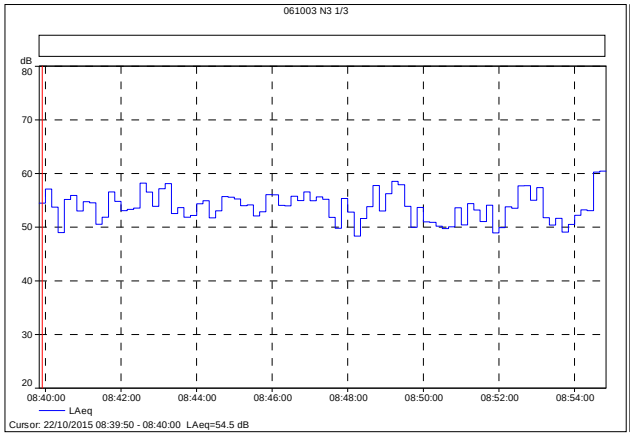
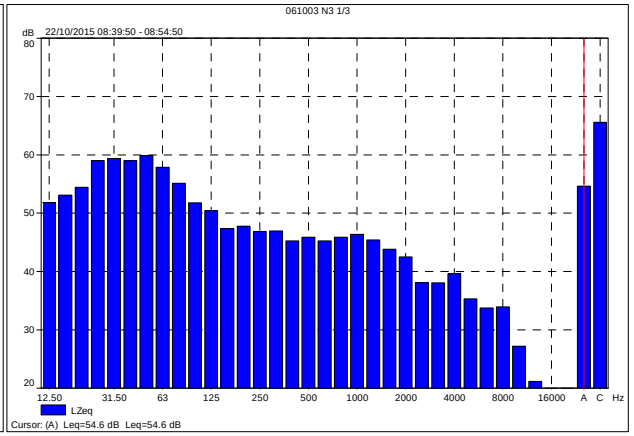
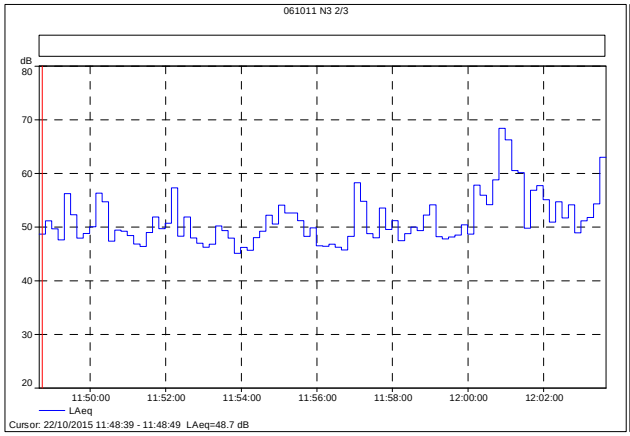
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=64.3 dB Leq=64.3 dB

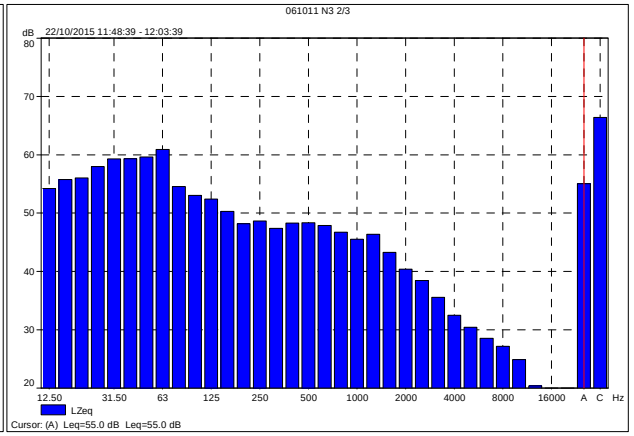

061017 N2 3/3
dB
80
70
60
50
40
30
20
14:18:00
14:20:00
14:22:00
14:24:00
14:26:00
14:28:00
14:30:00
14:32:00
LAeq
Cursor: 22/10/2015 14:17:24 - 14:17:34 LAeq=60.3 dB

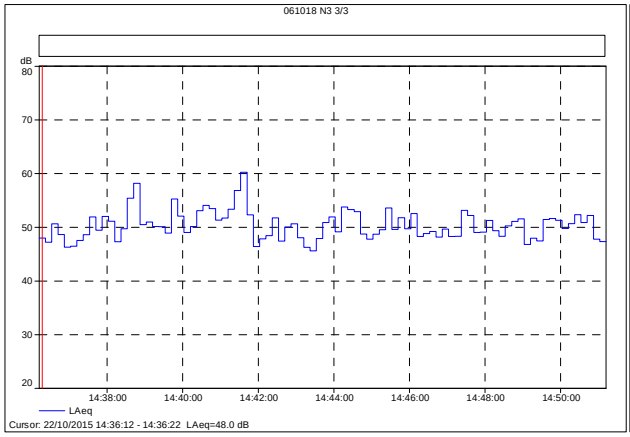

061017 N2 3/3
dB
22/10/2015 14:17:24 - 14:32:24
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=61.5 dB Leq=61.5 dB

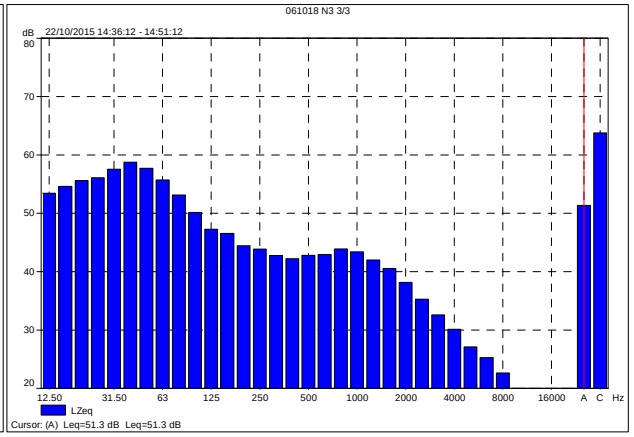

061003 N3 1/3
dB
80
70
60
50
40
30
20
08:40:00
08:42:00
08:44:00
08:46:00
08:48:00
08:50:00
08:52:00
08:54:00
LAeq
Cursor: 22/10/2015 08:39:50 - 08:40:00 LAeq=54.5 dB

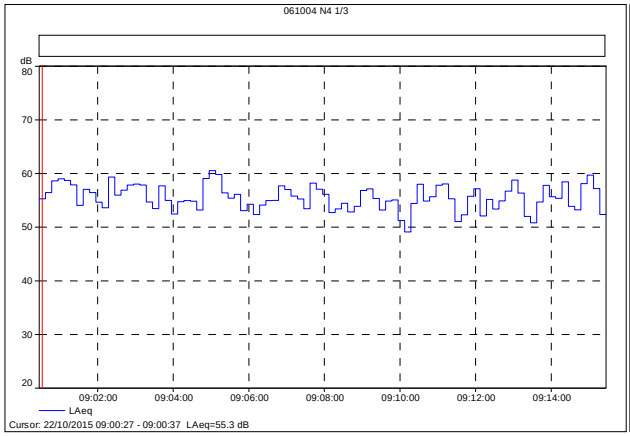

061003 N3 1/3
dB 22/10/2015 08:39:50 - 08:54:50
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=54.6 dB Leq=54.6 dB

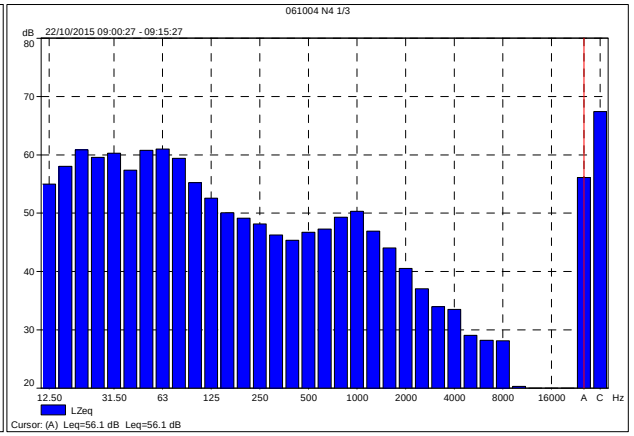

061011 N3 2/3
dB
80
70
60
50
40
30
20
11:50:00
11:52:00
11:54:00
11:56:00
11:58:00
12:00:00
12:02:00
LAeq
Cursor: 22/10/2015 11:48:39 - 11:48:49 LAeq=48.7 dB

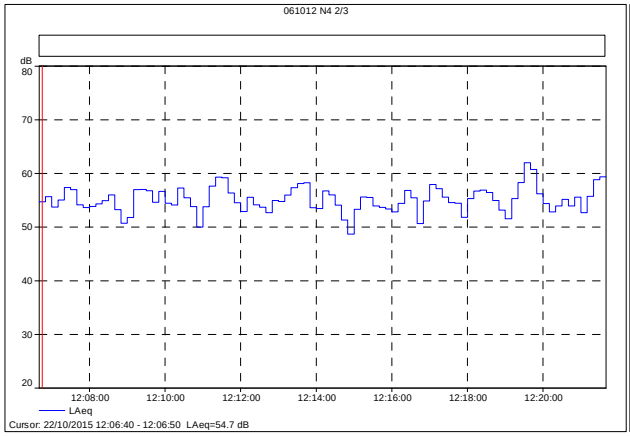

061011 N3 2/3
dB 22/10/2015 11:48:39 - 12:03:39
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=55.0 dB Leq=55.0 dB

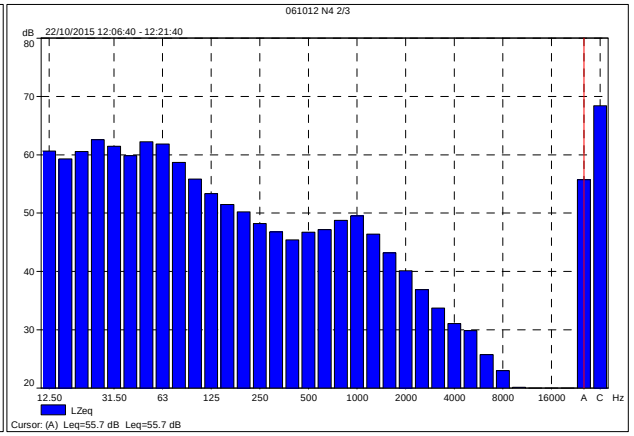

061018 N3 3/3
dB
80
70
60
50
40
30
20
14:38:00
14:40:00
14:42:00
14:44:00
14:46:00
14:48:00
14:50:00
LAeq
Cursor: 22/10/2015 14:36:12 - 14:36:22 LAeq=48.0 dB

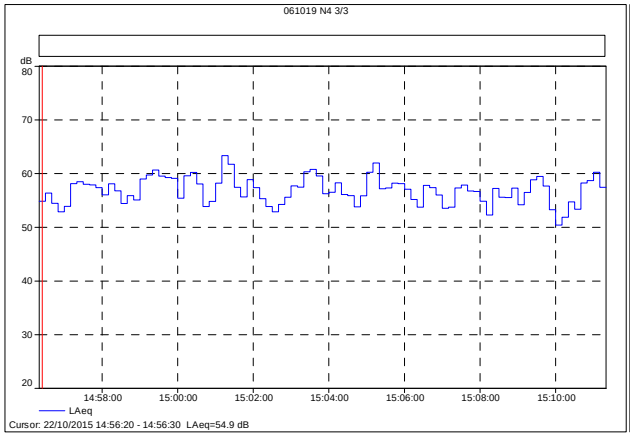

061018 N3 3/3
dB 22/10/2015 14:36:12 - 14:51:12
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=51.3 dB Leq=51.3 dB

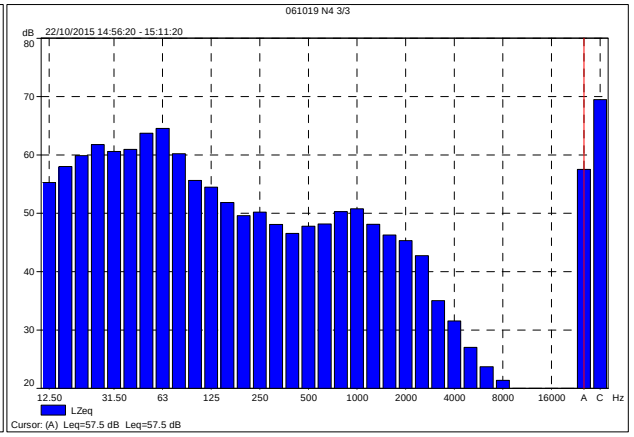

061004 N4 1/3
dB
80
70
60
50
40
30
20
09:02:00
09:04:00
09:06:00
09:08:00
09:10:00
09:12:00
09:14:00
LAeq
Cursor: 22/10/2015 09:00:27 - 09:00:37 LAeq=55.3 dB

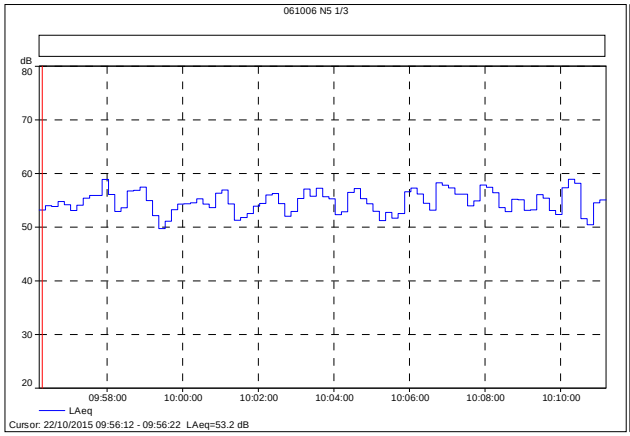

061004 N4 1/3
dB 22/10/2015 09:00:27 - 09:15:27
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=56.1 dB Leq=56.1 dB

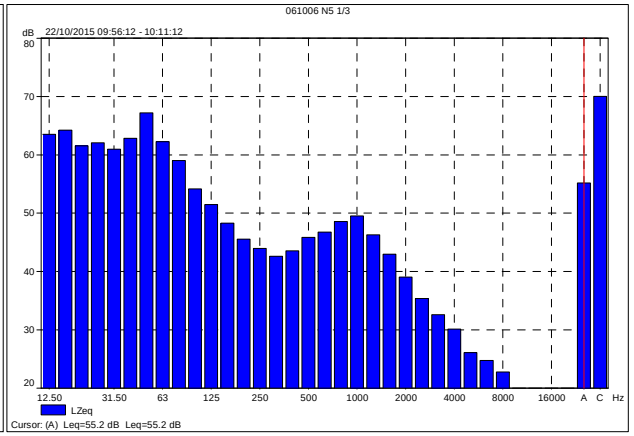

061012 N4 2/3
dB
80
70
60
50
40
30
20
12:08:00
12:10:00
12:12:00
12:14:00
12:16:00
12:18:00
12:20:00
LAeq
Cursor: 22/10/2015 12:06:40 - 12:06:50 LAeq=54.7 dB

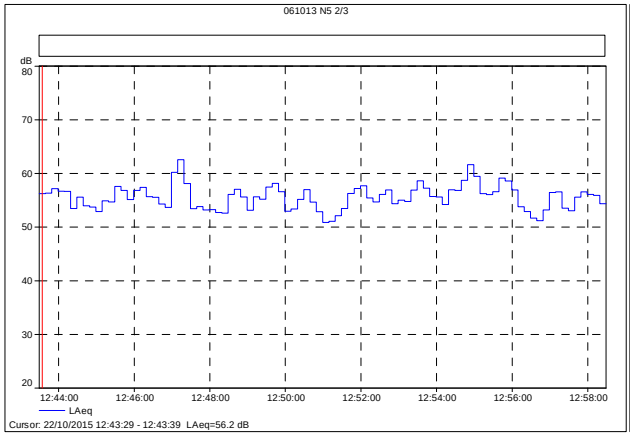

061012 N4 2/3
dB 22/10/2015 12:06:40 - 12:21:40
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=55.7 dB Leq=55.7 dB

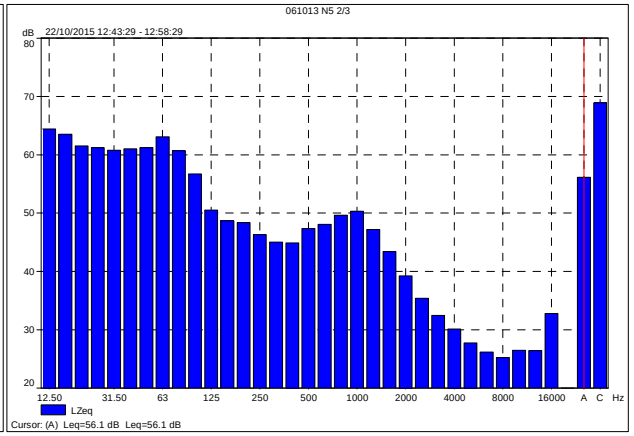

061019 N4 3/3
dB
80
70
60
50
40
30
20
14:58:00
15:00:00
15:02:00
15:04:00
15:06:00
15:08:00
15:10:00
LAeq
Cursor: 22/10/2015 14:56:20 - 14:56:30 LAeq=54.9 dB

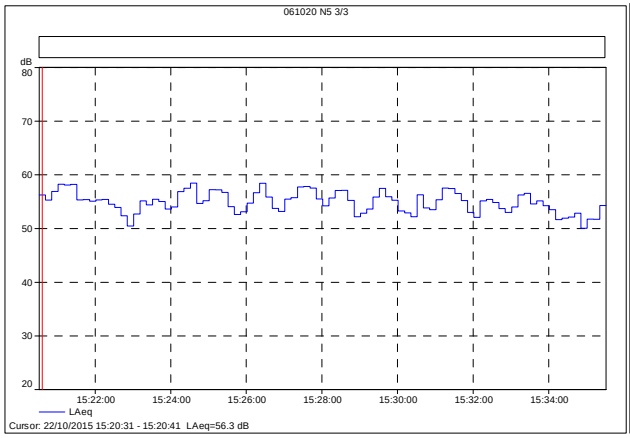

061019 N4 3/3
dB 22/10/2015 14:56:20 - 15:11:20
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=57.5 dB Leq=57.5 dB

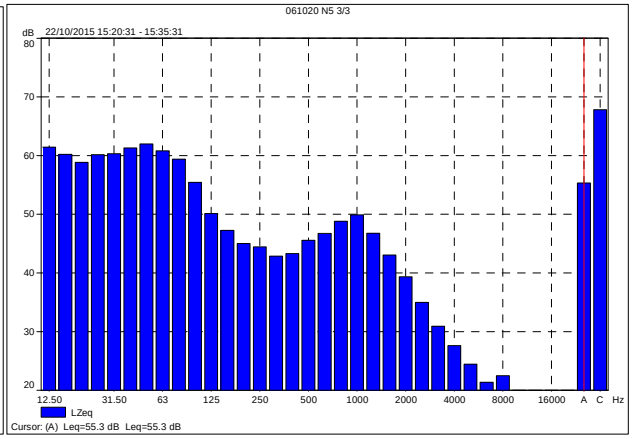

061006 N5 1/3
dB
80
70
60
50
40
30
20
09:58:00
10:00:00
10:02:00
10:04:00
10:06:00
10:08:00
10:10:00
LAeq
Cursor: 22/10/2015 09:56:12 - 09:56:22 LAeq=53.2 dB

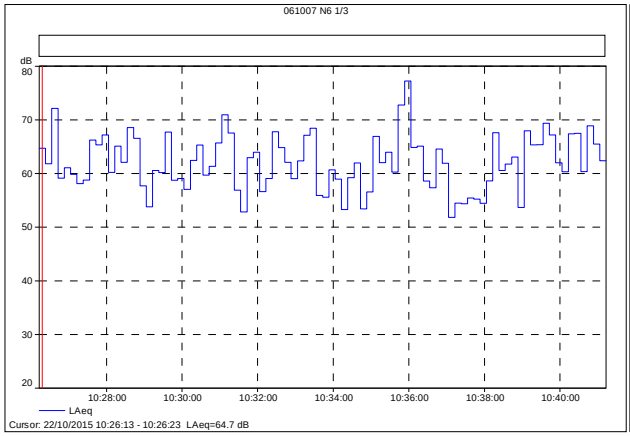

061006 N5 1/3
dB
22/10/2015 09:56:12 - 10:11:12
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=55.2 dB Leq=55.2 dB

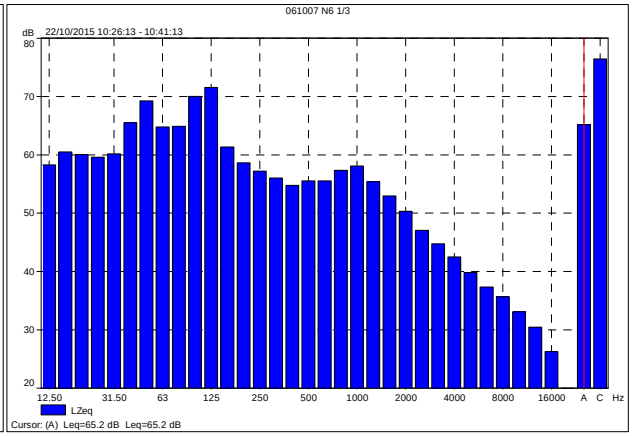

061013 N5 2/3
dB
80
70
60
50
40
30
20
12:44:00
12:46:00
12:48:00
12:50:00
12:52:00
12:54:00
12:56:00
12:58:00
LAeq
Cursor: 22/10/2015 12:43:29 - 12:43:39 LAeq=56.2 dB

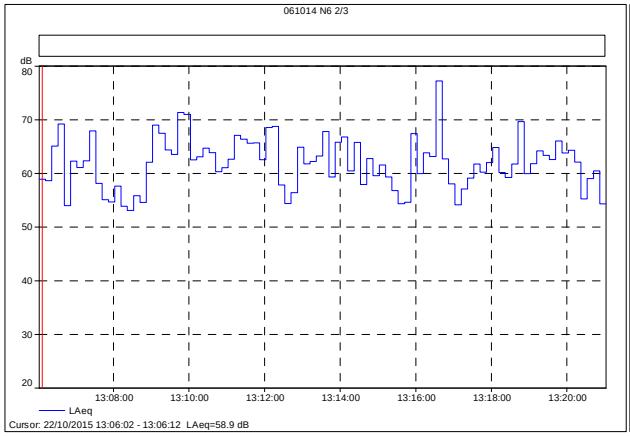

061013 N5 2/3
dB
22/10/2015 12:43:29 - 12:58:29
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=56.1 dB Leq=56.1 dB

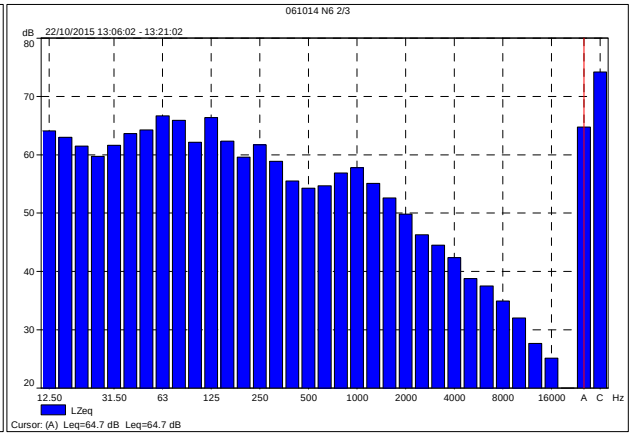

061020 N5 3/3
dB
80
70
60
50
40
30
20
15:22:00
15:24:00
15:26:00
15:28:00
15:30:00
15:32:00
15:34:00
LAeq
Cursor: 22/10/2015 15:20:31 - 15:20:41 LAeq=56.3 dB

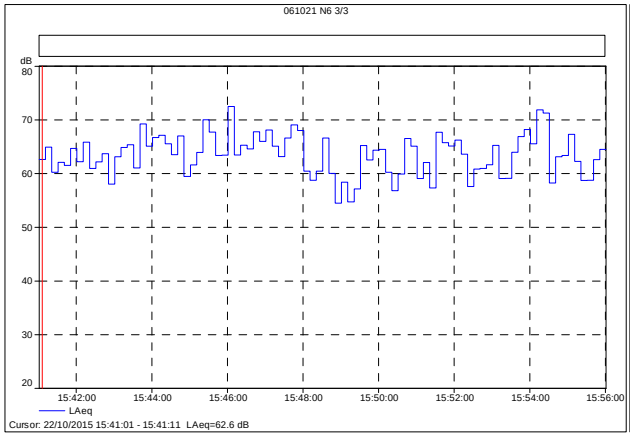

061020 N5 3/3
dB
22/10/2015 15:20:31 - 15:35:31
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=55.3 dB Leq=55.3 dB

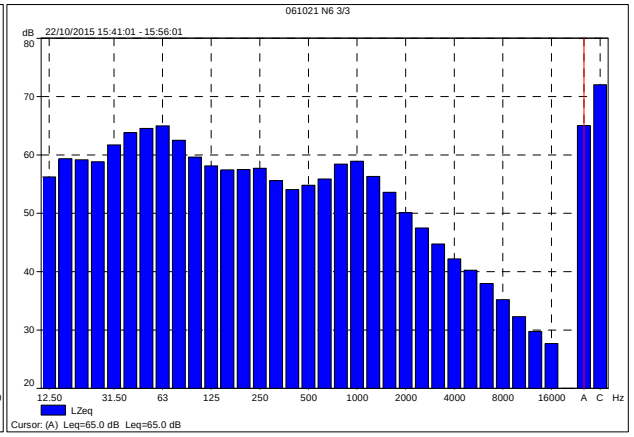

061007 N6 1/3
dB
80
70
60
50
40
30
20
10:28:00
10:30:00
10:32:00
10:34:00
10:36:00
10:38:00
10:40:00
LAeq
Cursor: 22/10/2015 10:26:13 - 10:26:23 LAeq=64.7 dB

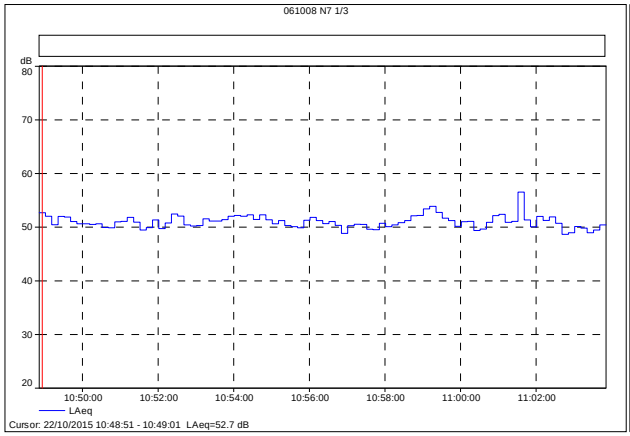

061007 N6 1/3
dB 22/10/2015 10:26:13 - 10:41:13
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=65.2 dB Leq=65.2 dB

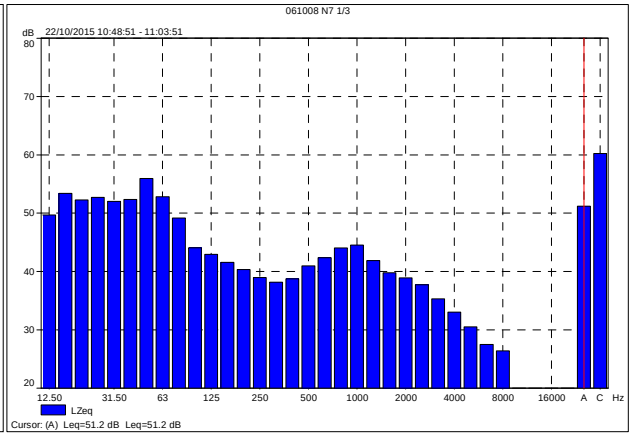

061014 N6 2/3
dB
80
70
60
50
40
30
20
13:08:00
13:10:00
13:12:00
13:14:00
13:16:00
13:18:00
13:20:00
LAeq
Cursor: 22/10/2015 13:06:02 - 13:06:12 LAeq=58.9 dB

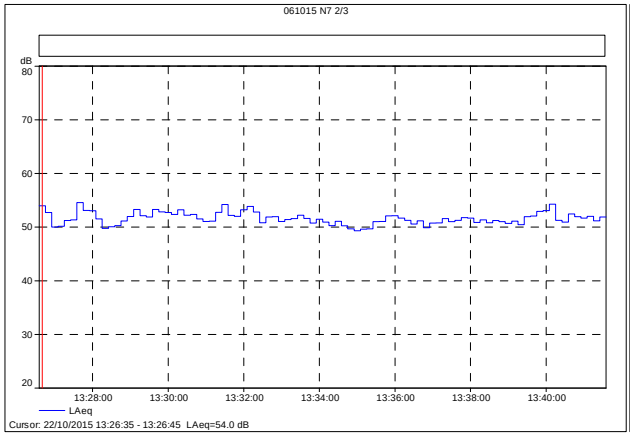

061014 N6 2/3
dB 22/10/2015 13:06:02 - 13:21:02
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=64.7 dB Leq=64.7 dB

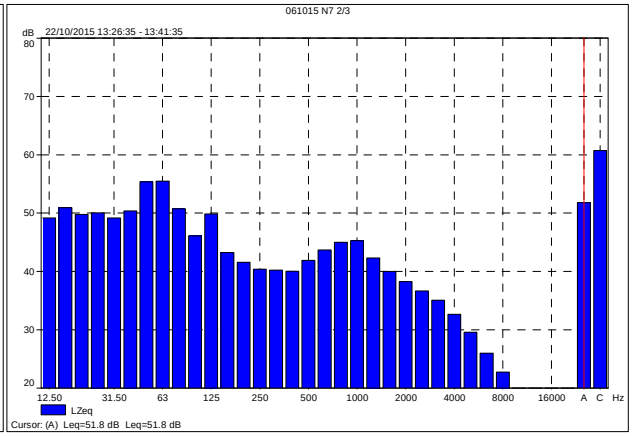

061021 N6 3/3
dB
80
70
60
50
40
30
20
15:42:00
15:44:00
15:46:00
15:48:00
15:50:00
15:52:00
15:54:00
15:56:00
LAeq
Cursor: 22/10/2015 15:41:01 - 15:41:11 LAeq=62.6 dB

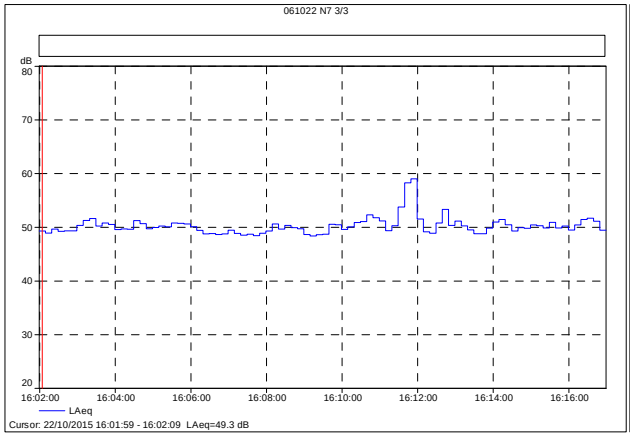

061021 N6 3/3
dB 22/10/2015 15:41:01 - 15:56:01
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=65.0 dB Leq=65.0 dB

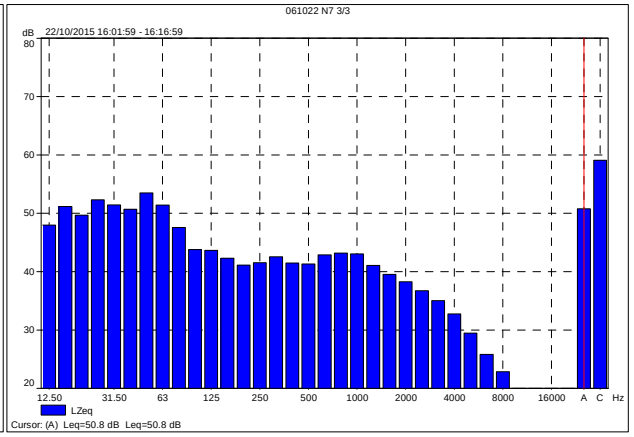

061008 N7 1/3
dB
80
70
60
50
40
30
20
10:50:00
10:52:00
10:54:00
10:56:00
10:58:00
11:00:00
11:02:00
LAeq
Cursor: 22/10/2015 10:48:51 - 10:49:01 LAeq=52.7 dB


061008 N7 1/3
dB 22/10/2015 10:48:51 - 11:03:51
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=51.2 dB Leq=51.2 dB


061015 N7 2/3
dB
80
70
60
50
40
30
20
13:28:00
13:30:00
13:32:00
13:34:00
13:36:00
13:38:00
13:40:00
LAeq
Cursor: 22/10/2015 13:26:35 - 13:26:45 LAeq=54.0 dB


061015 N7 2/3
dB 22/10/2015 13:26:35 - 13:41:35
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=51.8 dB Leq=51.8 dB


061022 N7 3/3
dB
80
70
60
50
40
30
20
16:02:00
16:04:00
16:06:00
16:08:00
16:10:00
16:12:00
16:14:00
16:16:00
LAeq
Cursor: 22/10/2015 16:01:59 - 16:02:09 LAeq=49.3 dB


061022 N7 3/3
dB 22/10/2015 16:01:59 - 16:16:59
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A C Hz
LZeq
Cursor: (A) Leq=50.8 dB Leq=50.8 dB

Appendix 10A
Cultural Heritage Photographic Record

APPENDIX 10A: CULTURAL HERITAGE PHOTOGRAPHIC RECORD

Plate 10.1: View of culverted section of Watercourse Road from south

Plate 10.2: View of culvert extending under Watercourse Road from north showing concreted channel (church wall and railings visible at right)

Plate 10.3: View of River Bride at south end of Orchard Gardens from south

Plate 10.4: View of overgrowth in River Bride with Commons Road at left and Orchard Gardens at right

Plate 10.5 View of modern wall along rear gardens of Commons Road terrace within village

Plate 10.6 View of River Bride within grounds of Blackpool Retail Park

Plate 10.7: View of River Bride in south end of Sunbeam Industrial Estate

Plate 10.8: View of riverside railings at north end of Sunbeam Industrial Estate

Plate 10.9: River Bride sluice at south end of Dulux Factory (in area of proposed sediment trap)

Plate 10.10: View of River Bride at north end of Dulux Factory

Plate 10.11: View of masonry road bridge on Fitz's Boreen (from north)

Plate 10.12: View of modern culvert within McDonald's car park

Plate 10.13: View of River Bride extending northwest alongside Westlink Business Park

Plate 10.14: View towards proposed 'winter channel' in northeast end of Commons Inn Hotel grounds

Plate 10.15: View of existing overgrown channel in area of proposed 'winter channel'

Plate 10.16: View towards proposed flood defences in northwest end of Commons Inn Hotel grounds

Plate 10.17: View of south side of masonry bridge along driveway to Woodview House

Plate 10.18: View of north side of masonry bridge along driveway to Woodview House

Plate 10.19: View of Woodview House from southwest with rail viaduct visible

Plate 10.20: View of mill remains in southeast corner of Woodview House garden

Plate 10.21: View of viaduct at east end of Woodview House garden

Plate 10.22: View of proposed location of embankment in east end of Woodview House garden

Plate 10.23: View of green field area at proposed location of flood defences surrounding private house property in Commons Townland

APPENDIX 10.2: EXTRACTS FROM 1ST EDITION 6-INCH MAPS OF STUDY AREA

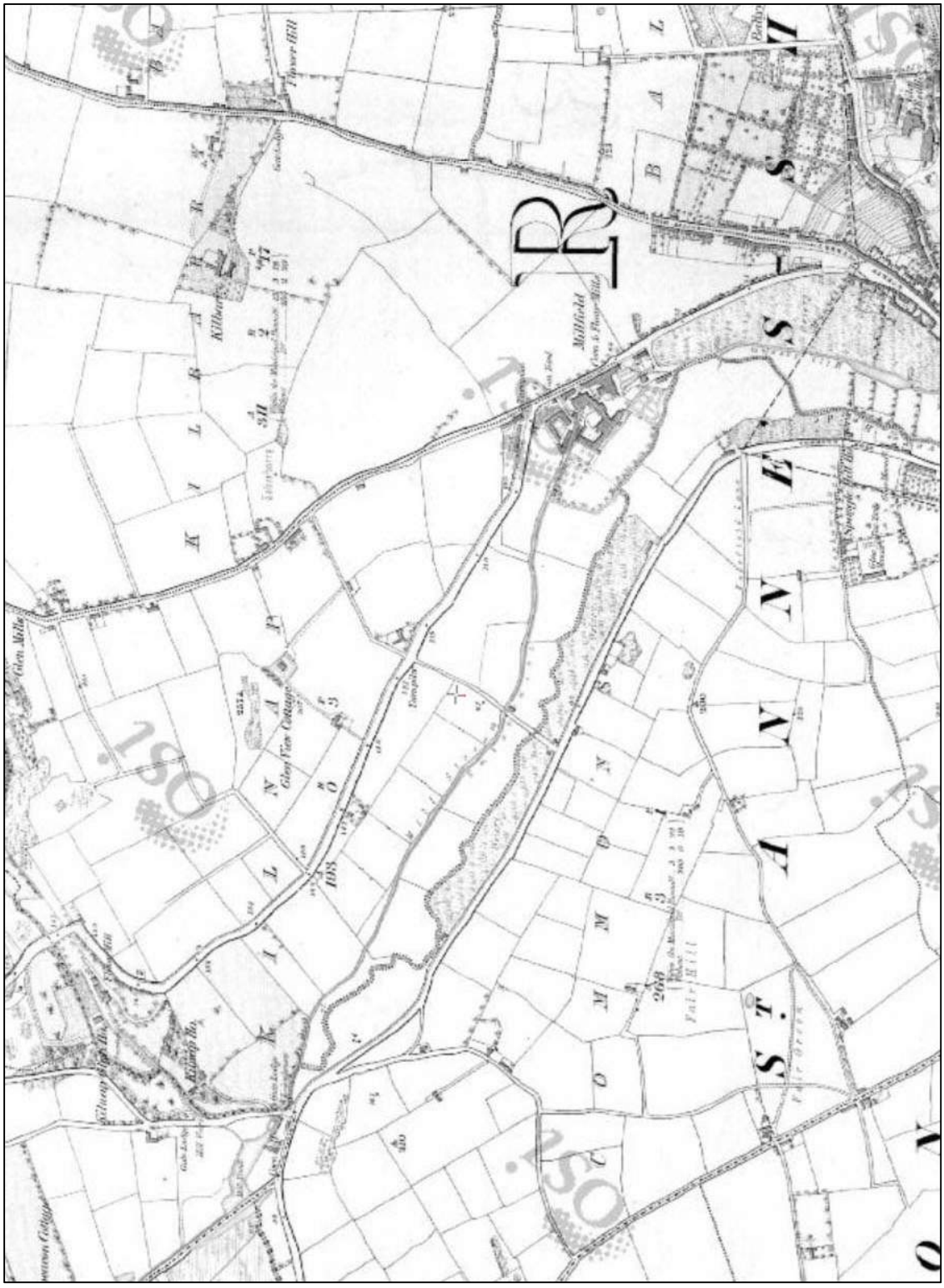
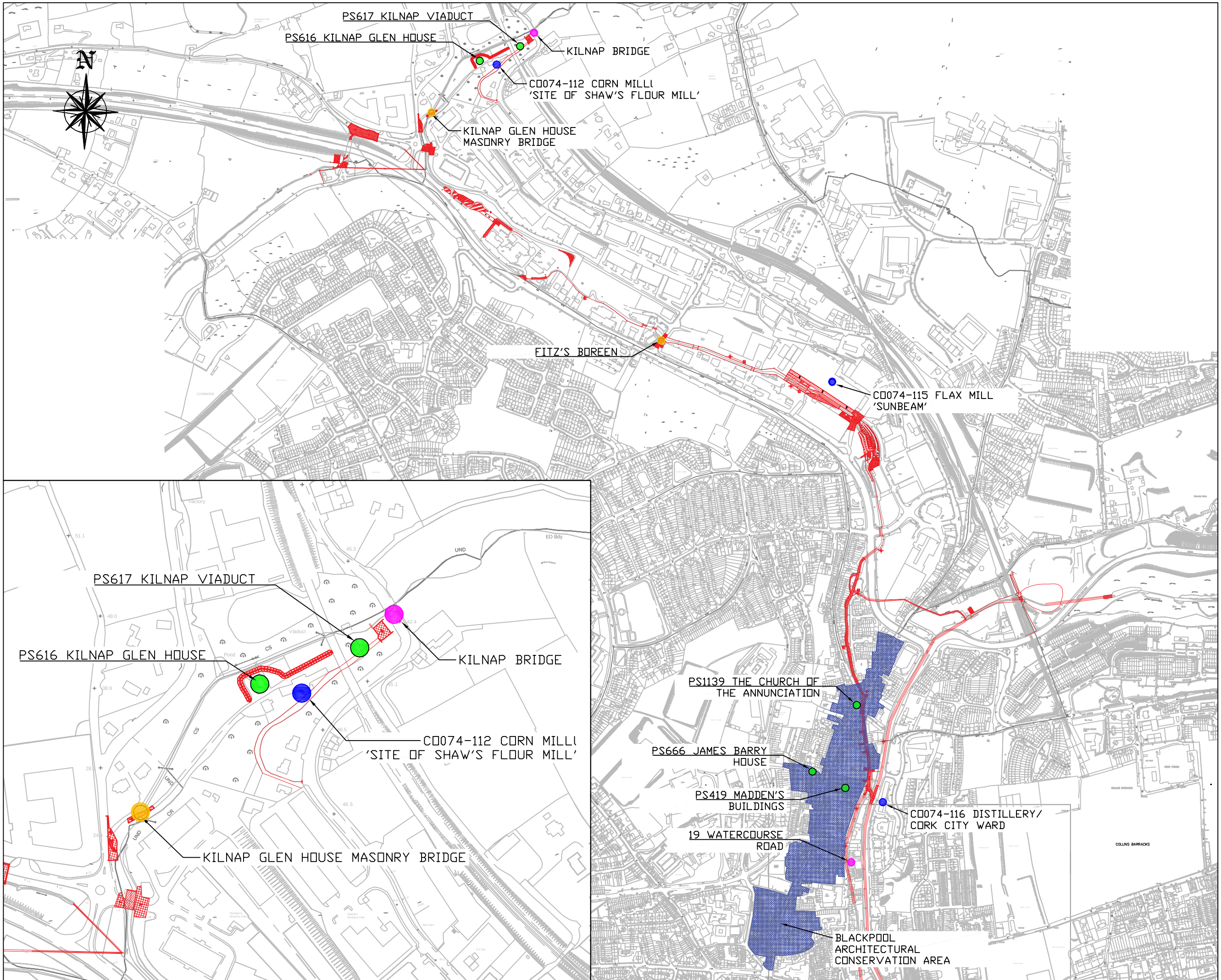


Figure 10.1: Extract from 1st edition 6-inch map showing north end of study area

Figure 10.2: Extract from 1st edition 6-inch map showing south end of study area

Appendix 10B
Cultural Heritage Location Map



LEGEND

- Record of Monuments and Places (RMP)
- Protected Structures
- National Inventory of Architectural Heritage
- Masonry Bridge
- Architectural Conservation Area
- Proposed Works Locations [See Appendix 3 for Details]

REV	DATE	DRN	DESCRIPTION	CHK	APD

REVISIONS

DRAWING STATUS

- ☐ PRELIMINARY
- ☐ CONTRACT
- ☐ TENDER
- ☐ PLANNING
- ☐ CONSTRUCTION
- ☐ FOR APPROVAL
- ☒ FOR YOUR INFORMATION
- ☐ AS CONSTRUCTED
- ☐ DRAFT

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CLIENT
OFFICE OF PUBLIC WORKS

PROJECT
RIVER BRIDE (BLACKPOOL)
CERTIFIED DRAINAGE SCHEME

TITLE
CULTURAL HERITAGE
LOCATION MAP

SCALE @ A3	DATE	DRAWN	CHECKED	APPROVED
NTS	NOV 2015	KC	JR	MJ

JOB No.	DRAWING No.	REV.
2317	CH 001	

Appendix 11A
Traffic, Services and Telecommunications