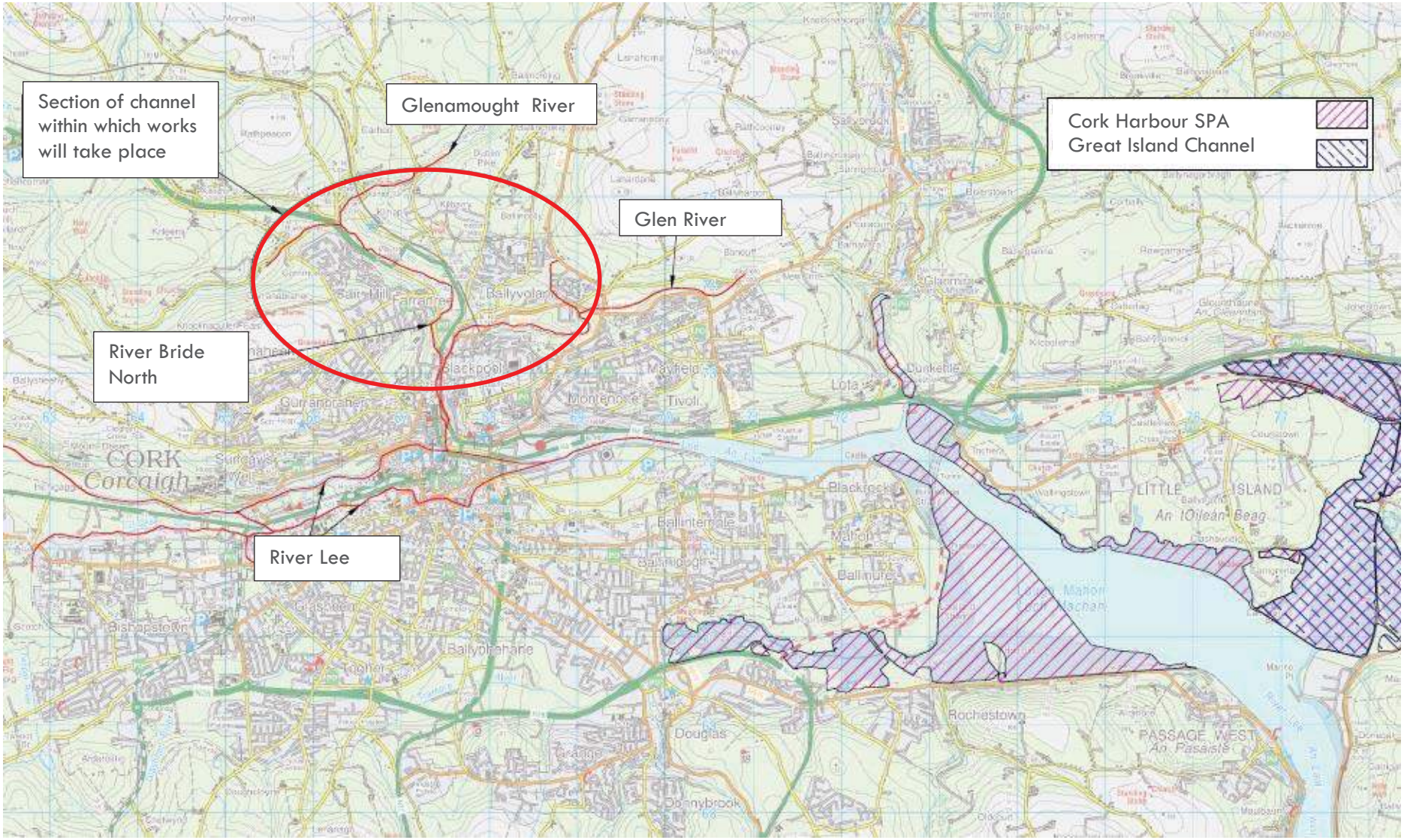


Figure 4.1: Location of Natura 2000 sites in relation to works

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 5E
Fishery Enhancement Proposals – North Bride

Fishery Enhancement Proposals

in relation to the

Proposed River Bride (Blackpool) Certified Drainage Scheme

Professor Martin O'Grady

April, 2016.

1. Introduction.

Ryan/Hanley on behalf of OWP has requested the author to review the River Bride (Blackpool) Certified Drainage scheme proposals with a view to modifying same, where possible, for the benefit of the fish stocks without compromising the functionality of the proposed drainage scheme. This report provides specific details in relation to achieving the aforementioned objective.

2. Methodologies.

The proposals in this document were generated following; -

1. The author reviewing all of the background biological data which had been compiled in relation to this study.
2. Looking at the detail of the proposed drainage scheme as outlined in the exhibition drawings for the scheme (Smyth, 24/11/2015).
3. Meeting with Ryan/Hanley personnel, following a site visit, to clarify some of the drainage proposals.
4. Visiting and walking the appropriate channel length on two occasions' accompanied by Mr Michael McPartland (Senior Environmental Officer with Inland Fisheries Ireland) (February, 23rd and April, 13th.

3. Recommendations

The reader should note that all of the coded references in this document are those used in the Exhibition Drawings Document (Smyth, 2015).

3.1 General Issues

3.1.1 Channel Reach of Concern to Fishery Interests.

The specific length of channel, within this proposed flood relief scheme, of concern from a fishery perspective, is the section from the bridge immediately downstream of McDonalds Restaurant (C06 _B01) downstream to where it is proposed to construct a trash rack as part of the flood relief scheme (CO6_ TO2) adjacent to Blackpool Shopping Centre.

3.1.2. The Nature of Channel Substrate Post-Drainage.

Within the channel reach of concern to fisheries it would be most desirable if the substrate on the wetted width of the channel be composed of the same cobble/gravel mix evident in the channel presently – it is accepted that cobble/gravel removal from the proposed gravel trap (CO6 _ CO3) will be necessary, from time to time, as part of a drainage maintenance programme.

3.1.3. Low Flow Wetted Channel Base width.

From a fishery perspective, it is crucial that post-drainage, there should be a "two stage" channel with the wetted width in low flow regimes having the same base width as is evident to-day – the concept of a "two stage" channel is illustrated in "Channels and Challenges" (O'Grady, 2006) (see also Fig. 1 below).

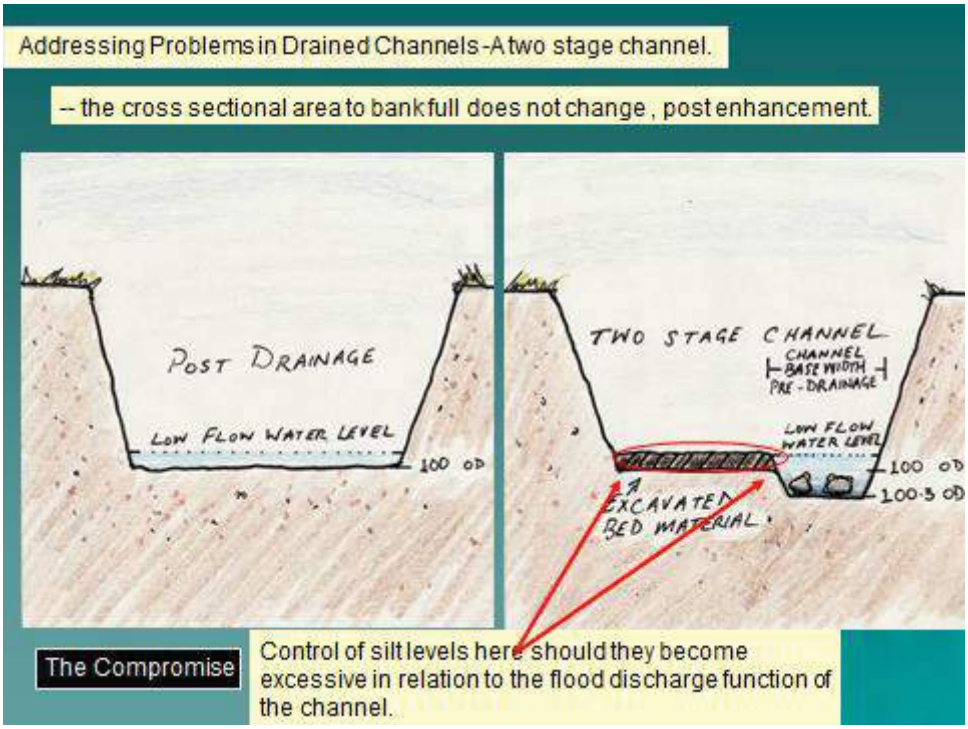


Figure 1. An illustration of the proposed “two stage” channel.

3.1.4. Channel Meander Pattern within the Low Flow Channel.

The channel reach within this programme of concern to fisheries, as defined in section 3.1.1 above, has a number of natural meanders. On each of these meanders the deposition of river silt presently illustrates the natural curvature of the channel. Essentially, post-drainage, the construction of a two-stage channel should mimic the existing pattern at a lower bed level at each meander point (see Figure 2 below by way of example).

Figure 2. Channel morphology at an existing meander bend just d/s of CO6 _ 2250.

3.1.5 Reorganisation of Channel Form, Post-Drainage, in a currently unnaturally broad shallow reach which is braided in nature (from the bridge at CO6 _ LO6 downstream to the bridge at CO6 _ L10).

Currently this artificially broad reach is braided in nature (Figure 3). Following drainage, it suggested that a meandering two stage channel be constructed with the low flow wetted area being circa 1/3 of the existing channel base width. An outline sketch of the proposal is provided in Figure 3. It is suggested that there be a total of four meander bends in the channel length between the two bridges. These should be equally spaced apart over the length of the channel in question.

The creation of a two-stage channel both in straight and meander sections of this channel will necessitate the construction of stone deflectors to function as the “higher tier” of the two bed levels. A suitable design for such a structure is illustrated in Figure 4.

Whenever maintenance of this channel is required, post drainage, the excess silt deposits which will lodge on top of the higher tier in the channel can be removed. Care needs to be taken to ensure that the original “two tiered” design remain in place following maintenance and that the bed of the wetted low flow tier is not disturbed by maintenance operations.

Figure 3. An outline sketch of the enhancement proposal for this reach following the implementation of the drainage programme.

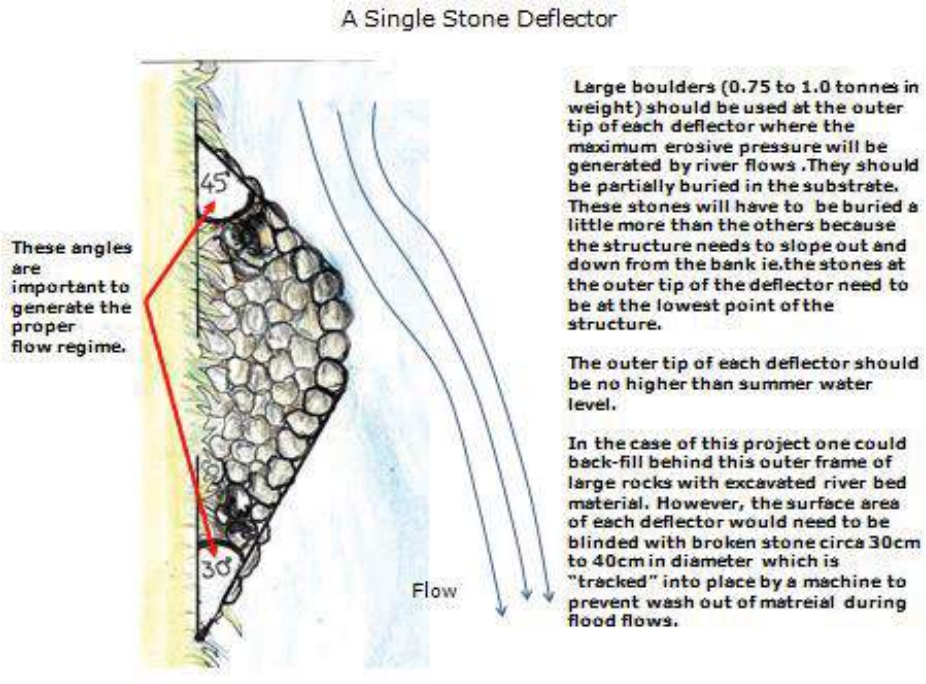


Figure 4. Construction detail in relation to the proposed" higher tier" in a two stage channel.

3.1.6. Introduction of boulders to the channel.

The introduction of boulders to the entire channel length of fishery interest (see Section 3.1.1.) would significantly enhance the morphology of this channel from a fishery perspective; -

- Localised hydrological alterations, caused by boulder placement, would provide resting places for trout and result in localised minor accumulations of the smaller gravels in the channel bed, downstream of individual boulders which would provide spawning opportunities for the trout.
- Stable boulders also provide an area which can be colonised by aquatic plants and invertebrates (Figure 5).

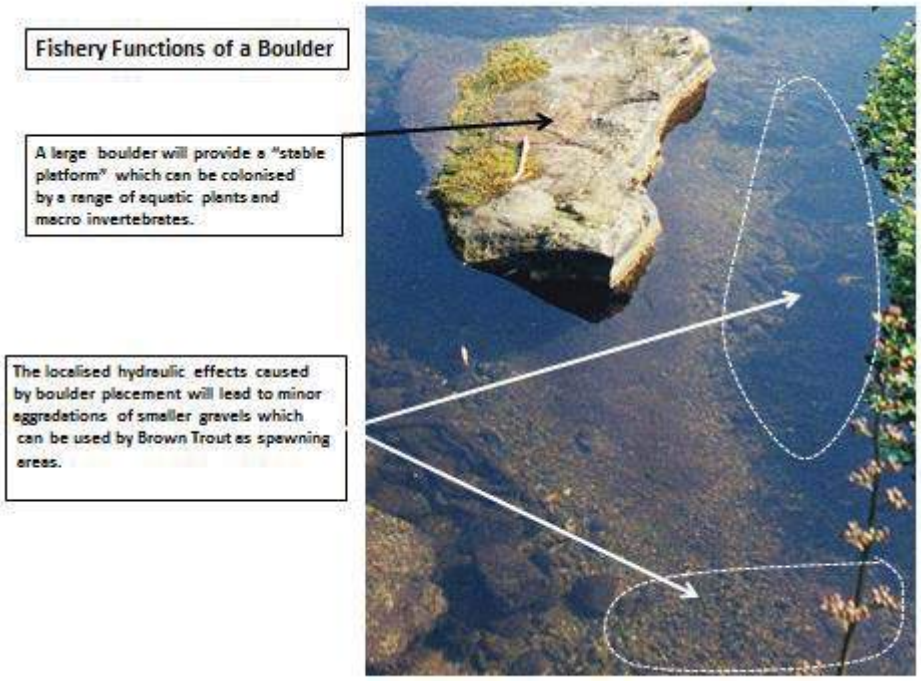


Figure 5. Visual evidence of the value of an introduced boulder.

3.1.6.1. Boulder Requirements and Distribution.

Suitable boulders for this project would be 1.0 to 1.5 tonnes in weight.

They should be at circa 10.0m centres, relative to one another, over the entire channel length in question (excluding the gravel trap area).

The distribution of all boulders should be confined solely to the low flow wetted area.

3.1.7. Providing a Riparian Zone.

The channel in question will have no vegetated riparian zone following the implementation of the proposed drainage programme. The complete absence of bankside vegetation, apart from some marginal grasses poses some severe ecological restrictions from a fishery perspective; -

- Marginal trees and shrubs partially shade channels providing camouflage for fish and help to maintain summer water temperatures beneath lethal levels for trout.

- Most aquatic insects have a short aerial phase in their life cycle during which time they mate and return to the river to lay their eggs. During their terrestrial phase they rest and shelter from storms in shrubbery adjacent to the river – in the absence of such vegetation few are likely to survive long enough to complete their life cycle thereby reducing the overall fish food supply.
- In the summer/autumn period many terrestrial insects, living in a riparian zone, fall into the watercourse. They constitute an important food source for trout during this seasonal period.

In order to counter these negative effects to some extent the author would make the following suggestion; - construct “concrete window boxes” on the upper inner face of the flood relief walls on selected channel reaches – wherever the low flow wetted reach is adjacent to the flood protection wall (Figure 6). Given the limited growing zone within these boxes the “weeping willows” will remain dwarf in nature and not interfere with flood flows (Figure 6).

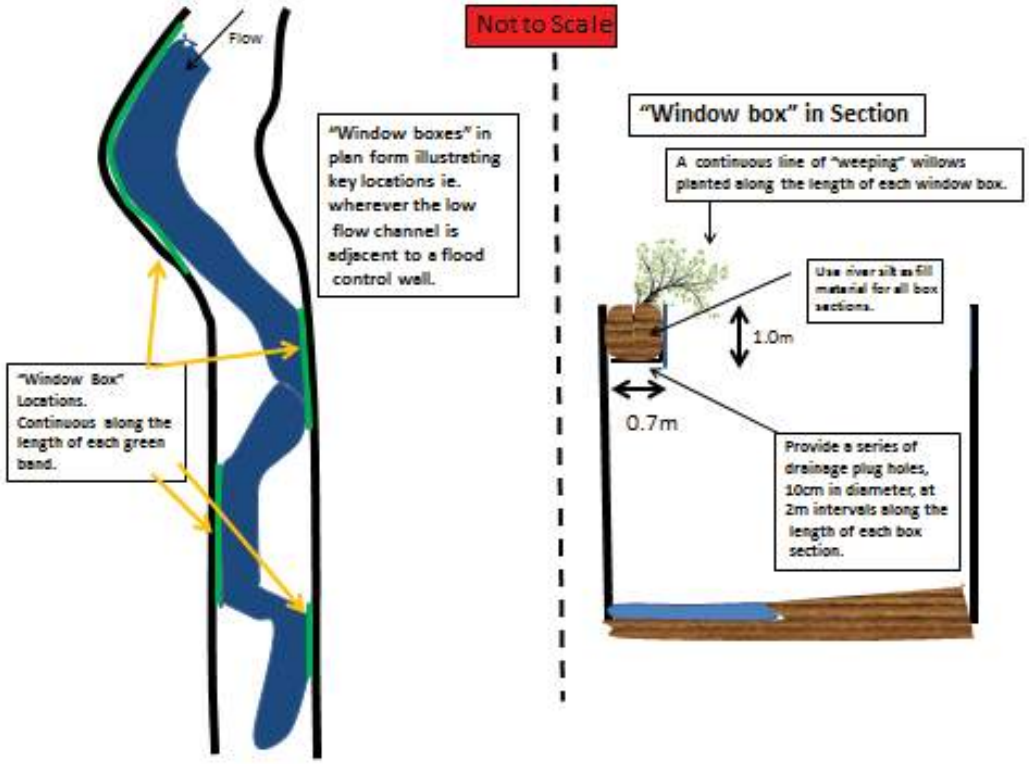


Figure 6. Detail in relation to the Willow planting proposal.

3.2. Specific Issues

There are two particular issues where minor alterations to particular aspects of the drainage proposal would help fishery interests.

3.2.1. Proposed construction of a “trash rack” at CO6 _ TO2 adjacent to Blackpool Retail Park.

It is important from a fishery perspective that trout (≤ 35.0 cm in length) have freedom of passage both upstream and downstream through the proposed “trash rack”.

3.2.2. Nature of the left bank on the channel reach where the sedimentation trap is proposed (CO6 _ CO3).

A proposed new wall is proposed here subject to structural assessment (CO6 _ L12). From an ecological perspective, a grassed embankment would be preferable.

4. Summary Comment.

The relevant reach of the River Bride (Blackpool) (see Section 3.1.1) is already in a very poor morphological and ecological state prior to the implementation of this proposed drainage scheme. In the authors opinion if the recommendations outlined in this document can be incorporated into the proposed drainage design (Smyth, 2015) it will significantly improve its capacity to support a brown trout population. In the authors opinion, the net gain in fish stock terms should more than offset the permanent loss caused by culverting in the lower reaches of the proposed drainage scheme.

5. References

O’Grady,M.F., 2006. Channels and Challenges. Enhancing salmonid rivers. Irish Freshwater Fisheries Ecology and Management Series: No.4.Central Fisheries Board, Dublin, Ireland.

Smyth, T., 2015. River Bride(Blackpool) Certified Drainage Scheme Exhibition Drawings. Office of Public Works, Cork City Council and Cork Co. Council.

6. Acknowledgements

The author is most grateful to Sinead Gavin (Ryan/Hanley) for supplying me with all relevant background information.

A special thanks is due to Michael McPartland (IFI) for sharing both his time and expertise with the author.

Appendix 6A
Quarry Location Map

Quarry Location

Copyright Ryan Hanley
This drawing must not be reproduced in any form without the prior written consent of Ryan Hanley consulting engineers

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

RYAN HANLEY
CONSULTING ENGINEERS
Sherwood House,Sherwood Avenue
Taylor's Hill, Galway
Tel: (091)587116 Fax: (091)587110
Email: rhc@ryanhanley.ie
Web: www.ryanhanley.ie
Dublin Office: 170 Ivy Exchange, Granby Place, Parnell Square West, Dublin 1

CLIENT

PROJECT
River Bride (Blackpool) Drainage Scheme

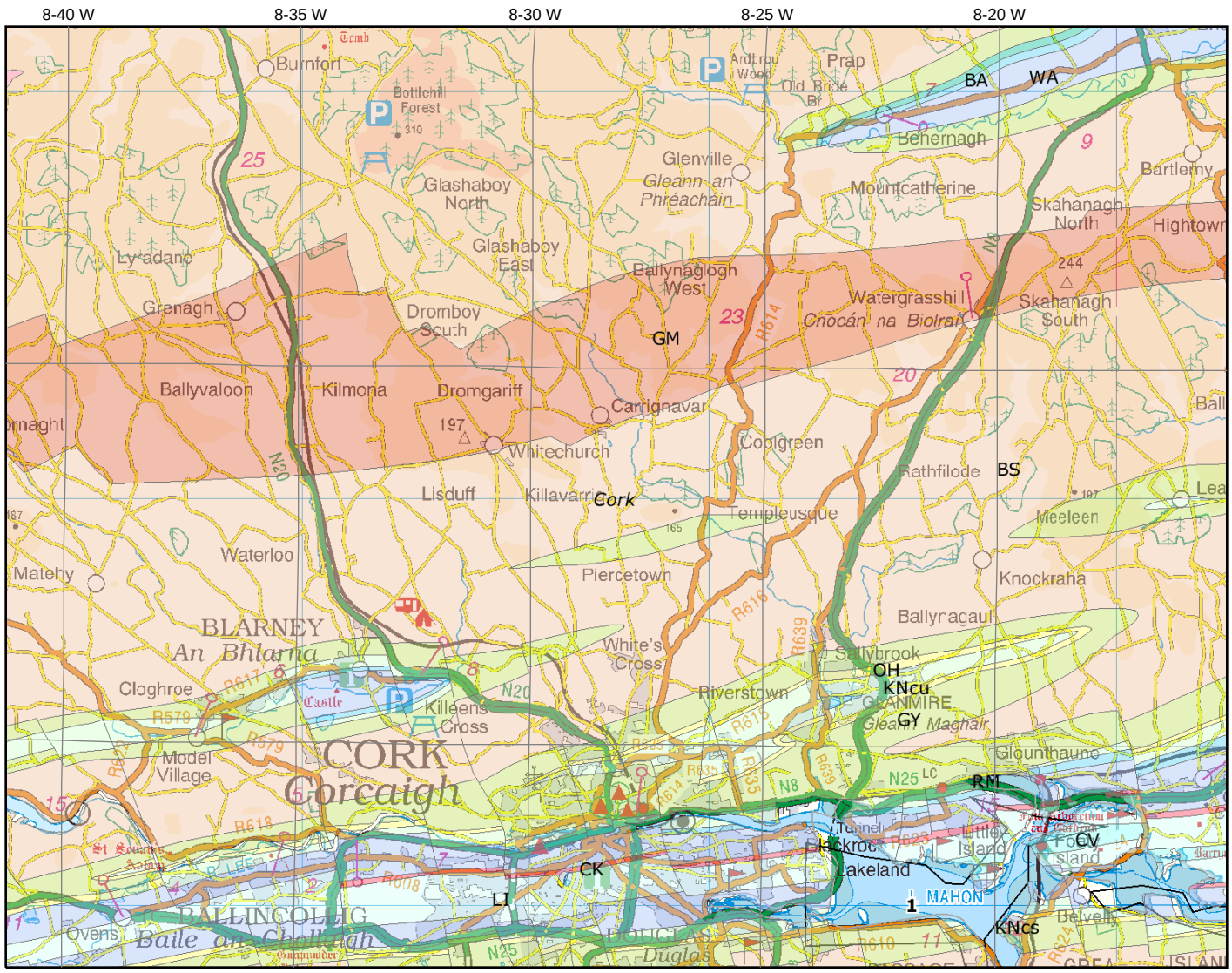
TITLE
Quarry Location

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

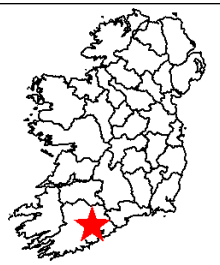
JOB No.	CAD FILE PATH	DRAWING No.	REV.
2317		SG001	

Appendix 6B
Bedrock Geology and Subsoil Maps

Bedrock Geology



ING:167749, 80015



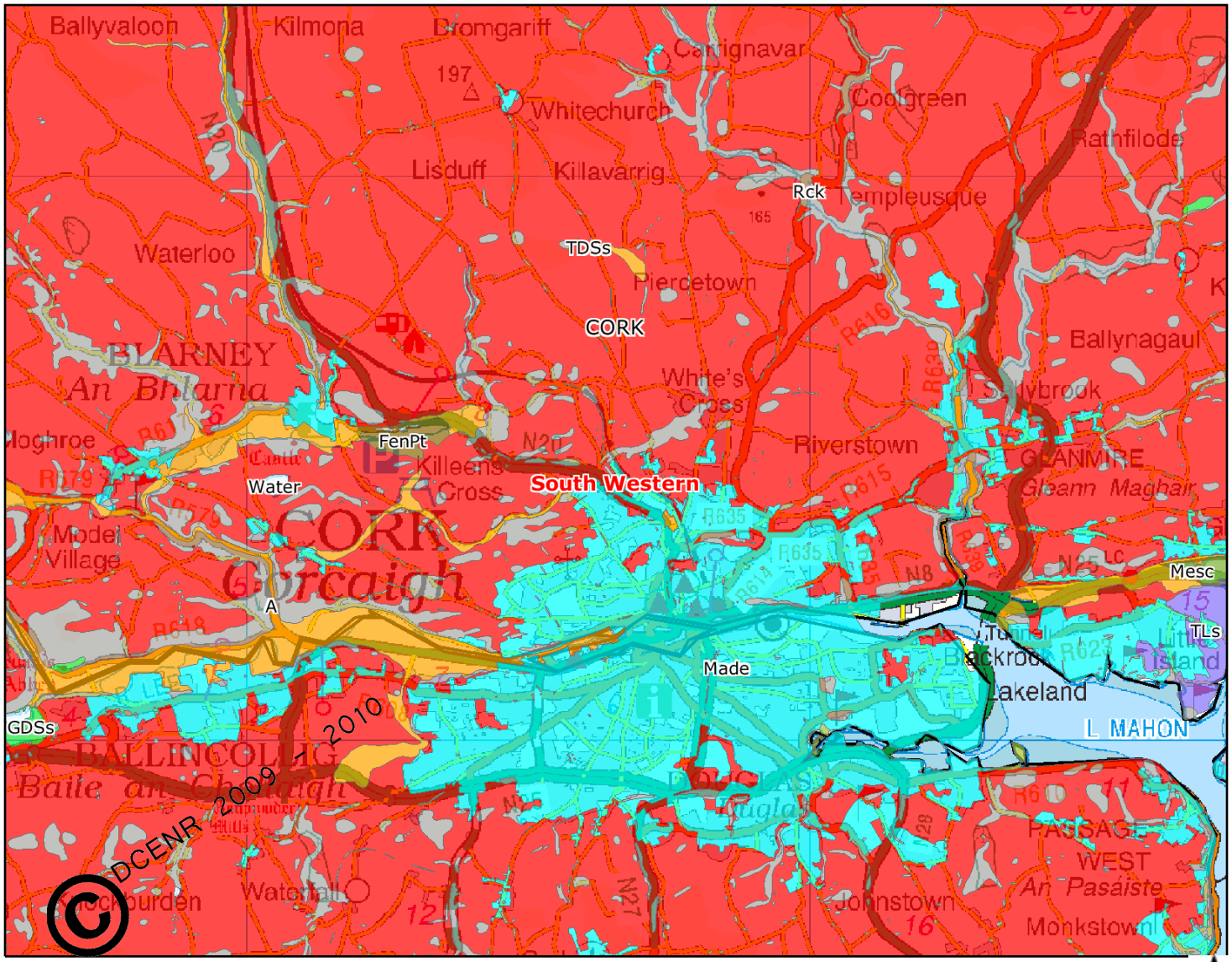
Legend

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

Event	Period	Daytime
	Date	23.10.17
	Day	Monday
	Time	1530-1700
	Operator	Damian Brosnan BSc MIOA MIEI
Conditions	Cloud cover	100 %
	Precipitation	0 mm
	Temperature	15 °C
Wind	Direction	SW
	Speed	0-1 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	24.01.17
	Calibrating laboratory	Bruel & Kjaer Denmark
	Calibration certificate	Available on request
Onsite calibration	Time	23/10/2017 15:50:09
	Type	External
	Sensitivity	42.36 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

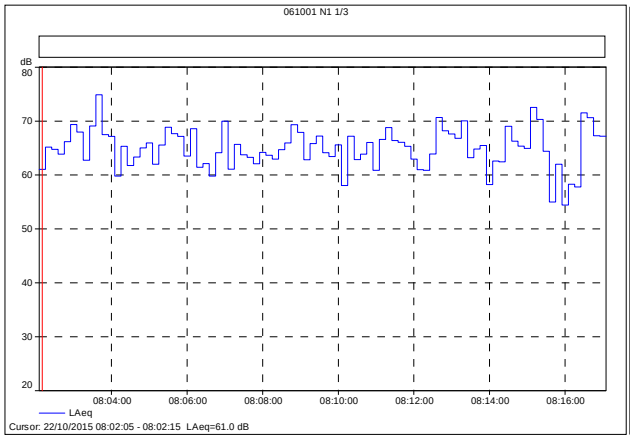
Appendix 8C: Ambient noise data

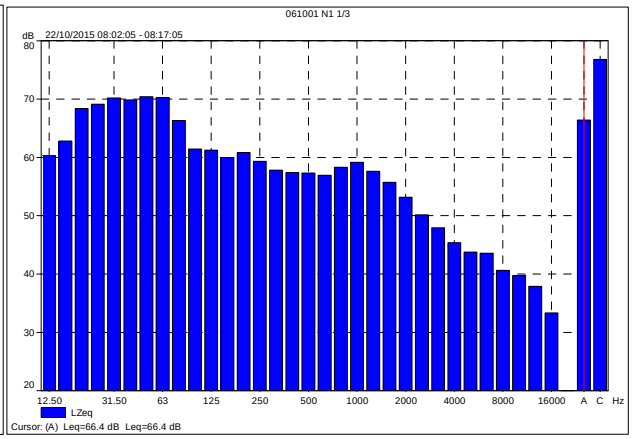
Station	Time	$L_{Aeq\ 15\ min}$ dB	$L_{AF10\ 15\ min}$ dB	$L_{AF90\ 15\ min}$ dB	L_{AFmax} dB	L_{AFmin} dB	Noise audible
N1	0802-0817	66	70	59	78	52	Watercourse Rd traffic dominant continuously, moving in waves caused by traffic lights. N20 traffic also clearly audible during local traffic lulls. Intermittent 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	

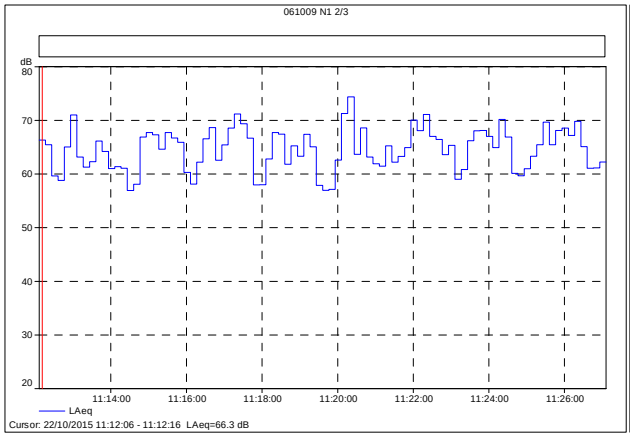
N6	1026-1041	65	69	54	86	48	Intermittent traffic through adjacent junction dominant when present. Otherwise, N20 traffic continuously clearly audible. Crow calls and aircraft.
	1306-1321	65	68	54	86	48	
	1541-1556	65	69	57	81	52	
N7	1048-1103	51	52	49	67	48	Water flow in nearby river clearly audible 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	
N8	1550-1605	56	50	47	81	46	Soundscape dominated by adjacent river flow, continuously clearly audible, masking all noise other than occasional traffic on bridge, and local birdsong. Local dog barking regularly at adjacent dwelling 1558-1603.
	1605-1620	48	49	47	59	46	
	1620-1635	48	50	47	57	46	

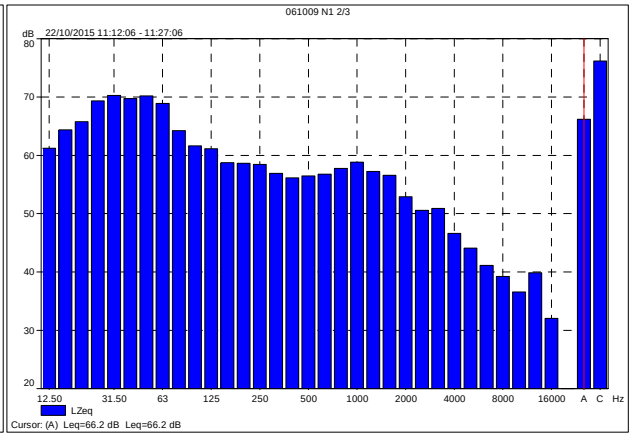
Appendix 8D
Profiles and Spectra

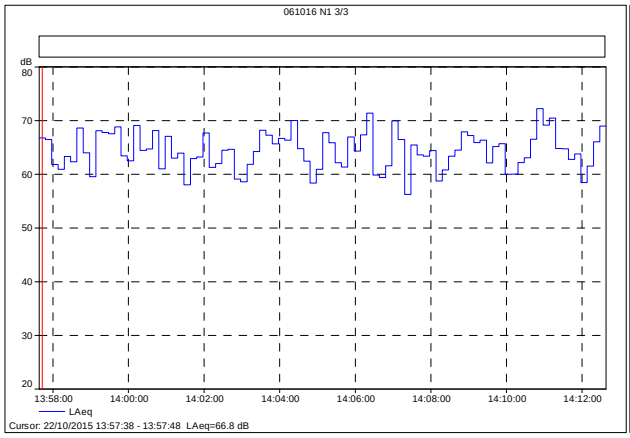
Appendix 8D: Profiles & spectra

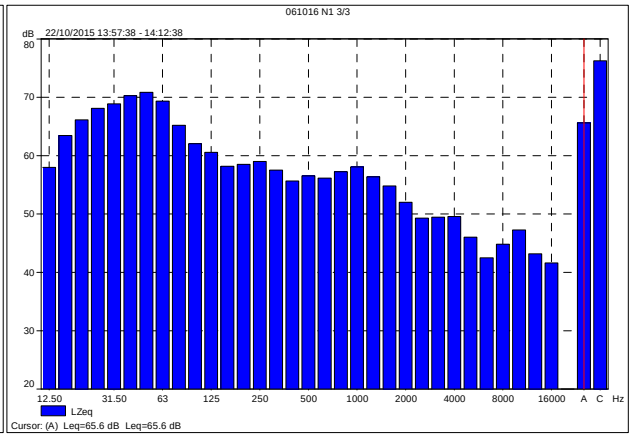


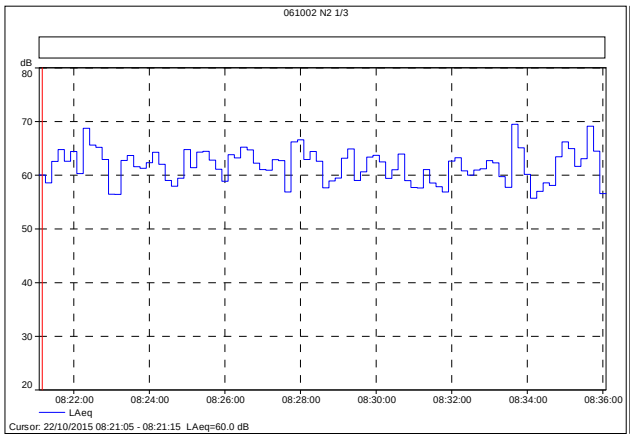


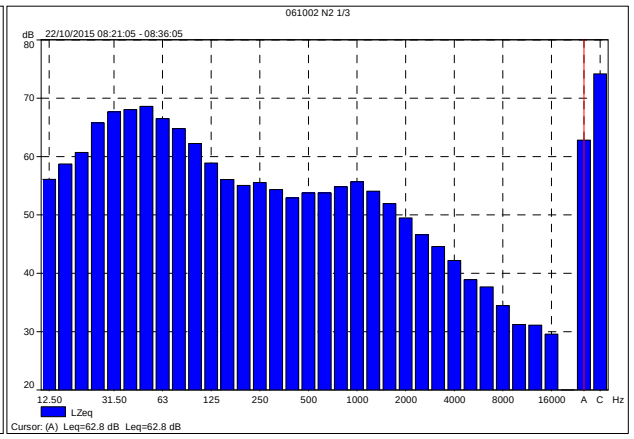


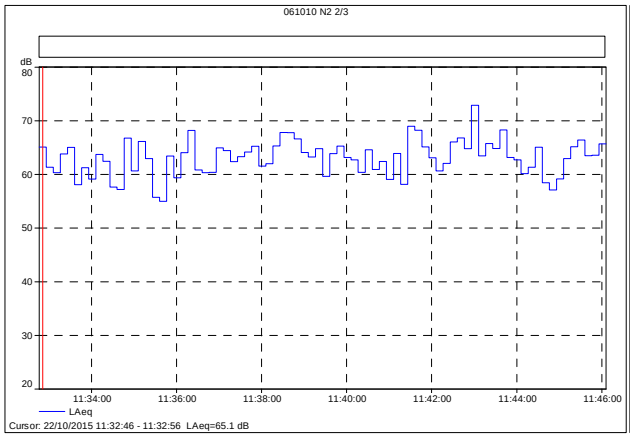


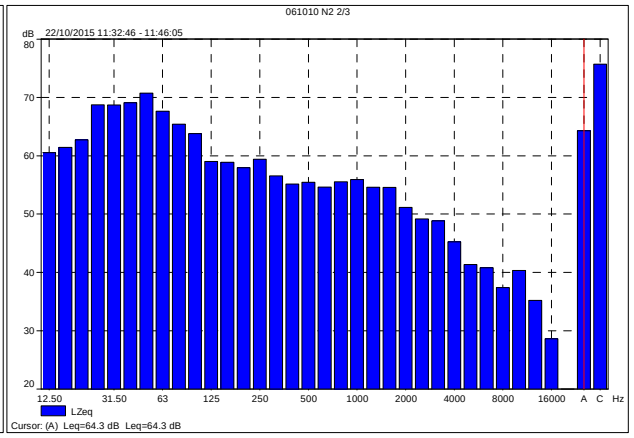


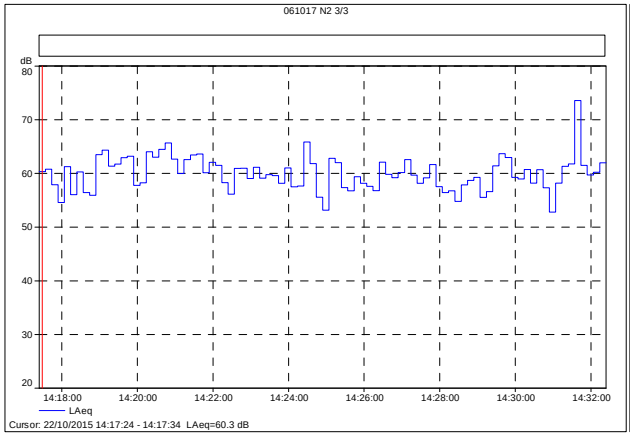


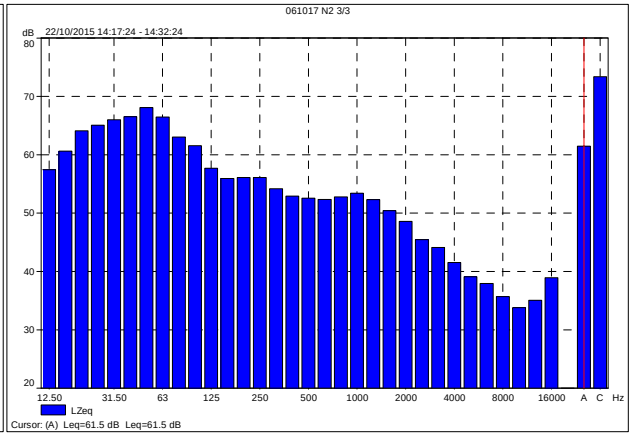

061002 N2 1/3
dB
80
70
60
50
40
30
20
08:22:00
08:24:00
08:26:00
08:28:00
08:30:00
08:32:00
08:34:00
08:36:00
LAeq
Cursor: 22/10/2015 08:21:05 - 08:21:15 LAeq=60.0 dB

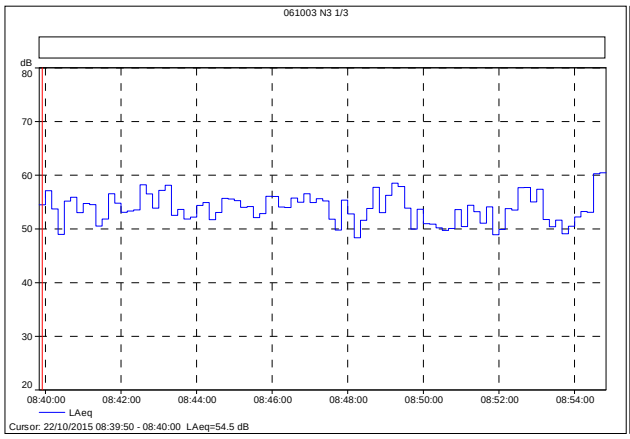

061002 N2 1/3
dB
22/10/2015 08:21:05 - 08:36:05
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=62.8 dB Leq=62.8 dB

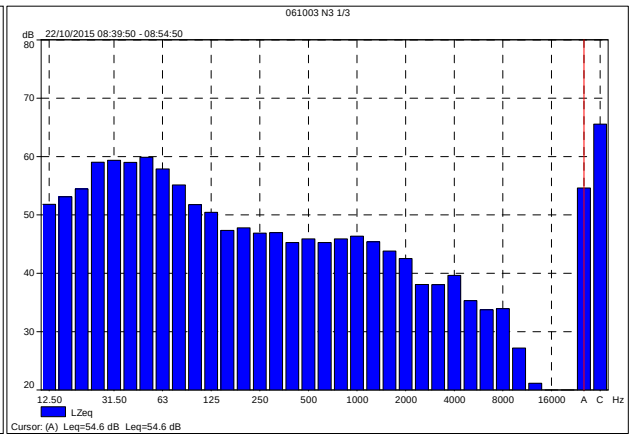

061010 N2 2/3
dB
80
70
60
50
40
30
20
11:34:00
11:36:00
11:38:00
11:40:00
11:42:00
11:44:00
11:46:00
LAeq
Cursor: 22/10/2015 11:32:46 - 11:32:56 LAeq=65.1 dB

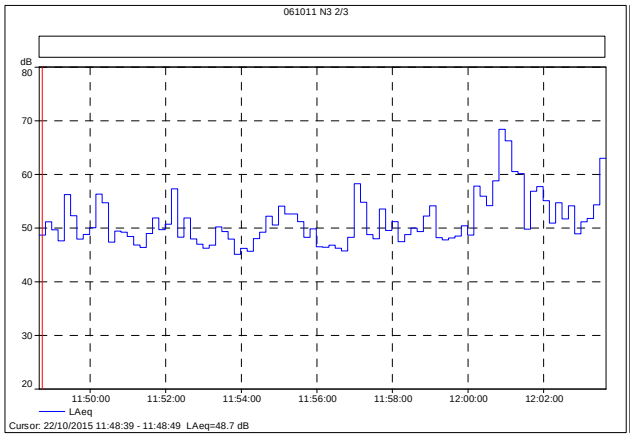

061010 N2 2/3
dB
22/10/2015 11:32:46 - 11:46:05
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=64.3 dB Leq=64.3 dB

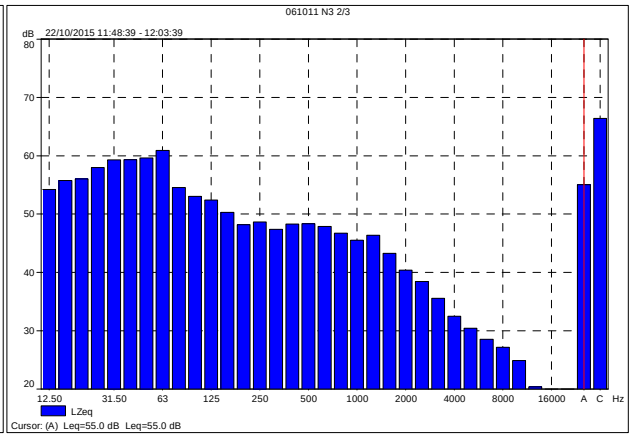

061017 N2 3/3
dB
80
70
60
50
40
30
20
14:18:00
14:20:00
14:22:00
14:24:00
14:26:00
14:28:00
14:30:00
14:32:00
LAeq
Cursor: 22/10/2015 14:17:24 - 14:17:34 LAeq=60.3 dB

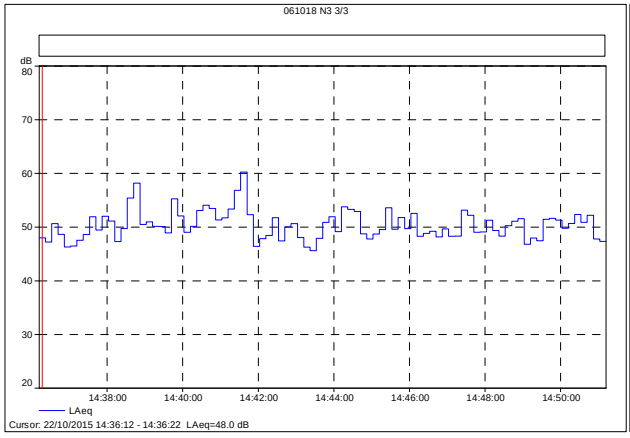

061017 N2 3/3
dB
22/10/2015 14:17:24 - 14:32:24
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=61.5 dB Leq=61.5 dB

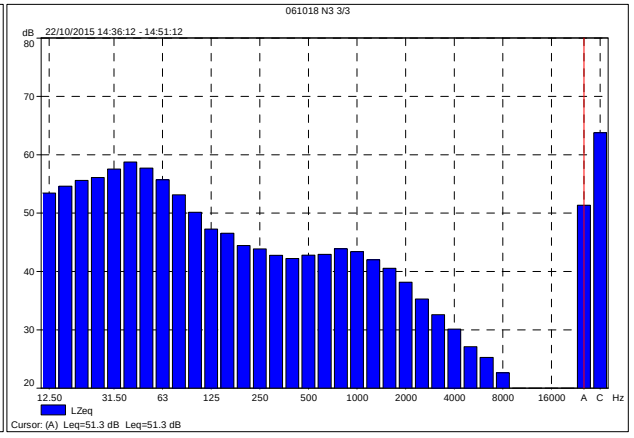

061003 N3 1/3
dB
80
70
60
50
40
30
20
08:40:00
08:42:00
08:44:00
08:46:00
08:48:00
08:50:00
08:52:00
08:54:00
LAeq
Cursor: 22/10/2015 08:39:50 - 08:40:00 LAeq=54.5 dB

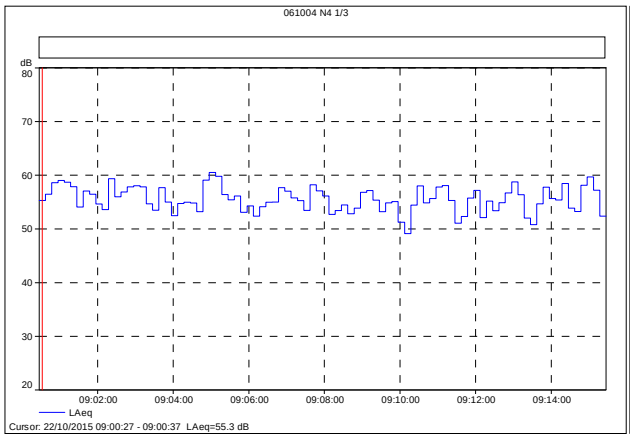

061003 N3 1/3
dB
22/10/2015 08:39:50 - 08:54:50
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=54.6 dB Leq=54.6 dB

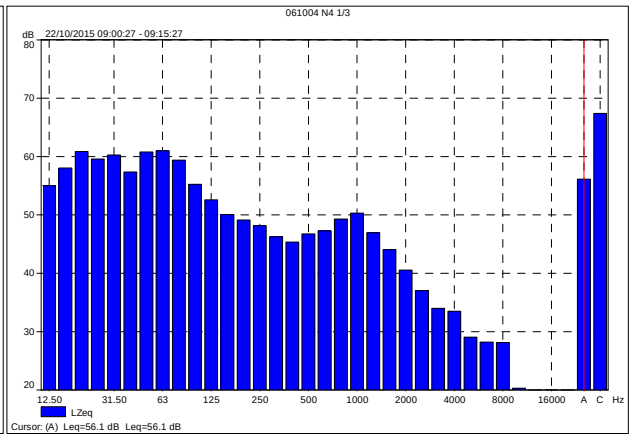

061011 N3 2/3
dB
80
70
60
50
40
30
20
11:50:00
11:52:00
11:54:00
11:56:00
11:58:00
12:00:00
12:02:00
LAeq
Cursor: 22/10/2015 11:48:39 - 11:48:49 LAeq=48.7 dB

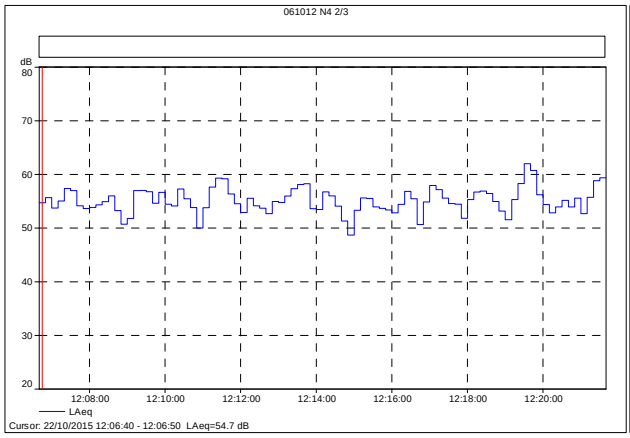

061011 N3 2/3
dB
22/10/2015 11:48:39 - 12:03:39
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=55.0 dB Leq=55.0 dB

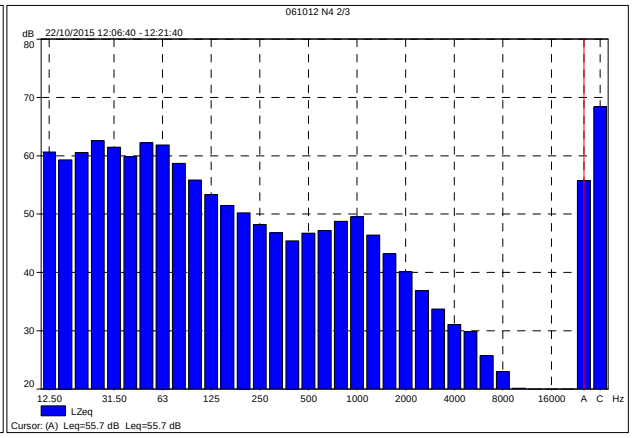

061018 N3 3/3
dB
80
70
60
50
40
30
20
14:38:00
14:40:00
14:42:00
14:44:00
14:46:00
14:48:00
14:50:00
LAeq
Cursor: 22/10/2015 14:36:12 - 14:36:22 LAeq=48.0 dB

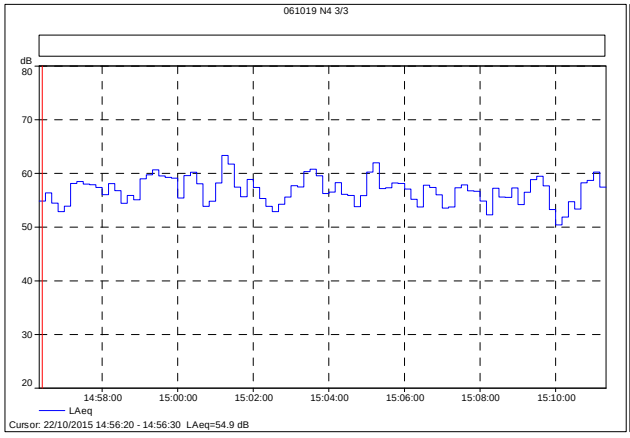

061018 N3 3/3
dB
22/10/2015 14:36:12 - 14:51:12
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=51.3 dB Leq=51.3 dB

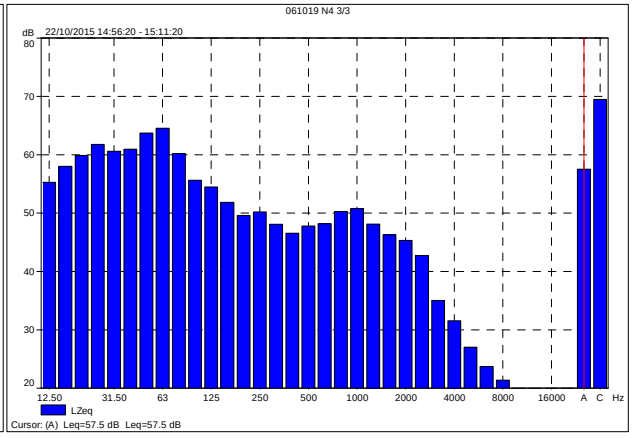

061004 N4 1/3
dB
80
70
60
50
40
30
20
09:02:00
09:04:00
09:06:00
09:08:00
09:10:00
09:12:00
09:14:00
LAeq
Cursor: 22/10/2015 09:00:27 - 09:00:37 LAeq=55.3 dB

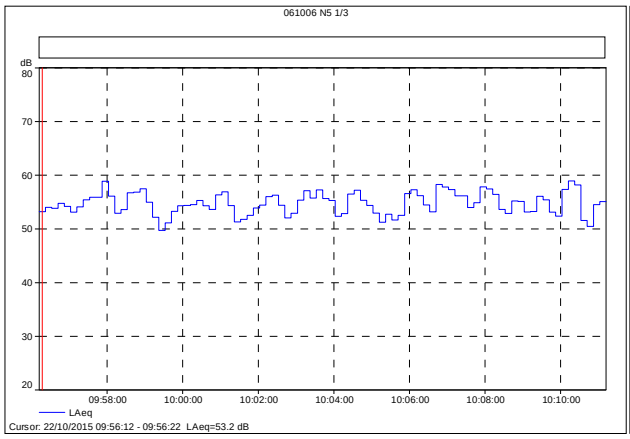

061004 N4 1/3
dB
22/10/2015 09:00:27 - 09:15:27
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=56.1 dB Leq=56.1 dB

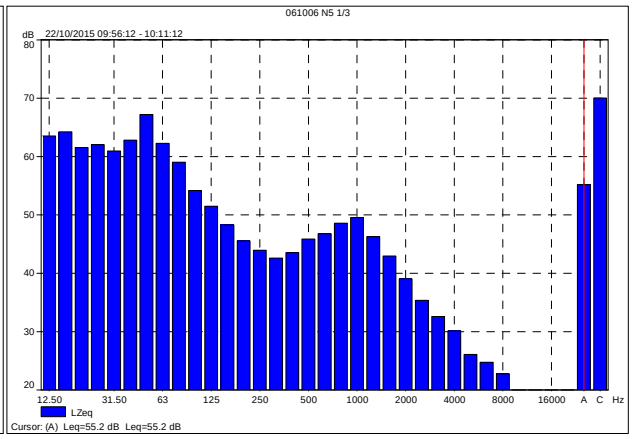

061012 N4 2/3
dB
80
70
60
50
40
30
20
12:08:00
12:10:00
12:12:00
12:14:00
12:16:00
12:18:00
12:20:00
LAeq
Cursor: 22/10/2015 12:06:40 - 12:06:50 LAeq=54.7 dB

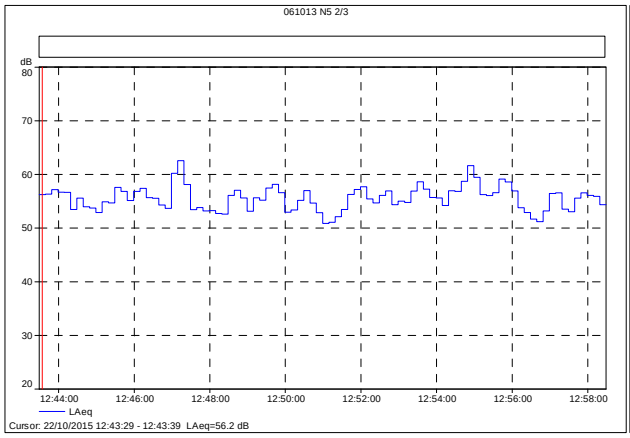

061012 N4 2/3
dB
22/10/2015 12:06:40 - 12:21:40
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=55.7 dB Leq=55.7 dB

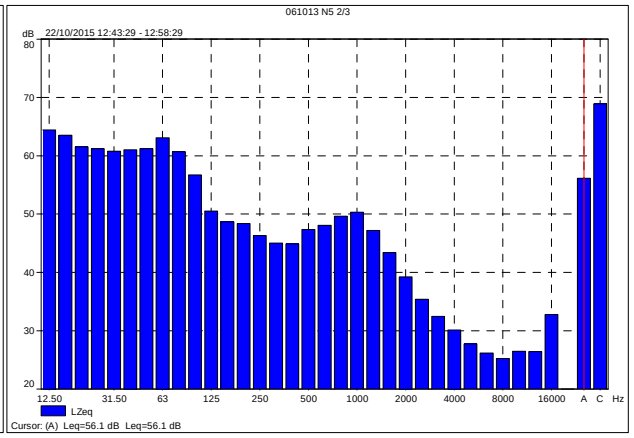

061019 N4 3/3
dB
80
70
60
50
40
30
20
14:58:00
15:00:00
15:02:00
15:04:00
15:06:00
15:08:00
15:10:00
LAeq
Cursor: 22/10/2015 14:56:20 - 14:56:30 LAeq=54.9 dB

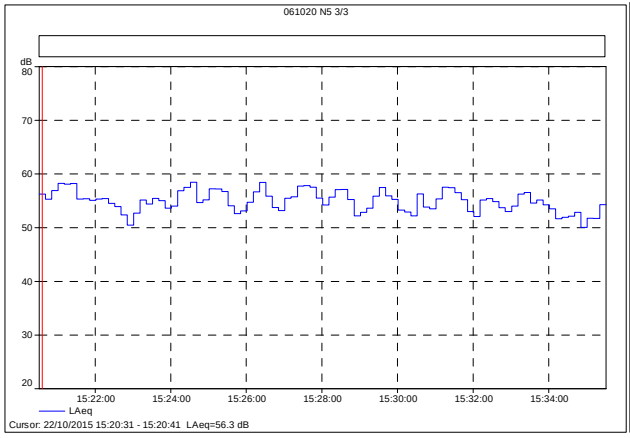

061019 N4 3/3
dB
22/10/2015 14:56:20 - 15:11:20
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=57.5 dB Leq=57.5 dB

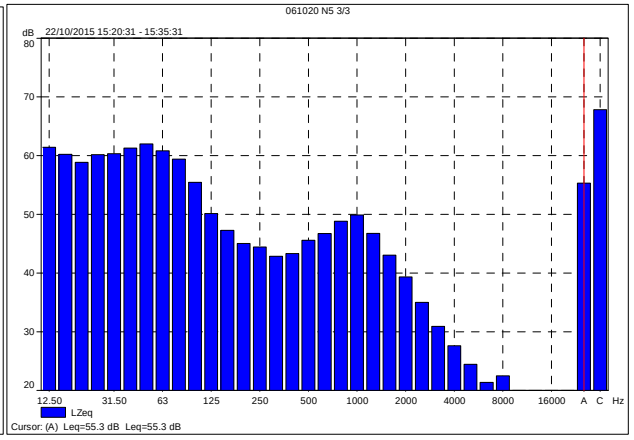

061006 N5 1/3
dB
80
70
60
50
40
30
20
09:58:00
10:00:00
10:02:00
10:04:00
10:06:00
10:08:00
10:10:00
LAeq
Cursor: 22/10/2015 09:56:12 - 09:56:22 LAeq=53.2 dB

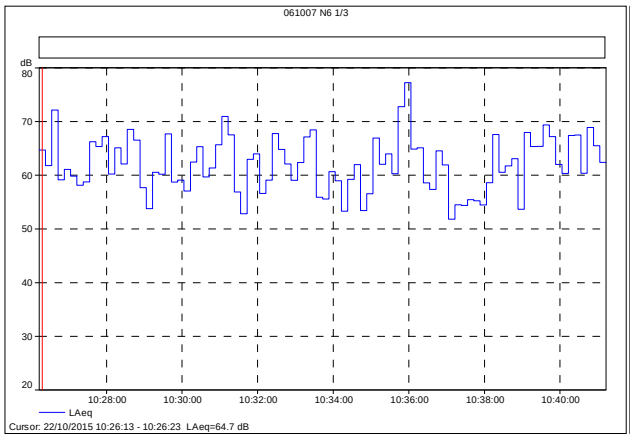

061006 N5 1/3
dB
22/10/2015 09:56:12 - 10:11:12
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=55.2 dB Leq=55.2 dB

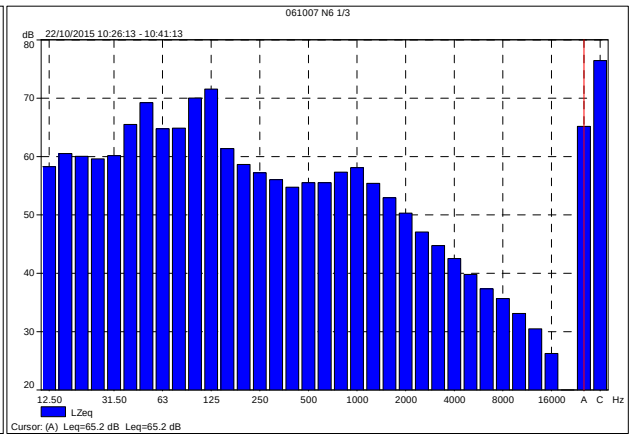

061013 N5 2/3
dB
80
70
60
50
40
30
20
12:44:00
12:46:00
12:48:00
12:50:00
12:52:00
12:54:00
12:56:00
12:58:00
LAeq
Cursor: 22/10/2015 12:43:29 - 12:43:39 LAeq=56.2 dB

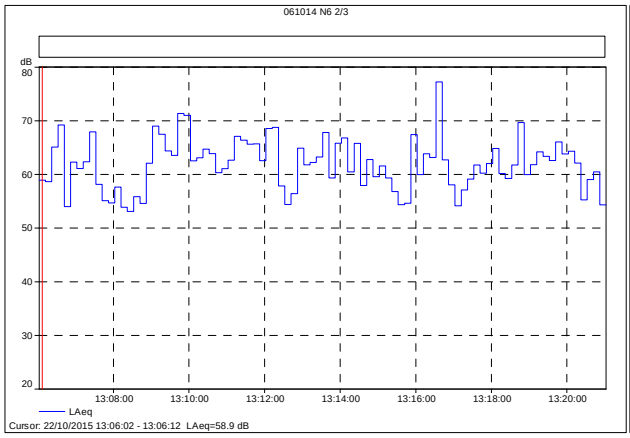

061013 N5 2/3
dB
22/10/2015 12:43:29 - 12:58:29
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=56.1 dB Leq=56.1 dB

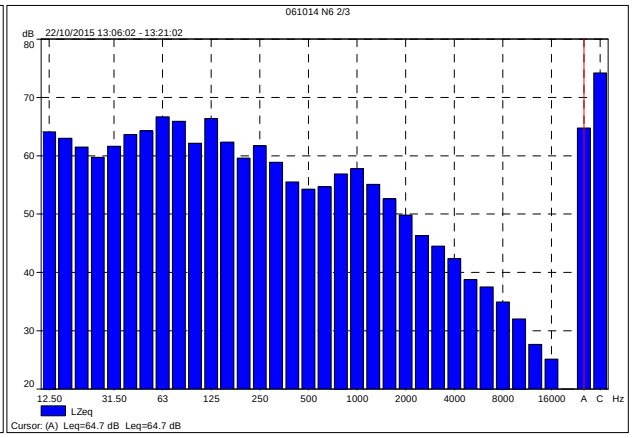

061020 N5 3/3
dB
80
70
60
50
40
30
20
15:22:00
15:24:00
15:26:00
15:28:00
15:30:00
15:32:00
15:34:00
LAeq
Cursor: 22/10/2015 15:20:31 - 15:20:41 LAeq=56.3 dB

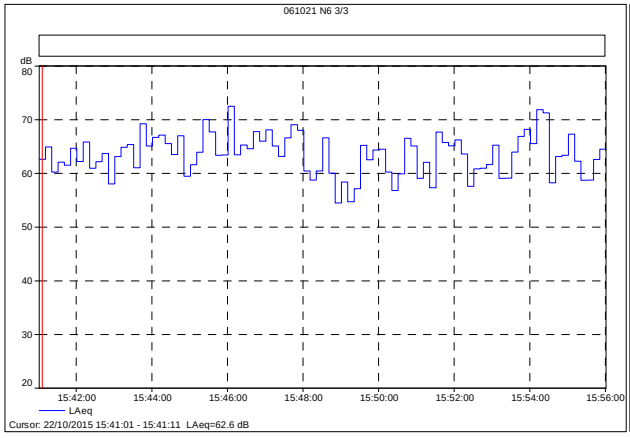

061020 N5 3/3
dB
22/10/2015 15:20:31 - 15:35:31
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=55.3 dB Leq=55.3 dB

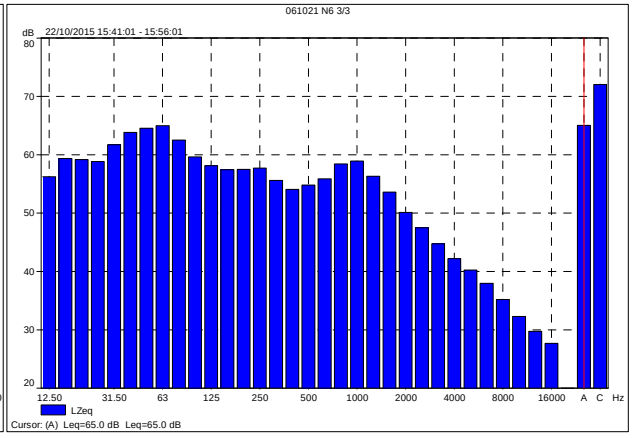

061007 N6 1/3
dB
80
70
60
50
40
30
20
10:28:00
10:30:00
10:32:00
10:34:00
10:36:00
10:38:00
10:40:00
LAeq
Cursor: 22/10/2015 10:26:13 - 10:26:23 LAeq=64.7 dB

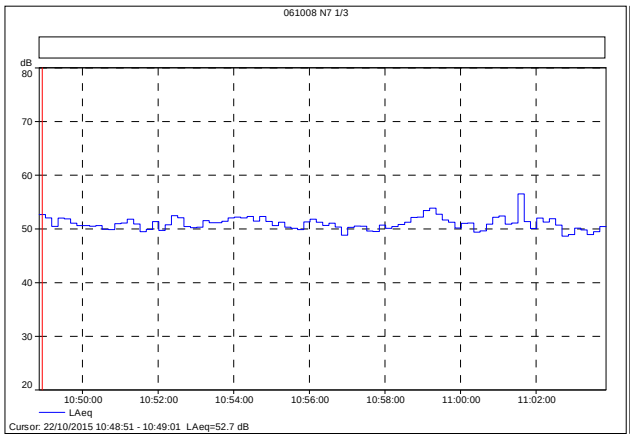

061007 N6 1/3
dB
22/10/2015 10:26:13 - 10:41:13
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=65.2 dB Leq=65.2 dB

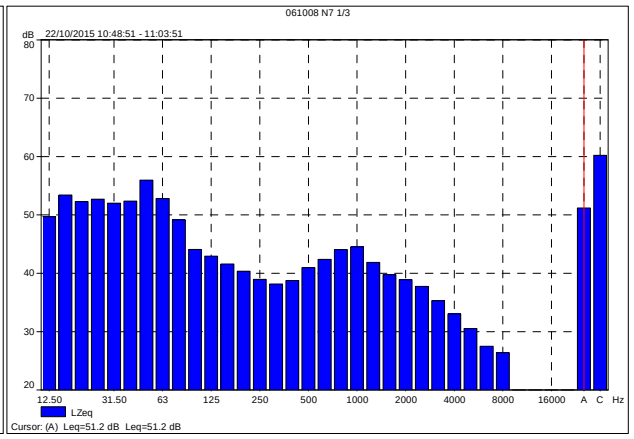

061014 N6 2/3
dB
80
70
60
50
40
30
20
13:08:00
13:10:00
13:12:00
13:14:00
13:16:00
13:18:00
13:20:00
LAeq
Cursor: 22/10/2015 13:06:02 - 13:06:12 LAeq=58.9 dB

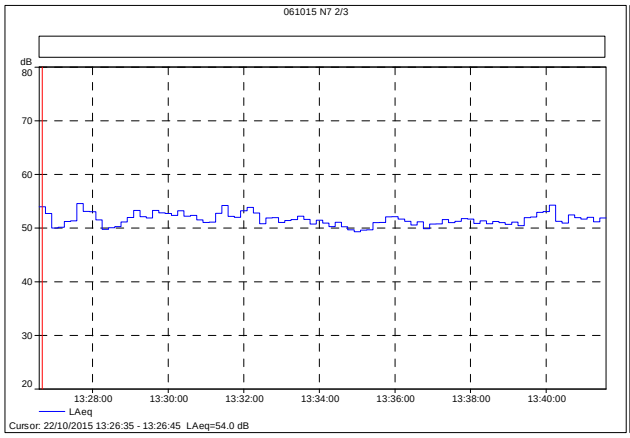

061014 N6 2/3
dB
22/10/2015 13:06:02 - 13:21:02
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=64.7 dB Leq=64.7 dB

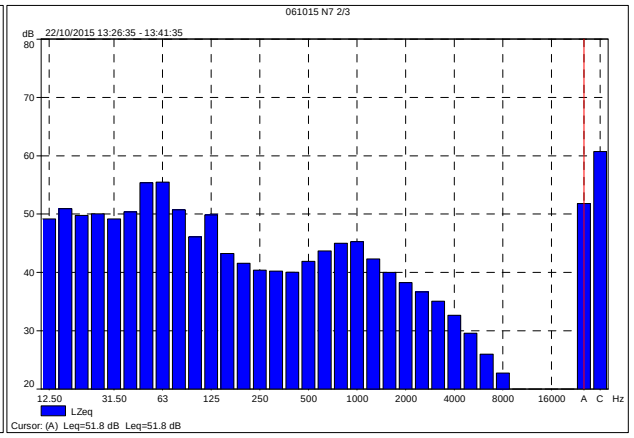

061021 N6 3/3
dB
80
70
60
50
40
30
20
15:42:00
15:44:00
15:46:00
15:48:00
15:50:00
15:52:00
15:54:00
15:56:00
LAeq
Cursor: 22/10/2015 15:41:01 - 15:41:11 LAeq=62.6 dB

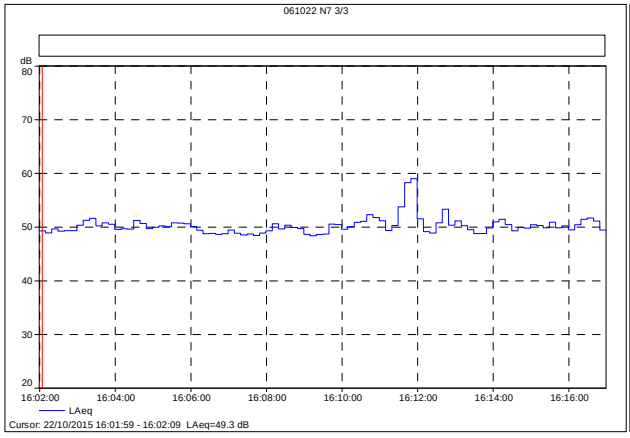

061021 N6 3/3
dB
22/10/2015 15:41:01 - 15:56:01
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=65.0 dB Leq=65.0 dB

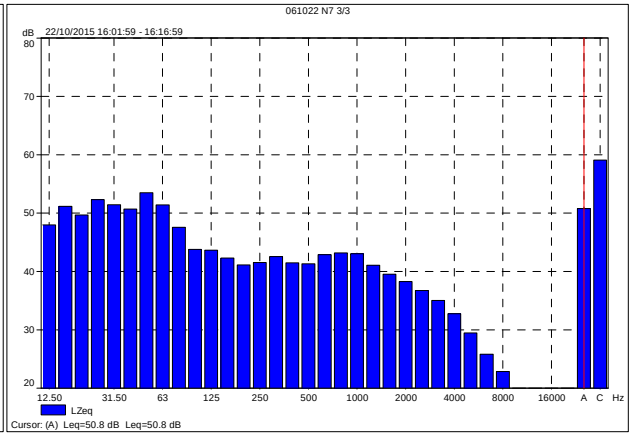

061008 N7 1/3
dB
80
70
60
50
40
30
20
10:50:00
10:52:00
10:54:00
10:56:00
10:58:00
11:00:00
11:02:00
LAeq
Cursor: 22/10/2015 10:48:51 - 10:49:01 LAeq=52.7 dB

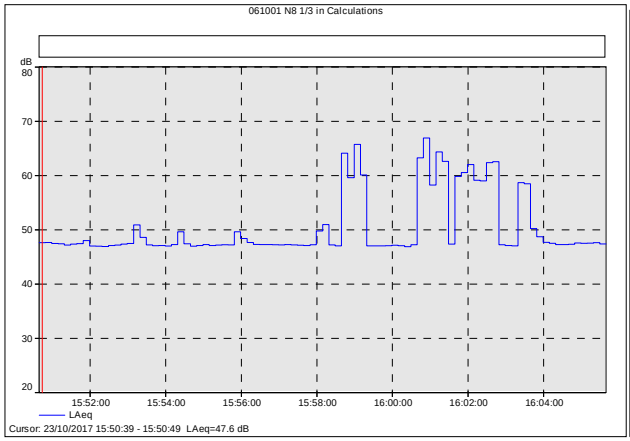

061008 N7 1/3
dB
22/10/2015 10:48:51 - 11:03:51
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=51.2 dB Leq=51.2 dB

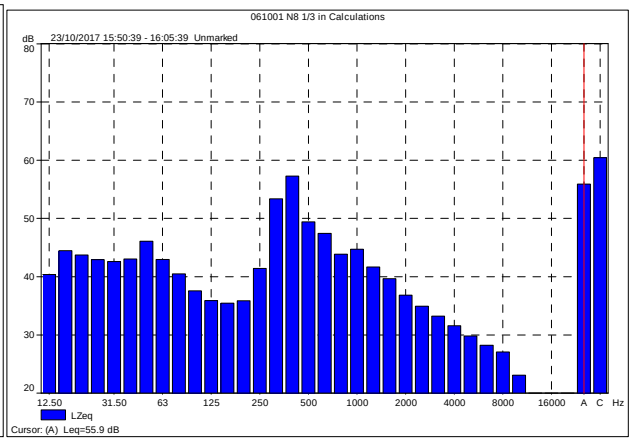

061015 N7 2/3
dB
80
70
60
50
40
30
20
13:28:00
13:30:00
13:32:00
13:34:00
13:36:00
13:38:00
13:40:00
LAeq
Cursor: 22/10/2015 13:26:35 - 13:26:45 LAeq=54.0 dB

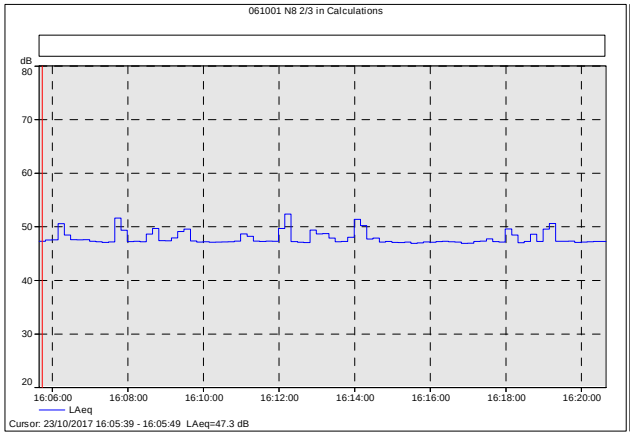

061015 N7 2/3
dB
22/10/2015 13:26:35 - 13:41:35
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=51.8 dB Leq=51.8 dB

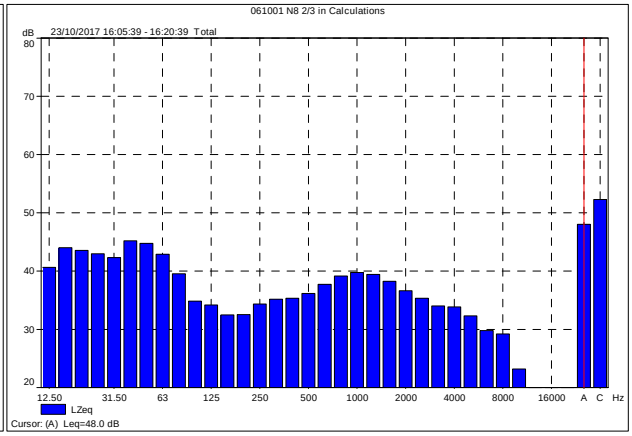

061022 N7 3/3
dB
80
70
60
50
40
30
20
16:02:00
16:04:00
16:06:00
16:08:00
16:10:00
16:12:00
16:14:00
16:16:00
LAeq
Cursor: 22/10/2015 16:01:59 - 16:02:09 LAeq=49.3 dB

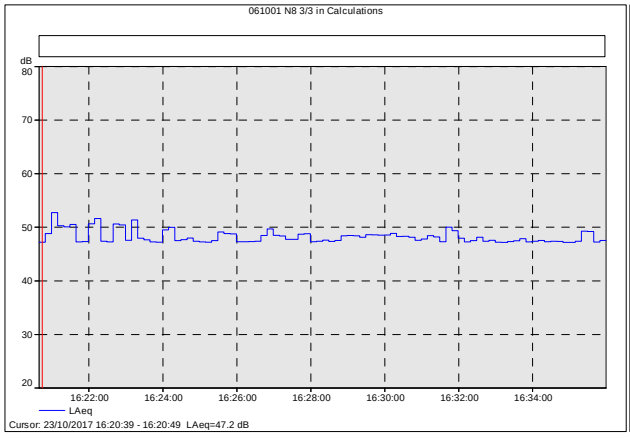

061022 N7 3/3
dB
22/10/2015 16:01:59 - 16:16:59
80
70
60
50
40
30
20
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=50.8 dB Leq=50.8 dB

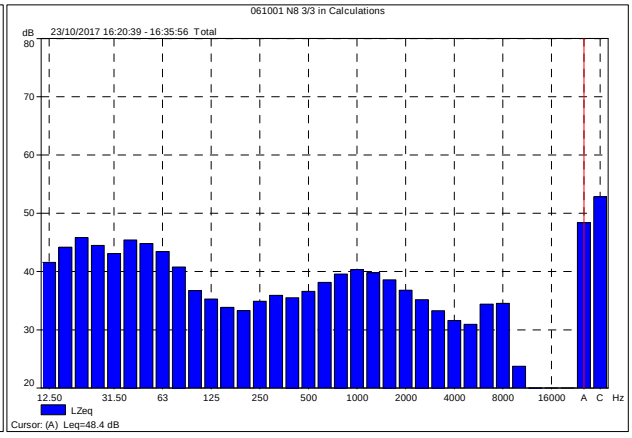

061001 N8 1/3 in Calculations
dB
80
70
60
50
40
30
20
15:52:00
15:54:00
15:56:00
15:58:00
16:00:00
16:02:00
16:04:00
LAeq
Cursor: 23/10/2017 15:50:39 - 15:50:49 LAeq=47.6 dB


061001 N8 1/3 in Calculations
dB
23/10/2017 15:50:39 - 16:05:39 Unmarked
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=55.9 dB


061001 N8 2/3 in Calculations
dB
80
70
60
50
40
30
20
16:06:00
16:08:00
16:10:00
16:12:00
16:14:00
16:16:00
16:18:00
16:20:00
LAeq
Cursor: 23/10/2017 16:05:39 - 16:05:49 LAeq=47.3 dB


061001 N8 2/3 in Calculations
dB
23/10/2017 16:05:39 - 16:20:39 Total
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=48.0 dB


061001 N8 3/3 in Calculations
dB
80
70
60
50
40
30
20
16:22:00
16:24:00
16:26:00
16:28:00
16:30:00
16:32:00
16:34:00
LAeq
Cursor: 23/10/2017 16:20:39 - 16:20:49 LAeq=47.2 dB


061001 N8 3/3 in Calculations
dB
23/10/2017 16:20:39 - 16:35:56 Total
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=48.4 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)

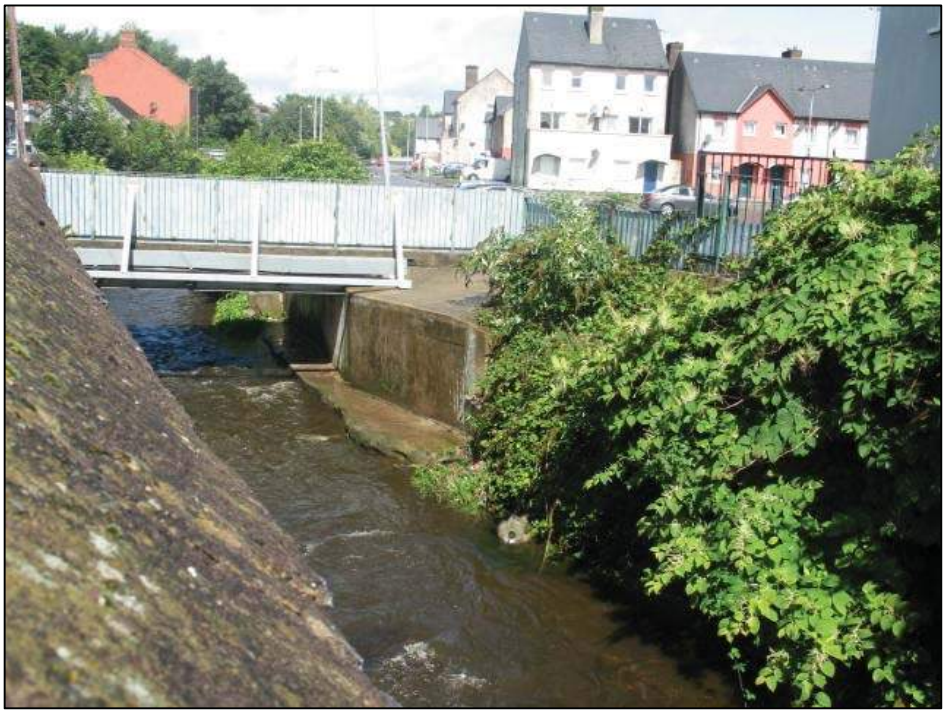


Plate 10.3: View of River Bride at south end of Orchard Gardens from south

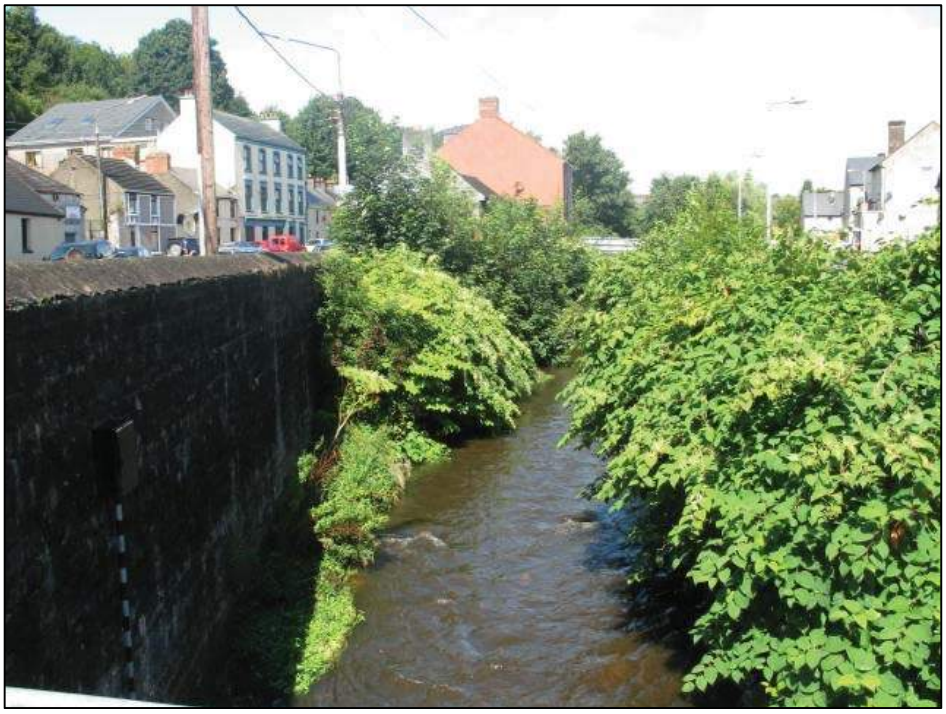


Plate 10.4: View of overgrowth in River Bride with Commons Road at left and Orchard Gardens at right

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

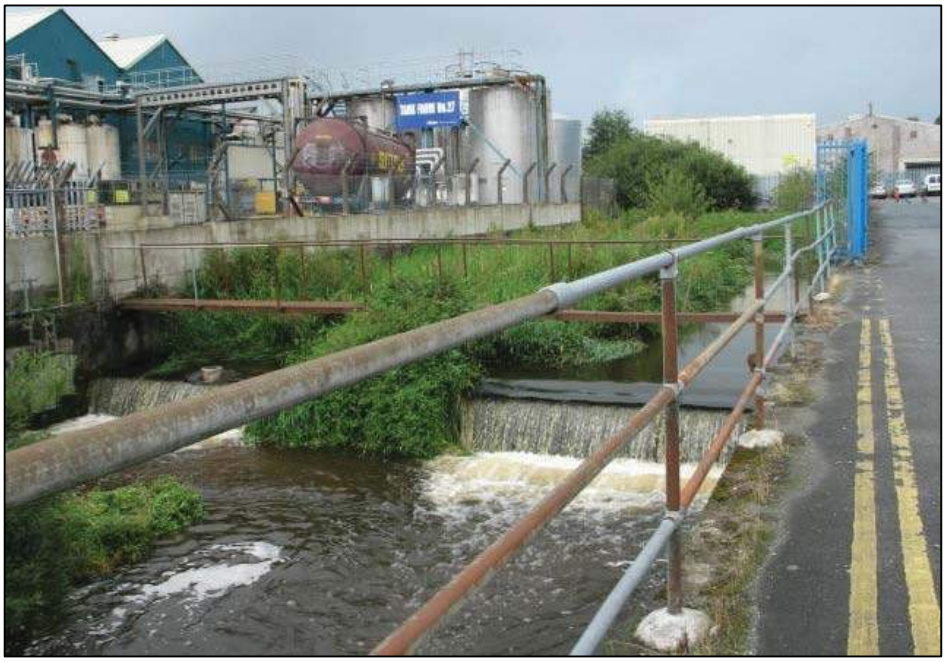


Plate 10.9: River Bride sluice at south end of Dulux Factory (in area of proposed sediment trap)

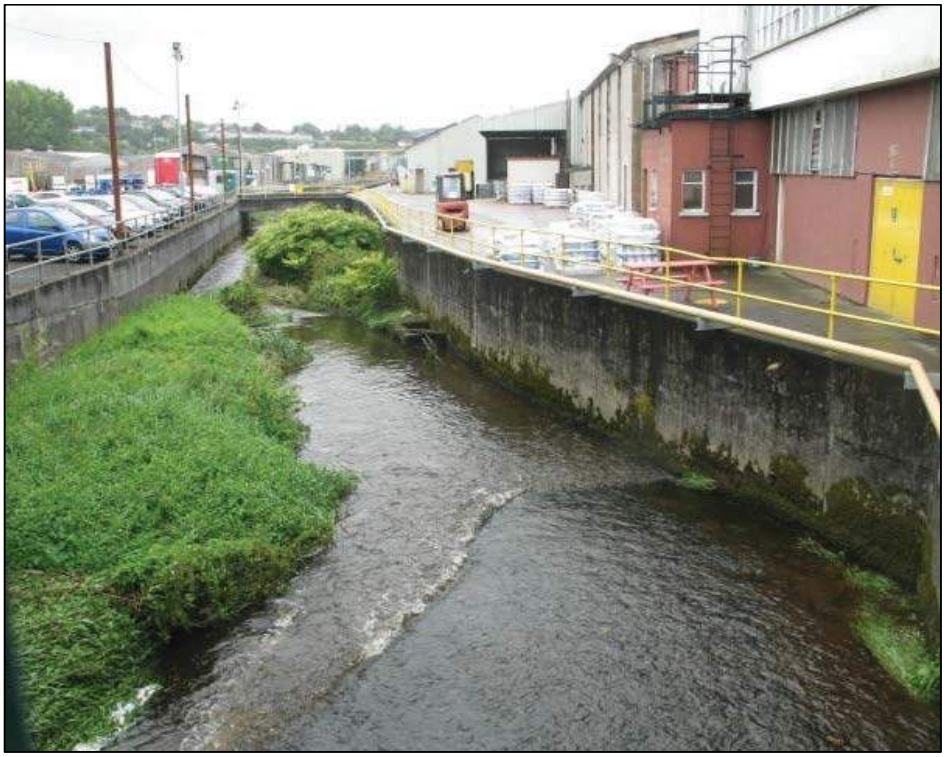


Plate 10.10: View of River Bride at north end of Dulux Factory

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

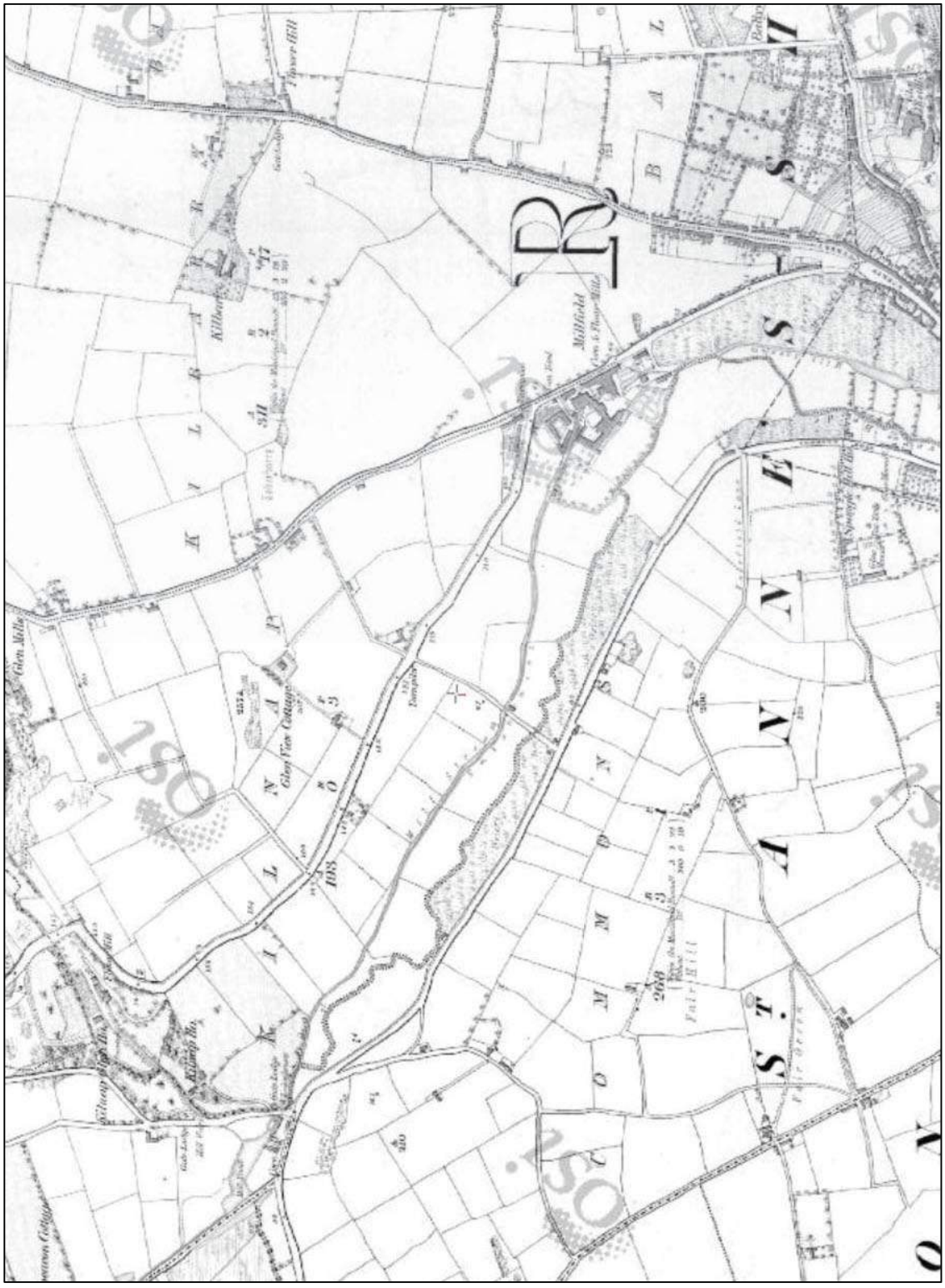


Figure 10.1: Extract from 1st edition 6-inch map showing north end of study area

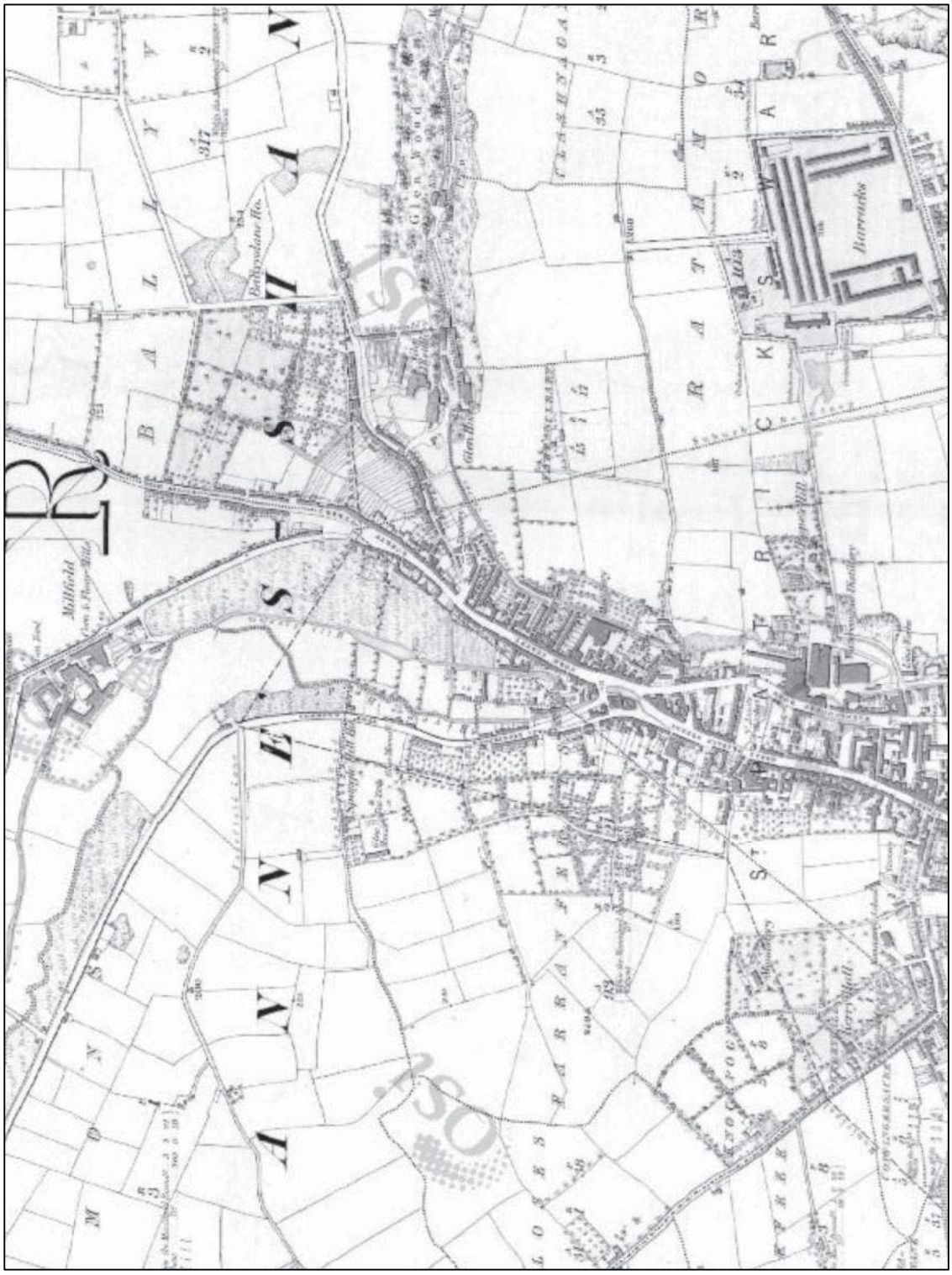
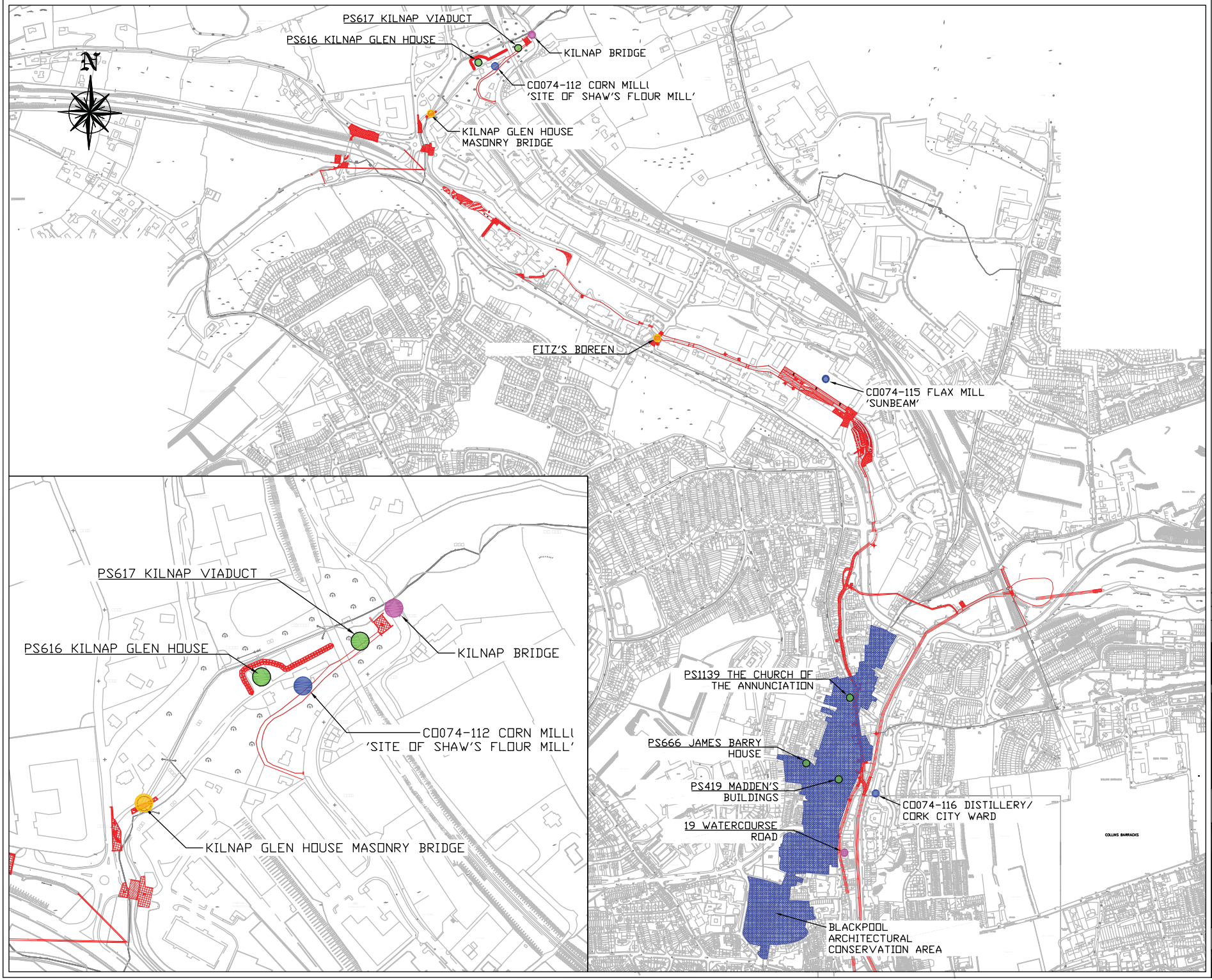


Figure 10.2: Extract from 1st edition 6-inch map showing south end of study area

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

RYAN HANLEY
CONSULTING ENGINEERS
Sherwood House, Sherwood Avenue
Taylor's Hill, Galway
Tel:(091)587116 Fax:(091)587110
Email: rhc@ryanhanley.ie
Web: www.ryanhanley.ie
DUBLIN OFFICE: Suite D4, The Cubes Offices, Beacon South Quarter, Sandyford, Dublin18.

CLIENT
OFFICE OF PUBLIC WORKS

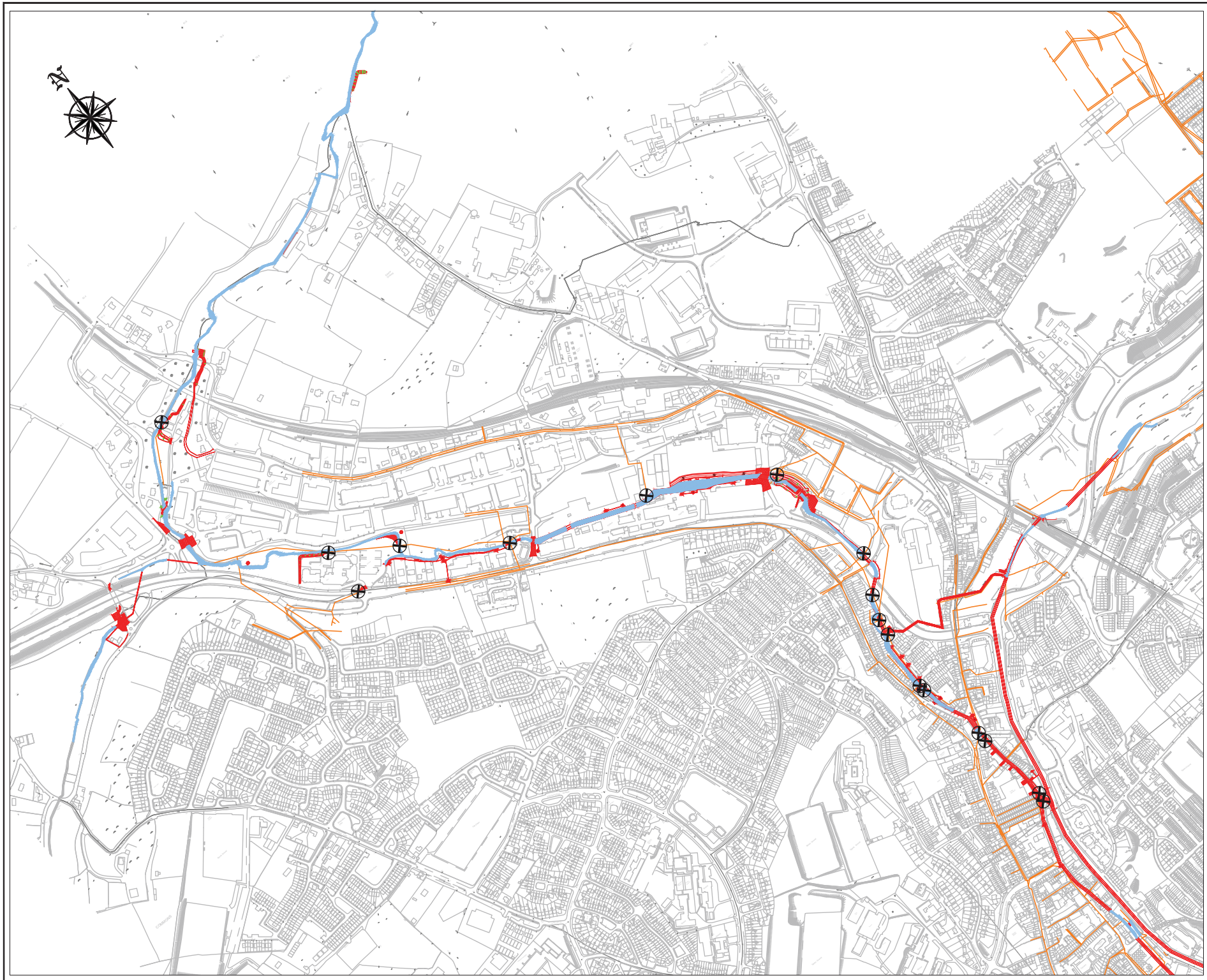
PROJECT
RIVER BRIDE (BLACKPOOL)
CERTIFIED DRAINAGE SCHEME

TITLE
CULTURAL HERITAGE
LOCATION MAP

SCALE @ A3	DATE	DRAWN	CHECKED	APPROVED
NTS	□□□ □□□□	□□	□□	□□

JOB No.	DRAWING No.	REV.
□□□□	CH 001	

Appendix 11A
Traffic, Services and Telecommunications



LEGEND

Drainage Network

Watercourse

Proposed Works Locations
[See Appendix 3 for Details]

Potential Impact due
to Proposed Works

REV	DATE	DRN	DESCRIPTION	CHK	APD
A	NOV 2017	RB	Update Extents	JR	MJ

REVISIONS

DRAWING STATUS

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

RYAN HANLEY
CONSULTING ENGINEERS
Sherwood House, Sherwood Avenue
Taylor's Hill, Galway
Tel:(091)587116 Fax:(091)587110
Email: rhc@ryanhanley.ie
Web: www.ryanhanley.ie
DUBLIN OFFICE: Suite D4, The Cubes Offices, Beacon South Quarter, Sandyford, Dublin18.

CLIENT
OFFICE OF PUBLIC WORKS

PROJECT
RIVER BRIDE (BLACKPOOL)
CERTIFIED DRAINAGE SCHEME

TITLE
MATERIAL ASSETS
DRAINAGE NETWORK

SCALE @ A3	DATE	DRAWN	CHECKED	APPROVED
1:20,000	NOV 2017	RB	JR	MJ

JOB No.	DRAWING No.	REV.
2317	MA 001	A