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Project	**AA Screening Report Emergency Works Fermoy, Co. Cork**		
Client	OPW		
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1. Introduction

The information in this report has been compiled by DixonBrosnan Environmental Consultants, on behalf of the OPW. It provides information on and assesses the potential for the proposed works to impact on any European sites within its zone of influence.

This report provides the results of the Appropriate Assessment Screening methodology for the proposed works. It assesses the likely significant effects on Natura 2000 sites within the zone of influence of the proposed works in accordance with Article 6(3) of the Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora).

2. Legislative Context

The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) aims to maintain or restore the favourable conservation status of habitats and species of community interest across Europe. The requirements of this Directive are transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations) 2011 (S.I. No. 477 of 2011).

Under the Directive a network of sites of nature conservation importance have been identified by each Member State as containing specified habitats or species requiring to be maintained or returned to favourable conservation status. In Ireland the network consists of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), and also candidate sites, which form the Natura 2000 network.

Article 6(3) of the Habitats Directive requires that, in relation to European designated sites (i.e. SACs and SPAs that form the Natura 2000 network), "*any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to* ***appropriate assessment*** *of its implications for the site in view of the site's conservation objectives*".

A competent authority (e.g. the OPW or Local Authority) can only agree to a plan or project after having determined that it will not adversely affect the integrity of the site concerned.

Under article 6(4) of the Directive, if adverse impacts are likely, and in the absence of alternative options, a plan or project must nevertheless proceed for imperative reasons of overriding public interest (IROPI), including social or economic reasons, a Member State is required to take all compensatory measures necessary to ensure the overall integrity of the Natura 2000 site. The European Commission have to be informed of any compensatory measures adopted, unless a priority habitat type or species is present and in which case an opinion from the European Commission is required beforehand (unless for human health or public safety reasons, or of benefit to the environment).

Appropriate Assessment Process

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DEHLG) (2009). These guidance documents identify a staged approach to conducting an AA, as shown **Figure 1.**

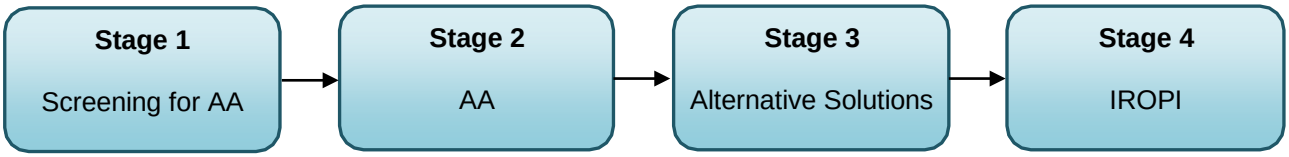

Figure 1: The Appropriate Assessment Process (from: Appropriate Assessment of plans and Projects in Ireland - Guidance for Planning Authorities, DEHLG, 2009)

Stage 1 - Screening for AA

The initial, screening stage of the Appropriate Assessment is to determine:

a. whether the proposed plan or project is directly connected with or necessary for the management of the European designated site for nature conservation

b. if it is likely to have a significant adverse effect on the European designated site, either individually or in combination with other plans or projects

For those sites where potential adverse impacts are identified, either alone or in combination with other plans or projects, further assessment is necessary to determine if the proposals will have an adverse impact on the integrity of a European designated site, in view of the sites conservation objectives (i.e. the process proceeds to Stage 2).

Stage 2 - AA

This stage requires a more in-depth evaluation of the plan or project, and the potential direct and indirect impacts of them on the integrity and interest features of the European designated site(s), alone and in-combination with other plans and projects, taking into account the site's structure, function and conservation objectives. Where required, mitigation or avoidance measures will be suggested.

The competent authority can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site(s) concerned. If this cannot be determined, and where mitigation cannot be achieved, then alternative solutions will need to be considered (i.e. the process proceeds to Stage 3).

Stage 3 - Alternative Solutions

Where adverse impacts on the integrity of Natura 2000 sites are identified, and mitigation cannot be satisfactorily implemented, alternative ways of achieving the objectives of the plan or project that avoid adverse impacts need to be considered. If none can be found, the process proceeds to Stage 4.

Stage 4 - IROPI

Where adverse impacts of a plan or project on the integrity of Natura 2000 sites are identified and no alternative solutions exist, the plan will only be allowed to progress if imperative reasons of overriding public interest (IROPI) can be demonstrated. In this case compensatory measures will be required.

The process only proceeds through each of the four stages for certain plans or projects. For example, for a plan or project, not connected with management of a site, but where no likely significant impacts are identified, the process stops at stage 1. Throughout the process, the precautionary principle must be applied, so that any uncertainties do not result in adverse impacts on a site.

3. Description of proposed works

3.1 Background

Fermoy has a long history of flooding and a Flood Relief Scheme for the town was completed in 2017. The works involved the construction of both permanent and temporary demountable walls and embankments on both the northern and south banks of the river. As part of this project works new flood defences were put in place at O'Neill-Crowley Quay.

However due to the deterioration of Fermoy Weir which is located upstream of this quay and changes in flow pattern, water is flowing towards this section of the flood defences at extremely high velocities. A hydrographical survey of the riverbed in Fermoy has indicated that significant scour has occurred in front of a number of the existing flood defence walls. It is evident from the survey that, since the east end of the original weir collapsed/breached, up to 4m (depth) of scour has occurred at the east end of the original weir. It is also evident that a section of the western end of Mill Island has eroded/collapsed into the river. From recent visual inspections, it is clear that the erosion of Mill Island is continuing. As such, there is a requirement for urgent emergency works to the river bed to maintain the stability of walls 19-21 of the Fermoy Flood Relief Scheme.

Therefore, emergency works are proposed to stabilize the situation. The extent of the erosion is shown below in **Figure 2** and **Figure 3.** It is noted that in the absence of works to stabilise the situation there is a significant probability that there will be high levels of erosion over the winter period which will weaken the flood defences. This may lead to long-term closure of the road at O'Neill-Crowley Quay and in the absence of emergency works, more extensive remedial works are likely to be required in the future with the potential for more significant ecological effects.

The situation is now becoming critical with the risk of large scale ground collapse and erosion over the winter, leading to infrastructural failure, increased flood risk to Fermoy town, and potential significant effects on qualifying interests and conservation objectives for the Blackwater River SAC from elevated silt levels.

As shown in **Appendix 2**, the estimated extent of ground that could be lost due to erosion if temporary/permanent remedial works are not carried out = 247m^3 to 413m3 most of which would be deposited on the riverbed as fine/coarse sediment. This has the potential to have a significant effect on Brook Lamprey, River Lamprey, Sea Lamprey, Atlantic Salmon, Freshwater Pearl Mussel, White Clawed Crayfish (recorded in proximity to the weir during recent surveys) and Floating River Vegetation.

Figure 2: Showing weir breach and area of flood defenses affected

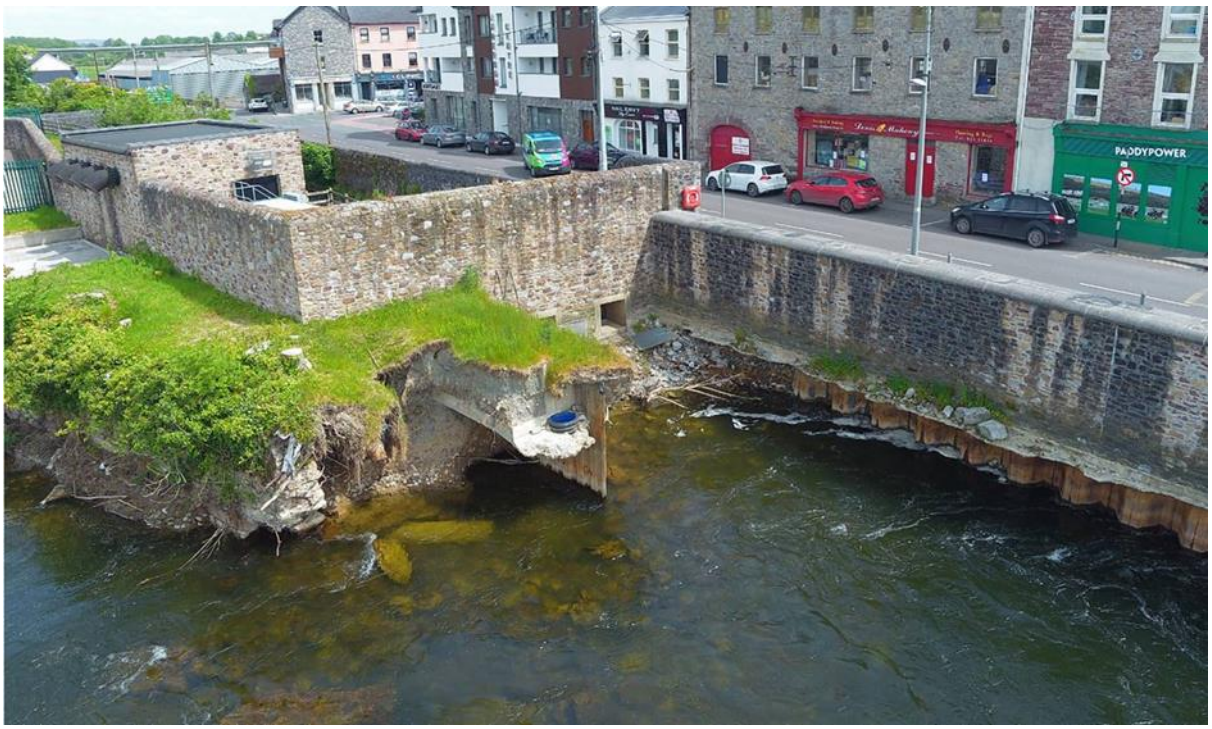

Figure 3: Area affected showing extensive damage ground instability.

3.2 Proposed Emergency Maintenance Work

The proposed works are shown in **Appendix 2** and are summarised below.

- The proposed emergency works generally consists of reinstating the river bed level in front of the flood defence walls to a level that restores the stability required to these walls. This will typically consist of infilling the scour holes with selected stone material and placing scour protection material above the river bed to limit the reoccurrence of scour in these areas.

- Large 1-3 tonne temporary protection rocks to be placed on periphery of works area to direct main velocity of flow away from works area.

- Installation of scour protection using selected stone material and rock armour to protect river bed levels in front of wall 19.Installation of scour protection using selected stone material and rock armour to protect river bed.Reinstatement of river bed level to a minimum of 18.000 A OD using selected granular material

- Much of the scoured river bed material has been deposited in large gravel beds to the north of Mill Island, downstream of the breached weir. It is proposed where possible to utilise the material from these gravel beds as part of the emergency works to restore the river bed to its original level prior to placement of the scour protection material. It is proposed to take gravel from the larger gravel beds to the north of Mill Island only and not the smaller gravel beds that are immediately downstream of Fermoy Bridge. If necessary additional material of similar geological composition will be imported if insufficient gravel is available.

- To carry out the emergency works, it is proposed to form an access ramp from Mill Island down onto the gravel beds to the north of Mill Island. This will be constructed of imported material and removed once works are complete. From here, it is proposed to form a working platform in the river working in a western direction towards Wall 19. The working platform will form the base of the final scour protection in this area. The scour holes in the river bed will be infilled and protected with scour protection as the works advance westwards.

- The working platform and emergency works will continue from Mill Island along Wall 20 (the flood defence wall across the Mill Race) and westwards along Wall 19. As the works approach the west end of the breach in the existing weir, the existing river channel between Wall 19 and the weir will need to be narrowed to facilitate the installation of the working platform and the scour protection.

- At this stage in the construction works, there may be a requirement, subject to confirmation from the works Contractor, to temporarily limit the flow of water between the Wall 19 and the existing weir to allow the final part of the emergency works to be installed.

- To limit the flow in this area, a temporary dam may be required upstream of Fermoy Bridge for a short period of time. We acknowledge that from an environmental viewpoint, it is preferable that this temporary dam is not installed, but given the constraints of the working area between Wall 19 and the weir, and the need to limit the velocity of the water in this area, we consider that the works Contractor is likely to require some temporary bunding of the area to place the stone fill/scour protection material and complete the emergency works which are critical to restore the stability of the flood defense wall.

- Should any bunding/temporary dam be installed, it will only remain in place for as short a period as is practicable in order to undertake and complete the emergency works. In these circumstances it is expected that for this period, fish passage upstream will be facilitated by water flow to the existing fish ladder, and/or to the area to the south of the fish ladder on the weir where there is a shallow trough type feature on the weir surface, which may facilitate fish passage during this short period. The timing for the installation of the temporary dam and the duration for which it remains in place will be agreed with Inland Fisheries Ireland

- The objective is to complete works by the end of October 2020 weather permitting, however taking a worst case scenario approach this report assumes that works may continue for the first three weeks of November.

- Construction works will largely be carried out within the standard day time only with standard working hours of 08:00-18:00 Monday to Friday and 08:00 – 13:00on Saturday. However given the exceptional circumstances and limited timeframe for the completion of works it may be necessary to undertake works outside of these times including night working

4. Assessment Methodology

The proposed development is not directly connected with, or necessary for, the management of any Natura 2000 site. Natura 2000 sites (European sites) are only at risk from significant effects where a source-pathway-receptor link exists between a proposed development and a Natura 2000 site(s). This can take the form of a direct impact (e.g. where the proposed development and/or associated construction works are located within the boundary of the Natura 2000 site(s) or an indirect impact where impacts outside of the Natura 2000 site(s) affect ecological receptors within (e.g. impacts to water quality which can affect riparian habitats at a distance from the impact source).

A zone of influence of 15km is considered sufficient to assess all potential impacts. This methodology is based on source > pathway > receptor chain principles and involves assessing likely significant effects on Natura 2000 sites within the zone of influence of the proposed emergency maintenance works in relation to the following pathways:

- Impacts on water quality
- Spread of invasive species and biosecurity risks
- Impacts on fish migration and spawning
- Loss of habitat
- Direct effects on qualifying species
- Prevention of ongoing erosion, damage to flood relief walls and siltation effects
- In-combination effects

The screening assessment involves assessing the impacts of the proposed works, and its zone of influence, in relation to each of these pathways individually. The results of each pathway are then combined in a concluding section to identify if/where likely significant effects may arise.

5. Desktop Study

A desktop review facilitates the identification of the baseline ecological conditions and key ecological issues relating to Natura 2000 sites and facilitates an evaluation assessment of potential in-combination impacts. Sources of information used for this screening report include reports prepared for the area, information from statutory and non-statutory bodies. The sources of information and relevant documentation utilised are as follows:

- National Parks & Wildlife Service (NPWS) - www.npws.ie including qualifying interests and
  conservation objectives for Natura 2000 sites.
- Environmental Protection Agency (EPA) – www.epa.ie
- BirdWatch Ireland - http://www.birdwatchireland.ie/
- National Biodiversity Data Centre – www.biodiversityireland.ie
- County Cork Biodiversity Action Plan 2009-2014
- NPWS (2012) Conservation objectives supporting document - marine habitats
- NPWS (2012) Blackwater River (Cork/Waterford) SAC (site code 2170) Conservation objectives supporting document -coastal habitats
- NPWS (2012) River Blackwater (Cork/Waterford) SAC (site code 2170) Conservation objectives supporting document- woodland habitats
- King J. J. and Linnane S. M. (2004) The status and distribution of lamprey and shad in the Slaney and Munster Blackwater SACs. Irish Wildlife Manuals, No. 14. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

6. Author of Report for Screening

This report was prepared by Carl Dixon MSc. (Ecological Monitoring). Carl Dixon MSc (Ecology) is a senior ecologist who has over 20 years' experience in ecological and water quality assessments with particular expertise in freshwater ecology. He also has experience in mammal surveys, invasive species surveys and ecological supervision of large-scale projects. Projects in recent years include the Waste to Energy Facility Ringaskiddy, Shannon LNG Project, supervision of the Fermoy Flood Relief Scheme, Skibbereen Flood Relief Scheme, Douglas Flood Relief Scheme, Great Island Gas Pipeline etc.

7. Designated sites

The proposed works will impact directly on the River Blackwater (Cork/Waterford) (Site Code 002170) as indicated as **Figure 4.** Potentially impacts on this designated site could also occur indirectly and further information on this site is provided below.

With respect to the proposed works, the Blackwater Callows SPA is hydrologically connected but is located 1.4km downstream of the proposed works area. The qualifying

interests for this designated Natura 2000 site are Whooper Swan (*Cygnus cygnus*), Wigeon (*Anas penelope*), Teal (*Anas crecca*), Black-tailed Godwit (*Limosa limosa*) and Wetland and Waterbirds. Given the distance involved which precludes any disturbance or noise impacts and the absence of habitats for these species within or in proximity to the works area, no potential effect on the qualifying objectives and conservation interests for the Blackwater Callows SPA has been identified.

Given the limited and temporary scope of the works and following an assessment of potential impact pathways a zone of influence of 15km is considered sufficient. No other designated sites occur within a 15 km radius of the proposed works.

Figure 4 Approximate location of River Blackwater SAC (shaded orange).

7.1 Natura 2000 Site – Site Synopses, qualifying interests and conservation objectives

As noted above the River Blackwater (Cork/Waterford) (Site Code 002170) is considered directly relevant to this project. The Blackwater Callows SPA is located 1.4 km downstream of the proposed works as shown in **Figure 5.** Site synopses are attached as **Appendix 1.**

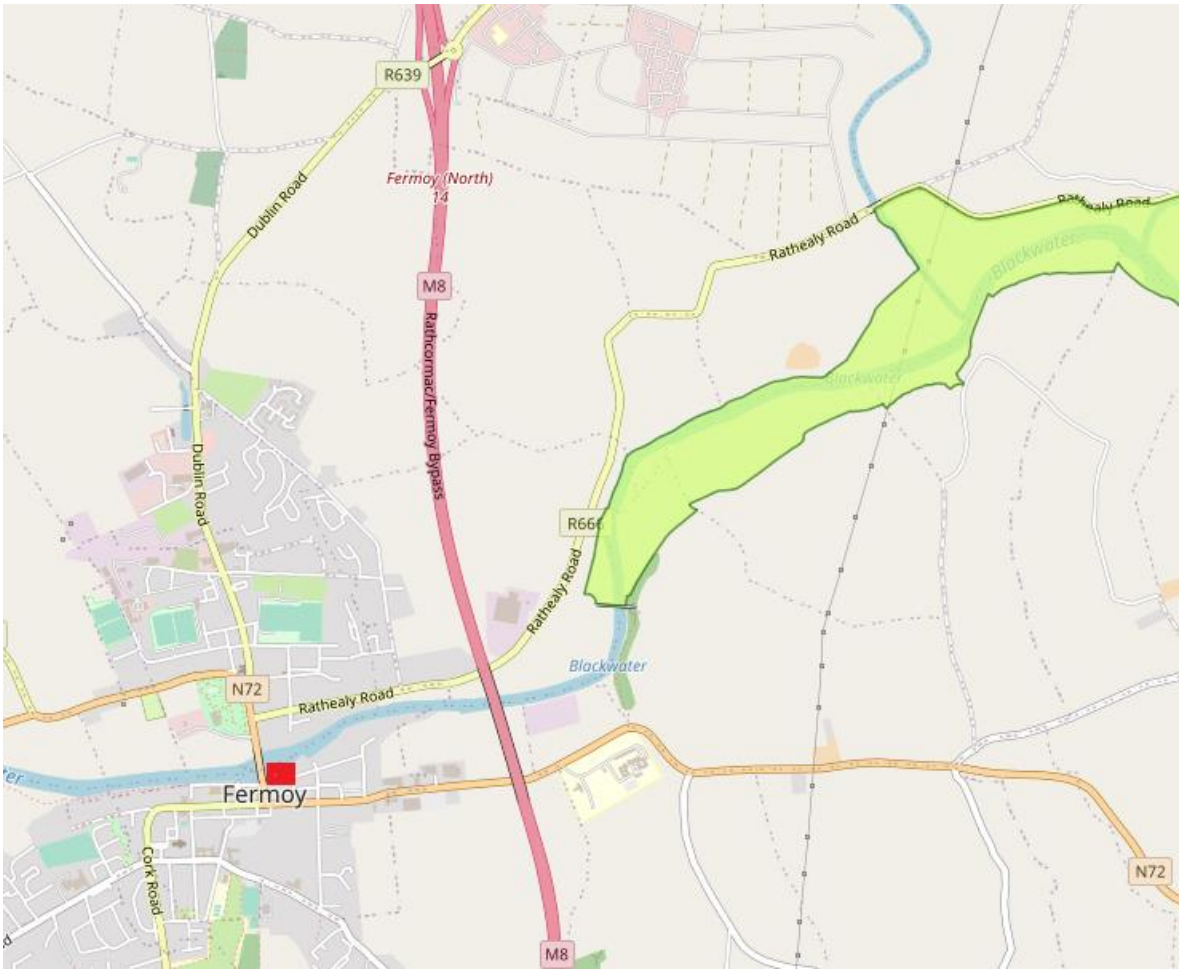

Figure 5 Approximate location of proposed works in relation to the Blackwater Callows SPA

7.1.1 Blackwater River (Cork/Waterford) SAC

This very large site drains a major part of County Cork and five mountain ranges. The site supports a high diversity of Annex I habitats and Annex II species of the E.U. Habitats Directive, including Atlantic salmon and otter.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, over-grazing within the woodland areas, and invasion by non-native species, for example Rhododendron and Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively. Furthermore, it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

7.1.2 Blackwater Callows SPA

The Blackwater Callows SPA comprises the stretch of the River Blackwater that runs in a west to east direction between Fermoy and Lismore in Counties Cork and Waterford, a distance of almost 25 km. The site includes the river channel and strips of seasonally-flooded grassland within the flood plain. Sandstone ridges, which run parallel to the river, confine the area of flooding to a relatively narrow corridor.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Whooper Swan, Wigeon, Teal and Black-tailed Godwit. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

7.1.3 Conservation Objectives & Features of Interests

The EU Habitats Directive contains a list of habitats (Annex I) and species (Annex II) for which SACs must be established by Member States. Similarly, the EU Birds Directive contains lists of important bird species (Annex I) and other migratory bird species for which SPAs must be established. Those that are known to occur at a site are referred to as 'qualifying interests' and are listed in the Natura 2000 forms which are lodged with the EU Commission by each Member State. A 'qualifying interest' is one of the factors (such as the species or habitat that is present) for which the site merits designation. The National Parks and Wildlife Service (NPWS) are responsible for the designation of SACs and SPAs in Ireland.

The conservation objectives for the site are detailed in: NPWS (2012) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170, Version 1. NPWS, Department of Arts, Heritage & the Gaeltacht (dated 31 July 2012). The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network. European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status sites designated as Special Areas of Conservation and Special Protection Areas. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level. Favourable conservation status of a habitat is achieved when its natural range, and area it covers within that range, is stable or increasing, and the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when population data on the species concerned indicate that it is maintaining itself, and the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The species and habitats listed as qualifying interests for the Blackwater River (Cork/Waterford) SAC and specific conservation objectives are included in **Table 2** and **3**. The special conservations interests for the Blackwater Callows SPA are listed in **Table 4.**

Table 2 Qualifying Species for the Blackwater River (Cork/Waterford) SAC

Species code	Species		*Conservation objective*
1092	White-clawed crayfish	*Austropotamobius pallipes*	Maintain
1095	Sea Lamprey	*Petromyzon marinus*	Restore
1096	Brook Lamprey	*Lampetra planeri*	Maintain
1099	River Lamprey	*Lampetra fluviatilis*	Maintain
1103	Twaite shad	*Alosa fallax*	Restore
1106	Atlantic Salmon	*Salmo salar*	Maintain
1355	Otter	*Lutra lutra*	Restore
1421	Killarney Fern	*Trichomanes speciosum*	Maintain

Table 3 Qualifying Habitats for the Blackwater River (Cork/Waterford) SAC

Habitat Code	Habitat	Conservation objective
1130	Estuaries	Maintain
1220	Perennial vegetation of stony banks	Maintain
1140	Mudflats and sandflats not covered by seawater at low tide	Maintain
1310	Salicornia and other annuals colonizing mud and sand	Maintain
1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	Restore
1410	Mediterranean salt meadows (*Juncetalia maritimi*)	Maintain
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation	Maintain
91E0	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (A*lno-Padion, Alnion incanae, Salicion albae*)	Restore
91J0	*Taxus baccata woods of the British Isles	Under Review
91A0	Old sessile oak woods with Ilex and Blechnum in British Isles	Restore

Restore = Restore favourable conservation condition, Maintain = Maintain favourable conservation condition

Table 4 Qualifying Species for the Blackwater Callows SPA

Species code	Species		*Conservation objective*
A038	Whooper Swan	*Cygnus Cygnus*	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA To maintain or restore the favourable conservation condition of the wetland habitat at Blackwater Callows SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.
A050	Wigeon	*Anas Penelope*	
A052	Teal	*Anas crecca*	
A156	Black-tailed Godwit	*Limosa limosa*	
A999	Wetland and Waterbirds		
		-	

8. Consultation

National Parks and Wildlife Service and Inland Fisheries Ireland were consulted in relation to the proposed development. Measures recommended by Inland Fisheries Ireland have been incorporated into the construction methodology for the project. Cork County Council have also been kept informed of the risks

associated with the erosion in front of the quay walls and have been consulted in respect of the proposals

9. Assessment of Potential Impacts

The potential impacts associated with the proposed development are discussed in the following section with respect to their likelihood to have significant impacts on Natura 2000 sites.

As part of the assessment direct, indirect and cumulative impacts will be assessed. Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development. Indirect and secondary impacts do not have a straight-line route between cause and effect, and it is potentially more challenging to ensure that all the possible indirect impacts of the project/plan - in combination with other plans and projects have been established.

Only those features of the development that have the potential to impact on features and conservation objectives of the identified Natura sites are considered. A number of factors were examined at this stage and dismissed or carried forward for appropriate assessment as relevant. The following areas were examined in relation to potential impacts from the proposed works on Natura 2000 sites in the area:

9.1 Impacts on water quality

Blackwater River SAC

Instream works have the potential to generate elevated silt levels which could have potential effects on the aquatic QI species and habitats for the Blackwater River SAC. Minor spills of hydrocarbons during works could also impact on water quality.

Blackwater Callows SPA

Given the distance involved and in the absence of a significant pathway by which SCI bird species could be adversely affected, no potential effect on the Blackwater Callows SPA has been identified.

9.2 Invasive species and biosecurity

Blackwater River SAC

The spread of invasive species (Himilayan Balsam) could impact on habitats listed as Qis for the Blackwater River SAC. Biosecurity issues, and in particular Crayfish Plague also has the potential to impact on QIs for the Blackwater River SAC.

Blackwater Callows SPA

Given the distance involved and in the absence of a significant pathway by which SCI bird species could be adversely affected, no potential effect on the Blackwater Callows SPA has been identified.

9.3 Impacts on fish migration and spawning

Blackwater River SAC

The use of a temporary dam may impact on movements of migratory fish species listed as QIs for the Blackwater River SAC. Change in migration patterns may impact on reproductive success or may make fish more susceptible to predation. Direct impacts on potential spawning gravels for salmon and lamprey species could impact on reproductive

success.

Blackwater Callows SPA

Given the distance involved and in the absence of a significant pathway by which SCI bird species could be adversely affected, no potential effect on the Blackwater Callows SPA has been identified.

9.4 Loss of habitat

Blackwater River SAC

The proposed works will take place within and adjacent to River Blackwater SAC and there is the potential for effects on Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation which is a QI habitat for the Blackwater River SAC.

Significant changes in flow patterns could impact on the distribution of habitats listed as Qis for the Blackwater River SAC such as Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (A*lno-Padion, Alnion incanae, Salicion albae*). There may also be a loss of habitat for aquatic species listed as QIs for the Blackwater River SAC. Impacts on hydrology could impact on alluvial woodland.

Perennial vegetation of stony banks, Salicornia and other annuals colonising mud and sand, Atlantic salt meadows (Glauco-Puccinellietalia maritimae) and Mediterranean salt meadows (Juncetalia maritimi) are estuarine habitats which are located in excess of 50km downstream of the proposed works. The closest point of the habitat estuaries is located approximately 29km downstream of the proposed works and the closest point of the habitat Mudflats and sandflats not covered by seawater at low tide is located approximately 46km downstream of the proposed works. These are robust habitats which are naturally adapted to the extreme fluctuations in silt levels that occur in the estuarine environment and given the high levels of dilution provided in the estuarine environment no impacts from any minor spills of hydrocarbons will occur. No potential effect on these qualifying habitats have been identified.

Blackwater Callows SPA

Given the distance involved and in the absence of a significant pathway by which SCI bird species could be adversely affected, no potential effect on the Blackwater Callows SPA has been identified.

9.5. Direct impacts on qualifying species

Blackwater River SAC

Instream works have the potential to impact directly on aquatic species which are listed as QIs for the Blackwater River SAC and which may occur within the proposed works area. Noise and disturbance could potentially impact on otter which is listed as a QI for the Blackwater River SAC.

Blackwater Callows SPA

Given the distance involved and in the absence of a significant pathway by which SCI bird species could be adversely affected, no potential effect on the Blackwater Callows SPA

has been identified.

9.6. Prevention of ongoing erosion, damage to flood relief walls and siltation effects

Blackwater River SAC

The proposed works will have a positive impact in preventing further erosion and damage to the flood relief scheme infrastructure which would necessitate major instream works in the future. In the absence of the proposed emergency works ongoing erosion and ground collapse will lead to high levels of silt being deposited within the Blackwater River SAC with subsequent potential effects on QI species and habitats for the Blackwater River SAC.

Blackwater Callows SPA

Given the distance involved and in the absence of a significant pathway by which SCI bird species could be adversely affected, no potential effect on the Blackwater Callows SPA has been identified.

9.7. In-combination Impacts

The proposed works may have an in-combination effect on species and habitats when other plans and projects are taken into account. Cumulative impacts refer to a series of individually modest impacts that may in combination produce a significant impact.

Blackwater River SAC

The site synopsis notes that the main threats to the Blackwater River SAC and current damaging activities, include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, over-grazing within the woodland areas, and invasion by non-native species, for example Rhododendron and Cherry Laurel. Given that the proposed works may impact on water quality and will take place within the SAC boundary there is the potential for the project to have an in-combination effect on species and habitats when other plans and projects are taken into account.

Blackwater Callows SPA

Given the distance involved and in the absence of a significant pathway by which SCI bird species could be adversely affected, no potential effect on the Blackwater Callows SPA has been identified.

10. Screening determination – Potential effect on European sites.

From this screening exercise it has been determined that significant likely effects may arise on the following Natura 2000 sites as a result of the proposed emergency works. See **Table 5.**

Table 5.Screening determination – Potential effect on European sites.

Site	Pathway of impact							Comments
	Impacts on water quality	Spread of invasive species and biosecurity risks	Impacts on fish migration and spawning	Loss of habitat	Direct impact on qualifying species	Potential beneficial effect from prevention of ongoing erosion, damage to flood relief walls and siltation effects	In-combination Impacts	
Blackwater River SAC								Potential Effects to be assessed by NIS
Blackwater Callows SPA								Effects screened out.

Note:Red = likely significant adverse effect Yellow = likely beneficial effect Green = no likely significant effect

11. Potential impacts on qualifying interests for the Blackwater River SAC

The Qualifying Interests/Special Conservation Interests for the remaining 'screened in' Natura 2000 sites were assessed to identify which may potentially be impacted upon by the proposed works based on potential impact pathways. Where no information on the location of Qualifying Interests/Special Conservation Interests was available, the precautionary principle was applied and the Qualifying Interests/Special Conservation Interests were screened in. Screening conclusions for the Blackwater River (Cork/Waterford) SAC qualifying interests is provided in **Tables 6.**

Table 6: Screening of the Blackwater River (Cork/Waterford) SAC qualifying interests

Natura 2000 Site	Qualifying Interest	Potential Impacts	Screened In/Out
Blackwater River (Cork/Waterford) SAC (site code 002170)	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410]	Given the, the high level of dilution provided in the estuarine/marine environment, the distance of these habitats from the proposed works area and the robust nature of these habitats, no potential effect has been identified.	Screened Out
	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] *Taxus baccata woods of the British Isles [91J0]	This is a terrestrial habitat which was not recorded within the works area or in close proximity and thus no potential effects have been identified.	Screened Out
	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion	Changes in hydrology could have adverse effects on this habitat	Screened In

	incanae, Salicion albae) [91E0]		
	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]	This habitat type is commonly distributed along the main Blackwater channel and within its tributaries and includes species such as Pond Watercrowfoot (Ranunculus peltatus), Water-crowfoot (Ranunculus sp.), Canadian Waterweed (Elodea canadensis), Broad-leaved Pondweed (Potamogeton natans) and Water Milfoil (Myriophyllum spp.). Impacts on water quality could have adverse effects on this habitat.	Screened In
	Trichomanes speciosum (Killarney Fern) [1421]	Killarney Fern belongs to the Filmy Fern family (Hymenophyllaceae) and is the only European representative of the genus Trichomanes. The species can occur as either sporophyte or gametophyte generations or as both generations together. Killarney fern generally requires specific habitat requirements which are found in dripping caves, cliffs, crevices and gullies by waterfalls, crevices in woodland, and occasionally on the floor of damp woodland – all deeply shaded humid habitats. No potential effect on this species has been identified.	Screened Out
	Alosa fallax fallax (Twaite Shad) [1103]	Twaite Shad spend their adult life at sea or in estuaries and spawn in freshwater in early summer. This species is known to exist in the Blackwater River and Cappoquin is the likely spawning area (NPWS, 2007e). Impacts on water quality could have adverse effects on this species	Screened In
	Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]	The River Blackwater Catchment represents the largest Freshwater pearl Mussel catchment in Ireland. Siltation or direct loss of habitat could have adverse effects on this species	Screened In

	Austropotamobius pallipes (White-clawed Crayfish) [1092] Petromyzon marinus (Sea Lamprey) [1095] Lampetra planeri (Brook Lamprey) [1096] Lampetra fluviatilis (River Lamprey) [1099] Salmo salar (Salmon) [1106]	Inhabit or migrate through freshwater and thus could be affected by impacts on water quality or loss of habitat.	Screened In
	Lutra lutra (Otter) [1355]	Impacts on prey availability and noise and disturbance could have adverse effects on this species	Screened in

12. Conclusions

Screening for Appropriate Assessment can identify that a Natura Impact Statement (NIS) is not required where:

(1) A project/proposal is directly related to the management of the site.
(2) There is no potential for significant effects affecting the Natura 2000 network

Where the screening process identifies that significant effects are certain, likely or uncertain the project must either proceed to Stage 2 Appropriate Assessment or be rejected.

The proposed works will impact directly on the Blackwater River SAC (Site Code 002170). Therefore, it is concluded that the proposed works could potentially have a significant impact on qualifying interests and conservation objectives for this Natura 2000 site, and hence the integrity of this site could potentially be adversely affected.

No potential effects on other European sites, including the Blackwater Callow SPA, were identified due the distance involved and the absence of a potential impact pathway.

Based on the above it is concluded that significant effects on Natura 2000 sites cannot be definitively discounted, and a Stage 2 Natura Impact Assessment (NIA) is required to assess the potential impacts from the proposed works and to determine whether the works as proposed will have a significant adverse impact on the qualifying interests, conservation interests and overall integrity of Natura 2000 sites.

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Appendices

Appendix 1 - Blackwater River (Cork/Waterford) SAC (Site Code 2170) Site Synopsis

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which include the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The portions of the Blackwater and its tributaries that fall within this SAC flow through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Nearby towns include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

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

- [1130] Estuaries
- [1140] Tidal Mudflats and Sandflats
- [1220] Perennial Vegetation of Stony Banks
- [1310] Salicornia Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [3260] Floating River Vegetation
- [91A0] Old Oak Woodlands
- [91E0] Alluvial Forests*
- [1029] Freshwater Pearl Mussel (Margaritifera margaritifera)
- [1092] White-clawed Crayfish (Austropotamobius pallipes)
- [1095] Sea Lamprey (Petromyzon marinus)
- [1096] Brook Lamprey (Lampetra planeri)
- [1099] River Lamprey (Lampetra fluviatilis)
- [1103] Twaite Shad (Alosa fallax)
- [1106] Atlantic Salmon (Salmo salar)
- [1355] Otter (Lutra lutra)
- [1421] Killarney Fern (Trichomanes speciosum)

The conservation objectives for the site are detailed in: NPWS (2012) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170, Version 1. NPWS, Department of Arts, Heritage & the Gaeltacht(dated 31 July 2012). The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest.

The Blackwater rises in boggy land in east Kerry, where Namurian grits and shales build the low heather-covered plateaux. Near Kanturk the plateaux enclose a basin of productive Coal Measures. On leaving the Namurian rocks the Blackwater turns eastwards along the northern slopes of the Boggeragh Mountains before entering the narrow limestone strike vale at Mallow. The valley deepens as first the Nagles Mountains and then the Knockmealdowns impinge upon it. Interesting geological features along this stretch of the Blackwater Valley include limestone cliffs and caves near the villages and small towns of Killavullen and Ballyhooly; the Killavullen caves contain fossil material from the end of the glacial period. The associated basic soils in this area support the growth of plant communities which are rare in Cork because in general the county's rocks are acidic. At Cappoquin the river suddenly turns south and cuts through high ridges of Old Red Sandstone. The Araglin valley is predominantly underlain by sandstone, with limestone occurring in the lower reaches near Fermoy.

Wet woodlands are found where river embankments have broken down and channel edges are subject to daily inundation. This is particularly evident in the steep-sided valley of the River Bride, between Cappoquin and Youghal. The river side of the embankments was often used for willow growing in the past (most recently at Cappoquin) so that the channel is lined by narrow woods of White and Almondleaved Willow (Salix alba and S. triandra), with isolated Crack Willow (S. fragilis) and Osier (S. viminalis). Rusty Willow (S. cinerea subsp. oleifolia) spreads naturally into the sites and occasionally, as at Villierstown on the Blackwater and Sapperton on the Bride, forms woods with a distinctive mix of woodland and marsh plants, including Gypsywort (Lycopus europaeus), Guelder-rose (Viburnum opulus), Bittersweet (Solanum dulcamara) and various mosses and algae. These wet woodlands form one of the most extensive tracts of the wet woodland habitat in the country.

A small stand of Yew (Taxus baccata) woodland occurs within the site. This is on a limestone ridge at Dromana, near Villierstown. While there are some patches of the wood with a canopy of Yew and some very old trees, the quality is generally poor due to the dominance of non-native and invasive species such as Sycamore (Acer pseudoplatanus), Beech (Fagus sylvatica) and Douglas Fir (Pseudotsuga menzsisii). However, it does have the potential to develop into a Yew dominated stand in the long term and the site should continue to be monitored.

Marshes and reedbeds cover most of the flat areas beside the rivers and often occur in mosaic with the wet woodland. Common Reed (Phragmites australis) is ubiquitous and is harvested for thatching. There is also much Marsh-marigold (Caltha palustris) and, at the edges of the reeds, the Greater and Lesser Pond-sedge (Carex riparia and C. acutiformis). Hemlock Water-dropwort (Oenanthe crocata), Wild Angelica (Angelica sylvestris), Reed Canary-grass (Phalaris arundinacea), Meadowsweet (Filipendula ulmaria), Common Nettle (Urtica dioica), Purple Loosestrife (Lythrum salicaria), Common Valerian (Valeriana officinalis), Water Mint (Mentha aquatica) and Water Forget-me-not (Myosotis scorpioides) are all also found.

At Banteer there are a number of hollows in the sediments of the floodplain where subsidence and subterranean drainage have created isolated wetlands, sunk below the level of the surrounding fields. The water rises and falls in these holes depending on the water table and

several different communities have developed on the acidic or neutral sediments. Many of the ponds are ringed with Rusty Willow, rooted in the mineral soils but sometimes collapsed into the water. Beneath the densest stands are woodland herbs like Yellow Pimpernel (Lysimachia nemorum), with locally abundant Common Water-starwort (Callitriche stagnalis) and Marsh Ragwort (Senecio aquaticus). One of the depressions has Silver Birch (Betula pendula), Ash (Fraxinus excelsior), Crab Apple (Malus sylvestris) and a little Pedunculate Oak (Quercus robur) in addition to the willows.

Floating river vegetation is found along much of the freshwater stretches within the site. The species list is quite extensive, with species such as water-crowfoots, including Pond Water-crowfoot (Ranunculus peltatus), Canadian Pondweed (Elodea canadensis), pondweed species, including Broad-leaved Pondweed (Potamogeton natans), water-milfoil species (Myriophyllum spp.), Common Club-rush (Scirpus lacustris), water-starwort species (Callitriche spp.), Lesser Water-parsnip (Berula erecta) particularly on the Awbeg, Water-cress (Nasturtium officinale), Hemlock Waterdropwort, Fine-leaved Water-dropwort (O. aquatica), Common Duckweed (Lemna minor), Yellow Water-lily (Nuphar lutea), Unbranched Bur-reed (Sparganium emersum) and the moss Fontinalis antipyretica all occurring.

The grasslands adjacent to the rivers of the site are generally heavily improved, although liable to flooding in many places. However, fields of more species-rich wet grassland with species such as Yellow Iris (Iris pseudacorus), Meadowsweet, Meadow Buttercup (Ranunculus acris) and rushes (Juncus spp.) occur occasionally. Extensive fields of wet grassland also occur at Annagh Bog on the Awbeg. These fields are dominated by Tufted Hair-grass (Deschampsia cespitosa) and rushes.

The Blackwater Valley has a number of dry woodlands; these have mostly been managed by the estates in which they occur, frequently with the introduction of Beech and a few conifers, and sometimes of the invasive species Rhododendron (Rhododendron ponticum) and Cherry Laurel (Prunus laurocerasus). Oak woodland is well developed on sandstone about Ballinatray, with the acid oak woodland community of Holly (Ilex aquifolium), Bilberry (Vaccinium myrtillus), Great Wood-rush (Luzula sylvatica) and the ferns Dryopteris affinis and D. aemula occurring in one place. Irish Spurge (Euphorbia hyberna) continues eastwards on acid rocks from its headquarters to the west, but there are also many plants of richer soils, for example Wood Violet (Viola reichenbachiana), Goldilocks Buttercup (Ranunculus auricomus), Broad-leaved Helleborine (Epipactis helleborine) and Red Campion (Silene dioica). Oak woodland is also found in Rincrew, Carrigane, Glendine, Newport and Dromana. The spread of Rhododendron is locally a problem, as is over-grazing. A few limestone rocks stand over the river in places showing traces of a less acidic woodland type with Ash, False Brome (Brachypodium sylvaticum) and Early-purple Orchid (Orchis mascula).

In the vicinity of Lismore, two deep valleys cut in Old Red Sandstone join to form the Owenashad River before flowing into the Blackwater at Lismore. These valleys retain something close to their original cover of oak with Downy Birch (Betula pubescens), Holly and Hazel (Corylus avellana) also occurring. There has been much planting of Beech (as well as some of coniferous species) among the oak on the shallower slopes and here both

Rhododendron and Cherry Laurel have invaded the woodland.

The oak wood community in the Lismore and Glenmore valleys is of the classic upland type, in which some Rowan (Sorbus aucuparia) and Downy Birch occur. Honeysuckle (Lonicera periclymenum) and Ivy (Hedera helix) cover many of the trees while Great Wood-rush, Bluebell (Hyacinthoides non-scripta), Wood-sorrel (Oxalis acetosella) and, locally, Bilberry dominate the ground flora. Ferns present on the site include Hard Fern (Blechnum spicant), Male Fern (Dryopteris filix-mas), the bucklerferns D. dilatata and D. aemula, and Lady Fern (Athyrium felix-femina). There are many mosses present and large species such as Rhytidiadelphus spp., Polytrichum formosum, Mnium hornum and Dicranum spp. are noticeable. The lichen flora is important and includes 'old forest' species which imply a continuity of woodland here since ancient times. Tree Lungwort (Lobaria spp.) is the most conspicuous and is widespread.

The Araglin valley consists predominantly of broadleaved woodland. Oak and Beech are joined by Hazel, Wild Cherry (Prunus avium) and Goat Willow (Salix caprea). The ground flora is relatively rich, with Pignut (Conopodium majus), Ramsons (Allium ursinum), Garlic Mustard (Alliaria petiolata) and Wild Strawberry (Fragaria vesca). The presence of Ivy Broomrape (Orobanche hederae), a local species within Ireland, suggests that the woodland, along with its attendant Ivy, is long established.

Along the lower reaches of the Awbeg River, the valley sides are generally cloaked with mixed deciduous woodland of estate origin. The dominant species is Beech, although a range of other species are also present, e.g. Sycamore, Ash and Horsechestnut (Aesculus hippocastanum).

In places the alien invasive species Cherry Laurel dominates the understorey. Parts of the woodlands are more semi-natural in composition, being dominated by Ash, with Hawthorn (Crataegus monogyna) and Spindle (Euonymus europaea) also present. However, the most natural areas of woodland appear to be the wet areas dominated by Alder and willows (Salix spp.). The ground flora of the dry woodland areas features species such as Pignut, Wood Avens (Geum urbanum), Ivy and Soft Shield-fern (Polystichum setiferum), while the ground flora of the wet woodland areas contains characteristic species such as Remote Sedge (Carex remota) and Opposite-leaved Golden-saxifrage (Chrysosplenium oppositifolium). In places along the upper Bride, scrubby, semi-natural deciduous woodland of willow, oak and Rowan occurs, with abundant Great Wood-rush in the ground flora.

The Bunaglanna River passes down a very steep valley, flowing in a north-south direction to meet the Bride River. It flows through blanket bog to heath and then scattered woodland. The higher levels of moisture here enable a vigorous moss and fern community to flourish, along with a well-developed epiphyte community on the tree trunks and branches.

At Banteer a type of wetland occurs near the railway line which offers a complete contrast to the others. Old turf banks are colonised by Royal Fern (Osmunda regalis) and Eared Willow

(Salix aurita), and between them there is a sheet of Bottle Sedge (Carex rostrata), Marsh Cinquefoil (Potentilla palustris), Bogbean (Menyanthes trifoliata), Marsh St. John's-wort (Hypericum elodes) and the mosses Sphagnum auriculatum and Aulacomnium palustre. The cover is a scraw (i.e. floating vegetation) with characteristic species like Marsh Willowherb (Epilobium palustre) and Early Marshorchid (Dactylorhiza incarnata).

The soil high up the Lismore valleys and in rocky places is poor in nutrients but it becomes richer where streams enter and also along the valley bottoms. In such sites Wood Speedwell (Veronica montana), Wood Anemone (Anemone nemorosa), Enchanter's-nightshade (Circaea lutetiana), Barren Strawberry (Potentilla sterilis) and shield-fern (Polystichum sp.) occur. There is some Ramsons, Three-nerved Sandwort (Moehringia trinervia) and Early-purple Orchid (Orchis mascula) locally, with Opposite-leaved Golden-saxifrage, Meadowsweet and Bugle (Ajuga reptans) in wet places. A stand of Hazel woodland at the base of the Glenakeeffe valley shows this community well.

The area has been subject to much tree felling in the recent past and re-sprouting stumps have given rise to areas of bushy Hazel, Holly, Rusty Willow and Downy Birch. The ground in the clearings is heathy with Heather (Calluna vulgaris), Slender St John's-wort (Hypericum pulchrum) and the occasional Broom (Cytisus scoparius) occurring.

The estuary and the habitats within and associated with it form a large component of the site. Very extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. The main expanses occur at the southern end of the site, with the best examples at Kinsalebeg in Co. Waterford, and between Youghal and the main bridge north of it across the river in Co. Cork. Other areas occur along the tributaries of the Licky in east Co. Waterford, and Glendine, Newport, Bride and Killahaly Rivers in Waterford west of the Blackwater. There are also large tracts along the Tourig River in Co. Cork. There are narrow bands of intertidal flats along the main river as far north as Camphire Island. Patches of green filamentous algae (Ulva sp. and Enteromorpha sp.) occur in places, while fucoid algae are common on the more stony flats, even as high upstream as Glenassy or Coneen.

The area of saltmarsh within the site is small. The best examples occur at the mouths of the tributaries and in the townlands of Foxhole and Blackbog. Those found are generally characteristic of Atlantic salt meadows. The species list at Foxhole consists of Common Saltmarsh-grass (Puccinellia maritima), small amounts of Greater Seaspurrey (Spergularia media), glasswort (Salicornia sp.), Sea Arrowgrass (Triglochin maritima), Annual Sea-blite (Suaeda maritima) and Sea Purslane (Halimione portulacoides) - the latter a very recent coloniser. Some Sea Aster (Aster tripolium) occurs, generally with Creeping Bent (Agrostis stolonifera). Sea Couch (Elymus pycnanthus) and small isolated clumps of Sea Club-rush (Scirpus maritimus) are also seen. On the Tourig River additional saltmarsh species found include sea-lavenders (Limoniun spp.), Thrift (Armeria maritima), Red Fescue (Festuca rubra), Common Scurvygrass (Cochlearia officinalis) and Sea Plantain (Plantago maritima). Oraches (Atriplex spp.) are found on channel edges. Species such as Saltmarsh Rush (Juncus gerardi) and Sea Rush (J. maritimus) are found in places in this site also, and are indicative of

Mediterranean salt meadows. Areas of Salicornia mud are found at the eastern side of the townland of Foxbole above Youghal, at Blackbog, along the Tourig and Kinsalebeg esturaies.

The shingle spit at Ferrypoint supports a good example of perennial vegetation of stony banks. The spit is composed of small stones and cobbles and has a well-developed and diverse flora. At the lowest part, Sea Beet (Beta vulgaris subsp. maritima), Curled Dock (Rumex crispus) and Yellow Horned-poppy (Glaucium flavum) occur, while at a slightly higher level Sea Mayweed (Matricaria maritima), Cleavers (Galium aparine), Rock Samphire (Crithmum maritimum), Sea Sandwort (Honkenya peploides), Spear-leaved Orache (Atriplex prostrata) and Babington's Orache (A. glabriuscula). Other species present include Sea Rocket (Cakile maritima), Herb-Robert (Geranium robertianum), Red Fescue and Kidney Vetch (Anthyllis vulneraria). The top of the spit is more vegetated and supports lichens and bryophytes, including Tortula ruraliformis and Rhytidiadelphus squarrosus.

The site supports several Red Data Book plant species, i.e. Starved Wood-sedge (Carex depauperata), Killarney Fern (Trichomanes speciosum), Pennyroyal (Mentha pulegium), Bird's-nest Orchid (Neottia nidus-avis), Golden Dock (Rumex maritimus) and Bird Cherry (Prunus padus). The first three of these are also protected under the Flora (Protection) Order, 2015, while the Killarney Fern is also listed on Annex II of the E.U. Habitats Directive. The following plants, relatively rare nationally, are also found within the site: Toothwort (Lathraea squamaria) - associated with woodlands on the Awbeg and Blackwater; Summer Snowflake (Leucojum aestivum) and Flowering Rush (Butomus umbellatus) on the Blackwater; Common Calamint (Calamintha ascendens), Red Campion, Sand Leek (Allium scorodoprasum) and Wood Club-rush (Scirpus sylvaticus) on the Awbeg.

The site is also important for the presence of several E.U. Habitats Directive Annex II animal species, including Sea Lamprey (Petromyzon marinus), Brook Lamprey (Lampetra planeri), River Lamprey (L. fluviatilis), Twaite Shad (Alosa fallax fallax), Freshwater Pearl Mussel (Margaritifera margaritifera), Otter (Lutra lutra) and Salmon (Salmo salar). The Awbeg supports a population of White-clawed Crayfish (Austropotamobius pallipes). This threatened species has been recorded from a number of locations and its remains are also frequently found in Otter spraints, particularly in the lower reaches of the river. The freshwater stretches of the Blackwater and Bride Rivers are designated salmonid rivers. The Blackwater is noted for its enormous run of salmon over the years. The river is characterised by significant pools, streams, glides, and generally, a good push of water coming through except in very low water. Spring salmon fishing can be carried out as far upstream as Fermoy and is highly regarded especially at Careysville. The Bride, main Blackwater upstream of Fermoy, and some of the tributaries are more associated with grilse fishing.

The site supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. The bat species Natterer's Bat, Daubenton's Bat, Whiskered Bat, Brown Long-eared Bat and Pipistrelle, can be seen feeding along the river, roosting under the old bridges and in old buildings.

Common Frog, a Red Data Book species that is also legally protected (Wildlife Act, 1976), occurs throughout the site. The rare bush cricket Metrioptera roselii (Order Orthoptera) has been recorded in the reed/willow vegetation of the river embankment on the Lower Blackwater River. The Swan Mussel (Anodonta cygnea), a scarce species nationally, occurs at a few sites along the freshwater stretches of the Blackwater.

Several bird species listed on Annex I of the E.U. Birds Directive are found on the site. Some use it as a staging area, others are vagrants, while others use it more regularly. Internationally important numbers of Whooper Swan (average peak 174, 1994/95-95/96) and nationally important numbers Bewick's Swan (average peak 5, 1996/97-2000/01) use the Blackwater Callows. Golden Plover occur in regionally important numbers on the Blackwater estuary (average peak 885, 1984/85-86/87) and on the River Bride (absolute maximum 2,141, 1994/95). Staging Terns visit the site annually, with >300 Sandwich Tern and >200 Arctic/Common Tern (average peak 1974-1994). The site also supports populations of the following: Red Throated Diver, Great Northern Diver, Barnacle Goose, Ruff, Wood Sandpiper and Greenland Whitefronted Goose. Three breeding territories for Peregrine Falcon are known along the Blackwater Valley. This, the Awbeg and the Bride River are also thought to support at least 30 pairs of Kingfisher. Little Egret breed at the site (12 pairs in 1997, 19 pairs in 1998).

The site holds important numbers of wintering waterfowl. Both the Blackwater Callows and the Blackwater Estuary Special Protection Areas (SPAs) hold internationally important numbers of Black-tailed Godwit (average peak 847, 1994/95-95/96 on the callows, average peak 845, 1974/75-93/94 in the estuary). The Blackwater Callows also hold Wigeon (average peak 2,752), Teal (average peak 1,316), Mallard (average peak 427), Shoveler (average peak 28), Lapwing (average peak 880), Curlew (average peak 416) and Black-headed Gull (average peak 396) (counts from 1994/95-95/96). Numbers of birds using the Blackwater Estuary, given as the mean of the highest monthly maxima over 20 years (1974-94), are Shelduck (137 +10 breeding pairs), Wigeon (780), Teal (280), Mallard (320 + 10 breeding pairs), Goldeneye (11-97), Oystercatcher (340), Ringed Plover (50 + 4 breeding pairs), Grey Plover (36), Lapwing (1,680), Knot (150), Dunlin (2,293), Snipe (272), Black-tailed Godwit (845), Bar-tailed Godwit (130), Curlew (920), Redshank (340), Turnstone (130), Black-headed Gull (4,000) and Lesser Black-backed Gull (172). The greatest numbers (75%) of the wintering waterfowl of the estuary are located in the Kinsalebeg area on the east of the estuary in Co. Waterford. The remainder are concentrated along the Tourig estuary on the Co. Cork side.

The river and river margins also support many Heron, non-breeding Cormorant and Mute Swan (average peak 53, 1994/95-95/96 in the Blackwater Callows). Heron occurs all along the Bride and Blackwater Rivers: 2 or 3 pairs at Dromana Rock; approximately 25 pairs in the woodland opposite; 8 pairs at Ardsallagh Wood and around 20 pairs at Rincrew Wood have been recorded. Some of these are quite large and significant heronries. Significant numbers of Cormorant are found north of the bridge at Youghal and there are some important roosts present at Ardsallagh Wood, downstream of Strancally Castle and at the mouth of the Newport River. Of note are the high numbers of wintering Pochard (e.g. 275 individuals in 1997) found at Ballyhay quarry on the Awbeg, the best site for Pochard in Co. Cork.

Other important species found within the site include Long-eared Owl, which occurs all along the Blackwater River, and Barn Owl, a Red Data Book species, which is found in some old buildings and in Castlehyde, west of Fermoy. Reed Warbler, a scarce breeding species in Ireland, was found for the first time in the site in 1998 at two locations. It is not known whether or not this species breeds on the site, although it breeds nearby to the south of Youghal. Dipper occurs on the rivers.

Land use at the site is mainly centred on agricultural activities. The banks of much of the site and the callows, which extend almost from Fermoy to Cappoquin, are dominated by improved grasslands which are drained and heavily fertilised. These areas are grazed and used for silage production. Slurry is spread over much of this area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the populations of E.U. Habitats Directive Annex II animal species within it. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the Blackwater and its tributaries, and there are a number of angler associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. Other recreational activities such as boating, golfing and walking are also popular. Water skiing is carried out at Villierstown. Parts of Doneraile Park and Anne's Grove are included in the site: both areas are primarily managed for amenity purposes. There is some hunting of game birds and Mink within the site. Ballyhay quarry is still actively quarried for sand and gravel. Several industrial developments, which discharge into the river, border the site.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, over-grazing within the woodland areas, and invasion by non-native species, for example Rhododendron and Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively. Furthermore, it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

SITE NAME: BLACKWATER CALLOWS SPA SITE CODE: 004094

The Blackwater Callows SPA comprises the stretch of the River Blackwater that runs in a west to east direction between Fermoy and Lismore in Counties Cork and Waterford, a distance of almost 25 km. The site includes the river channel and strips of seasonally-flooded grassland within the flood plain. Sandstone ridges, which run parallel to the river, confine the area of flooding to a relatively narrow corridor.

The river channel has a well-developed aquatic plant community, which includes such species as Pond Water-crowfoot (Ranunculus peltatus), Canadian Pondweed (Elodea canadensis) and a variety of pondweeds (Potamogeton spp.), water-milfoils (Myriophyllum spp.) and water-starworts (Callitriche spp.).

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Whooper Swan, Wigeon, Teal and Black-tailed Godwit. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The site is of high ornithological interest on account of its wintering waterfowl populations. Whooper Swan occurs in numbers of international importance (212) - all figures are mean peaks for the five winters 1995/96 to 1999/2000. Bewick's Swan were regularly recorded at the site up to the mid-1990s; however, in the winters of 1997/98 and 1998/99 only four and two individuals respectively were recorded, and the species is no longer considered to be a regular visitor. This decline is in line with a national decrease and a marked contraction in range. The site supports nationally important populations of Wigeon (2,313), Teal (898) and Black-tailed Godwit (251). Other wintering species that occur include Mallard (398) Shoveler (26), Lapwing (191), Curlew (457) and Black-headed Gull (311).

Little Egret uses the site throughout the year as there is a nearby breeding colony downstream. The river system provides an important feeding area for these birds.

The Blackwater Callows SPA is of importance for its populations of wintering waterfowl, including an internationally important population of Whooper Swan and nationally important populations of Wigeon, Teal and Black-tailed Godwit. The presence of Whooper Swan, as well as Little Egret, is of particular note as these species are listed on Annex I of the E.U. Birds Directive. Part of the Blackwater Callows SPA is a Wildfowl Sanctuary.

31.10.2014

Appendix 2 – Proposed Works

SURVEY SHOWN THUS WAS CARRIED OUT BY MURPHY SURVEYS GLOBAL CONSULTING SURVEYORS IN AUGUST 2020, DRAWING REFERENCE MSL37760_01. THE SURVEY WAS CARRIED OUT TO ITM AND HAS BEEN CONVERTED TO IRISH NATIONAL GRID.

OS MAP SHOWN IN BLACK

REINSTATE RIVER BED LEVEL TO A MINIMUM OF 18.000 MOD USING SELECTED GRANULAR MATERIAL.

APPROXIMATE ANCHOR LOCATIONS SHOWN THUS

INSTALL SCOUR PROTECTION USING SELECTED STONE MATERIAL AND ROCK ARMOUR TO PROTECT THE RIVER BANK / MILL ISLAND.

EXISTING MILL RACE SHEET PILE WALL INSTALLED BY LAGAN

CO-ORDINATES OF PILES TAKEN FROM LAGAN AS-BUILT PILE RECORDS

APPROXIMATE ANCHOR LOCATIONS SHOWN THUS

INSTALL SCOUR PROTECTION USING SELECTED STONE MATERIAL AND ROCK ARMOUR TO PROTECT RIVER BED LEVEL IN FRONT OF WALL 19.

WALL 19

WALL 20

WALL 21

MILL ISLAND PUMP STATION

22.0 mod

20.0 mod

18.0 mod

LEGEND

- FERMOY FLOOD DEFENCE WALLS
- GROUND ANCHORS
- RIVER BED LEVEL REINSTATED TO A MINIMUM OF 18.000 MOD.
- SCOUR PROTECTION TO BASE OF WALL 19.
- SCOUR PROTECTION TO RIVER BED AT WALL 19 / WALL 20.
- SCOUR PROTECTION TO RIVERBANK IN FRONT OF WALLS 20 & 21.
- SCOUR PROTECTION TO RIVER BED AT WALL 20 / WALL 21.
- APPROXIMATE OUTLINE OF GRAVEL BEDS IN RIVER

1/710 OVERVIEW OF PROPOSED EMERGENCY PROTECTION WORKS REQUIRED TO FLOOD DEFENCE WALLS 19, 20 AND 21

SCALE: 1:250

REV	STAT	DESCRIPTION	DATE
P03	S2	ISSUED FOR INFORMATION	18.09.2020
P02	S2	ISSUED FOR INFORMATION	16.09.2020
P01	S2	ISSUED FOR INFORMATION	28.08.2020

DRAWING STATUS: ISSUED FOR INFORMATION

CHECKED BY:	REVIEWED BY:	APPROVED BY:
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PROJECT: MUNSTER BLACKWATER RIVER - FERMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

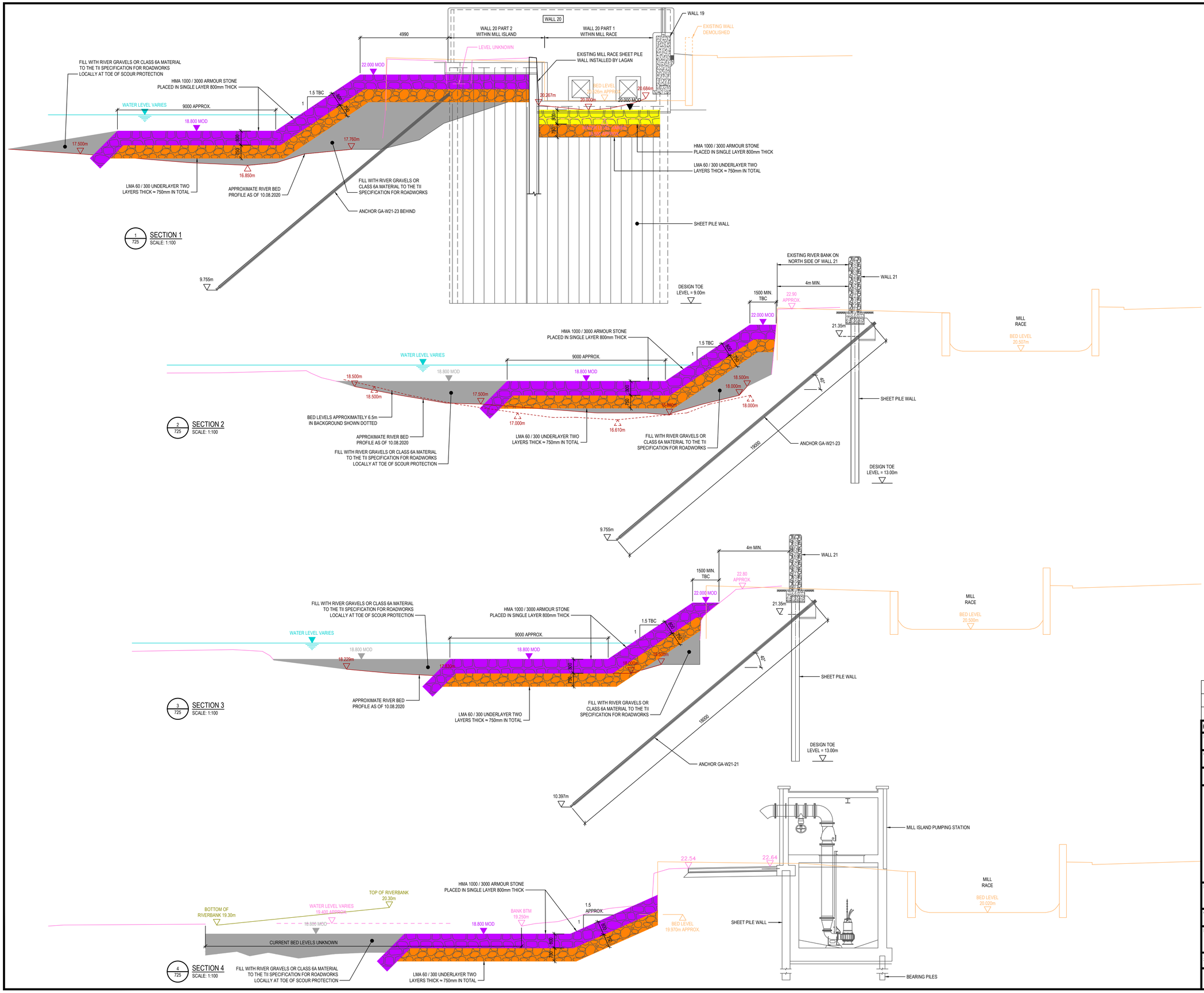
CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: OVERVIEW OF PROPOSED EMERGENCY PROTECTION WORKS REQUIRED TO FLOOD DEFENCE WALLS 19, 20 AND 21

SCALE: 1:250 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER: 2961 - 711

REV: P03



GROUND PROFILE AND LEVELS SHOWN THUS ARE TAKEN FROM SURVEY CARRIED OUT BY LAND SURVEYS IN 2002, DRAWING REFERENCE D9273-3D AND EXCEL FILE REFERENCE D9273-F. THE SURVEY WAS CARRIED OUT TO IRISH NATIONAL GRID.

GROUND PROFILE AND LEVELS SHOWN THUS ARE TAKEN FROM SURVEY CARRIED OUT BY PRECISE CONTROL LAND & ENGINEERING SURVEYORS IN FEBRUARY 2010, DRAWING REFERENCE 10002d-6. THE SURVEY WAS CARRIED OUT TO IRISH NATIONAL GRID.

GROUND PROFILE AND LEVELS SHOWN THUS ARE TAKEN FROM SURVEY CARRIED OUT BY GEODATA CHARTERED LAND SURVEYORS IN JUNE 2020, DRAWING REFERENCE 20423-101, REVISION 2. THE SURVEY WAS CARRIED OUT TO ITM AND CONVERTED TO IRISH NATIONAL GRID.

GROUND PROFILE AND LEVELS SHOWN THUS ARE TAKEN FROM SURVEY CARRIED OUT BY MURPHY SURVEYS GLOBAL CONSULTING SURVEYORS IN AUGUST 2020, DRAWING REFERENCE MSL37760_01. THE SURVEY WAS CARRIED OUT TO ITM AND HAS BEEN CONVERTED TO IRISH NATIONAL GRID.

NOTE:
REFER TO DRAWING 2961 -720 FOR OVERLAY OF PREVIOUS SURVEY INFORMATION ON CROSS SECTIONS.

LEGEND

- RIVER GRAVELS OR CLASS 6A MATERIAL TO THE TII SPECIFICATION FOR ROADWORKS.
- SCOUR PROTECTION TO BASE OF WALL 19 FORMED USING HMA 1000 / 3000 ARMOUR STONE PLACED IN SINGLE LAYER 800mm THICK.
- SCOUR PROTECTION TO RIVERBANK IN FRONT OF WALLS 20 & 21 FORMED USING HMA 1000 / 3000 ARMOUR STONE PLACED IN SINGLE LAYER 800mm THICK.
- UNDERLAYER / CORE MATERIAL FORMED USING LMA 60 / 300 UNDERLAYER TWO LAYERS THICK = 750mm IN TOTAL.

REV	STAT	DESCRIPTION	DATE
P03	S2	ISSUED FOR INFORMATION	18.09.2020
P02	S2	ISSUED FOR INFORMATION	16.09.2020
P01	S2	ISSUED FOR INFORMATION	28.08.2020

DRAWING STATUS: ISSUED FOR INFORMATION

CHECKED BY:	REVIEWED BY:	APPROVED BY:
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PROJECT:
MUNSTER BLACKWATER RIVER - FERMOY SOUTH
EAST AND SOUTH WEST DRAINAGE SCHEMES

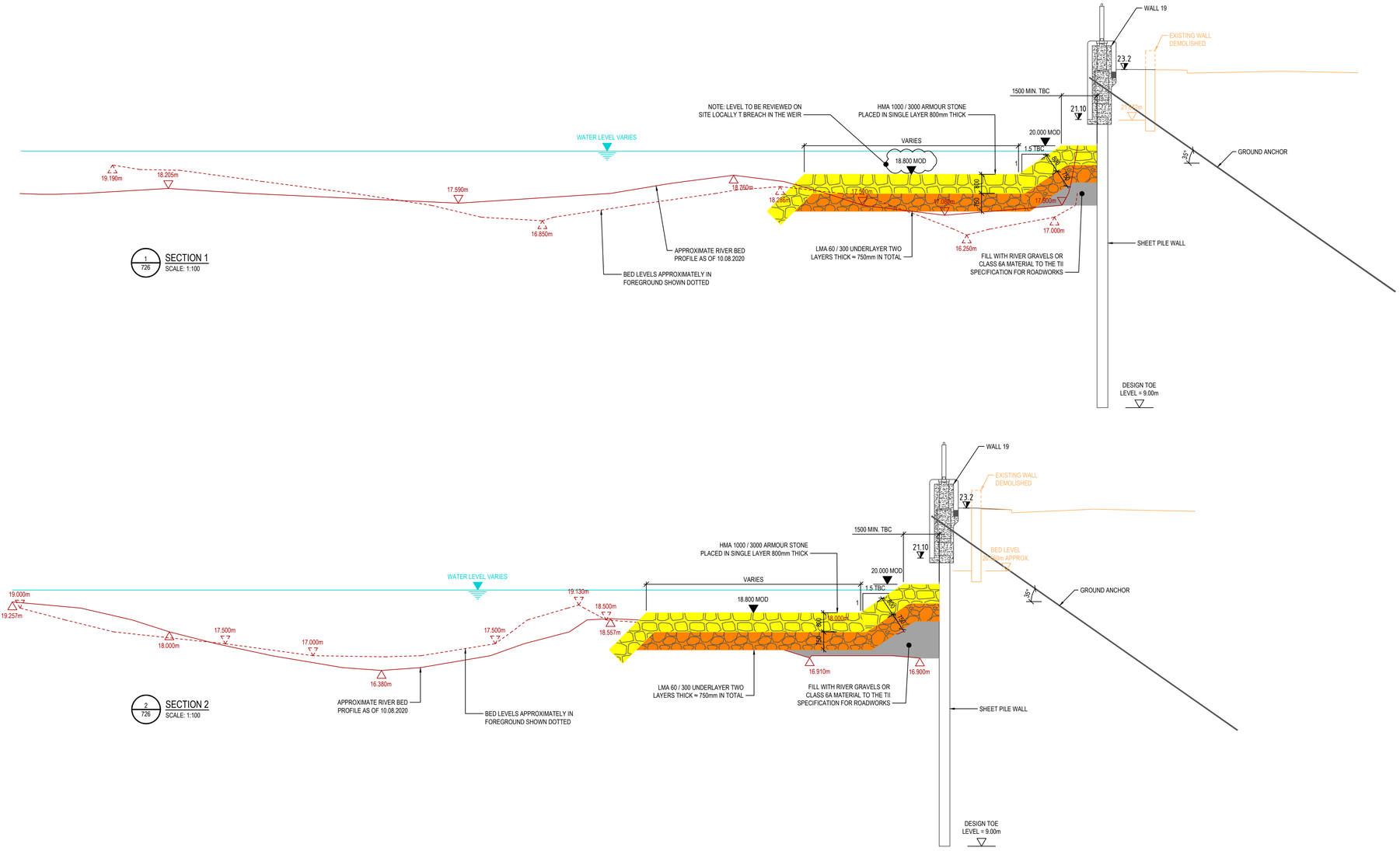
CLIENT:
OFFICE OF PUBLIC WORKS

DRAWING TITLE:
SECTIONS THROUGH FLOOD DEFENCE WALLS SHOWING
PROPOSED EMERGENCY PROTECTION WORKS - SHEET 1

SCALE: 1:100 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER
2961 - 725

REV: P03



GROUND PROFILE AND LEVELS SHOWN THUS ARE TAKEN FROM SURVEY CARRIED OUT BY LAND SURVEYS IN 2002, DRAWING REFERENCE D9273-3D AND EXCEL FILE REFERENCE D9273-F. THE SURVEY WAS CARRIED OUT TO IRISH NATIONAL GRID.

GROUND PROFILE AND LEVELS SHOWN THUS ARE TAKEN FROM SURVEY CARRIED OUT BY PRECISE CONTROL LAND & ENGINEERING SURVEYORS IN FEBRUARY 2010, DRAWING REFERENCE 10002d-6. THE SURVEY WAS CARRIED OUT TO IRISH NATIONAL GRID.

GROUND PROFILE AND LEVELS SHOWN THUS ARE TAKEN FROM SURVEY CARRIED OUT BY HYDROGRAPHIC SURVEY LTD. IN OCTOBER 2010, DRAWING REFERENCE P10032 / HS86/10, REVISION D02. THE SURVEY WAS CARRIED OUT TO IRISH NATIONAL GRID.

GROUND PROFILE AND LEVELS SHOWN THUS ARE TAKEN FROM SURVEY CARRIED OUT BY MURPHY SURVEYS GLOBAL CONSULTING SURVEYORS IN AUGUST 2018, DRAWING REFERENCE 27232 18024_Femoy_Weir. THE SURVEY WAS CARRIED OUT TO ITM AND HAS BEEN CONVERTED TO IRISH NATIONAL GRID.

GROUND PROFILE AND LEVELS SHOWN THUS ARE TAKEN FROM SURVEY CARRIED OUT BY MURPHY SURVEYS GLOBAL CONSULTING SURVEYORS IN AUGUST 2020, DRAWING REFERENCE MSL37760_01. THE SURVEY WAS CARRIED OUT TO ITM AND HAS BEEN CONVERTED TO IRISH NATIONAL GRID.

NOTE:
REFER TO DRAWING 2961 -721 FOR OVERLAY OF PREVIOUS SURVEY INFORMATION ON CROSS SECTIONS.

LEGEND

- RIVER GRAVELS OR CLASS 6A MATERIAL TO THE TII SPECIFICATION FOR ROADWORKS.
- SCOUR PROTECTION TO BASE OF WALL 19 FORMED USING HMA 1000 / 3000 ARMOUR STONE PLACED IN SINGLE LAYER 800mm THICK.
- SCOUR PROTECTION TO RIVERBANK IN FRONT OF WALLS 20 & 21 FORMED USING HMA 1000 / 3000 ARMOUR STONE PLACED IN SINGLE LAYER 800mm THICK.
- UNDERLAYER / CORE MATERIAL FORMED USING LMA 60 / 300 UNDERLAYER TWO LAYERS THICK ≈ 750mm IN TOTAL.

REV	STAT	DESCRIPTION	DATE
P03	S2	ISSUED FOR INFORMATION	18.09.2020
P02	S2	ISSUED FOR INFORMATION	16.09.2020
P01	S2	ISSUED FOR INFORMATION	28.08.2020

DRAWING STATUS: ISSUED FOR INFORMATION

CHECKED BY: RON | REVIEWED BY: JM | APPROVED BY: JM

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PROJECT: MUNSTER BLACKWATER RIVER - FERMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

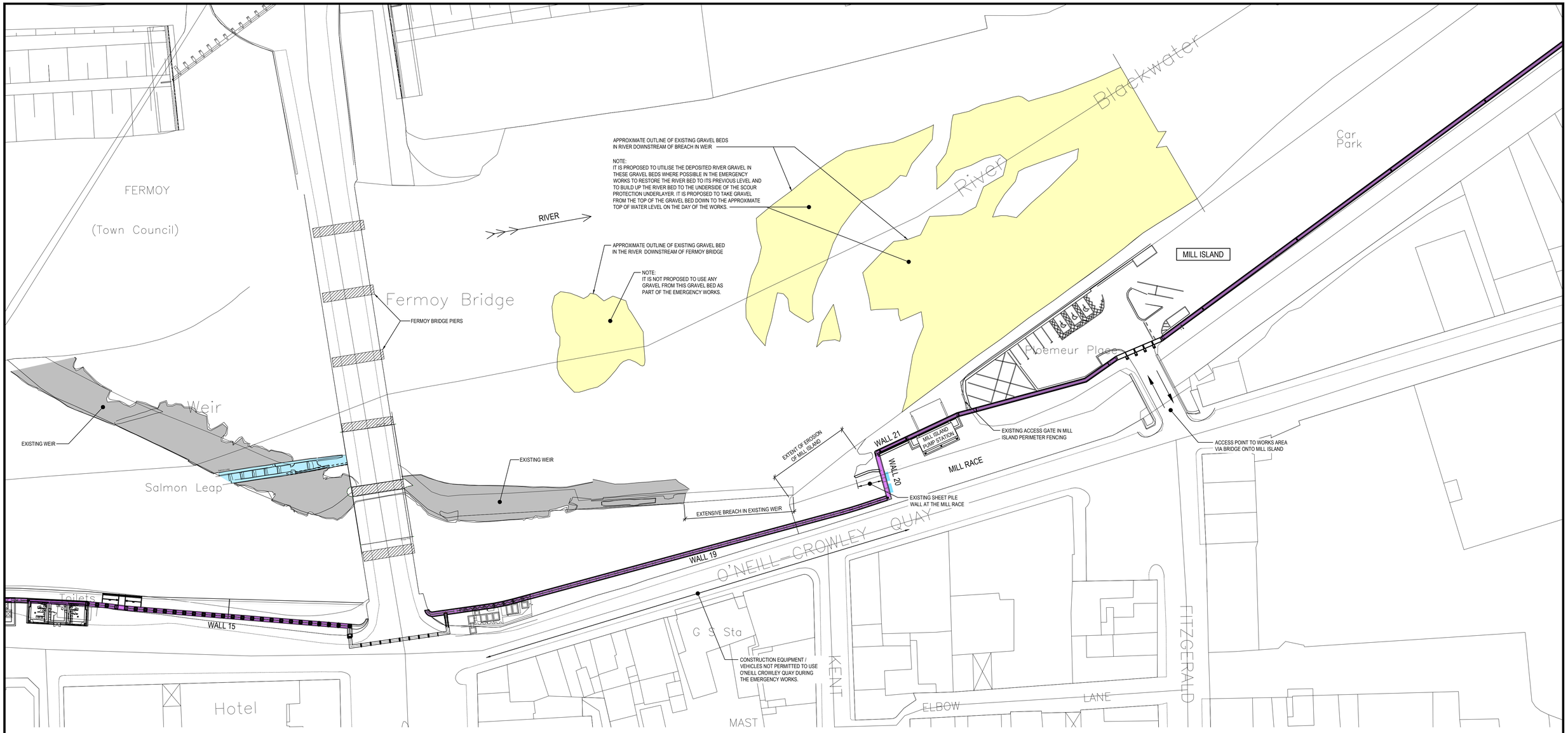
CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: SECTIONS THROUGH FLOOD DEFENCE WALLS SHOWING PROPOSED EMERGENCY PROTECTION WORKS - SHEET 2

SCALE: 1:100 (A1)

PROJECT - ORGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER: 2961 - 726

REV: P03



1/740 OVERVIEW OF MILL ISLAND AND O'NEILL CROWLEY QUAY
SCALE: 1:500

N

LEGEND:

- APPROXIMATE OUTLINE OF EXISTING WEIR TAKEN FROM MURPHY SURVEY LTD. DRAWING
- EXISTING FISH PASS
- FERMOY FLOOD DEFENCE WALLS
- APPROXIMATE OUTLINE OF GRAVEL BEDS IN RIVER

REV	STAT	DESCRIPTION	DATE
P02	S2	ISSUED FOR INFORMATION	18.09.2020
P01	S2	ISSUED FOR INFORMATION	16.09.2020

DRAWING STATUS: ISSUED FOR INFORMATION

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PROJECT: MUNSTER BLACKWATER RIVER - FERMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

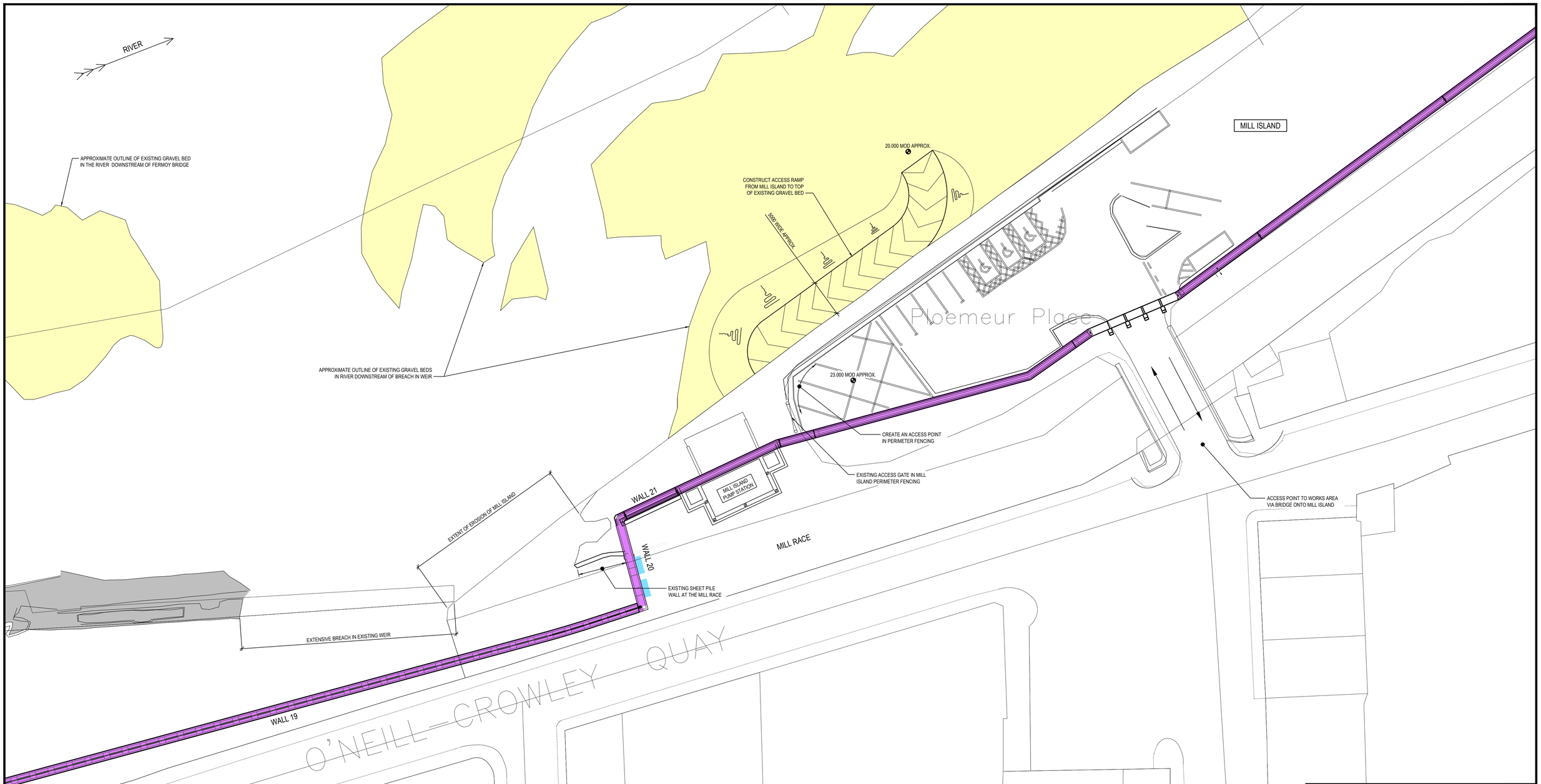
CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: OVERVIEW OF MILL ISLAND AND O'NEILL CROWLEY QUAY

SCALE: 1:500 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER: 2961 - 740

REV: P02



1/741 INDICATIVE CONSTRUCTION WORKS METHODOLOGY
SCALE: 1:250

NOTE: THE INDICATIVE CONSTRUCTION WORKS METHODOLOGY / SEQUENCE OF WORKS IS SET OUT ON THE FOLLOWING DRAWINGS: DRG. 742 TO 748.

N

LEGEND:

- APPROXIMATE OUTLINE OF EXISTING WEIR TAKEN FROM MURPHY SURVEY LTD. DRAWING
- FERMOY FLOOD DEFENCE WALLS
- APPROXIMATE OUTLINE OF GRAVEL BEDS IN RIVER

REV	STAT	DESCRIPTION	DATE
P02	S2	ISSUED FOR INFORMATION	18.09.2020
P01	S2	ISSUED FOR INFORMATION	16.09.2020

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PROJECT: MUNSTER BLACKWATER RIVER - FERMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

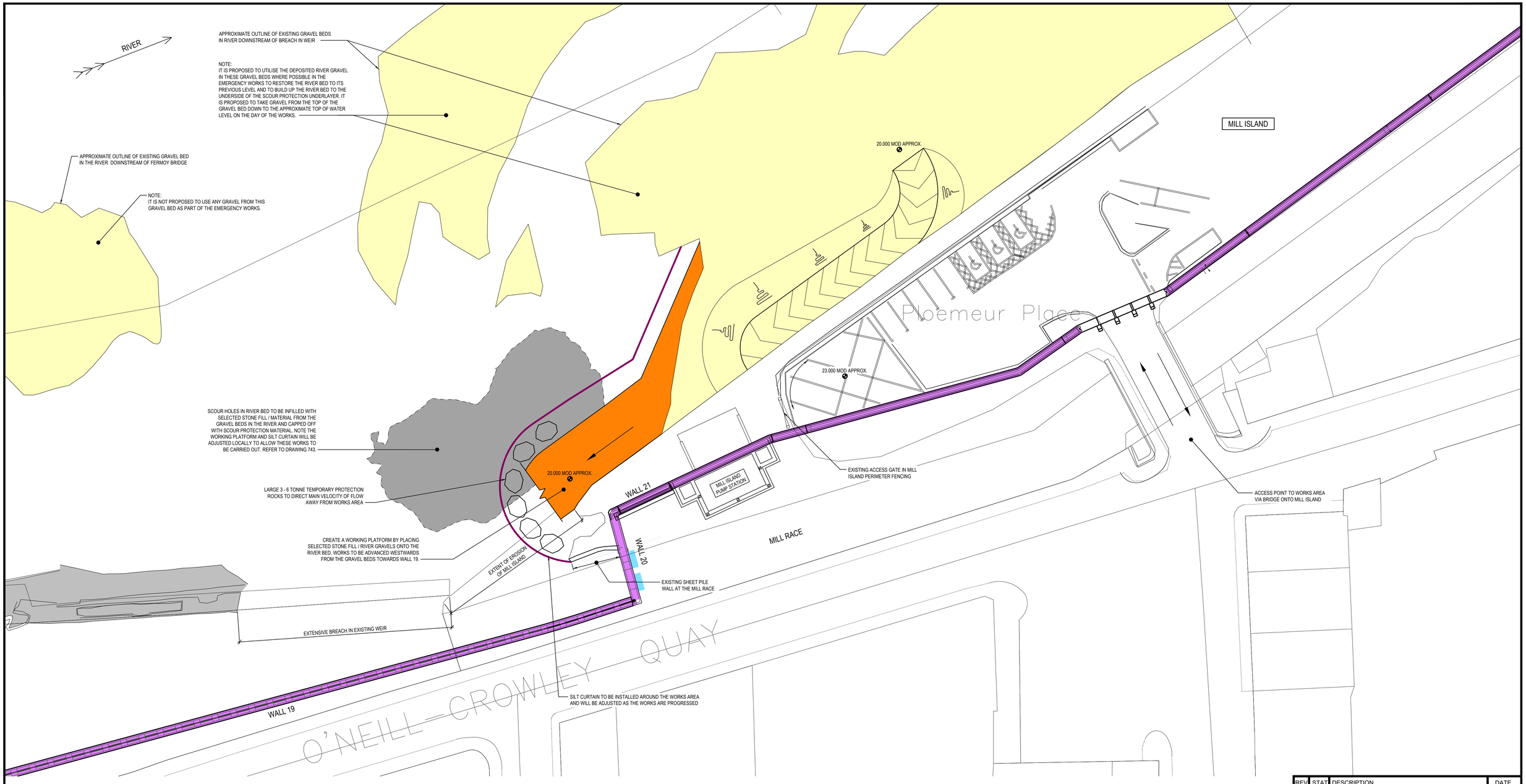
CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: INDICATIVE CONSTRUCTION WORKS METHODOLOGY - SHEET 1

SCALE: 1:250 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER: 2961 - 741

REV: P02



1/742 INDICATIVE CONSTRUCTION WORKS METHODOLOGY
SCALE: 1:250

LEGEND:

- APPROXIMATE OUTLINE OF EXISTING WEIR TAKEN FROM MURPHY SURVEY LTD. DRAWING
- FERMOY FLOOD DEFENCE WALLS
- APPROXIMATE OUTLINE OF GRAVEL BEDS IN RIVER
- WORKING PLATFORM CREATED BY PLACING SELECTED STONE FILL ON THE RIVER BED
- RIVER BED LEVEL REINSTATED TO A MINIMUM OF 18.000 MOD.
- APPROXIMATE OUTLINE OF SILT CURTAIN EXTENDING AROUND WORKS AREA.

N

REV	STAT	DESCRIPTION	DATE
P02	S2	ISSUED FOR INFORMATION	18.09.2020
P01	S2	ISSUED FOR INFORMATION	16.09.2020

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PROJECT: MUNSTER BLACKWATER RIVER - FERMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

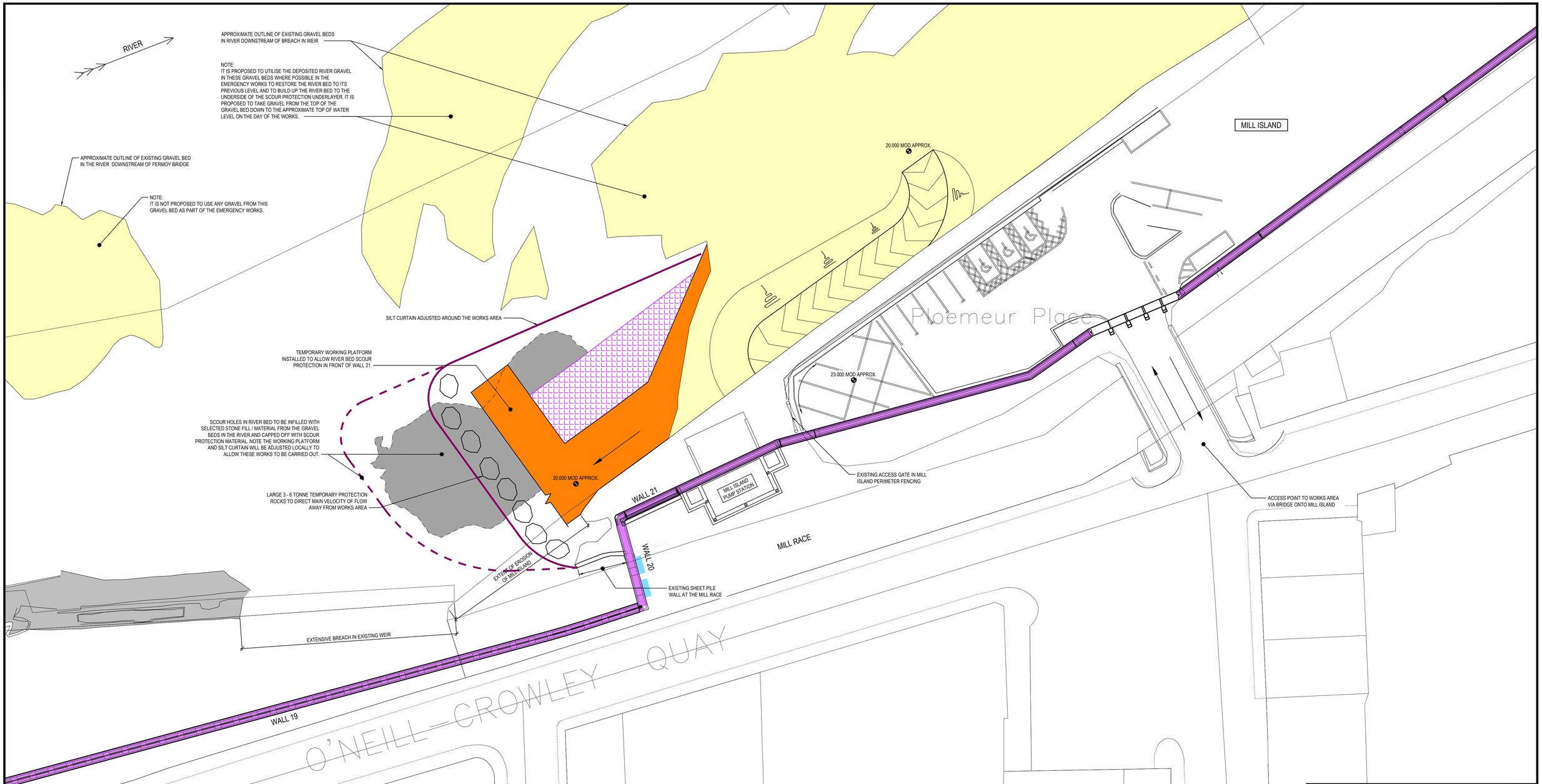
CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: INDICATIVE CONSTRUCTION WORKS METHODOLOGY - SHEET 2

SCALE: 1:250 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER: 2961 - 742

REV: P02



1/743 INDICATIVE CONSTRUCTION WORKS METHODOLOGY
SCALE: 1:250

LEGEND:

- APPROXIMATE OUTLINE OF EXISTING WEIR TAKEN FROM MURPHY SURVEY LTD. DRAWING
- FERMOY FLOOD DEFENCE WALLS
- APPROXIMATE OUTLINE OF GRAVEL BEDS IN RIVER
- WORKING PLATFORM CREATED BY PLACING SELECTED STONE FILL ON THE RIVER BED
- RIVER BED LEVEL REINSTATED TO A MINIMUM OF 18.000 MOD.
- APPROXIMATE OUTLINE OF SILT CURTAIN EXTENDING AROUND WORKS AREA.

N

REV	STAT	DESCRIPTION	DATE
P02	S2	ISSUED FOR INFORMATION	18.09.2020
P01	S2	ISSUED FOR INFORMATION	16.09.2020

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PROJECT: MUNSTER BLACKWATER RIVER - FERMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

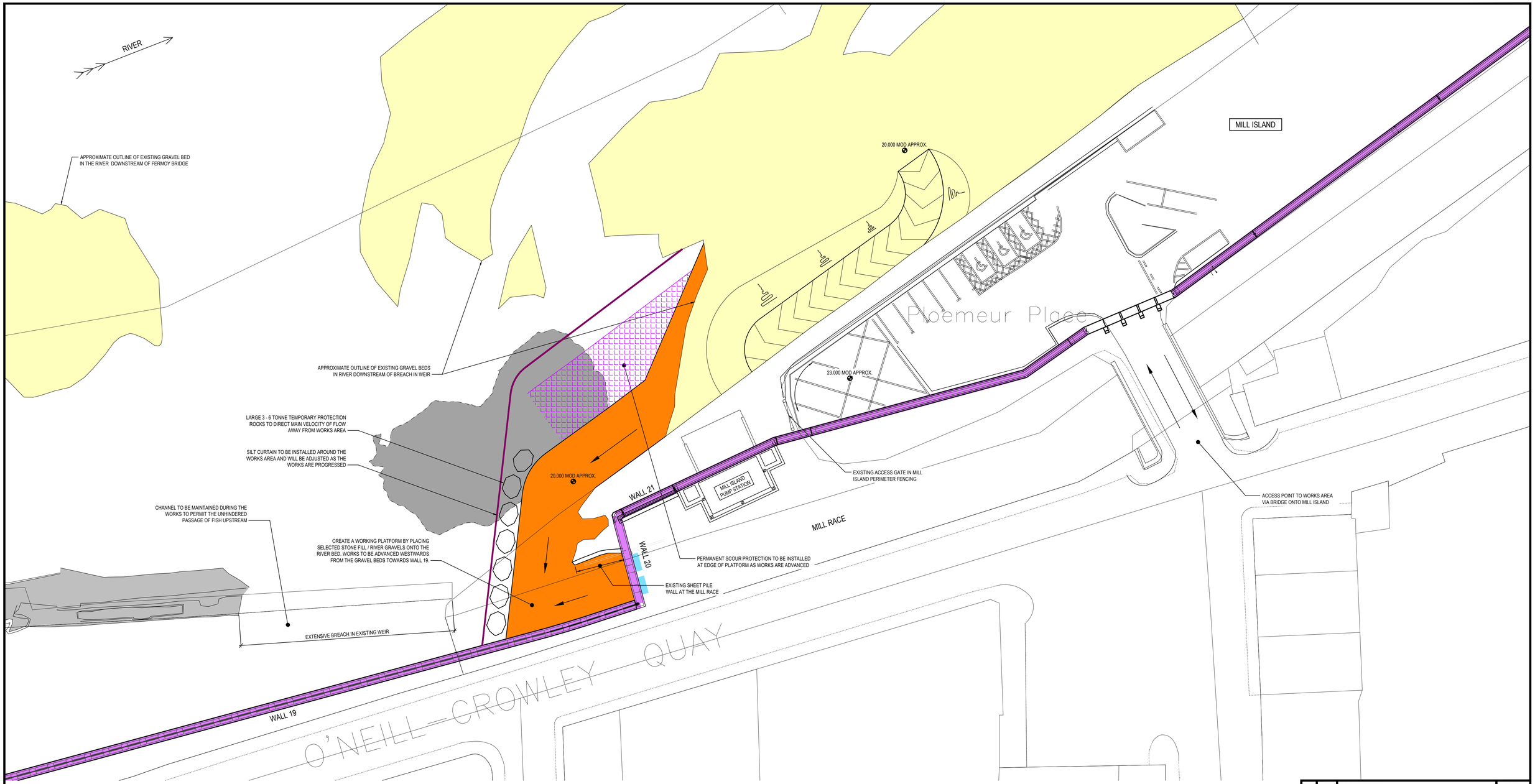
CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: INDICATIVE CONSTRUCTION WORKS METHODOLOGY - SHEET 3

SCALE: 1:250 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER: 2961 - 743

REV: P02



1/744 INDICATIVE CONSTRUCTION WORKS METHODOLOGY
SCALE: 1:250

LEGEND:

- APPROXIMATE OUTLINE OF EXISTING WEIR TAKEN FROM MURPHY SURVEY LTD. DRAWING
- FERMOY FLOOD DEFENCE WALLS
- APPROXIMATE OUTLINE OF GRAVEL BEDS IN RIVER
- WORKING PLATFORM CREATED BY PLACING SELECTED STONE FILL ON THE RIVER BED
- RIVER BED LEVEL REINSTATED TO A MINIMUM OF 18.000 MOD.
- APPROXIMATE OUTLINE OF SILT CURTAIN EXTENDING AROUND WORKS AREA.

N

REV	STAT	DESCRIPTION	DATE
P02	S2	ISSUED FOR INFORMATION	18.09.2020
P01	S2	ISSUED FOR INFORMATION	16.09.2020

DRAWING STATUS: ISSUED FOR INFORMATION

CHECKED BY:	REVIEWED BY:	APPROVED BY:
RON	JM	JM

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PROJECT: MUNSTER BLACKWATER RIVER - FERMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

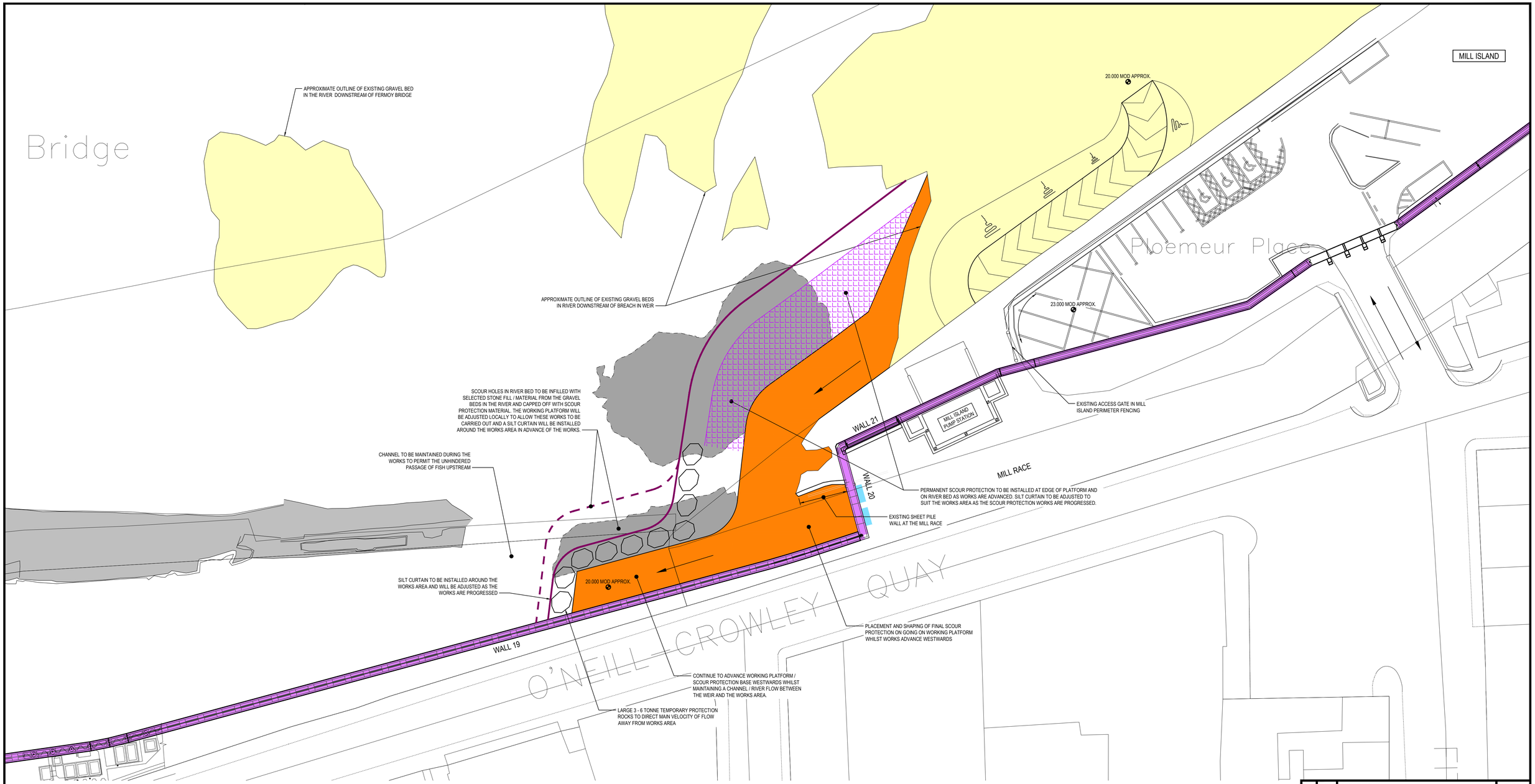
CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: INDICATIVE CONSTRUCTION WORKS METHODOLOGY - SHEET 4

SCALE: 1:250 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER: 2961 - 744

REV: P02



1/745 INDICATIVE CONSTRUCTION WORKS METHODOLOGY
SCALE: 1:250

LEGEND:

- APPROXIMATE OUTLINE OF EXISTING WEIR TAKEN FROM MURPHY SURVEY LTD. DRAWING
- FERMOY FLOOD DEFENCE WALLS
- APPROXIMATE OUTLINE OF GRAVEL BEDS IN RIVER
- WORKING PLATFORM CREATED BY PLACING SELECTED STONE FILL ON THE RIVER BED
- RIVER BED LEVEL REINSTATED TO A MINIMUM OF 18.000 MOD.
- APPROXIMATE OUTLINE OF SILT CURTAIN EXTENDING AROUND WORKS AREA.

N

REV	STAT	DESCRIPTION	DATE
P02	S2	ISSUED FOR INFORMATION	18.09.2020
P01	S2	ISSUED FOR INFORMATION	16.09.2020

DRAWING STATUS: ISSUED FOR INFORMATION

CHECKED BY:	REVIEWED BY:	APPROVED BY:
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PROJECT: MUNSTER BLACKWATER RIVER - FERMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

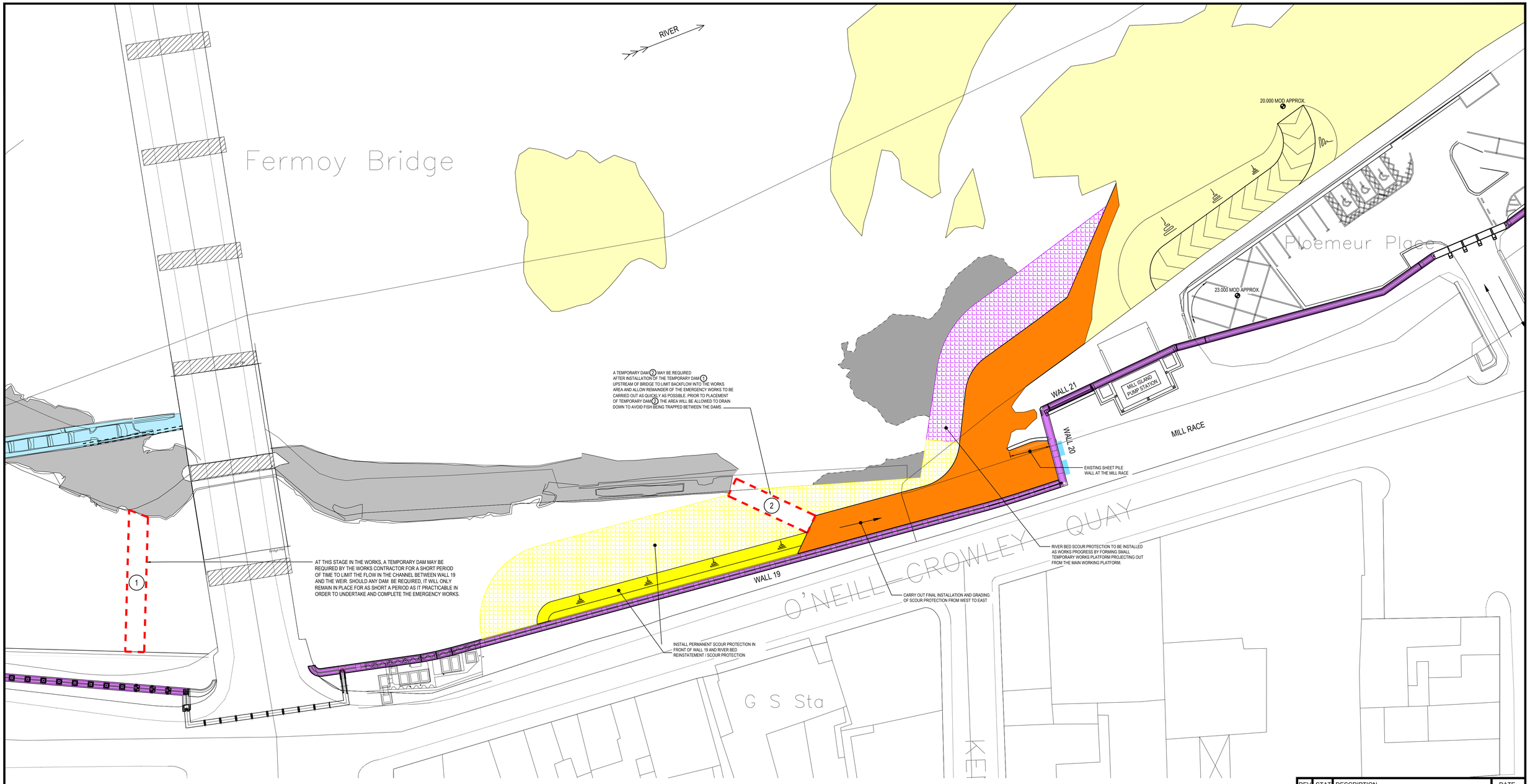
CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: INDICATIVE CONSTRUCTION WORKS METHODOLOGY - SHEET 5

SCALE: 1:250 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER: 2961 - 745

REV: P02



1/746 INDICATIVE CONSTRUCTION WORKS METHODOLOGY
SCALE: 1:300

LEGEND:

- APPROXIMATE OUTLINE OF EXISTING WEIR TAKEN FROM MURPHY SURVEY LTD. DRAWING
- FERMOY FLOOD DEFENCE WALLS
- APPROXIMATE OUTLINE OF GRAVEL BEDS IN RIVER
- WORKING PLATFORM CREATED BY PLACING SELECTED STONE FILL ON THE RIVER BED
- RIVER BED LEVEL REINSTATED TO A MINIMUM OF 18.000 MOD.
- SCOUR PROTECTION TO BASE OF WALL 19

N

REV	STAT	DESCRIPTION	DATE
P02	S2	ISSUED FOR INFORMATION	18.09.2020
P01	S2	ISSUED FOR INFORMATION	16.09.2020

DRAWING STATUS: ISSUED FOR INFORMATION

CHECKED BY:	REVIEWED BY:	APPROVED BY:
RON	JM	JM

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PROJECT: MUNSTER BLACKWATER RIVER - FERMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

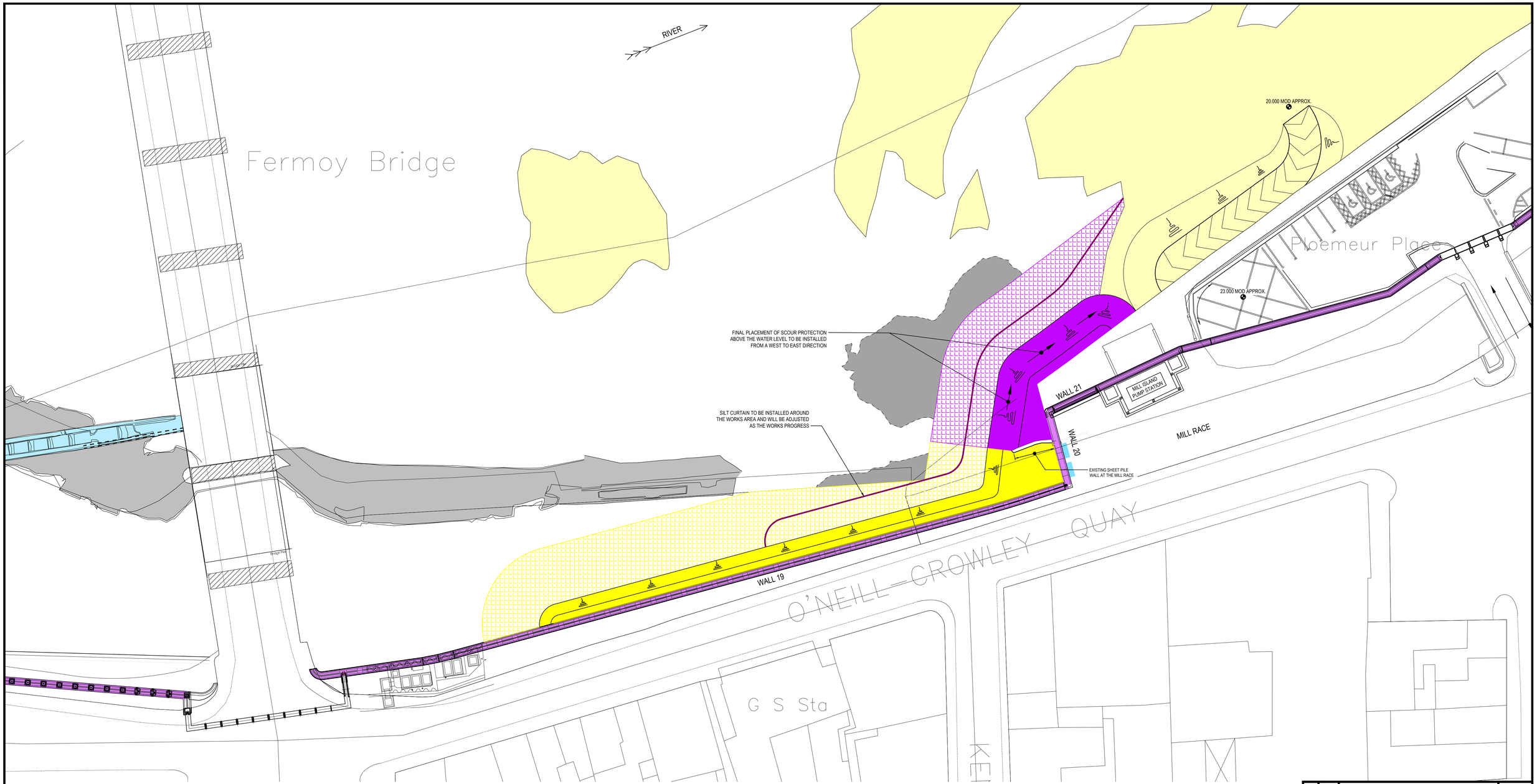
CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: INDICATIVE CONSTRUCTION WORKS METHODOLOGY - SHEET 6

SCALE: 1:300 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER: 2961 - 746

REV: P02



1/747 INDICATIVE CONSTRUCTION WORKS METHODOLOGY
SCALE: 1:300

LEGEND:

- APPROXIMATE OUTLINE OF EXISTING WEIR TAKEN FROM MURPHY SURVEY LTD. DRAWING
- FERMOY FLOOD DEFENCE WALLS
- APPROXIMATE OUTLINE OF GRAVEL BEDS IN RIVER
- WORKING PLATFORM CREATED BY PLACING SELECTED STONE FILL ON THE RIVER BED
- RIVER BED LEVEL REINSTATED TO A MINIMUM OF 18.000 MOD.
- SCOUR PROTECTION TO BASE OF WALL 19
- SCOUR PROTECTION TO RIVERBANK IN FRONT OF WALLS 20 & 21.

N

REV	STAT	DESCRIPTION	DATE
P02	S2	ISSUED FOR INFORMATION	18.09.2020
P01	S2	ISSUED FOR INFORMATION	16.09.2020

DRAWING STATUS: ISSUED FOR INFORMATION

CHECKED BY:	REVIEWED BY:	APPROVED BY:
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PROJECT: MUNSTER BLACKWATER RIVER - FERMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

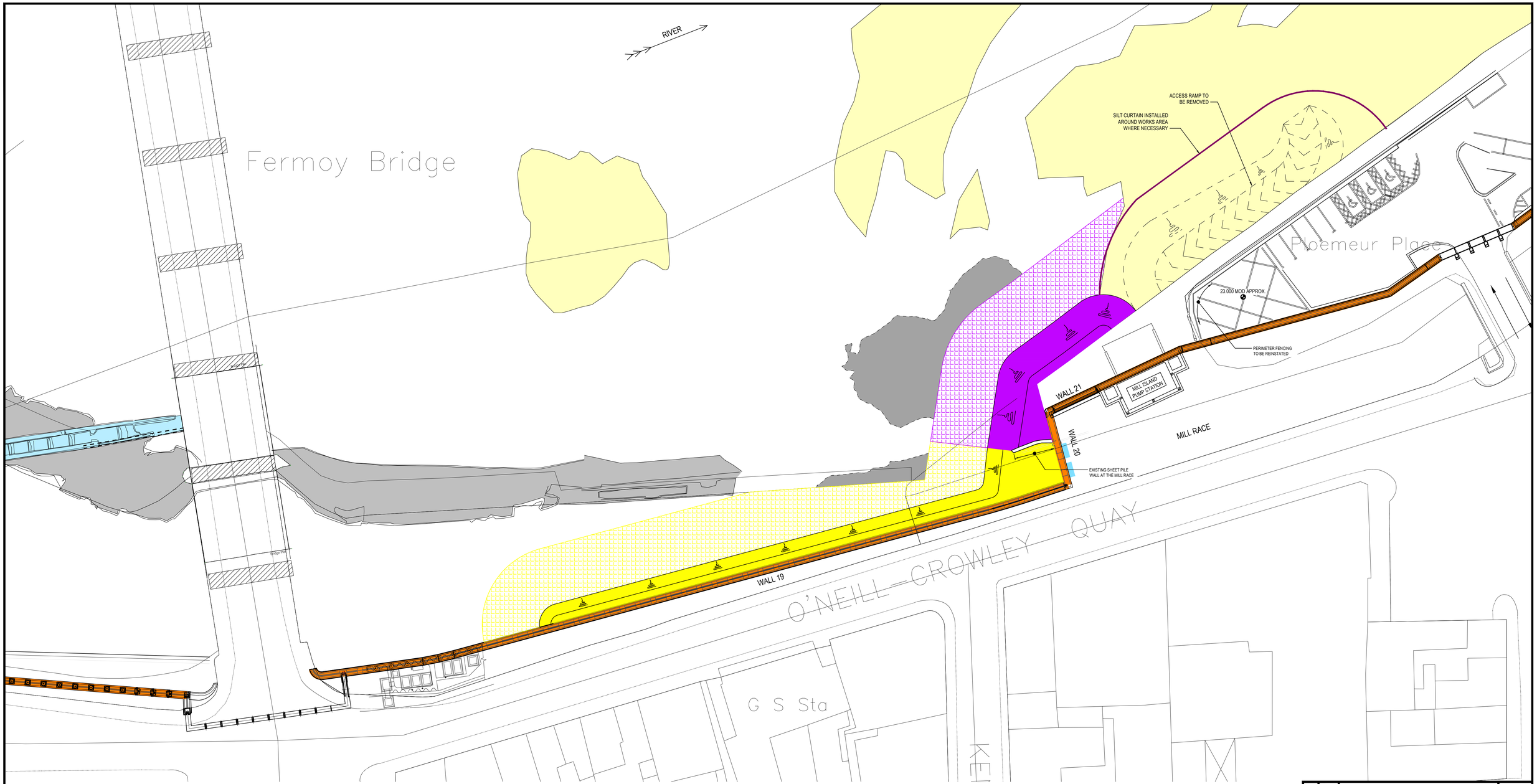
CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: INDICATIVE CONSTRUCTION WORKS METHODOLOGY - SHEET 7

SCALE: 1:300 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER
2961 - 747

REV: P02



1/748 INDICATIVE CONSTRUCTION WORKS METHODOLOGY
SCALE: 1:300

LEGEND:

- APPROXIMATE OUTLINE OF EXISTING WEIR TAKEN FROM MURPHY SURVEY LTD. DRAWING
- FERMOY FLOOD DEFENCE WALLS
- APPROXIMATE OUTLINE OF GRAVEL BEDS IN RIVER
- RIVER BED LEVEL REINSTATED TO A MINIMUM OF 18.000 MOD.
- SCOUR PROTECTION TO BASE OF WALL 19
- SCOUR PROTECTION TO RIVERBANK IN FRONT OF WALLS 20 & 21.

N

REV	STAT	DESCRIPTION	DATE
P01	S2	ISSUED FOR INFORMATION	18.09.2020

DRAWING STATUS: ISSUED FOR INFORMATION

CHECKED BY:	REVIEWED BY:	APPROVED BY:
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PROJECT: MUNSTER BLACKWATER RIVER - FERMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

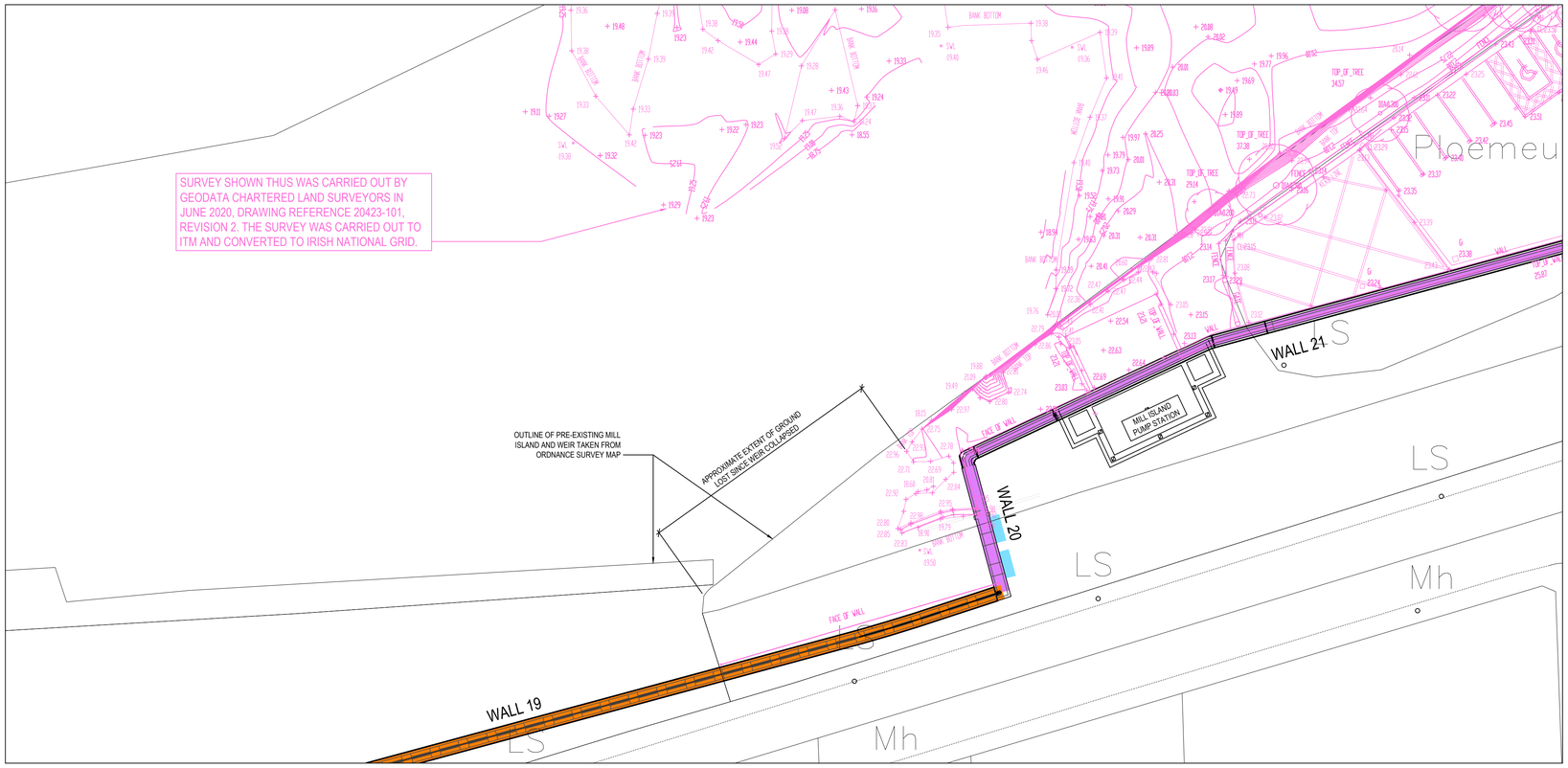
CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: INDICATIVE CONSTRUCTION WORKS METHODOLOGY - SHEET 8

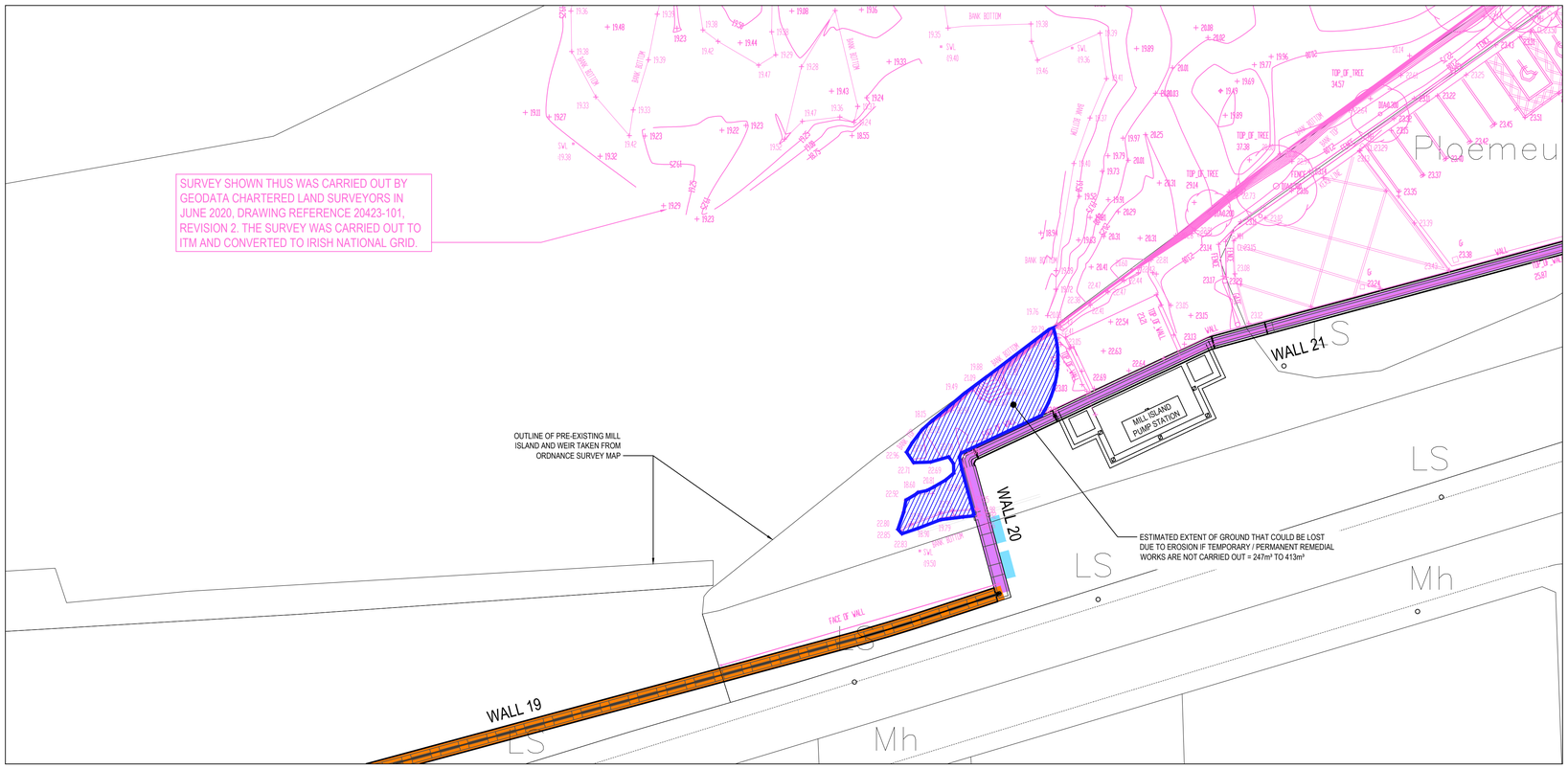
SCALE: 1:300 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER: 2961 - 748

REV: P01



1/706 OVERLAY OF FLOOD DEFENCE WALLS ON OS MAP AND 2020 SURVEY
SCALE: 1:250



2/706 APPROXIMATE ESTIMATE OF GROUND LOSS WITHOUT TEMPORARY / PERMANENT REMEDIAL WORKS
SCALE: 1:250

N

REV	STAT	DESCRIPTION	DATE
P01	S2	ISSUED FOR INFORMATION	27.07.2020

DRAWING STATUS: ISSUED FOR INFORMATION

CHECKED BY:	REVIEWED BY:	APPROVED BY:
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PROJECT: MUNSTER BLACKWATER RIVER - FORMOY SOUTH EAST AND SOUTH WEST DRAINAGE SCHEMES

CLIENT: OFFICE OF PUBLIC WORKS

DRAWING TITLE: ESTIMATED LOSS OF GROUND DUE TO ONGOING EROSION

SCALE: 1:250 (A1)

PROJECT - ORIGINATOR - VOLUME - LOCATION - TYPE - ROLE - NUMBER: 2961 - 706

REV: P01