

Shadow HRA

Fairbourne Outfall, Fairbourne, Gwynedd

Waterco Consulting

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1 Introduction and background

Fairbourne Outfall is a short marine outfall on the coast of Barmouth Bay and to the north of the village of Fairbourne in Gwynedd. The outfall has an approximate central national grid reference (NGR) of SH 61047 13619.

The outfall is a 9 inch cast iron pipe approximately 270m long from the sea wall. The outfall has been in place for over 100 years.

The Fairbourne Outlet lies within the Pen Llyn a'r Sarnau/ Llyn Peninsula and the Sarnau Marine Special Area of Conservation (SAC). As such, there is the potential for work in this area to directly affect designated features of the SAC.

In Article 6(3) of the EC Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora – The Habitats Directive, any project or plan which is not directly connected with or necessary to the management of a European site but would be likely to have a significant effect either alone or in combination with other plans or projects shall be subject to an Appropriate Assessment of its implications for the European site in view of that site's conservation objectives. In light of the findings and subject to the provisions of Article 6(4) of the Habitats Directive, the Competent Authority shall agree to the plan or project only after ensuring that it will not affect the integrity of the European site. Whilst mitigation may be taken into account at the Appropriate Assessment stage it is not to be considered when initially screening the project in order to determine whether or not an Appropriate Assessment is needed.

Article 6(4) makes provision that if a negative assessment is made of the implications of the project on the site, and in the absence of other alternative solutions, the plan or project can go ahead for imperative reasons of overriding interest (IROPI) but that compensatory measures must be taken to ensure that the overall coherence of the site is protected/maintained. A distinction is to be drawn between mitigation and compensation.

Since this is a project, as defined by the Habitats Directive, and transposed into English and Welsh law in The Conservation of Habitats and Species Regulations (2017), which is not directly connected with or necessary to the management of the Pen Llyn a'r Sarnau/ Llyn Peninsula and the Sarnau SAC (Marine), then a Habitats Regulations Assessment (HRA) will be required. This will be carried out by the Competent Authority, advised by the Statutory Nature Conservation Body.

The purpose of this report, which has been commissioned by Waterco Consultants Ltd, to inform the progression of working methodology/programme, is to carry out a shadow HRA, for discussion with the Competent Authority and Statutory Consultee. To do this, four stages of assessment will be carried out:

- Screening – is there a likely significant effect on the SPA as a result of the project?
- Appropriate Assessment
- Assessment of Alternatives (if required)
- Finalisation of HRA

1.1 Background

1.1.1 The proposals

The Fairbourne short sea outfall is a 9ins cast iron pipe approximately 270m long. In Autumn 2018 it was identified that the pipe which makes up the outfall and which has been in situ since the outfall was installed, had been badly damaged at the top of the beach at a junction between the shingle/cobble bank and the sand leading to treated sewage leaking on to the beach. It is proposed to replace approximately 40m at this location. This pipe has been severed at approximately 150m from the sea wall, which has caused the pipe to block. This blockage propagated a failure of a cracked/corroded section of pipe at the base of the shingle/cobble bank shortening the outfall to this point. A temporary discharge point has been installed at this upper location.

The works are to undertake the identification and repair of the severed section at 150m from the sea wall as well as replacing the damaged and corroded section of the pipe below the shingle/cobble bank.

The exact extent of both is not known until trial excavations can take place upon possession of the site. Trial excavations will reduce the working area by identifying exactly where the work needs to take place with minimal equipment. At the upper replacement, whilst the actual length is not known until after work starts it is expected to be not less than 40m from the existing valve chamber.

Excavation at the breach 150 m from the sea wall is expected to be complete within two tidal cycles. Because of this sand from the excavation will be removed and stored onshore and the void will be covered with coffer and filled with sand bags before the high tide period. The sandbags will then be removed before work commences once the tide has fallen. At the end of the excavations when all work is complete, stored sand will be returned to the area.

At the upper level, cobble will be set to one side. To protect the working area during construction and immediately afterwards, a semi-permanent coffer will be installed over the works to protect from tidal action in the immediate aftermath of the works, and cobble replaced.

Pre-cast concrete joints, with pre-installed pipes, manufactured at the site compound will be used so that the requirement to pour concrete in the marine environment is reduced.

Divers will be used to clean and install new Tideflex flap on the outfall structure during suitable tide and weather condition. The works will in total last for 8 weeks.

The area of works are shown in Appendix A.

This will be carried out immediately following the successful application for a Marine Licence, Band 2.

Works will involve excavating down to the pipes being repaired, removal of the broken section and then replacement and reconnection with replacement piping.

1.2 Statutory designated sites

The Fairbourne Outfall lies within two statutory designated sites; Pen Llyn a'r Sarnau/ Llyn Peninsula and the Sarnau SAC (Marine) and Aber Mawddach/Mawddach Estuary SSSI.

1.2.1 Special Area of Conservation (Marine)

Pen Llyn a'r Sarnau/ Llyn Peninsula and the Sarnau

The Pen Llyn a'r Sarnau/ Llyn Peninsula SAC which encompasses areas of sea, coast and estuary that support a wide range of marine habitats and species. It has been selected as an SAC for the presence of 9 marine habitat types and associated species (Habitats Directive Annex I habitat types) and 3 mammal species (Habitats Directive Annex II species). For the qualifying habitats and species, this designated site is considered to be one of the best areas in the UK for:

- Reefs
- Large shallow inlets and bays
- Sandbanks which are slightly covered by seawater all the time
- Estuaries
- Coastal lagoons

It is also considered to support a significant presence of:

- Mudflats and sandflats not covered by seawater at low tide
- Atlantic salt meadows (*Glauco-Puccinellietalia maritima*)
- *Salicornia* and other annuals colonising mud and sand
- Submerged and partially submerged sea caves
- Grey seal *Halichoerus grypus*
- Bottlenose dolphin *Tursiops truncatus*
- Otter *Lutra lutra*

These features are distributed throughout the SAC with no single feature occupying the entire SAC and with features overlapping in some locations. A number of the habitats and species listed within the SAC are also listed in the Section 7 list of habitats and Species of Principal Importance (SPI) in Wales (Natural Environment and Rural Communities Act 2006 (NERC)) and in the OSPAR List of Threatened and/or Declining Species and Habitats.

Conservation objectives

The conservation objectives for the Pen Llyn a'r Sarnau/ Llyn Peninsula SAC (Countryside Council for Wales, 2009) are listed below.

To achieve favourable conservation status all the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve favourable conservation status.

- Range- The overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing.
- Structure and function: The physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded.

- Typical species- The presence, abundance, condition and diversity of typical species are such that habitat quality is not degraded.

1.2.2 Site of Special Scientific Interest

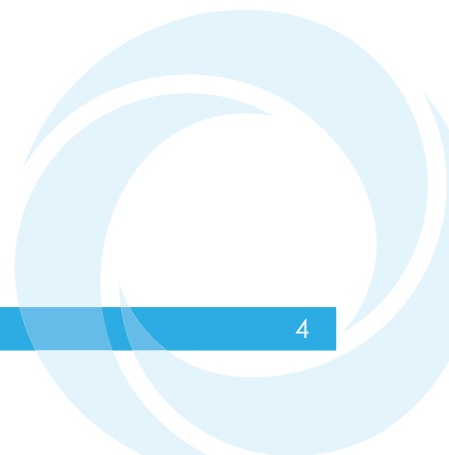
Aber Mawddach/Mawddach Estuary

The outfall site lies within this SSSI and is of special interest for its biological features. It includes the Mawddach estuary, which is a large shallow estuary draining into Cardigan Bay, as well as adjacent habitats. The estuary is wide with extensive sandflats, areas of muddy sediments and large areas of saltmarsh. The mouth of the estuary is protected to the south by Fairbourne Spit, a sand and shingle spit, and on the north side of the small town of Barmouth. The species features of the site of the estuarine habitats, particularly muddy sediments and saltmarshes, reed beds and raised mire. There is also substantial species interest, including breeding waders, scarce vascular plants, bryophytes and invertebrates.

There is one plant known to be present on the site, *Eleocharis parvula*, which is listed under Schedule 8 species under the Wildlife & Countryside Act 1981 (as amended). There are two Wildlife & Countryside Act Schedule 5 animal species occurring within the SSSI, otter and allis shad *Alosa alosa* (non-spawning population). These species are both also listed under Annex II of the European Habitat & Species Directive and three other Annex II species also occur, twaite shad *Alosa fallax*, sea lamprey *Petromyzon marinus* and Atlantic salmon *Salmo salar*.

1.2.3 Current use of the area

Fairbourne Outfall is a short marine outfall on the coast of Barmouth Bay and to the north of the village of Fairbourne in Gwynedd. The outfall has an approximate central national grid reference (NGR) of SH 61047 13619. The outfall is buried under the beach at approximately 1500mm deep; at the top of the beach under the shingle/cobble this continues to 1500mm deep and up to 5m deep at the bank. The working area is open and the beach is used for recreation and as a landscape amenity.



2 Stage 1 - Screening

In the first stage of HRA, a project is screened to establish if there will be a likely significant effect, either alone or in combination with other proposals/projects with potential to have an effect upon the SAC. In reaching this conclusion it is settled law that a precautionary approach should be taken to this assessment and that a LSE should be assumed unless the risk can be excluded. Essentially, this test of likely significant effect (LSE) determines whether the second stage of the process, Appropriate Assessment (AA) is required. Where no LSE is identified, then AA is not required; conversely, where LSE is identified, then AA is required to determine if there will be adverse impacts which would prevent the conservation objectives of the SAC from being met.

The area where the work is to be carried out is within an SAC and therefore forms part of it. Above ground the beach forms part of the SAC. The pipe is buried at varying distance under this habitat. After construction, sand and shingle will be replaced over the outfall.

Natural Resources Wales was consulted and providing mapping showing the occurrence of the qualifying habitats within the SAC. As a result it was identified that the following features of the SAC do not occur within the working area or in proximity to it and where they do occur they are sufficiently far enough away from the working area that it is considered there is no mechanism for a significant:

- Reefs
- Salicornia and other annuals colonising mud and sand feature
- Large shallow inlets and bays
- Atlantic salt-meadow
- Sandbanks which are slightly covered by seawater all the time
- Coastal lagoons
- Submerged or partially submerged sea caves
- Grey seal *Halichoerus grypus*- haul outs tend to be in undisturbed locations for which the working area is not. A survey of grey seal distribution and abundance in North Wales did not identify this area as an area used by grey seals (Westcott & Tringell 2004),¹ Breeding tends to occur to the north of SAC around Bardsey Island¹
- Bottlenose dolphin *Tursiops truncatus*- these are present through the SAC and wider area but work will be carried out on intertidal areas when the tide is out there is no likely significant

The following features of the SAC are within a distance of the works that they may be significantly affected:

- Mudflats and sandflats
- Estuaries
- Otter *Lutra lutra*

¹

<https://naturalresources.wales/media/673816/Pen%20Llyn%20ar%20Sarnau%20%20R33%20Feb%202009.pdf>

The habitat within the proposed working area includes both Estuaries and Mudflats and Sandflats. These habitats are designated as features of the SAC. The proposed work may temporarily/permanently damage/destroy these features and cause severance of habitats within the SAC. Otters may also frequent the working area and without mitigation, actions could affect the species.

As a result, there is a finding of likely significant effect on features of the SAC and therefore AA is required in order to establish whether the loss of the habitat, albeit temporary, would have an adverse impact such that the integrity of the SAC could not be maintained and if so whether appropriate mitigation can be developed which would maintain the integrity of the SAC to be maintained.

3 Stage 2 - Appropriate Assessment

Given a likely significant effect has been determined due to the effects of actions taken within the SAC to features within it, AA is required to determine if there is a potential adverse impact on the SAC, and if so whether it can be mitigated so as to avoid any such effect.

In particular, an assessment must be made as to whether as a result of the works, without mitigation, the effects on the habitat feature are such that the conservation objectives could no longer be met/upheld.

3.1 Current use of the area

The working area is currently made up of shingle at the westerly part of the working area leading to sandflat. The shingle is not a feature of the SAC however the sandflat is classified as Mudflat and Sandflat, which is a feature of the SAC. Due to its proximity to the Mawddach Estuary the entire working area forms part of the estuary feature of the SAC.

3.1.1 Mudflat and Sandflat

There are three main types of mudflats and sandflats known to occur, these are clean sands, muddy sands and mudflats. They are defined by the EU Interpretation Manual as:

"Sands and muds of the coasts of the oceans, their connected seas and associated lagoons, not covered by sea water at low tide, devoid of vascular plants, usually coated by blue algae and diatoms. They are of particular importance as feeding grounds for wildfowl and waders". Eelgrass communities are included in this habitat.

Intertidal Mudflats and Sandflats also can form a component part of estuaries. The working area is south of the mouth of the Mawddach estuary on an exposed area of sandy coastline, it is therefore considered that the working area is of a clean sand Mudflat and Sandflat type. Due to the exposure to the waves, typically within this SAC these areas are found in full marine conditions on the open coast intertidal areas with few muddier sediment communities present. This would suggest that although it is classified as being within the Mawddach estuary, the estuary at this point has limited influence on the habitat present.

The upper reaches of the sandflats outside of estuaries, as found in the working area, are species poor with sandhoppers *Talitrus saltator* found where washed up seaweed is found. Burrowing amphipods and polychaete worm species are found lower down the tidal range that vary depending on the exposure to wave action.

Likely effects on qualifying feature

The works will involve:

- Accessing the site by taking machinery over the sandflats (potentially over several tidal periods);

- Digging into the sandflats/shingle banks to gain access to the underground infrastructure;
- Repairing/replacing infrastructure. This will include the use of concrete to set the pipe repairs; and
- Replacement of substrate over the repaired infrastructure.

Localised damage will occur to the surface of the feature due to accessing of the working area; however, given the nature of the habitat wave action is likely to repair/remove damage between tidal cycles.

To gain access to the underground infrastructure, the substrate which comprises the habitat would be removed and stored off site. Approximately 117 cubic meters would have to be removed. Substrate would be replaced/backfilled if work was spread across more than one tidal cycle, and then removed again once works restarted.

There would be localised disturbance effects within the substrate as a result of these processes. This could damage cohesion within the sandflats and it could take time for any structure within the area disturbed to re-establish. There would be a risk that following disturbance, the area would be vulnerable to increased sediment loss or scour effects.

However, the working area is within an environment which is dynamic and shifting such that causing additional movement within the area could not necessarily be said to have an adverse impact on a system which is not static. Loss would be localised, and in this area would be balanced by deposition elsewhere, likely within the same habitat so there would be no net loss.

The area of this habitat within the SAC is 3358.24 ha (JNCC 2016); the working area comprises less than 1 ha in total and as such would not affect what would be considered a significant area of the habitat.

It will be necessary to use concrete within the repairs; pre-cast concrete structures will be used where possible but a limited amount of poured concrete will be required. Concrete would be suitable for use in a marine environment, and contain anti-leaching agents.

The works are towards the southern boundary of the SAC, so there a possibility of fragmentation of the habitat. However, given the shifting nature of the habitat, and the fact that the habitat likely continues beyond the immediate boundary of the SAC, it is unlikely that fragmentation would occur.

As such, the works would not be considered a significant adverse effect due to the small area affected, the large extent of the habitat present and the nature of that habitat.

3.1.2 Estuary

There are three main bar built estuaries within the SAC, the Glaslyn/Dwryrd estuary, the Mawddach estuary and the Dyfi estuary. The working area falls within the Mawddach estuary and lies within the southern mouth of the estuary.

The estuarine systems are all similar in that they are highly mobile systems with sediment movement being the 'core process', moving sediment within the estuary and both between the coastal and marine areas of the SAC. Each of these estuaries has a sediment spit that extends along the south and then across the estuary mouth. The

estuaries are primarily made up of coarse sand that has come in on the tidal flow and built up high banks, to such an extent they are relatively dry on low tides.

The relatively mountainous catchment coupled with the shallow soils mean little fresh water is stored as groundwater and generally enters the estuary immediately following high rainfall and dissipates quickly, or is not present at all during low rainfall.

The typical species associated with the Mawddach exploit the sandy nature of the habitat type such as amphipods and bivalve molluscs.

As noted in 3.1.1, the substrate present at the area of works suggests that the estuary processes in this area may be relatively limited.

Likely effects on qualifying feature

Similar effects on the estuarine habitat would be observed as described in 3.1.1 as there is overlap between estuarine and sandflats and mudflats where the latter can occur in the former, as is the case here. Due to the substrate present, the estuarine habitats likely consist of the habitats described in 3.1.1.

There would be no barriers to tidal processes or hydraulic processes associated with the estuary.

Due to the works occurring on the southern extent of the Mawddach estuary, there is a potential for fragmentation; however the works would not redefine or alter the extent of the estuary and its reach over the adjacent marine areas so no fragmentation would occur.

As a result the works would result in no significant adverse impacts to the Mawddach estuary.

3.1.3 Otter

Cofnod, the North Wales Environmental Information Service, was contacted in February 2019 and provided 37 records of otter *Lutra lutra* dating from between 1998 and 2018. The closest of these is located approximately 0.5 km to the south of the outfall site and is a record of a spraint beneath a bridge that dates from 2019. The most recent record is a spraint containing crab remains, which indicates intertidal foraging, located approximately 1.4 km from the site.

The population of otters of Gwynedd and Ceridigion are not thought to entirely reside within the SAC to form a discrete population but the SAC provides a high quality feeding habitat complimenting their range outside the SAC. The population of otters within the SAC is not known.

Otters within the SAC are drawn to coastal fringes and areas where their prey species are occur. Within the SAC, holts and resting places are expected to be found where there are large holes and crevices away from human activity.

Likely effects on qualifying feature

There may be some limited disturbance/displacement effects as a result of the works, with otters potentially avoiding the works during the duration of the works. This would be a very limited period and given the limited area of effect would not be considered large enough to be considered sufficient to alter the range of the otter within the SAC on a measurable basis.

Similarly there could be a limited reduction in the quality of the habitat following the works, as a result short term damage done and increased suspension of sediments increasing turbidity in the water making foraging more difficult in the immediate area of the works. Otters however range over large areas so given the small scale and short period of effect, this would not be considered sufficient to alter the use of the SAC by otters.

3.2 Assessment of effects

A summary of the impacts of the works against the Conservation Objectives is provided in Table 1.

Table 1: Assessment of effects on Conservation Objectives

Conservation Objective	Mudflat and Sandflat	Estuary	Otter
Range	The working area is within an area defined as mudflat and sandflat. Although there will be some damage to the area, it will be reinstated following works and will remain as mudflat and sandflat. As such, this conservation objective will be maintained.	The works will not affect the tidal range and flow of the estuary and therefore the range of this habitat will not be effected by the works. Due to this, the conservation objective will be maintained.	The work is of a temporary nature in an area where there is a high level of disturbance by local residents, which is considered to deter animals from the area. As otter activity is recorded within 0.5km of the working area it may be possible for otters to be affected during construction. However, the limited scope and scale of the works means that any effects would be very temporary and limited such that the range within the SAC would not be affected. The conservation objective will be maintained.
The structure and function of the habitats of the qualifying features	A small area would be damaged as a result of the works although it would be reinstated following the works. Given the nature of the habitat this would have short term effects on the habitat but the habitat would continue to function and the conservation objective would be maintained.	There would be no effect on the structure and function of the habitats of the qualifying features. This conservation objective would be maintained.	There would be some localised, short term effects which could affect the supporting habitats. However, the area is very limited and the duration of any effect would be short, the quality for foraging otters is likely to be low and as such, the effects would not be sufficient to mean that the conservation objective would not be maintained.

Conservation Objective	Mudflat and Sandflat	Estuary	Otter
Typical species	Working within the two areas already identified would have a direct effect on the typical species found within this habitat type as the working area will be dug out whilst work is going on in the working area. However, reinstatement would mean that the habitats could continue to support typical species; effects would be very localised and short term and would not affect the distribution or occurrence of typical species in a way which would jeopardise the ability to maintain the conservation objective. As such it would be maintained.	Working within the two areas already identified would have a direct effect on the typical species found within this habitat type as the working area will be dug out whilst work is going on in the working area. However, reinstatement would mean that the habitats could continue to support typical species; effects would be very localised and short term and would not affect the distribution or occurrence of typical species in a way which would jeopardise the ability to maintain the conservation objective. As such it would be maintained.	N/A

The review of the Conservation Objectives for the SAC has identified that they would be maintained and there would be no adverse impact on the integrity of the SAC.

Nevertheless, given the sensitivity of the area, a review of mitigation which would be undertaken, including that designed into the works from an early stage has been provided in section 3.4.

3.3 In-combination effects

Given the limited period of time effects will occur over and the very localised scale, it is not considered there are any other projects which could have in-combination effects with the proposed works.

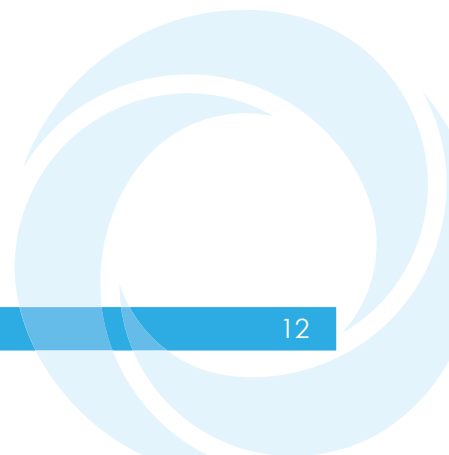
3.4 Conclusions

A review of the works to be done has shown that they can be carried out without adversely impacting the integrity of the Pen Llyn a'r Sarnau/ Llyn Peninsula SAC. As such, it is concluded that the project has passed the Appropriate Assessment.

3.5 Mitigation

Although mitigation is not required in order to pass the appropriate assessment, as the works will be occurring directly within the marine environment a series of measures will be put in place throughout construction to minimise impacts on the environment.

- The contractor will ensure that a suitable tide and weather window is used so that the risk of storm damage is minimised.
- Pre-construction assessment of the site to identify logistical routes, access to the beach and a suitable location for the site compound outside of the SAC. The site compound will contain the Site office, Operational Welfare, Storage Container, Vehicle and Plant Parking and the designated Plant refuelling station. Machinery will be stored in this compound when not in use. Fuel will be stored in double bunded containers and nappy liners will be used when refuelling.
- Excavated sand will be removed from the working area and stored on sheets in an area free from contamination and sufficiently far away from water sources.
- Each excavation will be have a trench box constructed around it so that there is minimal disturbance to the working areas and therefore potential leaching of chemicals into the sea. These will be closed off at the ends. The lower one will be covered by the sea between cycles and it is anticipated that work will span over two tidal cycles. As this will be covered by the sea between shifts, sandbags full of clean 'concrete sand' will be placed over the coffer to minimise the void being filled by the surrounding sandflat during the high tide. Buoys will be installed to aid finding the coffer after each tide.
- The upper section will involve cobbles being moved to the side and it is not anticipated that these will be need to be moved off site. The coffer will extend above the high tide mark so the water laps up to it.
- To minimise concrete used within the SAC the repair in both locations will utilise pre-cast concrete blocks with the pipe encased within; this reduces the amount of concrete that will be needed on site; these will be made on the landward side of the sea wall off the extent of the SAC and carried out to the location with appropriate pollution control measures in place within the site. The blocks will be joined together with a small quantity of in-situ rapid concrete with suitable anti-bleed additive so that it is well set and does not wash away before the following tide.
- If a leak occurs from any plant, if appropriate it will be immediately removed from the SAC and dealt within in the site compound. Spill kits will be immediately available should a leak occur and it will be recorded in an incident book.
- At the end of construction when all coffers have been removed, the sand that has been stored off site will be replaced. Cobbles will be replaced from the top of the beach.

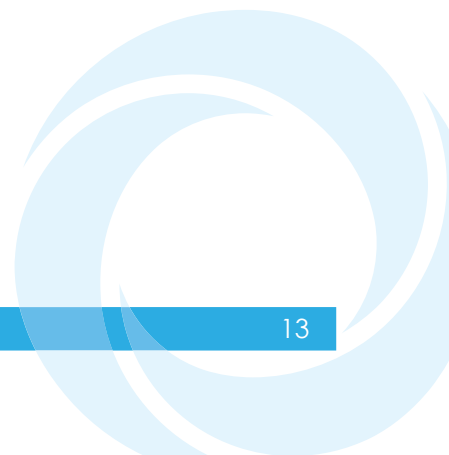


4 Conclusions

A shadow HRA has been carried out of the works proposed at Fairbourne Outlet, Gwynedd. This went through the following stages:

- Stage 1 – the project was screened and a likely significant effect was identified for the proposed development;
- Stage 2 – a shadow Appropriate Assessment was carried out which assessed features of the SAC within and immediately adjacent to the working area. This showed that there the habitats potentially affected were not of significance that the conservation objectives of the SAC would not be met and so the works pass the appropriate assessment;
- Mitigation was outlined to protect and maintain habitats within the SAC.

As a result, the HRA has shown that work as identified in the Marine Licence Application, Band 2 can proceed without affecting the integrity of the Pen Llyn a'r Sarnau/ Llyn Peninsula and the Sarnau SAC. Appropriate good working practices in marine environments are put in place to prevent pollution and minimise the disruption of typical species found within the SAC during construction.



5 References

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Appendices

Appendix A. Working area and work proposals



EXISTING DIFFUSER

EXISTING 9" SEA
OUTFALL PIPELINE

EXISTING TIDAL TANK

Post

Ro Wen

Sand

Mean High Water

Shingle

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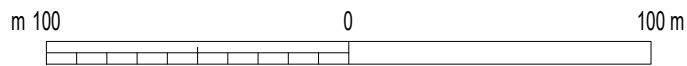
ALYN

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SCALE 1 : 2500



REPRODUCED FROM OS MASTERMAP 1:2500 SCALE BY PERMISSION OF ORDNANCE
SURVEY ON BEHALF OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE.
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NOTES

- FOR GENERAL ARRANGEMENT PLAN OF PROPOSED REPLACEMENT SEE
DRAWING w2476-2100.
- MARINE LICENCE HAS BEEN APPLIED FOR. NO WORKS TO COMMENCE
BEFORE OBTAINED.

KEY

LOCATION OF TIDAL TANK

GRID REFERENCE: 261052, 313597
SITE ADDRESS: PENRHYN DRIVE NORTH, FRIDD FECHAN,
FAIRBOURNE
LL38 2DJ



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P00	31-10-18	FIRST ISSUE	VJ	MJ	PMJ
REV.	DATE	DESCRIPTION	DSGND	CHKD	APPD

CLIENT



PRINCIPAL DESIGNER

DWR CYMRU WELSH WATER



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SCHEME

FAIRBOURNE REPLACEMENT
SEA OUTFALL

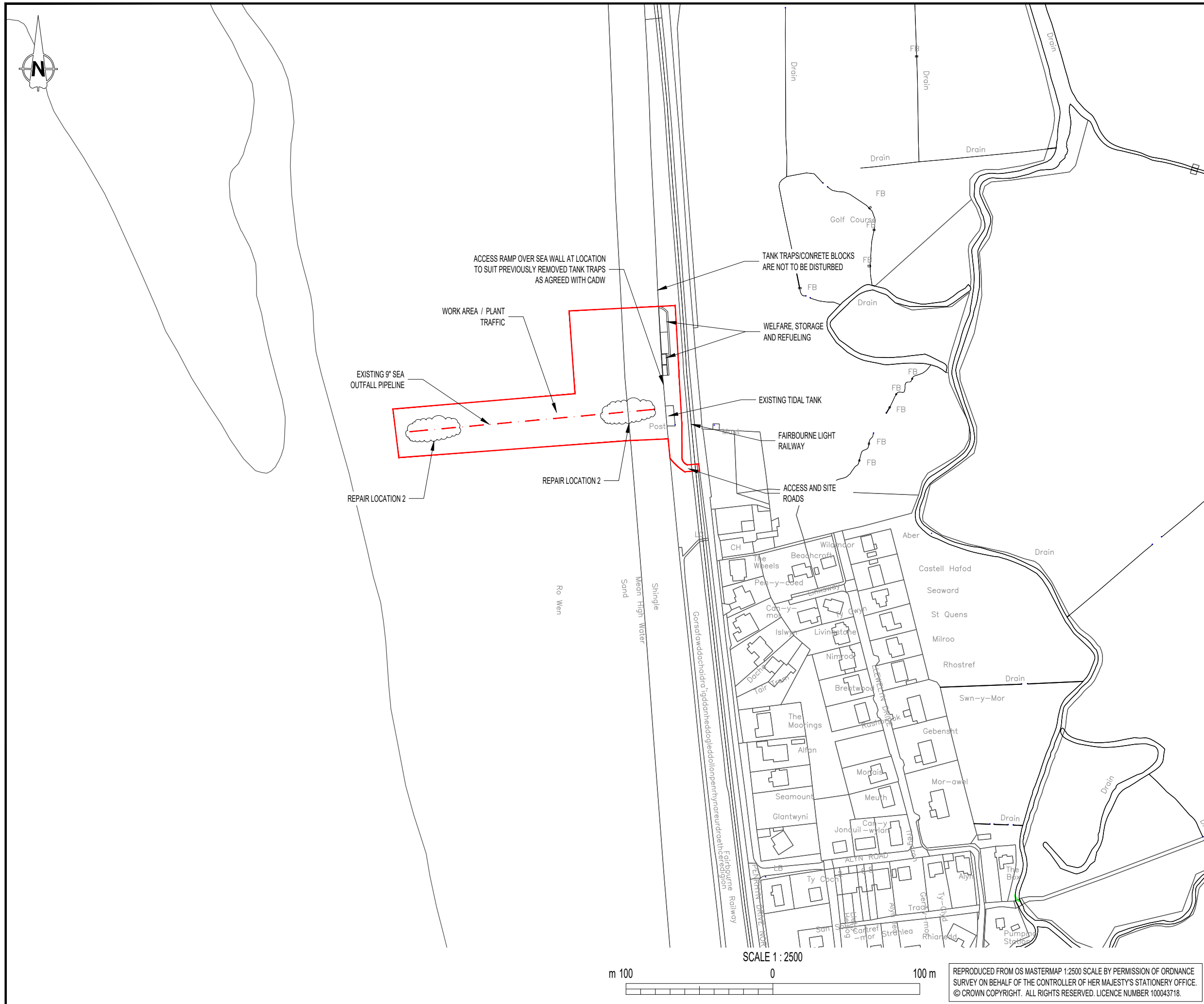
TITLE

SITE LOCATION PLAN

STATUS

PRELIMINARY

DESIGNED	CHECKED	APPROVED	SCALE / SHEET SIZE
VJ	MJ	PMJ	1 : 2500 / A3
DRAWING NO.			REV
w2476-0001			P00



NOTES

- ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS SHOWN OTHERWISE.
- THIS DESIGN IS PROPOSED ON THE BASIS OF CLIENT BRIEF, SPECIFICATIONS, BEST PRACTICE AND RISK REDUCTION / ELIMINATION. THE DESIGNER MUST BE CONSULTED ON ANY PROPOSED CHANGES, BEFORE THEY ARE CONSIDERED FOR IMPLEMENTATION.
- ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH CESWI 7 (CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY (7TH EDITION)) SUPPLEMENTED BY THE 'DCWW CIVIL ENGINEERING SPECIFICATION CS501A'.

KEY

REPLACEMENT OUTFALL

SITE BOUNDARY / WORKING AREA

SITE LOCATION

GRID REFERENCE: 261052 , 313599

SITE ADDRESS: TIDAL TANKS, PENRHYN DRIVE NORTH, FAIRBOURNE LL38 2DJ

REFERENCE CALCULATIONS

NOT APPLICABLE

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I01	15-02-19	REPAIR LOCATION ADDED	CJC	MJ	PMJ
I00	11-12-18	FIRST ISSUE	MJ	KJP	PMJ

REV.	DATE	DESCRIPTION	DSGND	CHKD	APP'D

CLIENT

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SCHEME

FAIRBOURNE
SEA OUTFALL REPAIR

TITLE

SITE ACCESS AND
WORKING AREA

STATUS

INFORMATION

DESIGNED MJ	CHECKED KJP	APPROVED TM	SCALE / SHEET SIZE 1 : 2500 / A3
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DRAWING NO. w2476-2000	REV I01
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EXISTING DIFFUSER
TO BE RETAINED

TIDEFLEX FLAP TO BE INSTALLED
SUBJECT TO DCWW INSTRUCTION

EXISTING 9" C.I. OUTFALL, OUT
TO SEA IS TO BE RETAINED.

CONTRACTOR TO ARRANGE PIPE SEAWARD OF CONNECTION
POINT TO BE CLEANSED BY HIGH PRESSURE JETTING BEFORE
CONNECTION OF NEW PIPE

NEW REPAIR 2 DETAILED TO INCLUDE
ACCESS POINT FOR JETTING AND
FUTURE MAINTENANCE.

CONNECTION POINT TO BE DETERMINED AFTER TRIAL HOLES
ASSUMED TO BE CLOSE TO THIS LOCATION FROM OBSERVATION
OF "BOILING" SAND AND LOCAL OPS NARRATIVE

②

EXISTING RETAINED PIPE TO BE CLEANED
BY HI PRESSURE JETTING AND INSPECTED
FOR OTHER DAMAGE BY CCTV

280mm OD PE100 SDR11 INSERTED THOUGH DN350
D.I. PIPE WITH CONCRETE SURROUND. SEE
DRAWING w2476-2402 FOR DETAILS

Y CONNECTION IN THIS AREA FOR PUMPED BYPASS
DETAILS NOT KNOWN. SEE DRAWING w2476-2402. TO
BE DETERMINED ON SITE UPON EXPOSURE

NEW REPAIR 1 SEE DRAWING w2476-2403 FOR
CONNECTION DETAIL ASSUME 5 x BLOCKS AND
CONNECT TO CHAMBER AS DETAIL

CONNECT TO TO FLANGE DOWNSTREAM OF
INCOMING PUMPED BY PASS OUTSIDE OF EXISTING
VALVE CHAMBER

SHINGLE BANK SUBJECT TO
MOVEMENT DUE TO WAVE ACTION

EXISTING TIDAL TANK

Most

LC

CH

Ro Wen

Sand

Mean High Water

Shingle

Gorsafawddochairio'igdd

SCALE 1 : 1250



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NOTES

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- ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH CESWI7 ('CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY (7TH EDITION)') SUPPLEMENTED BY THE 'DCWW CIVIL ENGINEERING SPECIFICATION CS501A'.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NOS w2476-2202, 2402, 2403 AND 2404.

KEY

- EXISTING SEWER RISING MAIN
- SEWER OUTFALL TO BE REPLACED
- SEWER OUTFALL TO BE RETAINED

SITE LOCATION

GRID REFERENCE: 261030, 313602
SITE ADDRESS: PENRHYN DRIVE NORTH, FAIRBOURNE LL38 2DJ

CAUTION: THE MANAGEMENT AND DESIGN OF ANY AND ALL TEMPORARY WORKS REQUIRED TO EXECUTE THIS DESIGN ARE THE RESPONSIBILITY OF THE CONTRACTOR.

T00	15-02-19	PRICING ISSUE	KJP	MJ	PMJ
P00	23-11-18	FIRST ISSUE	KJP	MJ	TM
REV.	DATE	DESCRIPTION	DSGND	CHKD	APP'D

CLIENT



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SCHEME

FAIRBOURNE
SEA OUTFALL REPAIR

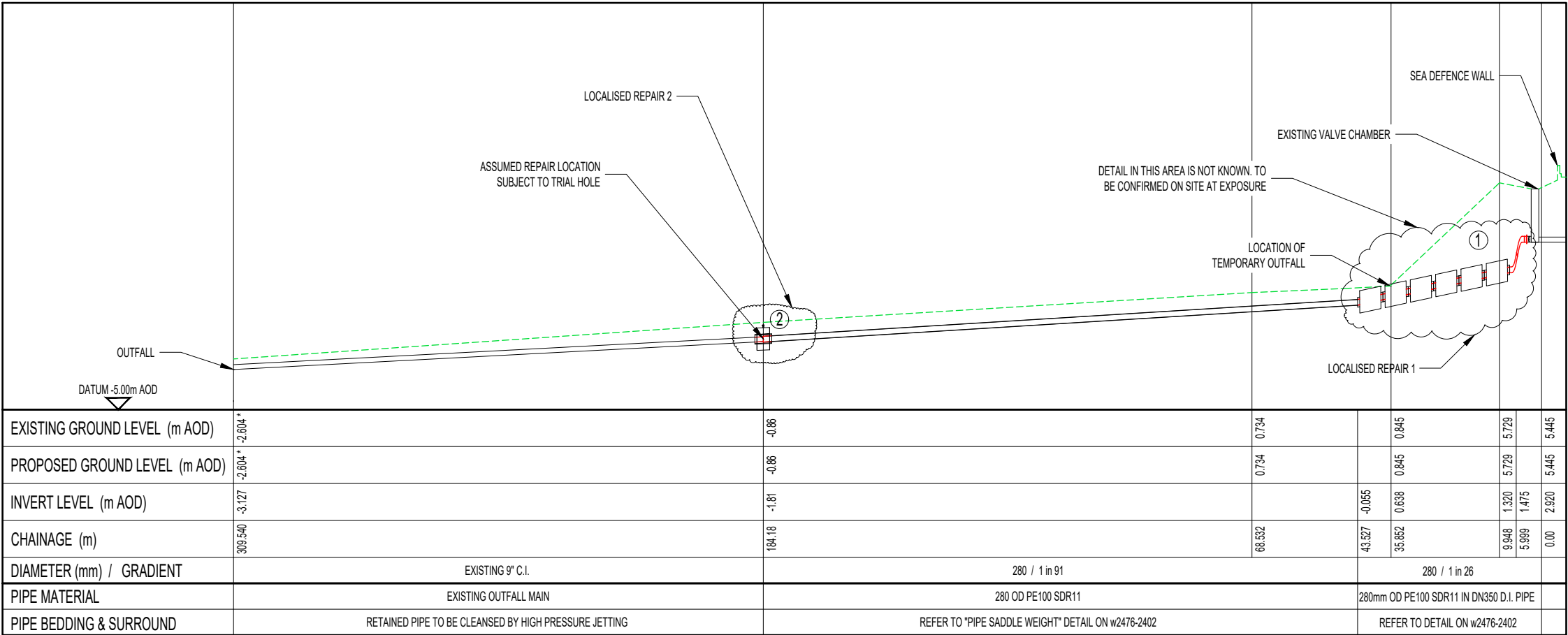
TITLE

GENERAL
ARRANGEMENT PLAN

STATUS

PRICING

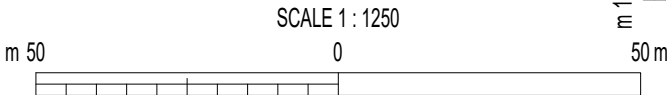
DESIGNED	CHECKED	APPROVED	SCALE / SHEET SIZE
KJP	MJ	TM	1 : 1250 / A3
DRAWING NO. w2476-2102			REV T00



* GROUND LEVELS ASSUMED LEVEL SURVEY STOPPED AT CH 187.83m

LONGITUDINAL SECTION - VALVE CHAMBER TO OUTFALL

SCALE 1 : 1250 HORIZONTAL / 1 : 250 VERTICAL



NOTES

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- ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH CESWI7 (CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY (7TH EDITION)) SUPPLEMENTED BY THE 'DCWW CIVIL ENGINEERING SPECIFICATION CS501A'.
- GROUND PROFILE HAS BEEN GENERATED FROM LEVEL SURVEY CARRIED OUT 05/11/18.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH w2476-2102 AND 2402.

KEY

- EXISTING GROUND PROFILE
- SEWER TO BE RENEWED
- SEWER TO BE RETAINED

SITE LOCATION
GRID REFERENCE: 261030, 313602
SITE ADDRESS: PENRHYN DRIVE NORTH, FAIRBOURNE LL38 2DJ

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T00	18-02-19	PRICING ISSUE	KJP	MJ	PMJ
P00	23-11-18	FIRST ISSUE	MJ	KJP	TM
REV.	DATE	DESCRIPTION	DSGND	CHKD	APPD

CLIENT

PRINCIPAL DESIGNER
DŴR CYMRU WELSH WATER

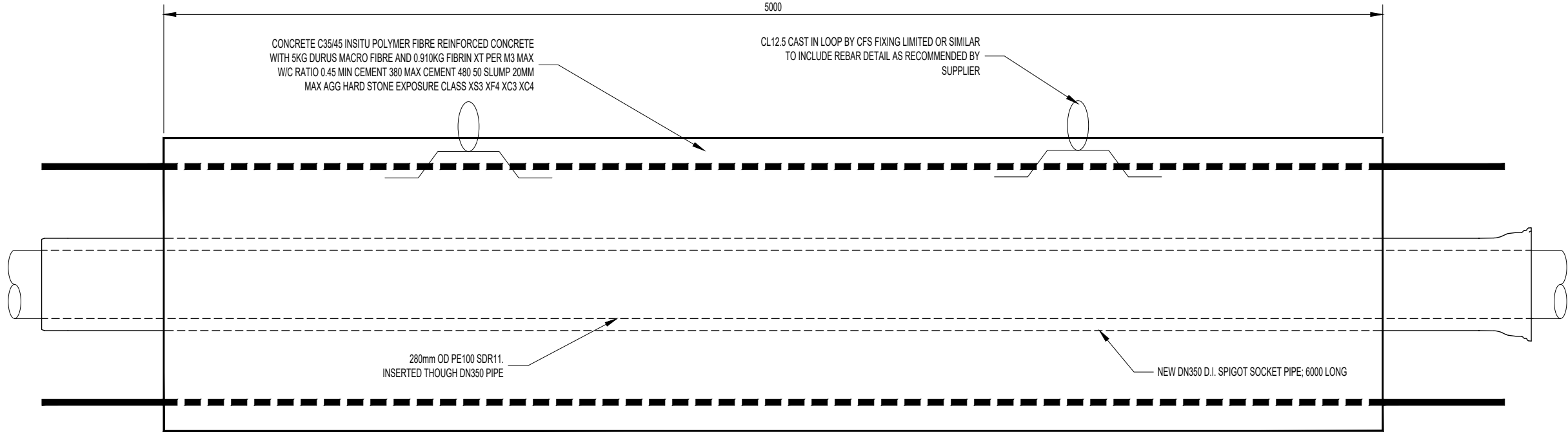
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tel (+44) 1824 702220
www.waterco.co.uk

SCHEME
FAIRBOURNE
SEA OUTFALL REPAIR

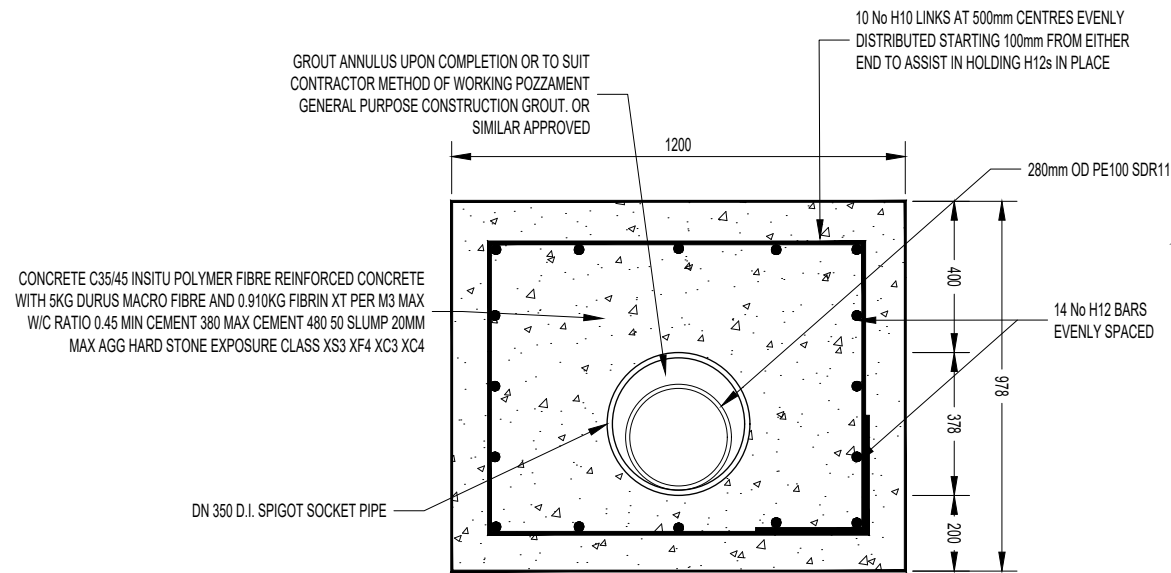
TITLE
LONGITUDINAL SECTION

STATUS			PRICING	
DESIGNED	CHECKED	APPROVED	SCALE / SHEET SIZE	
MJ	KJP	TM	AS SHOWN / A3	
DRAWING NO.			w2476-2202	REV T00

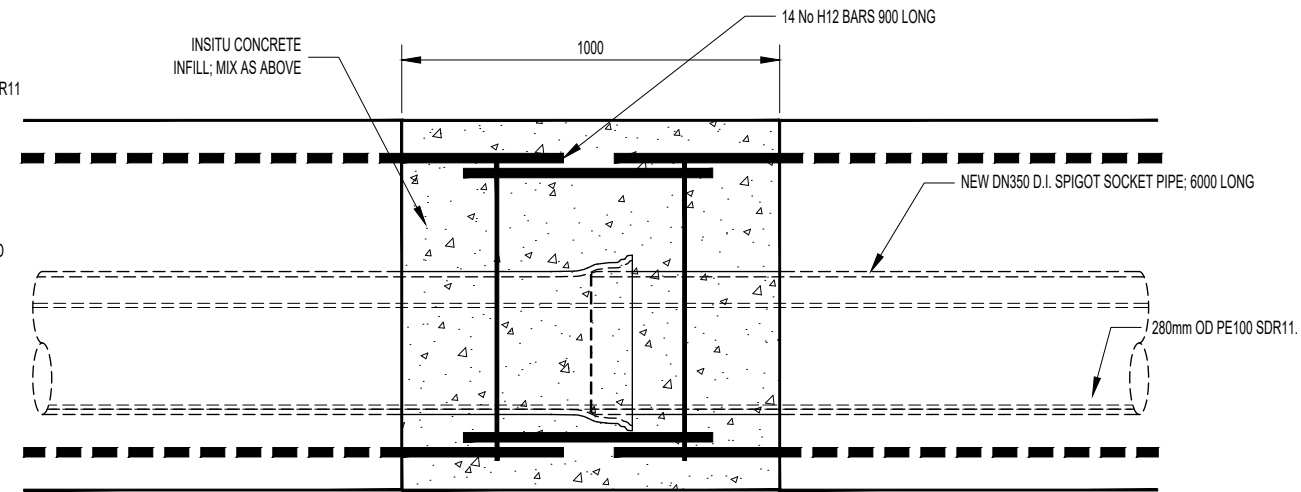


(8No) CONCRETE SURROUND
SECTION VIEW
SCALE: 1 : 20

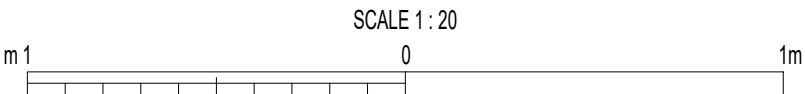
NOTE
APPROXIMATE WEIGHT 15.2t -
LIFTING STRAP DETAIL T B C



CONCRETE SURROUND
SECTION VIEW
SCALE: 1 : 20



CONNECTION PIECE
PLAN VIEW
SCALE: 1 : 20



NOTES

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- IN-SITU CONCRETE SHALL BE TESTED IN ACCORDANCE WITH CESWI 7 Cl 2.20 TO 2.22 CRITICAL STRUCTURE. ADDITIONALLY FIELD CURES TO BE TAKEN TO VERIFY ACTUAL BEFORE TRANSPORT AND PLACING.
- COVER TO REINFORCEMENT 60mm

REFERENCE CALCULATIONS

< CALCULATION FILE/DOCUMENT REFERENCE >



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T00	15.02.19	PRICING ISSUE	KJP	MJ	PMJ
P00	23-11-18	FIRST ISSUE	KJP	MJ	TM
REV.	DATE	DESCRIPTION	DSGND	CHKD	APP'D

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SCHEME

FAIRBOURNE
SEA OUTFALL REPAIR

TITLE

PIPE PROTECTION DETAIL
REPAIR LOCATION 1

STATUS

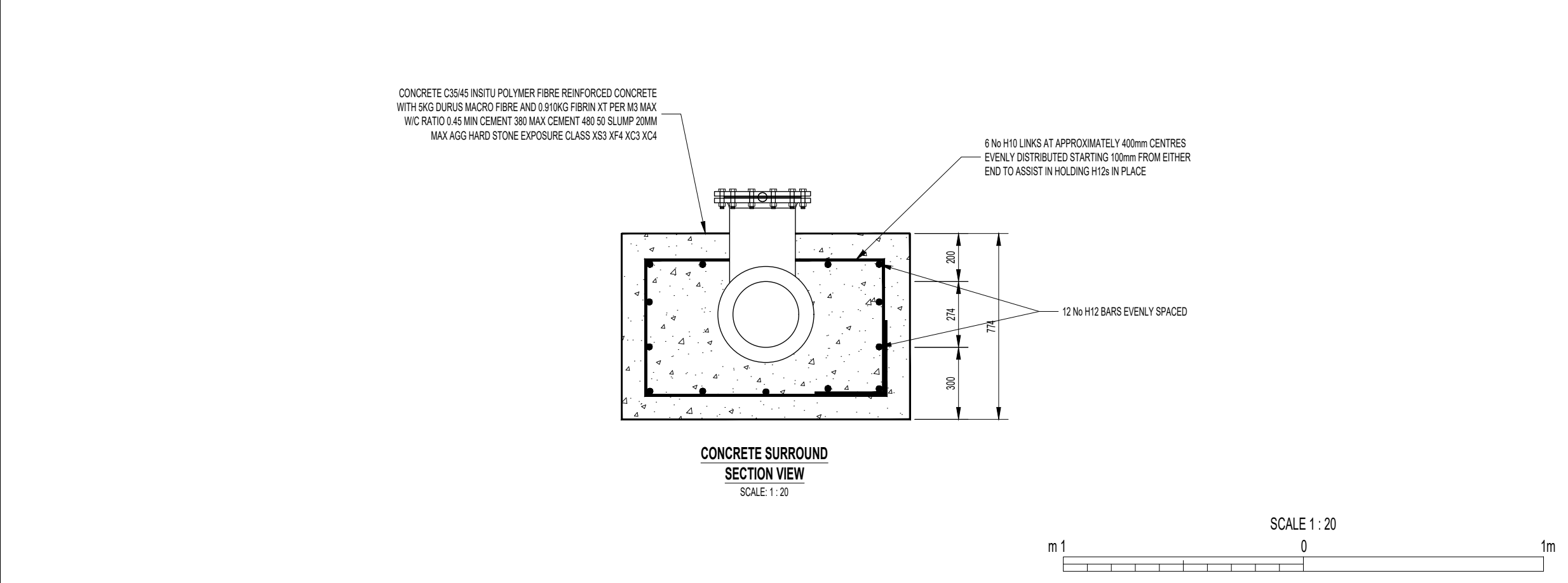
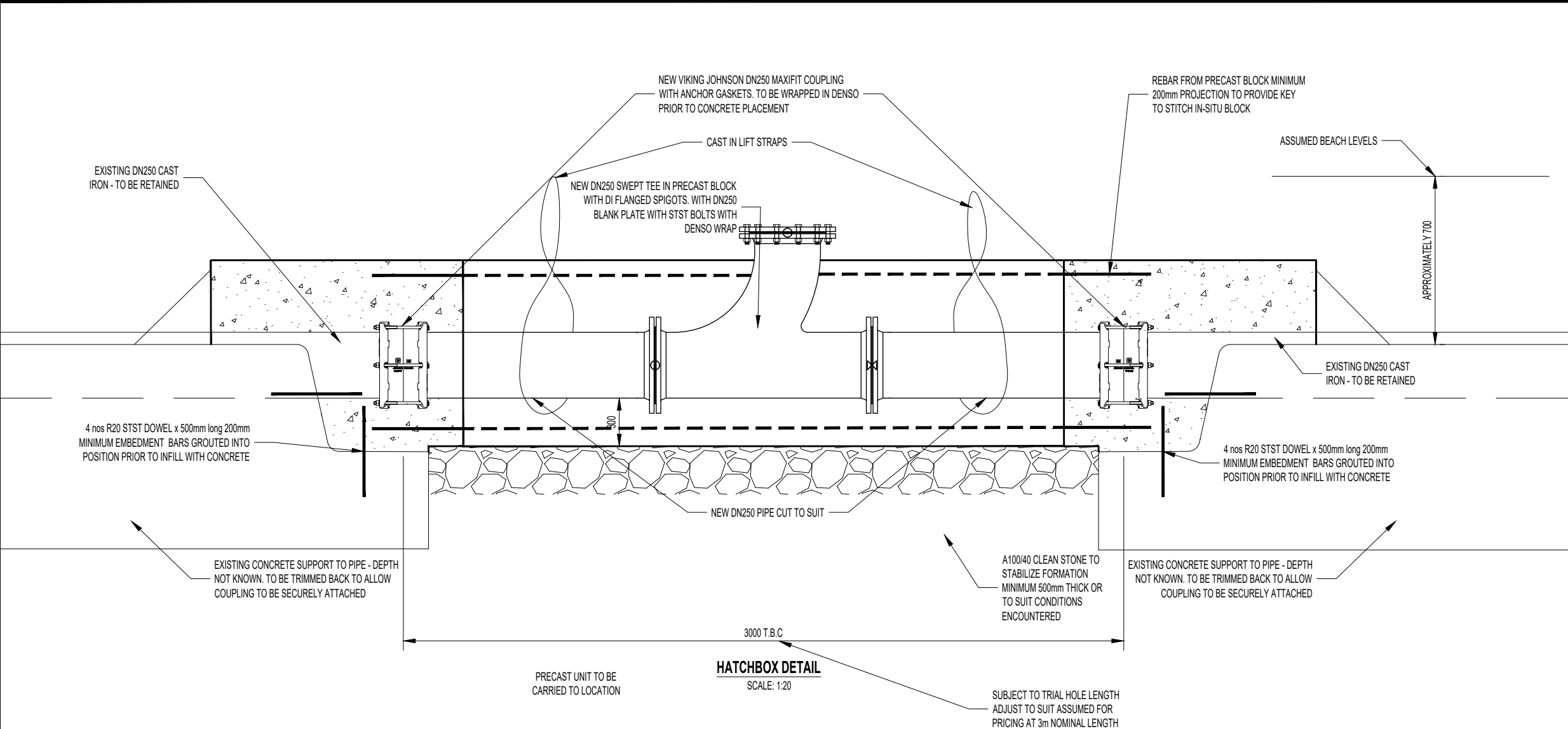
PRICING

DESIGNED	CHECKED	APPROVED	SCALE / SHEET SIZE
MJ	KJP	TM	AS SHOWN / A3

DRAWING NO.	REV
w2476-2402	T00



- | | |
|-------------|-----|
| DRAWING NO. | REV |
| w2476-2404 | T00 |



NOTES

1. ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS SHOWN OTHERWISE.
2. THIS DESIGN IS PROPOSED ON THE BASIS OF CLIENT BRIEF, SPECIFICATIONS, BEST PRACTICE AND RISK REDUCTION / ELIMINATION. THE DESIGNER MUST BE CONSULTED ON ANY PROPOSED CHANGES, BEFORE THEY ARE CONSIDERED FOR IMPLEMENTATION.
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4. IN-SITU CONCRETE SHALL BE TESTED IN ACCORDANCE WITH CESWI 7 CI 2.20 TO 2.22 CRITICAL STRUCTURE. ADDITIONALLY FIELD CURES TO BE TAKEN TO VERIFY ACTUAL BEFORE TRANSPORT AND PLACING.
5. COVER TO REINFORCEMENT 60mm

REFERENCE CALCULATIONS

< CALCULATION FILE/DOCUMENT REFERENCE >



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T00	15-02-19	FIRST ISSUE	KJP	MJ	PMJ
REV.	DATE	DESCRIPTION	DSGND	CHKD	APP'D

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SCHEME

FAIRBOURNE
SEA OUTFALL REPAIR

TITLE

CONNECTION DETAILS
REPAIR LOCATION 2

STATUS		PRICING	
DESIGNED MJ	CHECKED KJP	APPROVED TM	SCALE / SHEET SIZE 1:20 / A3
DRAWING NO. w2476-2405			REV T00