

APPLICATION FOR A MARINE LICENCE FOR MARINE WORKS

Marine Works include, but are not limited to, coast defences, beneficial uses of dredged materials, subsea cables, pontoons, jetties, land reclamation, grab samples and outfall pipes under the Marine and Coastal Access Act 2009

Please read the notes carefully before completing the form.

- The Marine Licensing Team (MLT) administers Part 4 of the Marine and Coastal Access Act 2009 on behalf of the Licensing Authority, the Welsh Ministers.
- The completed application form must be accompanied by a location plan and, where appropriate, descriptive drawing(s) and any supporting environmental assessments. One completed hard copy of the application and supporting documents will always be required. Additional copies are required for consultation purposes.
 - For application and supporting documents less than 10MB we can accept an additional copy via email.
 - For applications larger than 10MB **16** additional copies in CD/DVD format will be required
 - When applications and supporting documents are hard copy only **16** copies will be required.
- Please submit applications to the **Permit Receipt Centre** via the details at the top of this form
- Please submit marine licence applications, including this form and all supporting documents, **at least 4 months before the licence is required.**

Some projects may raise matters that require a significantly longer time for consideration. These are most likely to be:

- Projects that fall **within** The Marine Works (Environmental Impact Assessment) Regulations 2007 – as amended requiring an Environmental Statement
- Large scale projects with substantial volumes of material being deposited or excavated
- Works requiring an Appropriate Assessment to be conducted under The Conservation of Habitats and Species Regulations 2017.
- Information should be provided about the anticipated **duration of the entire project** in respect of works below/seaward of Mean High Water Spring (MHWS). Where appropriate, planned phasing of the work for which consent is sought must be detailed. For projects lasting more than one calendar year, planned phasing details must be given for each 12 month period.

A licence fee is payable in respect of an application. Details of fees can be found on our web pages.

Please note applications will not be processed without the correct relevant fee or invoicing details.

- Payments can be made via Cheque, BACS or credit/debit card.
 - Cheques should be crossed and made payable to **Natural Resources Wales.**
 - For BACS payments ensure you provide the reference number (not remittance number)

- For credit/debit card payments please complete the CC1 form and submit with the application. The CC1 form can be found on our web pages

Further information on payment methods can be found on our web pages

- **All activities need to comply with the Water Framework Directive (WFD). The framework and guidance can be found on the Natural Resources Wales website, <http://naturalresources.wales>. The results of your WFD assessment must be attached to your marine licence application.**
- Please answer all questions. If any information is not available at the time of application please indicate in the relevant section, giving reasoning in a covering letter. Outstanding details must be submitted as soon as possible. Any delay in forwarding details is likely to result in delays in determining your application.

Your application may not be considered complete and therefore not processed until key information has been submitted. Your application may be returned if you fail to submit outstanding information within given timescales.

- Please note any licence may have conditions that must be discharged before works can commence. This will take additional time.
- If you have any queries with regards to completing this application please contact the MLT: marinelicensing@naturalresourceswales.gov.uk

How your application will be processed by the MLT:

- Submit all application to the **Permit Receipt Centre** via the details at the top of this form.
- Checked and acknowledged by the MLT within 21 days of receipt of application and payment
- If the application is complete and no further information is needed at this time, your application will be placed in a work queue to be assigned a permitting officer
- If the application is not complete, further information will be request and need to be provided before the application can be considered as complete
- Our **4 months** service level for determining non-EIA applications will begin from the date the **completed** application is received (*Please note some projects may take significantly longer than 4 months to determine due to their nature*)
- EIA projects may take significantly longer due to their scale and complexity. Therefore we encourage early engagement with the MLT
- Your application and supporting documents will be sent to for an initial consultation period of 28 days (*42 days for EIA projects*)
- For the majority of projects, a public notice must be advertised. Public consultation will be 28 days (*49 days for EIA projects*).
For EIA projects a second public notice will be required. The MLT will advise on how this should be done.
- Responses to consultation will be considered and additional information requested at this time, if necessary.

- A decision on your Marine Licence Application will be made

All information submitted may be referred to within a licence, therefore all works must be in accordance with this information, unless otherwise agreed with NRW acting on behalf of the Licensing Authority during the determination process.

It is the responsibility of the applicant to obtain any other consents/authorisations that may be required.

Application Form Structure

1. Project Description and Cost
2. Applicant Details
3. Details of Agent, Contractor, Vehicles and/or Vessels used to carry out works
4. Environmental Impact Assessment (EIA)
5. Licensable Period
6. Project Description
7. Methods Statement
8. Materials of Project
9. Beach Replenishment, Land Reclamation or Salt Marsh Feeding
10. Temporary Works
11. Dredge and Disposal of Dredge Material
12. Protected Sites
13. Other Consents
14. Statutory Powers
15. Public Register
16. Application Fee
17. Declaration

Check List

Please ensure that you have included all the necessary information before you submit your application. **If any of the below are not completed in the application form, the application is likely to be considered incomplete and may be returned to you**

Item	Yes (✓)
The applicant is a legal entity?	✓
The declaration is signed by the applicant?	✓
Is the application fee correct?	✓
Are the grid references/coordinates correct?	✓
Do the coordinates match map locations?	✓
Have all the relevant supporting documents been submitted?	✓
Has a clear methodology been provided in the application form?	✓
Has Protected sites information been included?	✓
Has a Water Framework Directive (WFD) assessment been submitted?	✓
Are all the continuation sheets for application questions appended with correct corresponding numbers?	✓

Should you have any queries regarding your application please contact the MLT via marinelicensing@naturalresourceswales.gov.uk

1. Project Description and Cost

1 (a). Project Name

Manorbier Outfall

1(b). Please provide a brief description of the proposed project, including location

Manorbier sea outfall is located on Manorbier Bay beach, south west of the village of Manorbier; approximate NGR SS06109745. The works involve repairing the surround to existing manhole SS06971570 and exposed 350mm dia. pipework that has had its concrete surround eroded. Approximately 20 m of concrete surround downstream of manhole SS06971570 will need to be excavated, realigned and made good with a concrete surround.

1(c). Please provide an estimated gross cost of the project (Inc. materials and labour) for works that fall below/seaward of Mean High Water Springs (MHWS)

£40,000

2. Applicant Details

To whom the licence will be issued. *This must be a legal entity such as an individual, registered company/ charity or public body.*

Title	Mr	Full Name	Geoff Tilling
Company or Trading Name	Morgan Sindall (Infrastructure) plc		
Company Registration Number (if applicable)	04273754		
Name of Contact or individual (if different)			
Position in Company	Senior Contracts Manager		
Address inc. postcode (provide registered Company address if applicable)	Kent House, 14-17 Market Place, London, W1W 8AJ		
Telephone Number	01633 963058		
Email Address	geoff.tilling@morgansindall.com		

3. Details of Agent, Contractor, Vehicles and/or Vessels used to carry out works

3(a). Agent Details

This is who we will correspond with unless otherwise informed. If no agent we will contact the applicant.

Title	Miss	Full Name	Stephanie Chapman
Company or Trading Name	Ove Arup and Partners Ltd.		
Company Registration Number (if applicable)	1312453		
Name of Contact or individual (if different)			
Position in Company	Senior Environmental Consultant		
Address (Inc. postcode)	63 St Thomas Street Redcliffe Bristol BS1 6JZ		
Telephone Number	0117 988 6736		
Email Address	Stephanie.chapman@arup.com		

3(b). Does the Applicant wish to be included in all correspondence? Yes ☐ No ☐

3(c). Contractor Details

In order for contractors to benefit from the licence permission, details must be provided.
Any details not provided with application must be confirmed before operations commence.

Contractor Company or Trading Name	Address
Morgan Sindall plc,	Corporation Street, Rugby, Warwickshire. CV212DW

3(d). Will the works require the use of vessels?

Yes ☐ No ☒

3(d) (i). Vessel Details (if applicable and available)

In order for contractors to benefit from the licence permission, details must be provided.
Any details not provided with application must be confirmed before operations commence.

Operator	Name of Vessel	Type of Vessel	Vessel Registration Number	Country of Registration

3(e). Will the works require the use of vehicle?

Yes ☒ No ☐

☐

3(e) (i). Vehicle Details (if applicable and available) to be used below MHWS

In order for contractors to benefit from the licence permission, details must be provided.
Any details not provided with application must be confirmed before operations commence.

Operator	Type/Description of Vehicle
Morgan Sindall	8t Tracked Excavator
Morgan Sindall	6T Dumper
Morgan Sindall	Tractor and trailer

3(f). If the contractor or vessels or vehicles are not known at the application stage, when do you expect to provide these details?

These details will need to be confirmed prior to the licence and operations commencement

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4. Environmental Impact Assessment (EIA)

Certain projects, due to their scale, location and/or nature, may require an EIA under the Environmental Impact Assessment Directive (Directive 85/337/EEC – as amended). If a project qualifies under EIA, an Environmental Statement (ES) must be prepared and submitted with the application.

Projects that fall within Annex I of the Directive automatically require an EIA. Projects that fall within Annex II of the Directive are assessed on a case-by-case basis for the requirement for an EIA to be undertaken.

4(a). Do you consider the works to be under the Environmental Impact Assessment Directive (Directive 85/337/EEC – as amended)? Yes ☐ No ☒

4(a) (i) If Yes, which Annex does the proposal fall under? Annex I ☐ Annex II ☐

4(a) (ii) Which number(s) within the Annex does the proposal relate to?

4(b). Have you applied for a screening or scoping opinion from the MLT under the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)? Yes ☐ No ☒

4(b) (i). If Yes, please provide the reference number

4(c). Has an Environmental Impact Assessment been undertaken? Yes ☐ No ☒

4(c)(i). If Yes, has an Environmental Statement been submitted to support this Marine Licence application? Yes ☐ No ☐

4(d). If an Environmental Impact Assessment has been undertaken, but an ES has not been submitted, please provide an explanation

Please continue on a separate sheet if necessary. Please tick if you have done this ☐

5. Licensable Period

Determination of applications will be based on the works taking place during these dates. Please ensure you have included an adequate contingency period. If works are not completed by the Requested Licence Expiry Date you may be required to submit a new application. *Including a contingency period within your original application does not impact on Licence Fee*

Start Date

Requested Licence Expiry Date

Please ensure you submit your application for a Marine Licence **at least 4 months** prior to the intended start date. Some projects, such as EIA projects, will take significantly longer to determine.

6. Project Description

6(a). Please give a description of the proposed project.

This should include the purpose of the project, estimated timescales of construction and operation, and broken down by the phases of works, if applicable.

Details should include, but not be limited to, dimensions of project, quantity of material being deposited and removed.

The proposed works involve repairing the surround to existing manhole SS06971570, which has been undermined by tidal activities, causing the complete erosion of the bottom of the concrete manhole. Tidal activities have also exposed 350mm diameter pipework; the concrete surround has been eroded and the pipework has become misaligned.

The proposed works comprise:

- Approximately 20 m of exposed pipe, downstream of manhole SS06971570 to be excavated;
- Realignment of 20m of pipework;
- Construction of 20m of new concrete surround. All concrete on the scheme will be to a C 40/50 marine grade specification, due to the presence of seawater.

Please continue on a separate sheet if necessary. Please tick if you have done this ☐

6(b). Please detail the location of the proposed construction project.

This should be either Ordnance Survey National Grid Reference (i.e. AB 12345 67890) or Latitude and Longitude in decimal degrees to 4 decimal places (i.e. Lat 52.1234 Long - 4.1234), defining the extent of the project. **Please specify which coordinate system has been used.**

National Grid Reference (NGR):

New concrete surround for pipework (circa 20m): SS 06115 97434 to SS 06108 97432

Manhole SS06971570: SS 06130 97444

Please continue on a separate sheet if necessary. Please tick if you have done this ☐

6(c). The following must be provided with the completed application form:

- (i) a suitably scaled extract of an Ordnance Survey Map or Admiralty Chart with location of project, complete with **North Arrow** and **Scale**
- (ii) construction plans and sectional drawings showing those proposed works below/seaward of MHWS, which should give details of the materials to be used (for beach replenishment the quantity, particle size and source of material to be deposited and deposit location is also required).
- (iii) a descriptive schematic drawing and suitably scaled location plan which show the full extent of the project clearly in relation to the surrounding area and features.

Please list below **all supporting documents** that have been submitted with this application, including suitable documents/maps/drawing titles and reference numbers

All figures and supporting documents are provided at the end of this form.

Appendix A: Supporting Figures

- Location Plan - 4692_S_205-ARP-01-BG-DR-CD-05000
- Existing Manhole and concrete repair pipe detail - 4692_S_205-ARP-01-BG-DR-CD-05002

Appendix B Construction Methodology

Appendix C Habitat Regulation Assessment

Appendix D Preliminary Ecological Appraisal

Appendix E Water Framework Assessment

Please continue on a separate sheet if necessary. Please tick if you have done this ☐

The applicant should note that these drawings/plans may be copied to others as part of the MLT's consultation procedures. If they are subject to copyright, it is the **responsibility of the applicant to obtain the necessary approvals to reproduce the documents and to submit up to 16 copies with the application.**

7. Methods Statement

7(a). Please provide a detailed method statement for the works

This must include methods for all works including temporary structures or deposits such as jetties, cofferdams, moorings or landing stages to be constructed seaward of MHWS

Please refer to Morgan Sindall Risk Assessment and Method Statement (RAMS) (Ref: SH1 FRM4) (Appendix B).

Please continue on a separate sheet if necessary. Please tick if you have done this ☒

7(b). Do you intend to undertake activities that could generate underwater noise?
This include piling, use of explosives, geophysical, acoustic deterrent devices and multibeam echosounders. Yes ☐ No ☒

7(b) (i). If Yes, what type(s) of activities will be undertaken?

7(b) (ii). If Yes, approximately how many days will the activity be undertaken for?

If Yes, you will be required to complete an additional form that will be provided.

7(c). Please state the measures to be taken to:
(i) Minimise risk to the marine environment

Please refer to Appendix C (the Habitat Regulation Assessment) the HRA report for details on mitigation measures.

Works will be undertaken outside of the Bathing Water Season.

(ii) Prevent undue interference to others

Whilst plant are accessing or traversing the beach area, vehicle banks men will be present to control movements to ensure members of the public are not put at risk from the machines. If members of the public come near the working vicinity area where plant is moving then the banks men will stop the work and allow the public to pass. Where the proposed works are above the mean high tide (see sketch box 1), work activities on site will be segregated from the public area using double clipped heras panels and feet. Panels will be clearly signed to deter any third parties from entering the site working area. Working areas that are affected by the tide shall have temporary barriers set up during the shift as a visual barrier to segregate the working area from the public. At the end of each working shift all equipment will be returned to the site compound and stored securely. Any equipment left on site will be contained within the Heras security fencing.

(iii) Maintain navigational safety, including marking and lighting of works

Not applicable; intertidal works.

Please continue on a separate sheet if necessary. Please tick if you have done this ☒

8. Materials of Project

8(a). Description of materials to be deposited seaward of MHWS (Please tick all that apply)

Timber	☐	Iron/Steel	☐	Concrete	☒	Biocides/other chemicals	☐
Silt	☐	Stone/Rock	☐	Gravel	☐	Plastic/Synthetics	☐
Sand	☐	Other	☐				

If other, please provide a description of materials.

8(b). Delivery method of materials to site

If sea delivery, please include details of vessels to be used with a chart of proposed route and transshipment area. If vehicle delivery, please provide the proposed access route.

Please refer to Appendix B construction methodology

Please continue on a separate sheet if necessary. Please tick if you have done this ☒

8(c). Will the works involve removals seaward of MHWS?

Yes ☒ No ☐

8(c) (i). Description of materials to be removed seaward of MHWS (Please tick all that apply)

Timber	☐	Iron/Steel	☐	Concrete	☒	Biocides/other chemicals	☐
Silt	☐	Stone/Rock	☐	Gravel	☐	Plastic/Synthetics	☐
Sand	☐	Other	☐				

8(c) (ii). Description of objects/materials to be removed seaward of MHWS

Including quantities to be removed.

Remains of eroded 20m of concrete surround of pipework.

9. Beach Replenishment, Land Reclamation or Salt Marsh Feeding

For works involving any of the above, please provide the following information

9(a). Is the material to be deposited like for like to existing material? Yes ☐ No ☐

9(a)(i) If No for Beach Replenishment please provide justification why?

9(b). Description of material to be deposited

Please provide the grading specification of materials to be used, if using a range of grain sizes please state the percentage by weight passing. *If unsure, please refer to the Wentworth Scale*

Please continue on a separate sheet if necessary. Please tick if you have done this ☐

9(c). Source of the material to be deposited

Including dredged or land based stating the origin of material

9(d). Has the material been chemically analysed?

Yes ☐ No ☐

If material has been analysed, we may request this information to determine the application

9(d) (i) If Yes, is the analysis data been included with the application? Yes ☐ No ☐

10. Temporary Works

10(a). Will there be any temporary deposits below MHWS? Yes ☒ No ☐

This includes construction materials, removed objects/material, jetties or cofferdams

If **Yes**, please continue with section **10**

10(b). Please provide the location of temporary deposits

Please include a map/chart displaying the location of temporary deposits, if necessary.

The temporary deposits as described in 10 (c.) will be along the pipe line as shown on the Location Plan in Appendix A.

10(c). Description of temporary deposits

Some metal or wooden shuttering may be required – this will be determined when the contractor is on site.

Please continue on a separate sheet if necessary. Please tick if you have done this ☒

11. Dredge and Disposal of Dredge Material

If you are undertaking Dredge and Disposal activities please also complete the Dredge and Disposal application form and submit together.

11(a). Do you intend to apply for a marine licence to dispose of dredged material to sea as part of the works in this application? Yes ☐ No ☒

12. Protected Sites

Licensing Authorities have a duty to ensure that projects will **not have significant adverse environmental impact**, particularly on any designated **European Site of Conservation Importance - Special Areas of Conservation (SAC) and Special Protection Areas (SPA)**, listed under the **Habitats Directive (Council Directive 92/42/EEC on the conservation of natural habitats and of wild fauna and flora)**. In addition, it is Government Policy that Wetlands of International Importance (Ramsar sites) are also considered as European Sites. There is a duty to take reasonable steps to further the conservation and enhancement of nationally designated sites (Sites of Special Scientific Interest (SSSIs)).

12(a). Have you had pre-application correspondence with NRW, its legacy bodies or Natural England? Yes ☐ No ☒

12(a)(i). If Yes, please provide copies of correspondence with application and state which team(s) you have contacted?

12(b). Are any part of the works located *within* or *likely to affect* a designated conservation site? (SAC, SPA, SSSI or Ramsar) Yes ☒ No ☐

12(b)(i). If Yes, which designated site(s) may be affected?

SACs:

- Proposed works are within Pembrokeshire Marine SAC.
- Bristol Channel Approaches candidate SAC is approximately 0.25km west from proposed works.
- Limestone Coast of South West Wales SAC is situated approximately 1.8km east from proposed works.

SSSIs:

- Proposed works are within Freshwater East Cliffs to Skrinkle Haven SSSI.

12(c). Please provide a description of all mitigation measures proposed to avoid any impact on designated conservation sites.

A list of mitigation measures are provided within the Habitat Regulation Assessment in Appendix C.

A SSSI Assent to be granted through this Marine Licence application. Appendix D presents the preliminary ecological assessment and mitigation measures.

Please continue on a separate sheet if necessary. Please tick if you have done this ☒

12(d). If the works are not located *within* or *likely to affect* a designated conservation site, please indicated the approximate distance to the nearest designated conservation site.

Please note that if the proposed works are in or within 2km of a European Site of Conservation Importance you will have to provide suitable mitigation measure to avoid any impact on designated conservation sites.

13. Other Consents

Please detail all consents that you have applied for or received for these works

Type of Consent	Applied for	To be applied for	Reference Number	Date of Issue and Expiry
Planning Permission under Town and County Planning Act 1990 – From Local Planning Authority (LPA)				
Name and Address of LPA for location of works				
Land Owners Consent such as The Crown Estate Consent		Yes		
Port Authority or Local Harbour permissions				
Other NRW consents <i>such as Flood Defence or SSSI assent</i>		SSSI Assent to be applied for with this marine licence		
Details of NRW consent				
Other consents <i>such as Transport and Works Act Order, Section 36 Electricity Act, grant/loan sanction</i>				
Details of other consents	Water Framework Directive			

14. Statutory Powers

14(a). Does the applicant have statutory powers to consent any aspect of the project?
 E.g. coast protection authority, dredging powers, statutory undertakers Yes ☒ No ☐

14(a)(i).If Yes, please give details and state the relevant legislation that gives these powers

Morgan Sindall plc will undertake the works on behalf of Dŵr Cymru Welsh Water (DCWW). DCWW may apply permitted development rights as statutory undertakers pursuant to the Town and Country Planning (General Permitted Development) Order 1995 [non-EIA development]. Under Part 16: Class E, permitted development rights are afforded to development consisting of: '(a) development not above ground level required in connection with the provision, improvement, maintenance, repair of a sewer, outfall pipe, sludge main or associated apparatus' and '(e) any other development in, on, over or under their operational land, other than the provision of a building but including the extension or alteration of a building.'

15.Public Register

Under The Marine Licensing (Register of Licensing Information)(Wales) Regulations 2011 and the Environmental Impact Assessment Directive (Directive 85/337/EEC – as amended) , all information contained within or provided in support of this application will be placed on the Public Register unless NRW approve of the applicant's reasons for withholding all or part.

15. Is there any information contained within or provided in support of this application that you consider should NOT be included on the Public Register on the grounds that its disclosure:

15(a). Would be contrary to the interest of National Security? Yes ☐ No ☒

15(b). Would prejudice to an unreasonable degree you, or some other person's commercial interest of those of a third party? Yes ☐ No ☒

If Yes to either (a) or (b), please provide full justification as to why all or part of the information you have provided should be withheld

Please continue on a separate sheet if necessary. Please tick if you have done this ☐

16. Application Fee

16(a). What are the corresponding fee band for this application? Band 2 ☒ Band 3 ☐

16(b) Band 2 Only

Projects are charged at a fixed fee of £1920. The application will not be processed until the correct fee has been provided.

Please provide the method of payment

Method	Yes (✓)	Reference Number
Cheque		
BACS (not remittance no.)	✓	PRCAPPMORGA275
World Pay (phone or CC1)		

Please attach **CC1 Form** with application. Can be found on our web pages

16(c) Band 3 Application only

Band 3 applications are charged at on hourly rate of £120 and are invoiced in arrears. Please complete the details below which will be required for invoicing.

Customer Name	
FAO	
Purchase order number	
Address for invoice	
Telephone Number	
Email Address	

17. Declaration

I declare that to the best of my knowledge and belief that the information given in this application form and supporting documentation is true.

WARNING: It is an offence under the Marine and Coastal Access Act 2009, under which this application is made, to fail to disclose information or to provide false or misleading information and can invalidate any licence granted.

Signature  Date 1/2/19

Name (in capitals) GEOFF TILLING

Position in Company SENIOR CONTRACTS MANAGER

*Applications cannot be processed unless signed by the **Applicant** (not agent), the applicant must have appropriate level of authority within the company.*

Applications will not be processed unless signed

Appendix A: Supporting Figures

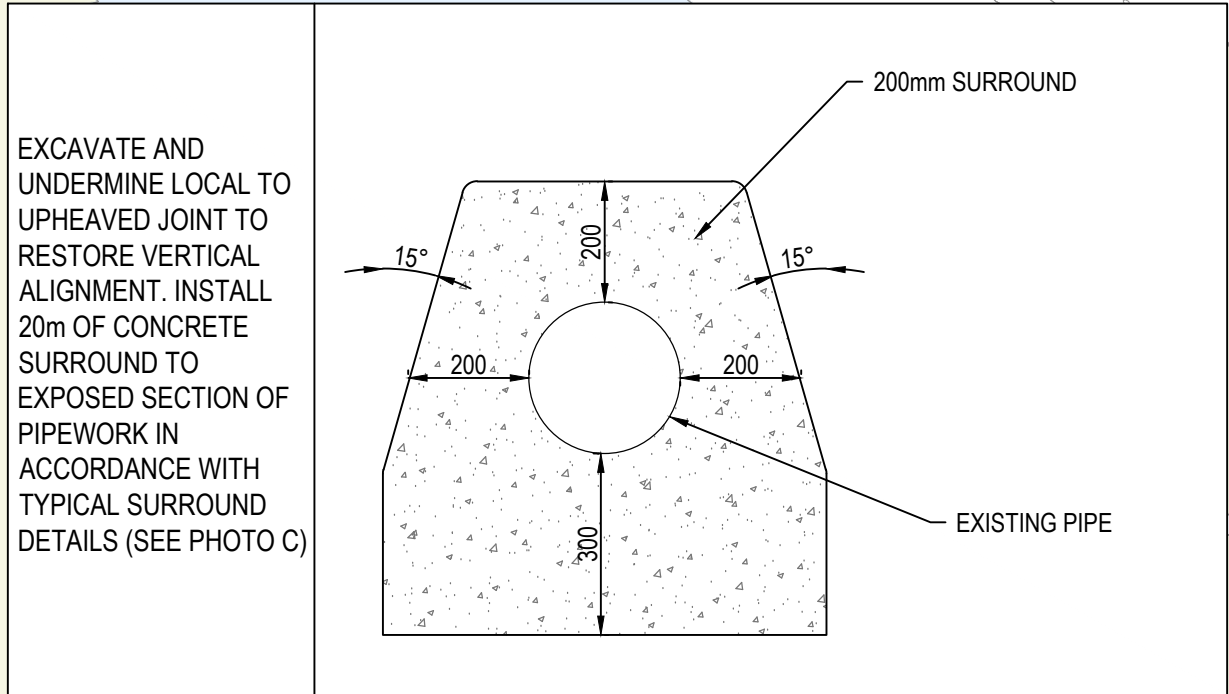
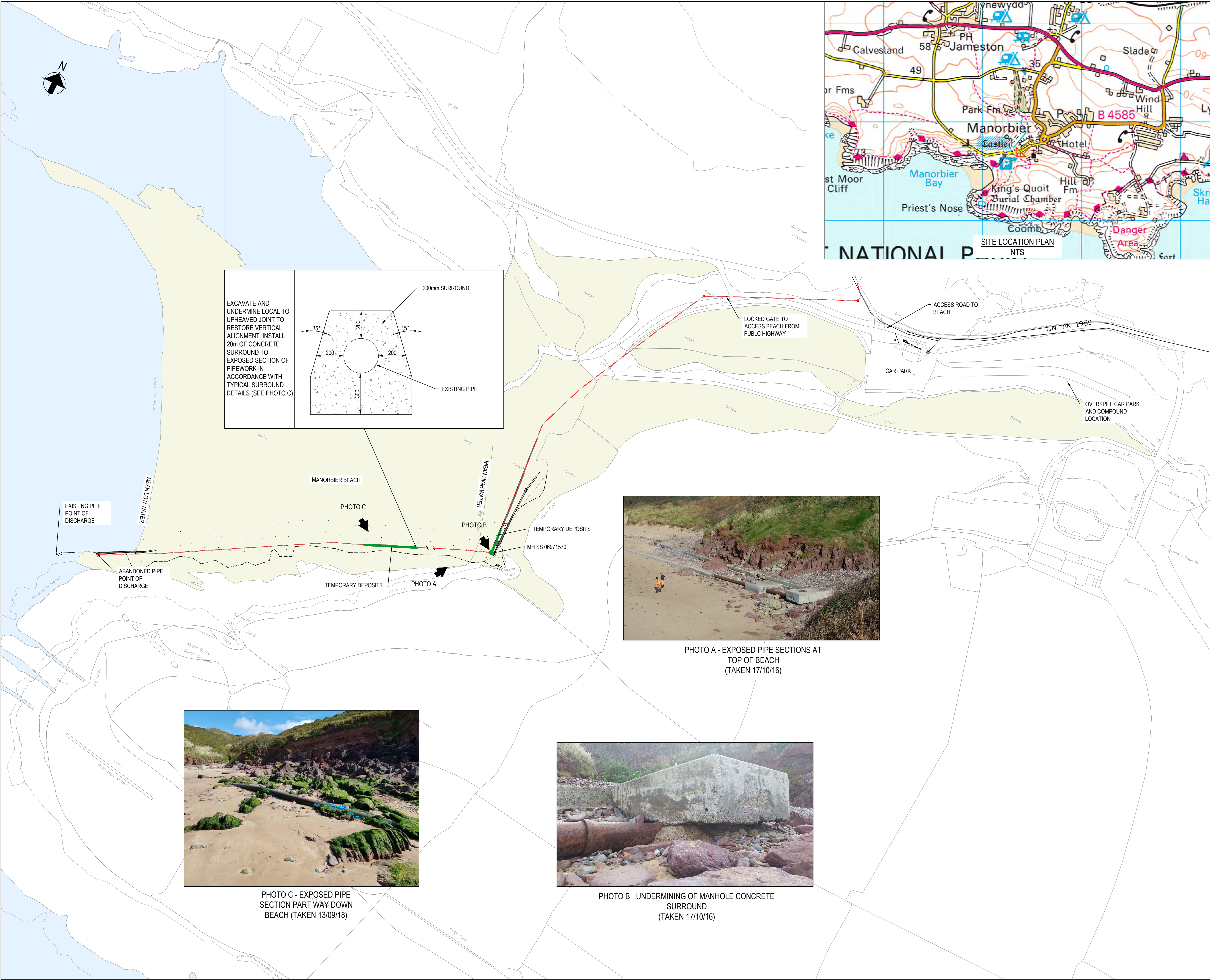


PHOTO A - EXPOSED PIPE SECTIONS AT TOP OF BEACH (TAKEN 17/10/16)

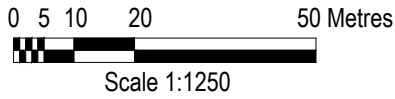


PHOTO B - UNDERMINING OF MANHOLE CONCRETE SURROUND (TAKEN 17/10/16)



PHOTO C - EXPOSED PIPE SECTION PART WAY DOWN BEACH (TAKEN 13/09/18)

LEGEND:
— EXISTING OUTFALL
— PROPOSED WORKS



P1	01.02.19	LOB	ISSUED FOR INFORMATION	X		
Rev.	Date	Drawn	Description	Chkd	Appd.	Date
 Capital Delivery Alliance Cynghrair Cyflawni Cyfalaf Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ						
Project Name: MANORBIER OUTFALL						
Drawing Title: PROPOSED WORKS LOCATION PLAN						
Suitability: X					Suitability Code: P1	
Originator: LOB		Designer: LOB		Date:	01.02.19	
Internal Project Number: 241055		Scale: 1:1250		Rev.	P4	
Drawing Number: 4692_S_205-ARP-19-AG-DR-CL-00602						

1. CONCRETE SPECIFICATION
 - C40/C50 IN SEAWATER
 - CEMENT TO BS EN 197
 - MINIMUM CEMENT CONTENT 340Kg/m³
 - MAXIMUM AGGREGATE SIZE 20mm FREEZE THAW RESISTING AGGREGATES.
 - MAX W/C RATIO OF 0.45
 - DENSITY OF CONCRETE TO BE 2300kg/m³. * OR - 100kg/m.

 NEW CONCRETE SURROUND
 EXISTING CONCRETE SURROUND
 EXPOSED PIPEWORK
 EXISTING OUTFALL PIPEWORK

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:

 MARINE ENVIRONMENT - IN TIDAL ZONE RISK OF DROWNING

DECOMMISSIONING / DEMOLITION

REFER TO THE DESIGN RISK REGISTER FOR FURTHER DETAILS.
IT IS ASSUMED THAT ALL THE WORKS ON THIS DRAWING WILL
BE CARRIED OUT BY A COMPETENT CONTRACTOR WHO HAS
CARRIED OUT A COMPREHENSIVE RISK ASSESSMENT.

M4 Capital Delivery Alliance



Drawing Title.	EXISTING MANHOLE AND CONCRETE REPAIR PIPE DETAIL
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Suitability.

CONSTRUCTION APPROVAL

Suitability Coefficient	S4
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Originator.	Designer.	Date.
LOD	LOD	10.03.17

LOB	LOB	19.06.17
Internal Design Member	Costs	Days

Internal Project Number:	Scale:	Rev.
241055	AS SHOWN	P3

Drawing Number.	
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4692_S_205-ARP-01-BG-DR-CD-05002



SCALE 1:20



SCALE 1:20

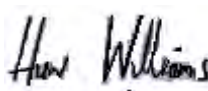


SCALE 1:20

Appendix B: Construction Methodology

Method Statement

Note: This method statement must be read in conjunction with any developed task statements.

Method Statement Title: Manorbier Outfall Repair		Scheme Title: Manorbier Outfall (1W6000/S1/S2/S3)			
		RAMS Number:- 3988			
		Start Date: October 2019			
Prepared by: Huw Rees	Job title: Engineer	Company: Morgan Sindall		Signed: 	Date: 10/12/18
Checked by: Huw Williams	Job title: Site Agent	Company: Morgan Sindall		Signed: 	Date: 14.12.18
Checked by: Kevin James	Job title: Project Manager	Company: Morgan Sindall		Signed: 	Date: 14.12.18
Issued by: A Morgan	Job title: Document Controller	Issue: Revision 0	Status For construction	Issue Date:	
Review Process: (This method statement accepted as current working document)	Name (Print)	Signed:	Status	1 st Review Date:	
	Name (Print)	Signed:	Status	2 nd Review Date:	
Issued to:	Job title:	Please acknowledge receipt of your copy of this MS by signing and returning the transmittal note.		Transmittal date:	

Method Statement

Control sheet:

Risk Assessment / Method statement – Tracking Sheet

Name	Job title	Signature	Status	Comments
Huw Williams	Site Agent			
Kevin James	Project Manager			
Mike Sellers	SHE Advisor			

Review process

No	Prompt List	Yes	No	In Part	N/A
1.	Unique project specific number and title identified for the document?				
2.	Does the method statement / risk assessment include suitable arrangements if sub-sub contractors are involved?				
3.	Authorisation and distribution personnel identified?				
4.	Brief overview including location and duration of the works described?				
5.	Specific Risk Assessment † attached and satisfactory? Are all the hazards/environmental impacts identified? Have all the risks been evaluated and controls identified?				
6.	High risk/safety critical / COSHH activities identified / controls specified? (Controls eg – Statutory permits/ licences, Security, Testing / commissioning / special training)				
7.	Scope of works identifying / listing all activities? Philosophy identified? Are all parameters identified / listed?				
8.	Temporary Works schemes identified? Philosophy identified? Temporary work drawings listed including relevant calculations? Permits required? Interfaces identified?				
9.	Names / titles / contact details of key personnel / supervisors responsible?				
10.	Resources identified e.g. personnel, supervision, equipment, plant, materials? Craneage – lifting plan in place? Lifting equipment – plan / certificates in place? Access / scaffolding requirements clearly set out?				
11.	Induction / training / permit requirements identified? Permit issue authorisation regime identified? Daily briefing and toolbox talk regime identified?				
12.	General site requirements identifying access / egress / traffic measures? Details of services / works isolation? PPE / evacuation requirements identified?				

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	Welfare / first aid facilities identified?				
13.	Monitoring & compliance Monitoring by whom Enforcement – how by whom- equipment (meters / sampling)				
14.	Interfaces / security of the client / public / other contractors identified?				
15.	Environmental controls / Waste Controller / ECCoP identified?				
16.	QC monitoring and inspection / testing regime identified? I&T Plans refs				
17.	Contingency plan e.g. emergency / fire / rescue / spill response identified?				
18.	Any special conditions identified e.g.				
19.	Management of Change – process in place to identify change requirements				
20.	Review date as required				
21.	Approvals statement incorporated?				
22.	Confirmation of Operatives briefing / Operatives induction sheet incorporated?				
23.	Any other (specify)?				
† Any Risk Assessment shall be amended / confirmed as site specific. * Status A Work can proceed as described B Work can proceed when comments are incorporated C Resubmit and agree before work can proceed					
Comments					
Note Clearance to proceed with this Method Statement does not relieve the Subcontractor of their contractual obligations, including safety, structural integrity or any implications to permanent works arising from these proposals.					

Method Statement

Contract Title	Manorbier Outfall
Contractor	Morgan Sindall
MS No	3988

This method statement has been developed further to the completion of the following references risk assessments:

Risk Assessment Number	Title
01	Manorbier Outfall Repair

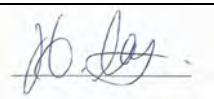
Section 1 – General Details

Scope of Works:

The activities covered in this Method Statement are to detail the construction methodology involved in Manorbier outfall works. The works involve repairing the surround to existing manhole SS06971570 and exposed 350mm dia. pipework that has had its concrete surround eroded. Approximately 20 m of concrete surround downstream of manhole SS06971570 will need to be excavated, realigned and made good with a concrete surround. All concrete on the scheme will be to a C 40/50 marine grade specification, due to the presence of seawater.

Location of the Works (Use sketch boxes if required):

Manorbier beach, access will be via the beach car park.

Prepared by:	Huw Rees		
Position held:	Engineer		
Signed:		Date:	10/12/18
Review date:	TBC		

Work Supervisor(s); TBC

Refer to Method Statement Tracking and Content Sheet

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Section 2 – Programme of Operations

Start date / time:	TBC				
Preceding Works to be Completed:	N/A				
Duration:	20 days				
Permit required:					
Permit to Work (General)	Y	Permit to Enter (Confined Spaces)	Y	Permit to Dig	Y
Hot Work Permit	Y	Out of Hours Work Permit	☐	Other (specify)	☐

Section 3 – Personnel

Include details of all personnel involved in the task and any special training, skills or qualifications required

Name	Role	Competence Details

Method Statement

Section 4 – Safe System of Work to be Adopted

4.0 Introduction

- 4.0.1 This method statement (MS) outlines initial proposals for this activity. Where it is identified that there is a need to change the method of work due to unforeseen circumstances for example, then revision, authorisation and issue will follow the same procedure as the original. This method statement is only valid when the person who has prepared it and the person who has authorised it have signed the front sheet accordingly.
- 4.0.2 Task Statements (TS) will be developed for specific tasks required to carry out the works, as and when required. The MS and TS should be read in conjunction with the site specific plan and the construction programme. The MS and TS are “live” documents and will be updated as required, with newly identified risks.
- 4.0.3 The Responsible Person must be in possession of an approved method statement and task statement for the works. The Project Manager and Foreman / Supervisor shall ensure that the works proceed according to this approved method statement and subsequently developed task statements.

4.1 Risk Assessment

- 4.1.1 Template displayed in Appendix A.

4.2 Induction / Training

- 4.2.1 All site personnel will be familiarised with the site and made aware of any hazards, by way of a site specific induction.
- 4.2.2 All operatives working on the tasks described in this method statement, risk assessment and any associated task statement must be briefed on its contents. Operatives must sign the attached briefing attendance sheet to confirm that they have been briefed and understood the contents.
- 4.2.3 Daily briefings shall be given to the operatives prior to work commencing. Tool Box talks will be planned monthly and given to all operatives on a weekly basis. The Morgan Sindall designated person must be in possession of an approved MS and TS before issuing any permits. All operatives must be briefed on the requirements of the permit before work commences.

4.3 General Site Requirements

4.3.1 Access and Egress

Access and egress to the outfall will be via the beach car park as per the photograph below. Operatives and plant will use the existing footpath down to the beach. Whilst plant are accessing or traversing the beach area, vehicle banks men will be present to control movements to ensure members of the public are not put at risk from the machines. If members of the public come near the working vicinity area where plant is moving then the banks men will stop the work and allow the public to pass. Any ramped excavation works will be undertaken using the site excavator that will shape the ground into a suitable gradient. If deemed necessary type I and Geo grid will be used to provide stability for the ramp.

Tide times will be monitored throughout the duration of the works using the following timetables:
<https://www.tidetime.org/europe/united-kingdom/manorbier.htm>

There is a six-hour period between high tide and low tide which will dictate when work can be carried out. Some work will be able to be undertaken above the tide level, whereas on other occasions the site team will only have a 3 hour working window. Therefore work shall be programmed accordingly to suit the tide times.

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Where the proposed works are above the mean high tide (see sketch box 1), work activities on site will be segregated from the public area using double clipped heras panels and feet. Panels will be clearly signed to deter any third parties from entering the site working area. Working areas that are affected by the tide shall have temporary barriers set up during the shift as a visual barrier to segregate the working area from the public.

At the end of each working shift all equipment will be returned to the site compound and stored securely. Any equipment left on site will be contained within the Heras security fencing.

4.3.2 Safety of Services

With reference to the statutory undertakers drawings and trial hole information, all known services will be marked on the ground. A CAT scan will be carried out and a permit to excavate issued prior to carrying out excavations on site. Excavations carried out within 500mm of known services will be carried out by hand.

Not all services encountered will be identified from the service plans and CAT scan – therefore utilise recognised best practice whilst completing excavations.

No lifting operations can take place before a permit to lift has been issued. All lifting operations are to be controlled by a permit to lift produced by a competent appointed person. Machine driver, Slinger Signaller/Crane Supervisor and appointed person all to be CPCS trained and competent.

4.3.3 Safety Works or Isolation Measures

Throughout the works, the tide levels will be continuously monitored by a supervisor to ensure the work force and plant are not cut off by the rising tide. If there is any doubt, all work must cease and all plant and operatives to leave the foreshore.

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4.3.4 Site office, welfare and first aid facilities

A suitable location will be provided within Manorbier as a temporary site compound where a site office and welfare facilities will be located and where plant and materials shall be stored. No plant or materials will be stored on the foreshore or beach areas.

4.4 Interface Issues

The local community will be fully engaged and advised of the project prior to works starting on site. Any interface with DCWW operatives will be controlled at the site level.

4.5 Scheme Construction Methodology

If any of the methodology or construction sequence detail below should change, STOP works immediately, make safe and report to the site supervision.

Preliminary Instructions

- Main lifting on the project will primarily be undertaken by the onsite excavator. A valid lift plan will be compiled and completed by an authorised CPCS appointed person complete with a schedule of lifts. All slinging of equipment will be undertaken by a CPCS certified slinger/signaller. The excavator driver must also hold a valid CPCS card with the relevant 'lifting with excavators' category and be component in the proposed works to be undertaken.
- All lifting chains and equipment will have current test certificates and shall display the current colour coded lifting tag. A copy of the test certificates will be held in the site file.
- A Delivery Lifting Plan & Lorry Loader Checking Form must be completed prior to any delivery offloading on site and the supplier must also have a safe system of work for offloading.
- It may be necessary to temporarily leave broken out concrete or rock on site at the end of a shift if it is not possible to remove fully due to time constraints. All excess and waste materials however will be removed from the beach and disposed of off-site at a suitable licensed facility

4.5.1

Works to manhole SS06971570

Since this manhole has been undermined due to tidal activities the bottom of the concrete manhole is completely gone leaving the pipe exposed. The design requires a new concrete surround, a minimum of 1 m below the underside of the existing concrete. Therefore beach rocks will be removed from the underside of the manhole using the site excavator. All rocks will be stored in the material storage area and segregated for further use. A temporary Works design shall be required to support the concrete slab in order to allow the material to be excavated below it. Alternatively the concrete will be saw cut by a specialist subcontractor and broken up using the pneumatic breaker or excavator. If this is the case then a separate RAMS will be made to cover both scenarios

The site team will then excavate the sand layer to the agreed design depth and proceed to pour a blinding layer of concrete. All sand will be stored in a separate area.

Once the blinding has cured the site carpenter will drill dowel bars into the existing manhole and attach steel reinforcement to the underside of the manhole. All dowel bars will be drilled to the agreed depth and anchored using a chemical fixing product. Material data sheets and COSHH

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assessments will be used and briefed to the site operatives on the safe use of chemical anchors and their disposal.

If the saw cut option is adopted shutters will be installed to the full height of the original concrete slab level.

The carpenter will then erect shutters around the underside of the manhole and provide suitable strutting. For manual handling purposes the site carpenter will be assisted for any lifting works.

If the manhole is still on struts at this point, the underside of the manhole can be poured in two stages. The first pour will cover two thirds of the area of the manhole base, while the other third is supported by props. Once the concrete has cured to a sufficient strength the temporary props will be taken away from the final third, the above process will be repeated for shuttering and meshing and will then be filled with concrete.

The concrete face will be scabbled when necessary to ensure that the next concrete pour bonds correctly to the first part.

The concrete wagon will be supervised by a site banksman at all times.

The concrete will be poured into a skip, and the bagging placed inside the letterbox shuttering under the manhole. Under no circumstance will the operatives on site stand underneath the concrete skip.

Once the concrete has been poured it will be compacted using a vibrating poker and left to cure. Care will be taken to ensure that no concrete is left on the beach or to enter any water body.

The concrete wagon will wash out in designated washout area away from the beach or any water course.

Once the concrete has cured the shuttering will be removed and the finish inspected.

If the original concrete slab is saw cut and removed, the entire shutter could be poured in one operation which will save time overall.

Pipework renovation

The pipework downstream of the manhole has become misaligned and exposed due to tidal activity.

To rectify the misalignment of the pipe the site team will excavate approximately 400 mm underneath the pipe to expose it fully. The site team will also excavate along its linear length until it finds sections of pipe either end of the misalignment that are correctly aligned in the vertical plane.

Once the full length of the pipe is exposed the pipe will be lifted using the excavator straps. This will lift any pipework that has dipped. If the pipework is too high in the vertical plane then the site excavator will press down upon any bowing. Before pressing down on any pipework timber chocks will be placed on the crown of the pipe so that it is not crushed.

Sandbags could also be used to spread the load on the pipe.

The affected linear length of the pipework measures approximately 20 m and the site team will realign all of the affected pipework. The gradient will then be checked using either a spirit level or auto level to ensure that the gradient is satisfactory.

The underside of the pipework will then be blinded with concrete following the same methodology outlined above, using the marine grade mix. The blinding will need to be thicker than normal to prevent it being washed away at high tide.

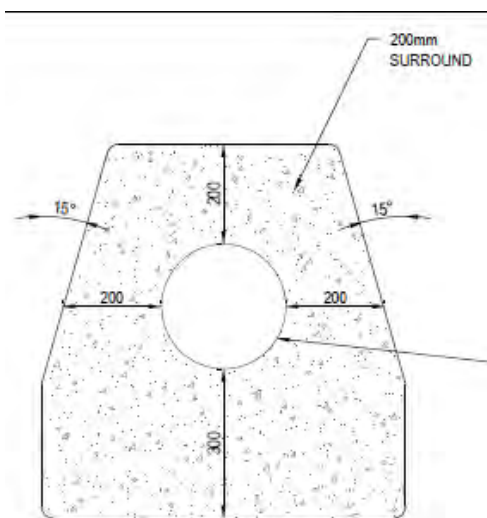
After the concrete has cured temporary timber props will be used to hold the pipework in place ensuring that there is no sagging or further misalignment.

The carpenter will then erect shutters along the 20 m length of the pipework so that it can be concrete surrounded.

All shutters will be struttled and pinned and will have the correct chamfer as per design shown:

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This section is affected by the tide and will be underwater during high tide (see sketch box 1). Therefore the length of the pipework will be split into manageable parts that can be completed during an arranged shift pattern.

Once the shutters have been inspected by the site manager concrete will be poured along the 20 m length, using the C 40/50 marine grade mix.

The pouring sequence will follow that which has been outlined above.

Once the concrete has cured the timber will be removed from the face of the concrete and placed in the timber skip.

4.7 Contingency Plans

- 4.7.1 In the event of a spill on site no matter how minor, site personnel must firstly find the source of the spill and **Stop** it, then **Contain** it by using the equipment available in the Spill Response Kit. Then **Notify** the Project Manager, Foreman or Engineer of the details of the incident. A clean-up of the spill will be undertaken.
- 4.7.2 In the event of a serious injury which as a result the operative cannot be safely moved the Coastguard will be called immediately by calling 999.
- 4.7.3 Should one of the vehicles break down whilst on the foreshore, a towing chain or strap will be fitted to allow one of the other vehicles to tow it to safety.
- 4.7.4 First Aid kits are available in the site cabins and vehicles and are also kept by appointed First Aiders.
- 4.7.5 Damage to any statutory undertakers apparatus should be notified to relevant people using the following contact numbers:-

Statutory Undertaker	Additional Info.	Number
BT	Emergency & Dial before you dig	0800 9173993
WPD	Emergency	0800 052 0400
Wales & West Utilities	Emergency	0800 111 999
DCWW Pollution Helpline	Sewerage	08000 853968
DCWW Control Room	General Enquiries	08000 520130

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Section 5 – Plant, Equipment

Match plant and equipment to qualified personnel and include any specific PPE details.

Plant and Equipment

Equipment description	Test Certificates in date (matched to equipment)	Operator details
8t Tracked Excavator		
6T Dumper		
Tractor and trailer		
Lifting Equipment Tagged and Tested		
Hand power tools e.g. drills		
Electric/Petrol Disc Cutter		
Cable avoidance tool and generator		
Small tools e.g. hammers, saws		
Compressor/generator		

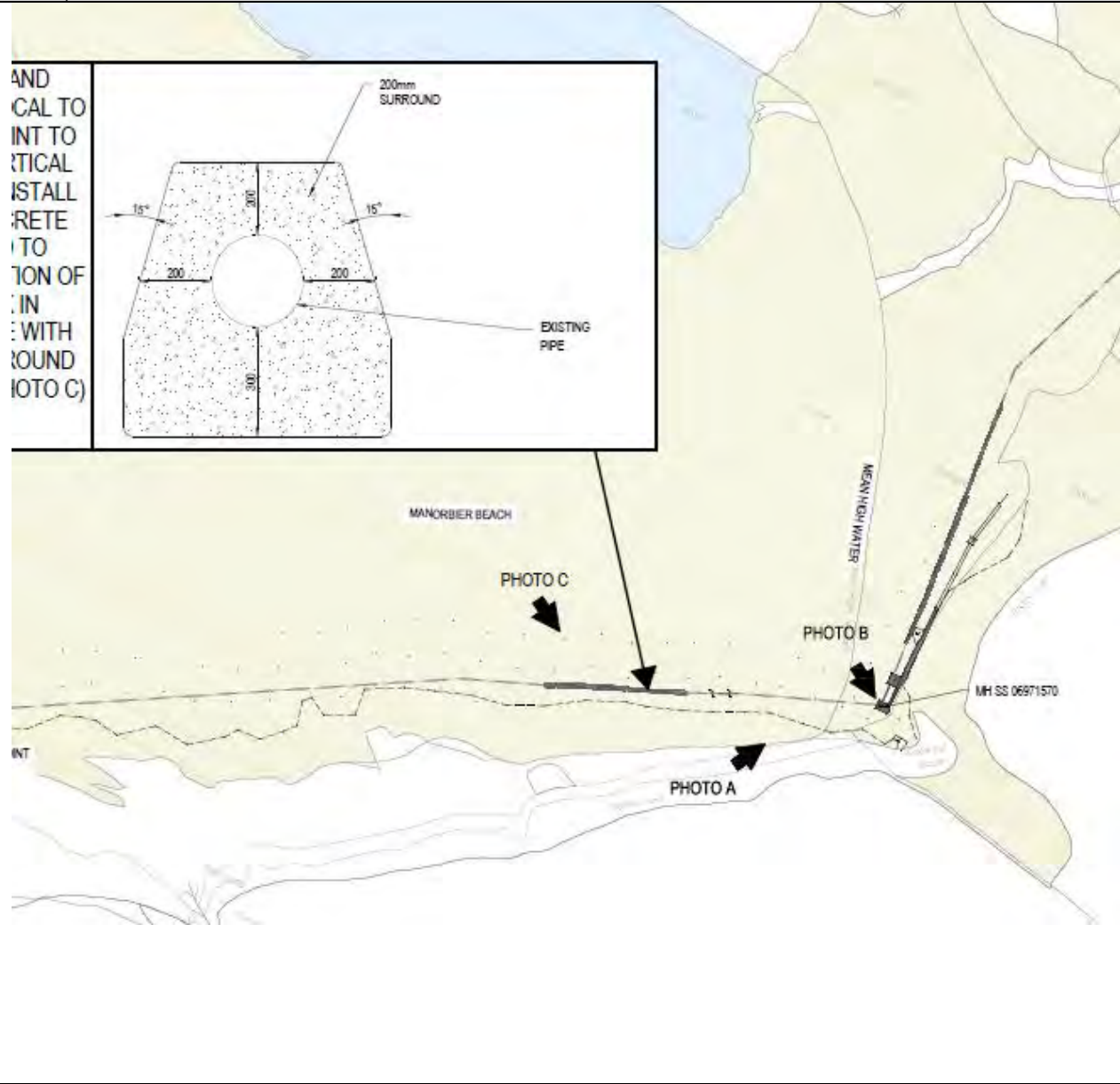
Personal Protective Equipment (PPE)

Equipment description	Specification (e.g. type, grade)	Training required
<i>Fluorescent jackets or waistcoats</i>	<i>(to BS EN 471 Class 2) (Class 3 on high speed roads))</i>	
<i>Safety glasses or goggles</i>	<i>(to BS EN 166-F for general site work)</i>	
<i>Safety helmets</i>	<i>(to BS EN3 97)</i>	
<i>Steel toe capped boots with steel midsole</i>		
<i>Gloves (appropriate for task)</i>		

Method Statement

Section 6 – How environmental matters are controlled

Refer to prompts in the SHE Risk Assessment Form and project Register of Environmental Effects (SE FRM1).Sketch box 1



Method Statement

Receipt Acknowledgements

Supervisor in charge of the Work

I confirm that I have read and understand the requirements of this method statement and associated risk assessments and will ensure their communication to operatives under my control and to those who may be affected by its requirements

Signed		Date	
Print name		Supervisor	

Communication

Communicate the contents of the Method Statement to all those involved or affected by the works and record their details below.

Name	Signature

NOTE:

1. If you have any doubt about any information given or contained in this Method Statement – ASK FOR CLARIFICATION.

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FORM



Project title and contract no.		Manobier Outfall		Risk assessment no.		01		Risk Factor							
Activity		Replacement of existing outfall		Location		Manobier		Risk Quantity		No injury, damage or environment impact	Minor injury, damage or environment impact	Major injury, damage or environment impact	Fatality, building loss, catastrophic environment impact		
Person conducting assessment		Huw Rees		Date											
Person supervising work				Date											
Persons exposed															
Employees	x	Other workers	x	Public/ visitors	x	Young persons		Almost no probability		A	A	A	U		
New / expectant mothers				Disabled		Others									
Estimated total number of persons at risk			5												
Hazards (what might cause harm?)		S	H	E			S	H	E	A small probability		A	A	U	U
1	Adverse Weather Conditions	✓			17	Loading/Unloading	✓	✓							
2	Cold	✓	✓		18	Materials	✓	✓		A small probability		A	U	U	U
3	Electricity				19	Moving Parts of Machinery	✓	✓							
4	Excavation	✓			20	Proximity to Water	✓	✓	✓	Almost certain		A	U	U	U
5	Fire/Flammable Atmosphere				21	Scaffold									
6	Floor/Ground Conditions	✓			22	Sharp Objects				Acceptable		U	U	U	U
7	Flying Particle/Dust	✓	✓	✓	23	Stairs/Steps									
8	Hand or Power Tool	✓	✓		24	Static Equipment/Machinery				Unacceptable		U	U	U	U
9	Hazardous Substance	✓	✓	✓	25	Structure									
10	Heat/Hot Work				26	Temporary Works				Notes:		Acceptable	U	U	U
11	Lack of Experience	✓			27	Vehicle/Mobile Equipment	✓	✓	✓						
12	Lack of Training	✓	✓	✓	28	Working Hours/Fatigue	✓	✓		Unacceptable		U	U	U	U
13	Lack of/too much Oxygen				29	Workstation Design									
14	Access	✓	✓		30	Work at Height				Notes:		Acceptable	U	U	U
15	Lifting Equipment Appliances	✓			31	Other									
16	Lighting	✓								Notes:		Acceptable	U	U	U
										1. Physical Hazards are the nature of issues that may cause harm. Tick box for hazard.					
										2. Preventative / Control Measures are the actions that will stop it going wrong.					
										3. Control measures are to ensure that residual risks are reduced to a minimum. Where controls fail to reduce the risk to an acceptable level then refer assessment to your line manager.					
										4. If the operations are likely to affect the public or the safe operation of a public infrastructure or transport system, the control measures must reduce the likelihood of significant harm to the level that existed before our work commenced.					
										5. Where young persons or expectant mothers are involved in the activity, ensure that any additional controls are put in place in accordance with local procedures.					
										6. In addition to the above, consideration must be given to other individuals' susceptibility due to pre-existing health conditions, e.g. bad back, poor hearing. Additional 'human factors' such as ergonomics, workplace design, etc. should					

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			also be considered. 7. Where a hazard is identified that is not listed in the Physical Hazards list, enter the hazard description followed by other in brackets i.e. (Other).		
Hazard no. (from page 1)	Nature of risk (What might go wrong?)	Risk before controls U / A	Control measures (How do you stop it going wrong?)	Control measure implemented by (name)	Risk after controls U / A
14, 16, 20	Being cut off due to incoming tides - Damage to plant - Loss of materials - Potential drowning	U	- Works to be undertaken during lowest possible tide levels to provide suitable access and egress. - Work to be undertaken during good weather conditions. - Tide levels to be monitored throughout the work to ensure operatives, plant and materials are safely removed from site before being cut off. - Minimal quantities of labour and kit to be taken to work area. - Work to be carried out during day light hours.	Site Supervisors/ Operatives	A
4, 6, 26	Excavating under concrete slab - slab collapses trapping/crashing operatives - loss of limbs	U	- Saw cut slab and remove/breakout in manageable sections - temporary Works design to support slab	Site Supervisors/ Operatives	A
9	Environmental Threat: Spillage or use of chemicals such as diesel, concrete, grease, resin resulting in environmental pollution or harm to personnel	U	- Use of environmentally friendly products where possible. - COSHH assessments for all COSHH items - Dispose of all waste materials to designated skips etc. - Emergency spill kits are to be maintained at every work location and with each main item of plant. - Equipment to be stored on designated drip trays/bunded areas - Minimal quantities of materials, fuels etc. to be taken on to foreshore.	Site staff, operatives	A

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6, 14	Working on construction sites - Slips, trips, falls. - Sprains, strains, broken limbs.	U	- Ensure good housekeeping of working areas. - All personnel to have received a specific project and site induction. - Footwear to have good grips and soles. - Use of crawling boards on rock to prevent slips and falls. - Where possible do not walk across rocks and avoid obvious wet or seaweed covered areas	Site Supervisors/ Operatives	A
7, 8, 12, 19	Working with construction plant - Noise and vibration - Ear damage - Environmental impact i.e nuisance noise and damage to properties from vibration - Dust/debris blown into eyes, off cuts of tying wire flying into eyes. - Catching hands on sharp or rough surfaces. - Injuries to eyes, possible blindness. Cuts, lacerations to hands and fingers.	U	- Ensure all plant has noise reduction measures in place and working correctly i.e. baffles, acoustic jackets. - PPM scheme to ensure plant working correctly. - All personnel must wear safety glasses/goggles and gloves at all times once they enter the working area in addition to the mandatory high visibility clothing, hard hat and safety boots. CPCS trained plant operatives. (or similar approved) - Switch off all plant when not in use. - Vibration and noise monitoring during certain operations.	Site Supervisors/ Operatives	A
7, 27	Interaction with public - Injury to members of the public due to plant and materials crossing public beach area - Injury to members of the public during works	U	- Minimum quantity of plant and materials to be taken to the work area to reduce number of trips across beach. - Vehicles to be marshalled by operatives walking in front to control speeds. - Where possible avoid busiest locations and abundance of people. - Work area to be controlled to prevent members of the public encroaching by banksman. Stop works if members of the public enter working area.	Site Supervisors/ Operatives	A

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12, 15, 17, 19	Lifting operations Load falling due to failure of lifting equipment, or incorrectly slung loads Dropping of load in an unsafe manner uncontrolled slewing causing collision with plant or operatives Serious injury due to crushing, possible death	U	- All lifts to be controlled by trained/competent slinger/signaller. - Lift plan to be completed by crane appointed person and plant certificates to be in place. - No personnel to stand under or near to suspended loads. - Safety zones to be established around lifting operations. - All lifting equipment to be thoroughly examined prior to use - All drivers to be competent experienced and trained to CPCS standard. - Weather conditions to be monitored.	Appointed person, machine operator, slinger/signaller, Site Supervisors.	A
14, 17, 30	Unloading of materials Operatives falling off the bed of delivery vehicles whilst assisting with the unloading of materials/plant resulting in serious injury/fatality.	U	- Delivery vehicles to be fitted with integral edge protection barriers. - Under no circumstances are operatives to access the bed of a lorry unless a safe system of work is in place and agreed by the site management. - Hiab off-loading form to be completed and authorised.	Site Supervisors, Operatives.	A
12, 27,	Use of construction plant. Possible crushing of operatives and pedestrians	U	- All mobile plant must only be operated by suitably licensed and trained operators i.e. CPCS cards. - Operatives to wear high visibility clothing - Banksman to be appointed to supervise works - Segregated pedestrian and vehicle access wherever possible.	Plant operator, site personnel, banks man. Site supervisors.	A
9	Contact with sewage - Weils disease - Waterborne pollutants and bacteria causing death	U	PPE to include safety boots/wellingtons, hard hat, glasses, hi-viz, gloves, disposable overalls/oil skins, waders and face mask.	All operatives, Supervisors	A

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	or serious injury.		- Maintain good personal hygiene practices - Avoid breathing in sewage dust or spray – dust mask/face masks should be worn - Clean contaminated equipment onsite, do not take contaminated equipment home for washing. Where possible isolate flows as much as possible to reduce likelihood of contact.		
8, 27	Noise from works: - Noise level too high resulting in noise induced hearing loss. - Disturbance to residents.	U	- Noise to be reduced by engineering means wherever practicable, e.g. use of noise reducing blades, purchasing of silenced equipment, maintenance of equipment to manufacturers specification to avoid worsening noise, e.g. ensure rotating parts are checked for balance and replace if necessary. - Control of Noise at work regulations 2005 to apply - Where noise level is above the 1st action level, currently 80dB(A), hearing protection to be provided on request. - Where noise level is at or above the second action level, currently 85dB(A), appropriate PPE must be worn. - Operatives to be supplied and wear ear defenders to provide protection at 500-2000Hz frequency. Standard Noise Reduction (SNR) - 28-32dB - Approved to EN 352-2.	Site Supervisors, Operatives.	A
7, 8, 12, 19	Use of Abrasive Wheels: Injury to user and other personnel from flying debris or incorrect use of wheel	U	- Use of goggles (to BS2092) - Wear mandatory PPE inclusive of ear defenders - Tool box talks - Ensure all necessary guards are in place - PPM scheme	Site Supervisors, Operatives.	A

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			- Competent person only to change the blade ensuring speed match. - Do not use side of blade for any use - Ensure operatives have received abrasive wheel training.		
7, 8, 12, 19	Contact with flying particles: Injury from cutting/grinding operations	U	- Use dust suppression as required - Wear safety spectacles/goggles suitable for the task being carried out - Ensure the manufacturer's recommended/provided guards are present and set correctly on all tools - Ensure a clear area around operation before commencing - Heat resistant clothing - Only trained/competent operatives to use equipment - When using disc cutters always cut away from other operatives and inform anybody in the immediate area that cutting will soon commence	Site Supervisors, Operatives.	A
6, 18	Material Storage: Improper storage/stacking of materials which could overturn/topple resulting in serious injury/fatality to nearby site personnel.	U	- An designated storage area will be fenced off using pedestrian barriers - Good housekeeping must be maintained at all times. - Visual check on lifting points to ensure integrity - Materials to be stacked on firm level ground.	Site Supervisors, Operatives	A
11, 12, 15, 19, 27	Use of Quick Hitch Risk of operatives being struck by a falling excavator bucket or attachment as a result of incorrect attachment or missing locking pins, resulting in death or major injury.	U	- CPCS Trained and Certified machine drivers/Operatives. - Operatives are prohibited from working beneath excavators - Machine operators must be trained and deemed competent to operate the type of quick hitch system fitted to their machine. NB:	Site Management, Operatives & Operators	A

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	• Bucket Failure/Falling whilst digging/grading causing death, major injury • Risk of serious injury to the excavator driver when changing attachments to the quick hitch mechanism. Incorrect attachment change not in accordance with operators manual resulting in death, major injury to persons within the operating area of the machine • Failure of Quick Hitch or Attachments due to incorrect fitting. • Failure of Quick Hitch or Attachments due to crowding.		Operators must demonstrate competence by a change of bucket in the presence of Site Supervisors. • Magnor Plant Operators must be inducted by Magnor plant before being employed on a Morgan Sindall Site. • Semi Automatic and Automatic Single locking Quick Hitches are banned on all Morgan Sindall Sites. Quick hitches must be either then Fully Automatic Double Locking or of the Manual type. • Machine operators must sign a declaration at induction to confirm that they have been trained in the use of the machine quick hitch (Quick Hitch Equipment Pre – Start Arrival Check Form) and that they have read and understood the operators manual specific to that quick hitch. • In date certificate of thorough examination or certificate of conformity for all excavators. • Manufactures installation and operation manuals for all types of Quick Hitches must be kept within the excavator and not removed from the cab. • PPM's on all plant to include quick hitch checks. • Visual / physical inspection to be carried out on quick hitch system at the start of each shift or when attachment is changed to ensure the safety pin / latch or clamp connection is in place and secure. NB: Operators must physically get out of the cab to check this – Mandatory Instruction) • Manual quick hitch lever - to be inspected by driver after change of bucket without fail to		
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			ensure it is in its locked position. - Buckets and other attachments & “Shake Rattle Roll tests” shall be changed in a safe area away from operatives/third parties. “Shake, Rattle, Roll” test of the fitted attachment, or placing the bucket flat on the ground then trying to un-crowd the bucket so that the bucket tries to disengage from the QH. Test to be carried out when a bucket is changed and at the start of every shift. - Bucket to be removed prior to any lifting operation by the excavator - Any excessive movement of bucket connected via a quick hitch to be reported to site supervisor immediately for investigation of working mechanism of the quick hitch. - Any visual indication of hydraulic leak near to quick hitch mechanism to be reported immediately, stop work immediately and do not commence work until authorised to do so by site supervisor. - Special care to be taken when using quick hitch systems: Manual: This requires the winding of a screw or the use of a bar to open a spring actuated latch. Automatic: This is operated entirely from the cab of the excavator and usually has an independent locking system which functions automatically and does not rely on hydraulic pressure to hold the latch in the closed position. The operator must ensure the locking system has completed before proceeding with work.		
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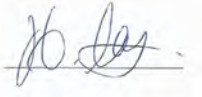
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			- Under no circumstances must Piling Hammers be fitted directly to the Quick Hitch, these must be fitted directly to the Excavator Dipper Arm. - Breakers may not be fitted to the Quick Hitch for tasks of a long duration, they must be fitted directly to the Dipper Arm. - Piling Hammers and Quick Hitches must be fitted by a competent service engineer. - Ensure that the correct size of excavator has been chosen to adequately carry out the task.		
4	Excavation works Striking buried services resulting in electrical shock, injury from damaging pressurised pipes etc.	U	- All excavations will be covered by a permit to excavate. - Prior to issue of the permit all service drawings are to be studied and a thorough C.A.T scan performed. - All services known and found to be marked on site. - Excavation to be carried out by hand when 500mm or less from a known service. - Trench dig to be supervised by a competent trained and experienced person - If unknown service is found, stop and report it to the site management team.	Site management team, work supervisor, services coordinator	A
6, 14, 16, 23	Falls on same level - Trip over - Fall onto sharp objects - Land on uneven surface - Fall into existing chambers	U	- Good Housekeeping, ensure clean and tidy work spaces - Ensure all materials are stacked as per manufacturers recommendations - Place waste material in the designated areas - Designated walkways to segregate operatives and materials - Signage as necessary	Site Supervisors, Operatives	A
2, 3, 7, 8, 12, 19	Use of small tools: - Injury due to faulty equipment - HAV's exposure limits exceeded	U	- All guards are to be in place as per manufacturers recommendations - Tool box talks on safe use of equipment	Site Supervisors, Operatives	A

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			- Plant to be used in accordance with manufacturer's instructions. - Trained personnel for use of plant. - Remove any faulty tools/equipment from service immediately and inform your supervisor - PAT testing all portable electrical equipment - Use of correct PPE to suit equipment being used - PPM's for each item to be completed by a competent person - Keep hands warm during colder weather - Limit "trigger" time for equipment being used and rotate workforce - Exercise hands to increase blood flow - Record actual trigger times on daily form		
9, 12, 18	Contact with/exposure to hazardous substances: - Injury/Poisoning/Ingestion of COSHH items - Concrete Burns - Weils Disease	U	- Use alternative less harmful substances - Complete COSHH assessment and brief operatives accordingly - Training as required - Wear appropriate PPE - Only authorised personnel to use substances - Tool box talks (COSHH) - Disposal to designated COSHH skips and further disposal to licensed tip ensuring a waste transfer note has been completed. - Do not use materials until fully aware of the associated risks - Wash off any concrete/mortar splashes as soon as possible - Report any burns to your supervisor – do not ignore burning "sensations" check them out. - Good Hygiene – wash any area that came into contact with substances thoroughly	Site Supervisors, Operatives	A

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6, 12, 17, 18, 28	Manual Handling: - Operatives suffering musculoskeletal injuries - Damaging items being lifted				U	- Provide regular manual handling training/toolbox talks - Assess load to be lifted using TILE and use mechanical means of lifting if possible - Complete manual handling risk assessment if mechanical lift is not possible - Break down load to a more manageable size - More than one person to complete lift if load is awkward or irregular in shape				Site Supervisors, Operatives		A	
Method Statement required?		Yes	☒	No		Method Statement number:		MS/ 1W6000					
Additional Risk Assessment (Tick box as required)						PPE (Tick box as required)							
Noise		COSHH		Handling		Helmet		Respiratory		Boots		High Vis	
Asbestos		Lead		Radiation		Hearing		Eye		Harness		Others	
		Name				Signature				Date			
Person completing the assessment:		Huw Rees								10.12.18			
Person reviewing the assessment:		Kevin James											
Date to be reviewed:		TBC											

Appendix C: Habitat Regulation Assessment

Welsh Water

Manorbier Outfall

Statement to Inform an Appropriate Assessment

Issue | 1 February 2019

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 241437-16

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ARUP

Document verification

ARUP

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		Signature			
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Appendix A

Habitats Regulations Assessment Process

Appendix B

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Appendix C

Environmental Constraints Plan

Appendix D

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Appendix E

Desk Study Summary Results

1 Introduction

Ove Arup and Partners Ltd ('Arup') has been commissioned by Welsh Water, working as part of the Capital Delivery Alliance (CDA), to submit a Habitats Regulation Assessment (HRA) report in compliance with the requirements of the Conservation of Habitats and Species Regulations 2017; hereafter referred to as the 'Habitats Regulations'.

Welsh Water are proposing to repair the Manorbier outfall, which has had a history of issues, and currently the pipe capping has been washed away. Without reparation, the outfall is further at risk of collapse and poses both a concern to the environment and bathing water.

The site is situated on the coast of Manorbier, Pembrokeshire at National Grid Reference SS061975.

1.1 Purpose of this Document

This document has been prepared by Arup, on behalf of Welsh Water as the competent authority, of the potential for effects on European Sites from the implementation of the proposed works, as required by Regulation 63 of the Habitats Regulations 2017.

This HRA will therefore follow the consultation process required by Regulation 73 of the Habitats Regulations.

1.2 Structure of this Report

This report uses the following structure:

- Section 2 provides information on the proposed works (the 'project') including the environmental baseline and a description of the development;
- Section 3 provides information on the data and methodology used in the assessment;
- Section 4 provides information on the European Sites that are considered within the assessment;
- Section 5 provides a screening assessment for the potential pathways for effects;
- Section 6 provides the appropriate assessment of the likelihood of adverse effects occurring with mitigation measures and the residual effects;
- Section 7 provides proposals for monitoring; and
- Section 8 provides a summary and conclusions.

1.3 The HRA Process

Regulation 61 of the Habitats Regulations requires a competent authority to undertake an ‘appropriate assessment’ of any plan or project (alone or in combination with other plans and projects) which is likely to have a significant effect on the features of a European Site, unless the project is directly connected with the management of the site. In light of the conclusions of the assessment, the competent authority may proceed with or consent to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site. European Sites include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). UK Government policy requires proposed SACs and SPAs to be treated as European Sites along with wetlands designated under the Convention on Wetlands of International Importance (Ramsar sites).

All plans and projects should identify any possible effects early in the plan/project making process and then either alter the plan/project to avoid them or introduce mitigation measures to the point where no adverse effects remain. The ‘competent authority’ shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site or sites concerned. In coming to a conclusion, the Competent Authority must consult with the Statutory Nature Conservation Organisation (Natural Resources Wales) and have regard to their comments. They may also consult the general public if considered appropriate.

The assessment of a project under the Habitats Regulations can be split into four sections as shown in Appendix A¹.

Stage 1 is the assessment of the likelihood of a plan or project having a significant effect on the features of a European site. This is the trigger for the need for an Appropriate Assessment as set out in Regulation 61(1). The Appropriate Assessment (Stage 2) is the detailed consideration of the potential effects of the plan or project in relation to the conservation objectives for the features of the European Site(s) to determine if there is likely to be an adverse effect on the integrity of the site (i.e. an effect that would compromise the site meeting its conservation objectives). Providing it can be demonstrated that with appropriate mitigation measures the plan or project would not give rise to an adverse effect on the integrity of a European Site, the plan or project can proceed.

Where this cannot be demonstrated or there is uncertainty, the assessment would then need to consider if there were any other alternatives to the plan or project (Stage 3) that would not give rise to adverse effects on the integrity of the European Site. If there are no alternatives, Stage 4 would then consider if there are any Imperative Reasons of Overriding Public Interest (IROPI), only at this stage can Compensatory Measures be considered. It is very unusual for plans for projects to be considered in Stages 3 or 4.

¹ Tyldesley, D. (2011). Assessing Projects under the Habitats Directive: Guidance for Competent Authorities. Bangor: Countryside Council for Wales.

1.3.1.1 Mitigation

With regards to recent case law (Coillte vs People against Wind²) the inclusion of plainly established and uncontroversial mitigation during Stage 1 is no longer considered appropriate. Mitigation, as considered by the Centre Européen de Coopération Juridique (CECJ) in regard to the case law², is interpreted to mean measures that are intended to avoid or reduce the harmful effects of the envisaged project on the site concerned.

Consequently, any project which identifies an impact on a European Site and where avoidance and mitigation is applicable will need to address these measures during Stage 2 Appropriate Assessment.

² People over Wind, Case C323/17 European Court of Justice, 12th April 2018.

2 Project Description

2.1 Site Description

The site is located on the coast of Manorbier, 8.0km south-east from Pembroke and within the county of Pembrokeshire, South Wales. The site is broadly centred on National Grid Reference SS061975.

The project involves upgrading infrastructure at Manorbier outfall. The proposed works are displayed in Appendix B.

2.2 Proposed Works Description

In December 2012 operations at the site described how two sections of pipe were washed away across the beach, which could have led to a Category 1 pollution incident if the pumping station storm tanks had discharged. A repair was undertaken (November 2012) using concrete to protect replaced sections of the outfall pipe.

The Intervention Brief, largely informed by the Risk Capture Database, states that the pipe capping has been washed away, which has caused the pipe to move. It is acknowledged that Natural Resources Wales (NRW) are aware of the associated issues with this outfall.

The following works to Manorbier Wastewater Treatment Works outfall are proposed:

- New concrete surround to existing pipe and manhole at top of the beach; and
- Excavation of 20m length of concrete surround downstream of top manhole, realignment and outfall made with good with concrete surround.

All proposed works will be undertaken under Schedule 2, Part 16, Class A of the General Permitted Development Order 1995, as the works are classed as permitted development. As works are being carried out below Mean High Water a Marine Licence is further required.

Access and egress to the outfall will be via the beach car park, moving down the road and using the footpath towards the foreshore. The site compound location is anticipated to be within the beach car park on hard standing.

2.3 Environmental Baseline

An Environmental Constraints Plan (Appendix C) identified the sensitive sites within 10km of the project. These sites are described in detail in Table 1.

An Extended Phase 1 Habitat Survey was carried out on the 12th December 2018 to cover the extent of the proposed works area (both terrestrial and intertidal) at Manorbier (Appendix D, Extended Phase 1 Habitat Survey Plan).

The site at Manorbier includes both a terrestrial and intertidal aspect. The terrestrial side to the site (north-east of the beach), comprises hardstanding representing the public car park, and improved grassland. Both areas are surrounded by dense scrub and broad-leaved trees. A stream runs to the south of the site through the scrub and woodland. Footpaths and a road run through the site.

Towards the coast the habitat grades from the carpark into dune grassland, and scrub to the sides of valley. The beach front is largely open dune, dune grassland and shingle grading into intertidal sand, shingle and rock. The shore to the north and south of the beach centre is comprised of intertidal rocks progressing into a cliff-face.

A desk study search was carried out on 11th December 2018. A summary of the results is included in Appendix E.

3 Guidance and Methodology

This section sets out the guidance and evidence base used in assessing the potential effects of the project.

3.1 Guidance and Policy

This information has been informed by the following guidance and policy documents:

- Planning Policy Wales - Technical Advice Note (TAN) 5: Nature Conservation and Planning³;
- The Habitats Regulations Assessment Handbook, DTA Publications Ltd, 6th Issue, 2017⁴; and
- Tyldesley, D. and Chapman, C. 2018. People Over Wind – some Implications of the Judgment. The Habitat Regulations Journal, Issue 10, pp. 19 – 23.

This guidance is intended to improve understanding of how projects are regulated under the Habitats Directive. This guidance draws on experience throughout Britain and on case law in Britain and Europe.

3.2 Desk Study Information

In addition to the guidance noted above, the following websites were used to gather information on the European Protected Sites;

- Natural Resources Wales (NRW) (and legacy body Countryside Council for Wales) website;
- Magic (Multi-Agency Geographic Information for the Countryside) website;
- Joint Nature Conservation Committee (JNCC); and
- Biodiversity Information Service from the local records centre (via Aderyn).

Information on the interest features of European Sites has been obtained from the information provided on the Joint Nature Conservation Committee (JNCC) website and NRW⁵. In particular the Core Management Plans for European Sites, and Regulation 35 information containing advice on European Marine Sites where relevant, were obtained and have been used to inform this assessment.

These documents provide the main elements of NRW's management plan for European Sites along with the Conservation Objectives for the features. The features will be considered to be in Favourable Conservation Status only when the conservation objectives are being met. These objectives therefore provide an

³ Welsh Government. (2009). Planning Policy Wales - Technical Advice Note 5: Nature Conservation and Planning. Cardiff: Welsh Government.

⁴ Tyldesley & Chapman. (2017). The Habitats Regulations Assessment Handbook, January 2017 Edition, UK: DTA Publications Limited.

⁵ <https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/find-protected-areas-of-land-and-seas/designated-sites/?lang=en>

indication of the type of effects which could affect the features of European Site. An effect which could affect the ability of a site or feature to meet its objective could be considered to be an adverse effect on the integrity of the European Site concerned.

3.3 Habitats Regulations Assessment Methodology

In order to understand the potential implications for European Sites from the proposed project it is necessary to identify those sites that are located close to the project or are linked by pathways such as hydrological connections.

All European Sites of the project were identified using Geographic Information System data from datasets downloaded from the JNCC, Magic and NRW.

3.3.1 Understanding qualifying interests and conservation objectives

For each of the sites identified the features were established and the conservation objectives for each feature were obtained. Information was also sought to understand the potential vulnerability of the features to any effects that might arise from the proposed project.

3.3.2 Identification of the potential effects of the project

Any potential pathways for effect on European Sites resulting from the proposed development were identified prior to consideration of best practice procedures (e.g. Guidelines for Pollution Prevention and CIRIA guidance) or the integration of any mitigation measures.

3.3.3 Identification of plans or projects considered for in-combination effects

An ‘in-combination’ assessment is required where the project may have an effect on a European Site, but on its own the effects would not be significant. The potential effects of the project should be considered in-combination with other plans or projects that similarly may have an effect, but where on their own those effects would not be significant. The combined effects may therefore become significant.

Details of other plans and projects which are currently proposed or consented within the vicinity of the European Sites identified were obtained to inform the in-combination assessment of the proposed project.

3.3.4 Consideration of the significance of potential effects

The significance of potential effects was assessed in the absence of avoidance or other mitigation measures other than those which are standard construction practices such as pollution control or those incorporated into the scheme. The assessment has been made with awareness of the conservation objectives for the

features of the European Sites, although as stated in the relevant guidance the assessment of the project against the conservation objectives is not required until the Appropriate Assessment stage of the HRA process.

In the assessment of the significance of effects, professional judgement was applied using the following criteria, as often insufficient information about the elements and interests is available:

- The vulnerability/sensitivity of the receiving environment/features of interest;
- When the risk of effects is likely to occur (e.g. construction and/or operation);
- The likely geographical extent of the effects; and
- Likelihood of significant effects (e.g. those above negligible in magnitude) occurring based on previous experience with similar elements, where available.

Professional judgement was used in the carrying out of this work where professional guidance was not available. Where there was not enough information about the risk of qualifying interest being present, or of the risk of effects, the assessment used the precautionary principle to inform the judgement. The precautionary principle has been applied to ensure that any assessment errs on the side of caution, without being overly cautious. This principle means that the conservation objectives should prevail where there is uncertainty or that harmful effects will be assumed in the absence of evidence to the contrary.

4 European Sites Potentially Affected by the Proposal

The Environmental Constraints Plan contained within Appendix C shows the location of the project in relation to European Sites within 10km of the proposed works.

The European Sites identified within 10km of the proposed works are as follows (distances and direction are measured as a straight line from the proposed site to the European Site):

- Pembrokeshire Marine / Sir Benfro Forol SAC, within site boundary;
- Bristol Channel Approaches / Dynesfeydd Mor Hafren candidate SAC, approximately 0.25km west of the site;
- Limestone Coast of South West Wales / Arfordir Calchfaen De Orllewin Cymru SAC, 1.8km east of the site;
- Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer Sgogywm a Moroedd Penfro SPA, 5.3km south-west from the site;
- Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC, 6.7km east of the site;
- Castlemartin Coast SPA, 7.1km south-west of the site;
- Carmarthen Bay / Bae Caerfyrddin SPA, 8.1km east of the site; and
- Pembrokeshire Bat Sites and Bosherton Lakes / Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC, 8.3km south-west of the site.

The features for which the identified European Sites have been designated are summarised in Table 1. The distance of the European Site in relation to the project has also been noted within Table 1.

Table 1. European Sites within 10km of the site.

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
Pembrokeshire Marine / Sir Benfro Forol SAC (within site boundary) ⁶	Annex I habitats that are a primary reason for selection of this site:		Habitat Features	Outcomes arising from human action that are likely to be considered detrimental include such effects such as: - permanent and long-term change of distribution or reduction in extent of a feature or feature component, or temporary modification or reduction sufficiently significant to negatively impact on biota or ecological processes; - reduction in ecological function caused by loss, reduction or modification of
	Feature 1) Estuaries Pembrokeshire Marine includes the Daugleddau estuary, a ria estuary in south-west Wales, formed in the upper reaches of one of the best examples of a ria in the UK. Associated with the wide range of environmental conditions, particularly seabed substrates, tidal streams and salinity gradients, there is a wide diversity of communities and species. The species-richness of sediment communities throughout Milford Haven and the Daugleddau is high. Tide-swept sponge communities on shell/cobble substrates and bedrock in the upper reaches of the Daugleddau are exceptional in their diversity. The site also includes smaller estuaries entering the Daugleddau and Milford Haven, and wide intertidal mudflats with rich and productive invertebrate annelid and mollusc communities, occurring in 'pills' (creeks).		Range The overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing. - For the inlets and bays feature these include; - The embayment of St. Brides Bay - The ria of Milford Haven - Peripheral embayments and inlets For the coastal lagoons feature this is subject to the requirements for maintenance of the artificial impoundment structure and maintenance of the lagoons for the original purpose or subsequent purpose that pre-dates classification of the site.	
	Feature 2) Large shallow inlets and bays Pembrokeshire Marine in south-west Wales includes Milford Haven, one of the best examples of a ria in the UK, and the wide, shallow, predominantly sandy embayment of St Brides Bay. The wide range of environmental conditions, particularly seabed substrates, tidal streams and salinity gradients, supports high community and species diversity. The species-richness of		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. Important elements include; - geology, - sedimentology, - geomorphology, - hydrography and meteorology, - water and sediment chemistry, - biological interactions.	

⁶ NRW, 2017. Pembrokeshire Marine / Sir Benfro Forol Special Area of Conservation. Advice provided by Natural Resources Wales in fulfilment of Regulation 37 of the Conservation of Habitats and Species Regulations 2017.

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
	sediment communities throughout Milford Haven is particularly high, with intertidal sandy/muddy areas supporting extensive beds of narrow-leaved eelgrass <i>Zostera angustifolia</i>. High-salinity water and rocky substrates penetrate far upstream, and communities characteristic of fully saline conditions occur. A wide range of subtidal and intertidal rocky habitats are present, from rocky reefs and boulders to rich underboulders, crevices, overhangs and pools. Feature 3) Reefs Reefs in this south-west Wales site are largely composed of igneous rock but include areas of more friable Old Red Sandstone and some limestone. Extensive areas of sublittoral rocky reef stretch offshore from the west Pembrokeshire coast and between the Pembrokeshire islands and many small rocky islets. Limestone reefs occur in the south of the site. Reefs also extend through Milford Haven and into the variable salinity conditions of the Daugleddau estuary. Reefs within the site are subject to an exceptional variation in strength of tidal streams and wave exposure. The highly variable rocky seabed topography, together with the indented coastline and extreme tidal range, cause strong tidal streams, particularly around headlands, through sounds and in tidal inlets. The shallower and south-west-facing rocky reefs are exposed to severe wave action, while many others are extremely wave-sheltered. Many of the reefs extend onto the shore and provide examples of both the most exposed and the most sheltered intertidal rock communities in southern Britain. Reef habitat diversity is increased by caves, tunnels and surge gullies in both subtidal and intertidal zones. The wide variation in		This includes a need for: nutrient levels in the water column and sediments to be: - at or below existing statutory guideline concentrations - within ranges that are not potentially detrimental to the long-term maintenance of the features species populations, their abundance and range. Contaminant levels in the water column and sediments derived from human activity to be: - at or below existing statutory guideline concentrations - below levels that would potentially result in increase in contaminant concentrations within sediments or biota - below levels potentially detrimental to the long-term maintenance of the feature species populations, their abundance or range. <u>Restoration and recovery</u> As part of this objective it should be noted that; the Milford Haven waterway complex would benefit from restorative action, for example through the removal of non-natural beach material, and the removal, replacement or improved maintenance of rock filled gabions. There is also need for some restoration of the populations of several typical species of the Milford Haven waterway complex that are severely depleted with respect to historical levels as a consequence primarily of human exploitation.	habitat structural integrity; - interference in or restriction of the range, variety or dynamism of structural, functional or ecological processes, e.g.: alteration of habitat structure, obstruction of tidal streams, chronic or acute thermal, salinity or suspended sediment elevations or reductions; - hypertrophication or eutrophication; - contamination by biologically deleterious substances; - reduction in structure, function and abundance of species populations;

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
	exposure to water movement, the range of rock type, slope, aspect and topography, and the high water quality, together with local exposure to abrasion from adjacent sediments and reduced salinity in the Daugleddau, are reflected in the wide diversity and species abundance of biological communities. Offshore there are particularly extensive areas of tide-swept kelp and species-rich red algal populations and, across the large areas of deeper rock reef, a wide range and abundance of invertebrate animal communities, with hydroid, bryozoan, soft coral and anemone species. More sheltered reefs, including those in lowered salinity and higher turbidity, typically support diverse and species-rich sponge- and ascidian-dominated communities. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: Feature 4) Sandbanks which are slightly covered by sea water all the time Feature 5) Mudflats and sandflats not covered by seawater at low tide Feature 6) Coastal lagoons Feature 7) Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) Feature 8) Submerged or partially submerged sea caves		In the Milford Haven waterways complex inputs of nutrients and contaminants to the water column and sediments derived from human activity must remain at or below levels at the time the site became a candidate SAC. For the lagoons feature this is subject to the requirements for maintenance of the artificial impoundment structures of coastal lagoons and maintenance of the lagoons for their original purpose or subsequent purpose that pre-dates classification of the site. Typical species The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded. Important elements include: - species richness, - population structure and dynamics, - physiological health, - reproductive capacity, - recruitment, - mobility, - range. As part of this objective it should be noted that: - populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum sustainable yield and secure in the long term	- change in reproductive capacity, success or recruitment of species populations; - reduction in feeding opportunities of species populations - reduction of health to a sub-optimal level, or injury, rendering the population less fit for, inter alia, breeding, foraging, social behaviour, or more susceptible to disease; - increase in abundance and range of opportunist species through the unnatural generation of preferential conditions (e.g.

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
	Annex II species that are a primary reason for selection of this site:		- the management and control of activities or operations likely to adversely affect the habitat feature is appropriate for maintaining it in favourable condition and is secure in the long term. <u>Restoration and recovery</u> For the inlets and bays features this includes the need for some restoration of the populations of several typical species which are severely depleted with respect to historical levels as a consequence primarily of human exploitation. In the Milford Haven waterways complex inputs of nutrients and contaminants to the water column and sediments derived from human activity must remain at or below levels at the time the site became a candidate SAC. <u>Species Features</u> Populations The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements include: - Population size - Structure, production - Condition of the species within the site As part of this objective it should be noted that for otter and grey seal; - Contaminant burdens derived from human activity are below levels that may cause physiological damage, or immune or reproductive suppression	organic enrichment), at the expense of existing species and communities. - increase in abundance and range of non-native species.
	Feature 9) Grey seal <i>Halichoerus grypus</i>			
	Feature 10) Shore dock <i>Rumex rupestris</i>			
	Annex II species present as a qualifying feature, but not a primary reason for site selection:			
	Feature 11) Sea lamprey <i>Petromyzon marinus</i>			
	Feature 12) River lamprey <i>Lampetra fluviatilis</i>			
	Feature 13) Allis shad <i>Alosa alosa</i>			
	Feature 14) Twaite shad <i>Alosa fallax</i>			
	Feature 15) Otter <i>Lutra lutra</i>			

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
			For grey seal and otter, populations should not be reduced as a consequence of human activity. Range The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future. As part of this objective it should be noted that for otter and grey seal: - Their range within the SAC and adjacent inter-connected areas is not constrained or hindered - There are appropriate and sufficient food resources within the SAC and beyond - The sites and amount of supporting habitat used by these species are accessible and their extent and quality is stable or increasing	
Bristol Channel Approaches / Dynesfeydd Mor Hafren candidate SAC (Approximately 0.25km west) ⁷	Annex II species that are a primary reason for selection of this site: Feature 1) Harbour porpoise <i>Phocoena phocoena</i>	Considered to support a significant presence.	To avoid deterioration of the habitats of the harbour porpoise or significant disturbance to the harbour porpoise, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to maintaining Favourable Conservation Status (FCS) for the UK harbour porpoise. To ensure for harbour porpoise that, subject to natural change, the following attributes are maintained or restored in the long term: • The species is a viable component of the site. • There is no significant disturbance of the species.	Physical factors, e.g. water depth, current speed, human-related marine activities (e.g. fishing), recreation, natural processes and other factors

⁷ JNCC, Natural England and Natural Resources Wales, 2016. Harbour Porpoise (*Phocoena phocoena*) possible SAC: Bristol Channel Approaches. Draft Conservation Objectives and Advice Activities.

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
			The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	
Limestone Coast of South West Wales / Arfordir Calchfaen De Orllewin Cymru SAC, (1.8km east) ⁸	Annex I habitats that are a primary reason for selection of this site:		Cliff and crevice vegetation continues to form a very open cover of deep-rooted crevice dwelling species forming a narrow band along the steep cliff edges. On their seaward edges the cliff and crevice communities grade into the supralittoral lichen zone. Landwards they meet the maritime grassland and thereophyte communities which themselves intermingle with the maritime heaths. Both golden samphire and rock sea lavenders are typically associated with crevices and ledges and continue to be generally widespread where open and exposed conditions prevail. The maritime grasslands range from short open swards with occasional areas of bare ground to taller, more closed swards where Red Fescue (<i>Festuca rubra</i>) forms tussocks and “mattresses”. The more strongly maritime influenced grassland communities on this site, for the most part, occur on the exposed south and south westerly facing slopes. Elsewhere, in less exposed situations the grasslands show less maritime influence with species such as cowslips (<i>Primula veris</i>) and bluebells (<i>Hyacinthoides non-scripta</i>) occurring. The grasslands also support important populations of typical invertebrates such as ants and butterflies as well as insects associated with open soils, grass roots or dung such as various crane fly and beetle larvae. Maritime heath occurs in exposed locations as stands of low, wind-pruned heath dominated by heather (<i>Calluna vulgaris</i>) and bell heather (<i>Erica cinerea</i>). Species such as spring squill (<i>Scilla verna</i>), milkworts (<i>Polygala</i> spp.), pale dog violet (<i>Viola lactea</i>) and sedges (<i>Carex</i> spp.) are present in stands.	Grazing pressure, burning, pollution, military activity, access and recreation, natural processes and other factors (invasive or alien plants).
	Feature 1) Vegetated sea cliffs of the Atlantic and Baltic Coasts	Considered to be one of the best areas in the United Kingdom.		

⁸ Countryside Council for Wales, 2008. Core Management Plan, including Conservation Objectives for Limestone Coast of South West Wales SAC, Version 10.

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
			This gives way to gorse-dominated dry heath in more sheltered areas. - Cliff and crevice vegetation occurs naturally on suitably exposed rocky ledges and crevices throughout the site. The variety of vegetation types reflecting the degree of exposure to maritime influences - including communities with thrift, rock and golden samphire, sea lavender, sea-beet and sea plantain. - Maritime grassland occupies approximately 15% of the total site area. - The following plants are common in the maritime grassland: thrift (<i>Armeria maritima</i>); spring squill and sea plantain (<i>Plantago maritima</i>). - Maritime Heathland occupies approximately 10% of the total site area. - The following plants are common in the maritime heathland: heather; bell heather and spring squill. - Populations of nationally rare and nationally scarce vascular and lower plant species, associated with cliff-crevice, maritime grassland and related calcareous grassland swards are maintained. - Competitive species indicative of under-grazing, particularly cocksfoot (<i>Dactylis glomerata</i>), tor grass (<i>Brachypodium pinnatum</i>), bracken (<i>Pteridium aquilinum</i>) and western gorse (<i>Ulex gallii</i>) are kept in check. Non-native plants such as Hottentot fig (<i>Carpobrotus edulis</i>) are absent or rare.	

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
	Feature 2) Fixed coastal dunes with herbaceous vegetation ("grey dunes")	Considered to be one of the best areas in the United Kingdom.	The dune complex at Broomhill Burrows, Broadhaven South and Barafundle Bay will demonstrate a fairly complete sequence from fore dunes fringed on the seaward edge by narrow bands of mobile dune, through to fixed dune grassland. There will be small blow-out patches of bare sand and foredune and strandline. Elsewhere in the SAC, the perched dunes (such as at Stackpole Warren) may not show this zonation from fore dune to fixed dune but should none-the-less have some blowouts and areas of bare sand. - Fixed dunes occupy approximately 20% of the total site area. - The following plants will be common in a short, open sward: <i>Asperula cyanchica</i>, <i>Carlina vulgaris</i>, <i>Euphrasia</i> spp., <i>Gentianella amarella</i>, <i>Linum catharticum</i>, <i>Lotus corniculatus</i>, <i>Pilosella officinarum</i>, <i>Plantago coronopus</i>, <i>Sedum acre</i>, <i>Thymus polytrichus</i>, <i>Viola</i> spp., <i>Anacamptis pyramidalis</i>. - Distinct patches of open, lichen-rich turf, supporting <i>Fulgensia fulgens</i> on <i>Trichosporum</i> moss will occur in several mapped locations. - Alien species will be absent, and other negative indicator species (such as bracken) will be under control in fixed dune grassland. Sea buckthorn <i>Hippophae rhamnoides</i> will be absent from all dunes systems within the SAC.	
	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:		The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: - The current extent of dry heath will be maintained. - Dry heath will occupy areas of the site where heathland extends beyond the zone of maritime influence.	Livestock grazing/mowing, burning, pollution, mowing, military activity, access and recreation, natural processes and other factors.
	Feature 3) European dry heaths	Considered to be one of the best areas in the United Kingdom.		

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
			- As a result dry heath may lack the species characteristic of maritime heath. - Much of the dry heath will have a short and open structure. The dry heaths will support typical species such as the dark green fritillary <i>Argynnis aglaja</i> and the silver-studded blue butterfly <i>Plebeius argus</i>.	
	Feature 4) Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	Considered to be one of the best areas in the United Kingdom.	- The semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) / dry grasslands and scrublands on chalk or limestone will be referable to the NVC communities <i>Festuca – Avenula</i> grassland (CG2) and <i>Festuca – Hieracium – Thymus</i> grasslands (CG7). - The communities making up this feature will cover at least 14 ha within Castlemartin Cliffs and Dunes SSSI and 10 ha within Stackpole and Stackpole Quay to Trewent Point SSSI, and 18 ha within the Gower Coast SSSI (which also includes NVC community CG1) occurring as small patches along coastal cliff-tops, among the fixed dune grasslands, mainly on shallow soils overlying areas of limestone bedrock. The feature will support a range of typical plant and invertebrate species.	Grazing pressure, burning, pollution, military activity, access and recreation, natural processes and other factors (invasive or alien plants).
	Feature 5) Caves not open to the public	Considered to be one of the best areas in the United Kingdom.	These caves continue to be primarily of importance as bat hibernacula and roost sites. Their performance indicators are expressed in terms of their suitability as bat hibernacula/roost sites. Choughs continue to breed high in the roofs of several caves. - There is minimal disturbance to the caves by the public. - The caves remain suitable as bat roost/hibernation sites. - Caves utilised by breeding choughs remain undisturbed for choughs. - The geological interest of the caves will be unconcealed.	Access and recreation, natural processes and other factors (rock falls, tidal activity, subsidence or crumbling of the cave).

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
			Natural processes such as small rock falls will be tolerated.	
	Feature 6) Submerged or partially submerged sea caves	Considered to be one of the best areas in the United Kingdom.	Other than prevention of human disturbance to both the caves themselves and any species which may be using them (mainly bats and grey seals), there is little management required or indeed possible for this feature. - There should be minimal disturbance to the caves and they should remain closed to the public. - The caves should remain suitable as bat roost/hibernation sites - The caves used by grey seal should remain free of human disturbance - The geological interest of the caves will be unconcealed - Natural processes such as small rock falls will be tolerated The effects of tidal activity in partially submerged caves should have a minimal effect on the internal environment of the cave (where the cave is a bat roost).	Access and recreation
	Annex II species that are a primary reason for selection of this site:		- Greater horseshoe bats will continue to utilise known caves roosts undisturbed by the public. - Distinctive droppings indicate presence at any time of year but largest numbers of bats are likely to be found in the period November to March. - The peak winter population in the main Castlemartin Cave is equivalent to approximately 20% of the Pembrokeshire Bat Sites and Bosherton lakes SAC greater horseshoe bat population. - The greater horseshoe bat population within the caves being monitored is stable or increasing.	Condition of the caves, access and recreation.
	Feature 7) Greater horseshoe bat <i>Rhinolophus ferrumequinum</i>	Considered to support a significant presence.		

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
			- Natural processes such as rock falls will be tolerated but other factors affecting the achievement of these conditions are under control.	
	Feature 8) Early gentian <i>Gentianella anglica</i>	Considered to support a significant presence.	- The feature will be present at Stackpole in management unit 3d. - Dune gentians with three or fewer internodes and a long terminal internode, which contributes between 40-100% of the height of the stem (corresponding to the current definition/description of Early gentian) occur within at least 4 open dry dune slacks on Stackpole Warren and in other open, herb-rich calcareous grassland areas. Further survey/research will confirm that these forms are definitely separable from <i>G. amarella</i>.	Livestock grazing/mowing, burning, pollution, mowing, military activity, access and recreation, natural processes and other factors.
	Annex II species present as a qualifying feature, but not a primary reason for site selection:		<i>Petalophyllum ralfsii</i> will continue to be found at two SSSI sand dune systems within the SAC, (Broomhill Burrows & Brownslade Burrows). The Brownslade Burrows population will occur patchily at high densities in successional young, open vegetation in damp, dune slacks.	Livestock grazing/mowing, bracken and scrub encroachment, pollution, access and recreation, natural processes and other factors.
	Feature 9) Petalwort <i>Petalophyllum ralfsii</i>	Considered to support a significant presence.	- <i>P. ralfsii</i> has a continued presence at Broomhill Burrows SSSI. - <i>P. ralfsii</i> occurs at high densities in suitable dune slacks at Brownslade Burrows SSSI. - At both sites there are areas of open, damp, calcareous dune slacks with patches of suitable and optimal habitat present.	

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
			- Suitable dune slacks have patches of bare ground that is being colonised by jelly lichens (<i>Collema</i> spp.) and <i>Barbula</i> mosses. Brownslade Burrows continues to be winter grazed by cattle and sheep, which is helping to maintain the short sward and open conditions required by <i>P. ralfsii</i>.	
Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer Sgogywm a Moroedd Penfro SPA (5.3km south-west) ^{9,10}	Annex I qualifying ornithological features:		The protected features covered by the draft conservation advice are the qualifying marine species of the SPA: breeding populations of storm petrel, lesser black-backed gull, Manx shearwater, and Atlantic puffin as well as the breeding seabird assemblage. For each of these features there are four conservation objectives: - The size of the population should be stable or increasing, allowing for natural variability, and sustainable in the long term. - The distribution of the population should be being maintained, or where appropriate increasing. - There should be sufficient habitat, of sufficient quality, to support the population in the long term. - Factors affecting the population or its habitat should be under appropriate control. Chough - The Skomer breeding population will be at least 3 pairs	- Limited distribution of breeding species due to anthropogenic activities - The trampling of burrows by visitors, staff and researchers away from the footpaths could cause damage. - Rafting birds at sea are vulnerable to water-borne human disturbance and oil pollution. - Egg collecting has been known to
	Feature 1) European storm petrel <i>Hydrobates pelagicus</i>	4.1% GB (1995) population		
	Feature 2) Red-billed chough <i>Pyrrhocorax pyrrhocorax</i>	1.2% GB population		
	Feature 3) Short-eared owl <i>Asio flammeus</i>	0.6% GB population		
	Regularly occurring migratory species (breeding):			
	Feature 4) Manx shearwater <i>Puffinus puffinus</i>	56.9% Global (count late 1990s) population		
	Feature 5) Atlantic puffin <i>Fratercula arctica</i>	1.1% Global (count late 1990s) population		

⁹ NRW, 2015. Skomer, Skokholm and the seas off Pembrokeshire / Sgomer, Sgogywm a Moroedd Penfro potential Special Protection Area: Draft conservation objectives.

¹⁰ CCW, 2008. Core Management Plan, including Conservation Objectives for Skomer and Skokholm SPA (Special Protection Area). Version 6.

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
	Feature 6) Lesser black-backed gull <i>Larus fuscus</i>	16.4% of the biogeographical population (mean 1993 - 1997)	- The Skokholm breeding population will be at least 1 pair - The SPA breeding population will be 4 pairs, (this currently represents around 5 % of the Pembrokeshire chough population and 1.2% of the GB population) - Breeding success will be 1.5 chicks/pair - Sufficient suitable habitat will be present to support the populations - The factors affecting the feature are under control. Short-eared owl - The breeding population will be at least 6 pairs - Breeding success will be at least 1 chicks/pair - Sufficient suitable habitat will be present to support the populations - The factors affecting the feature are under control. Storm petrel - The breeding population of storm petrel should be stable or increasing. The aim, across the 2 islands is for at least 3500 pairs, with this number to be stable or increasing. - The distribution of this species within the site should not be constrained by anthropogenic factors, including disturbance by the public and activities leading to possible loss of suitable nesting sites. - The foraging habitat of this species should be stable or increasing in terms of its area, and its quality should remain unaffected by anthropogenic factors. There should be no contraction of the distribution of nesting sites as a result of anthropogenic factors.	- occur, but is a rare occurrence. - Fire could have a serious effect on breeding shearwaters/chicks. - The continued absence of mammalian land predators is fundamental. - Loss of breeding habitat from natural processes, e.g. soil erosion
	Bird assemblage of international importance - At least 20,000 seabirds in any season.			
	Feature 7) Seabird assemblage	-		

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
			- Breeding success of this species should remain unaffected by negative human influence. Factors affecting the species within the site should be under control. Lesser black-backed gull - The breeding population size of lesser black-backed gull should be stable or increasing, aiming for at least 20,300, with a breeding productivity rate and an adult survival rate that allows this number to be maintained/increased. Colonies of this species must not be lost as a result of anthropogenic influence. - The distribution of this species within the site should not be constrained by anthropogenic factors. Reductions in the range of this species can only be acceptable if there is significant risk of detriment, to the FCS of priority features of this SPA. - The breeding and foraging habitat of this species should be stable or increasing in terms of its area, and its quality should remain unaffected by anthropogenic factors. - There should be no mammalian land predators present in the SPA, and control measures should be in place to ensure that accidental introduction does not take place. Access beyond designated footpaths, should be under appropriate control. Factors affecting the species within the site should be under control. Manx Shearwater - The breeding population of Manx shearwater should be stable or increasing with no measured decrease in	

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
			numbers (based on a population count of 150,968), based on annual study plots. - The distribution of this species within the site should not be constrained by anthropogenic factors, including disturbance of nesting sites by the public and activities leading to possible loss of suitable nesting sites. - The breeding and foraging habitat of this species should be stable or increasing in terms of its area, and its quality should remain unaffected by anthropogenic factors. - Rafting birds should remain unaffected by boat use and other anthropogenic factors; appropriate codes of conduct must be followed by all visitors and craft surrounding the islands. Factors affecting the species within the site should be under control. Atlantic Puffin - The breeding population of Atlantic puffin should be stable or increasing with an aim of 9500 individuals being achieved. - The distribution of this species within the site should not be constrained by anthropogenic factors. There should be no contraction of the distribution of nesting sites as a result of anthropogenic factors. - The breeding and foraging habitat of this species should be stable or increasing in terms of its area, and its quality should remain unaffected by anthropogenic factors. - There should be no mammalian land predators present in the SPA, and control measures should be in place to ensure that accidental introduction does not take place.	

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
			Access beyond designated footpaths, should be under appropriate control. - Rafting birds should remain unaffected by boat use and other anthropogenic factors; appropriate codes of conduct must be followed by all visitors and craft surrounding the islands. Factors affecting the species within the site should be under control. Breeding seabird assemblage - The breeding populations should be stable or increasing based on a total population of 394,260. - The distribution of these species within the site should not be constrained by anthropogenic factors, including disturbance by the public and activities leading to possible loss of suitable nesting sites. - The breeding and foraging habitat of these species should be stable or increasing in terms of their area, and its quality should remain unaffected by anthropogenic factors. There should be no contraction of the distribution of nesting sites as a result of anthropogenic factors. - There should be no mammalian land predators present in the SPA, and control measures should be in place to ensure that accidental introduction does not take place. Access beyond designated footpaths, should be under appropriate control. Rafting birds should remain unaffected by boat use and other anthropogenic factors; appropriate codes of conduct must be followed by all visitors and craft surrounding the islands. Factors affecting these species within the site should be under control.	

Site	Qualifying Features	Importance	Conservation Objectives Summary		Vulnerability
Castlemartin Coast SPA (7.1km south-west) ¹¹	This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:		- A breeding chough population will occur along the limestone coast, between Freshwater West and Barafundle Bay. - This population will be maintained at a minimum of 12 breeding pairs (representing 3.5% of the GB population, at the 1993 SPA designation level) - Choughs will continue to, feed, roost and breed successfully, unhindered by human recreational activities (e.g. climbing). - The majority of pairs will rear young each year, with an annual average productivity of at least two young per occupied territory. - Choughs will continue to have access to large amounts of optimal feeding habitat (open areas with very short grassland and heath vegetation)		- Cliff climbing - Coastal recreation - Inappropriate grazing regime - Loss of rabbit populations - Use of avermectins for cattle, resulting in loss invertebrate populations
	Feature 1) During the breeding season; Chough	12 pairs representing at least 3.5% of the breeding population in Great Britain (Count as at 1998)			
	Feature 2) Over winter; Chough	24 pairs representing at least 3.5% of the wintering population in Great Britain (Count as at 1998)			
Carmarthen Bay / Bae Caerfyrddin SPA (8.1km east) ¹²	Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them:		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:	- Outcomes arising from human action that are likely to be considered detrimental include such effects such as: - Permanent and long-term change of distribution or reduction in extent of a feature or feature component, or temporary modification or reduction	
	Feature 1) Common scoter <i>Melanitta nigra</i>	SPA is used regularly by ca. 1.1 % of the biogeographic population of migratory and overwintering common scoter.			

¹¹ CCW, 2008. Core Management Plan including Conservation Objectives for Limestone Coast of South West Wales / Arfordir Calchfaen de Orllewin Cymru SAC (Incorporating Castlemartin Coast SPA). Version 10.

¹² CCW, 2009. Carmarthen Bay and Estuaries/Bae Caerfyrddin ac Aberoedd European Marine Site comprising: Carmarthen Bay and Estuaries/Bae Caerfyrddin ac Aberoedd Special Area of Conservation Carmarthen Bay/Bae Caerfyrddin Special Protection Area Burry Inlet Protection Area & Ramsar Site. Advice Provided by the Countryside Council for Wales in Fulfilment of Regulation 33 of the Conservation (Natural Habitats &c.) Regulations 1994. February 2009.

Site	Qualifying Features	Importance	Conservation Objectives Summary		Vulnerability
		The 5-year peak mean for 1997/98 to 2001/02 was 16,946 individuals with the biogeographic population estimated to comprise of 1.6 million individuals.	- The numbers of all SPA bird species are stable or increasing. - The abundance and distribution of suitable prey are sufficient and appropriate to support the numbers of all SPA bird species. - All SPA birds are allowed to inhabit their feeding grounds and resting areas with minimum disturbance, and are allowed to move unhindered between them. - All states of the Conservation Objectives for the supporting habitats and species, subject to natural processes, are fulfilled and maintained in the long-term. ‘Large shallow inlets and bays’ are the supporting habitat for the common scoter of the Carmarthen Bay SPA.		sufficiently significant to negatively impact on biota or ecological processes; - Reduction in ecological function caused by loss, reduction or modification of habitat structural integrity; - Interference in or restriction of the range, variety or dynamism of structural, functional or ecological processes, e.g.: alteration of habitat structure, obstruction of tidal streams, chronic or acute thermal, salinity or suspended sediment elevations or reductions; - Hypertrophication or eutrophication; Contamination by biologically deleterious substances; - Reduction in structure, function and abundance of species populations; - Change in reproductive capacity, success or recruitment of species populations; - Reduction in feeding opportunities of species populations - Reduction of health to a sub-optimal level, or injury, rendering the population less fit for, inter alia, breeding, foraging, social behaviour, or more susceptible to disease; - Increase in abundance and range of opportunist species through the unnatural generation of preferential conditions (e.g. organic enrichment), at

Site	Qualifying Features	Importance	Conservation Objectives Summary		Vulnerability
				the expense of existing species and communities. - Increase in abundance and range of non-native species.	
Pembrokeshire Bat Sites and Bosherton Lakes / Saffleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC (8.3km south-west) ¹³	Annex I habitats that are a primary reason for selection of this site: Feature 1) Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp.	Bosherton Lakes are an outstanding shallow marl lake system created at intervals in the late 18th and mid-19th centuries by damming a limestone river valley. They are fed in part by a series of calcium-rich springs and are isolated from the sea by a small sand dune ridge. Charophytes are represented by bristly stonewort <i>Chara hispida</i> which forms dense beds up to 1 m high, with individual plants up to 3.5 m long, and by variable quantities of <i>C. globularis</i> , <i>C. virgata</i> and <i>C. vulgaris</i> . Extensive white water lily <i>Nymphaea alba</i> beds also occur, mainly in the western and central arms. In contrast, the eastern arm is characterised by variably dense stands of curled pondweed <i>Potamogeton crispus</i> , fennel pondweed <i>P. pectinatus</i> ,	Feature 1) Submerged <i>Chara</i> beds (mainly <i>Chara hispida</i> in places up to a metre long) will form the predominant submerged macrophyte vegetation throughout most of Central and Western Arms and Central Lake of Bosherton Lakes (unit 1a) and may be present in the Eastern Arm (unit 1b). <i>Chara</i> will occur at more than 50% frequency along regular surveillance transects within the Western and Central arms. <i>Chara</i> species (not necessarily <i>hispida</i>) will be present in other embayments and pools, including the Eastern Arm of Bosherton Lakes (unit 1b) and pools in the Mere Pool Valley (unit 1d). The Western and Central Arms are spring-fed, so nutrient levels here remain low. One of the main nutrients (phosphorous) will reach no more than 25 micrograms per litre in regular sampling areas. Nitrogen levels in the water will be low (less than 1 milligram per litre) and declining or stable. The Western Arm, Central Arm and Central Lake water will be fairly clear, but well vegetated with submerged and marginal plants. In natural openings (e.g. over springs) within otherwise dense <i>Chara</i> beds, a sechii disk will be viewable on the lakebed. Water depth will vary from about 3.5 metres OD (winter maximum) to about 0.5 metres or less in places in summer. Fringing the <i>Chara</i> beds, are beds of white water lilies <i>Nymphaea alba</i> . They will remain fairly abundant in the Western and Central Arms, with smaller populations in Central Lake. Reed and swamp and fringing		- Water quality – nutrient enrichment - Water quantity – water loss - Lake siltation - Aquatic aliens - Access and recreational pressures - Disturbance from noise and lighting

¹³ CCW, 2008. Core Management Plan including Conservation Objectives for Pembrokeshire Bat Sites and Bosherton Lakes SAC. Version 10.

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
		spiked water-milfoil <i>Myriophyllum spicatum</i> and Canadian waterweed <i>Elodea canadensis</i> . Emergent vegetation fringes parts of the system, mostly common reed <i>Phragmites australis</i> , bulrush <i>Typha latifolia</i> , common spike-rush <i>Eleocharis palustris</i> and branched bur-reed <i>Sparganium erectum</i> .	burr-reed will be restricted to shallow zones – covering not more than 10 % of the site. All factors affecting the achievement of these conditions are under control.	
	Annex II species that are a primary reason for selection of this site:		Feature 2) The greater horseshoe bat population will be capable of maintaining itself on a long-term basis as a viable component of its natural habitats. The natural range of greater horseshoe bats will neither be reduced nor will be likely to be reduced for the foreseeable future, and there will be sufficient habitat to maintain its populations on a long-term basis. At least three SSSI maternity roosts will be occupied annually by adult greater horseshoe bats and their babies: Stackpole Courtyard Flats and Walled Garden SSSI Slebech Stable Yard Loft, Cellars and Tunnels SSSI Felin Llwyngwair SSSI. Carew Castle SSSI will continue to be used as an intermediate greater horseshoe bat roost, during the spring and autumn, as a male summer roost and an autumn/spring mating roost. The greater horseshoe bat population at the component SSSI’s will be stable or increasing. There will be a sufficiently large area of suitable habitat surrounding these roosts to support the bat population, including continuous networks of sheltered, broadleaved woodland, tree lines and hedgerows connecting the various types of roosts with areas of insect-rich grassland and open water. All factors affecting the achievement of these conditions are under control.	
	Feature 2) Greater horseshoe bat	This site in south-west Wales supports approximately 9.5% of the UK greater horseshoe bat population. It represents the species at the north-western extremity of its range. The site contains a mixture of maternity, transitory and hibernation sites and so demonstrates good conservation of features required for survival.		
	Annex II species present as a qualifying feature, but not a primary reason for site selection:			
	Feature 3) Otter			
	Feature 4) Lesser horseshoe bat			

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
			stable or increasing. There will be a sufficiently large area of suitable habitat to support an otter breeding population, including: Open water with sufficient food resources (notably eels and other fish species) and a continuous network of undisturbed sheltered resting places along the lake shoreline – including swamp, broadleaved woodland and calcareous scrub. All factors affecting the achievement of these conditions are under control. Feature 4) The Lesser horseshoe bat population will be capable of maintaining itself on a long-term basis as a viable component of its natural habitats. The natural range of lesser horseshoe bats will be neither being reduced nor will be likely to be reduced for the foreseeable future, and there will be sufficient habitat to maintain its populations on a long-term basis. At least four SSSI maternity roosts will be occupied annually by adult lesser horseshoe bats and their babies: Beech Cottage, Waterwynch SSSI, Orielton Stable Block and Cellars SSSI, Park House Outbuildings SSSI, Stackpole Courtyard Flats and Walled Garden SSSI. The lesser horseshoe bat population at the component SSSI's will be stable or increasing. There will be a sufficiently large area of suitable habitat surrounding these roosts to support the bat population, including continuous networks of sheltered, broadleaved woodland, tree lines and hedgerows connecting the various types of roosts with areas of insect-rich grassland and open water. All factors affecting the achievement of these conditions are under control.	
Carmarthen Bay and	Annex I habitats that are a primary reason for selection of this site:		<u>Habitat Features</u>	

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
Estuaries / Bae Caerfyrddin ac Aberoedd SAC, (6.7km east) ¹⁴	Feature 1) Sandbanks which are slightly covered by sea water all the time	Considered to be one of the best areas in the United Kingdom.	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 is such that habitat quality is not degraded. <u>Species Features</u> Range The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future. Supporting Habitats and Species The presence, abundance, condition and diversity of habitats and species required to support this species is such that the	- Variation in nutrient levels in the water column
	Feature 2) Estuaries	Considered to be one of the best areas in the United Kingdom.		- Variation in contaminant levels and sediments derived from human activity in the water column
	Feature 3) Mudflats and sandflats not covered by seawater at low tide	Considered to be one of the best areas in the United Kingdom.		
	Feature 4) Large shallow inlets and bays	Considered to be one of the best areas in the United Kingdom.		
	Feature 5) <i>Salicornia</i> and other annuals colonising mud and sand	Considered to be one of the best areas in the United Kingdom.		- Aggregate dredging from Helwick Bank.
	Feature 6) Atlantic saltmeadows <i>Glaucopuccinellietalia maritimae</i>	Considered to be one of the best areas in the United Kingdom.		- Commercial fishing
	Annex II species present as a qualifying feature, but not a primary reason for site selection:			- Contamination of potential prey species and disturbance by human activity for Species Features.
	Feature 7) Sea lamprey	Considered to support a significant presence.		

¹⁴ Countryside Council for Wales, 2009. Advice provided by the Countryside Council for Wales in Fulfilment of Regulation 33 of the Conservation (Natural Habitats, &c.) Regulations 1994.

Site	Qualifying Features	Importance	Conservation Objectives Summary	Vulnerability
	Feature 8) River lamprey	Considered to support a significant presence.	distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	
	Feature 9) Allis shad	Considered to support a significant presence.		
	Feature 10) Otter	Considered to support a significant presence.		
	Annex II species that are a primary reason for selection of this site:			
	Feature 11) Twaite shad	Considered to be one of the best areas in the United Kingdom.		

4.1 Identification of Other Plans and Projects

The following planning applications were identified in the vicinity of the project¹⁵.
¹⁶. The following list is correct at the time of writing (January 2019) and includes those applications from the last six months approximately and within a 500m radius from the site works.

1. NP/18/0651/LBA. Works to Listed ruins including removal of later infill, making good masonry and improving access to upper part of garden. Priests Nose, Manorbier, Tenby, Pembrokeshire, SA70 7SZ, SS0651497612. 170m south of the proposed works.
2. NP/17/0732/FUL. Two storey rear extension. Coach House, Tarr Farm, Manorbier, Tenby, Pembrokeshire, SA70 7SX, SS0662198088. 330m north-east of the proposed works.
3. NP/17/0661/FUL. Demolition of timber-framed shed & replacement in blockwork (Retrospective). Castle Inn, Manorbier, Tenby, Pembrokeshire, SA70 7TE, SS0666197852. 210m east of the proposed works.
4. NP/17/0500/FUL. Roof alterations to garage, replacement extension to side & rear. Beachcroft, Manorbier, Tenby, Pembrokeshire, SA70 7SX, SS0647998179. 382m north of the proposed works.

¹⁵ An inquiry was made to the Pembrokeshire Coast National Park Development Management Section. They informed by email on the 22/01/2019 that no applications were noted within Manorbier Bay with the above criteria from the last 6 months.

¹⁶ <http://planning.pembrokeshire.gov.uk/swift/g/apas/run/wphappcriteria.display> An online search was conducted in January 2019 with the above criteria from the last 6 months, which identified the above four applications.

5 Screening Assessment

5.1 Potential Effects of the Proposed Works

During construction there is considered to be a potential pathway for effect on the features of the European Sites. The potential pathways for effect are in the form of:

- Habitat degradation;
- Disturbance; and
- Species mortality / injury.

During operation there is not predicted to be a pathway for effect on features of the European Sites.

These potential effects are considered in more detail below (Section 6) and in Table 2.

Table 2. Summary of effects from proposed work during construction and operation.

Pathways for Effects	Pembrokeshire Marine SAC		Bristol Channel Approaches cSAC	Limestone Coast of South West Wales SAC		Skomer, Skokholm and the Seas off Pembrokeshire SPA		Castlemartin Coast SPA	Carmarthen Bay SPA	Pembrokeshire Bat Sites and Bosherton Lakes		Carmarthen Bay and Estuaries SAC	
	Annex I habitats	Annex II species	Harbour porpoise	Annex I habitats	Annex II species	Annex I species	Seabird Assemblage	Chough	Common scoter	Annex I habitats	Annex II species	Annex I habitats	Annex II species
Construction													
Habitat loss	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Habitat degradation	Pathway for effects	Pathway for effects	Pathway for effects	Pathway for effects	No pathway for effects	Pathway for effects	Pathway for effects	Pathway for effects	Pathway for effects	No pathway for effects	No pathway for effects	Pathway for effects	Pathway for effects
Habitat severance	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Disturbance	No pathway for effects	Pathway for effects	Pathway for effects	No pathway for effects	Pathway for effects	Pathway for effects	Pathway for effects	Pathway for effects	Pathway for effects	No pathway for effects	Pathway for effects	No pathway for effects	Pathway for effects
Species mortality / injury	No pathway for effects	Pathway for effects	Pathway for effects	No pathway for effects	No pathway for effects	Pathway for effects	Pathway for effects	Pathway for effects	Pathway for effects	No pathway for effects	Pathway for effects	No pathway for effects	Pathway for effects
Operation													
Habitat loss	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Habitat degradation	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Habitat severance	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Disturbance	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects
Species mortality / injury	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects	No pathway for effects

5.2 Consideration of Effects and Significance

The Pembrokeshire Marine / Sir Benfro Forol SAC, Bristol Channel Approaches / Dynesfeydd Mor Hafren candidate SAC, Limestone Coast of South West Wales / Arfordir Calchfaen De Orllewin Cymru SAC, Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer Sgogywm a Moroedd Penfro SPA, Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC, Castlemartin Coast SPA, Carmarthen Bay / Bae Caerfyrddin SPA and Pembrokeshire Bat Sites and Bosherton Lakes / Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC have all been scoped into the assessment due to their proximity to the proposed works and / or their hydrological linkage, notably with regards to the effect of pollution.

For the purposes of this assessment it is concluded that in the absence of mitigation (as confirmed by *Coillte vs People against Wind* judgement¹⁷) where pathways for effects are present, these are considered to have the potential to cause significant effects and therefore an appropriate assessment is required for these sites.

Whilst there is considered a low likelihood of significant effects occurring for this project, the marine pathway for effect provides a small chance of mobile receptors coming into contact with, for example, pollution incidences. The screening of European Sites at distance is therefore considered precautionary, in the unlikely event of serious pollution events not being diluted in the marine environment, in the absence of mitigation.

¹⁷ *People over Wind*, Case C323/17 European Court of Justice, 12th April 2018.

6 Appropriate Assessment

6.1 Pembroke Marine / Sir Benfro Forol SAC

6.1.1 Habitats

6.1.1.1 Conservation Objectives

The habitat features of this site are potentially vulnerable to the effects of water quality changes from pollutants, and the potential effects of air quality from dust generation during construction.

Conservation status of a natural habitat means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2 of the Habitats Directive.

The conservation status of a natural habitat will be taken as 'favourable' when:

- Its natural range and the areas it covers within that range are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- Conservation status of typical species is favourable as defined in Article 1(i) of the Habitats Directive.

6.1.1.2 Habitat Degradation

Water Quality Effects

During construction, there is possibility that pollutants could be generated from the accidental spillage of chemicals from machinery, the opening of sewer systems, and / or plant, e.g. fuel, grease, oils etc. Construction activities could also generate sediment from several sources, e.g. tracking of plant across upper foreshore and excavation.

If a pollution incident on site was to occur, any pollution would be deposited on to rocky surfaces, i.e. shingle, and / or soak into a sandy substrate (dune system and / or beach). Pollutants are then likely to enter the marine system on the flooding tide, or through the watercourses on the terrestrial side of the site, and potentially be transported off site to impact the designated site.

The relatively small size of the site and the potential discharge quantity off-site into adjacent habitat is considered relatively small, in particular in relation to the total area of the SAC. The temporal duration of the proposed works will limit the probability and extent of any pollution event. Based on the site however and the potential to impact Annex I habitats from pollution incidences causing habitat

degradation, there could be considered an adverse effect on the integrity of the SAC.

Air Quality Effects

Construction works may generate dust from the proposed excavation, drilling, scabbling, opening of sewer systems and the use of access roads for vehicular / plant movements. The generated dust could impact on-site and off-site SAC habitats, both from aerial deposition and through the hydrological connectivity when suspended within the marine environment.

As the proposed works and works area are relatively small, in particular in relation to the total area of the SAC, there is not considered to be an adverse effect on the integrity of the SAC, via degradation of Annex I habitats from dust generation. With the quantity of dust potentially generated and the dilution effect within the marine environment any perceptible effect on the European Site is minimal. From a precautionary viewpoint however, mitigation is proposed to further reduce the impact of dust on the European Site features.

6.1.2 Species

6.1.2.1 Conservation Objectives

Conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term natural distribution and abundance of its populations within the territory referred to in Article 2;

The conservation status will be taken as ‘favourable’ when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitat(s);
- The natural range of the species is neither being reduced, nor is 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.

6.1.2.2 Habitat Degradation

Water Quality Effects

As described in Section 6.1.1.2, during construction sediment and pollutants may inadvertently enter the marine or freshwater environment. If polluted water were to reach the European Site the habitat on site may be affected, which could result in habitat degradation and / or displacement of Annex II species, as features of the European Site.

The potential scale of any negative change to water quality on site from the proposed construction work is not considered to be of a scale to adversely effect the Annex II species as features of the European Site, through indirect habitat

degradation. However, from a precautionary viewpoint, mitigation is proposed to further reduce the impact of negative water quality on the European Site features.

Air Quality Effects

The scale of dust generation on site from the proposed construction work is not considered to be of a scale to adversely affect the Annex II species as features of the European Site, through indirect habitat degradation. However, from a precautionary viewpoint, mitigation is proposed to further reduce the impact of negative water quality on the European Site features.

6.1.2.3 Disturbance

Noise and vibration

Otter - There is the possibility that otter could be present on site, however it is considered unlikely otter will be present during the hours of construction, as all works are proposed for the day and there is a high level of public disturbance on site.

If otter were present, disturbance from noise and vibration could displace individuals from the area; however, as works are only of relatively short duration and there is available habitat elsewhere for foraging and commuting (along the coastline or up freshwater systems) there is considered to be no adverse effect on the integrity of the SAC feature.

Fish - Fish species present within the SAC include sea lamprey, river lamprey, allis and twaite shad (i.e. species which are listed in Table 1). Lamprey are regarded as 'non-specialists' with respect to hearing ability, since they do not possess a swim bladder and therefore are not regarded to be sensitive to acoustic effects¹⁸; consequently, lamprey species have been scoped out of the assessment.

Allis and twaite shad both require rivers >20m wide on average to migrate up and spawn¹⁹. It can be assumed that the freshwater inlet at Manorbier Bay is therefore unsuitable for spawning (being only a few metres wide at most and largely above the high tide mark most of the time with only a shallow flow over shingle) and shad will not migrate up this river. Impacts from construction on shad therefore involve displacement from the marine environment through acoustic deterrents as a result of percussive activities, e.g. drilling, plant movement. Significant sources of noise and vibration on site include plant movement, excavation, scabbling, drilling and any hammering associated with shuttering construction.

Given the short duration of the works, the absence of night works (when shad may try to migrate upstream), the availability of suitable coastal/marine habitat elsewhere, and the fact that works will occur at low tide (reducing the transmission of noise and vibration as it passes through solid substrate rather than water) there is unlikely to be an adverse impact on Annex II fish as features of the European Site.

¹⁸ Popper, A. 2005. Environmental Bioacoustics. A Review of Hearing by Sturgeon and Lamprey

¹⁹ Maitland PS & Hatton-Ellis TW (2003). Ecology of the Allis and Twaite Shad. Conserving Natura 2000 Rivers Ecology Series No. 3. English Nature, Peterborough.

Grey seal - Grey seal may also be present within the coastal waters at low tide, however if works commence around the proposed dates of September/October then grey seal are likely to be pupping at this time of year. As grey seal are unlikely to pup at Manorbier beach (given the levels of public disturbance and absence of desk study records) they are likely to spend less time in Manorbier bay. If grey seal are in the area, they are likely to be displaced from the noise and vibration associated with the construction activities.

Given the short duration of the works, the availability of suitable coastal/marine habitat elsewhere, and the fact that works will occur at low tide (reducing the transmission of noise and vibration as it passes through solid substrate rather than water) there is unlikely to be an adverse impact on grey seal as features of the European Site.

Lighting

No construction works are proposed at night time. It is possible that there may be lighting associated with the site compound, which could displace otter from the area, if they are present.

The general level of disturbance regarding lighting from the public car park, where the site compound is likely to be located, will probably displace otter from the area. All lighting will be designed to face away from watercourses. If otter were present, disturbance from lighting could displace individuals from the area; however, as works are only of relatively short duration and there is available habitat elsewhere for foraging and commuting (along the coastline or up terrestrial systems) there is considered to be no adverse effect on the integrity of the SAC feature.

Lighting is anticipated to not illuminate habitat suitable for grey seal or Annex II fish species.

6.1.2.4 Species / Mortality Injury

During construction, sediment and pollutants could be generated (as discussed in Section 6.1.1.2), which could lead to direct impacts to grey seal and Annex II fish species (mortality, illness and behavioural changes) if any contaminated water is directly ingested or indirectly through contaminated prey (who have ingested pollutants).

Given the works are proposed to start in late autumn (from September / October 2019) both Annex II fish species and grey seal could be present. As the proposed works are confined to the intertidal area and the access track to site is heavily disturbed from public use the presence of shore dock is not anticipated within the work's area.

As the proposed works and works area are relatively small, in particular in relation to the total area of the SAC, there is therefore not considered to be an adverse effect on the integrity of the SAC, via injury/mortality of Annex II species. From a precautionary viewpoint however, mitigation is proposed to further reduce the impact of contaminants on the European Site features.

6.1.3 Mitigation

6.1.3.1 Water Quality

The risk of sediment reaching the water courses and of leakage or spillage of fuel, chemicals and other potentially polluting substances will be mitigated through good site practice and management, implemented via the final CEMP. The CEMP will include measures such as those contained within the Environment Agency's Pollution Prevention Guidelines 6 (PPG620). All measures detailed in the agreed CEMP will be adhered to by contractors working on site. All construction activities will be carried out in accordance with guidance outlined within Construction Industry Research and Information Association (CIRIA) best practice guidance.

The storage of fuel/oils on sites would be in accordance with The Water Resources (Control of Pollution) (Oil Storage) (Wales) Regulations 2016. Additional guidance can be found in Guidelines For Pollution Prevention (GPP) 2 – Above Ground Oil Storage Tanks, GPP 3 – Use and design of oil separators, GPP 8 - Safe Storage and Disposal of Used Oils, and PPG 26 – Safe Storage – Drums and Intermediate Bulk Containers. The storage and use of hazardous chemicals would be in accordance with the Control of Substances Hazardous to Health (COSHH) Regulations (1998).

Further mitigation methods as specified in the contractor's method statement will be adhered to:

- All excess and waste materials however will be removed from the beach and disposed of off-site at a suitable licensed facility;
- The concrete wagon will wash out in designated washout area, ensuring surface run-off does not reach watercourses or semi-natural habitats;
- Use of environmentally friendly products where possible;
- Dispose of all waste materials to designated skips etc.;
- Emergency spill kits are to be maintained at every work location and with each main item of plant;
- Equipment to be stored on designated drip trays/ bunded areas; and
- Minimal quantities of materials, fuels etc. to be taken on to foreshore.

6.1.3.2 Air Quality

The dust emitting activities assessed will be greatly reduced or eliminated by applying the site-specific mitigation measures for sites according to the IAQM

²⁰ Working at construction and demolition sites: PPG6, Pollution Prevention Guidelines, Environment Agency, Accessed at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/290139/pmho0412bwfe-e-e.pdf

guidance²¹. These mitigation methods proposed are considered precautionary in relation to air quality effects on the SAC features.

The guidance notes that it is anticipated that with the implementation of effective site-specific mitigation measures, the environmental effect will not be significant in most cases. The following measures from the guidance are relevant and will be included in the final Construction Environmental Management Plan (CEMP) for the site (which will be prepared by the contractor).

- Avoid scabbling (roughening of concrete surfaces) if possible;
- Sand and other aggregates are to be stored in bunded areas and are not to be allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- Bulk cement and other fine powder materials are to be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery;
- For smaller supplies of fine powder materials bags are to be sealed after use and stored appropriately to prevent dust;
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- Avoid dry sweeping of large areas;
- Any excavations will be kept damp, where possible, to control dust generation.

Further methods as specified in the contractor's method statement will be adhered to:

- Minimum quantity of plant and materials to be taken to the work area to reduce number of trips across beach;
- Vehicles to be marshalled by operatives walking in front to control speeds; and
- Use dust suppression as required.

6.1.3.3 Disturbance

Grey seal - Disturbance to non-breeding grey seal from noise and vibration is not considered to have an adverse effect on the integrity of the European Site, with the aforementioned reasons within Section 6.1.2.3, when grey seal are within the marine environment.

²¹ Holman et al (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf

Further methods as specified in the contractor's method statement (applicable to all Annex II species) will be adhered to:

- Ensure all plant has noise reduction measures in place and working correctly i.e. baffles, acoustic jackets;
- Switch off all plant when not in use;
- Vibration and noise monitoring during certain operations; and
- Noise to be reduced by engineering means wherever practicable, e.g. use of noise reducing blades, purchasing of silenced equipment, maintenance of equipment to manufacturers specification to avoid worsening noise, e.g. ensure rotating parts are checked for balance and replace if necessary.

6.1.3.4 Species / Mortality Injury

As described above in Sections 6.1.3.1 and 6.1.3.2, appropriate water and air quality mitigation measures have been provided from a precautionary point of view to further reduce the impact of contaminants on the European Site features.

For otter and grey seal (where appropriate) the following additional measures are to be implemented from a precautionary point of view prior to or during construction through detailed design and adherence to the final CEMP:

- Any security lighting / site compound lighting, which may be required on site is to avoid overspill onto adjacent habitats, which are likely to support crepuscular or nocturnal species including otter and bats.
- Plant and vehicular movements are to be restricted to agreed low speed limits;
- Excavations are to be protected at night-time or a means of escape provided (such as a plank of wood); and
- All tools, food, litter and construction materials and packaging that may constitute a hazard to otter and grey seal will be removed daily from the site.

6.1.4 Residual Effects

With the inclusion of the mitigation measures outlined above it is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the Pembrokeshire Marine / Sir Benfro Forol SAC.

6.2 Bristol Channel Approaches / Dynesfeydd Mor Hafren cSAC

6.2.1 Species

6.2.1.1 Conservation Objectives

The focus of the conservation objectives for harbour porpoise sites is on addressing pressures that affect site integrity and would include:

- Killing or injuring significant numbers harbour porpoise (directly or indirectly);
- Preventing their use of significant parts of the site (disturbance / displacement);
- Significantly damaging relevant habitats; and
- Significantly reducing the prey base.

6.2.1.2 Habitat Degradation

As described in Section 6.1.2.2, a number of pathways for habitats to be degraded occur through negative impacts on water and air quality. If there are significant inputs of sediment and / or pollutants into the Manorbier bay, it is possible the habitat could be temporarily degraded and result in the displacement of harbour porpoise from the area.

Even though the scale of the works and their temporal duration are relatively small, if significant quantities of pollutants enter the marine system harbour porpoise could be displaced from their habitat.

However, given the size of the European Site and the mobility of harbour porpoise there is not considered to be an adverse effect on the integrity of the European Site, through habitat degradation for harbour porpoise.

6.2.1.3 Disturbance

Impacts from construction on harbour porpoise could involve displacement from the marine environment through acoustic deterrents as a result of percussive activities, e.g. drilling, plant movement. Significant sources of noise and vibration on site include plant movement, excavation, scabbling, drilling and any hammering associated with shuttering construction.

Given the short duration of the works, the availability of suitable coastal/marine habitat elsewhere, and the fact that works will occur at low tide (reducing the transmission of noise and vibration as it passes through solid substrate rather than water) there is unlikely to be an adverse effect on the integrity of the European Site, through disturbance to harbour porpoise.

6.2.1.4 Species Injury / Mortality

During construction, sediment and pollutants could be generated (as discussed in Section 6.1.1.2), which could lead to direct impacts to harbour porpoise (mortality, illness and behavioural changes) if any contaminated water is directly ingested or indirectly through contaminated prey (who have ingested pollutants).

As the proposed works and works area are relatively small, in particular in relation to the total area of the cSAC, and harbour porpoise are a mobile receptor that can swim away, there is therefore not considered to be an adverse effect on the integrity of the cSAC, via injury/mortality of harbour porpoise. From a precautionary viewpoint however, mitigation is proposed to further reduce the impact of contaminants on harbour porpoise

6.2.2 Mitigation

6.2.2.1 Water and Air Quality

Whilst adverse effects on the integrity of the cSAC are not predicted from the proposed works, the mitigation outlined in Sections 6.1.3.1 and 6.1.3.2 are also applicable for measures to mitigate impacts on water and air quality on harbour porpoise from a precautionary point of view.

6.2.2.2 Disturbance

Disturbance to harbour porpoise from noise and vibration is not considered to have an adverse effect on the integrity of the European Site, with the aforementioned reasons within Section 6.2.1.3.

From a precautionary point of view, the contractor's method statement on noise reduction (Section 6.1.3.3) is also applicable for harbour porpoise.

6.2.2.3 Species Injury / Mortality

As described above in Sections 6.1.3.1 and 6.1.3.2, appropriate water and air quality mitigation measures have been provided from a precautionary point of view to further reduce the impact of contaminants on harbour porpoise.

6.2.3 Residual Effects

It is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the Bristol Channel Approaches / Dynesfeydd Mor Hafren cSAC.

6.3 Limestone Coast of South West Wales / Arfordir Calchfaen De Orllewin Cymru SAC

6.3.1 Habitats

6.3.1.1 Conservation Objectives

The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing;
- The specific structure and functions which 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.

6.3.1.2 Habitat Degradation

Water Quality

As described in Section 6.1.1.2, pollutants could potentially be generated from the proposed works. Given the marine aspect of the works, a pathway for effect exists to potentially cause habitat degradation from the transfer of pollutants / sediments to the European Site.

The relatively small size of the proposed site, the distance between the source of pollutants and the European Site, and the potential discharge quantity off-site into adjacent habitat is considered relatively small, in particular in relation to the total area of the SAC. The temporal duration of the proposed works will limit the probability and extent of any pollution event.

Whilst the scale of any impact is likely to be small, it is considered that without mitigation and / or avoidance there is the potential to cause an adverse effect on the integrity of the SAC, from degradation of Annex I habitats from pollution incidences.

6.3.2 Species

6.3.2.1 Conservation Objectives

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- Population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is 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.

6.3.2.2 Disturbance

Greater horseshoe bats are unlikely to be disturbed from the proposed works given the absence of night works and the absence of caves on the stretch of coast adjacent to the proposed works²².

Working at night is not expected, however there may be some lighting at night associated with the site compound. If greater horseshoe bats were present, disturbance from lighting could displace individuals from the area; however, as works are only of relatively short duration and there is available habitat elsewhere for foraging and commuting (along the coastline) there is considered to be no adverse effect on the integrity of the SAC feature.

6.3.3 Mitigation

6.3.3.1 Water Quality

The measures outlined in Sections 6.1.3.1 are applicable to mitigate impacts on Annex I habitats, as features of the SAC, from water quality effects.

6.3.4 Residual Effects

With the inclusion of the mitigation measures outlined above it is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the Limestone Coast of South West Wales / Arfordir Calchfaen De Orllewin Cymru SAC.

²² A search for caves was undertaken on the Cambrian Cave Registry. As no caves were located both on the Extended Phase 1 survey and none are reported in the Cave Registry it is assumed that there is a low likelihood of bats roosting and / or hibernating along the exposed stretch of coastline at Manorbier.

6.4 Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer Sgogywm a Moroedd Penfro SPA

6.4.1 Species

6.4.1.1 Conservation Objectives

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- Population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is 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.

This assessment and mitigation will consider the features of the European Site, namely Annex I species and the seabird assemblage as a single entity, unless specified otherwise.

6.4.1.2 Habitat Degradation

Water Quality

As described in Section 6.1.1.2, pollutants could potentially be generated from the proposed works. Given the marine aspect of the works, a pathway for effect exists to potentially cause habitat degradation from the transfer of pollutants / sediments to the European Site.

The relatively small size of the proposed site, the distance between the source of pollutants and the European Site, and the potential discharge quantity off-site into adjacent habitat is considered relatively small, in particular in relation to the total area of the SPA. The temporal duration of the proposed works will limit the probability and extent of any pollution event.

Given the mobility of the Annex I species, as features of the SPA, it is considered that there will not be an adverse effect on the integrity of the SPA, from habitat degradation and subsequent displacement of Annex I species.

6.4.1.3 Disturbance

As discussed above in Sections 6.1.2.3 and 6.2.1.3, the proposed works may disturb Annex I species through noise, vibration and lighting (only from site compound lighting) from site activities.

Given the short duration of the works, the availability of suitable coastal/marine habitat elsewhere, and the fact that works will occur at low tide (reducing the transmission of noise and vibration as it passes through solid substrate rather than water) there is unlikely to be an adverse effect on the integrity of the European Site, through disturbance to SPA features.

6.4.1.4 Species Mortality / Injury

As discussed above in Section 6.1.2.4, the proposed works may result in direct impacts to SPA features (mortality, illness and behavioural changes) if any contaminated water is directly ingested or indirectly through contaminated prey (who have ingested pollutants).

As the proposed works and works area are relatively small, in particular in relation to the total area of the SPA, there is therefore not considered to be an adverse effect on the integrity of the SPA, via injury/mortality of SPA features. From a precautionary viewpoint however, mitigation is proposed to further reduce the impact of contaminants on SPA features.

6.4.2 Mitigation

6.4.2.1 Species Mortality / Injury

As described above in Sections 6.1.3.1, appropriate water quality mitigation measures have been provided from a precautionary point of view to further reduce the impact of contaminants on SPA features.

6.4.3 Residual Effects

It is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer Sgogywm a Moroedd Penfro SPA.

6.5 Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC

6.5.1 Habitats

6.5.1.1 Conservation Objectives

Conservation status of a natural habitat means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2 of the Habitats Directive.

The conservative status of a natural habitat will be taken as 'favourable' when:

- Its natural range and the areas it covers within that range are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future;
- Conservation status of typical species is favourable as defined in Article 1(i) of the Habitats Directive.

6.5.1.2 Habitat Degradation

Water Quality

As described in Section 6.1.1.2, pollutants could potentially be generated from the proposed works. Given the marine aspect of the works, a pathway for effect exists to potentially cause habitat degradation from the transfer of pollutants / sediments to the European Site.

The relatively small size of the proposed site, the distance between the source of pollutants and the European Site, and the potential discharge quantity off-site into adjacent habitat is considered relatively small, in particular in relation to the total area of the SAC. The temporal duration of the proposed works will limit the probability and extent of any pollution event.

With the distances involved and the likely dilution of any pollutants, it is considered unlikely for there to be an adverse effect on the integrity of the SAC, from degradation of Annex I habitats from pollution incidences.

6.5.2 Species

6.5.2.1 Conservation Objectives

Conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term natural distribution and abundance of its populations within the territory referred to in Article 2 of the Habitats Directive;

The conservation status will be taken as ‘favourable’ when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is 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.

6.5.2.2 Habitat Degradation

Water Quality

As described in Section 6.1.1.2, pollutants could potentially be generated from the proposed works. Given the marine aspect of the works, a pathway for effect exists to potentially cause habitat degradation from the transfer of pollutants / sediments to the European Site.

The relatively small size of the proposed site, the distance between the source of pollutants and the European Site, and the potential discharge quantity off-site into adjacent habitat is considered relatively small, in particular in relation to the total area of the SAC. The temporal duration of the proposed works will limit the probability and extent of any pollution event.

Given the mobility of the Annex II species, as features of the SAC, it is considered that there will not be an adverse effect on the integrity of the SAC, from habitat degradation and subsequent displacement of Annex II species.

6.5.2.3 Disturbance

Noise and vibration

Otter - There is the possibility that otter could be present on site, however it is considered unlikely otter will be present during the hours of construction, as all works are proposed for the day and there is a high level of public disturbance on site.

If otter were present, disturbance from noise and vibration could displace individuals from the area; however, as works are only of relatively short duration and there is available habitat elsewhere for foraging and commuting (along the coastline or up freshwater systems) there is considered to be no adverse effect on the integrity of the SAC feature.

Fish - Fish species present within the SAC include sea lamprey, river lamprey, allis and twaite shad (i.e. species which are listed in Table 1). For the reasons described in Section 6.1.2.3, lamprey species been scoped out of the assessment, and for allis and twaite it is considered unlikely that there will be an adverse effect on the integrity of the SAC through disturbance to these species based on the separation distance between the SAC and the proposed works.

Lighting

No construction works are proposed at night time. It is possible that there may be lighting associated with the site compound, which could displace otter from the area, if they are present.

For the reasons described in Section 6.1.2.3, there is considered to be no adverse effect on the integrity of the SAC feature, from lighting disturbance to otter.

Lighting will not illuminate habitat suitable Annex II fish species.

6.5.2.4 Species / Mortality Injury

During construction, sediment and pollutants could be generated (as discussed in Section 6.1.1.2), which could lead to direct impacts to otter and Annex II fish species (mortality, illness and behavioural changes) if any contaminated water is directly ingested or indirectly through contaminated prey (who have ingested pollutants).

Given the works are proposed to start in late autumn (from September / October 2019) both Annex II fish species and otter could be present.

As the proposed works and works area are relatively small, in particular in relation to the total area of the SAC and there is a large separation distance, there is therefore not considered to be an adverse effect on the integrity of the SAC, via injury/mortality of Annex II species. From a precautionary viewpoint however, mitigation is proposed to further reduce the impact of contaminants on the European Site features.

6.5.3 Mitigation

6.5.3.1 Water Quality

From a precautionary point of view the measures outlined in Sections 6.1.3.1 are applicable to mitigate potential impacts on Annex I habitats and Annex II species, as features of the SAC, from water quality effects.

6.5.4 Residual Effects

It is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC.

6.6 Castlemartin Coast SPA

6.6.1 Species

6.6.1.1 Conservation Objectives

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- Population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is 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.

6.6.1.2 Habitat Degradation

Water Quality

As described in Section 6.1.1.2, pollutants could potentially be generated from the proposed works. Given the marine aspect of the works, a pathway for effect exists to potentially cause habitat degradation from the transfer of pollutants / sediments to habitats which could utilise for foraging, e.g. coastal habitats such as the intertidal habitat.

Desk study records indicate chough are within the area, however the frequent public disturbance and sub-optimal foraging habitat is likely to limit their presence on site. Furthermore, the relatively small size of the proposed site, and the potential discharge quantity off-site into adjacent habitat is considered relatively small, in particular in relation to the total area of the SPA. The temporal duration of the proposed works will further limit the probability and extent of any pollution event.

Given the mobility of the Annex I species, as a feature of the SPA, it is considered that there will not be an adverse effect on the integrity of the SPA, from habitat degradation and subsequent displacement of Annex I species.

6.6.1.3 Disturbance

As discussed above in Sections 6.1.2.3 and 6.2.1.3, the proposed works may disturb chough species through noise and vibration from site activities.

Given the works will not impact suitable foraging terrestrial habitat, the works are outside the breeding bird season, the works are of short duration and there is availability of suitable coastal habitat elsewhere, there is unlikely to be an adverse effect on the integrity of the European Site, through disturbance to this SPA feature.

6.6.1.4 Species Mortality / Injury

As discussed above in Section 6.1.2.4, the proposed works may result in direct impacts to SPA features (mortality, illness and behavioural changes) if any contaminated water or material is directly ingested or indirectly through contaminated prey (who have ingested pollutants).

As the proposed works and works area are relatively small, in particular in relation to the total area of the SPA, there is therefore not considered to be an adverse effect on the integrity of the SPA, via injury/mortality of chough. From a precautionary viewpoint however, mitigation is proposed to further reduce the impact of contaminants on chough.

6.6.2 Mitigation

6.6.2.1 Pollution

From a precautionary point of view the measures outlined in Sections 6.1.3.1 are applicable to mitigate potential impacts on chough, as a feature of the SPA, from water quality effects.

6.6.3 Residual Effects

It is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the Castlemartin Coast SPA.

6.7 Carmarthen Bay / Bae Caerfyrddin SPA

6.7.1 Conservation Objectives

Conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term natural distribution and abundance of its populations within the territory referred to in Article 2 of the Habitats Directive;

The conservation status will be taken as ‘favourable’ when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is 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.

6.7.2 Species

6.7.2.1 Habitat Degradation

Water Quality

As described in Section 6.1.1.2, pollutants could potentially be generated from the proposed works. Given the marine aspect of the works, a pathway for effect exists to potentially cause habitat degradation from the transfer of pollutants / sediments to the European Site.

The relatively small size of the proposed site, the distance between the source of pollutants and the European Site, and the potential discharge quantity off-site into adjacent habitat is considered relatively small, in particular in relation to the total area of the SPA. The temporal duration of the proposed works will limit the probability and extent of any pollution event.

Given the mobility of the Annex I species, as features of the SPA, it is considered that there will not be an adverse effect on the integrity of the SPA, from habitat degradation and subsequent displacement of Annex I species.

6.7.2.2 Disturbance

As discussed above in Sections 6.1.2.3 and 6.2.1.3, the proposed works may disturb common scoter species through noise and vibration from site activities.

Given the short duration of the works, the availability of suitable marine habitat elsewhere, the more pelagic tendency of common scoter and the fact that works will occur at low tide (reducing the transmission of noise and vibration as it passes through solid substrate rather than water) there is unlikely to be an adverse effect on the integrity of the European Site, through disturbance to SPA features.

6.7.2.3 Species Mortality / Injury

As discussed above in Section 6.1.2.4, the proposed works may result in direct impacts to SPA features (mortality, illness and behavioural changes) if any contaminated water is directly ingested or indirectly through contaminated prey (who have ingested pollutants).

Whilst the proposed works and works area are relatively small, in particular in relation to the total area of the SPA, and that scoter are mobile and could swim away and there is a large separation distance, there is therefore not considered to be an adverse effect on the integrity of the SPA, via injury/mortality of common scoter.

6.7.3 Mitigation

6.7.3.1 Species Mortality / Injury

From a precautionary point of view the measures outlined in Sections 6.1.3.1 are applicable to mitigate potential impacts on common scoter, as a feature of the SPA, from water quality effects.

6.7.4 Residual Effects

It is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the Carmarthen Bay / Bae Caerfyrddin SPA.

6.8 Pembrokehire Bat Sites and Bosherton Lakes / Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC

6.8.1 Species

6.8.1.1 Conservation Objectives

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- Population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is 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.

6.8.1.2 Disturbance

Otter - There is the possibility that otter could be present on site, however it is considered unlikely otter will be present during the hours of construction, as all works are proposed for the day and there is a high level of public disturbance on site.

If otter were present, disturbance from noise and vibration could displace individuals from the area; however as works are of a large distance from the SAC (8.3km), the works are only of relatively short duration and there is available habitat elsewhere for foraging and commuting (along the coastline or up freshwater systems) there is considered to be no adverse effect on the integrity of the SAC feature.

No construction works are proposed at night time. It is possible that there may be lighting associated with the site compound, which could displace otter from the area, if they are present. As described in Section 6.3.2.2, the impact from site lighting is unlikely to cause an adverse effect on the integrity of the SAC.

Bats – As described in Section 6.3.2.2, greater and lesser horseshoe bat are unlikely to be disturbed from the proposed works given the absence of night works and the absence of caves on the stretch of coast adjacent to the proposed works.

Working at night is not expected, however there may be some lighting at night associated with the site compound. If greater or lesser horseshoe bats were present, disturbance from lighting could displace individuals from the area; however, as works are only of relatively short duration and there is available

habitat elsewhere for foraging and commuting (along the coastline) there is considered to be no adverse effect on the integrity of the SAC feature.

6.8.1.3 Species Mortality / Injury

During construction, sediment and pollutants could be generated (as discussed in Section 6.1.1.2), which could lead to direct impacts to otter (mortality, illness and behavioural changes) if any contaminated water is directly ingested or indirectly through contaminated prey (who have ingested pollutants).

Whilst the proposed works and works area are relatively small, in particular in relation to the total area of the SAC, and there is a large separation distance, there is therefore not considered to be an adverse effect on the integrity of the SAC, via injury/mortality of Annex II species.

6.8.2 Mitigation

6.8.2.1 Pollution

From a precautionary point of view the measures outlined in Sections 6.1.3.1 are applicable to mitigate potential impacts on Annex II species, as features of the SAC, from water quality effects.

6.8.3 Residual Effects

It is concluded that the proposed development is unlikely to give rise to an adverse effect on the integrity of the Pembrokeshire Bat Sites and Bosherton Lakes / Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC.

6.9 In-Combination Assessment

An in-combination assessment was screened out for all planning applications (see Section 4.1) given their small scale of works, the separation distance between them and the proposed works, and their presence outside of a European Site.

When considering the mitigation measures proposed for this project, it is concluded that the project will not have an adverse effect in-combination with other projects and plans. This is in accordance with Tyldesley (2011)¹.

7 Proposals for Monitoring

7.1 Pre-Construction Monitoring

If more than two years have elapsed since the surveys were undertaken to inform this assessment further monitoring will be undertaken to provide up to date information on the presence of European Site features and other protected species.

7.2 Monitoring During Construction

The contractor undertaking these works will incorporate all recommended mitigation from this HRA into the CEMP.

7.3 Post-Construction Monitoring

With the inclusion of the mitigation measures outlined and the conclusion that there is unlikely to be an adverse effect on the integrity any European Site post-construction monitoring is not required.

7.4 Reporting

The final CEMP and all correspondence between NRW and the contractors should be retained.

8 Conclusion

Welsh Water are proposing to repair the Manorbier outfall, which has had a history of issues, and currently the pipe capping has been washed away. Without reparation, the outfall is further at risk of collapse and poses both a concern to the environment and bathing water.

A number of European Sites exist within proximity to the proposed works and with a potential pathway for effect: Pembrokeshire Marine / Sir Benfro Forol SAC, Bristol Channel Approaches / cSAC, Limestone Coast of South West Wales SAC, Skomer, Skokholm and the Seas off Pembrokeshire SPA, Carmarthen Bay and Estuaries SAC, Castlemartin Coast SPA, Carmarthen Bay SPA and Pembrokeshire Bat Sites and Bosherton Lakes SAC.

Potential adverse effects could occur through pollution events, and disturbance from noise, vibration and lighting. In the absence of mitigation, impacts could arise on features of European Sites, e.g. Annex I habitats, Annex II species and Annex I bird species.

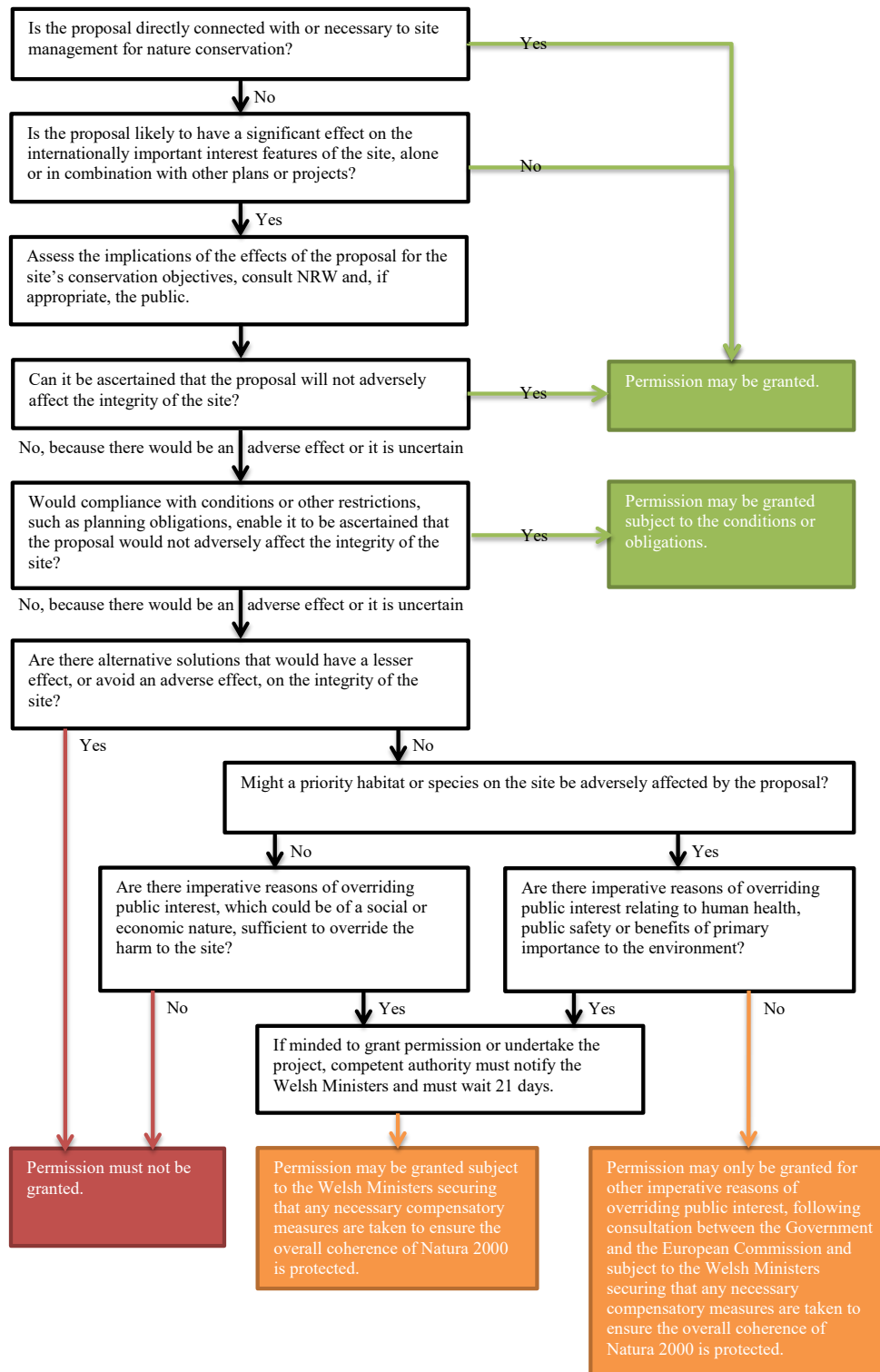
The Appropriate Assessment has considered these effects in relation to the Conservation Objectives for the features of the European Sites and identified a number of mitigation measures.

These measures along with the proposed monitoring are considered sufficient to ensure that the construction and operation of the proposed development do not give rise to any adverse effects on the integrity of the European Sites.

Appendix A

Habitats Regulations Assessment Process

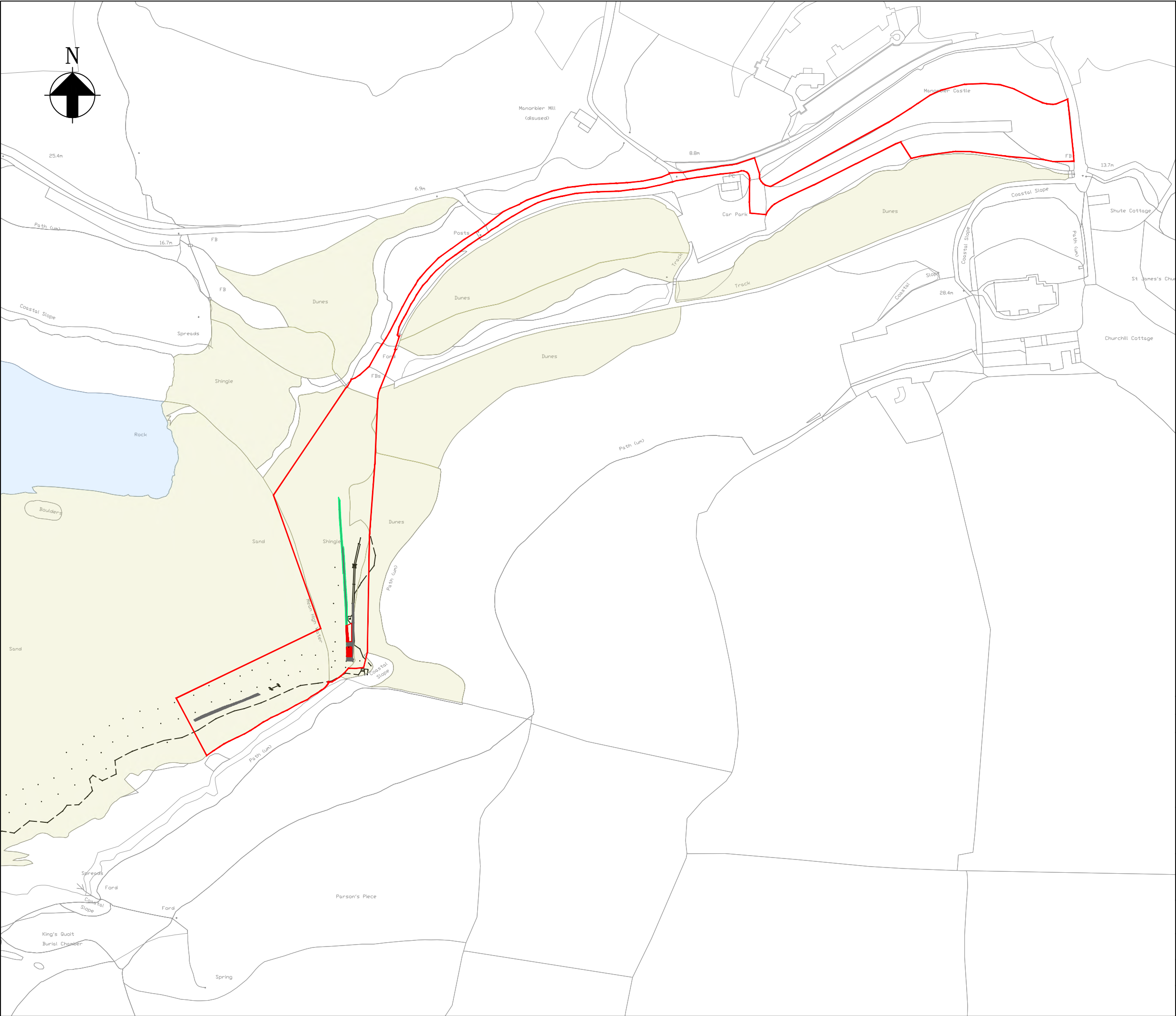
A1 Habitats Regulations Assessment Process



Appendix B

Proposed Works

B1 Proposed Works



LEGEND:

AREA OF LAND TO BE SURVEYED

CO-ORDINATES:

E = 206129.221

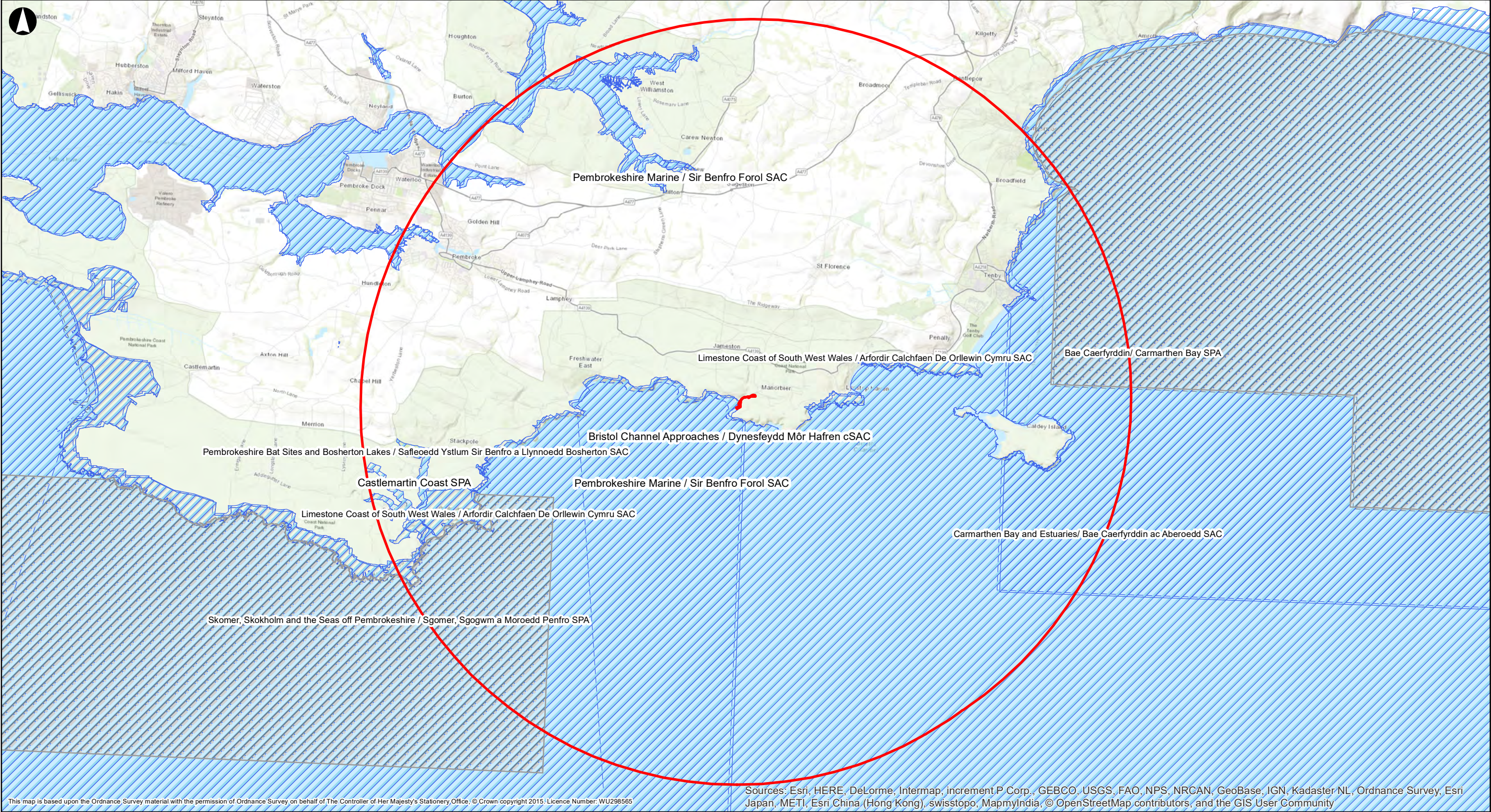
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P1	05.1218	LOB	ISSUE FOR INFORMATION			
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Capital Delivery Alliance Cynghrair Cyflawni Cyfalaf Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ						
Project Name. MANORBIER						
Drawing Title. ECOLOGICAL SURVEY AREA						
Suitability. INFORMATION					Suitability Code. S2	
Originator. LOB		Designer. LOB		Date. DEC 18		
Internal Project Number. 241055		Scale. 1:2000		Rev. P1		
Drawing Number. 4692_S_205-ARP-19-AG-DR-CL-00601						

Appendix C

Environmental Constraints Plan

C1 Environmental Constraints Plan



Legend

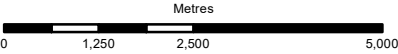
- Site Boundary
- 10km Buffer
- ▨ SPA
- ▨ SAC

PO	2019-01-18	AC	PW	AC
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Issue	Date	By	Chkd	Appd
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Job Title
AMP6 Manorbier Outfall

Manorbier Environmental Constraints

Scale at A3
1:100,000

Job No
241437-00

Drawing Status
Preliminary

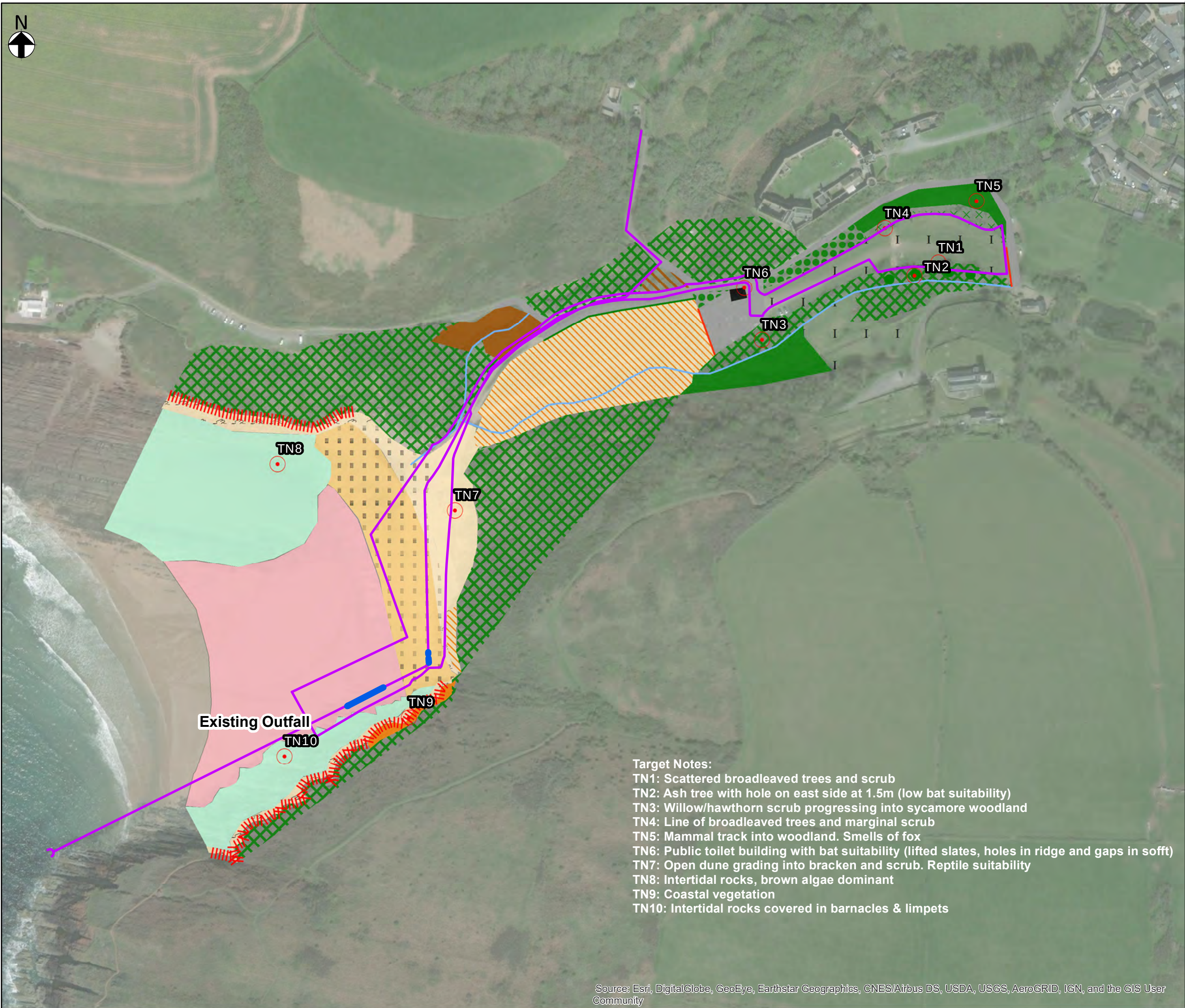
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001

Issue
P0

Appendix D

Extended Phase 1 Habitat Plan

D1 Extended Phase 1 Habitat Plan

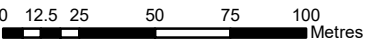


Target Notes:
TN1: Scattered broadleaved trees and scrub
TN2: Ash tree with hole on east side at 1.5m (low bat suitability)
TN3: Willow/hawthorn scrub progressing into sycamore woodland
TN4: Line of broadleaved trees and marginal scrub
TN5: Mammal track into woodland. Smells of fox
TN6: Public toilet building with bat suitability (lifted slates, holes in ridge and gaps in sofft)
TN7: Open dune grading into bracken and scrub. Reptile suitability
TN8: Intertidal rocks, brown algae dominant
TN9: Coastal vegetation
TN10: Intertidal rocks covered in barnacles & limpets

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Site Boundary
- Proposed Concrete Surround
- A3.1 - Broad-leaved parkland/scattered trees
- TN - Target note
- H8.1 - Hard cliff
- G2 - Running water
- J2.1.2 - Intact hedge - species-poor
- J2.5 - Wall
- A1.1.1 - Broadleaved woodland - semi-natural
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- B4 - Improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- H1.1 - Intertidal - mud/sand
- H1.2 - Intertidal - shingles/cobbles
- H1.3 - Intertidal - boulders/rocks
- H3 - Shingle above high tide mark
- H4 - Rocks/boulders above mean high water
- H6.5 - Dune grassland
- H6.8 - Open dune
- H8.4 - Coastal grassland
- J3.6 - Buildings
- J5 - Gravel/hard standing



P0	2019-01-23	KJ	Preliminary	CD	NH	2019-01-31
Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.

 **Capital Delivery Alliance**
Cynghair Cyflawni Cyfalaf

Ty Awon, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name:	MANORBIER
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Drawing Title:	EXTENDED PHASE 1 HABITAT SURVEY
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Suitability:	FOR INFORMATION	Suitability Code:	S2
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Originator	KJ	Designer	KJ	Date.	2019-01-31
Internal Project Number	241055-00	Scale	1:2,500	Rev.	P0

Drawing Number:	002
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Appendix E

Desk Study Summary Results

E1 Desk Study Summary Results

Species	Records
Otter <i>Lutra lutra</i>	No records were returned from within the last 10 years and within the search area.
Bats	Numerous records of bats were returned within the last 10 years, and further records back to the 1970's. Roost records were returned from around 300m from the site of both greater horseshoe bat and brown long-eared bat from within the last 16 years. Manorbier Castle is a known bat roost. Species recorded from the last 10 years include: noctule, lesser horseshoe, whiskered, brown long-eared and greater horseshoe.
Great crested newt <i>Triturus cristatus</i>	No records were returned from within the search area.
Hazel dormouse <i>Muscardinus avellanarius</i>	No records were returned from within the search area.
Schedule 1 birds on Wildlife and Countryside Act 1981	Schedule 1 birds potentially breeding near the site: barn owl, chough, Dartford warbler, firecrest and peregrine.
Badger <i>Meles meles</i>	Twenty-one records of badger were provided from the last 10 years. The closest record from the last 10 years was from 1.2km north of the site.
Reptiles	Forty-seven records of reptiles were returned from within the last 10 years. Species include: common lizard, grass snake, adder and slow-worm. The closest record was from 120m east of the site of a female adder in 2012.
Water vole <i>Arvicola amphibius</i>	No records were returned from within the search area.

Appendix D: Preliminary Ecological Appraisal

Dwr Cymru Welsh Water
**Manorbier WwTW Outfall
Remediation**
Ecological Appraisal Report

Issue | 1 February 2019

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

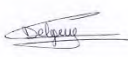
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Figure 1 – Site Location Plan

Figure 2 – Extended Phase 1 Habitat Survey

Appendices

Appendix A

Legislative Context

Appendix B

Photographs

1 Introduction

1.1 Background

Ove Arup and Partners Limited (Arup) was commissioned by Dwr Cymru Welsh Water (DCWW) to undertake an ecological appraisal comprising a desk study and Extended Phase 1 Habitat Survey in relation to proposed remediation works to the Manorbier Wastewater Treatment Works (WwTW) outfall in Manorbier, Pembrokeshire. The remediation works required to the outfall are on the beach and involve covering some exposed sections of pipe and a manhole in concrete.

1.2 The Site

The redline boundary shown in Figure 1 includes the manhole and exposed sections of pipe on the beach, which need repair, as well as the site compound (beach car park) and access track. The area within this redline boundary was the focus of the Extended Phase 1 Habitat Survey and is referred to as 'the Site'.

The Site is located on the coast of Manorbier, 8km south-east from Pembroke and within the county of Pembrokeshire, South Wales. The Site is broadly centred on National Grid Reference SS061975.

1.3 Proposed Works

Manorbier outfall has short sections of exposed pipe at the top end of the beach. In December 2012, operations at the Site described how two sections of pipe were washed away across the beach, which could have led to a Category 1 pollution incident if the pumping station storm tanks had discharged. A repair was undertaken (November 2012) using concrete to protect replaced sections of the outfall pipe.

The Intervention Brief, largely informed by the Risk Capture Database, states that the pipe capping has been washed away, which has caused the pipe to move. It is acknowledged that Natural Resources Wales (NRW) are aware of the associated issues with this outfall. The following works to Manorbier WwTW outfall are therefore proposed:

- Repair surround to existing manhole at National Grid Reference SS06130 97444 (the last manhole on the outfall pipeline, located at the top end of the beach providing final change of direction). Refer to Drawing number: 4692_S_205-ARP-01-BG-DR-CD-05000 Location Plan.
- Cover exposed pipework upstream of existing manhole with marine spec concrete surround (two small sections approximately 5.2 metres and 8.75 metres long). Refer to Drawing number: 4692_S_205-ARP-01-BG-DR-CD-05000 Location Plan.
- Cover exposed pipework downstream of existing manhole marine spec concrete surround (approximately a 20m section of exposed pipe). Refer to Drawing number: 4692_S_205-ARP-01-BG-DR-CD-05002 Existing Manhole and Concrete Repair Pipe Detail.

All proposed works will be undertaken under Schedule 2, Part 16, Class A of the General Permitted Development Order 1995, as the works are classed as permitted development.

As works are being carried out below Mean High Water, a Marine Licence is required.

The existing beach car park and access track down to the beach will be used by vehicles and plant during the works to access the outfall. The Site compound location is anticipated to be within the beach car park on existing hard standing.

The works are due to take place over a five-week period starting week commencing 9th October 2019.

1.4 Objectives of the Appraisal

The objectives of the ecological appraisal are as follows:

- To establish baseline ecological conditions on Site and within the immediate vicinity, including its potential to support important habitats and notable / protected species;
- To identify key ecological constraints to the proposed works;
- To inform project design to allow significant ecological effects to be avoided or minimised wherever possible; and
- To recommend further ecological surveys required to inform an updated ecological assessment as appropriate.

1.5 Legislative Context

A framework of international (European), national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. The following core legislation exists to protect habitats and species of nature conservation importance:

- i. The Conservation of Habitats and Species Regulations 2017 (the Habitat Regulations) which transposes Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) into UK law;
- ii. The Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds) (the Wild Birds Directive);
- iii. Wildlife and Countryside Act 1981 (as amended) (WCA);
- iv. Environment (Wales) Act 2016;
- v. The Countryside and Rights of Way Act 2000;
- vi. The Hedgerow Regulations 1997; and
- vii. Protection of Badgers Act 1992.

These pieces of legislation include a number of offences relating to protected species and requirements for licences to allow construction works to proceed. In

addition, the Habitats Regulations set out the requirement for the consideration of the potential effects of a project on European Sites. Further information on relevant legislation for protected species is provided in Appendix A.

Actions which are prohibited by legislation can be made lawful on the approval and granting of a protected species licence from NRW, subject to conditions.

2 Methodology

2.1 Desk Study

A desk study was undertaken to identify any existing ecological information relating to the Site and its surroundings. The Multi-Agency Geographic Information for the Countryside (MAGIC)¹ website was reviewed for information on internationally designated Sites of nature conservation importance within 10km of the Proposed Works and nationally designated Sites of nature conservation importance within 2km. The search included Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar Sites, Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs).

In addition, ecological records were obtained from the West Wales Biodiversity Information Centre (WWBIC) on 11th December 2018. The records included protected and priority species² up to 2km from the Proposed Works and included details of local designations such as Local Wildlife Sites, Local Nature Reserves and Ancient Woodland Sites. Species records were only requested from within the last 10 years.

A search using aerial imagery for waterbodies within 500m of the Site was undertaken, in order to assess whether suitable habitats for great crested newts (GCN) *Triturus cristatus* were present.

This desk-top assessment has been carried out based on relevant and available information to gain a more thorough understanding of the site and to inform subsequent surveys.

2.2 Field Survey

2.2.1 Extended Phase 1 Habitat Survey

A terrestrial and intertidal Joint Nature Conservation Committee (JNCC) Extended Phase 1 Habitat Survey (JNCC, 2010) was undertaken within the Site on 19th September 2016 by two experienced Arup ecologists. The survey was updated on 12th December 2018. Extended Phase 1 Habitat Survey is a standard technique for rapidly obtaining baseline ecological information over a large area of land. It is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas (including intertidal) of land on the basis of the vegetation and species present.

The ultimate purpose of the Extended Phase 1 Habitat Survey was to map key habitats and species assemblages and identify the presence and / or potential for protected habitats and species. This report presents an initial assessment of the ecological significance of the features currently present on site, and the likelihood that the area supports species of conservation interest which may be affected by

¹ www.magic.gov.uk

² EU and UK legally protected species under the Conservation of Habitats and Species Regulations 2017 and Wildlife and Countryside Act 1981 (as amended); and species present on the Species of Principal Importance in Wales list in response to Section 7 of the Environment (Wales) Act 2016 (known as Section 7 species).

the Proposed Works. These are made by using Target Notes (TNs) to record species composition within habitats and to highlight features of ecological interest.

Details of the key dominant species on the shoreline were recorded as well as the habitat potential for the Site to support each species or species group was assessed based on known ranges and the suitability of the habitats present. As a result, the algal species listed in this report do not constitute a complete list of the species present on site; instead, they are used as an indication of habitat type and condition. Identification of species was undertaken on site using relevant guide books (Hayward & Ryland 2000; Bunker *et al*, 2012; Porter, 2012; Wood, 2013).

2.2.2 Field Survey Limitations

The findings presented in this report represent those at the time of survey and reporting, and data collected from available sources. Ecological surveys are limited by factors which affect the presence of plants and animals, such as the time of year, migration patterns and behaviour. Additionally, ecological survey data is generally valid for two years.

Whilst not a full protected species or botanical survey, an Extended Phase 1 Habitat Survey allows an experienced ecologist to obtain a sufficient understanding of the ecology of a site in order to either confirm the conservation importance of the site, and assess the potential for impacts on habitats and species likely to represent a material consideration in planning terms, or to ascertain that further surveys will be required before such confirmation can be made.

The 2016 survey was undertaken within the recommended months for intertidal surveys of April to October. The survey was also timed to take advantage of the lowest tides of the month (0.4m) with the biotopes in the vicinity of MLWS assessed at low tide (14:45 GMT).

The December 2018 survey was undertaken at a suboptimal time of year for botanical surveys. However, enough species were identified in order to assign broad habitat types to the Site and therefore this is not considered to be a significant limitation. Furthermore, this survey was an update to the previous 2016 Extended Phase 1 Habitat Survey which had been undertaken within the recommended survey season (September).

The absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

2.3 Assessment Methodology

The Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland – Terrestrial, Freshwater Coastal and Marine (CIEEM, 2018) form the basis of the impact assessment presented in this report. These guidelines set out a process of identifying the value of ecological receptors and then characterising the impacts that are predicted. They go on to discuss the impacts on the integrity or conservation status of the receptor, the proposed mitigation and residual impacts.

The CIEEM guidelines recommend that the value of ecological receptors or features is determined based on a geographic frame of reference. For this assessment the following geographic frame of reference is used:

- International;
- National (i.e. Wales);
- Regional (i.e. South of Wales);
- County (i.e. Pembrokeshire);
- Local (i.e. within circa 5km); and
- Less than Local (or Site).

In accordance with CIEEM guidelines, actions resulting in changes to an ecological feature would be termed as an 'Impact' e.g. loss of habitat. An 'Effect' is deemed to be the outcome to an ecological feature from an impact e.g. reduction to species population due to habitat loss.

When describing impacts reference is made to the following:

- Positive or negative – i.e. a change that improves or reduces the quality of the environment according to nature conservation objectives and policy;
- Extent – i.e. the area over which an impact occurs;
- Magnitude – i.e. the size of an impact in quantitative terms where possible;
- Duration – i.e. the time for which an impact is expected to last;
- Timing - i.e. whether impacts occur during critical life stages or seasons;
- Frequency – i.e. how often impacts occur; and,
- Reversibility – i.e. a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it.

In accordance with the CIEEM guidelines, a significant effect, in ecological terms, is defined as 'An effect that either supports or undermines biodiversity conservation objectives for 'important ecological features'.

It is important to note, however, that in accordance with the CIEEM guidelines, the actual determination of whether an effect is ecologically significant is made irrespective of the value of the receptor in question. In this respect, the CIEEM methodology differs from some other approaches to EIA.

Furthermore, when carrying out an evaluation of significant effects, the precautionary principle should be adopted. Whereby if sufficient information is

unavailable to assess an effect, a significant effect should be assumed and / or uncertainty acknowledge in the assessment.

3 Baseline Conditions

3.1 Desk Study

WWBIC provided details of protected habitats and species to inform the baseline conditions of the Site. The data were provided on 14th December 2018.

3.1.1 European Statutory Designated Sites

The site lies within the Pembrokeshire Marine / Sir Benfro Forol Special Area of Conservation (SAC). The search using MAGIC highlighted another three SACs, one candidate SAC (cSAC) and three Special Protection Areas (SPA) within 10km of the Site. All of these designated sites are detailed in Table 1 below.

Table 1: European Statutory Designated Sites with 10km of the Site

Site Name	Qualifying Features	Distance from Proposed Works
Pembrokeshire Marine / Sir Benfro Forol Special Area of Conservation (SAC)	Annex I habitats that are a primary reason for selection of this site include: - Estuaries; - Large shallow inlets and bays; and - Reefs. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site include: - Sandbanks which are slightly covered by seawater all the time; - Mud-flats and sand-flats not covered by seawater at low tide; - Coastal lagoons (priority feature); - Atlantic salt meadows <i>Glaucopuccinellietalia maritima</i>; and - Submerged or partially submerged sea caves. Annex II species that are a primary reason for selection of this site include: - Grey seal <i>Halichoerus grypus</i>; and - Shore dock <i>Rumex rupestris</i>. Annex II species present as a qualifying feature, but not a primary reason for site selection include: - Sea lamprey <i>Petromyzon marinus</i>; - River lamprey <i>Lampetra fluviatilis</i>; - Allis shad <i>Alosa alosa</i>; - Twaite shad <i>Alosa fallax</i>; and - Otter <i>Lutra lutra</i>.	Site lies within the SAC boundary
Bristol Channel Approaches candidate SAC (cSAC)	The site is proposed for its predictable and persistent high densities of the Annex II species, harbour porpoise <i>Phocoena phocoena</i> .	0.25km west of the Site
Limestone Coast of South	Annex I habitats that are a primary reason for selection of this site include:	1.8km east of the Site

Site Name	Qualifying Features	Distance from Proposed Works
West Wales Special Area of Conservation (SAC)	- Vegetated sea cliffs of the Atlantic and Baltic Coasts; and - Fixed coastal dunes with herbaceous vegetation. Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site include: - European dry heaths; - Semi-natural dry grasslands and scrublands facies on calcareous substrates; - Caves not open to the public; and - Submerged or partially submerged sea caves. Annex II species present as a qualifying feature, but not a primary reason for site selection include: - Greater horseshoe bat <i>Rhinolophus ferrumequinum</i>; and - Early gentian <i>Gentianella anglica</i>. Annex II habitats present as a qualifying feature, but not a primary reason for selection of this site include: - Petalwort <i>Petalophyllum ralfsii</i>.	
Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer Sgogwm a Moroedd Penfro SPA (Marine Components GB)	During the breeding season the area regularly supports: - Storm petrel <i>Hydrobates pelagicus</i> (breeding), 3,500 pairs, representing 4.1% of the GB population, count as at 1995; - Chough <i>Pyrrhocorax pyrrhocorax</i> (breeding), 4 pairs, representing 1.2% of the GB population, count as at late 1990s; and - Short-eared owl <i>Asio flammeus</i> (breeding), 6 pairs, representing 0.6% of the GB population, count as at 1998. Regularly occurring migrating species include: - Manx shearwater <i>Puffinus puffinus</i> (breeding), 150,968 pairs, representing 56.9% of the global breeding population, count, as at late 1990s; - Puffin <i>Fratercula arctica</i> (breeding), 9,500 pairs, representing 1.1% of the global breeding population, count as at mid-1980s; and - Lesser Black-backed gull <i>Larus fuscus</i> (breeding), 20,300 pairs representing 16.4% of the breeding biogeographic region population, 4 year mean 1993-1997. In the breeding season the site regularly supports at least 394,260 individual seabirds including: razorbill <i>Alca torda</i>, guillemot <i>Uria aalge</i>, kittiwake <i>Rissa tridactyla</i>, puffin, lesser black-backed gull, Manx shearwater and storm petrel.	5.3km south-west of the Site
Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC	Annex I habitats that are a primary reason for selection of this site include: - Sandbanks which are slightly covered by sea water all the time; - Estuaries; - Mudflats and sandflats not covered by seawater at low tide; - Large shallow inlets and bays; - Salicornia and other annuals colonizing mud and sand; and - Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>).	6.7km east of the Site

Site Name	Qualifying Features	Distance from Proposed Works
	Annex II species that are a primary reason for selection of this site include: - Twaite shad. Annex II species present as a qualifying feature, but not a primary reason for site selection include: - Sea lamprey; - River lamprey; - Allis shad; and - Otter.	
Castlemartin Coast SPA	This site qualifies by supporting populations of European importance of the following species: During the breeding season; Chough, 12 pairs representing at least 3.5% of the breeding population in Great Britain (Count as at 1998) Over winter; Chough, 24 pairs representing at least 3.5% of the wintering population in Great Britain (Count as at 1998).	6.7km south-west of the Site
Camarthen Bay / Bae Caerfyrddin SPA	Over winter the area regularly supports: Common scoter <i>Melanitta nigra</i> (Western Siberia/Western & Northern Europe/North-western Africa), representing 1.0% of the population (5-year peak mean 1997/98 - 2001/02).	8.1km east of the Site
Pembrokeshire Bat Sites and Bosherton Lakes / Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC	Annex I habitats that are a primary reason for selection of this site include: - Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. Annex II species that are a primary reason for selection of this site include: - Greater horseshoe bat. Annex II species present as a qualifying feature, but not a primary reason for site selection include: - Lesser horseshoe bat <i>Rhinolophus hipposideros</i>; and - Otter.	8.3km south-west of the Site

3.1.2 National Statutory Designated Sites

The Site also lies within the Freshwater East Cliffs to Skrinkle Haven Site of Special Scientific Interest (SSSI), as detailed in Table 2 below. There are no other nationally statutory designated sites within 2km.

Table 2: National Statutory Designated Sites with 2km of the Site

Site Name	Qualifying Features	Distance from Proposed Works
Freshwater East Cliffs to Skrinkle Haven SSSI	Designated in part for its coastal cliff habitats and a number of rare and scarce plants and invertebrates. The coastline gives of a variety of geological formations which give rise to a variety of coastal habitat in particular maritime heath and maritime grassland. The cliffs support communities of maritime plants, e.g. rock samphire <i>Crithmum maritimum</i> and rock sea-spurrey <i>Spergularia rupicola</i>. Seabird-dominated cliffs support their own characteristic bird-cliff communities. There is a variety of communities progressing on shore. Closer to Manorbier there is a small sand dune system, dominated by red fescue <i>Festuca rubra</i>, common restharrow <i>Ononis repens</i>, lady's bedstraw <i>Galium verum</i>, and marram <i>Ammophila arenaria</i> and other plants. Scrub and woodland fringe the dune grassland at Manorbier and the small trees, as well as the neighbouring cliffs and rocky outcrops, support an interesting epiphytic lichen flora, including the nationally rare golden-hair lichen <i>Teloschistes flavicans</i>. Yarrow broomrape <i>Orobanche purpurea</i> found on the church wall at Manorbier is the only known Welsh site for this species. There is a notable invertebrate community, including dipteran and coleopteran species. There is also a notable weevil <i>Sibinia sodalis</i> and the grayling butterfly <i>Hipparchia semele</i>. Chough regularly feed along parts of this section and there is also a peregrine eyrie on the cliffs. Fulmar and raven are also present including a variety of passerines. The foreshore habitats and communities are of marine biological interest, with rich red algal assemblages and associated invertebrate communities.	The Site lies within the SSSI boundary

3.1.3 Non-Statutory Designated Sites

No non-statutory designated sites were identified within 2km of the Site.

3.1.4 Notable Habitats

Five areas of Ancient Woodland sites were recorded within 2km of the Site, the closest of which was approximately 150m north.

3.1.5 Key Species

The following species have been found from the WWBIC desk study search and are considered to be of relevance and could be affected by the Proposed Works.

3.1.5.1 Badger

There were 16 records of badger *Meles meles* within 2km of the Site. The closest records were approximately 700m south-east of the Site.

3.1.5.2 Bats

There were numerous bat records from within 2km of the Site. A record of two roosting lesser horseshoe bats was recorded 500m east of the Site. Common pipistrelles *Pipistrellus pipistrellus*, soprano pipistrelles *P. pygmaeus*, brown long-eared bats *Plecotus auritus*, noctule bats *Nyctalus noctula* and whiskered bats *Myotis mystacinus* were all recorded roosting within 500m north-east of the Site. There were four records of greater horseshoe bats, the closest of which was approximately 2.6km north-east of the Site.

3.1.5.3 Marine Mammals

There were no recent records (from within the last 10 years) of marine mammals within 2km of the Site. However, there was one record of a harbour porpoise and one grey seal from 2003, approximately 500m south of the Site.

3.1.5.4 Otter

There were no recent records (from within the last 10 years) of otter within 2km of the Site. However, there were two records from 2007, the closest of which was approximately 900m north of the Site.

3.1.5.5 Birds

WWBIC provided records for birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) within 2km of the Site, comprising: black redstart *Phoenicurus ochruros*, chough, Dartford warbler *Sylvia undata*, green sandpiper *Tringa ochropus*, peregrine *Falco peregrinus* and whimbrel *Numenius phaeopus*. WWBIC also delivered records for other notable species which may be breeding within the study area such as kestrel *F. tinnunculus*, starling *Sturnus vulgaris* and yellowhammer *Emberiza citrinella*, which are all listed on Section 7 of the Environment (Wales) Act 2016. The closest record was of a grasshopper warbler *Locustella naevia*, which is also a Section 7 species, approximately 100m east of the Site.

3.1.5.6 Reptiles & Amphibians

Twenty-four records of adder *Vipera berus* and 24 records of common lizard *Zootoca vivipara* were identified along the coast path, the closest of which were approximately 140m and 340m from the Site respectively. There were four records of slow worm *Anguis fragilis* within 2km of the Site, the closest of which was 400m. Two records of grass snake *Natrix helvetica* were identified, approximately 500m from the Site. There were two records of common toad *Bufo bufo*, approximately 1.7km from the Site. One record of palmate newt *Lissotriton helveticus* was identified in 2005, approximately 400m from the Site.

No suitable waterbodies for GCN were identified within 500m of the Site and no records were returned from within 2km of the Site.

3.1.5.7 Fish

No records of fish species were returned from within 2km of the Site.

3.1.5.8 Invertebrates

There were three records of small blue butterfly *Cupido minimus* approximately 1.6km south-east of the Site. This species is listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and on Section 7 of the Environment (Wales) Act 2016. There were 35 other records of Section 7 species within 2km, comprising 15 butterfly and moth species.

3.1.5.9 Vascular Plants

There were 12 records of bluebell *Hyacinthoides non-scripta* within 2km of the Site, the closest of which was approximately 140m south-east. Bluebells are listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended).

3.1.5.10 Lichens

One record of golden hair-lichen was identified approximately 370m south of the Site. This species is listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) and on Section 7 of the Environment (Wales) Act 2016. Another Section 7 species, *Parmotrema perlatum* was identified approximately 140m east of the Site.

3.2 Extended Phase 1 Habitat Survey

Common terrestrial and intertidal habitats were recorded during the Extended Phase 1 Habitat Survey. A total of 21 habitat types were identified within the Site and immediately adjacent to the Site. They are described in the sections below with their relevant Phase 1 habitat codes:

1. Broadleaved woodland – semi-natural (A1.1.1);
2. Dense scrub (A2.1);
3. Scattered scrub (A2.2);
4. Broad-leaved parkland/scattered trees (A3.1);
5. Improved grassland (B4);
6. Bracken – continuous (C1.1);
7. Tall ruderal (C3.1);
8. Running water (G2);
9. Intertidal mud/sand (H1.1);
10. Intertidal shingle/cobbles (H1.2);
11. Intertidal boulders/rocks (H1.3);
12. Shingle above high tide mark (H3);
13. Rock above high tide mark (H4);
14. Dune grassland (H6.5);

15. Open dune (H6.8);
16. Cliff (H8.1)
17. Coastal grassland (H8.4);
18. Intact hedge – species-poor (J2.1.2);
19. Wall (J2.5);
20. Buildings (J3.6); and
21. Hard standing (J5).

The habitats are mapped on Figure 2 and described below. Important features have also been mapped as Target Notes (TNs), which are described below in Table 3. Photographs are provided in Appendix B.

3.2.1 Broadleaved woodland – semi-natural (A1.1.1)

An area of semi-natural broad-leaved woodland was present in the north-east of the Site. The woodland was on a north-facing slope, dominated by semi-mature sycamore *Acer pseudoplatanus* and was wet at the bottom the slope.

3.2.2 Dense scrub (A2.1)

Within the grassland on the top of the coastal cliffs there were large patches of dense scrub which were predominantly common gorse *Ulex europaeus* with smaller areas of bramble *Rubus fruticosus* agg. Around the edges of these, scrub areas in the grassland became denser which small pockets of common heather *Calluna vulgaris* colonising the grassland. This habitat is verging on coastal heath characteristics.

The area of scrub in the north-east of the Site (TN1) bordered broadleaved woodland and comprised bramble, common nettle *Urtica dioica*, herb-Robert *Geranium robertanum*, ivy *Hedera helix*, hart's tongue *Asplenium scolopendrium*, pendulous sedge *Carex pendula* and opposite-leaved golden saxifrage *Chrysosplenium oppositifolium*.

3.2.3 Scattered scrub (A2.2)

Scattered scrub bordered the improved grassland in the north of the Site (TN4). Species present here included bramble, common nettle, broad-leaved dock *Rumex obtusifolius*, Alexanders *Smyrnium olusatrum* and winter heliotrope *Petasites fragrans*.

3.2.4 Broad-leaved parkland/scattered trees (A3.1)

Lines of broad-leaved trees were present along the northern (TN4) and southern (TN1) boundaries of the improved grassland on Site. One mature ash tree *Fraxinus excelsior* (TN2) had a potential bat roosting feature comprising a cavity on the east side and was assessed as having low suitability to support roosting bats. Other species present included elder *Sambucus nigra*, sycamore, alder *Alnus*

glutinosa, hawthorn *Crataegus monogyna*, willow species *Salix* sp. and poplar species *Populus* sp. A mammal path was identified in this habitat (TN5).

3.2.5 Improved grassland (B4)

This habitat was present in the north-east of the Site. The grassland was well-mown and dominated by perennial rye-grass *Lolium perenne*. Other species present included ribwort plantain *Plantago lanceolata*, greater plantain *Plantago major* and creeping buttercup *Ranunculus repens*.

3.2.6 Bracken – continuous (C1.1)

There was a dense area of bracken *Pteridium aquilinum* to the north of the Site between dense bramble scrub.

3.2.7 Tall ruderal (C3.1)

A small patch of ruderal habitat was present along the road towards the north of the Site. This area was formed of the following species: rosebay willowherb *Chamerion angustifolium*, common nettle and bramble.

3.2.8 Running water (G2)

Two streams bisected the Site running east to west, joining together before meeting the sea at Manorbier Beach. Aquatic macrophytes were present, including fool's-water-cress *Apium nodiflorum* and hemlock water dropwort *Oenanthe crocata*.

3.2.9 Intertidal mud/sand (H1.1)

Intertidal sand lies within and adjacent to the Site and provides key habitats listed as qualifying features of the Pembrokeshire Marine / Sir Benfro Forol SAC (sandbanks which are slightly covered by seawater all the time; sandflats not covered by seawater at low tide). These habitats are notable due to the diversity of benthic fauna they support.

The sandflat habitat areas were noted to support polychaete worm *Polychaeta* spp. casts in the exposed substrate at low tide. Cockle shells *Cardiidae* spp. and other benthic bivalve mollusc species were also noted.

3.2.10 Intertidal shingle/cobbles (H1.2)

The majority of the surrounding beach, which exists on the edge of the cliff faces when exposed below the intertidal rock and boulders, consists of coarser shingles with few cobbles. This beach area is exposed to the full force of wave action at certain stages of the tide and totally submerged at high tide during all tidal cycles.

Three distinct sub-community structures exist within this habitat; these are the exposed intertidal rock faces, rock pool communities and the under-boulder communities. All of these communities are encompassed within the Annex I 'Reef' habitat feature that is a primary reason for selection of the Pembrokeshire Marine / Sir Benfro Forol SAC.

Red algae species that were found to be present on the exposed intertidal rock faces. Common molluscs were also within the exposed areas including common limpet and barnacle species.

Within the rock pools a diverse community of mixed algae types and fauna types exist. This included red algae such as encrusting coralline algae *Corallinaceae* spp. Green algae species included *Ulva* species and sea lettuce *Ulva lactuca*.

At the bottom of the shoreline there is the start of a brown algal bed predominantly consisting of serrated wrack with some stands of kelp species including oarweed *Laminaria digitata*.

3.2.11 Intertidal boulders/rocks (H1.3)

This habitat was present on the sea shore to the north and south of the Site. Those in the north (TN8) were dominated by brown algae, with bladderwrack *Fucus vesiculosus* and sea lettuce species present. Barnacles and limpets covered the rocks. In the south of the Site (TN10) there were rock pools containing sea lettuce, coralline algae *Corallina* sp, beadlet anemone *Actinia equina* and chiton species *Lepidochitona* sp.

3.2.12 Shingle/gravel above high tide mark (H3)

The top of the beach comprised shingle/gravel habitat.

3.2.13 Rock above high tide mark (H4)

Above the reach of the tide, the rocks on site are generally bare with small areas of lichen colonising in places and with small plants existing where their roots can hold within cracks and crevices. Thrift *Armeria maritima* was the main plant species found here, along with sea beet *Beta vulgaris* and sea mayweed *Tripleurospermum maritimum*.

3.2.14 Dune grassland (H6.5)

This habitat was present behind the open sand dunes. The sward was relatively long and dominated by fescue species *Festuca* sp. Cock's-foot *Dactylis glomerata* and sea radish *Raphanus maritimus* were also present.

3.2.15 Open dune (H6.8)

A sand dune system was present on the eastern side of the beach (TN7). Marram grass *Ammophila arenaria* dominated with sea spurge *Euphorbia paralias* also present.

3.2.16 Cliffs (H8.1)

Soft and hard cliffs exist around the Site boundary. The crumbling shale and slate soft cliffs form the general surrounds and dividing line between the intertidal habitats and the coastal grassland habitat. The soft cliff habitat is generally bare of

species. The steep hard cliffs of the headland and bay cliffs consist of sandstone substrate.

3.2.17 Coastal grassland (H8.4)

At the top the cliffs, areas of coastal grassland start to colonise and continue to spread up the banks of the headland and across the wider landscape inland. This grassland is characterised by coastal species such as thrift, spring squill *Scilla verna*, scurvy grass *Cochlearia officinalis*, bladder campion *Silene vulgaris*, sea plantain *Plantago maritime* and sea rocket *Cakile maritima*

Further common grassland species were also found in this habitat including ribwort plantain *Plantago lanceolata*, Yorkshire fog *Holcus lanatus*, false oat grass *Arrhenatherum elatius*, curled dock *Rumex crispus*, smooth Hawk's-beard *Crepis capillaris*, white clover *Trifolium repens*, common mouse-ear *Cerastium fontanum* and dandelion *Taraxacum officinale*.

3.2.18 Intact hedge – species-poor (J2.1.2)

A species-poor hedge bordered the road on Site, comprised solely of hawthorn.

3.2.19 Wall (J2.5)

Stone walls were present on Site to the north and south of the car park.

3.2.20 Buildings (J3.6)

The existing outfall pipe is classified as a building, due to it being a permanent manmade structure. There was a public toilet block within the beach car park (TN6), that was assessed as having moderate suitability to support roosting bats, due to having multiple potential roosting features.

3.2.21 Hard standing (J5)

The car park and roads within and adjacent to the Site consisted of hardstanding.

3.2.22 Target Notes

Table 3: Target Note Descriptions

Target Note	Description
TN1	Scattered broadleaved trees and scrub.
TN2	Ash tree with cavity on east side, 1.5m high. Low bat roost suitability.
TN3	Willow/hawthorn scrub progressing into sycamore woodland.
TN4	Line of broadleaved trees and marginal scrub.
TN5	Mammal track into woodland. Smells of fox.
TN6	Public toilet building with moderate bat roost suitability (lifted slates, holes in ridge and gaps in soffit).
TN7	Open dune grading into bracken and scrub. Suitable reptile habitat.
TN8	Intertidal rocks, brown algae dominant.
TN9	Coastal vegetation.

Target Note	Description
TN10	Intertidal rocks covered in barnacles and limpets.

3.3 Protected and Notable Species

As noted, common intertidal fauna and algae species were observed within the habitats recorded during the intertidal Phase 1 Habitat survey.

3.3.1 Birds

During the 2016 field survey, ten bird species were recorded and during the 2018 field survey, 28 species were noted. There is potential for some of these to be breeding on cliffs and rocks near to the Site. The birds observed are listed in Table 4 below.

Table 4: Bird species recorded during the surveys

Species Name	Latin Name	Year Observed
Blackbird	<i>Turdus merdula</i>	2018
Black-headed gull	<i>Chroicocephalus ridibundus</i>	2016 & 2018
Blue tit	<i>Cyanistes caeruleus</i>	2018
Bullfinch	<i>Pyrrhula pyrrhula</i>	2018
Carrion crow	<i>Corvus corone</i>	2018
Chaffinch	<i>Fringilla coelebs</i>	2018
Cormorant	<i>Phalacrocorax carbo</i>	2016 & 2018
Dunnock	<i>Prunella modularis</i>	2016 & 2018
Feral pigeon	<i>Columba livia domestica</i>	2018
Goldfinch	<i>Carduelis carduelis</i>	2018
Great spotted woodpecker	<i>Dendrocopos major</i>	2018
Grey wagtail	<i>Motacilla cinerea</i>	2018
Herring gull	<i>Larus argentatus</i>	2016 & 2018
Jackdaw	<i>Corvus monedula</i>	2016 & 2018
Kestrel	<i>Falco tinnunculus</i>	2018
Lesser black-backed gull	<i>Larus fuscus</i>	2016
Long-tailed tit	<i>Aegithalos caudatus</i>	2018
Magpie	<i>Pica pica</i>	2018
Oystercatcher	<i>Haematopus ostralegus</i>	2016
Peregrine	<i>Falco peregrinus</i>	2018
Pheasant	<i>Phasianus colchicus</i>	2018
Pied wagtail	<i>Motacilla alba</i>	2018
Raven	<i>Corvus corax</i>	2016 & 2018
Robin	<i>Erithacus rubecula</i>	2018
Rock pipit	<i>Anthus petrosus</i>	2016 & 2018
Song thrush	<i>Turdus philomelos</i>	2018
Stonechat	<i>Saxicola torquata</i>	2016 & 2018
Turnstone	<i>Arenaria interpres</i>	2018

Species Name	Latin Name	Year Observed
Wood pigeon	<i>Columba palumbus</i>	2018
Wren	<i>Troglodytes troglodytes</i>	2018

3.3.2 Marine Mammals

No signs of marine mammals were observed during the 2016 or 2018 surveys.

3.3.3 Invasive Non-native Species

No signs of invasive species (including marine) were observed during the 2016 or 2018 surveys.

4 Evaluation of Ecological Receptors

This section initially evaluates the nature conservation importance of the habitats and species present within and in the vicinity of the Site in terms of their importance in an international, national, county, local and less than local or Site context as per the geographic scale identified in Section 2.3. Table 5 below evaluates all the ecological resources present or potentially present within the Site.

Table 5: Nature Conservation Evaluation of Ecological Receptors at the Site

Ecological Receptor	Evaluation	Conservation in the context of the Development
Designated Sites		
Pembrokeshire Marine / Sir Benfro Forol Special Area of Conservation (SAC)	International	The Site falls within the designated area. Designated for internationally important marine habitats, grey seal, shore dock, otter and assemblages of fish.
Bristol Channel Approaches candidate SAC (cSAC)	International	0.25km west of the Site. Proposed to be designated for harbour porpoise.
Limestone Coast of South West Wales Special Area of Conservation (SAC)	International	1.8km east of the Site. Designated for internationally important marine and heathland habitats, greater horseshoe bat and plant species.
Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer Sgogwm a Moroedd Penfro SPA	International	5.3km south-west of the Site. Designated for populations of breeding, migrating and overwintering sea birds.
Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC	International	6.7km east of the Site. Designated for internationally important marine habitats, otter and assemblages of fish.
Castlemartin Coast SPA	International	6.7km south-west of the Site. Designated for populations of breeding and overwintering sea birds.
Camarthen Bay / Bae Caerfyrddin SPA	International	8.1km east of the Site. Designated for populations of overwintering sea birds.
Pembrokeshire Bat Sites and Bosherton Lakes / Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC	International	8.3km south-west of the Site. Designated for aquatic habitat and greater horseshoe bat.
Freshwater East Cliffs to Skrinkle Haven SSSI	National	The Site falls within the designated area. Designated in part for its coastal cliff habitats and a number of rare and scarce plants and invertebrates.
Habitats		
Hedgerows, maritime cliffs and slopes, coastal sand dunes, intertidal boulder communities, subtidal sands and gravels.	National	These habitats are present on Site and are listed as Section 7 Habitats of Principal Importance (HPI) for the conservation of biodiversity for Wales via the provisions of the Environment (Wales) Act 2016.
Broad-leaved woodland, scrub, improved grassland, bracken, tall ruderal, running water.	Local	These habitats lie outside of the designated sites and are not HPI. Therefore, they are considered to provide ecological value at a Local level for the species they may support.

Ecological Receptor	Evaluation	Conservation in the context of the Development
Species		
Badger	Site	No evidence of badger was recorded on site however scrub and woodland offer suitable habitat for this species.
Bats	Local	There are records of bat roosts within 500m of the Site and suitable foraging habitat present in the form of woodland and tree lines.
Otter	International	No evidence of otters was recorded on Site, but the watercourse on Site does offer suitable habitat for foraging and commuting otter. Potential resting places, although breeding unlikely due to disturbance. Otter are a qualifying feature of the SAC that the Site lies within.
Birds	Local	Habitat at the Site such as cliffs, scrub and woodland provide suitable habitat for nesting birds including Schedule 1 species.
Reptiles & Amphibians	Local	There are multiple records of common reptiles and amphibians in the vicinity of the Site and the Site offers suitable scrub and grassland habitat.
Fish Species	International	Fish are a qualifying feature of the SAC that the Site lies within.
Invertebrates	National	The Site lies within the Freshwater East Cliffs to Skrinkle Haven SSSI, which is designated in part for its important invertebrate communities. However, habitats supporting these communities are unlikely to be affected by the Proposed Works.
Vascular Plants & Lichens	National	The Site lies within the Freshwater East Cliffs to Skrinkle Haven SSSI, which is designated in part for its important plant communities. However, habitats supporting these communities are unlikely to be affected by the proposed works because vehicles and plant will use the existing car park and existing access track to access the beach.

5 Assessment of Potential Impacts

There is potential for impacts on designated sites, habitats and protected or notable species during the construction phase of the outfall works.

Potential impacts may be direct or indirect and categorised as follows;

- Habitat degradation including pollution;
- Disturbance to species; and
- Species mortality / injury.

During operation there is not predicted to be a pathway for effect on features on ecological receptors.

5.1 Designated Sites

5.1.1 Habitat Loss

The site is within the Pembrokeshire Marine / Sir Benfro Forol SAC; designated for [Annex I habitats that are a primary reason for selection of this site: estuaries, large shallow inlets and bays, reefs, and Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: sandbanks which are slightly covered by seawater all the time, mud-flats and sand-flats not covered by seawater at low tide; coastal lagoons; Atlantic salt meadows and submerged or partially submerged sea caves].

The site is also within the Freshwater East Cliffs to Skrinkle Haven SSSI designated in part for its coastal cliff habitats and a number of rare and scarce plants and invertebrates (for more detailed information see section 4.1.2).

There will be no habitat loss as a result of the proposed work. Potential habitat degradation of these two sites is discussed below.

5.1.2 Habitat Degradation

The Site is within the Pembrokeshire Marine / Sir Benfro Forol SAC and the Freshwater East Cliffs to Skrinkle Haven SSSI. There is potential for construction to cause degradation of the habitats which are the qualifying features of these two designated sites.

During construction, there is the possibility of pollution events occurring, e.g. from the accidental spillage of oil / chemicals from machinery / plant, and the opening of sewer systems. Construction activities could also generate sediment from several sources, e.g. tracking of plant across upper foreshore and excavations.

If a pollution incident on site was to occur, any pollution would be deposited on to rocky surfaces, i.e. shingle, and / or soak into a sandy substrate (dune system and / or beach). Pollutants are then likely to enter the marine system on the flooding

tide, or through the watercourses on the terrestrial side of the Site, and potentially be transported off site to impact the nearby designated sites.

Construction works may generate dust from the proposed excavation and the use of access roads for vehicular / plant movements. The generated dust could impact on-site and off-site habitats, both from aerial deposition and through the hydrological connectivity when suspended within the marine environment.

There is also the potential for direct and indirect impacts to the qualifying features of the following nearby European Sites:

- Bristol Channel Approaches / Dynesfeydd Mor Hafren candidate SAC,
- Limestone Coast of South West Wales / Arfordir Calchfaen De Orllewin Cymru SAC,
- Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer Sgogywm a Moroedd Penfro SPA,
- Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC,
- Castlemartin Coast SPA,
- Carmarthen Bay / Bae Caerfyrddin SPA,
- Pembrokeshire Bat Sites and Bosherton Lakes / Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC.

A draft Habitat Regulation Assessment (HRA) screening report has been prepared to assess potential pathways for effect on the SACs and SPAs. As a result of new case law as ruled by the European Court of Justice (ECJ, 2018), mitigation measures cannot be included within the Screening Stage of HRA, and therefore any potential pathways for effect will need to be evaluated within an Appropriate Assessment.

There is also the potential for direct and indirect impacts to the qualifying species of these designated sites, including birds, fish and otter, which are discussed in Section 6.3 below.

5.2 Habitats

5.2.1 Habitat Degradation

A range of notable habitats, including hedgerows, maritime cliffs and slopes, coastal sand dunes, intertidal boulder communities, subtidal sands and gravels have been recorded within the Site, which may be directly or indirectly affected during construction. There is also the potential for pollution events, as detailed in Section 6.1.1 above, to affect these habitats.

Mitigation will be required to avoid offences being committed and is detailed in Section 6.

5.3 Species

Fish species present as qualifying features within the Pembrokeshire Marine / Sir Benfro Forol SAC (but not the primary reason for selection of the site) include sea lamprey, river lamprey, allis and twaite shad. Lamprey are regarded as 'non-specialists' with respect to hearing ability, since they do not possess a swim bladder and therefore are not regarded to be sensitive to acoustic effects (Popper, 2005); consequently, lamprey species have been scoped out of the assessment.

Allis and twaite shad both require rivers >20m wide on average to migrate up and spawn (Maitland & Hatton-Ellis, 2003). It can be assumed that the freshwater inlet at Manorbier Bay is therefore unsuitable for spawning (being only a few metres wide at most and largely above the high tide mark most of the time with only a shallow flow over shingle) and shad will not migrate up this river. Impacts from construction on shad therefore involve displacement from the marine environment through acoustic deterrents as a result of percussive activities, e.g. drilling, plant movement. Significant sources of noise and vibration on site include plant movement, excavation, scabbling, drilling and any hammering associated with shuttering construction.

Given the short duration of the works, the absence of night works (when shad may try to migrate upstream), the availability of suitable coastal / marine habitat elsewhere, and the fact that works will occur at low tide (reducing the transmission of noise and vibration as it passes through solid substrate rather than water) there is unlikely to be an adverse impact on Annex II fish as features of the European site.

5.3.1 Disturbance

There is the potential for disturbance through noise, vibrations and lighting to species present at the Site, including those that are qualifying features of the SACs and SPAs in the vicinity.

Noise and vibrations from vehicles and plant are likely to displace otter, marine mammals and bird species from the Site.

Lighting may cause disturbance to badger, bats and otter that are active during the night. There are not expected to be works overnight, but there may be lighting associated with the Site compound.

Mitigation will be required to avoid offences being committed and is detailed in Section 6.

5.3.2 Species Mortality / Injury

There is the potential for injury or mortality to species that may be present within the Site, and in proximity, including badger, bats, otter, marine mammals, nesting birds, reptiles and amphibians.

Injury and mortality could occur as a result of vegetation clearance, trampling by machinery, direct collision with construction vehicles, and / or entrapment within excavations.

In addition, potential pollution events could cause injury and mortality to species on / near the Site, either directly, e.g. through ingestion of contaminated water or becoming trapped in oil / chemical spills, or indirectly through ingestion of contaminated prey.

Mitigation will be required to avoid offences being committed and is detailed in Section 6.

6 Recommendations

6.1 Designated Sites

6.1.1 Pre-Construction

- NRW should be consulted on the HRA screening report;
- For any planning applications, the Local Planning Authority will also require a copy of the updated Appropriate Assessment as it assumed they would become 'competent authority'.
- Consultation will be required with NRW regarding impacts on the Freshwater East Cliffs to Skrinkle Haven SSSI due to the Site falling within the SSSI, and SSSI assent required for construction.

6.1.2 Mitigation During Construction

The following general mitigation measures to avoid or alleviate negative impacts upon ecological receptors will be implemented during the construction phase to comply with existing legislation and good practice as detailed below.

- **Toolbox Talks** will be provided by a suitably experienced ecologist to all site personnel to inform them of ecological features at the Site including protected and notable species prior to the commencement of construction works. An associated registry of attendance will be signed and kept as a record and a copy of the toolbox talk left at the Site office.
- **A Construction Environmental Management Plan (CEMP)** will be maintained by the contractor which will include Site-specific methods to ensure that all Site activities, especially those in proximity to watercourses and waterbodies are controlled and are in accordance with relevant legislation and undertaken in compliance with the relevant Guidance for Pollution Prevention (GPPs) and Construction Industry Research and Information Association (CIRIA) best practice guidance.

Further mitigation methods as specified in the contractor's method statement will be adhered to:

- All excess and waste materials will be removed from the beach and disposed of off-site at a suitable licensed facility;
- The concrete wagon will wash out in designated washout area, ensuring surface run-off does not reach watercourses or semi-natural habitats;
- Use of environmentally friendly products where possible;
- Emergency spill kits are to be maintained at every work location and with each main item of plant;
- Equipment to be stored on designated drip trays / bunded areas; and
- Minimal quantities of materials, fuels etc. to be taken on to foreshore.

The dust emitting activities assessed will be greatly reduced or eliminated by applying the site-specific mitigation measures for sites according to the Institute of Air Quality Management guidance (Holman *et al.*, 2014).

The following measures from the guidance are relevant and will be included in the CEMP:

- Bulk cement and other fine powder materials are to be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery;
- For smaller supplies of fine power materials bags are to be sealed after use and stored appropriately to prevent dust;
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- Avoid dry sweeping of large areas; and
- Any excavations will be kept damp, where possible, to control dust generation.

6.2 Habitats

Disturbance to habitats on Site to be minimized as much as possible, e.g. by using existing roads for access and existing car park for Site compound.

Vehicles to be marshalled by operatives walking in front to control speeds and ensure habitats either side of track are avoided.

Any removed vegetation to be re-instated on a like-for-like basis post-construction with similar native plant species.

6.3 Species

An Ecological Clerk of Works (ECoW) should attend Site immediately prior to construction to ensure that otter, grey seal, breeding birds, reptiles and amphibians have not become resident in the immediate area of the works. Advice will be given by the ECoW should this be the case.

Any vegetation clearance of suitable bird nesting habitat should be undertaken outside of the bird nesting season (March to August inclusive, subject to regional and seasonal variations) to avoid damage or destruction of occupied nests or harm to breeding birds. If this cannot be achieved, works will require an inspection of vegetation by a suitably qualified ecologist no more than 24 hours prior to any works commencing. If any nesting birds are identified during the survey they will be left in situ within an appropriate exclusion zone until the chicks have fledged.

Good practice working methods will be adhered to which to prevent any adverse impact to badger, otter or other mammals at the site; i.e. materials will not be left overnight in areas accessible to animals or will be fenced off and excavations will not be left uncovered overnight. If any excavations are required to be left open overnight, a ramp will be created to allow any animals to escape, including other mammals at the Site.

Clearance of vegetation suitable for reptiles and amphibians (long grass, hedges and scrub) will be avoided or kept to a minimum during the reptile active season (March to October). If required during this time, clearance will be subject to a Toolbox Talk and Precautionary Methods of Working written and overseen by a suitably experienced ecologist. This is likely to include two-staged directional strimming towards retained habitat.

All works will be carried out during daylight hours (up to 30 minutes after sunrise and 30 minutes before sunset) where possible to avoid disturbance to commuting or foraging badger, bats and otters.

Any task lighting required for health and safety or security reasons will be directional lighting (towards the ground) to avoid light spill onto adjacent habitats or surroundings known to support protected species.

Noise will be limited as far as is practicable, for example:

- scabbling (roughening of concrete surfaces) will be avoided if possible to reduce noise;
- ensure all plant has noise reduction measures in place and working correctly i.e. baffles, acoustic jackets;
- switch off all plant when not in use; Vibration and noise monitoring during certain operations; and
- noise to be reduced by engineering means wherever practicable, e.g. use of noise reducing blades, purchasing of silenced equipment, maintenance of equipment to manufacturers specification to avoid worsening noise, e.g. ensure rotating parts are checked for balance and replace if necessary.

6.4 Residual Effects

Subject to implementation of the mitigation measures discussed above, the Proposed Works are capable of being accommodated without significant negative impacts on ecologically sensitive receptors within the Site.

7 Conclusions

The Site is situated within the Pembrokeshire Marine / Sir Benfro Forol SAC, which is designated for internationally important marine habitats, grey seal, shore dock, otter and assemblages of fish.

The Site is also within the Freshwater East Cliffs to Skrinkle Haven SSSI, which supports coastal cliff habitats and a number of rare and scarce plants and invertebrates.

The Site is also within close proximity to three other SACs, a candidate SAC and three SPAs.

An Appropriate Assessment will be required in consultation with the competent authority to assess any likely significant effects upon the SACs and SPAs, taking into account proposed mitigation. In addition, a SSSI assent will be required from NRW prior to any works being undertaken within the SSSI.

Notable habitats were present on Site, including: hedgerows, maritime cliffs and slopes, coastal sand dunes, intertidal boulder communities, subtidal sands and gravels.

The Site has the potential to support the following protected / notable species: badger, bats, otter, marine mammals, nesting birds, reptiles, amphibians and fish species.

Mitigation measures, to be included in a CEMP, are proposed to avoid significant effects on all sensitive ecological receptors within and in the vicinity of the Site.

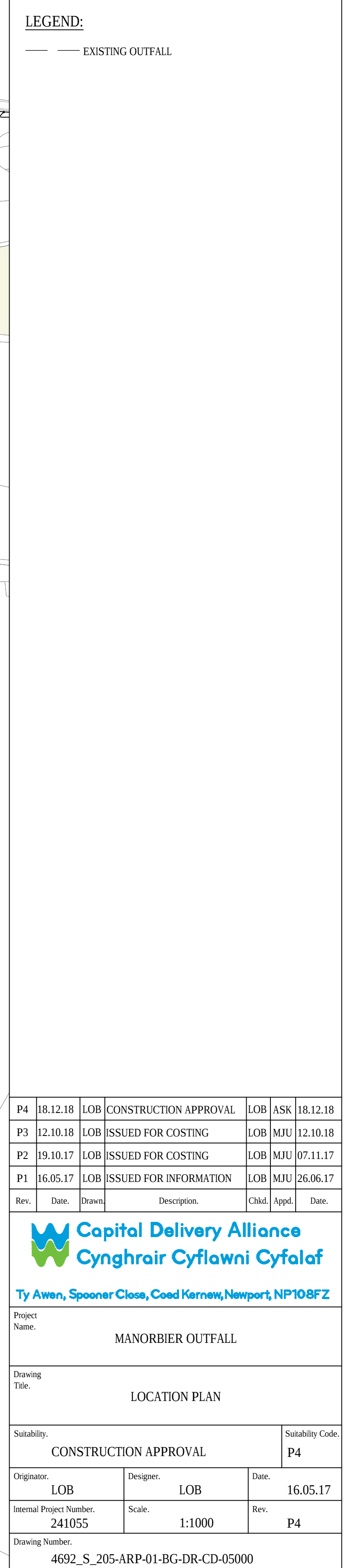
This report is the result of survey work undertaken between September 2016 and December 2018. This report refers, within the limitations stated, to the condition or proposed development of the Site at the time of the inspections. Changes in legislation, guidance, best practice, etc. may necessitate a re-survey and re-assessment. It is also advised that if there is a delay of over a year in undertaking the works, an updated walkover survey is recommended to ensure the baseline conditions have not changed.

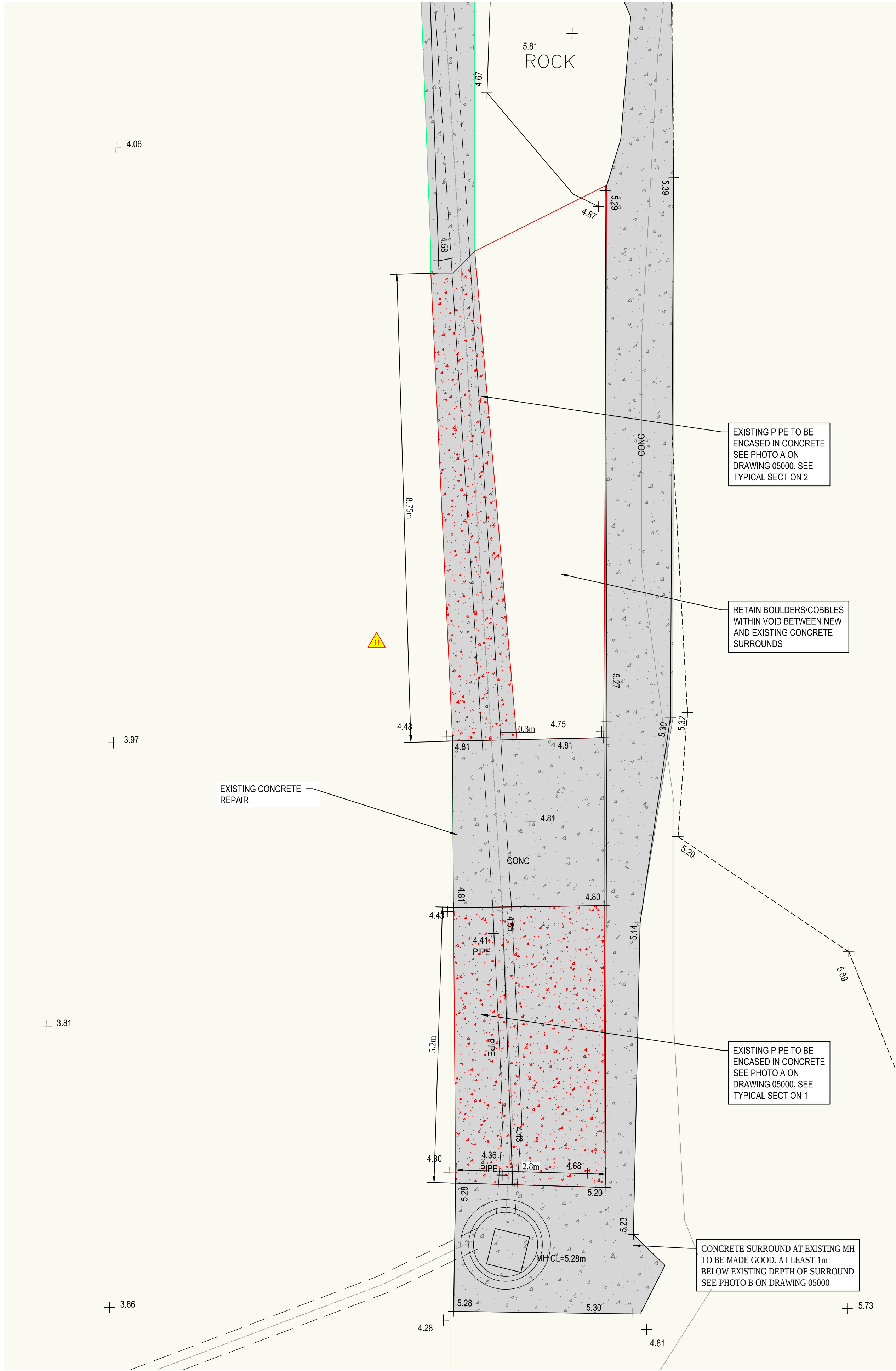
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8 References

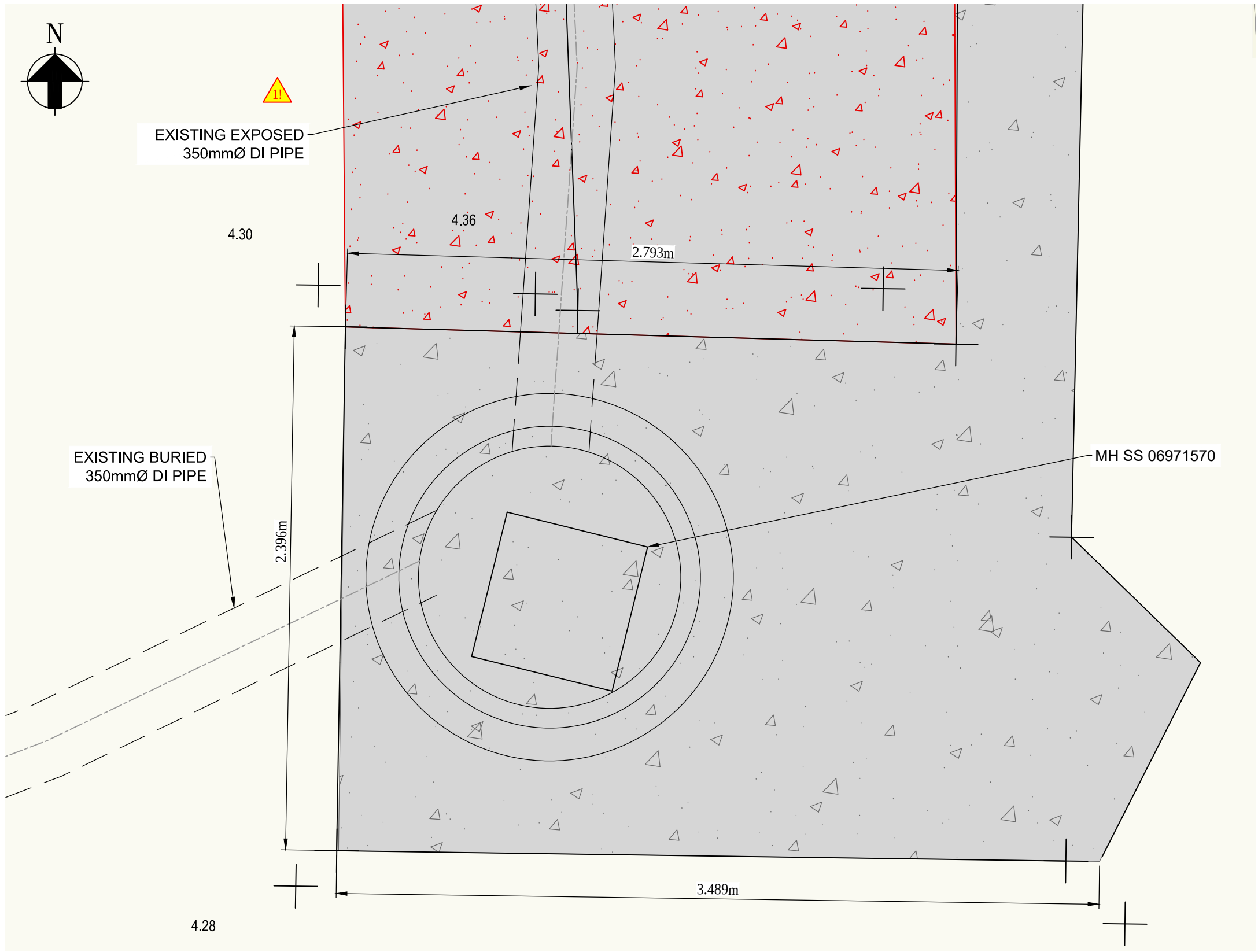
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Figures

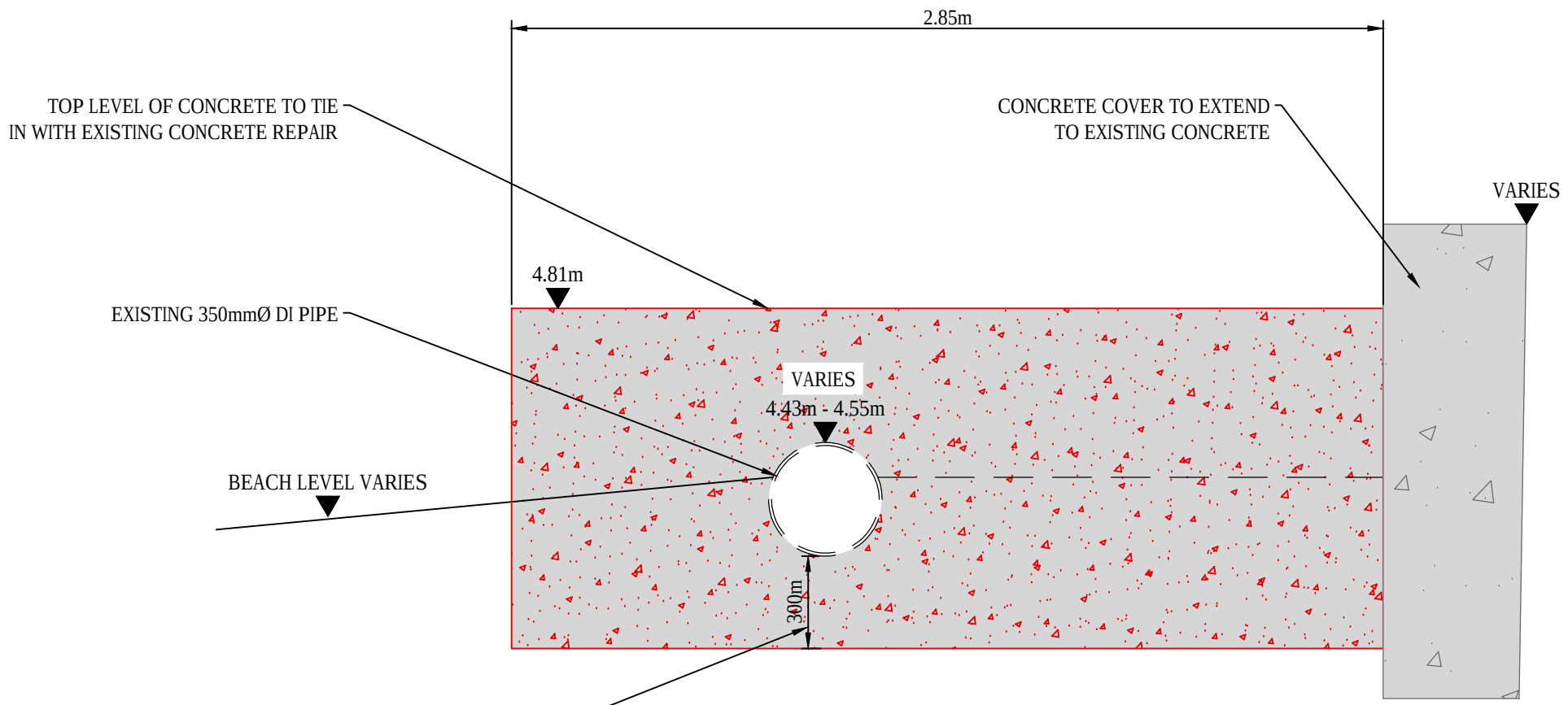




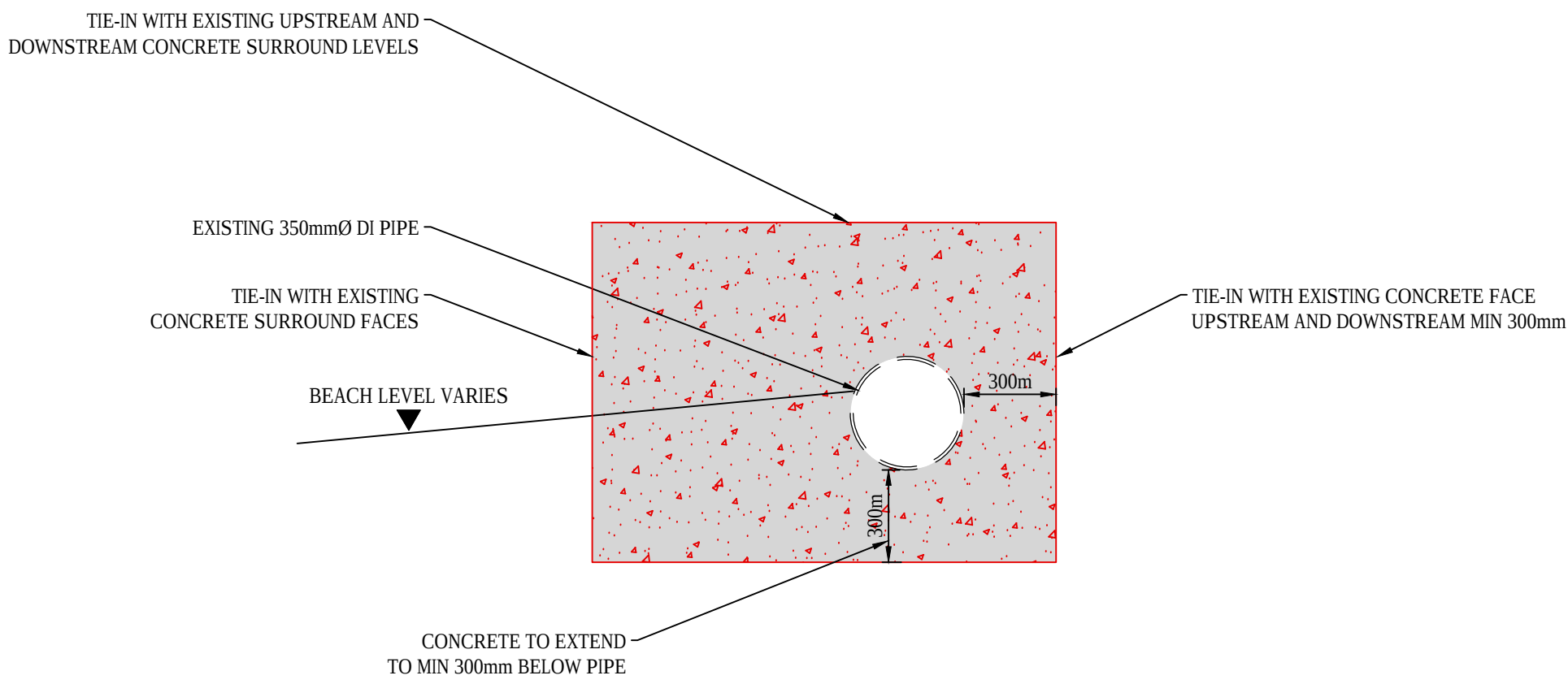
PLAN
SCALE 1:200



PLAN ON MH SS 06971570
SCALE 1:20



TYPICAL SECTION 1
SCALE 1:20



TYPICAL SECTION 2
SCALE 1:20

NOTES:

- CONCRETE SPECIFICATION
 - C40/C50 IN SEAWATER
 - CEMENT TO BS EN 197
 - MINIMUM CEMENT CONTENT 340kg/m³
 - MAXIMUM AGGREGATE SIZE 20mm FREEZE THAW RESISTING AGGREGATES.
 - MAX W/C RATIO OF 0.45
 - DENSITY OF CONCRETE TO BE 2300kg/m³, + OR - 100kg/m.

LEGEND:

- NEW CONCRETE SURROUND
- EXISTING CONCRETE SURROUND
- EXPOSED PIPEWORK
- EXISTING OUTFALL PIPEWORK

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:

CONSTRUCTION

MARINE ENVIRONMENT - IN TIDAL ZONE RISK OF DROWNING

MAINTENANCE / CLEANING / OPERATION

DECOMMISSIONING / DEMOLITION

REFER TO THE DESIGN RISK REGISTER FOR FURTHER DETAILS. IT IS ASSUMED THAT ALL THE WORKS ON THIS DRAWING WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WHO HAS CARRIED OUT A COMPREHENSIVE RISK ASSESSMENT.

P3	18.12.18	LOB	CONSTRUCTION APPROVAL	LOB	ASK	18.12.18
P2	19.10.17	LOB	ISSUED FOR COSTING	LOB	MJU	07.11.17
P1	16.05.17	LOB	ISSUED FOR INFORMATION	LOB	MJU	26.06.17

Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.
 Ty Awon, Spooner Close, Coed Kernew, Newport, NP108FZ						

Project Name.	MANORBIER OUTFALL
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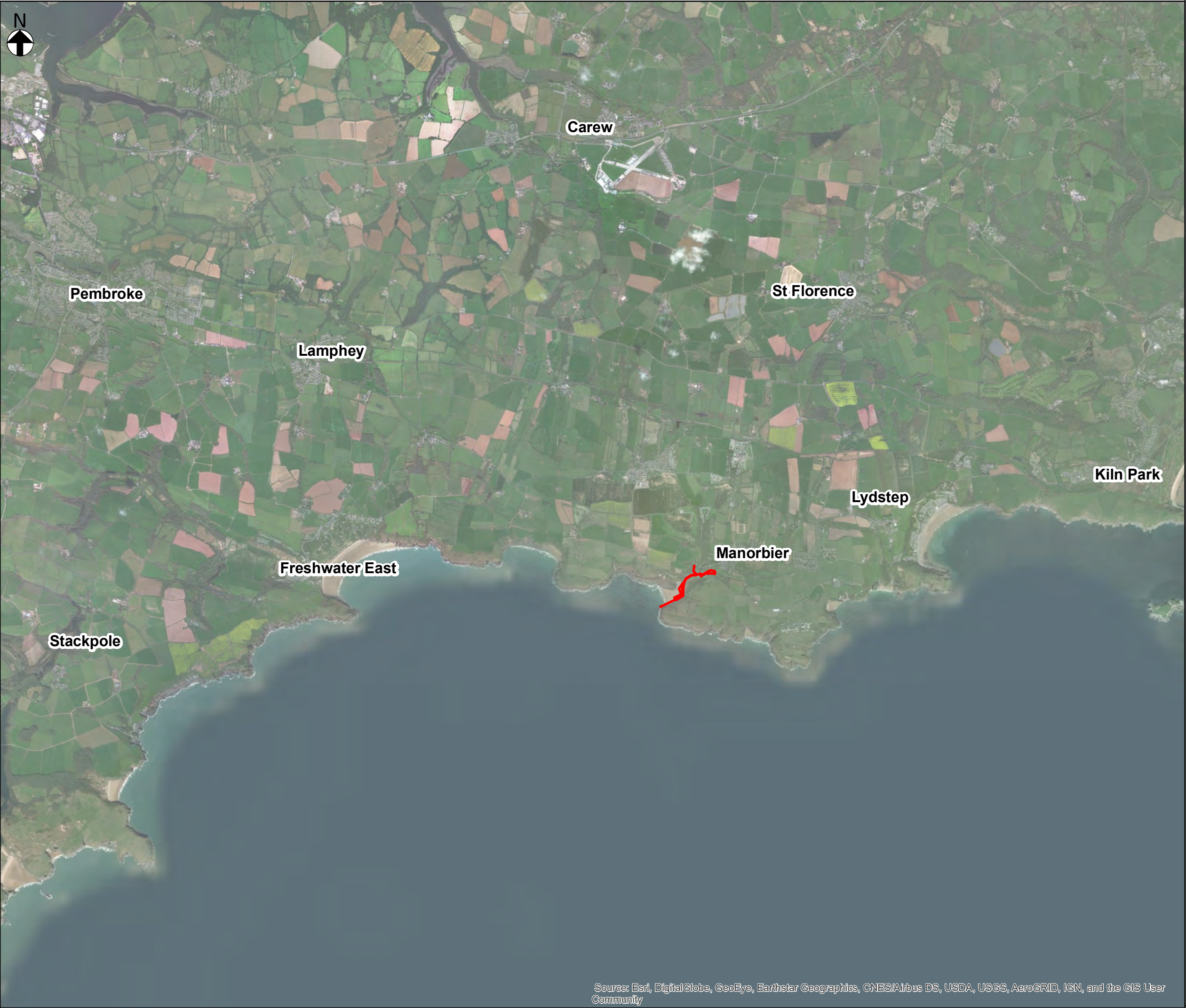
Drawing Title.	EXISTING MANHOLE AND CONCRETE REPAIR PIPE DETAIL
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Suitability.	CONSTRUCTION APPROVAL	Suitability Code.	S4
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Originator.	LOB	Designer.	LOB	Date.	19.06.17
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Internal Project Number.	241055	Scale.	AS SHOWN	Rev.	P3
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Drawing Number.	4692_S_205-ARP-01-BG-DR-CD-05002
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Legend

— Site Boundary

02505001,0001,5002,000

Metres

P0	2019-01-23	KJ	Preliminary	CD	NH	2019-01-31
Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.

Capital Delivery Alliance

Cynghrair Cyflawni Cyfalaf

Ty Awon, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name.

MANORBIER

Drawing Title.

SITE LOCATION PLAN

Suitability.	FOR INFORMATION	Suitability Code.	S2
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Originator	KJ	Designer	KJ	Date.	2019-01-31
Internal Project Number	241055-00	Scale	1:44,000	Rev.	P0

Drawing Number.

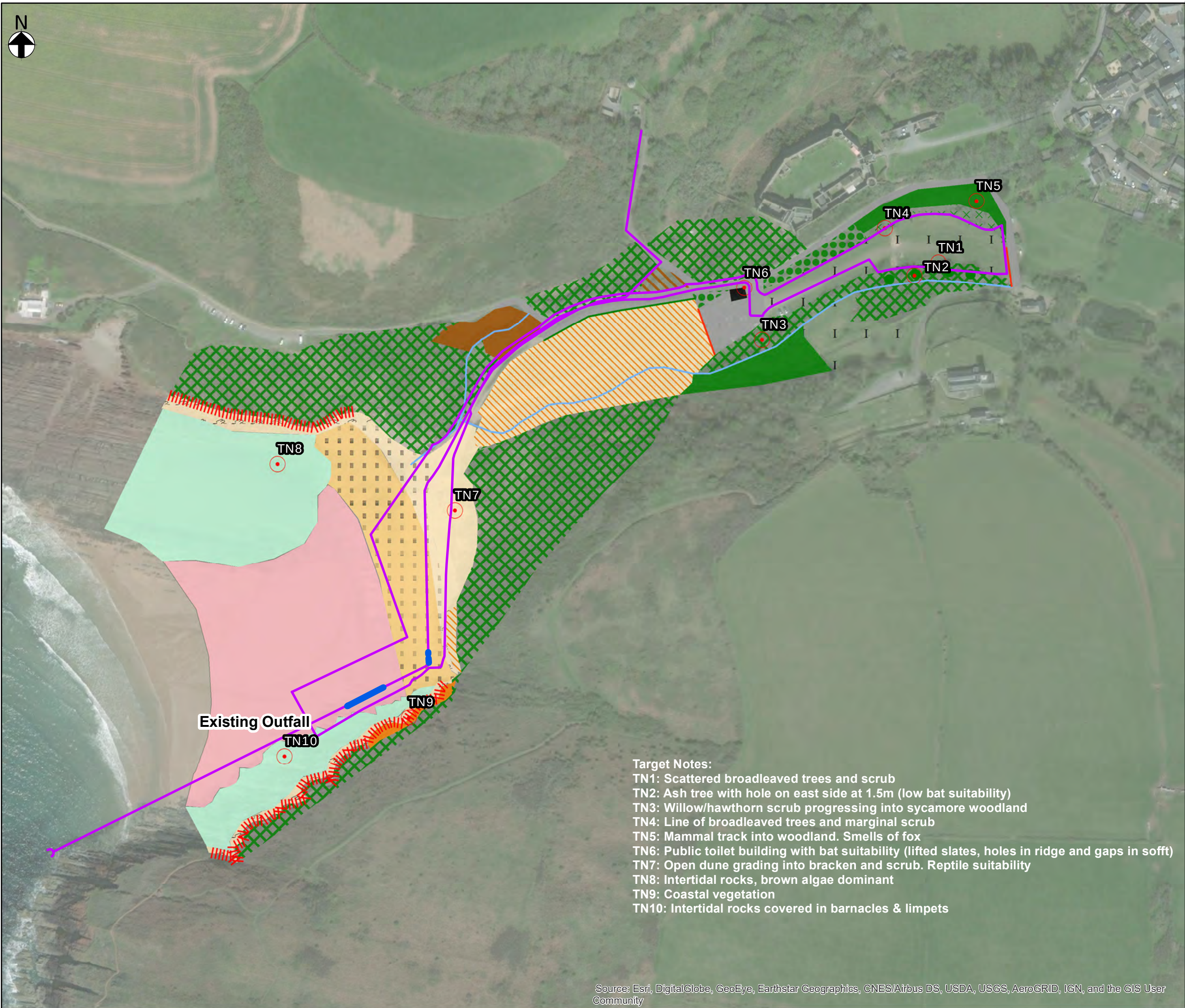
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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A3

THIS MAP IS BASED UPON THE ORDNANCE SURVEY MATERIAL WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE. © CROWN COPYRIGHT 2015 LICENCE NUMBER

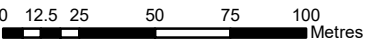


Target Notes:
TN1: Scattered broadleaved trees and scrub
TN2: Ash tree with hole on east side at 1.5m (low bat suitability)
TN3: Willow/hawthorn scrub progressing into sycamore woodland
TN4: Line of broadleaved trees and marginal scrub
TN5: Mammal track into woodland. Smells of fox
TN6: Public toilet building with bat suitability (lifted slates, holes in ridge and gaps in sofft)
TN7: Open dune grading into bracken and scrub. Reptile suitability
TN8: Intertidal rocks, brown algae dominant
TN9: Coastal vegetation
TN10: Intertidal rocks covered in barnacles & limpets

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Site Boundary
- Proposed Concrete Surround
- A3.1 - Broad-leaved parkland/scattered trees
- TN - Target note
- H8.1 - Hard cliff
- G2 - Running water
- J2.1.2 - Intact hedge - species-poor
- J2.5 - Wall
- A1.1.1 - Broadleaved woodland - semi-natural
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- B4 - Improved grassland
- C1.1 - Bracken - continuous
- C3.1 - Other tall herb and fern - ruderal
- H1.1 - Intertidal - mud/sand
- H1.2 - Intertidal - shingles/cobbles
- H1.3 - Intertidal - boulders/rocks
- H3 - Shingle above high tide mark
- H4 - Rocks/boulders above mean high water
- H6.5 - Dune grassland
- H6.8 - Open dune
- H8.4 - Coastal grassland
- J3.6 - Buildings
- J5 - Gravel/hard standing



P0	2019-01-23	KJ	Preliminary	CD	NH	2019-01-31
Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.

Capital Delivery Alliance
Cynghair Cyflawni Cyfalaf

Ty Awon, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name:	MANORBIER
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Drawing Title:	EXTENDED PHASE 1 HABITAT SURVEY
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Suitability:	FOR INFORMATION	Suitability Code:	S2
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Originator	KJ	Designer	KJ	Date.	2019-01-31
Internal Project Number	241055-00	Scale	1:2,500	Rev.	P0

Drawing Number:	002
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Appendix A

Legislative Context

A1 Legislative Context

A framework of international, European, national and local legislation and planning policy guidance exists to protect and conserve wildlife and habitats. This is described in the following sections. The reader will refer to the original legislation for the definitive interpretation.

A1.1 Statutory Designated Sites

A network of nationally designated sites has been established through the designation of Sites of Species Scientific Interest (SSSI) under the Wildlife and Countryside Act 1981 (as amended). The protection afforded by the Act means it is an offence to carry out or permit to be carried out any operation listed within the notification without the consent of the Statutory Nature Conservation Organisation³ (Natural Resources Wales).

The protection afforded to SSSIs is used to underpin the designation of areas at a European Level. European sites comprise:

- Special Areas of Conservation (SAC) designated under the Conservation of Habitats and Species Regulations 2017 (known as the Habitats Regulations);
- Special Protection Areas (SPA) designated under the Wildlife and Countryside Act.

Wetlands of International Importance (Ramsar sites) declared under the Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 are normally also notified as SSSIs but are only considered European sites as a matter of UK and Local Government Policy.

The Habitats Regulations transpose the requirements of Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) in to law within England and Wales, while the Wildlife and Countryside Act transposes Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive) in the law within England and Wales. Equivalent legislation exists to transpose these directives in the law within Scotland and Northern Ireland.

The Habitats Regulations require that consideration is given to the implications of plans and projects (developments) on European sites are considered. Specifically, Regulation 61(1) states:

“A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which –

(a) is likely to have a significant effect on a European site or European marine site (either alone or in combination with other plans or projects), and

³ Section 28 of the Wildlife and Countryside Act 1981 (as substituted by Schedule 9 of the Countryside and Rights of Way Act 2000).

(b) is not directly connected with or necessary to the management of that site, must make an appropriate assessment of the implications for that site in view of that site's conservation objectives."

The formal consideration of effects on European sites is therefore undertaken by the determining authority such as the Local Planning Authority.

Local Nature Reserves can be given protection against damaging operations through powers within the National Parks and Access to the Countryside Act 1949 (as amended). However, this protection is usually conveyed through inclusion of protection within local planning policy relating to these sites and other non-statutory sites such as sites of Importance for Nature Conservation.

A1.2 European Protected Species

The Habitats Regulations convey special protection to a number of species which are listed in Schedule 2 of the Regulations and are referred to as European Protected Species (EPS):

- All UK resident bat species;
- All whale and dolphin species;
- Large blue butterfly (*Maculinea arion*);
- Hazel dormouse (*Muscardinus avellanarius*);
- Pool frog (*Rana lessonae*);
- Sand lizard (*Lacerta agilis*);
- Fisher's estuarine moth (*Gortyna borelii lunata*);
- Great crested newt (*Triturus cristatus*);
- European otter (*Lutra lutra*);
- Wild cat (*Felis silvestris*);
- Lesser Whirlpool Ram's-horn Snail (*Anisus vorticulus*);
- Smooth snake (*Coronella austriaca*);
- Sturgeon (*Acipenser sturio*);
- Natterjack toad (*Bufo calamita*); and
- All marine turtles.

Regulation 41 makes it an offence to:

- a) Deliberately capture, injure or kill any wild animal of a EPS;
- b) Deliberately disturb wild animals of such a species;
- c) Deliberately takes or destroys the eggs of such a species;
- d) Damage or destroy a breeding site or resting place of such an animal.

Disturbance in the context of the offences above is disturbance which is likely to impair the ability of the animals to survive, to breed or reproduce, to nurture their young, to hibernate, to migrate; or to affect significantly the local distribution of the species.

Licences can be granted by the relevant SNCO for developments (sometimes referred to as EPS Licences or Derogation Licences) providing the purposes of the licence is for *“preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment”*.

A1.3 UK Protected Species

The Wildlife and Countryside Act 1981 provide protection to both EPSs and other species including wild birds, water voles and reptiles.

All wild birds, their nests and eggs are protected with some rare species afforded extra protection from disturbance during the breeding season (these species are listed in Schedule 1 of the Act). It is illegal to take any wild bird or damage or destroy the nests and eggs of breeding birds. There are certain exceptions to this in respect of wildfowl, game birds and certain species that may cause damage.

Water vole receive protection under the Wildlife and Countryside Act 1981 which prohibits the killing, injuring or taking by any method.

All native reptile species in the UK are subject to partial protection from intentional or reckless killing or injury only.

Badger and their setts are protected under the Protection of Badgers Act 1992 which makes it an offence to kill, injure or take a badger, or interfere with a sett.

A1.4 Other Legislation Relating to Species

The Environment (Wales) Act 2016

Section 6 of the Environment (Wales) Act 2016 includes a duty on all public authorities to “seek to maintain and enhance biodiversity” so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to “promote the resilience of ecosystems”. This duty applies to government bodies, local authorities and statutory undertakers.

To assist in complying with this duty, public authorities must have regard to relevant evidence provided in the State of Natural Resources Report 2016⁴ and any relevant area statement for an area in which the authority exercises functions, as well as having regard to the list of living organisms and habitats published under Section 7 of the Act. Species and habitats listed on Section 7 are considered to be of Principal Importance for the conservation of biological diversity.

⁴ The State of Natural Resources Report (SoNaRR) 2016. <https://naturalresources.wales/evidence-and-data/research-and-reports/the-state-of-natural-resources-report-assessment-of-the-sustainable-management-of-natural-resources/?lang=en>

The Environment (Wales) Act 2016 replaces the NERC Act 2006; Section 6 replaces Section 40 of the NERC Act and Section 7 replaces the Section 42 lists.

Planning Policy Wales

Planning Policy Wales⁵ sets the national policies in relation to development control through the Town and Country Planning Act 1990. This is supported by a series of Technical Advice Notes, of particular relevance is Technical Advice Note 5⁶ which sets out the consideration of nature conservation in the determination of planning applications.

United Kingdom Biodiversity Action Plan (UK BAP)

In 1992 the UK signed the Convention on Biological Diversity at the Rio Convention pledging the UK to develop national strategies for the conservation and sustainable use of biological diversity. The UK Government subsequently produced Biodiversity: The UK Action Plan in 1994, which described the biological resources of the UK as a whole and in turn led to the production of Biodiversity Action Plans for individual habitats and species.

Biodiversity policy within the UK has been revised through the publication of the UK Post-2010 Biodiversity Framework⁷ which covers the period from 2011 to 2020. A total of 65 Priority Habitats and 1150 Priority Species have been identified as the most in need of protection. Such species and habitats present in Wales have been included in the list of species and habitats under Section 7 of the Environment (Wales) Act 2016.

Pembrokeshire Local Biodiversity Action Plan

The Pembrokeshire Local Biodiversity Action Plan (LBAP) provides a framework within which existing and new actions are co-ordinated to conserve and enhance biodiversity in Pembrokeshire, taking account of local and national priorities. The Pembrokeshire Nature Recovery Action Plan provides the most current guidance⁸.

Part 2 of the LBAP comprises the habitat and species action plans which include the following action plans relevant to the Site: marine habitats, otter, bats, reptiles and amphibians and cetaceans.

⁵Welsh Government (2019) Planning Policy Wales, Edition 9.

⁶ Welsh Government (2009) Technical Advice Note 5: Nature Conservation and Planning. <https://gov.wales/docs/desh/policy/100730tan5en.pdf>

⁷ JNCC (2012), UK post 2010 Biodiversity framework. <http://jncc.defra.gov.uk/page-6189>

⁸ <https://www.pembrokeshire.gov.uk/biodiversity/pembrokeshire-nature-partnership-plans-and-guidance>

Appendix B

Photographs

B1 Photographs



Photograph 1 showing broad-leaved woodland, scrub and improved grassland habitats.



Photograph 2 showing running water and dense scrub habitats.



Photograph 3 showing hardstanding and building.



Photograph 4 showing potential bat roosting features on building (TN6).



Photograph 5 showing open dune and coastal grassland habitats.



Photograph 6 showing intertidal habitats and cliffs.



**Cyfoeth
Naturiol
Cymru
Natural
Resources
Wales**

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Appendix E Water Framework Assessment

Dwr Cymru Welsh Water

Manorbier

WFD Compliance Assessment

WFD/01

Final | 31 January 2019

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

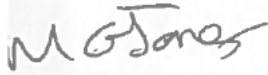
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Document Verification

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Job title		Manorbier		Job number	
				241055	
Document title		WFD Compliance Assessment		File reference	
				4-02	
Document ref		WFD/01			
Revision	Date	Filename	Manorbier WFD Scoping .docx		
Final	31 Jan 2019	Description	For issue to support Marine Licence application		
			Prepared by	Checked by	Approved by
		Name	Mike Jones	Rhodri Thomas	Andrzej Kamler
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
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6 Conclusion	9

1 Introduction

Arup has been commissioned by Dwr Cymru Welsh Water (DCWW) to undertake a Water Framework Directive (WFD) Assessment for the scheme known as Manorbier. Details of the scheme are provided in Section **Error! Reference source not found.**

Under the WFD¹, all proposed schemes with the potential to impact upon WFD-designated water bodies must be assessed to ensure:

- no deterioration of the current status or potential of any WFD quality elements; and
- no prevention of future attainment of the ‘good’ status or potential objectives of any WFD quality elements.

This report follows guidance produced by Natural Resources Wales² (NRW) to produce a WFD Assessment Report which identifies the activities related to the scheme that may cause deterioration or prevent a water body from meeting its objectives. The report follows the scoping template provided as part of this guidance, along with a detailed impact assessment of residual risk identified.

¹ European Commission. Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.

² Natural Resources Wales / Environment Agency. Water Framework Directive assessment: estuarine and coastal water. Available at: <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters>

2 Project Details

Your activity	Description, notes or more information
Applicant name	Dwr Cymru Welsh Water
Application reference number (where applicable)	
Name of activity	Existing manhole and concrete repair, lining open pipeline
Brief description of activity	The following works to Manorbier WwTW Outfall are proposed: - New concrete surround to existing pipe at top of the beach - Approx. 20m of new concrete surround to exposed pipe running down the beach Appendix A shows the Location Plan.
Location of activity (central point XY coordinates or national grid reference)	SS 06120 97446
Footprint of activity (ha)	Along existing asset
Timings of activity (including start and finish dates)	Start date TBC, duration 20 days
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	The works are not anticipated to result in any changes to the operational discharge of the asset.
Use or release of chemicals (state which ones)	The construction methodology states the potential for spillage or use of chemicals such as diesel, concrete, grease, resin resulting in environmental pollution or harm to personnel.

3 WFD Baseline Information

Water body ³	Description, notes or more information
WFD water body name	<i>Pembrokeshire South</i>
Water body ID	<i>GB611008590003</i>
River basin district name	<i>Western Wales</i>
Water body type (estuarine or coastal)	<i>Coastal</i>
Water body total area (ha)	<i>413.3</i>
Overall water body status (2015)	<i>Good</i>
Ecological status	<i>Good</i>
Chemical status	<i>Good</i>
Target water body status and deadline	<i>Good by 2015</i>
Hydromorphology status of water body	<i>Not designated</i>
Heavily modified water body and for what use	<i>No</i>
Higher sensitivity habitats present	<i>No</i>
Lower sensitivity habitats present	<i>Yes (Rocky intertidal reef)</i> <i>Mudflats and sandflats (N2K / Annex 1 habitats; BAP habitats have been focussed on as part of the project instigated by CCW) Area = 5ha)</i>
Phytoplankton status	<i>High</i>
History of harmful algae	<i>NA (Not a category in Wales spreadsheets)</i>
WFD protected areas within 2km	<i>Manorbier beach is within Pembrokeshire Marine SAC and Freshwater East Cliffs to Sparkle Haven SSSI</i>

³ Water body information can be found in the Environment Agency's catchment data explorer and the water body summary table. Magic maps provide additional information on habitats and protected areas. Links to these information sources can be found in the WFD assessment guidance for estuarine and coastal waters.

4 Scoping Assessment

4.1 Hydromorphology

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status		Impact assessment not required	<i>Not a WFD waterbody of high status</i>
Could significantly impact the hydromorphology of any water body		Impact assessment not required	<i>This impact is not likely to be significant due to a low frequency of spills and low volume of outfalls relative to the scale of the coastal waterbody (413ha).</i>
Is in a water body that is heavily modified for the same use as your activity		Impact assessment not required	<i>Not in a HMWB</i>

4.2 Biology

Habitats

Higher sensitivity habitats ⁴	Lower sensitivity habitats ⁵
chalk reef	cobbles, gravel and shingle
clam, cockle and oyster beds	intertidal soft sediments like sand and mud
intertidal seagrass	rocky shore
maerl	subtidal boulder fields
mussel beds, including blue and horse mussel	subtidal rocky reef
polychaete reef	subtidal soft sediments like sand and mud
saltmarsh	
subtidal kelp beds	
subtidal seagrass	

⁴ Higher sensitivity habitats have a low resistance to, and recovery rate, from human pressures.

⁵ Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures.

Consider if the footprint ⁶ of your activity is:	Yes	No	Biology habitats risk issue(s)
0.5km ² or larger	Yes to one or more – requires impact assessment		Lower sensitivity habitat present:
1% or more of the water body's area			The scheme covers an area of rocky intertidal reef on the shoreline. It is considered this is less than 1% of the habitat.
Within 500m of any higher sensitivity habitat			Two areas of Marine Article 17 Habitats Features - Article 17 Mudflats and Sandflats are crossed by the scheme. The area above the MHW line is 0.25ha and the area below MHW is 5ha. The footprint of the scheme covers more than 1% of the area above the MHW.
1% or more of any lower sensitivity habitat			

Fish

Consider if your activity:	Yes	No	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary		No - Go to next section	
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)		No - Go to next section	
Could cause entrainment or impingement of fish		No - Go to next section	

⁶ Note that a footprint may also be a temperature or sediment plume. For dredging activity, a footprint is 1.5 times the dredge area.

4.3 Water quality

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)		No - Impact assessment not required	<i>There is no change to volume or content of outfall from the existing.</i>
Is in a water body with a phytoplankton status of moderate, poor or bad		No - Impact assessment not required	
Is in a water body with a history of harmful algae		No - Impact assessment not required	<i>NA (Not a category in Wales spreadsheets)</i>
If your activity uses or releases chemicals (for example through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the Environmental Quality Standards Directive (EQSD) list		No - Impact assessment not required	None specified on RAMS
It disturbs sediment with contaminants above Cefas Action Level 1		No - Impact assessment not required	

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	Yes	No	Water quality risk issue(s)
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list		No - Impact assessment not required	None specified on RAMS

4.4 WFD Protected Areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2km of any WFD protected area ⁶	Requires impact assessment		<i>Manorbier beach is within Pembrokeshire Marine SAC</i>

4.5 Invasive non-native species (INNS)

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS		Impact assessment not required	Ecological Appraisal 2016 and 2018 showed no signs of invasive species (including marine) were observed during the survey.

4.6 Scoping Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	
Biology: habitats	Yes	<i>Marine Article 17 Habitats Features - Article 17 Mudflats and Sandflats: More than 1% of this habitat is covered by the footprint of the works.</i>
Biology: fish	No	
Water quality	No	
Protected areas	Yes	<i>Manorbier beach is within Pembrokeshire Marine SAC</i>
Invasive non-native species	No	

5 Detailed Assessment

The scoping assessment has identified potential risks to two receptors: lower sensitivity habitats and protected areas.

A Habitats Regulation Assessment (HRA) was prepared for the works in January 2019. This has assessed the potential for impacts to protected areas and habitats in detail. For brevity, the findings of the HRA have been used to inform the conclusion of this assessment as they relate to the same works and protected areas / habitats. Both assessments will support a Marine Licence application for the works, to be submitted in February 2019.

5.1 Potential Risks

In the absence of any avoidance and/or mitigation measures, nearby higher sensitivity habitats and protected areas are at risk of pollution impacts from the works. Potential impacts include sedimentation (e.g. from excavations, jetting or vehicle tracking), accidental spillage (e.g. leaks from machinery/plant) or the introduction or spread of INNS (e.g. from contaminated machinery/plant).

5.2 Mitigation Measures

The likelihood of impacts occurring is relatively low given the short construction period (20 days), localised nature and limited operational impact due to improving the operational nature of the outfall whilst maintaining full compliance with the extant NRW discharge consent. The Risk Assessment / Method Statement (RAMS) (Appendix B) outlines the mitigation measures incorporated into the construction of the scheme. The Appropriate Assessment within the HRA recommends a number of mitigation measures in relation to the Conservation Objectives for the features of the European Sites. The measures related to the Water Environment include but are not limited to:

- All excess and waste materials however will be removed from the beach and disposed of off-site at a suitable licensed facility;
- The concrete wagon will wash out in designated washout area, ensuring surface run-off does not reach watercourses or semi-natural habitats;
- Use of environmentally friendly products where possible;
- Dispose of all waste materials to designated skips etc;
- Emergency spill kits are to be maintained at every work location and with each main item of plant;
- Equipment to be stored on designated drip trays/ bunded areas; and
- Minimal quantities of materials, fuels etc. to be taken on to foreshore.

6 Conclusion

The assessment has established the potential risks to receptors associated with the proposed works to Manorbier WwTW Outfall which include a new concrete surround to existing pipe at top of the beach and approx. 20m of new concrete surround to exposed pipe running down the beach. The key receptors are the 0.25ha and 5ha area of mudflats and sandflats and Pembrokeshire Marine SAC.

Given that the potential impacts relate to protected areas and habitats, the findings of the HRA prepared for the works have been used to inform the conclusion of this assessment. The HRA has proposed suitable mitigation to ensure that the construction and operation of the proposed development do not give rise to any adverse effects on the integrity of the European Sites.

The areas of mudflats and sandflats within the area are considered fall under Feature 1 Estuaries of the Annex I habitats, but not a primary reason for selection of this site for the Pembrokeshire Marine SAC. Applying the conclusions and mitigation measures advised within the HRA, the works will not give rise to adverse effects to this lower sensitivity habitat.

Combined with the temporary and minimal nature of the works, this mitigation is considered sufficient to ensure that the proposed works do not, either alone or in combination with other projects, give rise to any adverse effects upon WFD water bodies or habitats or prevent them from attaining good status in the future.

This assessment has been based on currently available WFD baseline data (Section **Error! Reference source not found.**) and design information for the scheme. It is considered a 'live' document and should be reviewed and updated during construction, particularly if:

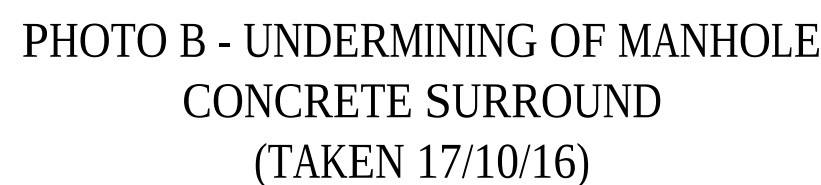
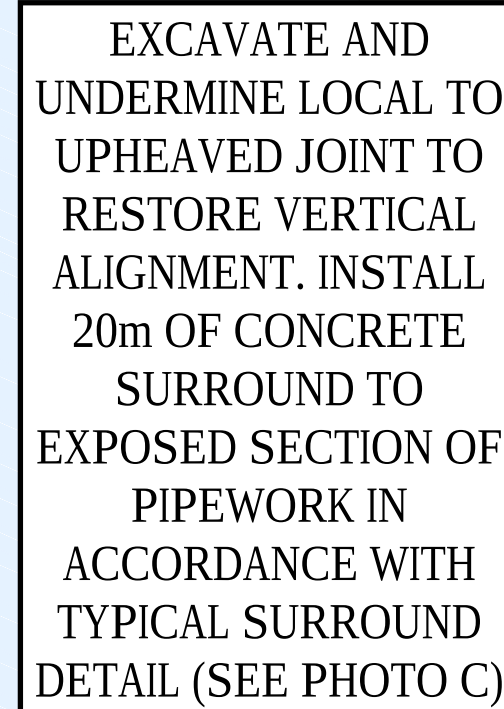
- NRW update or provide additional WFD baseline data for the relevant water bodies; and/or
- Significant changes to the nature, spatial extent, scale or construction methods of the scheme are made.

The outcomes of this assessment should be shared and agreed with NRW (as the regulatory authority for the WFD in Wales) as part of the Marine Licencing process.

Appendix A

LEGEND:

—— ——— EXISTING OUTFALL



P3	12.10.18	LOB	ISSUED FOR COSTING	LOB	MJU	12.10.18
P2	19.10.17	LOB	ISSUED FOR COSTING	LOB	MJU	07.11.17
P1	16.05.17	LOB	ISSUED FOR INFORMATION	LOB	MJU	26.06.17
Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.



Project Name.	
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Drawing Title.	LOCATION PLAN
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Suitability.	Suitability Code
FOR COSTING	D1

Originator.	Designer.	Date.
LOB	LOB	16.05.17

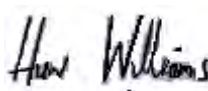
Internal Project Number.	Scale.	Rev.
241055	1:1000	P3

Drawing Number.
4692_S_205-ARP-01-BG-DR-CD-05000

Appendix B

Method Statement

Note: This method statement must be read in conjunction with any developed task statements.

Method Statement Title: Manorbier Outfall Repair		Scheme Title: Manorbier Outfall (1W6000/S1/S2/S3)			
		RAMS Number:- 3988			
		Start Date: October 2019			
Prepared by: Huw Rees	Job title: Engineer	Company: Morgan Sindall		Signed: 	Date: 10/12/18
Checked by: Huw Williams	Job title: Site Agent	Company: Morgan Sindall		Signed: 	Date: 14.12.18
Checked by: Kevin James	Job title: Project Manager	Company: Morgan Sindall		Signed: 	Date: 14.12.18
Issued by: A Morgan	Job title: Document Controller	Issue: Revision 0	Status For construction	Issue Date:	
Review Process: (This method statement accepted as current working document)	Name (Print)	Signed:	Status	1 st Review Date:	
	Name (Print)	Signed:	Status	2 nd Review Date:	
Issued to:	Job title:	Please acknowledge receipt of your copy of this MS by signing and returning the transmittal note.		Transmittal date:	

Method Statement

Control sheet:

Risk Assessment / Method statement – Tracking Sheet

Name	Job title	Signature	Status	Comments
Huw Williams	Site Agent			
Kevin James	Project Manager			
Mike Sellers	SHE Advisor			

Review process

No	Prompt List	Yes	No	In Part	N/A
1.	Unique project specific number and title identified for the document?				
2.	Does the method statement / risk assessment include suitable arrangements if sub-sub contractors are involved?				
3.	Authorisation and distribution personnel identified?				
4.	Brief overview including location and duration of the works described?				
5.	Specific Risk Assessment † attached and satisfactory? Are all the hazards/environmental impacts identified? Have all the risks been evaluated and controls identified?				
6.	High risk/safety critical / COSHH activities identified / controls specified? (Controls eg – Statutory permits/ licences, Security, Testing / commissioning / special training)				
7.	Scope of works identifying / listing all activities? Philosophy identified? Are all parameters identified / listed?				
8.	Temporary Works schemes identified? Philosophy identified? Temporary work drawings listed including relevant calculations? Permits required? Interfaces identified?				
9.	Names / titles / contact details of key personnel / supervisors responsible?				
10.	Resources identified e.g. personnel, supervision, equipment, plant, materials? Craneage – lifting plan in place? Lifting equipment – plan / certificates in place? Access / scaffolding requirements clearly set out?				
11.	Induction / training / permit requirements identified? Permit issue authorisation regime identified? Daily briefing and toolbox talk regime identified?				
12.	General site requirements identifying access / egress / traffic measures? Details of services / works isolation? PPE / evacuation requirements identified?				

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	Welfare / first aid facilities identified?				
13.	Monitoring & compliance Monitoring by whom Enforcement – how by whom- equipment (meters / sampling)				
14.	Interfaces / security of the client / public / other contractors identified?				
15.	Environmental controls / Waste Controller / ECCoP identified?				
16.	QC monitoring and inspection / testing regime identified? I&T Plans refs				
17.	Contingency plan e.g. emergency / fire / rescue / spill response identified?				
18.	Any special conditions identified e.g.				
19.	Management of Change – process in place to identify change requirements				
20.	Review date as required				
21.	Approvals statement incorporated?				
22.	Confirmation of Operatives briefing / Operatives induction sheet incorporated?				
23.	Any other (specify)?				
† Any Risk Assessment shall be amended / confirmed as site specific. * Status A Work can proceed as described B Work can proceed when comments are incorporated C Resubmit and agree before work can proceed					
Comments					
Note Clearance to proceed with this Method Statement does not relieve the Subcontractor of their contractual obligations, including safety, structural integrity or any implications to permanent works arising from these proposals.					

Method Statement

Contract Title	Manorbier Outfall
Contractor	Morgan Sindall
MS No	3988

This method statement has been developed further to the completion of the following references risk assessments:

Risk Assessment Number	Title
01	Manorbier Outfall Repair

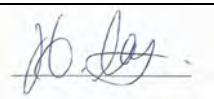
Section 1 – General Details

Scope of Works:

The activities covered in this Method Statement are to detail the construction methodology involved in Manorbier outfall works. The works involve repairing the surround to existing manhole SS06971570 and exposed 350mm dia. pipework that has had its concrete surround eroded. Approximately 20 m of concrete surround downstream of manhole SS06971570 will need to be excavated, realigned and made good with a concrete surround. All concrete on the scheme will be to a C 40/50 marine grade specification, due to the presence of seawater.

Location of the Works (Use sketch boxes if required):

Manorbier beach, access will be via the beach car park.

Prepared by:	Huw Rees		
Position held:	Engineer		
Signed:		Date:	10/12/18
Review date:	TBC		

Work Supervisor(s); TBC

Refer to Method Statement Tracking and Content Sheet

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Section 2 – Programme of Operations

Start date / time:	TBC				
Preceding Works to be Completed:	N/A				
Duration:	20 days				
Permit required:					
Permit to Work (General)	Y	Permit to Enter (Confined Spaces)	Y	Permit to Dig	Y
Hot Work Permit	Y	Out of Hours Work Permit	☐	Other (specify)	☐

Section 3 – Personnel

Include details of all personnel involved in the task and any special training, skills or qualifications required

Name	Role	Competence Details

Method Statement

Section 4 – Safe System of Work to be Adopted

4.0 Introduction

- 4.0.1 This method statement (MS) outlines initial proposals for this activity. Where it is identified that there is a need to change the method of work due to unforeseen circumstances for example, then revision, authorisation and issue will follow the same procedure as the original. This method statement is only valid when the person who has prepared it and the person who has authorised it have signed the front sheet accordingly.
- 4.0.2 Task Statements (TS) will be developed for specific tasks required to carry out the works, as and when required. The MS and TS should be read in conjunction with the site specific plan and the construction programme. The MS and TS are “live” documents and will be updated as required, with newly identified risks.
- 4.0.3 The Responsible Person must be in possession of an approved method statement and task statement for the works. The Project Manager and Foreman / Supervisor shall ensure that the works proceed according to this approved method statement and subsequently developed task statements.

4.1 Risk Assessment

- 4.1.1 Template displayed in Appendix A.

4.2 Induction / Training

- 4.2.1 All site personnel will be familiarised with the site and made aware of any hazards, by way of a site specific induction.
- 4.2.2 All operatives working on the tasks described in this method statement, risk assessment and any associated task statement must be briefed on its contents. Operatives must sign the attached briefing attendance sheet to confirm that they have been briefed and understood the contents.
- 4.2.3 Daily briefings shall be given to the operatives prior to work commencing. Tool Box talks will be planned monthly and given to all operatives on a weekly basis. The Morgan Sindall designated person must be in possession of an approved MS and TS before issuing any permits. All operatives must be briefed on the requirements of the permit before work commences.

4.3 General Site Requirements

4.3.1 Access and Egress

Access and egress to the outfall will be via the beach car park as per the photograph below. Operatives and plant will use the existing footpath down to the beach. Whilst plant are accessing or traversing the beach area, vehicle banks men will be present to control movements to ensure members of the public are not put at risk from the machines. If members of the public come near the working vicinity area where plant is moving then the banks men will stop the work and allow the public to pass. Any ramped excavation works will be undertaken using the site excavator that will shape the ground into a suitable gradient. If deemed necessary type I and Geo grid will be used to provide stability for the ramp.

Tide times will be monitored throughout the duration of the works using the following timetables: <https://www.tidetime.org/europe/united-kingdom/manorbier.htm>

There is a six-hour period between high tide and low tide which will dictate when work can be carried out. Some work will be able to be undertaken above the tide level, whereas on other occasions the site team will only have a 3 hour working window. Therefore work shall be programmed accordingly to suit the tide times.

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Where the proposed works are above the mean high tide (see sketch box 1), work activities on site will be segregated from the public area using double clipped heras panels and feet. Panels will be clearly signed to deter any third parties from entering the site working area. Working areas that are affected by the tide shall have temporary barriers set up during the shift as a visual barrier to segregate the working area from the public.

At the end of each working shift all equipment will be returned to the site compound and stored securely. Any equipment left on site will be contained within the Heras security fencing.

4.3.2 Safety of Services

With reference to the statutory undertakers drawings and trial hole information, all known services will be marked on the ground. A CAT scan will be carried out and a permit to excavate issued prior to carrying out excavations on site. Excavations carried out within 500mm of known services will be carried out by hand.

Not all services encountered will be identified from the service plans and CAT scan – therefore utilise recognised best practice whilst completing excavations.

No lifting operations can take place before a permit to lift has been issued. All lifting operations are to be controlled by a permit to lift produced by a competent appointed person. Machine driver, Slinger Signaller/Crane Supervisor and appointed person all to be CPCS trained and competent.

4.3.3 Safety Works or Isolation Measures

Throughout the works, the tide levels will be continuously monitored by a supervisor to ensure the work force and plant are not cut off by the rising tide. If there is any doubt, all work must cease and all plant and operatives to leave the foreshore.

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4.3.4 Site office, welfare and first aid facilities

A suitable location will be provided within Manorbier as a temporary site compound where a site office and welfare facilities will be located and where plant and materials shall be stored. No plant or materials will be stored on the foreshore or beach areas.

4.4 Interface Issues

The local community will be fully engaged and advised of the project prior to works starting on site. Any interface with DCWW operatives will be controlled at the site level.

4.5 Scheme Construction Methodology

If any of the methodology or construction sequence detail below should change, STOP works immediately, make safe and report to the site supervision.

Preliminary Instructions

- Main lifting on the project will primarily be undertaken by the onsite excavator. A valid lift plan will be compiled and completed by an authorised CPCS appointed person complete with a schedule of lifts. All slinging of equipment will be undertaken by a CPCS certified slinger/signaller. The excavator driver must also hold a valid CPCS card with the relevant 'lifting with excavators' category and be component in the proposed works to be undertaken.
- All lifting chains and equipment will have current test certificates and shall display the current colour coded lifting tag. A copy of the test certificates will be held in the site file.
- A Delivery Lifting Plan & Lorry Loader Checking Form must be completed prior to any delivery offloading on site and the supplier must also have a safe system of work for offloading.
- It may be necessary to temporarily leave broken out concrete or rock on site at the end of a shift if it is not possible to remove fully due to time constraints. All excess and waste materials however will be removed from the beach and disposed of off-site at a suitable licensed facility

4.5.1

Works to manhole SS06971570

Since this manhole has been undermined due to tidal activities the bottom of the concrete manhole is completely gone leaving the pipe exposed. The design requires a new concrete surround, a minimum of 1 m below the underside of the existing concrete. Therefore beach rocks will be removed from the underside of the manhole using the site excavator. All rocks will be stored in the material storage area and segregated for further use. A temporary Works design shall be required to support the concrete slab in order to allow the material to be excavated below it. Alternatively the concrete will be saw cut by a specialist subcontractor and broken up using the pneumatic breaker or excavator. If this is the case then a separate RAMS will be made to cover both scenarios

The site team will then excavate the sand layer to the agreed design depth and proceed to pour a blinding layer of concrete. All sand will be stored in a separate area.

Once the blinding has cured the site carpenter will drill dowel bars into the existing manhole and attach steel reinforcement to the underside of the manhole. All dowel bars will be drilled to the agreed depth and anchored using a chemical fixing product. Material data sheets and COSHH

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assessments will be used and briefed to the site operatives on the safe use of chemical anchors and their disposal.

If the saw cut option is adopted shutters will be installed to the full height of the original concrete slab level.

The carpenter will then erect shutters around the underside of the manhole and provide suitable strutting. For manual handling purposes the site carpenter will be assisted for any lifting works.

If the manhole is still on struts at this point, the underside of the manhole can be poured in two stages. The first pour will cover two thirds of the area of the manhole base, while the other third is supported by props. Once the concrete has cured to a sufficient strength the temporary props will be taken away from the final third, the above process will be repeated for shuttering and meshing and will then be filled with concrete.

The concrete face will be scabbled when necessary to ensure that the next concrete pour bonds correctly to the first part.

The concrete wagon will be supervised by a site banksman at all times.

The concrete will be poured into a skip, and the bagging placed inside the letterbox shuttering under the manhole. Under no circumstance will the operatives on site stand underneath the concrete skip.

Once the concrete has been poured it will be compacted using a vibrating poker and left to cure. Care will be taken to ensure that no concrete is left on the beach or to enter any water body.

The concrete wagon will wash out in designated washout area away from the beach or any water course.

Once the concrete has cured the shuttering will be removed and the finish inspected.

If the original concrete slab is saw cut and removed, the entire shutter could be poured in one operation which will save time overall.

Pipework renovation

The pipework downstream of the manhole has become misaligned and exposed due to tidal activity.

To rectify the misalignment of the pipe the site team will excavate approximately 400 mm underneath the pipe to expose it fully. The site team will also excavate along its linear length until it finds sections of pipe either end of the misalignment that are correctly aligned in the vertical plane.

Once the full length of the pipe is exposed the pipe will be lifted using the excavator straps. This will lift any pipework that has dipped. If the pipework is too high in the vertical plane then the site excavator will press down upon any bowing. Before pressing down on any pipework timber chocks will be placed on the crown of the pipe so that it is not crushed.

Sandbags could also be used to spread the load on the pipe.

The affected linear length of the pipework measures approximately 20 m and the site team will realign all of the affected pipework. The gradient will then be checked using either a spirit level or auto level to ensure that the gradient is satisfactory.

The underside of the pipework will then be blinded with concrete following the same methodology outlined above, using the marine grade mix. The blinding will need to be thicker than normal to prevent it being washed away at high tide.

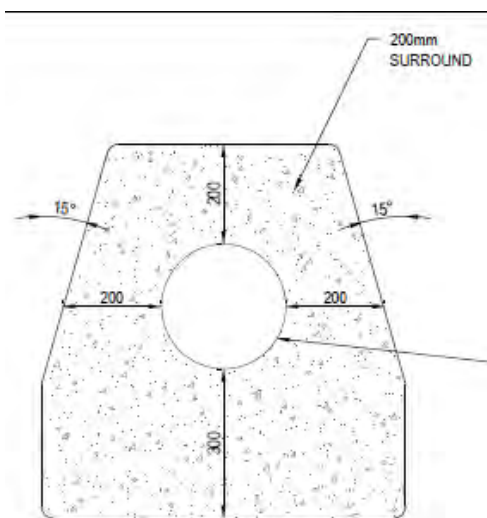
After the concrete has cured temporary timber props will be used to hold the pipework in place ensuring that there is no sagging or further misalignment.

The carpenter will then erect shutters along the 20 m length of the pipework so that it can be concrete surrounded.

All shutters will be struttled and pinned and will have the correct chamfer as per design shown:

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This section is affected by the tide and will be underwater during high tide (see sketch box 1). Therefore the length of the pipework will be split into manageable parts that can be completed during an arranged shift pattern.

Once the shutters have been inspected by the site manager concrete will be poured along the 20 m length, using the C 40/50 marine grade mix.

The pouring sequence will follow that which has been outlined above.

Once the concrete has cured the timber will be removed from the face of the concrete and placed in the timber skip.

4.7 Contingency Plans

- 4.7.1 In the event of a spill on site no matter how minor, site personnel must firstly find the source of the spill and **Stop** it, then **Contain** it by using the equipment available in the Spill Response Kit. Then **Notify** the Project Manager, Foreman or Engineer of the details of the incident. A clean-up of the spill will be undertaken.
- 4.7.2 In the event of a serious injury which as a result the operative cannot be safely moved the Coastguard will be called immediately by calling 999.
- 4.7.3 Should one of the vehicles break down whilst on the foreshore, a towing chain or strap will be fitted to allow one of the other vehicles to tow it to safety.
- 4.7.4 First Aid kits are available in the site cabins and vehicles and are also kept by appointed First Aiders.
- 4.7.5 Damage to any statutory undertakers apparatus should be notified to relevant people using the following contact numbers:-

Statutory Undertaker	Additional Info.	Number
BT	Emergency & Dial before you dig	0800 9173993
WPD	Emergency	0800 052 0400
Wales & West Utilities	Emergency	0800 111 999
DCWW Pollution Helpline	Sewerage	08000 853968
DCWW Control Room	General Enquiries	08000 520130

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Section 5 – Plant, Equipment

Match plant and equipment to qualified personnel and include any specific PPE details.

Plant and Equipment

Equipment description	Test Certificates in date (matched to equipment)	Operator details
8t Tracked Excavator		
6T Dumper		
Tractor and trailer		
Lifting Equipment Tagged and Tested		
Hand power tools e.g. drills		
Electric/Petrol Disc Cutter		
Cable avoidance tool and generator		
Small tools e.g. hammers, saws		
Compressor/generator		

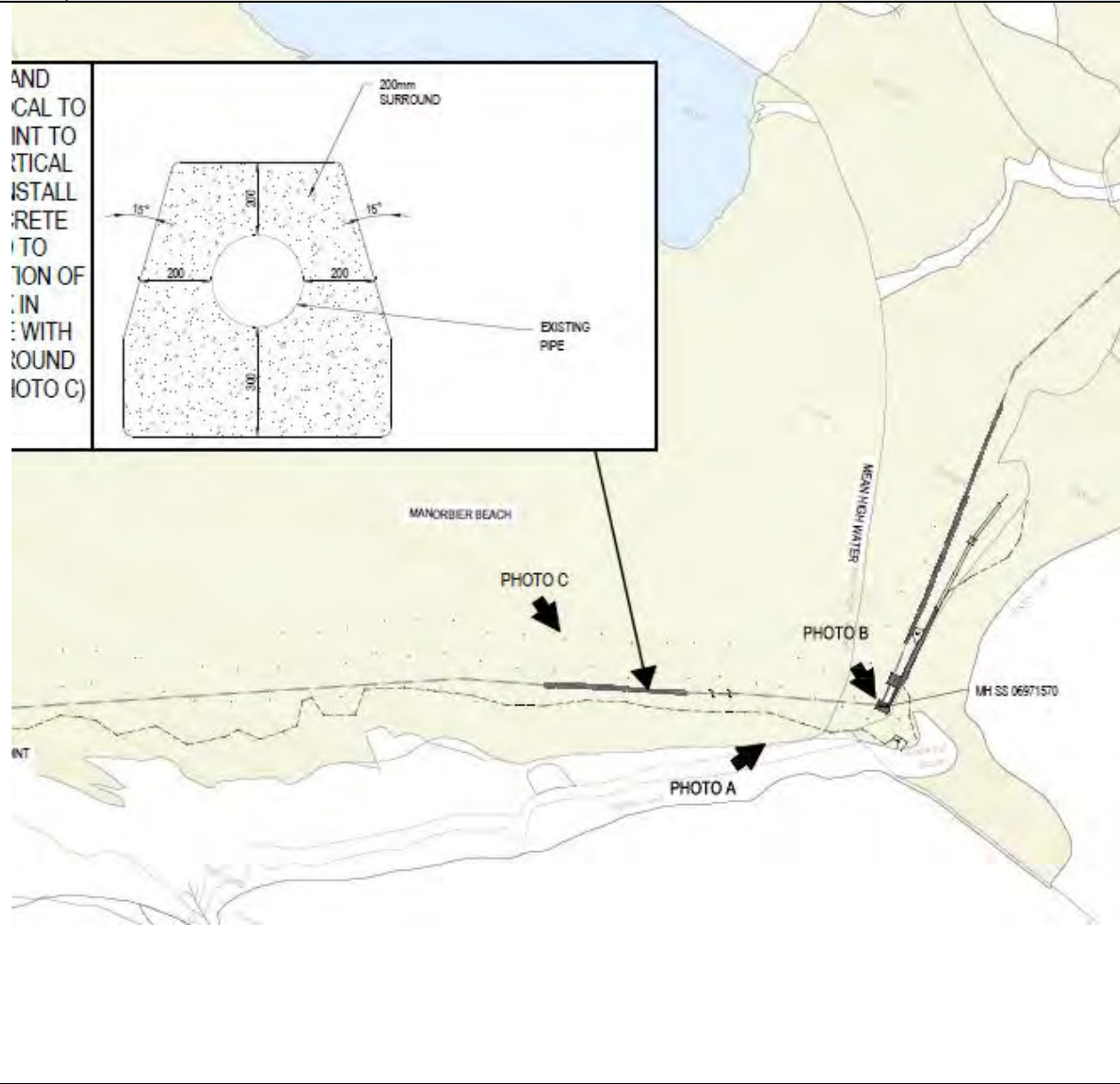
Personal Protective Equipment (PPE)

Equipment description	Specification (e.g. type, grade)	Training required
<i>Fluorescent jackets or waistcoats</i>	<i>(to BS EN 471 Class 2) (Class 3 on high speed roads))</i>	
<i>Safety glasses or goggles</i>	<i>(to BS EN 166-F for general site work)</i>	
<i>Safety helmets</i>	<i>(to BS EN3 97)</i>	
<i>Steel toe capped boots with steel midsole</i>		
<i>Gloves (appropriate for task)</i>		

Method Statement

Section 6 – How environmental matters are controlled

Refer to prompts in the SHE Risk Assessment Form and project Register of Environmental Effects (SE FRM1).Sketch box 1



Method Statement

Receipt Acknowledgements

Supervisor in charge of the Work

I confirm that I have read and understand the requirements of this method statement and associated risk assessments and will ensure their communication to operatives under my control and to those who may be affected by its requirements

Signed		Date	
Print name		Supervisor	

Communication

Communicate the contents of the Method Statement to all those involved or affected by the works and record their details below.

Name	Signature

NOTE:

1. If you have any doubt about any information given or contained in this Method Statement – ASK FOR CLARIFICATION.

Method Statement

[illegible]

Project title and contract no.		Manobier Outfall		Risk assessment no.		01		Risk Factor												
Activity		Replacement of existing outfall		Location		Manobier		Risk Quantity												
Person conducting assessment		Huw Rees		Date				No injury, damage or environment impact Minor injury, damage or environment impact Major injury, damage or environment impact Fatality, building loss, catastrophic environment impact												
Person supervising work				Date																
Persons exposed										Almost no probability A small probability A small probability Almost certain										
Employees	x	Other workers	x	Public/ visitors	x	Young persons														
New / expectant mothers		Disabled		Others																
Estimated total number of persons at risk		5																		
Hazards (what might cause harm?)		S	H	E		S	H	E	Acceptable Unacceptable											
1	Adverse Weather Conditions	✓			17	Loading/Unloading	✓	✓		<table border="1"> <tr> <th>Risk Level</th> <th>Action</th> </tr> <tr> <td>Insignificant</td> <td>No action required and no documentary records need to be kept.</td> </tr> <tr> <td>Acceptable</td> <td>No further preventative action. Consideration shall be given to more cost effective solutions or improvements that impose no additional cost burden. Monitoring required to ensure that controls in place are properly maintained.</td> </tr> <tr> <td>Unacceptable</td> <td>Work shall not be started or continued until the risk level has been reduced to an acceptable risk level. While the control measures selected shall be cost-effective, legally there is an absolute duty to reduce the risk, this means that if it is not possible to reduce the risk even with unlimited resources, then the work shall not be started or shall remain prohibited.</td> </tr> </table> Notes: - Physical Hazards are the nature of issues that may cause harm. Tick box for hazard. - Preventative / Control Measures are the actions that will stop it going wrong. - Control measures are to ensure that residual risks are reduced to a minimum. Where controls fail to reduce the risk to an acceptable level then refer assessment to your line manager. - If the operations are likely to affect the public or the safe operation of a public infrastructure or transport system, the control measures must reduce the likelihood of significant harm to the level that existed before our work commenced. - Where young persons or expectant mothers are involved in the activity, ensure that any additional controls are put in place in accordance with local procedures. - In addition to the above, consideration must be given to other individuals' susceptibility due to pre-existing health conditions, e.g. bad back, poor hearing. Additional 'human factors' such as ergonomics, workplace design, etc. should			Risk Level	Action	Insignificant	No action required and no documentary records need to be kept.	Acceptable	No further preventative action. Consideration shall be given to more cost effective solutions or improvements that impose no additional cost burden. Monitoring required to ensure that controls in place are properly maintained.	Unacceptable	Work shall not be started or continued until the risk level has been reduced to an acceptable risk level. While the control measures selected shall be cost-effective, legally there is an absolute duty to reduce the risk, this means that if it is not possible to reduce the risk even with unlimited resources, then the work shall not be started or shall remain prohibited.
Risk Level	Action																			
Insignificant	No action required and no documentary records need to be kept.																			
Acceptable	No further preventative action. Consideration shall be given to more cost effective solutions or improvements that impose no additional cost burden. Monitoring required to ensure that controls in place are properly maintained.																			
Unacceptable	Work shall not be started or continued until the risk level has been reduced to an acceptable risk level. While the control measures selected shall be cost-effective, legally there is an absolute duty to reduce the risk, this means that if it is not possible to reduce the risk even with unlimited resources, then the work shall not be started or shall remain prohibited.																			
2	Cold	✓	✓		18	Materials	✓	✓												
3	Electricity				19	Moving Parts of Machinery	✓	✓												
4	Excavation	✓			20	Proximity to Water	✓	✓	✓											
5	Fire/Flammable Atmosphere				21	Scaffold														
6	Floor/Ground Conditions	✓			22	Sharp Objects														
7	Flying Particle/Dust	✓	✓	✓	23	Stairs/Steps														
8	Hand or Power Tool	✓	✓		24	Static Equipment/Machinery														
9	Hazardous Substance	✓	✓	✓	25	Structure														
10	Heat/Hot Work				26	Temporary Works														
11	Lack of Experience	✓			27	Vehicle/Mobile Equipment	✓	✓	✓											
12	Lack of Training	✓	✓	✓	28	Working Hours/Fatigue	✓	✓												
13	Lack of/too much Oxygen				29	Workstation Design														
14	Access	✓	✓		30	Work at Height														
15	Lifting Equipment Appliances	✓			31	Other														
16	Lighting	✓																		

			also be considered. 7. Where a hazard is identified that is not listed in the Physical Hazards list, enter the hazard description followed by other in brackets i.e. (Other).		
Hazard no. (from page 1)	Nature of risk (What might go wrong?)	Risk before controls U / A	Control measures (How do you stop it going wrong?)	Control measure implemented by (name)	Risk after controls U / A
14, 16, 20	Being cut off due to incoming tides - Damage to plant - Loss of materials - Potential drowning	U	- Works to be undertaken during lowest possible tide levels to provide suitable access and egress. - Work to be undertaken during good weather conditions. - Tide levels to be monitored throughout the work to ensure operatives, plant and materials are safely removed from site before being cut off. - Minimal quantities of labour and kit to be taken to work area. - Work to be carried out during day light hours.	Site Supervisors/ Operatives	A
4, 6, 26	Excavating under concrete slab - slab collapses trapping/crashing operatives - loss of limbs	U	- Saw cut slab and remove/breakout in manageable sections - temporary Works design to support slab	Site Supervisors/ Operatives	A
9	Environmental Threat: Spillage or use of chemicals such as diesel, concrete, grease, resin resulting in environmental pollution or harm to personnel	U	- Use of environmentally friendly products where possible. - COSHH assessments for all COSHH items - Dispose of all waste materials to designated skips etc. - Emergency spill kits are to be maintained at every work location and with each main item of plant. - Equipment to be stored on designated drip trays/bunded areas - Minimal quantities of materials, fuels etc. to be taken on to foreshore.	Site staff, operatives	A

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6, 14	Working on construction sites - Slips, trips, falls. - Sprains, strains, broken limbs.	U	- Ensure good housekeeping of working areas. - All personnel to have received a specific project and site induction. - Footwear to have good grips and soles. - Use of crawling boards on rock to prevent slips and falls. - Where possible do not walk across rocks and avoid obvious wet or seaweed covered areas	Site Supervisors/ Operatives	A
7, 8, 12, 19	Working with construction plant - Noise and vibration - Ear damage - Environmental impact i.e nuisance noise and damage to properties from vibration - Dust/debris blown into eyes, off cuts of tying wire flying into eyes. - Catching hands on sharp or rough surfaces. - Injuries to eyes, possible blindness. Cuts, lacerations to hands and fingers.	U	- Ensure all plant has noise reduction measures in place and working correctly i.e. baffles, acoustic jackets. - PPM scheme to ensure plant working correctly. - All personnel must wear safety glasses/goggles and gloves at all times once they enter the working area in addition to the mandatory high visibility clothing, hard hat and safety boots. CPCS trained plant operatives. (or similar approved) - Switch off all plant when not in use. - Vibration and noise monitoring during certain operations.	Site Supervisors/ Operatives	A
7, 27	Interaction with public - Injury to members of the public due to plant and materials crossing public beach area - Injury to members of the public during works	U	- Minimum quantity of plant and materials to be taken to the work area to reduce number of trips across beach. - Vehicles to be marshalled by operatives walking in front to control speeds. - Where possible avoid busiest locations and abundance of people. - Work area to be controlled to prevent members of the public encroaching by banksman. Stop works if members of the public enter working area.	Site Supervisors/ Operatives	A

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12, 15, 17, 19	Lifting operations Load falling due to failure of lifting equipment, or incorrectly slung loads Dropping of load in an unsafe manner uncontrolled slewing causing collision with plant or operatives Serious injury due to crushing, possible death	U	- All lifts to be controlled by trained/competent slinger/signaller. - Lift plan to be completed by crane appointed person and plant certificates to be in place. - No personnel to stand under or near to suspended loads. - Safety zones to be established around lifting operations. - All lifting equipment to be thoroughly examined prior to use - All drivers to be competent experienced and trained to CPCS standard. - Weather conditions to be monitored.	Appointed person, machine operator, slinger/signaller, Site Supervisors.	A
14, 17, 30	Unloading of materials Operatives falling off the bed of delivery vehicles whilst assisting with the unloading of materials/plant resulting in serious injury/fatality.	U	- Delivery vehicles to be fitted with integral edge protection barriers. - Under no circumstances are operatives to access the bed of a lorry unless a safe system of work is in place and agreed by the site management. - Hiab off-loading form to be completed and authorised.	Site Supervisors, Operatives.	A
12, 27,	Use of construction plant. Possible crushing of operatives and pedestrians	U	- All mobile plant must only be operated by suitably licensed and trained operators i.e. CPCS cards. - Operatives to wear high visibility clothing - Banksman to be appointed to supervise works - Segregated pedestrian and vehicle access wherever possible.	Plant operator, site personnel, banks man. Site supervisors.	A
9	Contact with sewage - Weils disease - Waterborne pollutants and bacteria causing death	U	PPE to include safety boots/wellingtons, hard hat, glasses, hi-viz, gloves, disposable overalls/oil skins, waders and face mask.	All operatives, Supervisors	A

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	or serious injury.		- Maintain good personal hygiene practices - Avoid breathing in sewage dust or spray – dust mask/face masks should be worn - Clean contaminated equipment onsite, do not take contaminated equipment home for washing. Where possible isolate flows as much as possible to reduce likelihood of contact.		
8, 27	Noise from works: - Noise level too high resulting in noise induced hearing loss. - Disturbance to residents.	U	- Noise to be reduced by engineering means wherever practicable, e.g. use of noise reducing blades, purchasing of silenced equipment, maintenance of equipment to manufacturers specification to avoid worsening noise, e.g. ensure rotating parts are checked for balance and replace if necessary. - Control of Noise at work regulations 2005 to apply - Where noise level is above the 1st action level, currently 80dB(A), hearing protection to be provided on request. - Where noise level is at or above the second action level, currently 85dB(A), appropriate PPE must be worn. - Operatives to be supplied and wear ear defenders to provide protection at 500-2000Hz frequency. Standard Noise Reduction (SNR) - 28-32dB - Approved to EN 352-2.	Site Supervisors, Operatives.	A
7, 8, 12, 19	Use of Abrasive Wheels: Injury to user and other personnel from flying debris or incorrect use of wheel	U	- Use of goggles (to BS2092) - Wear mandatory PPE inclusive of ear defenders - Tool box talks - Ensure all necessary guards are in place - PPM scheme	Site Supervisors, Operatives.	A

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			- Competent person only to change the blade ensuring speed match. - Do not use side of blade for any use - Ensure operatives have received abrasive wheel training.		
7, 8, 12, 19	Contact with flying particles: Injury from cutting/grinding operations	U	- Use dust suppression as required - Wear safety spectacles/goggles suitable for the task being carried out - Ensure the manufacturer's recommended/provided guards are present and set correctly on all tools - Ensure a clear area around operation before commencing - Heat resistant clothing - Only trained/competent operatives to use equipment - When using disc cutters always cut away from other operatives and inform anybody in the immediate area that cutting will soon commence	Site Supervisors, Operatives.	A
6, 18	Material Storage: Improper storage/stacking of materials which could overturn/topple resulting in serious injury/fatality to nearby site personnel.	U	- An designated storage area will be fenced off using pedestrian barriers - Good housekeeping must be maintained at all times. - Visual check on lifting points to ensure integrity - Materials to be stacked on firm level ground.	Site Supervisors, Operatives	A
11, 12, 15, 19, 27	Use of Quick Hitch Risk of operatives being struck by a falling excavator bucket or attachment as a result of incorrect attachment or missing locking pins, resulting in death or major injury.	U	- CPCS Trained and Certified machine drivers/Operatives. - Operatives are prohibited from working beneath excavators - Machine operators must be trained and deemed competent to operate the type of quick hitch system fitted to their machine. NB:	Site Management, Operatives & Operators	A

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	• Bucket Failure/Falling whilst digging/grading causing death, major injury • Risk of serious injury to the excavator driver when changing attachments to the quick hitch mechanism. Incorrect attachment change not in accordance with operators manual resulting in death, major injury to persons within the operating area of the machine • Failure of Quick Hitch or Attachments due to incorrect fitting. • Failure of Quick Hitch or Attachments due to crowding.		Operators must demonstrate competence by a change of bucket in the presence of Site Supervisors. • Magnor Plant Operators must be inducted by Magnor plant before being employed on a Morgan Sindall Site. • Semi Automatic and Automatic Single locking Quick Hitches are banned on all Morgan Sindall Sites. Quick hitches must be either then Fully Automatic Double Locking or of the Manual type. • Machine operators must sign a declaration at induction to confirm that they have been trained in the use of the machine quick hitch (Quick Hitch Equipment Pre – Start Arrival Check Form) and that they have read and understood the operators manual specific to that quick hitch. • In date certificate of thorough examination or certificate of conformity for all excavators. • Manufactures installation and operation manuals for all types of Quick Hitches must be kept within the excavator and not removed from the cab. • PPM's on all plant to include quick hitch checks. • Visual / physical inspection to be carried out on quick hitch system at the start of each shift or when attachment is changed to ensure the safety pin / latch or clamp connection is in place and secure. NB: Operators must physically get out of the cab to check this – Mandatory Instruction) • Manual quick hitch lever - to be inspected by driver after change of bucket without fail to		
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			ensure it is in its locked position. - Buckets and other attachments & “Shake Rattle Roll tests” shall be changed in a safe area away from operatives/third parties. “Shake, Rattle, Roll” test of the fitted attachment, or placing the bucket flat on the ground then trying to un-crowd the bucket so that the bucket tries to disengage from the QH. Test to be carried out when a bucket is changed and at the start of every shift. - Bucket to be removed prior to any lifting operation by the excavator - Any excessive movement of bucket connected via a quick hitch to be reported to site supervisor immediately for investigation of working mechanism of the quick hitch. - Any visual indication of hydraulic leak near to quick hitch mechanism to be reported immediately, stop work immediately and do not commence work until authorised to do so by site supervisor. - Special care to be taken when using quick hitch systems: Manual: This requires the winding of a screw or the use of a bar to open a spring actuated latch. Automatic: This is operated entirely from the cab of the excavator and usually has an independent locking system which functions automatically and does not rely on hydraulic pressure to hold the latch in the closed position. The operator must ensure the locking system has completed before proceeding with work.		
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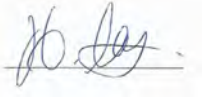
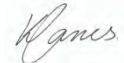
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			- Under no circumstances must Piling Hammers be fitted directly to the Quick Hitch, these must be fitted directly to the Excavator Dipper Arm. - Breakers may not be fitted to the Quick Hitch for tasks of a long duration, they must be fitted directly to the Dipper Arm. - Piling Hammers and Quick Hitches must be fitted by a competent service engineer. - Ensure that the correct size of excavator has been chosen to adequately carry out the task.		
4	Excavation works Striking buried services resulting in electrical shock, injury from damaging pressurised pipes etc.	U	- All excavations will be covered by a permit to excavate. - Prior to issue of the permit all service drawings are to be studied and a thorough C.A.T scan performed. - All services known and found to be marked on site. - Excavation to be carried out by hand when 500mm or less from a known service. - Trench dig to be supervised by a competent trained and experienced person - If unknown service is found, stop and report it to the site management team.	Site management team, work supervisor, services coordinator	A
6, 14, 16, 23	Falls on same level - Trip over - Fall onto sharp objects - Land on uneven surface - Fall into existing chambers	U	- Good Housekeeping, ensure clean and tidy work spaces - Ensure all materials are stacked as per manufacturers recommendations - Place waste material in the designated areas - Designated walkways to segregate operatives and materials - Signage as necessary	Site Supervisors, Operatives	A
2, 3, 7, 8, 12, 19	Use of small tools: - Injury due to faulty equipment - HAV's exposure limits exceeded	U	- All guards are to be in place as per manufacturers recommendations - Tool box talks on safe use of equipment	Site Supervisors, Operatives	A

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			- Plant to be used in accordance with manufacturer's instructions. - Trained personnel for use of plant. - Remove any faulty tools/equipment from service immediately and inform your supervisor - PAT testing all portable electrical equipment - Use of correct PPE to suit equipment being used - PPM's for each item to be completed by a competent person - Keep hands warm during colder weather - Limit "trigger" time for equipment being used and rotate workforce - Exercise hands to increase blood flow - Record actual trigger times on daily form		
9, 12, 18	Contact with/exposure to hazardous substances: - Injury/Poisoning/Ingestion of COSHH items - Concrete Burns - Weils Disease	U	- Use alternative less harmful substances - Complete COSHH assessment and brief operatives accordingly - Training as required - Wear appropriate PPE - Only authorised personnel to use substances - Tool box talks (COSHH) - Disposal to designated COSHH skips and further disposal to licensed tip ensuring a waste transfer note has been completed. - Do not use materials until fully aware of the associated risks - Wash off any concrete/mortar splashes as soon as possible - Report any burns to your supervisor – do not ignore burning "sensations" check them out. - Good Hygiene – wash any area that came into contact with substances thoroughly	Site Supervisors, Operatives	A

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6, 12, 17, 18, 28	Manual Handling: - Operatives suffering musculoskeletal injuries - Damaging items being lifted				U	- Provide regular manual handling training/toolbox talks - Assess load to be lifted using TILE and use mechanical means of lifting if possible - Complete manual handling risk assessment if mechanical lift is not possible - Break down load to a more manageable size - More than one person to complete lift if load is awkward or irregular in shape				Site Supervisors, Operatives		A	
Method Statement required?		Yes	☒	No		Method Statement number:		MS/ 1W6000					
Additional Risk Assessment (Tick box as required)						PPE (Tick box as required)							
Noise		COSHH		Handling		Helmet		Respiratory		Boots		High Vis	
Asbestos		Lead		Radiation		Hearing		Eye		Harness		Others	
		Name				Signature				Date			
Person completing the assessment:		Huw Rees								10.12.18			
Person reviewing the assessment:		Kevin James											
Date to be reviewed:		TBC											