



Construction Phase Plan

In accordance with the Construction (Design and Management) Regulations (2015 & 2016) (Northern Ireland)





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Construction Phase Plan

In accordance with the Construction (Design and Management) Regulations (2015 & 2016) (Northern Ireland)

784-B048567

September, 2023

PRESENTED TO

Natural Resources Wales

Ty Cambria,
29 Newport Road,
Cardiff,
CF24 0TP

PRESENTED BY

Tetra Tech Limited

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Prepared by:

James Craddock Senior Geo-environmental Engineer	September, 2023
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Reviewed by:

Nicolas Bool Associate	September, 2023
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Authorized by:

Chris Pugh Director	October, 2023
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1.0 DESCRIPTION OF PROJECT

1.1 THE SCOPE OF WORK

The scope of works instructed include:

- 2no. cable percussive boreholes located on the riverbanks to confirm the stratigraphy. Standard Penetration Testing (SPTs) proposed in boreholes. Laboratory testing of selected soil samples for geotechnical and geo-environmental purposes.
- 2no. window samples located along the proposed fish pass alignment to confirm the stratigraphy. SPTs proposed in boreholes. Laboratory testing of selected soil samples for geotechnical and geo-environmental purposes.
- 4no. hand trial pits; 2no upstream of the weir and 2no. downstream of the weir, to obtain soil samples for geo-environmental testing and check for the presence of obstructions which would impact the proposed sheet piling.
- 1 no. seismic refraction survey across the river profile upstream of the weir, to confirm the stratigraphical profile across the river.
- 4no. surface water samples; 1no. upstream of the proposed works, 1no. downstream of the proposed works, 1no. at the western outfall and 1no. at the eastern outfall for geo-environmental testing to inform the baseline conditions prior to construction activities.

1.2 SITE ADDRESS

The site is located at the existing weir in the River Afan and the area immediately upstream. The river is influenced by the tide with two high tides per a day. The site is bounded by the Newbridge Road Bridge to the North, Riverside Road to the East, existing outfalls to the South and the playing fields to the West. Newbridge Road Bridge is a Grade II listed bridge and is closed to vehicles and pedestrians.

The site is at National Grid Reference SS75521 89195.

1.3 SITE LOCATION PLAN



1.4 PROJECT PROGRAMME (KEY DATES)

Number of weeks	Proposed Start Date	Proposed Completion Date
1	TBC following issue of marine license.	TBC following issue of marine license.

Notes: Include mobilisation period if relevant

1.5 WORKING HOURS

Weekdays	Start	Finish
Monday-Friday	08:00	17:00

1.6 IS THE PROJECT NOTIFIABLE?

If the works will last longer than **30** working days **and** have more than **20** workers working **simultaneously at any point** in the project **OR** exceeds **500**-person days.

Then the **Client** must **notify** the project to the HSE or HSENI via a F10

This project is non-notifiable.

1.7 CLIENT BRIEF

A new weir and fish pass have been proposed to replace the existing weir and provide a constant access path for fish along the river. The proposed weir is to be constructed of sheet piles with a rock ramp fish pass on the eastern bank. Due to the specialist fish pass, this proposed design has been undertaken by FishTek Consulting. The proposed sheet pile weir is located immediately upstream of the existing weir. The outline design for the proposed weir is detailed in Drawing 3.

The ground investigation that is the subject of this specification is the main intrusive geotechnical and combined geo-environmental investigation of the site.

1.8 SITE SPECIFIC SAFETY INFORMATION

Site Information	Details
Access and Egress Arrangements	Access to the location of BH01 is along the South Wales Coastal Path from Darwin Road. Removable bollards will be unlocked and removed and boulders currently in place will be removed using a JCB 3CX which allow the cable percussive rig to be towed on the back of a 4x4 to the location of BH01. The cable percussive rig will be driven to the location at walking pace with the TT Supervisor (a qualified banksman) in attendance. Access to BH02 is via Riverside Road. The rig will be towed via a 4x4 and reversed onto the location of BH02 which is a raised concrete set down area used to moor boats. WS01 and WS02 will be accessed from Riverside Road. The cut down windowless sampler rig will be wheeled down the small set of steps from road level down on the concrete mooring area before being wheeled onto the river bed at low tide. HTP01 to HTP04 will be accessed via Riverside Road and the steps from road level onto the concrete mooring area before accessing the riverbed. As HTP03 is in the water column this will be sampled via Van Veen Grab rather than using hand tools. SW01 and SW02 will be accessed via Riverside Road and the steps from road level onto the concrete mooring area before accessing the riverbed on foot. SW03 will be accessed from the South Wales Coastal Path off Darwin Road on foot. The seismic refraction survey line will be accessed via Riverside Road. The survey line will be run out from the eastern bank across the channel to the western bank at low tide and under low flow conditions.
Existing Environment	The site is located at the existing weir in the River Afan and the area immediately upstream. The river is influenced by the tide with two high tides per a day. The site is bounded by the Newbridge Road Bridge to the North, Riverside Road to the East, existing outfalls to the South and the playing fields to the West. Newbridge Road Bridge is a Grade II listed bridge and is closed to vehicles and pedestrians.

	At the site there is an existing weir which crosses the River Avan. The weir was constructed using concrete supports spaced across the river with timber boards between the supports. The weir is supported by timber piles with vertical piles along the alignment of the timber boards, in addition to angled timber piles under the concrete supports downstream. The weir is in a poor condition and a survey indicated that the weir may fail in the next five years. On the downstream side of the weir, heavy steelworks slag was deposited to protect the basin from scour. On the upstream side of the weir, boulders are shown to be placed against the weir with silt behind. The western bank is fairly steep with large boulders visible across the length of the site. These boulders appeared to comprise of conglomerate
Previous Land Use	Although the construction of the weir is recorded between 1914 and 1919 there have been very few other changes to the river channel.
Previous Site Investigation	Historical ground investigation was undertaken on the western and eastern bank of the River Afan. The ground conditions on the eastern bank comprised: • Made Ground to 0.9mbgl • Blown Sand at 0.90m bgl • Tidal Flat Deposits at 4.1m bgl • South Wales Middle Coal Measures at 13.6m bgl The ground conditions on the western bank comprised: • Made Ground to 3.1mbgl • Blown Sand at 3.10m bgl • Tidal Flat Deposits at 4.60m bgl • South Wales Middle Coal Measures at 12.7m bgl
Expected Ground Conditions	See above.
Surrounding Area	The western bank comprises the South Wales Coastal Path. The eastern bank is owned by the Association of British Ports with the surrounding area comprising the Port Talbot Docks and associated commercial businesses.
Existing Structures	The existing weir and large blockwork retaining wall and mooring area along the eastern bank.
Asbestos Report	No previous occurrences known about however this should be anticipated given the surrounding land uses.
Existing Traffic Conditions	Foot traffic is to be anticipated on the South Wales Coastal Path. Riverside Road is a busy highway used by ABP and associated businesses that can include heavy goods vehicles as well as cars.
Other Site Activities	None notified
Other Contractors on Site	None notified

2.0 WORKING TOGETHER

2.1 WHO ELSE IS ON SITE?

Client

Company Name	Natural Resources Wales		
Contact Name	Elinor Meloy		
Position	Project Manager		
Address	Ty Cambria, 29 Newport Road, Cardiff, CF24 0TP		
Phone	03000 654641	Mobile	07817 026477
Email:	elinor.meloy@cyfoethnaturiolcymru.gov.uk		

Principal Designer

Company Name	Natural Resources Wales		
Contact Name	TBC		
Position			
Address			
Phone		Mobile	
Email:			

Designer

Company Name	Arup		
Contact Name	David Heard		
Position	Geotechnical Engineer		
Address	4 Pierhead Street, Capital Waterside, Cardiff, CF10 4QP, United Kingdom		
Phone	02920 054123	Mobile	
Email:	David.Heard@arup.com		

Principal Contractor

Company Name	Tetra Tech Limited		
Contact Name	Nicolas Bool		
Position	Associate		
Address	5th Floor Longcross Court, 47 Newport Road, Cardiff CF24 0AD		
Phone	02920 829200	Mobile	07917 735 669
Email	Nicholas.bool@tetrattech.com		

2.2 SUB-CONTRACTORS (INCLUDING TEMPORARY WORKS CONTRACTORS)

The selection and control of sub-contractors will be carried out in accordance with the Tetra Tech Procedure for the Selection and Control of Contractors.

All sub-contractors employed by Tetra Tech on this project shall have satisfied the requirements of the Tetra Tech 'Approved Supplier' system.

The following sub-contractors are to be employed on this project:

Company Name	Apex Drilling Services Ltd	Activity	Cable Percussive Boreholes
Contact Name	Roger Martin		
Position	Director		
Address	Sturmi Way, Village Farm Industrial Estate, Pyle, Bridgend CF33 6BZ		
Phone	01656 749 149	Mobile	07768 146 639
Email	admin@apex-drilling.com		
RAMS Approved	Yes	By Whom	NEB

Company Name	South Wales Ground Testing Ltd	Activity	Windowless Sampler/Dynamic Probing Hand pits
Contact Name	Dave McArthur		
Position	Director		
Address	59 Heol y Cwrt, North Cornelly, Bridgend, CF33 4AX		
Phone		Mobile	07974 924480
Email	swgroundtesting@gmail.com		
RAMS Approved	Yes	By Whom	NEB

Company Name	Midland Survey	Activity	Buried Service Clearance
Contact Name	Karl Nannfeldt		
Position	Head of Utilities		
Address	Cromwell House, Westfield Road, Southam, Warwickshire, CV47 0JH		
Phone	01926 810811	Mobile	07584 418228
Email	utilities@midlandsurvey.co.uk		
RAMS Approved	Yes	By Whom	NEB

Company Name	Atlas Geophysical	Activity	Seismic Refraction Survey
Contact Name	Alex Birtwhistle		
Position	Director		
Address	Unit 12, Swansea Valley Business Park, Glan-Yr-Afon, Ystalyfera, SA9 2EB		
Phone	01639 874 104	Mobile	07798 673108
Email	alex@atlasgeo.co.uk		
RAMS Approved	Yes	By Whom	NEB

2.3 HOW WILL YOU KEEP EVERYONE ON SITE UPDATED DURING THE PROJECT?

- Maximum contractor personnel on site at any one time 4 with 1 TT Supervisor
- Tetra Tech site induction;
- Daily activity briefings (DABS), 8am every morning for all contractors at the site compound;
 - Here access and egress arrangements for the day including traffic management requirements will be discussed with the subcontract team so access points and ground condition requirements are understood by all parties.
- Weekly site-specific toolbox talks;
- Emergency incident plans and site contact details to be displayed within compound; and
- Permits to work where applicable I.e. TT Permit of Ground Disturbance.

3.0 MANAGEMENT OF THE PROJECT

3.1 SITE SECURITY

See Appendix H for site layout plans.

- The site welfare container (GroundHog), will be located in the small set down area outside the ABP Main Gate off Riverside Road.
- All vehicles and plant will be secured and isolated when not in use.
- All staff to receive toolbox talk on the importance of site security.
- All small tools to be taken of site each evening.

3.2 SITE RULES

Site Rules including drug and alcohol policy

- Work only in agreed and designated area.
- Stop work and discuss the situation if at any time you feel unsafe or the agreed methods are not able to be used.
- Appropriate **PPE** must be worn at-all-times. Standard PPE includes full length trousers, short sleeve tops as a minimum, Tetra Tech logo high visibility vest (BS EN471). Safety helmet (BS EN397). Safety footwear (EN ISO 20345). (Rigger boots are not allowed). Gloves (EN388) Cat2. Eye protection (BS EN166: 1.F). Anyone breaking ground must wear a one-piece flame retardant overall. (amend as applicable).
- Eating, drinking and smoking are prohibited on site except in designated areas. Hands should be washed prior to eating, drinking and smoking.
- Smoking only allowed in designated areas.
- Persons suspected of being under the influence of drugs and alcohol will be asked to leave site.
- No works shall commence until staff have received a site induction.
- Sub-contractor method statements and risk assessments to be approved by Tetra Tech prior to starting works on site.
- A signed Permit to Dig will be in place prior to breaking ground. This will be issued by the site supervisor.
- No works shall commence until staff have received a site induction.
- Contactors will not be allowed to work on site until a Sub-Contractor Check Sheet has been completed by the Tetra Tech Site Supervisor.
- Vehicle and Plant Movements - The site speed limits shall be adhered to at all times.
- Rules for excavation – Permit to dig to be in place prior to excavation and following CAT & Genny clearance by suitably qualified Tetra Tech Supervising Engineer.

COSHH – Refer to Appendix F. No products to be used unless listed.

3.3 SITE WELFARE

A POD 7 Groundhog or similar will be utilised to provide welfare facilities include a toilet, drying room and kitchenette.

Drinking water, hand sanitiser and other personal products will be made available to all operatives in the canteen area.

On arrival to site all operatives and visitors will be expected to sign in each morning and sign out at the end of the day.

3.4 SITE INDUCTION

Site inductions will be undertaken for all workers and visitors. The site induction template form should be used for capturing site specific information. The induction register is to be kept up to date at all times. (Appendix I).

3.5 COMPETENCY REQUIREMENTS

The following competencies are required by personnel attending the site. These will be presented at induction prior to commencing works on site. If any of the below competencies cannot be presented at induction by an operative, then Tetra Tech will turn the operative away from site.

Competency/ Training Standard	Tetra Tech Site Manager	Cable Percussive Lead Driller	Cable Percussive Second Man	Window Sampler Lead Driller	Window Sampler Second Man
Site Induction	✓	✓	✓	✓	✓
CSCS (Relevant to Specialism)	✓	✓	✓	✓	✓
First Aid Training	✓				
CAT & Genny Training	✓				
Asbestos in Soils	✓				
Asbestos Awareness	✓	✓	✓	✓	✓
BDA or NVQ (Relevant to Specialism)		✓		✓	
CITB/CPCS (relevant to specialism)					

Competency/ Training Standard	GPR Clearance Contractor	Geophysical Operatives
Site Induction	✓	✓
CSCS (Relevant to Specialism)	✓	✓
First Aid Training		
CAT & Genny Training	✓	✓
Asbestos in Soils		
Asbestos Awareness	✓	✓
BDA or NVQ (Relevant to Specialism)		
CITB/CPCS (relevant to specialism)		

3.6 PLANT CHECKS AND INSPECTIONS

On arrival to site all plant is to be accompanied by an in date certificate of thorough examination as required by PUWER and LOLER of which copies will be taken by the TT Site Manager and kept on site for the duration of the works.

TT visual inspection sheets should also be undertaken on arrival as a check of the relative condition of the plant. Visual inspection sheets are presented in Appendix O.

Daily and Weekly Inspections are to be provided by the subcontractor which will also be stored on site for the duration of the works.

3.7 EMERGENCY ARRANGEMENTS

All Tetra Tech site personnel hold First Aid or Emergency first Aid qualifications. The following emergency equipment will be maintained on site:

Location	Fire Extinguisher	First Aid Kit	Cat & Genny	Spill Kit	Gas Alarm	Other
Groundhog Unit	✓	✓	✓	✓		
Drilling Rigs	✓			✓		

Trained Fire Wardens on site are:

Name: James Craddock

Contact No: 07966534346

Trained First Aiders on site are:

Name: James Craddock

Contact No: 07966534346

3.8 EMERGENCY CONTACTS

The Project Manager/Site Supervisor is responsible for ensuring that the site specific emergency numbers are established prior to the commencement of works as detailed below:

Role	Address	Phone No	E Mail Address
Tetra Tech SHEQ Manager Ian Sweeney	Midsummer Court, 314 Midsummer Boulevard, Milton Keynes, Buckinghamshire, MK9 2UB	01908 423 305 07342 066 090	ian.sweeney@tetrattech.com
Project Manager Nicholas Bool	5 th Floor Longcross Court, 47 Newport Road, Cardiff CF24 0AD	07917 735 669	Nicholas.bool@tetrattech.com
Site Supervisor <i>James Craddock</i>	5th Floor Longcross Court, 47 Newport Road, Cardiff CF24 0AD	07966534346	James.craddock@tetrattech.com

In the event of damage to utilities or and environmental incident Contact:

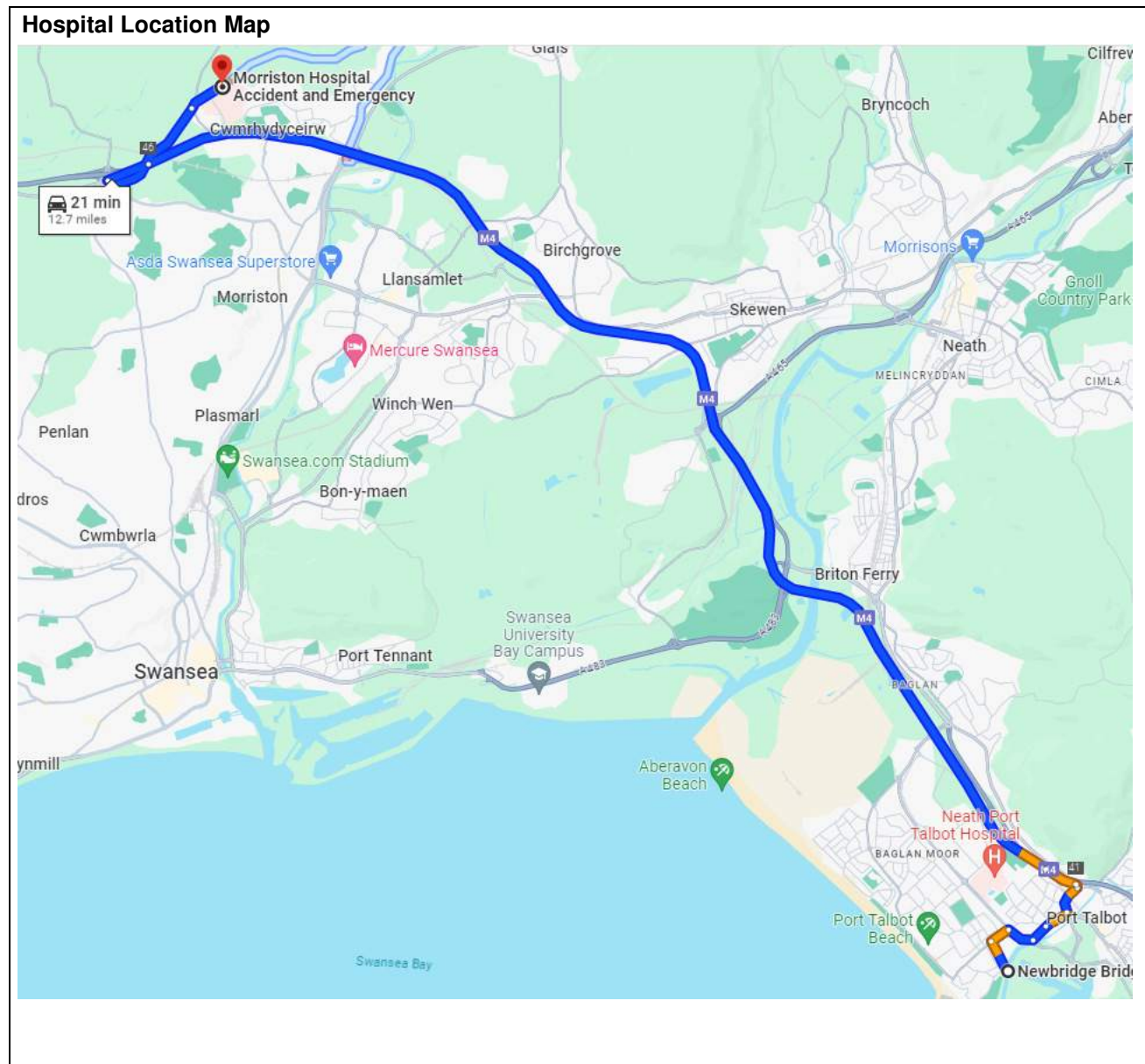
Utility	Utility Provider	Phone No
Electric	Western Power Distribution	0800 6783 105
Sewerage / Water	Dwr Cymru	0800 052 0130
Gas / Oil	Wales & West Utilities	0800 111 999
Telecommunications	Openreach	0800 023 2023
EA / SEPA / NIEA	Natural Resources Wales	0300 065 3000

All Accidents and Near Misses will be reported to the Tetra Tech Site Supervisor and then reported following Tetra Tech's accident reporting procedures ([Accident / Incident Report Notification](#)). Tetra Tech will then report these to the Client. Tetra Tech will conform with RIDDOR 2013 reporting requirements, where accidents/injuries are notifiable.

In the event of an Emergency call 999.

Hospitals

Hospital Address	Hospital Contact No
Morrison Hospital - Emergency Department Heol Maes Eglwys Morrison Swansea SA6 6NL	01792 702222



Hospital Location Route**Newbridge Bridge**

Port Talbot SA12 6BT

- Get on M4 in Baglan from Newbridge Rd, Afan Way/A4241, Water St, A48 and Exit 41

5 min (1.5 mi)

- Follow M4 to Clasemont Rd/A48 in Swansea. Take exit 46 from M4

11 min (10.0 mi)

- Take Pant Lasau Rd to your destination in Cwmrhydyceirw

3 min (1.2 mi)

Morriston Hospital Accident and Emergency

Morriston hospital, Heol Maes Eglwys, Cwmrhydyceirw,
Morriston SA6 6NL

3.9 CO-OPERATION & CO-ORDINATION BETWEEN PROJECT TEAM MEMBERS

- ABP Online Induction and Induction on Arrival
- Tetra Tech Site Induction.
- Weekly meetings and toolbox talks will be undertaken between all parties to discuss ongoing health and safety provisions and any concerns arising from the works. This should be considered an opportunity to discuss positives as well as negatives.

3.10 WORKER INVOLVEMENT ARRANGEMENTS

- The safety plan and other related matters will be reviewed regularly on site and any revisions to the plan will be raised in weekly Toolbox talks. Attendance at these meetings will be obligatory for representatives of the respective contractors.
- Tetra Tech will involve contractors and operatives in brief daily site safety meetings, the purpose of which will be to focus on safety issues concerning the days planned activities and to discuss any lessons to be learned from previous day's activities.
- Site safety issues will be coordinated by the site supervisor, with the support of the site health and safety coordinator (where required).
- A team approach to safety will be encouraged with suggestions from site personnel welcome.
- Results of risk assessments and investigations of accidents, dangerous occurrences, near misses and hazard spotting will be reported to the whole workforce by site briefing to maintain a level of safety awareness.

4.0 PROJECT HEALTH, SAFETY & ENVIRONMENT AIMS/TARGETS AND OBJECTIVES

4.1 HEALTH GOALS

- All personnel to remain fit and healthy throughout the project.
- No personnel to suffer from sunburn, dehydration or heat stress and exposure.
- High degree of good housekeeping.
- High level of hygiene.

4.2 SAFETY GOALS

- Achieve zero fatalities, zero permanent disabilities, zero incidents and improve safety performance year on year. Comply with all current Health and Safety Legislation and Approved Codes of Practice.
- Engage with Group SHEQ to carry out safety audits and inspections (where required).
- Co ordinate through our site supervisor, the use of safe procedures, tools, plant, equipment and the appropriate use of Personal Protective Equipment (PPE).
- Identify and address all risks arising from both our and our sub-contractors activities.
- Work with the clients direct contractors to maintain safety and site co-operation.
- Maintain adequate levels of welfare facilities for the workforce, including sub-contractors.
- Assess the impact of site activities on the environment and manage to minimise it.
- Identify and provide health and safety training to promote awareness of safety of self and others where necessary.
- Protection of the public at all times during the work through adequate segregation and traffic management.

4.3 ENVIRONMENT GOALS

- *No environment damage.*
- *No hydrocarbon spills.*
- *Less than 5% project waste to go to landfill.*

4.4 QUALITY GOALS

- Ensure *Compliance* with Client safety requirements and publish these as part of the project requirements.

4.5 TARGETS

Targets needed to comply with the objectives set out above are tabulated below and will be monitored during the project by the project site supervising engineer.

- 100% of site personnel and visitors to have received a project induction.
- Risk assessments and method statements prepared for each task.
- Risk assessments and procedures to be reviewed prior to commencement of the works.

- Dynamic Risk Assessment to be available on site.
- Safety Meetings conducted weekly and documented during project.
- Daily toolbox meetings.
- Emergency drills held at least once per month throughout the project.

5.0 IDENTIFICATION OF HAZARDOUS ACTIVITIES

Detail here any key hazardous activities for this project, making reference to the clients PCI (Appendix A) and Site-Specific Safety Information as detailed in Section 1.8. This section does not replace Risk Assessments and Method Statements and the control measures for the hazards listed below are detailed in the Risk Assessment within Appendix C and Appendix E.

- Driving to Site.
- Third Party Interface Bus Station Users & Staff, Rail Users & Staff, Car Park Users.
- Service Strike.
- Environmental Risk.
- Falls from Height
- Struck by moving plant
- Struck by moving vehicle
- Drowning

6.0 MONITORING AND REVIEW

6.1 HANDLING OF DESIGN CHANGES DURING THE PROJECT

- Any change to the design of the project shall be notified to the project team (Client, Principal Designer and Tetra Tech).
- Tetra Tech site / office team will ensure that working procedures are reviewed and, where relevant, modified to manage any additional risks that may have arisen from the design change. Any such changes in working procedures shall be documented in the method statements and these updates will be issued back to the Principal Designer and affected Contractors.
- All changes will be communicated via start of shift briefs/toolbox talks.

7.0 HEALTH AND SAFETY FILE

At the end of the project the Principal Designer should give the client a health and safety file.

If the Principal Designer leaves before the end of the project, the Principal Contractor (or contractor if there is only one contractor) should ensure the file is compiled and handed over to the client.

The Health and Safety file contains useful information which will help the client manage health and safety risks during any future maintenance, repair, construction work or demolition.

The client should keep the file, make it available to anyone who needs to alter or maintain the building, and update it if circumstances change. Items that should be considered for inclusion in the health and safety file include (but not limited too):

- Hazards that have not been eliminated - residual risks.
- Key structural principals.
- Hazardous materials – residual risks.
- Services
 - Including nature, location and marking of significant services
 - Including underground cables, gas supply etc.
- As-built drawings.

think safe



work safe



home safe



APPENDICES

APPENDIX A - CLIENT SPECIFIC INFORMATION / PRE-CONSTRUCTION INFORMATION (PCI) / DESIGNERS RISK ASSESSMENT

- ☐ Pre-Construction Information (PCI)
- ☐ Other
- ☐ Other
- ☐ Other

Natural Resources Wales

Ground Investigation Schedules 1 - 5

Project Name	Salmon for Tomorrow: Newbridge, Port Talbot
NRW Ground Investigation NGF Contract Reference	

Prepared by	Date
Arup	28/07/2023

Project Roles

<i>Employer</i> - Engineering Construction Short Contract	Natural Resources Wales
<i>Contractor</i> - Engineering Construction Short Contract	Select Contractor
<i>Investigation Supervisor</i> – NRW role under Clause 14.2	David Lynesmith 4 Pierhead Street, Cardiff, CF10 4QP
Client – CDM 2015	Natural Resources Wales
Principal Designer - CDM 2015	
Principal Contractor - CDM 2015	

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Specification

The specification shall be the UK Specification for Ground Investigation, Third Edition¹, including Schedule 4 and 5 amendments and additions published by ICE Publishing in 2022, with information, amendments and additions as described in the Schedules 1 – 3.

Schedule 1. Information and site-specific requirements

Schedule 2. Exploratory holes

Schedule 3. *Investigation Supervisor's* facilities

Schedule 4. Specification amendments

Schedule 5. Specification additions

Insofar as any Specification Amendment or Specification Addition may conflict with or be inconsistent with any provision of the Specification for Ground Investigation, the Specification Amendment or Specification Addition shall prevail.

¹ Institution of Civil Engineers. 2022. UK Specification for Ground Investigation, Third Edition.
https://www.icebookshop.com/product/uk-specification-for-ground-investigation-third-edition?gclid=CjwKCAiA_vKeBhAdEiwAFb_nrXrxC4F1nRxqiGo00ssxkSvOQ93NPgtlw7dRmvC5hO_4scTC3zo_iBoCjEsQAvD_BwE

Schedule 1 – Information and Site Specific Requirements

Clauses in the below table reference the General Requirements set out in the UK Specification for Ground Investigation, 3rd Edition.

S1.1 Name of Contract	Salmon for Tomorrow: Newbridge, Port Talbot
S1.2 Investigation Supervisor (in accordance with the ECSC contract)	As stated in the NEC3 ECSC GI Order to Proceed Contract Data. (David Lynesmith – Arup)
S1.3 Description of site	The site is at National Grid Reference SS75521 89195. Its location is shown on Drawing 1. The key features of the site are shown on Drawing 2. The Geotechnical and Geo-environmental Desk Study (290058-ARP-XX-NB-RP-CE-0001) documents the detailed information on the site. The key details are summarised below to inform the proposed Ground Investigation works. The site is located at the existing weir in the River Afan and the area immediately upstream. The river is influenced by the tide with two high tides per a day. The site is bounded by the Newbridge Road Bridge to the North, Riverside Road to the East, existing outfalls to the South and the playing fields to the West. Newbridge Road Bridge is a Grade II listed bridge and is closed to vehicles and pedestrians. A topographical survey was undertaken in 2018 and the approximate levels of the key features are listed below: • The upstream river basin was typically between 0.3mAOD and - 0.3mAOD; • The downstream river basin was typically at -3mAOD; • The western riverbank was typically at 3.3mAOD; and • The eastern riverbank was typically at 4mAOD. The surveyed width of the existing weir was approximately 45m. At the site there is an existing weir which crosses the River Avan. The weir was constructed using concrete supports spaced across the river with timber boards between the supports. The weir is supported by timber piles with vertical piles along the alignment of the timber boards, in addition to angled timber piles under the concrete supports downstream. The weir is in a poor condition and a survey indicated that the weir may fail in the next five years. On the downstream side of the weir, heavy steelworks slag was deposited to protect the basin from scour. On the upstream side of the weir, boulders are shown to be placed against the weir with silt behind. The western bank is fairly steep with large boulders visible across the length of the site. These boulders appeared to comprise of conglomerate

boulders and are anticipated to have been placed as part of the construction of the weir. Downstream of the weir, there is a concrete platform partially extending out of the western bank. Sheet piles are located along sections of this platform and are anticipated to have been constructed to support the platform.

The eastern bank upstream of the weir is shallower than the western bank, with a layer of gravels and cobbles visible approximately halfway up the bank underlain by a clayey silt material. At the location of the weir and downstream there is a concrete slab cut into the bank which is used to dock boats. There is also a minor outfall running across the slab.

The River Afan flows from the northeast towards the entrance channel to Swansea Bay in the southwest. The river is influenced by the tide and the weir is over topped twice a day due to these tidal changes. The typical tide heights are detailed in Figure 1.

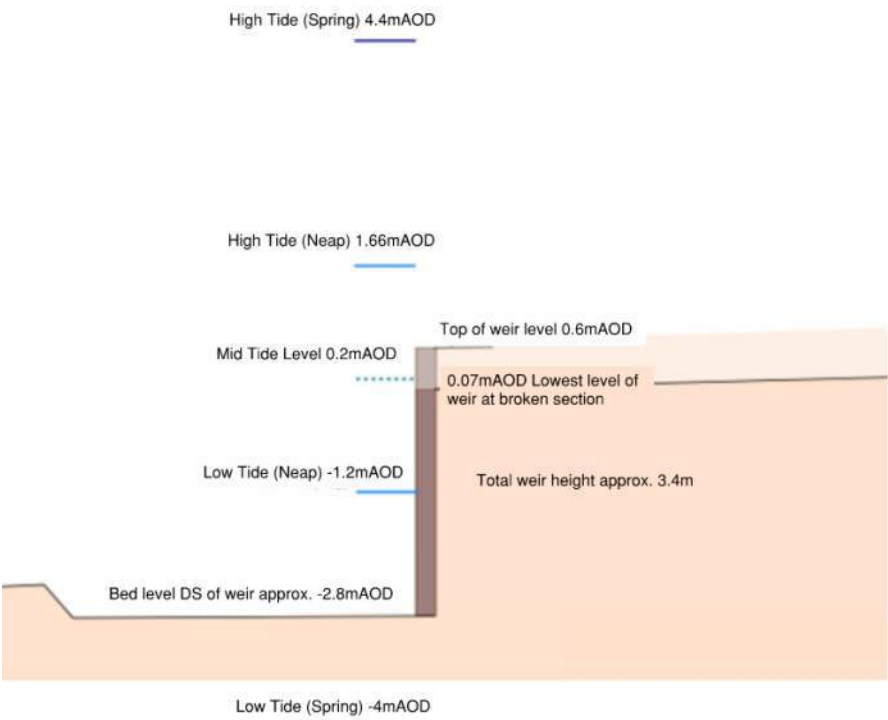


Figure 1: Typical tide levels – extract from Arup 'Options Assessment Note' [1]

The following table presents a risk assessment prepared by the designer of the ground investigation for the scope of ground investigation work presented in this Specification. The table does not include generic risks that would typically be encountered in any ground investigation at any site. The table focuses on risks that are particular to the planned scope of work at this site.

S1.3.1 Safety risk register	Activity for consideration	Risk for consideration	Proposed mitigation	Remaining risk to be managed by ground investigation contractor
	Proposed intrusive investigation	Encountering/ striking/ damaging existing recorded and unrecorded utilities.	Client to review existing utility plans prior to works commencing. GI contractor to ensure they have adequate utility survey information as part of their Risk Assessments and Method Statements.	Encountering/ striking/ damaging utilities not identified during survey.
	Proposed intrusive investigation	Potential for land contamination associated with historical land uses.	Contractor shall review available information and undertake their own risk assessments to ensure appropriate mitigation measures.	Potential for greater contamination encountered than anticipated.
	Proposed intrusive investigation	Potential for obstructions such as large boulders to be encountered on the site	Contractor to identify and record the locations of any obstructions and the type. Contractor to propose another location to be agreed with the Investigation Supervisor. If obstructions are identified the risk to the proposed sheet piling works should be considered at the design stage and a proposed removal plan if required.	Unidentified/ recorded obstructions to potentially require relocations of exploratory hole with agreement from the Investigation Supervisor.
	Proposed intrusive investigation	Risk of Weil's disease and from presence of livestock	Suitable PPE and appropriate duration of work. Contractor to establish mitigation procedures.	Reduced risk of Weil's disease and from presence of livestock.
	Proposed intrusive investigation	Potential for livestock to be present	Suitable PPE and appropriate duration of work. Contractor to establish mitigation procedures.	Reduced risk from presence of livestock.
	Proposed intrusive investigation	Steep slopes on site (river embankment). Risk of operatives and/or equipment falling down the slopes.	Contractor to identify a suitable location from which surface water samples and the handheld window sample can be taken and employ a suitable methodology as to minimise the risks of working close to water.	Reduced risk of personnel or equipment falling down the slopes.

	Proposed intrusive investigation	Working in proximity to the water course.	Exploratory hole locations positioned as close to watercourses as deemed to be safely practicable . GI contractor also to confirm that exploratory holes can be safely undertaken at these proposed locations. Contractor to review exploratory hole locations and follow own safe system of works prior to commencing investigation works on site. Contractor to identify a suitable location from which surface water samples and the handheld window sample can be taken and employ a suitable methodology as to minimise the risks of working close to water.	Risk of working in proximity to the water course for holes unable to be relocated away from the watercourse.
	Proposed intrusive investigation	Control of run-off into river	Contractor shall put measures into place to stop run off emitted from the works from entering the watercourse.	Reduced risk of run-off into the river.
	Proposed intrusive investigation	Tidal increase in river level flooding the site	Contractor to review available information to ensure water levels are below risk levels prior to commencements of works and follow own safe system of works prior to commencing investigation works on site.	Exploratory holes not completed during the low tidal period leading to flooding of the works.
	Proposed intrusive investigation	Working in the road/ parking area	Contractor to review exploratory hole locations and follow own safe system of works prior to commencing investigation works on site.	Works in the road/parking area to be appropriately secured.
	Proposed intrusive investigation	Constrained access in the river channel preventing silt sampling to the base of the silt layer	Contractor to propose alternative locations for exploratory hole if the proposed location cannot be achieved. The locations are to be confirmed with the Investigation Supervisor. If no alternative location can be found then the testing may need to be deferred to construction stage. This would increase uncertainty regarding materials management, and potentially could impact the programme with potential for increased cost of the construction stage if contaminated waste disposal is found to be required. The risk of encountering contamination within silts during the construction stage should be highlighted and accounted for in the materials management plan.	Limited accessible locations for silt sampling preventing an accurate representation of the site.

S1.4 Main works proposed and purpose of this contract	A new weir and fish pass have been proposed to replace the existing weir and provide a constant access path for fish along the river. The proposed weir is to be constructed of sheet piles with a rock ramp fish pass on the eastern bank. Due to the specialist fish pass, this proposed design has been undertaken by FishTek Consulting. The proposed sheet pile weir is located immediately upstream of the existing weir. The outline design for the proposed weir is detailed in Drawing 3. The ground investigation that is the subject of this specification is the main intrusive geotechnical and combined geoenvironmental investigation of the site.
S1.5 Objective and scope of investigation	The scope of the ground investigation is as follows: • 2no. cable percussive boreholes located on the riverbanks to confirm the stratigraphy. Standard Penetration Testing (SPTs) proposed in boreholes. Laboratory testing of selected soil samples for geotechnical and geo-environmental purposes. • 2no. window samples located along the proposed fish pass alignment to confirm the stratigraphy. SPTs proposed in boreholes. Laboratory testing of selected soil samples for geotechnical and geo-environmental purposes. • 4no. hand trial pits; 2no upstream of the weir and 2no. downstream of the weir, to obtain soil samples for geo-environmental testing and check for the presence of obstructions which would impact the proposed sheet piling. • 1no. seismic refraction survey across the river profile upstream of the weir, to confirm the stratigraphical profile across the river. • 4no. surface water samples; 1no. upstream of the proposed works, 1no. downstream of the proposed works, 1no. at the western outfall and 1no. at the eastern outfall for geo-environmental testing to inform the baseline conditions prior to construction activities. Refer to Schedule 2 and the Drawings for further details of scope of work to be undertaken at the site. Due to the site conditions and constraints, it may not be possible to undertake one or more of the specified holes at the proposed locations. It is recommended that the Contractor carries out their own walkover of the site to inform their planning of the proposed investigation. The Contractor may propose alternative locations or methods to gather the required information and samples. The proposed method should be agreed with the Investigation Supervisor prior to the commencement of the investigation works.
S1.6 Geology and ground conditions	The following general assessment of the geology of the site and ground conditions has been inferred from available information. No assurance is given to its accuracy.

	<table><tr><th>Stratum</th><th>Approximate Thickness from top of the riverbank (m)</th><th>Description</th></tr><tr><td>Made Ground</td><td>0.6 to 5.2</td><td>Ash, clinker, slag, slag boulders and sand</td></tr><tr><td>Blown Sand</td><td>2.9 to 7.8</td><td>Very loose medium to coarse brown sand with occasional layers of silty clay</td></tr><tr><td>Tidal Flat Deposits (TFD)</td><td>5.7 to 10.2</td><td>Soft to firm grey silty sandy clay with bands of fine sand.</td></tr><tr><td>Weathered South Wales Middle Coal Measures Formation (SWMCMF)</td><td>11.4+ (Unproven)</td><td>Medium dense/ dense coarse sandy gravel with occasional cobbles.</td></tr></table> A ground investigation was undertaken approximately 750m to the northeast of the site in 2019 as part of the construction of the Green Park weir in the River Afan. The investigation encountered shallow bedrock which was typically described as dense gravels and cobbles of Sandstone. No significant depths of superficial deposits were encountered. The following assessment of the groundwater at the site has been inferred from available information. No assurance is given to its accuracy. • According to the BGS mapping, the site is on the boundary of the secondary A aquifer associated with the Blown Sand and the secondary (undifferentiated) aquifer associated with the TFD. Both aquifers are classified as high vulnerability. The bedrock at the site is shown to be a Secondary A Aquifer which is classified as high vulnerability. • Given the proximity of the river, it is anticipated that the groundwater levels are heavily influenced by the river and tidal levels and are shallow.	Stratum	Approximate Thickness from top of the riverbank (m)	Description	Made Ground	0.6 to 5.2	Ash, clinker, slag, slag boulders and sand	Blown Sand	2.9 to 7.8	Very loose medium to coarse brown sand with occasional layers of silty clay	Tidal Flat Deposits (TFD)	5.7 to 10.2	Soft to firm grey silty sandy clay with bands of fine sand.	Weathered South Wales Middle Coal Measures Formation (SWMCMF)	11.4+ (Unproven)	Medium dense/ dense coarse sandy gravel with occasional cobbles.
Stratum	Approximate Thickness from top of the riverbank (m)	Description														
Made Ground	0.6 to 5.2	Ash, clinker, slag, slag boulders and sand														
Blown Sand	2.9 to 7.8	Very loose medium to coarse brown sand with occasional layers of silty clay														
Tidal Flat Deposits (TFD)	5.7 to 10.2	Soft to firm grey silty sandy clay with bands of fine sand.														
Weathered South Wales Middle Coal Measures Formation (SWMCMF)	11.4+ (Unproven)	Medium dense/ dense coarse sandy gravel with occasional cobbles.														
S1.7 Schedule of drawing(s) and documents	Schedule of drawings can be found in Appendix A. A summary of drawings is included below. Drawing 1 - Site location Drawing 2 – Key features, constraints and Landowners Drawing 3 – Proposed Fish Pass and Weir Design Drawing 4 - Site plan showing positions of exploratory holes. The following documents have been appended to this specification:															

	• Appendix A – Utilities Survey The following documents can be provided upon request from the Investigation Supervisor: • Geotechnical and Geo-environmental desk study
S1.8 General requirements (Specification Sections 3 and 4) – particular restrictions/ relaxations	The exploratory holes may be made in any order except as otherwise specified in Schedule 2. Once an exploratory hole has commenced, it shall be completed continuously and without undue delay. Notice of entry (Clause 3.9) and access to the site shall be arranged through NRW. Unhindered access is not available to all exploratory hole positions. Access requirements include: • Permission from the relevant landowners for site access. Landowners are shown on Drawing 2 and include: • NRW/ Local Council permission to access and potential closure of the footpath on the western riverbank; • Avan Boat Club & the Associated British Ports (ABP) permission for access to the eastern riverbank; and • The River Afan is influenced by the tide with high tide typically occurring twice per a day and results in the overtopping the weir. Access to the river channel for the proposed works is advised during the low tides which can be found on the local tide information. Notification shall be made to NRW prior to gaining access to the exploratory hole locations identified in Schedule 2. Access to the western side of the site is available via the footpath from Darwin Road and to the east from Riverside Road. Access to the river channel is available via the eastern bank either by the steps onto the lower concrete platform or immediately south of the Newbridge Road bridge where the riverbank is shallower. It is recommended that the Contractor carries out their own walkover of the site to inform their planned site access routes. The locations of the exploratory holes shall be agreed with the Investigation Supervisor prior to breaking the ground. The Contractor's RAMS shall be submitted to the Investigation Supervisor and the NRW for review in advance of the works.
S1.8.1 Data Management Plan (Clause 3.2)	As specified in the UK Ground Investigation Specification. A Data Management Plan (Plan) shall be prepared in accordance with BS 8574:2014, 'Code of practice for the management of geotechnical data for ground engineering projects', and used throughout the project. Digital data to be provided in AGS Data Format. Refer to Schedule 5 Annex J.

S1.8.2 Quality management system (Clause 3.3)	<i>The Contractor shall provide a suitable Construction Phase Plan (CPP) to the Employer a minimum of 10 working days prior to mobilisation.</i> The Contractor shall work to a quality management system established in accordance with BS EN ISO 900, BS EN ISO 14001 and OHSAS 450011 (Clause 3.3). Details shall be provided to the Investigation Supervisor prior to the start of field work.
S1.8.3 Project management, supervision and execution personnel (Clauses 3.2, 4.4 and 4.5)	<i>The Contractor shall supply staff in line with the requirements of Clauses 4.4, 4.5 and NRW's Safe Construction Code of Practice.</i> If the Contractor identifies additional resources the items in Bill A Item 7 and sub-items should be adjusted to reflect these and the revised bill resubmitted with justification of the proposed changes with the tender submission. Full-time professional attendance on site is required. The Contractor is responsible for providing its own supervision to ensure the requirements of the Specification are met (Clause 4.4.3). The costs associated with the provision of project management, supervision and execution personnel are to be included in Bill A. CVs for all site staff the Contractor plans to use shall be provided to the Investigation Supervisor in advance of the site works. For investigation on potentially asbestos-contaminated land, or in the event that asbestos is identified during the investigation, the Contractor shall ensure all staff on site as a minimum have received relevant asbestos awareness training. Where asbestos is or is likely to be present on site, the Contractor shall consult an appropriately competent, qualified and accredited specialist organisation for advice on asbestos. The Contractor and the specialist shall determine the nature of the work as defined by the Control of Asbestos Regulations 2012 (CAR 2012) and the Joint Industry Working Group Asbestos in Soil and Construction & Demolition Materials document “<i>Control of Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction & Demolition materials: Industry Guidance</i>” (CAR-SOIL™) and, where necessary, shall provide sufficiently trained and competent staff during the site works as required by CAR 2012, CAR-SOIL™ and applicable code(s) of practice. If the investigation (or any part of the investigation) is licensable work or is notifiable non-licensed work, the Contractor shall ensure:

	(i) that the work is notified to the appropriate enforcing authority; (ii) and (ii) the relevant work is undertaken by an Asbestos Licence Holder where applicable.
S1.8.4 Provision of ground practitioners and other personnel for technical support (Clauses 4.3.6, 4.4.7 and 4.5.4)	If required to execute the Works in a safe, efficient and timely manner the <i>Contractor</i> shall provide other personnel as necessary. The services of a specialist (Clause 4.4.6) are not required.
S1.8.5 Hazardous ground, land affected by contamination and notifiable and invasive weeds (Clauses 3.5.2 and 3.5.4)	As specified in the UK Ground Investigation Specification. The <i>Guidance for Safe Intrusive Activities on Contaminated or Potentially Contaminated Land</i> (British Drilling Association (BDA), (2008) designation of the potentially contaminated area is YELLOW. Personal and site safety equipment shall be provided in accordance with this BDA classification. With regards to asbestos in soil (AIS) or encountering asbestos containing material (ACM), the Contractor shall comply with the guidance and methods described in <i>Assessment and control of asbestos risk in soil, Part 1: Protection of personnel working on ground investigations</i> and <i>Part 2: Protection of personnel working in geotechnical and geoenvironmental laboratories</i> (AGS, 2021). The Contractor shall complete the required safety risk assessments set out in the guidance. The Contractor shall comply with CAR 2012 and CARSOIL™. The contractor to provide sufficiently trained and competent staff and appoint specialist practitioners as detailed in S1.8.3. Reference should be made to the desk study for details of the potential for ground contamination or other hazardous ground conditions (Clause 3.5.2) such as risk of landslips, collapse of underground voids or unexploded ordnance. A summary of potentially hazardous ground and land affected by contamination and non-native invasive/notifiable plant species at the site is provided below: • Steelworks slag placed as part of the construction of the weir; • Made Ground associated with the construction of the adjacent Docks; • Two outfalls (the western outfall is associated with a rising main/overflow and the eastern one is anticipated to be associated with an ABP source); • Docking area for boats along the eastern bank; and • Historical Railway. A preliminary risk assessment for the presence of buried unexploded ordnance (UXO) at the site has been completed in accordance with CIRIA Report C681 and is presented in the

	Geotechnical and Geo-environmental Desk Study (290058-ARP-XX-NB-RP-CE-0001). A summary of the UXO risk assessment is provided below: • The Zetica UXO Risk Map shows the site to lie in an area of low risk; • Two Luftwaffe targets are noted within 1km of the site; • The Docks adjacent to the site were targets for potential Luftwaffe bombings, however, record raids and bombings are minimal at the site; and • As the works are localised to the weir and minimal in extents the risk of UXO being encountered is minimal. As per the written notification the Contractor is responsible for undertaking all appropriate good practice measures. If the Desk Study shows an elevated risk to be present, then services from a qualified UXO/explosive ordnance disposal (EOD) specialist shall be engaged. If required, on a site-specific basis, the UXO / EOD expert to provide, site briefings, safe working zones, non-intrusive surveys, magnetometry probing, downhole magnetometer testing (combined with use of non-magnetic drill casing) for the avoidance of buried UXO including potential UXO features. If suspected UXO objects are encountered during an investigation they should be left undisturbed, and an appropriate exclusion zone established around the area. Their presence should be notified immediately to the Investigation Supervisor, who will give instructions on any actions to be taken by the Contractor. Further guidance can be obtained from the Association of Geotechnical and Geoenvironmental Specialists' (AGS) publication Guidance on the Risk of Unexploded Ordnance (UXO). (Clause 5.6) No known underground tunnels pass under or near the site.
S1.8.6 Additional information on services not shown on Contract drawings (Clause 3.5.2 and 5.5)	As specified in the UK Ground Investigation Specification. PAS 128 Survey Type C and D.
S1.8.7 Known/suspected mine workings, mineral extractions, etc. (Clauses 3.5.2 and 3.5.5)	There are no known active or former mine workings or other extractive works at or near the site.
S1.8.8 Protected species (Clause 3.5.3)	A summary of the ecological constraints at the site is provided below:

	Salmonids (Salmon, sea trout, etc) migration and spawning between October to March. Works should not be undertaken at the site during the migration/spawning period.
S1.8.9 Archaeological remains (Clause 3.5.6)	The desk study presents details of the suspected or known archaeological or heritage constraints for the site. A summary is provided below: - Newbridge Road bridge upstream of the site is a Grade II listed bridge. The access to the bridge is closed due to the central span and deck being in a poor condition; and - The weir is linked to the Newbridge Road bridge but is not a listed structure. However, it is anticipated that a full photographic survey of the weir would be required prior to any works on the weir based upon advice from NRW. As this survey has not been undertaken, the ground investigation works should not directly impact the weir. The areas of archaeological or heritage constraints are defined on the Drawing(s) detailed in Schedule S1.7.
S1.8.10 Security of site (Clause 4.3.5)	As specified in the UK Ground Investigation Specification. The requirements of Clause 4.3.5 apply. The Contractor is responsible for the security of the Contractor's equipment on site for the duration of the site works phase of the investigation. The site is unsecured.
S1.8.11 Traffic management measures (Clause 4.3.6)	Traffic management will be required (Clause 4.3.6) along the Riverside Road during the main investigation works. Traffic management will also be required (Clause 4.3.6) along Riverside Road and the minor road to the east during the geophysical works. Pedestrian management will be required (Clause 4.3.6) along the footpath on the western riverbank which can be accessed from Darwin Road, Drawing 2, and any other interfaces with pedestrians, to prevent pedestrians from accessing the worksite. If the works require the footpath to be closed this should be agreed with NRW and the Local Council prior to the works being undertaken.
S1.8.12 Working hours (Clause 4.3.7)	Work may take place on site between the hours of 8am and 5pm, Monday to Friday. Work outside these hours may take place only with the prior agreement of the Investigation Supervisor (Clause 4.3.7).

	The River Afan at the site is influenced by the tide and the existing weir is overtopped twice a day. Therefore, access to areas of the site in the river channel is very limited at or near to high tide. Therefore, it is recommended that works in the river channel are undertaken during the low tide periods which can be found from the local tide information.
S1.8.13 Trainee site operatives (Clause 4.5.2)	Trainee site operatives are not permitted. All drilling operatives (lead drillers and drilling support operatives) employed on the Contract shall hold a minimum level 2 vocational qualification in land drilling/drilling operations, a CSCS or equivalent MPQC skills card and a valid and current audit card of competence applicable to the work and specific drilling operation on which they are engaged, as issued by the British Drilling Association Limited under its BDA Audit or an equivalent body in a State of the European Union Operatives using plant covered by the Construction Plant Competence Scheme (CPCS) (e.g. excavators and dumpers) and employed on the Contract shall hold an appropriate vocational qualification for the plant being used and a CPCS or CSCS card, or an equivalent MPQC or National Plant Operators Registration Scheme (NPORS) skills card endorsed for that particular plant item.
S1.8.14 Contamination avoidance and/or aquifer protection measures required (Clauses 3.6.7, 3.6.8 and 6.1)	As specified in the UK Ground Investigation Specification. All equipment shall be thoroughly cleaned before being used on site. Jet washing equipment shall be provided to wash down relevant equipment and tools before starting each exploratory hole. A clean, stainless steel trowel shall be used to collect soil samples for chemical testing, and shall be cleaned between samples. When working on land affected by contamination the Contractor shall clean equipment (including wheels) before leaving the site. If significant contamination is encountered, sampling equipment and tools shall be cleaned between strata, particularly at the boundary between Made Ground and natural strata, in order to prevent cross contamination. The Contractor may only use vegetable oil-based lubricants on any equipment that may contact ground or groundwater. Aquifer protection as defined in Clause 3.6.8 is required. Aquifer protection measures are required. These measures shall prevent migration of potential contaminants into the underlying strata and groundwater, and shall be detailed in the Contractor's Method Statement.

	The known aquifers requiring protection are detailed below: • Aquifer 1: Blown Sand aquifer which is designated as a high vulnerability Secondary A aquifer; • Aquifer 2: SWMCMF which is designated as a high vulnerability Secondary A aquifer. Aquifer protection measures shall be formed by the following steps: (a) boring or drilling (both with temporary casing) to a suitable depth into, but not penetrating through, a suitably low permeability layer; (b) forming a bentonite plug at the depth penetrated in item (a), of a suitable thickness, then pulling back the temporary casing to just below the top of the bentonite seal; (c) installing a secondary, smaller-diameter temporary casing through the seal to the depth required. In the Tender return, the Contractor shall confirm details of the proposed aquifer protection measures in accordance with Clause 3.6.8.
S1.8.15 Maximum period for boring, pitting or trenching through hard material or obstruction (Clauses 2.11, 6.3.5 and 7.5)	As specified in the UK Ground Investigation Specification. The requirements of Clause 6.3.5 apply. The requirements of Clause 7.5 apply
S1.8.16 Reinstatement requirements (Clauses 3.6.5 and 4.3.2)	As specified in the UK Ground Investigation Specification. The site is to be reinstated to a condition as best as practicably possible without the need of specialist equipment or contractor. The Contractor shall carry out all site operations with the least possible damage and disturbance; The Contractor shall ensure any particular requirements for reinstatement specified by the NRW or the landowners, Drawing 2, is met.
S1.8.17 Welfare and other facilities required (Clauses 2.25, 4.3.2 and 4.3.4)	As specified and required under CDM. The Contractor shall provide hygiene and decontamination facilities appropriate for the colour designation stated in Schedule S1.8.4 and the scale and nature of the investigation and meet the minimum requirements as set out in CDM 2015, in order to control risks to the health and safety of site operatives and site visitors.

	A single controlled access point to and from areas of land affected by contamination where welfare facilities for personnel shall be provided. The Contractor shall take account of the requirements of: the Control of Asbestos Regulations 2012; AGS (2013) <i>Site investigation asbestos risk assessment for the protection of site investigation and geotechnical laboratory personnel</i>; CAR-SOIL™; and CIRIA C733 <i>Asbestos in soil and made ground: a guide to understanding and managing risks</i>. The Contractor shall comply with the safety requirements of HSG 66 (1991) <i>Protection of workers and the general public during the development of contaminated land</i>. The Contractor shall follow the safety guidance in CIRIA 132 (1996) <i>A guide for safe working on contaminated sites</i> and in Annex C of BS 10175 <i>Investigation of potentially contaminated sites - Code of practice</i>.
S1.8.18 Unavoidable damage to be reinstated by Contractor (Clauses 4.3.1 and 13.1)	As specified in the UK Ground Investigation Specification. All unavoidable damage shall be reinstated by the Contractor. Such reinstatement of damage shall be to the satisfaction of NRW and the Landowner, Drawing 2.
S1.8.19 Surveys (Clauses 5.1, 5.2, 5.3, 5.4, 5.6, 5.7, 5.8 and 5.9)	As specified in the UK Ground Investigation Specification. Pre-commencement walkover survey is recommended. (Clause 5.1 and Clause 5.2) Post condition survey is not required. (Clause 5.2) Topographical survey is not required. (Clause 5.3) The Contractor is responsible for setting-out each exploratory hole location and for surveying the as-built location of each exploratory hole. The accuracies specified for setting out, coordination and elevation (Clause 5.4) and accuracy and precision of the survey data (Clause 5.9) are appropriate. As-built positions shall be reported in National Grid coordinates. Levels shall be reported relative to Ordnance Datum. If there is a risk of UXO on site, the presence and nature of the UXO, exclusion zones and risk level shall be detailed here. An emergency response plan shall be developed and referenced here (Clause 5.6). Refer to Section 1.8.5.

	A site UAV/drone survey is not required (Clause 5.7) A cavity survey is not required (Clause 5.8)
S1.8.20 Inspection and survey records requirements (Clauses 5.2 and 5.10)	Photographs to be in JPEG format with associated date, location and direction information. Sufficient photographs to be collected to detail exploratory location findings and document site condition before and after the Works.
Further particular contract restrictions/relaxations shall be entered below, using sequential numbers to those above	
S1.9 Dynamic sampling (Clause 6.2) – particular restrictions/relaxations	Required.
S1.9.1 Permitted methods and restrictions (Clauses 6.1, 6.2.1, 6.2.2, 6.2.3, 6.2.4 and 6.2.5)	Dynamic (window or liner) sampling shall be carried out at the locations specified in Schedule 2. Dynamic sampling with liners, also referred to as ‘windowless sampling’, shall be carried out using hollow steel sampling tubes (sampling barrels) incorporating a removable plastic liner and cutting shoe in order to recover a nominally continuous soil sample for retention.
S1.9.2 Backfilling (Clauses 6.1.2 and 6.2.6)	Backfilling of boreholes with soil arisings is not permitted (Clause 6.1.2) unless otherwise agreed in advance with the Investigation Supervisor. Dynamic Sampling holes shall be backfilled with cement/bentonite grout, cement/bentonite pellets, bentonite pellets or as directed by the Investigation Supervisor.
Further particular contract restrictions/relaxations shall be entered below, using sequential numbers to those above	

S1.10 Cable percussion boring (Clause 6.3) – particular restrictions/relaxations	Required.
S1.10.1 Permitted methods and restrictions (Clauses 6.1 and 6.3.3)	Cable percussion boring shall be used at the locations specified in Schedule 2. It is envisaged that cable percussion boring will be used. Any other proposed methods should be submitted to the Investigation Supervisor for approval. The <u>minimum</u> nominal casing diameter shall be 150mm. At ground level before boring commences, the initial casing diameter shall be sufficiently large to ensure that the borehole can be completed to its scheduled depth. A borehole remaining open overnight shall be covered. Before the first sample of the new day is taken, the boring shall be advanced for at least 0.3m.
S1.10.2 Backfilling (Clauses 6.1.2 and 6.3.6)	Backfilling of boreholes with soil arisings is not permitted (Clause 6.1.2) unless otherwise agreed in advance with the Investigation Supervisor. All boreholes shall be backfilled with cement/bentonite grout, cement/bentonite pellets, or bentonite pellets, taking account of any requirements for the installation of instruments in the hole.
Further particular contract restrictions/relaxations shall be entered below, using sequential numbers to those above	
S1.11 Rotary drilling (Clauses 6.1, 6.4 and 6.4.6) – particular restrictions/relaxations	Not required.
S1.11.3 Drilling fluid type and collection (Clause 6.4.2)	Not required.

Further particular contract restrictions/relaxations shall be entered below, using sequential numbers to those above	
S1.13 Pavement/ concrete or structural coring (Clause 6.6) – particular restrictions/ relaxations	Not required.
S1.13.1 Permitted methods and restrictions (Clauses 6.1, 6.6.1 and 6.6.3)	Not required.
S1.13.2 Backfilling (Clauses 6.1.2 and 6.6.4)	Not required.
S1.14 Pitting and trenching (Specification Section 7) – particular restrictions/ relaxations	As specified in the UK Ground Investigation Specification. No entry of any personnel to unsupported pits or trenches. Sampling for geotechnical purposes from trial pits shall be in accordance with Clause 8.7.5, 8.7.6 and 8.7.7 and Schedule 1.15.2.
S1.14.1 PAS 128:2014 survey and inspection pits (Clauses 5.5 and 7.1)	As specified in the UK Ground Investigation Specification. PAS 128 Survey Type C and D. The Contractor is responsible for undertaking all appropriate good practice measures for the identification and avoidance of underground services at each exploratory hole location, including but not limited to: review of documentary records; use of cable detection methods such as generator scanning and CAT (cable avoidance tool) scanning; and direct investigation. The Contractor shall excavate inspection pits of sufficient size for locating and avoiding of underground services which should extend to a minimum depth of 1.2m below ground level, where possible (Clauses 5.5 and 7.1).

S1.14.2 Restrictions on machines or pitting/ trenching methods (Clauses 7.2 and 7.4)	As specified in the UK Ground Investigation Specification. It is not anticipated that man-entry will be required in any pits. The use of machine excavators is not permitted.
S1.14.3 Utility pits and trenches (Clause 7.3)	As specified in the UK Ground Investigation Specification. Not required.
S1.14.4 Alternative pit and trench dimensions (Clause 7.7)	As specified in the UK Ground Investigation Specification. Pits and trenches shall have the minimum dimensions specified in Clause 7.7.
S1.14.5 Groundwater (Clause 7.9)	As specified in the UK Ground Investigation Specification. On land affected by contamination, measures for the collection and temporary storage of pumped water (while testing and classification is being undertaken) shall be agreed in advance with the Investigation Supervisor.
S1.14.6 Backfilling (Clauses 6.1.2 and 7.10)	As specified in the UK Ground Investigation Specification. Pits and trenches shall be backfilled using excavation plant in the manner specified in Clause 7.10. Pits and trenches shall be backfilled on the day of completion.
S1.14.7 Photographic requirements (Clauses 7.8 and 7.12)	As specified in the UK Ground Investigation Specification. All photographs should be taken from a safe distance. Photographs should attempt to document trial pit findings and at minimum include one exposed trial pit face, arisings and any features of interest encountered such as services or buried objects/voids. Schedule S1.8.19 applies. Photographs are required of all pits, including inspection pits, and arisings therefrom. Where the faces in a pit differ in stratigraphic levels and/or strata, photographs of each face are required. The requirements of Clause 7.12 apply. Each photograph of a pit or of pit arisings shall include details of the exploratory hole number and date, and include a visible colour scale, grey scale and length scale. The features being photographed shall reasonably fill the frame to show the details clearly. Where a pit collapses additional photographs should clearly document this.

S1.14.8 Artificial lighting (Clause 7.12)	As specified in the UK Ground Investigation Specification. Artificial lighting of pits is not required.
S1.14.9 Daily provision of trial pitting/trenching machine, equipment and crew (Clause 7.13)	As specified in the UK Ground Investigation Specification. Not required.
S1.15 Sampling and monitoring during intrusive investigation (Specification Section 8) – particular restrictions/relaxations	As specified in the UK Ground Investigation Specification. All geotechnical samples shall be removed from the vicinity of the exploratory holes at the end of each day's work and shall be protected from frost damage or excessive heat by being stored on or near the site in a structure that is under cover and is secure from interference. All geotechnical samples shall be removed from the site so as to reach the laboratory within [4] days of being taken. Sampling shall at a minimum conform to Section 25.11 of BS 5930. Small disturbed samples shall be placed in lidded airtight containers in conformance with Section 25.11.3 of BS 5930. No standing time shall be applicable in the event that suitable containers for samples are not available on site during sampling. For any sampling that is not undertaken in accordance with this Technical Specification: (i) the Investigation Supervisor may require the Contractor to repeat the relevant drilling and sampling operations so as to provide samples that are in conformance with this Technical Specification; and (ii) the Contractor is responsible for the cost and programme impacts of any such repeated drilling and sampling.
S1.15.1 Retention and disposal of geotechnical samples (Clauses 8.10.3 and 8.10.4)	As specified in the UK Ground Investigation Specification. Geotechnical samples shall not be disposed of until 28 days after submission of the approved final report. After this time, the samples shall be disposed of, unless the Investigation Supervisor provides an instruction to pay ongoing storage costs at the rates provided in the Contract. (Clause 8.10.3).
S1.15.2 Frequency of sampling for geotechnical purposes (Clauses 8.2 and 8.7.2)	As specified in the UK Ground Investigation Specification. The sampling and testing frequencies for geotechnical purposes shall be as stated in Clauses 8.7.2 to 8.7.9 with the following additions. For boreholes: • in fine-grained (cohesive) soil, an SPT and disturbed sample shall follow every attempt to take an open tube sample

	- in Made Ground and in coarse-grained (non-cohesive) soil, bulk disturbed samples shall be taken at 1m depth intervals. For pits: - small disturbed samples shall be taken of the topsoil and at each change in soil type or consistency and between successive bulk disturbed samples - bulk disturbed samples shall be taken at 1m intervals with at least one large bulk disturbed sample being taken of each soil type.
S1.15.3 Open-tube and piston sample diameters (Clauses 8.7.3.1, 8.7.3.2 and 8.7.3.3)	As specified in the UK Ground Investigation Specification. Except as specified otherwise in Schedule 2, open tube samples shall be of the thin-walled type (denoted OS-T/W in EN ISO 22475-1). Open tube and piston samples shall have 100mm internal diameter (Clause 7.6.5). Sample tubes shall be made of steel or aluminium. Plastic lining tubes shall not be used in substitution for steel or aluminium sampling tubes. Soil samples shall be at least 300mm long. A hand vane test shall be carried out in the top and bottom of each sample prior to sealing.
S1.15.4 Retention of cutting shoe samples (Clauses 8.7.3.2 and 8.7.3.3)	As specified in the UK Ground Investigation Specification. Cutting shoe samples shall be retained as small disturbed samples.
S1.15.5 Mostap sampling (Clause 8.7.10)	As specified in the UK Ground Investigation Specification. Not required.
S1.15.6 Groundwater samples and groundwater level measurements during exploratory hole formation (Clauses 8.7.11 and 8.8.1)	As specified in the UK Ground Investigation Specification. The requirements of Clause 8.7.11 and 8.8.1 to 8.8.3 apply. Groundwater levels in boreholes during boring/drilling shall be measured at the beginning and end of each shift and other rest periods. Groundwater samples are not required.
S1.15.7 Special geotechnical sampling (Clause 8.7.12)	As specified in the UK Ground Investigation Specification. Requirements for dynamic sampling are specified in Schedule 5 Annex A3 and Schedule 2.

	Requirements for 100mm-diameter thin-walled sampling are specified in Schedule 5 Annex A1 and Schedule 2.
S1.15.8 Address for delivery of selected samples (Clauses 8.10.2 and 8.10.3)	Not required.
S1.15.9 Retention and disposal of contamination/waste acceptance criteria (WAC) samples (Clause 8.10.3)	As specified in the UK Ground Investigation Specification. All untested contamination samples and remaining sample portions shall be retained for 28 days from receipt at the laboratory. Untested samples and untested sample portions for waste acceptance criteria (WAC) analysis shall be retained for 28 days after submission of the approved final report.
S1.15.10 Frequency of sampling for geoenvironmental purposes (Clause 8.9.2)	As specified in the UK Ground Investigation Specification. The frequency of sampling for contamination/WAC sampling is specified in out in Schedule 5 Annex H Section H5. Samples for contamination testing shall be representative of the conditions encountered and shall not be collected at strata boundaries.
S1.15.11 Sampling method (Clause 8.9.3)	As specified in the UK Ground Investigation Specification. All soil samples for contamination/WAC testing shall be taken by, or under the supervision of, an environmental scientist or geoenvironmental engineer or geochemist meeting the requirements of Clause 2.3(c). Each soil sample suite collected for contamination/WAC testing shall comprise the following: • vial(s) (in coarse-grained soils) or sealed core(s) (in fine grained soils) for volatile organic compound analysis; • amber glass jar(s) for hydrocarbon analysis; and • plastic tub(s) for inorganic, metals and WAC leachability soil analysis. Depending on size and soil type multiple tubs may be required to achieve analysis including leachability. Soil samples for VOC analysis shall be collected immediately after recovering the soil or exposing a fresh surface to minimise losses of volatile compounds.

	The amber glass jar(s) shall be collected next followed by the plastic tub(s). All containers shall be filled tightly and completely to minimise air voids and headspace. The incorporation of materials such as roots or stones should be avoided as far as possible. The quantity of soil containers used for each sample suite shall be sufficient to allow all the potential contaminants to be analysed as defined in Schedule S1.23. Following collection, environmental sub-samples shall be kept cool and dark in accordance with Section 8.6 of BS 10175.
S1.15.12 Headspace testing (Clause 8.9.6)	As specified in the UK Ground Investigation Specification. Not required.
S1.16 Field testing (Specification Section 9) – particular restrictions/ relaxations	As specified in the UK Ground Investigation Specification.
S1.16.1 Tests in accordance with British standards or other standards or methods (Clause 9.1)	As specified in the UK Ground Investigation Specification. Unless specified otherwise herein, field testing and reporting shall be in accordance with the standards listed in Clause 9.1 and the Tables 9.1a and 9.1b as applicable, except where British Standards or test methodologies have been updated since the publication of the <i>UK Specification for Ground Investigation</i>. Any work undertaken to a British Standard shall conform to the latest version of the published standard.
S1.16.8 Standard penetration tests and reporting requirements (Clause 9.3)	When an SPT test is carried out, the Contractor shall record and report the blow count for each of the four 75mm increments of penetration or parts thereof. BS EN ISO 22476-3 Section 5.3 applies. To be undertaken at 1-m centres between 0 and 10 mbgl and at 1.5 m centres thereafter. The first SPT shall be made at the base of the inspection pit. The SPT will be conducted in accordance with BS EN ISO 22476-3, and the energy ratio (Er) of the SPT equipment used shall be reported. In boreholes in fine-grained soil (including fine-grained Made Ground), the SPT testing intervals specified in Clause 8.7.2 apply. In boreholes in coarse-grained soil (including coarse-grained Made Ground), the SPT testing intervals specified in Clause 8.7.2 apply.

S1.16.14 Hand or torsion vane tests and reporting requirements (Clauses 9.6.1.1 and 9.6.1.2)	The following in-situ tests shall be undertaken in trial pits, observation pits and trenches: • Vane shear strength at 1m depth intervals in cohesive strata
S1.16.25 Soil infiltration tests and reporting requirements (Clauses 9.10.1 and 9.10.2)	As specified in the UK Ground Investigation Specification. Soil infiltration test reporting will give an infiltration rate based on the testing completed. Not required.
Further particular contract restrictions/relaxations shall be entered below, using sequential numbers to those above	
S1.17 Geophysical testing (Specification Section 10) – particular restrictions/relaxations	As specified in the UK Ground Investigation Specification.
S1.17.1 Geophysical survey objectives (Clause 10.1)	Refer to Schedule 5 Annex L. Land-based geophysical investigation
S1.17.2 Requirements for Ground Specialist - Geophysicist (Clause 10.1)	Where required, a qualified geophysicist shall design and advise the investigations in accordance with best practice, concentrating on recording quality and output requirements, including interpretation and digital data requirements. Survey planning and design shall be in accordance with: • ASTM D6429-99 e1 (ASTM, 2011) • And ASTM D5753-05 (ASTM, 2010) The geophysics site personnel shall have sufficient expertise and experience to provide preliminary advice on the results obtained from each geophysical test.
S1.17.3 Trials of geophysical methods (Clause 10.1)	A trial of land-based surface geophysical techniques will be required to verify the variables of the method and applicability to the objectives of the investigation. This shall be discussed in the pre-start meeting once the Contractor has confirmed the geophysical specialist subcontractor to the Investigation Supervisor.

S1.17.4 Information provided (Clause 10.2)	Refer to Schedule 5 Annex L. Digital mapping, existing ground investigation, geological and topographic data will be provided by the Contractor. The Contractor will be responsible for providing survey control for each site.
S1.17.5 Data density (Clause 10.3)	Refer to Schedule 5 Annex L. The Contractor/Specialist Contractor shall propose the number of readings or measurements per unit length (or per unit area) as appropriate to the objectives of the survey. This proposal shall be approved by the Investigation Supervisor.
S1.17.6 Level datum (Clause 10.4)	Refer to Schedule 5 Annex L. The level datum to be used for the geophysical survey shall be Ordnance Datum.
S1.17.7 Calibrations and conformance (Clause 10.5)	Refer to Schedule 5 Annex L. All instruments shall be calibrated where appropriate and/or conformance to the manufacturer's specification shall be demonstrated on site.
S1.17.8 Geophysical survey report (Clause 10.6, 10.7 and 10.8)	Refer to Schedule 5 Annex L. The geophysical contractor shall inform the Investigation Supervisor of the results of each survey run before demobilising and supply a copy of the unprocessed data collected within 24hr of undertaking any survey. The report shall be prepared by a Ground Specialist geophysicist and shall include a full geotechnical interpretation. Further to the specified content, a list of interpreted geotechnical parameters required will be provided to the Contractor as required. Unless specified otherwise, the Contractor shall keep a site log recording a) the timing and scheduling of the survey b) instrument serial numbers c) site conditions during the survey d) any constraints or problems encountered during the survey e) any feature likely to influence the data, together with details of the plan position, material type, depth and extent of the feature f) any other information specified

	Site conditions should include, for example, wind strength and direction, precipitation, sea state (e.g. wave height and direction) and proximity of potential sources of interference. Unless specified otherwise, the Contractor's report shall include: a) a copy of the site log b) all calibration certificates and serial numbers of the instruments used c) for mapping and profiling surveys, one or more chart/plan/section showing the positions of each of the measurement stations, and the reduced results of the survey overlain on the Ordnance Survey tile d) measurement station descriptions e) text outlining the objectives of the survey, a description of the methods used and any limitations affecting the results obtained, the measurement stations/line spacings used, an interpretation of the findings and the likely causes of any anomalies identified in the data f) the results of any on-site instrument calibrations or checks of equipment performance g) any other information specified h) A measure of vertical and horizontal uncertainty (+/- metres) of the data from positioning tolerance used.
Further particular contract restrictions/relaxations shall be entered below, using sequential numbers to those above	
S1.18 Instrumentation (Specification Section 11) – particular restrictions/relaxations	As specified in the UK Ground Investigation Specification. Not required.
S1.18.1 Protective covers and terminal boxes for installations (Clauses 11.2, 11.4.2 and 11.4.3)	As specified in the UK Ground Investigation Specification. Not required.
S1.18.2 Protective fencing (Clauses 11.3, 11.4.2 and 11.4.3)	As specified in the UK Ground Investigation Specification. Not required.

Further particular contract restrictions/relaxations shall be entered below, using sequential numbers to those above	
S1.19 Installation monitoring and sampling (Specification Section 12) – particular	
S1.19.1 Groundwater readings in installations (Clauses 12.1 and 12.2)	No groundwater installations are required.
S1.19.11 Sampling and testing of surface water bodies (Clause 12.10)	Sampling of water from surface water bodies shall be undertaken at the following locations shown on Drawing 2 and specified in Schedule 2. General requirements for sampling from surface water bodies are specified in Schedule 5 Annex H. Surface water samples shall be sent for testing within 24 hours of sampling.
Further particular contract restrictions/relaxations shall be entered below, using sequential numbers to those above	
S1.20 Reinstatement (Specification Section 13) – particular restrictions/relaxations	As specified in the UK Ground Investigation Specification.
S1.20.1 General reinstatement (Clause 13.1)	As specified in the UK Ground Investigation Specification. All reinstatement requirements shall be agreed with the Client prior to commencement of the investigation.
S1.20.2 Turf and topsoil surfacing (Clause 13.2)	As specified in the UK Ground Investigation Specification. All reinstatement requirements shall be agreed with the Client prior to commencement of the investigation.

S1.20.3 Gravel or rubble surfacing (Clause 13.3)	As specified in the UK Ground Investigation Specification. All reinstatement requirements shall be agreed with the Client prior to commencement of the investigation.
S1.20.4 Paved surfacing (Clause 13.4)	As specified in the UK Ground Investigation Specification. All reinstatement requirements shall be agreed with the Client prior to commencement of the investigation.
S1.21 Daily records (Specification Section 14) – particular restrictions/ relaxations	As specified in the UK Ground Investigation Specification.
S1.21.1 Information for daily records (Clause 14.2)	As specified in the UK Ground Investigation Specification. The Contractor shall prepare for each exploratory hole or investigation point a daily record, preferably in digital format, which shall be submitted to the Investigation Supervisor at the beginning of the next working day/or as requested. Each set of daily records shall be emailed to the Investigation Supervisor (at email address(es) notified to the Contractor by the Investigation Supervisor). Information shall be recorded as work proceeds and, shall include the information detailed in Table 14.1, where relevant.
S1.21.2 Chain of custody (Clause 14.3)	As specified in the UK Ground Investigation Specification. Copies of all chain of custody records for geo-environmental samples shall be provided to the Investigation Supervisor upon request, within 24 h of the samples being taken. The forms should include as a minimum the details listed in Clause 14.3.
S1.21.3 Special field tests and instrumentation records (Clause 14.4)	As specified in the UK Ground Investigation Specification. Daily record reporting requirements for special in-situ testing (if any) and for instrumentation shall be as specified in the relevant section of Schedule 1 or Schedule 5.
S1.22 Geotechnical laboratory testing (Specification Section 15) – particular restrictions/ relaxations	As specified in the UK Ground Investigation Specification.

S1.22.1 Investigation Supervisor or Contractor to schedule testing (Clause 15.1)	<i>The Investigation Supervisor will schedule the testing on the basis of the daily site records. The Contractor will provide laboratory schedule within 24 hours of the samples being taken. Laboratory receipt confirmations shall be provided within 24 hours of submitting the testing schedules.</i> The Contractor shall provide their proposed method of data management for laboratory test scheduling for review and comment to the Investigation Supervisor prior to the commencement of site works, particular emphasis on how they will manage this time sensitive testing. The Contractor shall prepare digitally presented sampling schedules on an agreed proforma that identifies the sample details (hole no., depth, sample type etc.) and the test types available to allow the Investigation Supervisor to schedule testing based on daily records. Testing shall be carried out without undue delay for those parameters which are known to be unstable, or suspected of being unstable, or begins to degrade once the sample has been taken The Investigation Supervisor shall prepare a schedule of tests for the geotechnical laboratory testing. The Contractor shall prepare digitally presented sampling schedules on an agreed proforma (Clause 15.1) and provided within 5 working days of the receipt of the relevant preliminary logs as detailed in Clause 17.2.3 listing on one axis the following information for each sample taken: • borehole number • the sample number of each sample taken • the sample type of the sample • sample depth of the sample and on the other axis the following standard laboratory tests shall be listed: • water content • Atterberg limits • particle size distribution by dry sieving • particle size distribution by wet sieving • particle size distribution by pipette • specific gravity of soil particles • organic matter content • sulfate and pH of water sample • sulfate and pH of soil sample • quick triaxial test on 100mm diameter specimen (leave space for cell pressure to be specified) • oedometer (leave space for pressure range to be specified) • compaction test (dry density–water content relationship) • four blank columns for other tests.
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S1.22.3 Specifications for tests that vary or are not covered by the British standards (Clauses 15.2.1 and 15.4)	Unless specified otherwise herein, the version of any British Standard, including any published corrigenda, published by the BSI as at the issue date of this specification shall apply.
S1.22.4 Accreditation to be adopted (Clauses 3.3 and 15.3).	The testing laboratory shall be an approved UKAS accredited laboratory capable of undertaking all the individual tests to UKAS accreditation, if applicable. Any reference in the Contract to UKAS accreditation shall be construed equally as reference to equivalent European or other International accreditation agreed by UKAS through European cooperation for Accreditation (EA), International Laboratory Accreditation Cooperation (ILAC), or International Accreditation Forum (IAF). The Contractor shall nominate the laboratory to be used in his tender. The laboratory shall be approved by the Investigation Supervisor. Once approved the laboratory shall not be changed without the permission of the Investigation Supervisor. Any laboratories or organisations which the Contractor proposes to use for elements of testing and analysis beyond the scope of UKAS accreditation shall be nominated by the Contractor in his tender. The laboratory or organisation shall be to the approval of the Investigation Supervisor.
S1.22.5 Rock testing requirements (Clause 15.5)	The requirements of Clause 15.5 and Table 15.5 of the Specification apply.
S1.22.6 Geoenvironmental testing for aggressive ground/groundwater for concrete (Clause 15.6) (Test Suites A–D) Geo-chemical testing suites.pdf	Test suites forecast for use are identified within the Bill of Quantities. Additional sample analysis scheduling based on site observations to be directed by the Investigation Supervisor via contract Compensation Event. Investigation Supervisor to specify method. Chemical testing to determine the Aggressive Chemical Environment for Concrete (ACEC) class of the ground shall be carried out in accordance with BRE Special Digest 1 'Concrete in Aggressive Ground' Part 1, Box C10. A preliminary assessment of the anticipated ground conditions has been made and, on that basis, it is anticipated that the chemical geotechnical tests required are Suite D (Brownfield, pyrite present). This chemical geotechnical testing shall be additional to any geoenvironmental testing carried out in accordance with

	Schedule S1.23, unless otherwise instructed by the Investigation Supervisor.
S1.22.7 Laboratory testing on site (Clause 15.8)	Not required.
S1.22.8 Special laboratory testing (Clause 15.9)	Not required.
S1.22.9 Specimen preparation and abortive tests (Clause 15.10)	Not required.
S1.23 Geoenvironmental laboratory testing (Specification Section 16) – particular restrictions/relaxations	As specified in the UK Ground Investigation Specification.
S1.23.1 Investigation Supervisor or Contractor to schedule testing (Clause 16.1)	As specified in the UK Ground Investigation Specification. Except where specified otherwise herein, the Investigation Supervisor will schedule the required geoenvironmental tests. The Contractor shall prepare digitally presented sampling schedules on an agreed proforma, listing on one axis the following information for each sample: • borehole number • sample number of each sample taken • sample type of the sample • sample depth of the sample and on the other axis the following: • all suites of chemical tests that are identified with quantities in the Bill of Quantities, with separate sheets provided for solid, liquid and gas samples. The Contractor shall provide each blank geoenvironmental schedule, along with the relevant draft logs, to the Investigation Supervisor within 24 hours of the sampling for contamination testing.

	Where sampling of water is specified, the Contractor shall agree the suite of tests with the Investigation Supervisor in advance of starting water sampling operations. The water sample(s) and the completed water test schedule shall be sent by the Contractor to the laboratory on the same day as the water sampling occurred. If water sample(s) have not been received by the laboratory by mid-day on the day following the water sample collection, the Contractor may be required to retake the samples at their own cost.
S1.23.2 Accreditation required (Clauses 3.3 and 16.2)	As specified in the UK Ground Investigation Specification. Chemical laboratory testing shall be carried out to BS EN ISO/IEC 17025:2017. Laboratory testing on soil samples shall conform to the Environment Agency MCERTS (Monitoring Certification Scheme), where applicable. MCERTS is required for, but not limited to, the analytes listed in Annex A of the Environment Agency publication <i>Performance Standard for Laboratories Undertaking Chemical Testing of Soil</i>, Version 4, March 2012. For asbestos, the method of asbestos analysis used shall be accredited the UK Accreditation Service (UKAS); the use of non-accredited methods for asbestos analysis is not permitted. The quality control schemes used by the asbestos analysis laboratory shall comply with UKAS LAB 30 (<i>Application of ISO/IEC 17025 for asbestos sampling and testing</i>) and HSE HSG 248 (<i>Asbestos: the analyst's guide for sampling, analysis and clearance procedures</i>).
S1.23.3 Chemical testing for contamination (Clauses 8.9.4 and 16.3) (Test Suites E–I, NRW Framework specific suites BoQ items L13 – L28)  Geo-chemical testing suites.pdf	Test suites forecast for use are identified within the Bill of Quantities. Additional sample analysis scheduling based on site observations to be directed by the <i>Investigation Supervisor</i> via contract Compensation Event. <i>Investigation Supervisor</i> to specify method. The Contractor shall confirm in its Tender return the test methods and shall detail what accreditation requirement shall be provided. Additional required chemical testing is included in Schedule 5 Annex G.
S1.23.4 Waste characterisation and hazardous classification of soils (Clause 16.4)	Test suites forecast for use are identified within the Bill of Quantities. Additional sample analysis scheduling based on site observations to be directed by the <i>Investigation Supervisor</i> via contract Compensation Event.

	<i>Investigation Supervisor to specify method.</i> Not required.
S1.23.5 Waste acceptance criteria testing (Clauses 8.9.4 and 16.5) (Test Suites J–L)  Geo-chemical testing suites.pdf	<i>Test suites forecast for use are identified within the Bill of Quantities.</i> <i>Additional sample analysis scheduling based on site observations to be directed by the Investigation Supervisor via contract Compensation Event.</i> <i>Investigation Supervisor to specify method.</i> The Contractor shall confirm the test methods and detail what accreditation requirement will be provided. Additional required WAC testing is included in Schedule 5 Annex G.
S1.23.6 Laboratory testing on site (Clause 16.6)	Not required.
S1.23.7 Special laboratory testing (Clause 16.7)	The following special geoenvironmental laboratory testing is required: Soil leachability testing for purposes other than waste classification using method BS EN 12457 part 1. The testing requirements are included in Schedule 5 Annex G.
S1.24 Reporting (Specification Section 17) – particular restrictions/ relaxations	As specified in the UK Ground Investigation Specification.
S1.24.1 Raw data (Clause 17.2.2)	As specified in the UK Ground Investigation Specification. Raw data shall be provided for field and laboratory tests when requested by the Investigation Supervisor.
S1.24.2 Preliminary exploratory hole logs (Clause 17.2.3)	As specified in the UK Ground Investigation Specification. No project-specific format requirements apply.

S1.24.3 Exploratory hole logs (Clause 17.2.4)	As specified in the UK Ground Investigation Specification. The requirements of Clause 17.2.3 and 17.2.4 apply and Table 17.1 Exploratory hole locations shall be reported in National Grid coordinates and relative to Ordnance Datum Soil classification is required on exploratory hole logs and shall be in accordance with BS EN ISO 14688-2. For rock strata, fracture indices shall be reported. For rock strata, fracture spacings shall be reported.
S1.24.4 Field results (Clause 17.2.5)	As specified in the UK Ground Investigation Specification.
S1.24.5 Laboratory test results (Clause 17.2.6)	As specified in the UK Ground Investigation Specification.
S1.24.6 Plans and drawings (Clause 17.2.7)	As specified in the UK Ground Investigation Specification.
S1.24.7 Type of reports required (Clause 17.3)	As specified in the UK Ground Investigation Specification. A Ground Investigation Report is required. Specific requirements for the report are detailed in Schedule S1.24.9. No hard copy of the draft report is required. The copyright of the report shall be deemed to be vested in the Employer.
S1.24.8 Desk Study (Clause 17.3.2)	As specified in the UK Ground Investigation Specification. Not required.
S1.24.9 Ground Investigation Report (GIR) (or specified part thereof) (Clauses 4.4.7, 17.3.3 and 17.3.5)	As specified in the UK Ground Investigation Specification. The part of the Ground Investigation Report prepared by the Contractor (termed herein the ‘report’ or the ‘Ground Investigation Report’) shall comprise only the factual reporting from the ground investigation (Clause 16.6 and Clause 16.8). No interpretation and evaluation of geotechnical information (as defined in Section 3.4.3 of BS EN 1997-1) is required from the Contractor. The Ground Investigation Report, in both the draft version and final version, shall consist of two parts. Part one shall contain the

	digital data provided in AGS4 Data format and the second part shall be a PDF version of the digital information (Clause 17.4.1). The PDF shall be presented as a single collated file that includes text, exploratory hole records, laboratory test data, in-situ test data, all photographs and location plans. It shall be compiled as a bookmarked, non-copy protected, digitally-searchable portable document file (pdf). Both the digital information (i.e. PDF) and digital data (e.g. AGS Data file) shall be produced from the same information source. The geoenvironmental data shall be presented both in pdf format (within the Ground Investigation Report) and in spreadsheet format (Microsoft Excel® or equivalent). The spreadsheet shall present the data collated by type of test. The Ground Investigation Report shall conform to BS 5930 Section 10 and, as applicable, also to BS 10175 and BS 8576.
S1.24.10 Geotechnical Design Report (GDR) (or specified part thereof) (Clauses 4.4.7 and 17.3.4)	As specified in the UK Ground Investigation Specification. Not required.
S1.24.11 Report approval (Clause 17.3.6)	A draft version of all reporting will be submitted to the <i>Employer</i> one week after the conclusion of the Works, inclusive of laboratory analysis, exclusive of long term site monitoring (>1 month). The draft report will be reviewed by the <i>Employer</i> and or their designer. Any draft report submitted to the <i>Employer</i> should be considered in its final form by the producer unless otherwise stated. The <i>Employer</i> should not be viewed as last review. Basic reporting errors will be raised as a Defect and managed under the contract. The number of copies to be provided of the final report is as quantified in the Bill of Quantities. The draft report shall be provided as an electronic file to the Investigation Supervisor for approval.
S1.24.12 Digital data (Clauses 5.10 and 17.4.1)	As specified in the UK Ground Investigation Specification. Digital data of all fieldwork, monitoring and laboratory data (including contamination testing) are required (Clause 17.4). The final digital data shall be issued at the same time as the final report.

S1.24.13 Data format (Clauses 17.2.7, 17.3.1, 17.3.5, 17.4.1 and 17.4.2)	As specified in the UK Ground Investigation Specification. Digital data shall be provided in AGS4 format (as specified in Association of Geotechnical and Geoenvironmental Specialists <i>Electronic transfer of geotechnical and geoenvironmental data</i> Version 4 and in the guidance documents and standard abbreviations published by AGS on www.ags.org.uk) and in accordance with the requirements specified in Schedule 5 Annex J and Schedules S1.24.12 and S1.24.13. The AGS data and associated files shall be complete and identical to the data provided in the factual report. In order to ensure the AGS data provided is identical to the factual report version, both the report and digital versions of the data shall be generated from the same source software. The preferred approach is to use database software specifically intended for this purpose. AGS digital data shall be issued as a single file and should contain all available information unless otherwise omitted by exception. Data from chemical laboratories is required to be delivered as .hwo files, pdf, .xlsx and .ags																					
S1.24.14 Preliminary data (Clause 17.4.3)	As specified in the UK Ground Investigation Specification. Preliminary digital data are required. Requirements for preliminary digital data are specified in Schedule 5 Annex J and Schedules S1.21.3 and S1.21.4. The preliminary digital data shall be issued during the course of the field and laboratory work in accordance with the requirements specified in the following table: <table><tr><th colspan="4">S1.21.14 Requirements for the provision of preliminary digital data</th></tr><tr><th colspan="2">Hole, data or test type</th><th>Time period*</th><th>Specific requirements</th></tr><tr><td rowspan="4">Exploratory hole logs (preliminary)</td><td>Rotary core logs</td><td>5 days</td><td>Including core photographs (as associated files).</td></tr><tr><td>Pit and trench logs</td><td>5 days</td><td>Including photographs (as associated files). Sketches may be scanned hand-drawn images.</td></tr><tr><td>Cable percussion logs</td><td>3 days</td><td>Includes cable percussion segment where rotary follow-on is specified</td></tr><tr><td>Other exploratory hole logs</td><td>3 days</td><td></td></tr></table>	S1.21.14 Requirements for the provision of preliminary digital data				Hole, data or test type		Time period*	Specific requirements	Exploratory hole logs (preliminary)	Rotary core logs	5 days	Including core photographs (as associated files).	Pit and trench logs	5 days	Including photographs (as associated files). Sketches may be scanned hand-drawn images.	Cable percussion logs	3 days	Includes cable percussion segment where rotary follow-on is specified	Other exploratory hole logs	3 days	
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	<table><tr><td rowspan="2">In-situ test data</td><td>Automated recording</td><td>1 day</td><td rowspan="2">No interpretation (if specified) of in-situ data in preliminary digital data.</td></tr><tr><td>Manual recording</td><td>3 days</td></tr><tr><td rowspan="2">Laboratory test data</td><td>Geotechnical test</td><td>3 days</td><td rowspan="2"></td></tr><tr><td>Geoenvironmental test</td><td>3 days</td></tr><tr><td rowspan="2">Monitoring</td><td>Automatic logging</td><td>1 day</td><td></td></tr><tr><td>Manual logging</td><td>3 days</td><td></td></tr><tr><td colspan="2">Geotechnical laboratory test data</td><td>3 days</td><td rowspan="2"></td></tr><tr><td colspan="2">Chemical laboratory test data</td><td>5 days</td></tr><tr><td colspan="4">* Maximum period in working days between completing exploratory hole (including installing, but not commissioning, instruments) or completing test (as applicable), and submitting preliminary digital data.</td></tr></table>	In-situ test data	Automated recording	1 day	No interpretation (if specified) of in-situ data in preliminary digital data.	Manual recording	3 days	Laboratory test data	Geotechnical test	3 days		Geoenvironmental test	3 days	Monitoring	Automatic logging	1 day		Manual logging	3 days		Geotechnical laboratory test data		3 days		Chemical laboratory test data		5 days	* Maximum period in working days between completing exploratory hole (including installing, but not commissioning, instruments) or completing test (as applicable), and submitting preliminary digital data.			
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S1.24.15 Data submissions (Clause 17.4.4)	As specified in the UK Ground Investigation Specification. Geoenvironmental laboratory testing data to be provided in a single spreadsheet once all testing complete. The digital data provided by the Contractor with the Factual Report is required to be complete and a total replacement of any previous preliminary data submissions.																														
S1.24.16 Timing for submission of digital information files (Clause 17.4.5)	As specified in the UK Ground Investigation Specification. Requirements for the timing of the supply of electronic information (including draft logs, monitoring data, laboratory test schedules) are specified in the relevant Schedules herein. Attention is drawn to the Specification requirement for sequential numbering of data transmittals.																														
S1.24.17 File transfer (Clause 17.4.6)	As specified in the UK Ground Investigation Specification. Electronic information including digital data (if any) shall be transmitted using a secure non-public electronic transmission system, which shall be subject to the approval of the Investigation Supervisor. Where hyperlinks to access/download electronic information are provided via email, the Contractor shall send each email notification to the Investigation Supervisor and also to any other email recipients named by the Investigation Supervisor.																														

Schedule 2 – Exploratory Holes

Hole Number (reference)	Type	Scheduled depth	National Grid Reference		Approximate ground level/ surface	In situ testing	Remarks
			Easting (m)	Northing (m)			
BH01	Cable Percussive	Refusal or 25m	275484	189212	Grassed area adjacent to a footpath by the river	Geotechnical and Geo-environmental sampling SPTs to be undertaken	BH to be undertaken using a rig capable of reaching the rockhead or competent material. Access via the footpath off Darwin Road. Limited level area for the works with the potential for the extent of the works to obstruct the pedestrian footpath. Therefore, pedestrian management may be required. If the borehole cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative location to be agreed with the investigation supervisor.
BH02	Cable Percussive	Refusal or 25m	275552	189201	Hard surface (concrete) between the road and river level	Geotechnical and Geo-environmental sampling SPTs to be undertaken	BH to be undertaken using a rig capable of reaching the rockhead or competent material. Access via the Riverside Road. If the borehole cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative location to be agreed with the investigation supervisor.
WS01	Cable Percussive	5m or refusal	275548	189213	Riverbed (Clayey silt)	Geotechnical and Geo-environmental sampling SPTs to be undertaken	WS to be undertaken using small tracked dynamic sampling rig, capable of reaching the required depth. Access via the shallower riverbank to the North, Drawing 2. Risk of soft deposits on the riverbed so an assessment of the risk to machinery and personnel should be undertaken.

							If WS cannot be undertaken at the location due to the site conditions and constraints the Contractor should propose an alternative method to be agreed with the Investigation Supervisor. If WS cannot be undertaken at the location due to the site conditions and constraints the Contractor should propose an alternative method to be agreed with the Investigation Supervisor.
WS02	Cable Percussive	5m or refusal	275540	189196	Riverbed (Clayey silt)	Geotechnical and Geo-environmental sampling SPTs to be undertaken	WS to be undertaken using small tracked dynamic sampling rig, capable of reaching the required depth. Access via the shallower riverbank to the North, Drawing 2. Risk of soft deposits on the riverbed so an assessment of the risk to machinery and personnel should be undertaken. If WS cannot be undertaken at the location due to the site conditions and constraints the Contractor should propose an alternative method to be agreed with the Investigation Supervisor.
HHTP01	TP (Hand excavated)	0.5m	275519	189206	Riverbed (Clayey silt with gravels)	Geo-environmental sampling	If a trial pit cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative method to collect shallow ground samples for geoenvironmental testing to be agreed with the investigation supervisor. Any obstructions should be noted with a record of the size, depth and location, which should be passed onto the Investigation Supervisor to inform the potential obstruction risk to the proposed sheet piling. Risk of soft deposits on the riverbed so an assessment of the risk to personnel should be undertaken.
HHTP02	TP (Hand excavated)	0.5m	275541	189205	Riverbed (Clayey silt)	Geo-environmental sampling	If a trial pit cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative method to collect shallow ground samples for geoenvironmental testing to be agreed with the investigation supervisor. Any obstructions should be noted with a record of the size, depth and location, which should be passed

							onto the Investigation Supervisor to inform the potential obstruction risk to the proposed sheet piling. Risk of soft deposits on the riverbed so an assessment of the risk to personnel should be undertaken.
HHTP03	TP (Hand excavated)	0.5m	275515	189191	Riverbed (Structural Slag with clayey silt)	Geo-environmental sampling	If a trial pit cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative method to collect shallow ground samples for geoenvironmental testing to be agreed with the investigation supervisor. Any obstructions should be noted with a record of the size, depth and location, which should be passed onto the Investigation Supervisor to inform the potential obstruction risk to the proposed sheet piling. Risk of soft deposits on the riverbed so an assessment of the risk to personnel should be undertaken.
HHTP04	TP (Hand excavated)	0.5m	275531	189167	Riverbed (Clayey silt)	Geo-environmental sampling	If a trial pit cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative method to collect shallow ground samples for geoenvironmental testing to be agreed with the investigation supervisor. Any obstructions should be noted with a record of the size, depth and location, which should be passed onto the Investigation Supervisor to inform the potential obstruction risk to the proposed sheet piling. Risk of soft deposits on the riverbed so an assessment of the risk to personnel should be undertaken.
SW01	Surface Water Sample	N/A	275542	189224	River Afan	Geo-environmental sampling	Water sample from the River Afan upstream of proposed works area to establish baseline conditions. Sample to be taken from a safe access point upstream identified by the Contractor. Three rounds of sampling proposed (fortnightly intervals, post completion of the fieldwork), with a

							view to reduce to two rounds based on the sampling findings.
SW02	Surface Water Sample	N/A	275517	189148	River Afan	Geo-environmental sampling	Water sample from the River Afan downstream of proposed works area to establish baseline conditions. Sample to be taken from a safe access point downstream identified by the Contractor. Three rounds of sampling proposed (fortnightly intervals, post completion of the fieldwork), with a view to reduce to two rounds based on the sampling findings.
SW03	Surface Water Sample	N/A	275494	189182	Western Outfall	Geo-environmental sampling	Water sample from the western outfall into the River Afan to establish baseline conditions. Sample to be taken from a safe access point identified by the Contractor. Three rounds of sampling proposed (fortnightly intervals, post completion of the fieldwork), with a view to reduce to two rounds based on the sampling findings.
SW04	Surface Water Sample	N/A	275544	189185	Eastern Outfall	Geo-environmental sampling	Water sample from the eastern outfall into the River Afan to establish baseline conditions. Sample to be taken from a safe access point identified by the Contractor. Three rounds of sampling proposed (fortnightly intervals, post completion of the fieldwork), with a view to reduce to two rounds based on the sampling findings.
SEIS01	Seismic Refraction (S-wave)	N/A	Start:275469 End: 275579	Start:189218 End:189184	Level - Varied Multiple types (Grass, River Afan and hard surface)	None	Line Length 120m.
	Additional notes:						

Schedule 3 – *Investigation Supervisor's Facilities*

S3.1 Accommodation	Not required.
S3.2 Furnishings	Not required.
S3.3 Services	Not required.
S3.4 Equipment	Not required.
S3.5 Transport	Not required.
S3.6 Personal Protective Equipment for <i>Investigation Supervisor</i>	Not required.

Schedule 4 – Specification amendments

The below clause amendments are designed to improve ground investigation quality and protect NRW as an organisation they must not be removed or edited without authorisation by the framework manager.

The following clauses are amended			
Section Number	Clause Number	Delete the following	Substitute the following
3	3.6	Investigation Supervisor	<i>Employer Immediately</i>
Revised clause 3.17 Any damage, or claim by owners or occupiers for compensation for damage, shall be reported to the <i>Employer</i> immediately.			
All	-	PAS 128:2014	PAS 128:2022

Schedule 5 – Specification additions

The below clauses are designed to improve ground investigation quality and protect NRW as an organisation they must not be removed or edited without authorisation by the framework manager.

The following clauses are added to the Specification amended		
Section Number	Clause Number	Clause wording
2	2.37	The term Bill of Quantities has the same meaning as the term Price List.
3	3.4.1.1	The <i>Contractor</i> shall ensure that each day the site is left in a safe condition and shall at all times undertake his work in a safe manner. The <i>Contractor</i> shall return to an exploratory hole to backfill if the initial backfilling is not to the satisfaction of the <i>Investigation Supervisor</i> or <i>Employer</i> .
3	3.4.2.1	In delivering the Works the <i>Contractor</i> shall comply with the latest version of NRW's Safe Construction Code of Practice.
3	3.5.9	The <i>Contractor</i> shall report to the <i>Employer</i> any information recorded during site visits or the Works which could be relevant to the health and safety of any person visiting or working on the site in the future.
3	3.5.10	The <i>Contractor</i> shall work within the requirements of any Environmental Action Plan (EAP), and shall report immediately any environmental incidents to the <i>Employer</i> .
3	3.5.11	The <i>Contractor</i> shall work within the requirements of any Written Scheme of Investigation (WSI), and shall report immediately any Archaeological or heritage incidents to the <i>Employer</i> .
3	3.6.11	In line with NRW's core purpose and its Wellbeing Objectives NRW places considerable emphasis on providing first class service for the people of Wales and the protection of its enviros. NRW places a high expectation on its <i>Contractor's</i> in terms of their environmental performance and interaction with the general public. As such the <i>Contractor</i> shall at all times act in a professional manner when interacting with the general public.
3	3.8.9	Any services which have been damaged during the Works must be fully repaired. The cost of repair shall be borne entirely by the <i>Contractor</i> . A photographic record of all repair work carried out must be maintained. This record shall be made available to the <i>Investigation Supervisor</i> upon request.
7	7.8.1	Trial pit description to include depths and details of any 'loose' ground and or voids, emission of gas, water, foul air or other service related occurrences.
8	8.10.2.1	The <i>Contractor</i> shall be responsible for the collection and subsequent delivery (to the appropriate laboratory or storage facility) of all site won samples taken as part of the Works unless otherwise directed by the <i>Investigation Supervisor</i> .
17	17.3.1.1	Any Report produced shall include a section detailing any information recorded during the Works which could be relevant to the health and safety of any person visiting or working on the site in the future.

The following Schedule 5 annexes are used:

- Annex A1: Thin-wall and piston sampling
- Annex A3: Dynamic sampling (window/windowless sampling)
- Annex H: Ground investigation on potentially contaminated land

- Annex G: Geo-environmental testing suites
- Annex I: Interpretative reporting
- Annex J: Digital data
- Annex L2: Seismic refraction surveying

SCHEDULE 5 ANNEX A1 – THIN-WALL AND PISTON SAMPLING

A1 Thin-wall and piston sampling

Thin-walled sampling and piston sampling shall be carried out in accordance with BS 5930 Section 25.4 and this Schedule 5 Annex A1.

The object of the sampling shall be to obtain Class 1 samples that are as undisturbed as possible.

A1.1 Sampling equipment

The sampling equipment shall be subject to the advance approval of the Investigation Supervisor. The Contractor shall state in its Tender return the make and type of sampler the Contractor proposes to use. The Contractor shall also state in its Tender return the range of soil strengths in which the system proposed can be used.

Sample tubes shall be of a minimum length of 600mm and shall have a minimum internal diameter of 100mm. Tubes shall be made of steel or aluminium. Plastic lining tubes shall not be used in substitution for steel or aluminium sampling tubes. Tubes shall have a sharp cutting edge and provide suitable inside clearance.

The interior of each sample tube shall be smooth, clean and resistant to corrosion. The cutting edge and the ring seals of the sampler (if any) shall be inspected for wear or evidence of any damage and rejected if worn or damaged. The interior face of the tube shall be parallel and the area ratio (as defined in BS 5930) of the tube shall lie in the range 10% to 15%.

Before use, the tube shall be lightly coated inside and out with either petroleum jelly or vegetable oil.

A check shall be made by the Contractor that the various moving parts of the sampler function freely before the sampler is lowered into the borehole.

A1.2 Supervision

When in use, the sampler (whether piston sampler or thin-wall sampler) shall be under the direct full-time supervision of an experienced technical assistant from the Contractor's staff who is fully experienced in its use ("the Contractor's sampler specialist"). The rig operator may take the role of Contractor's sampler specialist if suitably experienced in the sampling technique involved.

A curriculum vitae (CV) for the Contractor's sampler specialist shall be provided to the Investigation Supervisor for approval by the Investigation Supervisor prior to the commencement of the Investigation. The submitted CV shall provide details of recent experience in the use of the relevant sampling method.

A1.3 Pushing the sampler

A1.3.1 General

For piston sampling and for thin-wall sampling, accurate measurements of the depth from which each sample is recovered, the length of sampling stroke and the length of sample recovered shall be made and recorded.

If an obstruction is met, the sampler shall be withdrawn and another sample taken when the obstruction has been removed. Immediately on completion of the sample stroke, the sampler shall be withdrawn from the ground and the sample tube shall be separated from the sampler.

Precautions shall be taken to ensure that there is no movement of the sample inside the sample tube or other mechanical disturbance. Any distortion or damage of the sampling tube greater than 1mm shall be noted.

A1.3.2 *Pushing the piston sampling*

The Contractor shall push the sampler down to the intended sampling level if this is practical. The sampler shall be advanced a minimum of 300mm below the bottom of the boring before sampling commences. The sampler shall be pressed down smoothly and continuously whilst the piston is firmly secured so that it remains stationary. The tubes shall be advanced into the soil by hydraulic means in a continual push over a period of between 10 minutes and 30 minutes. The time taken shall be recorded. The sample tube shall be left in the ground for a further 5 minutes and then withdrawn vertically without any rod rotation. Rod rotation shall not be used to shear the sample base.

A means for measuring the exact penetration of the tube and the maximum thrust achieved shall be provided and used.

A1.3.3 *Pushing the thin-walled sampling*

The base of the borehole shall be carefully cleaned out prior to sampling.

The tube shall be advanced into the ground from the base of the borehole by hydraulic means in a continual push. The time taken to advance the tube shall be recorded. The tube shall be progressed beyond the base of the borehole so that the majority of the sample is taken from ground unaffected by drilling induced disturbance. The sample tube shall be left in the ground for 5 minutes and then withdrawn vertically without any rod rotation. Rod rotation shall not be used to shear the sample base.

A means for measuring the exact penetration of the tube and the maximum thrust achieved shall be provided.

A1.4 *Sealing of samples*

Careful precautions shall be taken to ensure that there shall be no change in the water content of the sample after it is obtained.

A small amount of melted low melting point wax shall be poured over each end of the sample and a wax sealing disc laid in the wax within 30 minutes of the sample being removed from the ground. When that wax has stiffened, more wax shall be added to complete the seal. Any space between the wax and the ends of the sample tubes shall be packed and secure end caps fitted. The sample shall be clearly labelled with the project name, hole number, sample number and sample depth. The top of the sample shall be clearly labelled.

A1.5 *Written records*

The Contractor's sampling specialist shall complete a record sheet for the samples, which shall be submitted with the driller's daily record sheet. At a minimum, the record sheet shall tabulate for each sample:

- exploratory hole
- sample number
- sample type (distinguishing between piston and others)
- sample depth

- length of sample stroke
- length of sample recovered
- time taken to progress tube
- maximum thrust
- depth to base of exploratory hole
- depth of casing
- depth to water
- hand vane result at top of sample (if specified: see Schedule S1.15.3)
- hand vane result at base of sample (if specified: see Schedule S1.15.3)
- notes (for example, type of lubricant used, obstructions, sample disturbance, water added, as so forth).

A1.6 Storage and transportation of samples

Immediately after sealing, each sample tube shall be placed upright in stout wooden boxes suitably divided and provided with resilient packing to prevent movement and damage of the samples during transportation to the laboratory.

The boxes shall be labelled and handled to keep the samples upright until they are removed from the boxes for testing.

Care shall be taken at every stage of transportation and storage to ensure that the boxes containing the samples are protected from jarring, vibration and excessive temperature changes.

SCHEDULE 5 ANNEX A3 – DYNAMIC SAMPLING (WINDOW / WINDOWLESS SAMPLING)

A3 Dynamic sampling (window / windowless sampling)

A3.1 General requirements

Dynamic sampling (specifically, window sampling or windowless sampling in accordance with Schedule 2) shall be carried out at the locations specified in Schedule 2. The requirements of Clause 4.6 and this Annex A3 shall apply.

Where underground services and/or hard strata may be present at or near the surface, an inspection pit of sufficient size for locating and avoiding of underground services shall be dug. The materials excavated and the depth of the inspection pit shall be recorded on the dynamic sampler log.

When working on a slope, a bench may be cut into the slope to facilitate dynamic sampling. The materials excavated and the depth of the bench shall be recorded on the dynamic sampler log.

The dynamic sampler equipment shall be capable of sampling through the soil strata types listed in Schedule S1.6 to the relevant scheduled hole depths specified in Schedule 2. The Contractor is responsible for selecting and using the appropriate type of dynamic sampler rig (whether hand-held, tracked rig, or other) commensurate with, at a minimum, the specified penetration depth, anticipated ground conditions, and site access.

The dynamic sampler system shall be capable of carrying out standard penetration testing (SPT) in accordance with BS EN ISO 22476-3.

The dynamic sampler shall produce a continuous (or near continuous) sample for immediate visual examination and photography. Provision shall be made for disturbed sub-samples to be extracted for subsequent laboratory testing.

For window sampling only: the sampling probe shall have a 'window' down one side to allow visual examination and photographing of the soil sample recovered prior to the removal of any disturbed samples required.

For windowless sampling only: the sampling probe shall not include a window. Samples shall be retrieved within a suitably robust plastic liner deployed inside the dynamic sampler.

The system shall utilise a high frequency percussion hammer to drive the sampling probes into the ground, whilst soil passes into the sampling probe. Penetration rates, for each 1m-long run, during driving shall be recorded to provide additional indicative information about driving resistance.

Probes of 1m- and 2m-lengths and various diameters shall be available to address the expected range of ground conditions (refer to Schedule S1.6). Sample tubes of length greater than 2m shall not be used. In any hole, successive sampler runs may be driven in a sequence of decreasing diameters until the required depth is reached. A plastic casing may be installed to allow the hole to progress through collapsing ground if this is agreed with the Investigation Supervisor in advance. Care shall be taken to determine whether any collapse of the hole has occurred at depth after recovering of the preceding run. Where collapse has occurred, this shall be recorded. The subsequent run shall be driven from the top of the collapsed section for a maximum depth equal to the length of the sample tube. On no account will overdriving be permitted.

On reaching the specified termination depth for the hole, the driving hammer shall be removed and the sampling probe jacked out using hydraulic jacking equipment. Mechanical jacking equipment may be used if agreed with the Investigation Supervisor in advance.

A3.2 Dynamic sampler photographs

Colour photographs of the retrieved samples from the dynamic sampler shall be taken for each 1m of sampler run. Successive samples may be photographed together, so as to fill a photographic frame, provided each run follows in sequence and can be individually identified by suitable labelling. The camera settings shall be such that the entire sample is in focus. The requirements of Clause 3.25 apply.

For window sampling: the photograph shall be taken at the window side.

For windowless-sampling: the plastic liner shall be split in half longitudinally to allow photography.

Each sample run shall be photographed against a matt grey background and with a clearly legible notice giving the following information:

- contract title
- Contractor
- exploratory hole number
- date
- depth below ground level of top and bottom of sample
- scale bar, graduated in decimetres
- colour chart.

A3.3 Sub-sampling and testing

Immediately after extraction and photographing, sub-sampling and testing shall be undertaken on the dynamic sampler core.

Unless specified otherwise in Schedule 1, the following testing and sampling shall be undertaken, in the following sequence of priority, on each dynamic sampler core:

- strength measurement by hand penetrometer shall be undertaken at 0.25m spacing in cohesive (fine-grained) soils;
- a suite of samples for contamination testing purposes (where container types per suite are as defined in Schedule S1.15.11) shall be taken from each stratum or at 1m centres if the stratum is thicker than 1m;
- a disturbed sample shall be taken from stratum or at 1m centres if the stratum is thicker than 1m;
- a bulk sample shall be taken from each stratum.

A3.4 Installations and reinstatement

Where installations are required in dynamic sampler holes:

- the requirements for groundwater installations in dynamic sampler holes shall be as specified in Schedule 2 and Schedule 5 Annex B1;
- the requirements for gas monitoring installations and for combined gas-and-groundwater installations in dynamic sampler holes shall be as specified in Schedule 2 and Schedule 5 Annex H.

Where no installation is required in a dynamic sampler hole, the hole shall be backfilled immediately after its completion. The hole shall be backfilled with bentonite cement grout except

that: bentonite pellets may be used if agreed in advance with the Investigation Supervisor; and in coarse-grained (non-cohesive) strata overlying the highest cohesive stratum, arisings from the same non-cohesive strata material may be used as backfill.

All benches and starter pits shall be reinstated. A method statement for reinstatement shall be submitted to the Investigation Supervisor before starting the first dynamic sampler hole.

A3.5 Records and reporting for dynamic sampling

The Contractor shall provide a daily record (Clause 2.22) for each dynamic sampling hole. A copy of each daily record shall be submitted to the Investigation Supervisor at the beginning of the next working day.

Preliminary logs for dynamic sampler holes shall be prepared and issued in accordance with Clause 16.1 of the Specification.

Logging of dynamic sampler holes shall be carried out by an experienced geotechnical engineer or engineering geologist. Each dynamic sampler log shall include:

- all details marked ✓ and (✓) for ‘dynamic probing’ specified in Clause 13.2 and Clause 16.2.2 of the Specification and:
- details of the penetration time for each 1m run
- length of each dynamic sample run
- recovery in each dynamic sample run
- results of any hand penetrometer tests
- observations on the stability of the hole.

Digital data for dynamic sampler holes shall be supplied in accordance with the requirements of Schedule S1.21, as applicable. Dynamic sampler holes shall be treated as boreholes for the purpose of AGS records.

SCHEDULE 5 ANNEX H – GROUND INVESTIGATION ON POTENTIALLY CONTAMINATED LAND

H1 Definitions

Potentially contaminated land: the term ‘potentially contaminated land’ shall mean that land designated as such in the Specification. This land may contain substances which could give rise to hazards likely to affect human health, the natural environment or the proposed development.

Contamination ground investigation: the term ‘contamination ground investigation’ shall mean those parts of the Investigation that are undertaken on potentially contaminated land to obtain information on the contamination of the ground.

Hygiene facility: the term ‘hygiene facility’ shall mean designated washing and other specific facilities as described in Schedule S1.8.17.

Sampling well: the term ‘sampling well’ shall mean groundwater sampling standpipes and combined gas and groundwater sampling standpipes from which groundwater samples are taken for the contamination ground investigation.

H2 General requirements

H2.1 Potentially contaminated land

The presence and nature of the known areas of potentially contaminated land are noted in Schedule S1.8.5 and shown on the Drawings as far as available records permit. If evidence of further potentially contaminated land is encountered the Contractor shall cease affected work and inform the Investigation Supervisor immediately. The Contractor shall agree a revised method of working appropriate to the nature and level of hazards encountered, with the Investigation Supervisor and any regulatory authority concerned.

H2.2 Working on potentially contaminated land

The Contractor shall take the necessary precautions to control and secure the site operations on potentially contaminated land. Access to and egress from such land shall be via a single designated point where a hygiene facility for personnel and a wheel wash facility for equipment shall be provided as defined in Schedule S1.8.17. The main site office and messing facilities shall be located outside the potentially contaminated land.

If appropriate, arisings from exploratory holes shall be placed on heavy-gauge polyethylene sheeting and/or boards and covered in wet or windy weather so as to prevent the spread of contamination, or placed in covered skips.

At the end of the working day any exploratory hole not backfilled shall be securely covered and fenced so as to prevent human or animal access.

The Contractor shall dispose of all surplus excavated material in accordance with current waste disposal legislation.

H2.3 Statement of work (including safety plan)

Not less than 14 days before the start of site operations on potentially contaminated land the Contractor shall submit to the Investigation Supervisor a *statement of work* describing in full the arrangements and methods the Contractor proposes to adopt in carrying out the site operations

including full details of safety precautions. In addition, the statement of work shall incorporate a safety plan that includes, but is not limited to, the following:

- Specification for personal protective equipment to prevent ingestion of inhalation of and skin contact with contaminated materials.
- Details of decontamination facilities.
- Statement of safe working practices which will be employed to avoid or minimise contact with contaminated materials.
- Details of health and safety training undertaken by all levels of the work force.
- A schedule for each potentially contaminated area giving the name, organisation, specialism, availability, location and proximity of specialist health and safety expertise within the Contractor's organisation and externally.

Except as provided for in Section H2.4 of this Annex H, the Contractor shall not subsequently amend the statement of work or any working practice or procedure contained therein without the prior consent of the Investigation Supervisor.

H2.4 Liaison with authorities

Not required except where otherwise specified in Schedule 1 and as required to meet the Contractor's legal obligations including notifications.

H2.5 COSHH assessment

Not less than 7 days before to the start of site operations on potentially contaminated land, the Contractor shall provide to the Investigation Supervisor for information a copy of the Contractor's COSHH statement relating to the site operations.

H2.6 General safety precautions

On potentially contaminated land, the Contractor shall comply with the safety requirements of *Protection of workers and the general public during the development of contaminated land* (HSE, 1991) and follow the safety guidance in Annex C of BS 10175 *Investigation of potentially contaminated sites - Code of practice* and in *Guidelines for the safe intrusive activities on contaminated or potentially contaminated land* (BDA, 2008). In addition, the following minimum requirements shall apply in addition to any other requirements stipulated in Schedule 1:

- Site personnel shall wear protective overalls, safety hat, safety boots, gloves and/or barrier cream and eye protection where appropriate. Any protective clothing and footwear shall be removed at the hygiene facilities before leaving the potentially contaminated land.
- Dust masks of suitable efficiency and artificial respiratory equipment shall be available on site for the duration of the site operations on potentially contaminated land.
- Instructions for use of safety equipment shall be prominently displayed and at least one member of the Contractor's staff who is conversant with the use of the safety equipment shall be on site at all times during working hours.
- An adequate range of appropriate first aid facilities shall be provided.
- Adequate washing facilities shall be provided at the hygiene facilities.

- Activities that involve hand-mouth contact, such as eating and smoking, shall not be permitted on potentially contaminated land.
- No naked flames or other ignition sources shall be allowed on potentially contaminated land.
- Only suitably trained personnel shall be permitted to work in confined spaces or in excavations. Health and Safety Executive Guidance Note GS5 *Entry into confined spaces* shall be adhered to strictly.
- The Contractor shall make adequate provision of both staff and equipment to undertake rescue should an incident occur. The Contractor shall inform the local hospital of the type of work in progress and the potential type of injuries.

The above-stated requirements are not exclusive and do not remove from the Contractor any obligations to conform to statute.

H3 Rotary drilling

On potentially contaminated land, the Contractor shall take all necessary precautions to contain the drilling fluid returns in order to prevent at-surface contamination.

H4 Pits and trenches

Trial pits and trenches on potentially contaminated land shall be excavated by machine only. Observation pits and trenches on potentially contaminated land shall be excavated by machine, unless specified in Schedule 2 to be hand-dug. All safety precautions as required under Section H2.6 of this Annex H shall be followed before and during personal entry into observation pits and trenches.

Pits and trenches shall be examined and described by a geotechnical person meeting the requirements of Clause 2.3(c) of the Specification. Ground from potentially contaminated land shall be described by an environmental or geotechnical person, as appropriate, meeting the requirements of Clause 2.3(c) of the Specification.

Unless specified otherwise, backfill to trial pits and trenches on potentially contaminated land shall comprise the solid arisings which shall be placed at the same depth and location from which they originated. Any deficit in fill material at a particular level shall be made up with inert material having a coefficient of permeability of less than 1×10^{-5} m/sec as placed.

H5 Sampling for contamination ground investigation

H5.1 General

Solid and liquid samples for contamination testing shall be taken under the supervision of an environmental scientist meeting the requirements of Clause 2.3(c) of the Specification.

The size and type of samples and containers, method of sampling and time limitations for carrying out specific analyses shall be commensurate with the range of tests to be carried out as specified in Schedule 1.23.

The Contractor shall take all steps necessary to avoid cross contamination of sampling points. The Contractor shall take samples which are representative of each of the materials encountered. Specific requirements for sample containers are detailed in Schedule S1.15.11.

H5.2 Solid samples

Solid samples for the contamination ground investigation may be of any type covered by Clauses 8.7.3 to 8.7.9 inclusive of the Specification and may be taken from boreholes, trial pits and trenches, observation pits and trenches, as specified.

The requirements of Section 8.3.2 of BS 10175 apply to all solid samples. When collecting soil samples for the determination of volatile compounds, the sampling technique employed shall minimise the loss of volatiles and the requirements of BS 10176 shall apply.

Samples shall be as representative as possible of the zone or material of interest at the location and depth being sampled. Samples shall be free from debris which has fallen into the hole from shallower depths. Sample tubes and split spoon samplers used for recovering material for contamination testing shall be washed with clean water immediately before use to minimise the potential for cross contamination.

Small disturbed samples shall be taken with clean stainless steel hand tools and placed in rigid containers made of a material that is non-reactive with the likely contaminants. The containers shall be filled to the brim to effectively exclude air.

As a minimum suites of solid samples shall be taken as follows, except where specified otherwise in Schedule S1.15:

- The first solid sample suite shall be taken at varying depths between the surface and 0.3m. Subsequent samples should occur at approximately 1.0m intervals thereafter as required; and
- A solid sample suite shall also be taken where colour, odour or consistency indicate a change in the nature of the strata and/or the potential presence of contamination.

Solid samples shall be taken by the environmental scientist from the investigation position at the time of excavation. Sub-sampling from bags or from excavations left open for sampling is not permitted unless explicitly agreed in advance with the Investigation Supervisor.

H5.3 Water samples

Unless specified otherwise herein, samples of groundwater shall be taken from each exploratory hole at the frequency specified on Clause 12.3.1 of the Specification.

The requirements of Section 8.3.3 of BS 10175 apply to all water samples.

The following general requirements for water sampling shall be implemented, unless agreed otherwise with the Investigation Supervisor:

- The sampling equipment and procedures used shall allow discrete depth sampling and shall cause minimum disturbance to the physical or chemical condition of the water.
- Field tests and measurements as specified in Section H6.4 of this Annex H shall be carried out on all water samples.
- Depending on the suite of chemical or biological tests to be undertaken, several sub-samples of water may be required, using different types and sizes of container. Water samples shall be chemically fixed with an appropriate agent where necessary. Unless otherwise specified by the Investigation Supervisor, water samples shall be filtered through a 0.45 micron membrane filter on site before any preservation fixing agents or techniques are applied.
- Sufficient water samples shall be taken to allow laboratory testing of the parameters and to the detection limits detailed in Schedule S1.23. Any additional specific requirements are detailed in Schedule S1.23.

- Care shall be taken to ensure that no cross-contamination occurs either during extraction of the water sample from the sampling well (or water body) or whilst the sample is stored and handled prior to analysis.
- Testing for BOD, COD and ammoniacal nitrogen shall be started within 24 hours.

If NAPL is present, the water sampling requirements of Schedule S1.16.27 apply. If NAPL is not present sampling shall be undertaken as follows:

- The first round of water samples shall be collected at least one week after well development.
- Samples should be collected from the middle of the response zone or saturated response zone where only partially saturated.
- Water quality parameters including pH, conductivity levels, temperature, dissolved oxygen, turbidity and redox potential shall be monitored using a flow cell (low flow groundwater sampling) and groundwater sample collection shall not occur until water quality parameters have stabilised or until a maximum purging period (one hour) has elapsed.
- Water should be pumped for an initial minimum period of 10 minutes before a reading is taken.
- Readings should then be taken every 2.5 to 5 minutes and can be adjudged stable if variation is less than or equal to the values below over three consecutive readings:
 - Turbidity 10%
 - Dissolved Oxygen 10%
 - Temperature 3%
 - pH ± 1 unit
 - Oxidation/ Reduction ± 10 millivolts
 - Specific conductance 3%

H5.4 Gas and vapour samples

Samples of gas and/or vapour for analysis shall be obtained from exploratory holes and standpipes, as applicable, and shall be tested as specified in Schedule S1.23 or as directed by the Investigation Supervisor.

The gas/ vapour sampling method shall relate to the volume of gas/ vapour available and the type of laboratory analysis and shall be in accordance with Section 8 of CIRIA Report 131 *The measurement of methane and other gases from the ground* and Section 9.6 of BS 8576 *Guidance on investigations for ground gas*. The sampler receptacle for gas samples shall be airtight and may include lockable syringes, Tedlar bags, canisters or sorbent tubes. The sampler receptacle for vapour samples may comprise silonite canisters, sorbent tubes or passive sampling. Tedlar bags and Gresham cylinders are not suitable for vapour sampling.

Gas samples shall be not less than 0.075 litres in volume and shall be taken at the same time as in-situ gas concentration monitoring, gas emission rate and pressure measurements.

H5.5 Description of samples

All solid samples shall be examined and described in accordance with BS 5930 and BS EN 14688-1 by a geotechnical person meeting the requirements of Clause 2.3(c) of the Specification. Solid and liquid samples taken on potentially contaminated land shall be additionally described by an

environmental or a geotechnical person meeting the requirements of Clause 2.3(c) of the Specification, and the descriptions shall include colour and smell with reference to specific inclusions. Particular care shall be taken to describe the type and frequency of anthropogenic materials in Made Ground and fill materials.

H5.6 Labelling, protection and transportation of samples

All sample storage, labelling, preservation (including temperature control and protection from light) and handling shall be in accordance with BS 10175 and BS 5930.

Solid, liquid or gas samples suspected to be toxic or hazardous shall be tagged with a red label.

Samples shall be transported to the premises of the relevant test laboratory. The Contractor shall be responsible for the protection of all samples and for their transport, including loading and unloading.

All samples taken as part of the contamination ground investigation shall be placed in rigid, airtight, clean containers and labelled to indicate the site, exploratory hole, depth, date and time o'clock of sampling. Containers for water samples shall be opaque and shall be sufficiently robust to avoid being damaged during handling and transportation, and shall not react chemically with the sample. Containers for bacteriological sample collection shall be sterile.

H5.7 Disposal of samples

Subject to the requirements of Schedule S1.15.9, all untested samples and unused sample portions from potentially contaminated land shall be disposed of in accordance with current waste legislation.

H5.8 Quality control samples

Subject to the requirements of Schedule S1.19, quality control samples shall be collected.

Blind replicate samples: One or more sets of blind replicate samples (duplicates) shall be collected during the ground investigation. The number of samples will be agreed with the Investigation Supervisor. For soil, the duplicate samples shall be removed from the same sampling point in a single operate and divided into two vessels. These samples shall be submitted to the same laboratory as individual samples with no indication given that they are duplicates.

Trip blanks shall be used to detect cross-contamination of samples during transport. One trip blank shall be used per box used to contain the samples. Trip blanks shall consist of prepared vials transported to the field and then returned to the laboratory without being opened on site. The trip blanks shall accompany the field samples throughout the sampling and collection operation. They shall not be opened on site.

Field blanks shall be used to detect inconsistencies in the whole process from taking the sample until the analysis in the laboratory. A container or other collection medium, identical to the ones being used for the samples, shall be filled with soil. The container or other collection medium is sealed as for a sample from the project location, placed with the samples, and transported back to the laboratory. The blank shall then be analysed along with the collected samples.

H6 In-situ testing for contamination ground investigation

H6.1 Field tests on groundwater samples

The field tests and measurements specified in the following table shall be undertaken out on groundwater samples obtained for the contamination ground investigation from exploratory holes and from standpipes and piezometers during purging and sampling (Clause 12.3.2).

The date and time o'clock of sampling and carrying out the testing shall be recorded and reported.

TEST	UNITS	DETECTION LIMIT	DEGREE OF ACCURACY
pH	pH units	0.1	±0.1
Temperature	°C	0.1	±0.1
Dissolved oxygen	mgO ₂ /l	0.1	±0.1
Electrical conductivity	µS/cm	10	±2.0
Redox potential	mV	±1	±0.1

H7 Instrumentation for contamination ground investigation

Details of the specific installation depths for gas and combined gas-groundwater installations shall be instructed by the Investigation Supervisor via the protocol specified for groundwater installations in Schedule S1.16.3.

Requirements for the frequency of monitoring and sampling of gas and groundwater, as applicable, are specified in Schedule S1.17.

H7.1 Twin valve gas monitoring installations

Installations for monitoring gas concentration, pressure and gas flow velocity shall be installed in exploratory holes as specified in Schedule 2 and as instructed by the Investigation Supervisor. The installations shall be as described herein and on Figure H1. As-installed dimensions and depths shall be recorded.

The standpipe shall consist of uPVC tubing (conforming to BS 3506 Class D) or HDPE tubing (conforming to BS EN 12201 type PE 100) and shall be not less than 50mm in diameter.

The base of the tubing shall be capped and the tubing shall be perforated or slotted to provide an open area of between 10% and 15% of the surface area of the tubing. Holes shall not be greater than 5mm in diameter and slots shall not be greater than 5mm width.

The filter shall be pea gravel, or similar material, as approved by the Investigation Supervisor, 6mm to 10mm in diameter. The pea gravel shall be quartz based and shall have been washed prior to use. Where the depth of the exploratory hole is greater than the depth to which the filter and tubing are to be installed then the exploratory hole shall be backfilled below the base of the filter with cement/bentonite grout and a 1m plug of cement/bentonite paste in bags, or compressed bentonite pellets, in accordance with Clause 6.1.2 of the Specification. If compressed bentonite pellets are used as an alternative to grout balls they shall be partially saturated before being added to the borehole, and further clean water added to the borehole to complete saturation.

Simple standpipe response zones to be surrounded by pea gravel (where possible >0.3m gravel below the slotted section and >1m gravel above the slotted section), with a sand bridge (where possible to >0.3m above the gravel) and with a bentonite seal above and below the filter pack.

Sump section of standpipe to be included as instructed.

The standpipe slotted section shall be wrapped with a sewn fabric sleeve or stocking suitable for the materials encountered. The requirement should be discussed and agreed with the Investigation Supervisor but as a default a woven geotextile with pore size 90% finer than 180 microns may be adopted i.e. suitable for fine soils, unless otherwise directed.

The tubing with centralising devices attached at 2m intervals shall be lowered carefully down the exploratory hole to the level of the filter material, and the exploratory hole backfilled with pea gravel to the depth instructed by the Investigation Supervisor.

The top of the tubing shall be covered with a screw threaded plastic cap having two tap valves as indicated on Figure H1. One of the two tap valve assemblies shall have a quick fit compression fitting to enable a 5mm internal diameter tube to be suspended on the underside of the tap valve assembly. The tube shall be hung to within 1m of the groundwater level or to the base of the standpipe, whichever is the higher. Stainless steel or polypropylene tubing is suitable for most gases. Silicone, polyethylene and polyvinyl chloride tubing should not be used.

The Investigation Supervisor will specify the depth of unperforated tube at the top of the hole. The borehole shall be backfilled by a plug of cement/bentonite paste in bags, or compressed bentonite pellets, in accordance with Clause 6.1.2 of the Specification. The upper 0.7m shall be concrete. If compressed bentonite pellets are used they shall be partially saturated before being added to the borehole, and further clean water shall be added to the borehole to complete saturation.

Arrangements to prevent the ingress of surface water and to protect the top of the tubing and tap valves shall use a 150mm lockable stop cock cover which shall be set in a sufficiently stiff concrete mix standing slightly proud of the surrounding ground. Each gas standpipe shall be permanently labelled with a metal stamp or tag indicating the exploratory hole number and installation depth (or level). Protective fencing, where required, shall be as specified in Schedule S1.18.2.

The installation of gas installations shall be completed in a single day.

H7.2 Dual gas and groundwater sampling installation

Installations to allow both gas monitoring and groundwater sampling shall be installed in exploratory holes where indicated in Schedule 2, and as instructed by the Investigation Supervisor. The installations shall be as described herein and on Figure H2.

The details of the dual gas and groundwater sampling standpipe shall be as described in Section H7.1 of this Annex H. In addition, unless the installation is to be used for NAPL investigation, the standpipe slotted section shall be wrapped with a sewn fabric sleeve or stocking suitable for the materials encountered. The requirement should be discussed and agreed with the Investigation Supervisor but as a default a woven geotextile with pore size 90% finer than 180 microns may be adopted i.e. suitable for fine soils, unless otherwise directed. The slotted and wrapped section of pipe shall be surrounded by an inert filter material, as described in Section H7.1 of this Annex H.

H7.3 Discrete-depth groundwater sampling installation

Installations to allow discrete sampling of groundwater within a specific response horizon shall be installed in exploratory holes where indicated in Schedule 2, and as instructed by the Investigation Supervisor. The installations shall be as described herein and in Figure H3.

The installation details for discrete-depth groundwater sampling instruments shall be as specified in Section H.7.1 of this Annex H. In addition, an unslotted section of tubing with grout surround shall be formed above the response zone. The response zone shall be provided with well-formed bentonite seals above and below. The construction of the installation shall be such that cross-contamination from potentially contaminated surface strata is prevented.

The depth and length of the response zone shall be instructed by the Investigation Supervisor.

H7.4 Shallow groundwater sampling installation

Installations to allow discrete sampling of perched or shallow groundwater shall be installed in exploratory holes where indicated in Schedule 2, and as instructed by the Investigation Supervisor. The installations shall be as described herein and in Figure H4.

The installation details of the combined gas and groundwater sampling instruments shall be as described in Section H.7.1 of this Annex H. In addition, the slotted section shall be wrapped in a sewn fabric sleeve or stocking having a pore size of between 100 and 250 microns. The fabric

wrapping shall be to the approval of the Investigation Supervisor. The slotted and wrapped section of pipe shall be surrounded by an inert filter material, as described in Section H.7.1 of this Annex H. The top of the tubing shall be covered with a screw threaded plastic cap with a single valve. Suspended tubing is not required.

H7.5 Vapour sampling installation

Installations to allow sampling of vapour shall be installed in exploratory holes where indicated in Schedule 2, and as instructed by the Investigation Supervisor. The installations shall be as described herein and in Figure H5.

The installation details of the vapour sampling instruments shall be generally as described in Section H.7.1 of this Annex H, except that the standpipe shall preferably be narrow diameter (3mm to 10mm) but may be up to a maximum of 50mm in diameter. The bottom section of the standpipe (a maximum length of 1m, but typically 0.15m to 0.5m) shall be pre-slotted to target a depth specified by the Investigation Supervisor. The pre-slotted section shall comprise a metallic (e.g. stainless steel, copper) or nylon meshed tube. The remaining section of the pipe shall be unslotted and may be metallic (e.g. stainless steel, copper) or plastic.

Vapour observation wells shall be vapour specific and fully screened within the vadose zone. The length of the response zone and pipe material type shall be instructed by the Investigation Supervisor.

The slotted section of pipe shall be surrounded by an inert filter material, as described in Section H.7.1 of this Annex H. The remainder of the pipe shall be sealed with cement/bentonite paste in bags, or compressed bentonite pellets bentonite, while the upper 0.2m shall be concrete. The top of the pipe shall be sealed with a bung or similar.

H8 Laboratory testing for contamination ground investigation

For the contamination ground investigation, the laboratory shall work within the framework of suitable quality assurance scheme, for which approval in advance shall sought and obtained from the Investigation Supervisor.

Prior to undertaking any geotechnical testing on samples from potentially contaminated land a safe method of working shall be agreed with the Investigation Supervisor. This may include but is not limited to the safe storage and handling of all material.

The requirements and protocol for scheduling of geoenvironmental laboratory testing are specified in Schedule S1.23. It may be necessary to specify additional testing after the results of the initial tests are available.

H9 Reporting the contamination ground investigation

Draft results of the chemical analysis shall be provided to the Investigation Supervisor not more than 24 hours after they are available from the laboratory. The draft results of the chemical analysis shall be provided in electronic format using non-write protected Microsoft Excel® spreadsheets. Requirements for the final reporting of the results of the contamination ground investigation are specified in Schedule S1.24 of the Specification. Notwithstanding any requirements in Schedule S1.24 to provide contamination ground investigation data in digital format, the final results of the chemical analysis shall also be provided in electronic format using non-write protected Microsoft Excel® spreadsheets.

All test results for the contamination ground investigation shall be accompanied by an unambiguous description of sample preparation, extraction and analysis method used.

The Contractor shall provide the following additional details in the reporting for the contamination ground investigation (which shall be regarded as the data quality assessment report):

- The full analytical procedure for each parameter determined, including the detection limit and susceptibility to interference of the method and an appropriate reference to the method.
- Details of the chain of custody between sampling and analysis, including the time between sampling and analysis, storage procedures, procedures for quantifying analytical errors including data quality assessments and quality management procedures.

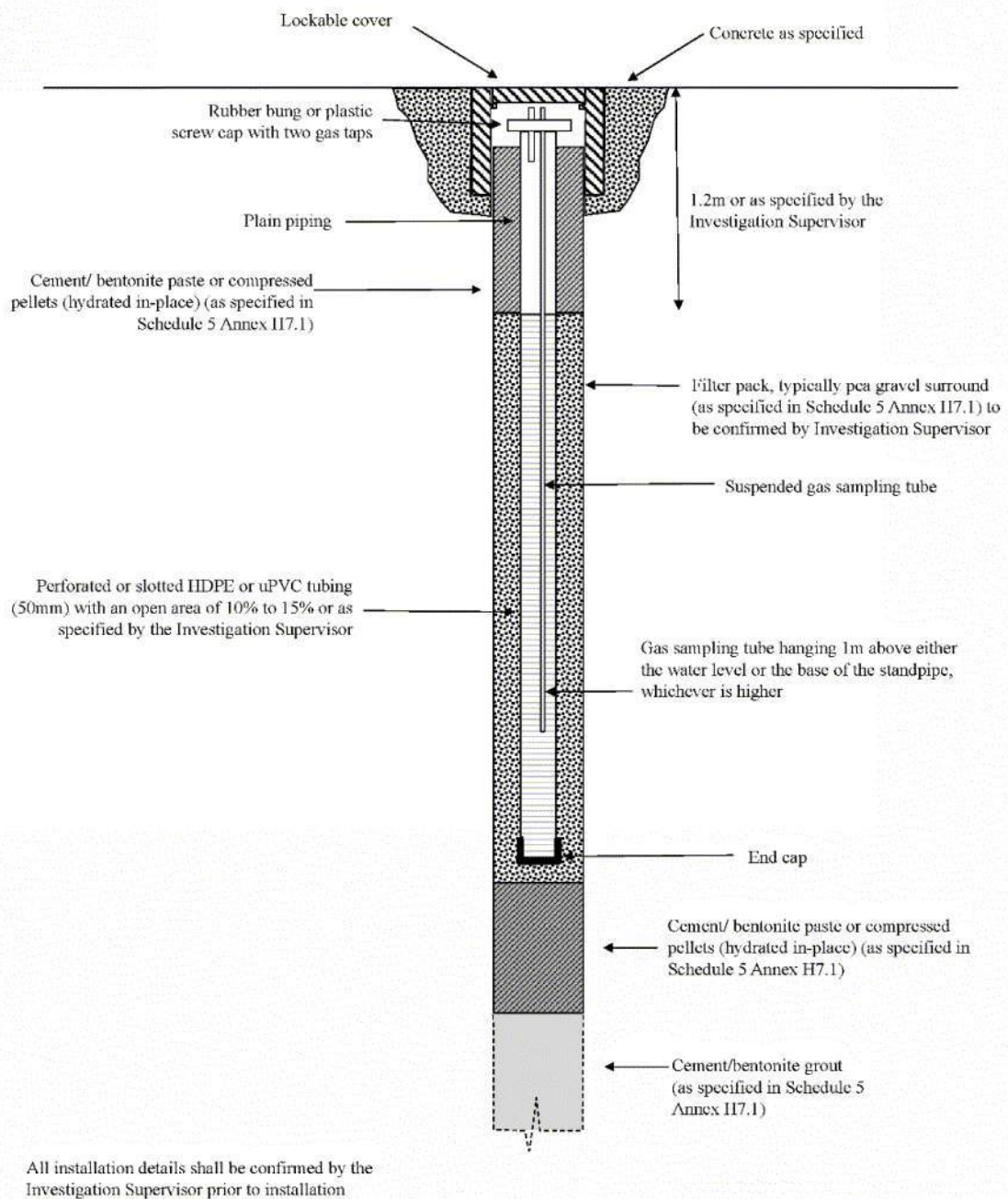


Figure H1 Gas monitoring installation detail

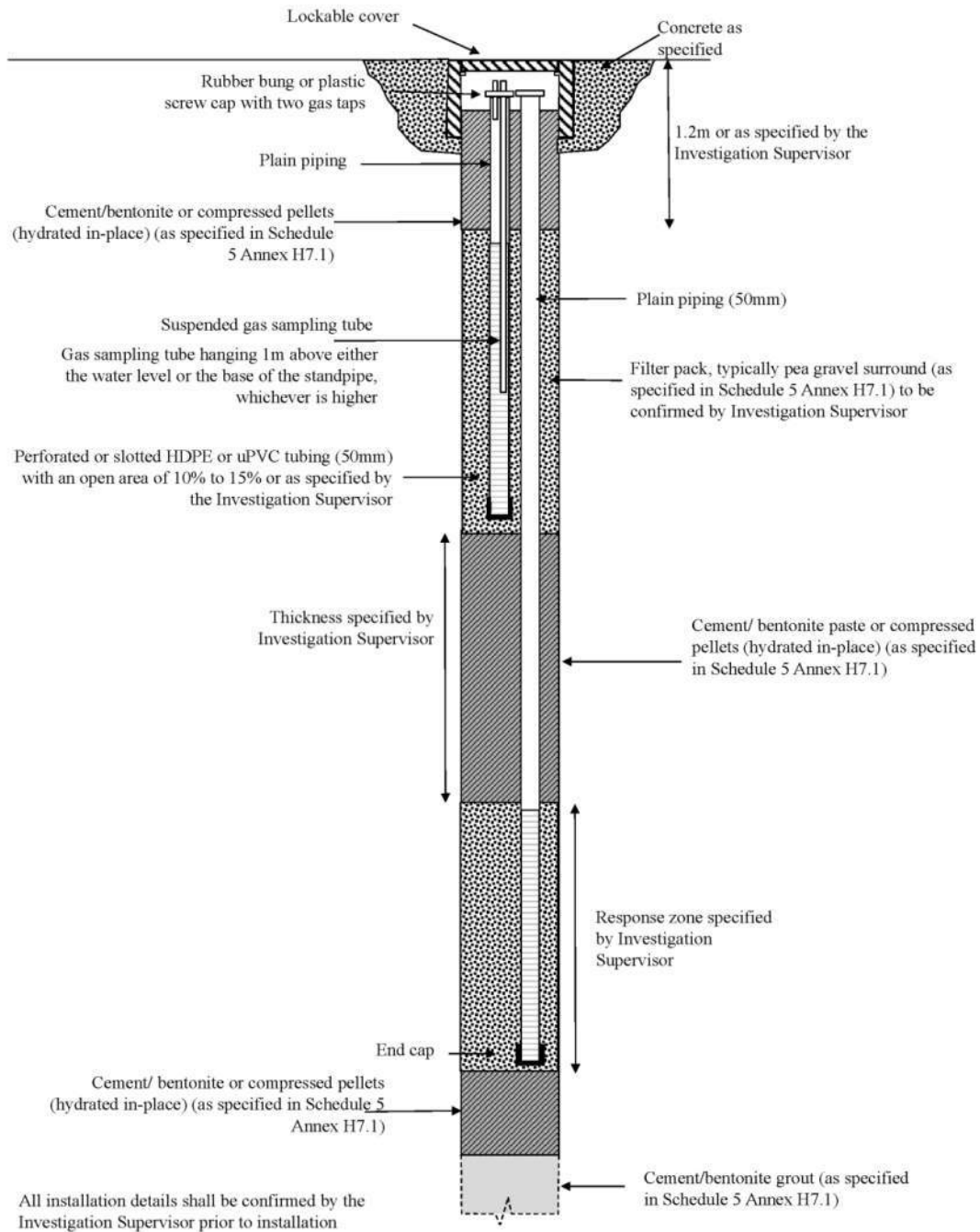


Figure H2 Dual gas and groundwater installation detail

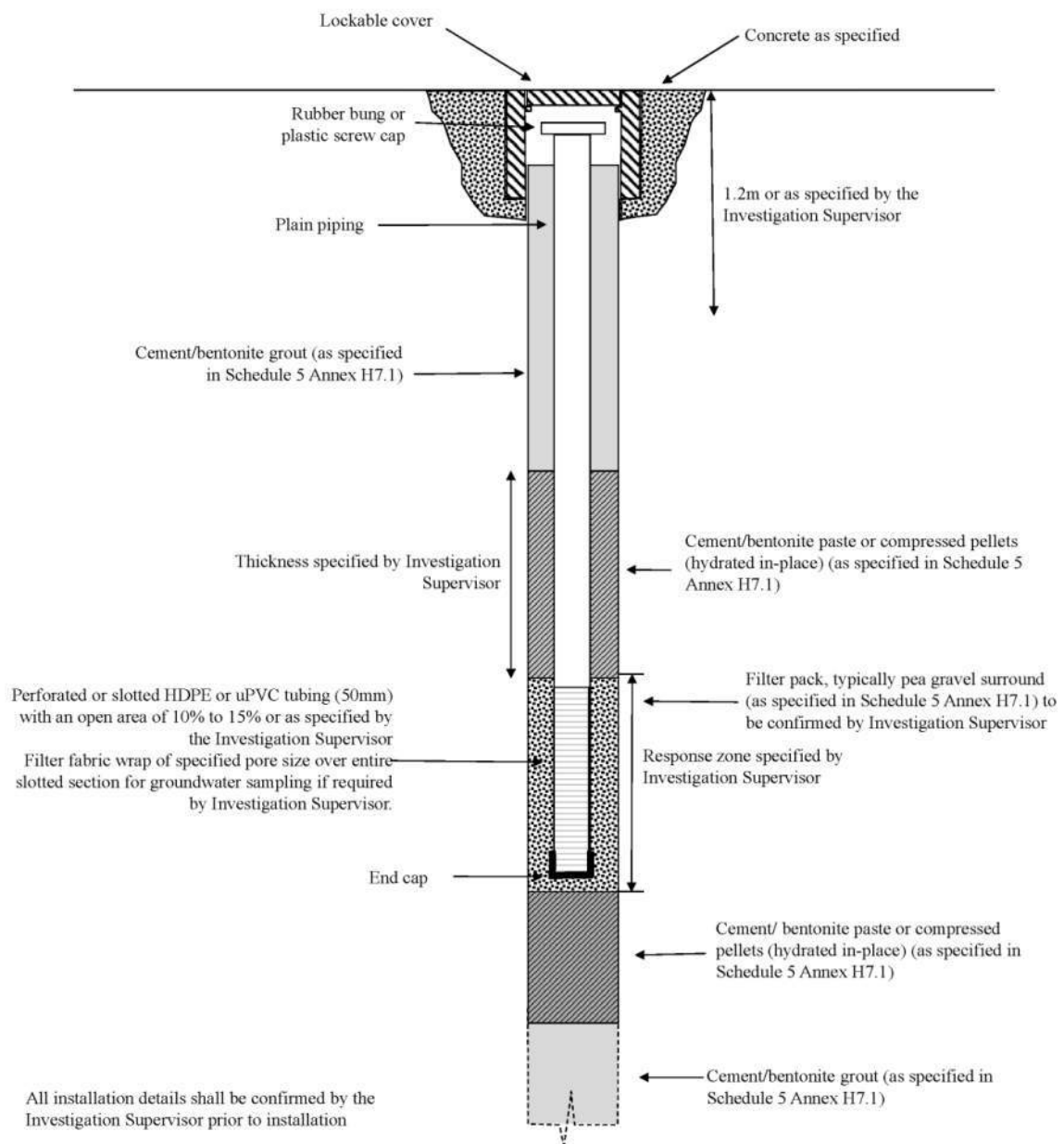


Figure H3 Discrete-depth groundwater sampling installation detail

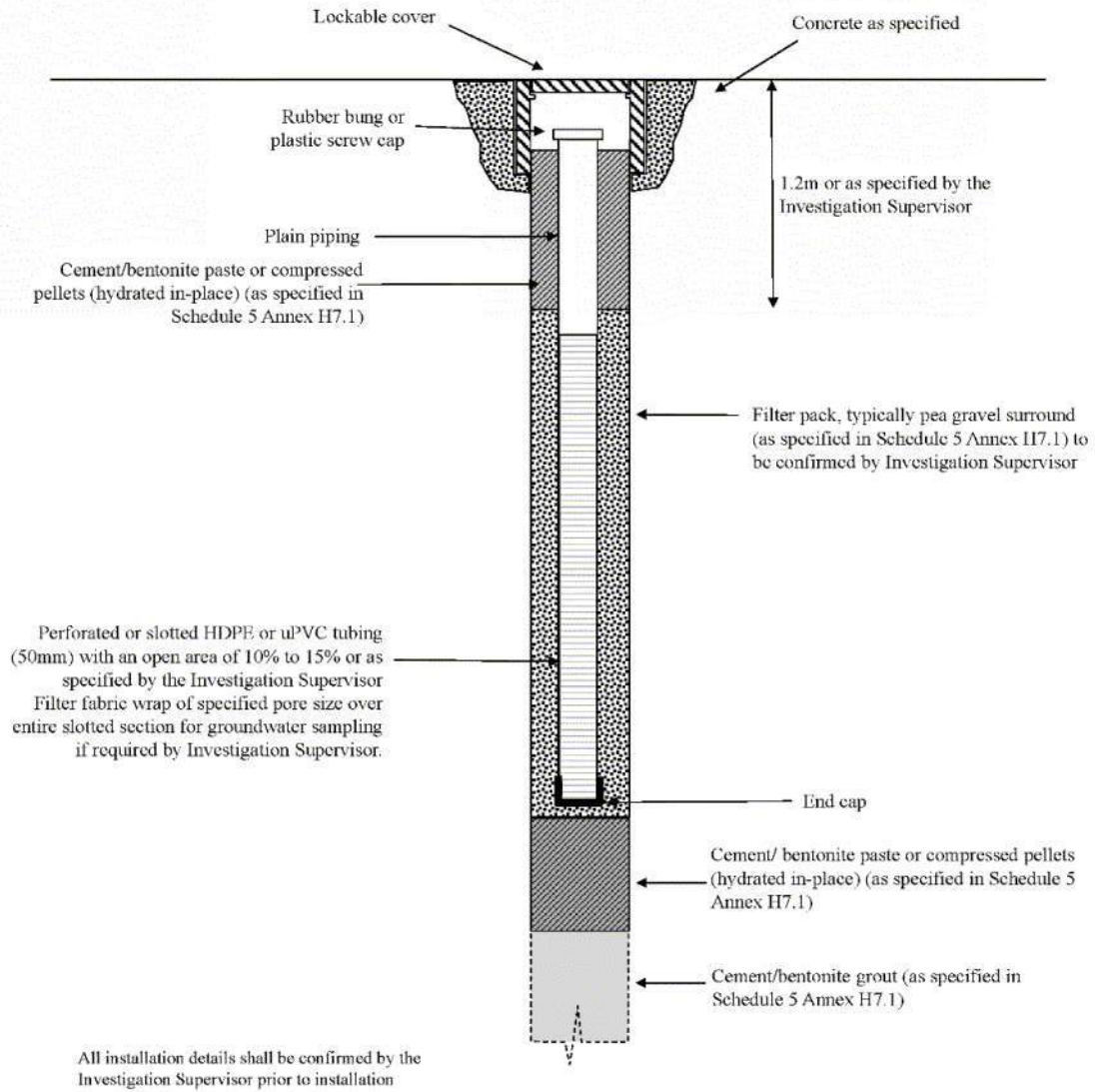


Figure H4 Shallow groundwater sampling installation detail

SCHEDULE 5 ANNEX G – GEO-ENVIRONMENTAL TESTING SUITES

Test Suites E to M are specified in the following tables. The Contractor shall confirm in its Tender return the test methods and shall detail what accreditation requirement shall be provided. Tests with an Asterix (*) are included in the standard NRW testing suites.

Limits of detection in the tables should reflect the guideline/threshold values against which the test results will be compared.

G1 SUITES E & F

Chemical laboratory testing for contamination

Table G1: Suite E

Determinand	Detection level [required]/[offered]	Test method [required]/[offered]	Accreditation [required]/[offered]
SUITE E1 – Soil samples general			
*Arsenic	1 mg/kg		
*Cadmium	0.5 mg/kg		
*Chromium - total	10 mg/kg		
Chromium – hexavalent	1 mg/kg		
*Copper	10 mg/kg		
*Lead	10 mg/kg		
*Mercury	0.5 mg/kg		
*Nickel	10 mg/kg		
Selenium	0.5 mg/kg		
*Zinc	10 mg/kg		
Antimony	0.1 mg/kg		
Beryllium	1 mg/kg		
Vanadium	0.5mg/kg		
*Cyanide - total	5 mg/kg		
*pH	0.1 units	Note E1a	
*Boron (water soluble)	0.5 mg/kg		
*Phenols - total	1 mg/kg		
Total Organic Carbon	0.1% w/w	ASTM D2974-87	

Determinand	Detection level [required]/[offered]	Test method [required]/[offered]	Accreditation [required]/[offered]
SUITE E2 – Soil samples Asbestos			
*Asbestos presence and identification	0.001% w/w	Note E2a	
*Asbestos quantification HSG248	0.001%w/w	Note E2b	
SUITE E3 – Soil samples TPHCWG			
*TPHCWG (C6-C40) Cleaned -up	10 mg/kg	GC-FID Note E3a	
SUITE E4 – Soil samples PAH			
*USEPA 16 Polyaromatic Hydrocarbons	0.2 mg/kg	GCMS	
SUITE E5 – Soil samples BTEX			
BTEX	0.05 mg/kg	GCMS	
SUITE E6 – Soil samples VOC and SVOC			
Semi-Volatile Organic Compounds	0.01 mg/kg	GC-MS US EPA Method 8270	
*Volatile Organic Compounds	0.01 mg/kg	GC-MS US EPA Method 8260	
SUITE E7 – Soil samples PCB			
Polychlorinated Biphenyls	0.005 mg/kg	WHO 12	
SUITE E9 – Soil samples Hexavalent Chromium			
Chromium - hexavalent	1 mg/kg		
SUITE E14 – Soil samples organotins			
Dibutyltin/ tributyltin/ tetrabutyltin/ triphenyltin	0.1mg/kg	GCMS	
SUITE E17 – Soil samples - other tests			
Free Sulphur	100 mg/kg		
Sulphides	10 mg/kg		
Chloride	5 mg/kg		
Loss on ignition	0.1% w/w		
Barium	1 mg/kg		
Molybdenum	0.5 mg/kg		
Note E1a pH should be completed on as received sample (uncrushed).			

Determinand	Detection level [required]/[offered]	Test method [required]/[offered]	Accreditation [required]/[offered]
Note E2a Initial Stereo-binocular/PLM identification Each sample is thoroughly mixed, spread across a clean plastic tray and examined visually for the presence of asbestos. Any obvious asbestos material (asbestos cement, pieces of loose lagging, etc.) is removed by hand picking and set aside for weighing. The samples in which asbestos is detected are dried and weighed along with any materials removed to determine the proportion of asbestos in the original soil sample. The asbestos content of the asbestos containing materials (ACM) are determined by comparison with standard reference materials. A representative sub-sample of approximately for each soil is selected by coning and quartering. These samples are analysed visually under stereo binocular microscope and by polarised light microscopy (PLM) using the method described in HSG 248 (HSE, 2005). Note E2b Approximately 1 gramme of each sample shall be transferred to a clean 500ml conical flask and 300ml of filtered distilled water added. The sample/water mixture shall be agitated for 20 seconds and allowed to stand for 10 seconds. After sedimentation time, aliquots shall be removed from just below the liquid surface and deposited onto a 0.8µm pore size blank tested membrane filter. The filter shall be carefully dried, cleared and fixed onto glass microscope slides using the acetone/triacetin method described in HSG 248 (2005). Two microscope slides produced from each sample. The estimated mass percentage calculated as the mean of the two results for each sample. Phase contrast microscopy shall be based closely on HSG 248 (2005) including reagents, equipment and filter clearing and mounting. A specific Walton-Beckett graticule shall be used for fibre sizing. For the purposes of estimating the asbestos mass percentage, a countable fibre is defined as an amphibole asbestos or chrysotile fibre. Non-asbestos fibres should not be counted. Fibre dimensions (length and diameter), number of ends falling in the graticule, and fibre identity shall be recorded for each individual countable fibre. Measurements shall be recorded to the nearest 5µm for length and to the nearest 0.5µm for diameter, up to a maximum of 5µm. The identity of each fibre shall be recorded as amphibole or chrysotile, where possible. Fibre identification shall be based on morphology and optical properties determined by polarised light microscopy. The overall mass percentage of asbestos is given by: $A.W.(\Sigma V.p_A + \Sigma V.p_C) \times 100 / (a.N.q.S)$ p_A = average density of amphibole asbestos ($3.0 \times 10^{-6} \mu\text{g } \mu\text{m}^{-3}$) p_C = density of chrysotile ($2.5 \times 10^{-6} \mu\text{g } \mu\text{m}^{-3}$) A = area of filter (mm^2) V = volume of fibre (μm^3) W = volume of water in suspension (ml) a = area of graticule (mm^2) N = number of graticules evaluated S = mass of soil in suspension (μg) q = aliquot on filter (ml) Note E3a Aliphatic: EC5-EC6; >EC6-EC8; >EC8-EC10; >EC10-EC12; >EC12-EC16 ;>EC16-EC35;>EC35-EC44 Aromatic: >EC6-EC7; >EC7-EC8; >EC8-EC10; >EC10-EC12; >EC12-EC16; >EC16-EC21; >EC21-EC35; >EC35-EC44 Specify TPH Cleaned-up which removes natural humic substances			

Table G1: Suite F

Determinand	Detection level [required]/[offered]	Test method [required]/[offered]	Accreditation [required]/[offered]
SUITE F1 – Water samples general			
*pH value	0.1 pH units		
Hardness	2 mg/l		
*Arsenic	1 µg/l		
*Cadmium	0.5 µg/l		
*Chromium	5 µg/l		
Chromium - hexavalent	1 µg/l		
*Copper	0.5 µg/l		
*Lead	1 µg/l		
*Mercury	0.05 µg/l		
*Nickel	1 µg/l		
Selenium	1 µg/l		
*Zinc	1 µg/l		
Antimony	1 µg/l		
Beryllium	1 µg/l		
Vanadium	1 µg/l		
Ammoniacal nitrogen	0.02 mg/l		
Ammonia	0.02 mg/l		
Chloride	1 mg/l		
*Cyanide - total	1 µg /l		
*Phenols - total	10 µg/l		
Dissolved organic carbon (DOC)	10 µg/l		
Calcium	10 µg/l		
Manganese	10 µg/l		
SUITE F2 – Water samples speciated TPH			
*TPH CWG	10 µg/l	Note F2 GC-FID	
SUITE F3 – Water samples BTEX			
BTEX – Benzene	0.01 µg/l	GCMS	

Determinand	Detection level [required]/[offered]	Test method [required]/[offered]	Accreditation [required]/[offered]
BTEX - Toluene	0.01 µg/l	GCMS	
BTEX - Ethyl Benzene	0.01 µg/l	GCMS	
BTEX - m & p Xylene	0.01 µg/l	GCMS	
BTEX - o Xylene	0.01 µg/l	GCMS	
MTBE (Methyl Tertiary Butyl Ether)	0.01 µg/l	GCMS	
SUITE F4 – Water samples PAH			
16 USEPA Polyaromatic Hydrocarbons	0.001 µg/l	GCMS	
SUITE F5 – Water samples VOC and SVOC			
*Volatile Organic compounds Detection limit for Vinyl chloride should be <0.5µg/l	1 µg/l	GC-MS US EPA Method 8260	
Semi-Volatile Organic compounds	1 µg/l	GC-MS US EPA Method 8270	
SUITE F6 – Water samples PCB			
Polychlorinated biphenyls	0.001 µg/l		
SUITE F10 – Water samples oxygen demand			
BOD	2 mg O ₂ /l		
COD	10 mg O ₂ /l		
SUITE F14 – Water samples other parameters			
Ferric Iron (FE(III))	10 µg/l		
Ferrous Iron (FE(II))	10 µg/l		
Magnesium	30 µg/l		
Sodium	10 µg/l		
Potassium	10 µg/l		
*Sulphates	2000 µg SO ₄ /l		
Sulphides	200 µg S/l		
Nitrate	0.3 mg/l		
Nitrite	0.01 mg/l		
Alkalinity	2 mg/l		

Determinand	Detection level [required]/[offered]	Test method [required]/[offered]	Accreditation [required]/[offered]
Note F2 Aliphatic: EC5-EC6; >EC6-EC8; >EC8-EC10; >EC10-EC12; >EC12-EC16 ;>EC16-EC35;>EC35-EC44 Aromatic: >EC6-EC7; >EC7-EC8; >EC8-EC10; >EC10-EC12; >EC12-EC16; >EC16-EC21; >EC21-EC35; >EC35-EC44			

G2 WASTE ACCEPTANCE CRITERIA

Chemical testing for waste acceptance criteria testing

Determinand	Detection level [required]/[offered]	Test method [required]/[offered]	Accreditation [required]/[offered]
SUITE J – Waste acceptance total soils			
*Total organic carbon	0.1%		
*Benzene, toluene, ethylbenzene and xylenes (BTEX)	0.1mg/kg		
*Polychlorinated biphenyls (PCBs) (7 congeners)	0.1mg/kg		
EPH (C10–C40)	10 mg/kg		
*Polyaromatic hydrocarbons (PAHs)	0.1 mg/kg		

G3 SPECIAL LABORATORY TESTING

Results shall be reported in mg/l

Determinand	Detection level [required]/[offered]	Test method [required]/[offered]	Accreditation [required]/[offered]
SUITE M1 – Soil leachability general			
pH value	0.1 pH units		
Arsenic	1 µg/l		
Cadmium	0.5 µg/l		
Chromium	5 µg/l		
Chromium - hexavalent	1 µg/l		
Copper	0.5 µg/l		
Lead	1 µg/l		
Mercury	0.01 µg/l		
Nickel	1 µg/l		

Determinand	Detection level [required]/[offered]	Test method [required]/[offered]	Accreditation [required]/[offered]
Selenium	1 µg/l		
Zinc	1 µg/l		
Antimony	1 µg/l		
Beryllium	1 µg/l		
Vanadium	1 µg/l		
Ammoniacal nitrogen	0.02 mg/l		
Chloride	1 mg/l		
Cyanide - total	1 µg /l		
Phenols - total	10 µg/l		
Calcium	10 µg/l		
Manganese	10 µg/l		
SUITE M2 – Soil leachability PAH and BTEX*			
BTEX	1 µg/l	GCMS	
16 Polyaromatic Hydrocarbons	0.01 µg/l	GCMS	

SCHEDULE 5 ANNEX I – INTERPRETATIVE REPORTING

The Contractor shall prepare all parts of the Geotechnical Interpretative Report for the site. The scope of the Geotechnical Interpretative Report shall conform in full to the requirements of BS EN 1997-1 Section 3.4, including (i) a presentation of all available geotechnical information including geological features; and (ii) a geotechnical evaluation of the information, stating the assumptions made in the interpretation of the test results.

I1 Summary of proposed development

The proposed development at the site comprises:

- New weir
- New fish pass
- Demolition of existing weir

The layout of the proposed development is shown in Drawing 3.

The Contractor shall contact the Investigation Supervisor for any further information about the proposed development that the Contractor requires in order to prepare the Ground Investigation Report for the proposed development at the site.

I2 Preliminary geotechnical study (desk study report)

The existing desk study cited in Schedule S1.7 can be referenced in the Ground Investigation Report. However, the Contractor is responsible for ensuring that the geotechnical information in the Ground Investigation Report is comprehensive and up-to-date and is relevant to the scope of the proposed development.

I3 Ground Investigation Report

The presentation of geotechnical information in the Ground Investigation Report shall conform to the requirements of Section 3.4.2 of BS EN 1997-1.

The evaluation of geotechnical information in the Ground Investigation Report shall conform to the requirements of Section 3.4.3 of BS EN 1997-1.

SCHEDULE 5 ANNEX J – DIGITAL DATA

J1 Preliminary data

The following requirements apply if the provision of preliminary digital data is specified in Schedule S1.24.2 and S1.24.14:

- the preliminary digital data shall represent all exploratory holes and shall correspond with the preliminary logs;
- co-ordinates and levels of exploratory hole locations and test locations shall be included in preliminary data if these have already been surveyed;
- interpreted geology codes to be included in preliminary logs. (Note: it is recognised that these will be provisional at preliminary data stage and may change subsequently);
- full referencing of associated files in the relevant fields in the AGS data is not required for preliminary data; and
- associated files not containing critical data may be omitted from preliminary data.

J2 Additional groups, fields and codes

In the event that it is found to be necessary to introduce additional groups, fields and codes that are not defined by the specified AGS standard or in this Schedule 5 Annex J or in Schedule S1.24.12 (including, for example, for specialist testing), the additional groups, fields and codes shall be agreed between the Contractor and the Investigation Supervisor at least 14 days before the scheduled date of issue of the relevant digital data.

J3 Use of particular groups and fields

Table J3.1 Usage of particular AGS groups and fields

Group	Field	Requirement
PROJ	PROJ_ID	Contractor's reference for the Investigation
	PROJ_NAME	Shall match the title of the factual report (including name of contract specified in Schedule S1.1)
	PROJ_CLNT	Employer for the Investigation
	PROJ_ENG	Investigation Supervisor
LOCA*	LOCA_TYPE	Compound codes shall be used as appropriate (e.g. CP+RC). Compound names using IP are not required unless the pit has been fully logged in which case a compound code shall be used.
	LOCA_STAT	Overall status of data for the exploratory hole (preliminary, draft or final)
	LOCA_CLST	If specified in Schedule S1.24.12.
	LOCA_LOCA	If specified in Schedule S1.24.12.
GEOL	GEOL_LEG	Use standard abbreviations provided on the AGS website.
	GEOL_GEOL	Use codes specified in Schedule S1.24.12.

Table J3.1 Usage of particular AGS groups and fields		
Group	Field	Requirement
		Where unique interpretation of geological stratum is unclear, combinations of relevant strata may be used (e.g. MG/ALV).
	GEOL_GEO2	Use codes specified in Schedule S1.24.12, as applicable.
HDPH	-	If an inspection pit has been dug for a routine services or obstructions check, this shall be noted.
ISPT	ISPT	Incremental blows and penetrations shall be provided. Use of other fields that duplicate this data (ISPT_MAIN etc.) is optional. The Contractor may determine the format for ISPT_REP.
WETH	-	Only required if specified in Schedule S1.24.12.
* If the use of AGS3.1 is specified in Schedule S1.24.12, substitute “HOLE” for “LOCA”		

Table J3.1 presents particular field and codes that shall be used in the digital data.

J4 Digital data files

Digital data shall be supplied as specified in S1.24.12 and usually submitted as a single file that contains the full data set (preliminary or final). However, in cases where this would lead to an unmanageably large file size, this requirement may be relaxed subject to the prior agreement of the Investigation Supervisor, in which case the digital data submission may be split across multiple files. Where submitted digital data are split between multiple files, data integrity across the files shall be rigorously maintained, for example LOCA group data shall exist for test data and shall not be duplicated across files.

Any AGS data submission is required to have passed the AGS validator tool and the associated *.txt file included.

The AGS data and associated files shall be complete and identical to the data provided in the factual report. In order to ensure the AGS data provided is identical to the factual report version, both the report and digital versions of the data shall be generated from the same source software. The preferred approach is to use database software specifically intended for this purpose. The digital data provided by the Contractor with the Factual Report is required to be complete and a total replacement of any previous preliminary data submissions.

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ANNEX 1 BILL OF QUANTITIES FOR GROUND INVESTIGATION

Preamble amendments and additions

The following clauses are amended or added to the preamble of Annex 1 Bill of Quantities for Ground Investigation:

Clause 1	Add at end of clause j) Reinstatement. k) Washing down of equipment as required to prevent cross contamination. l) Protection of the ground to prevent contamination from arisings as required.”
Clause 4	Add after "...site liaison, logistics, logging", the following ", the logging of pits and trenches"
Clause 6	Add after "... supply of negative", the following "or electronic file"
Clause 10	Add to a) after "....and removal" “and for any casing not recovered, including that necessary to prevent cross contamination as required” Add to b) after "....surface water" “and the formation of temporary grout plugs” Add at end of clause: “f) disposal off site of excavated material not required for reuse but excluding material regarded as hazardous or special waste. g) washing down of equipment as specified h) measures to prevent cross-contamination between strata.”
Clause 17	Add to b) after "... below the instrument" “and surface terminal (if appropriate)”
Clause 19	Add to end of clause “e) the time of the personnel carrying out the test.”
Additional Clause 24	“The rates for observation pits and trenches shall allow for all necessary shoring and shoring crew. For all hand-dug pits and trenches, the rates shall allow for working within a properly shored excavation. The size of a hand-dug pit or trench shall be sufficient to allow the excavation to be progressed to its scheduled depth. The rates for all pits and trenches should allow for the excavator, driver and technical assistant to log the pit and trench, take samples and carry out tests, and any washing down of equipment between locations.”
Additional Clause 25	“The rates for performing laboratory tests of long duration shall include for all costs incurred whilst working outside normal hours.”
Additional Clause 26	“Quantities associated with Items A12 and A13 will be reimbursed at cost on production of receipts.”
Additional Clause 27	“The rate for provision of an environmental scientist on site shall include provision of all equipment for taking of environmental samples and for performing all the in-situ environmental testing and measurements specified. The rate shall be per 8-hour day.”
Additional Clause 28	“The rate for photographs relates only to photographs taken and included within the factual report. The rate shall include all additional copies as specified.”

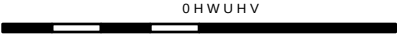
Appendix A - Schedule of drawing



Site Boundary

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&URZQ &RS1ULJKW DQG GDWDEDVH ULJKW 2UGQDQFH
QXPEHU
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:DOHV DQG GDWDEDVH ULJKW
% *HWPDSSSLQJ 3OF DQG %OXHV1\ ,QWHUQDWLRQDO /LPH



	04/04/23	PS	DR	DR
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&DHUG1GG &DUGL11
&1 43 - - -
7HO
ZZZ DUXS FRP

&OHLHQW &OLHQW

Cyfoeth Naturiol Cymru
Natural Resources Wales

(QZ D 5KLI \ 3URVLHFW &1& 15: 3URMHFW 1DPH DQG 1X

S4T2 Newbridge

7HLWO /OXQLDG 'UDZLQJ 7LWOH

Site Location

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5KDQ 5ROH

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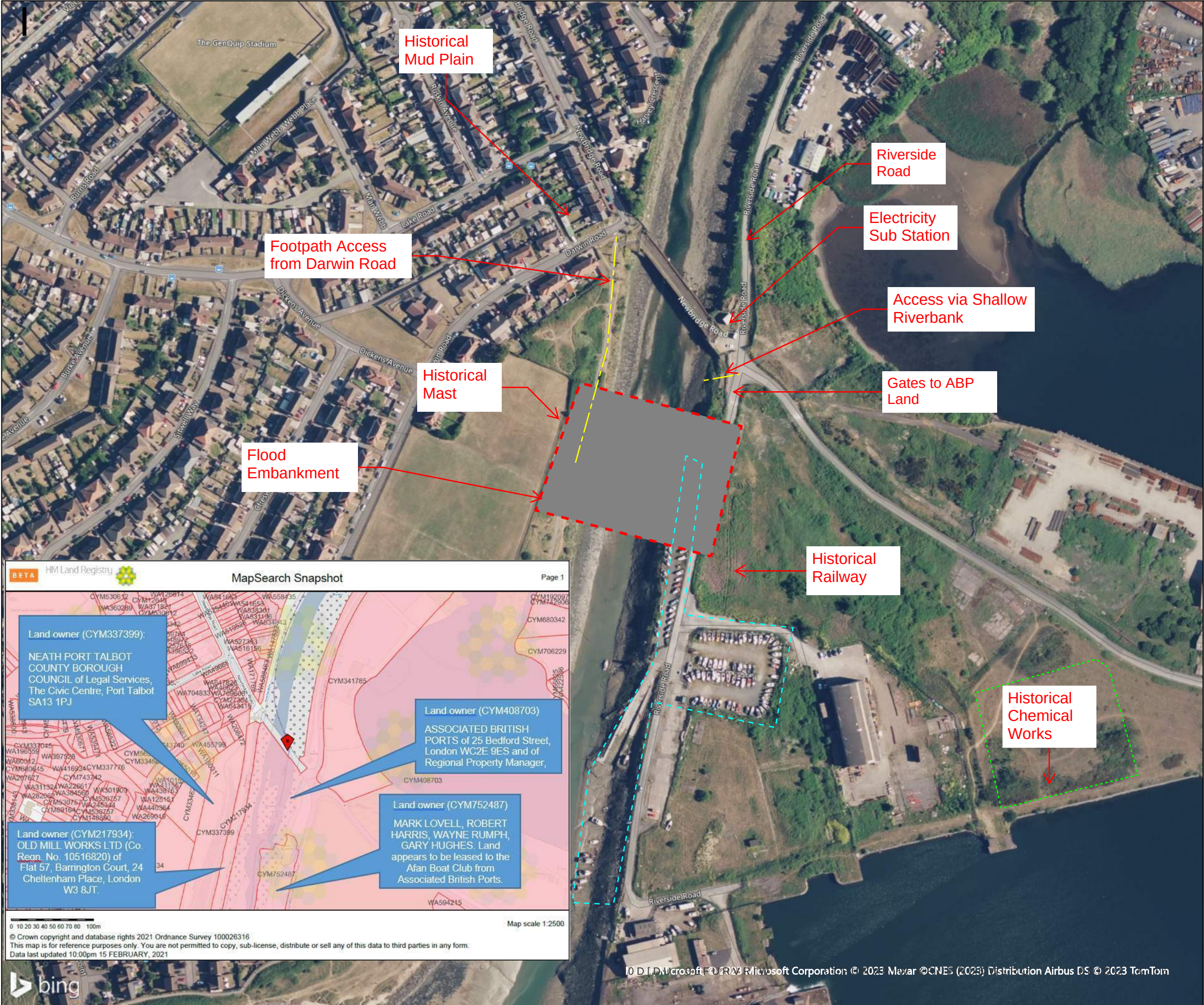
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'LWU1EXWLVRQ \$1U1XV '6
001

7RP7

Mapar, Microsoft © 2023 Microsoft Corporation © 2023 Navar © CNES (2025) Distribution Airbus DS © 2023 TomTom

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BETA

HIM Land Registry

MapSearch Snapshot

Page 1

Land owner (CYM337399):
NEATH PORT TALBOT
COUNTY BOROUGH
COUNCIL of Legal Services,
The Civic Centre, Port Talbot
SA13 1PJ

Land owner (CYM408703):
ASSOCIATED BRITISH
PORTS of 25 Bedford Street,
London WC2E 9ES and of
Regional Property Manager,

Land owner (CYM752487):
MARK LOVELL, ROBERT
HARRIS, WAYNE RUMPH,
GARY HUGHES. Land
appears to be leased to the
Afan Boat Club from
Associated British Ports.

Land owner (CYM217934):
OLD MILL WORKS LTD (Co.
Rean. No. 10516820) of
Flat 57, Barrington Court, 24
Cheltenham Place, London
W3 8JT.

0 10 20 30 40 50 60 70 80 100m

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This map is for reference purposes only. You are not permitted to copy, sub-license, distribute or sell any of this data to third parties in any form.
Data last updated 10:00pm 15 FEBRUARY, 2021

Map scale 1:2500

Site Boundary

Approximate extents of the Boat Club

Extents of historical chemical works

\$

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&URZQ &RSIULJKW DQG GDWDEDVH ULJKW 2UGODQFH
QXPEHU
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&IPUX D KDZOLDX FURQID GGDWD
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:DOHV DQG GDWDEDVH ULJKW
% *HWPDSSLQJ 3OF DQG %OXHVN1 ,QWHUQDWLRQDO /LPH

0HWUHV

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ARUP

3LHUKHDG 6WUHHW
&DHUGIGG &DUGLII
&) 43 - - -
7HO
ZZZ DUXS FRP

&OHLHQW &OLHQW

Cyfoeth Naturiol Cymru
Natural Resources Wales

(QZ D 5KLI \ 3URVLHFH &1& 15: 3URMHFW 10PH DQG 1X

S4T2 Newbridge

7HLWO /OXQLDG 'UDZLQJ 7LWOH

Key Features & Landowners

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5KDQ 5ROH

\$GGDVUZIGG 6XLWDELOLW1

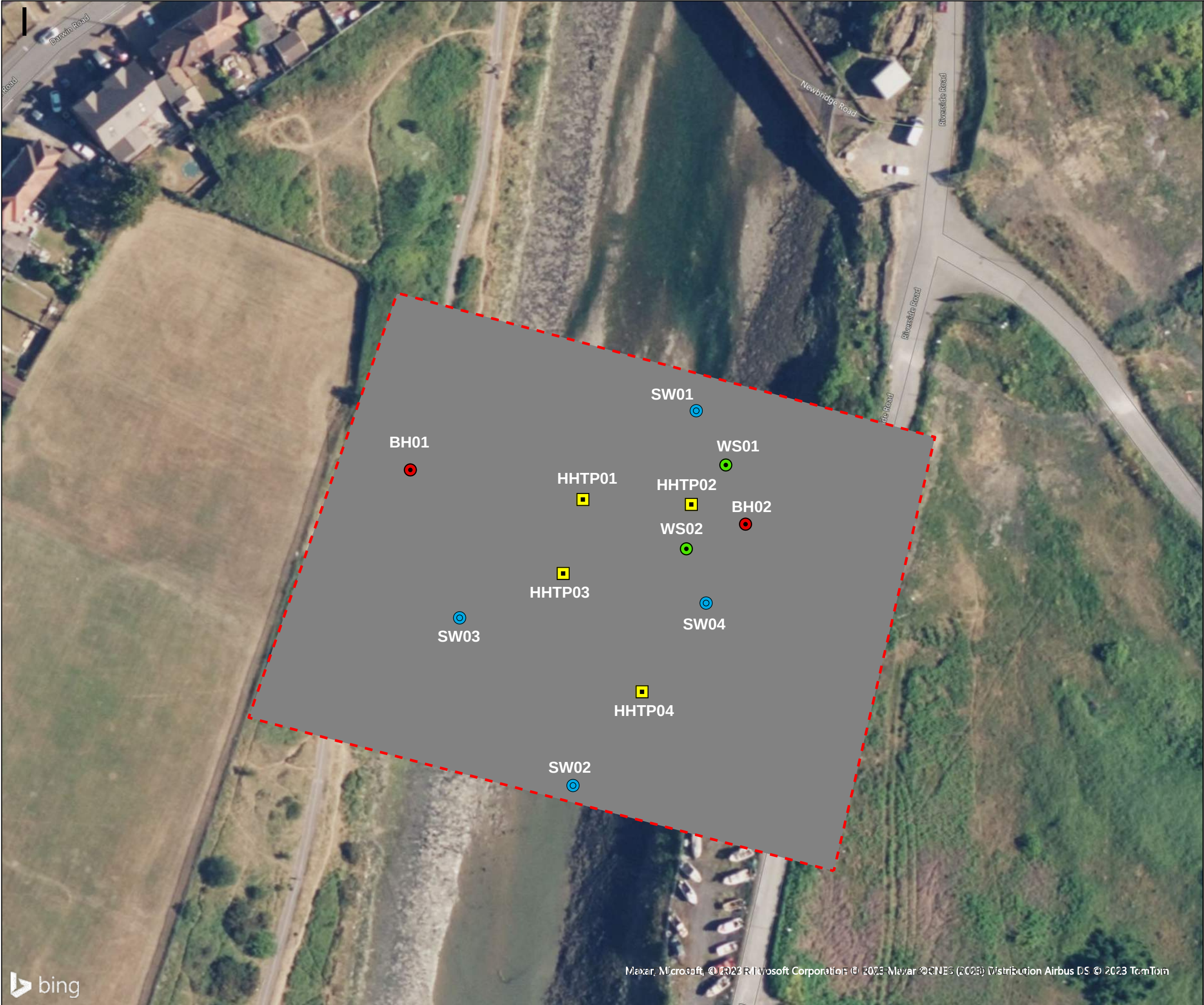
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5KLI \ 3URVLHFH 'UDZLQJ 7LWOH '6 "

002

7RP7

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7KLVL GHVLJQ DQG GUDZLQJ LV FRQILGHQWLDO DQG DOO ULJKWV WKHUHLQ LQFOXGLQJ FRSIULJKW DQG GHVLJQ ULJKW DUH WKH SURSHUW1 RI 1DWXUDO 5HVRXUFHV



Site Boundary

%RUHKROH

+DQGKHOG 7ULDO 3LW

6XUIDFH :DWHU 6DPSOH

:LQGRZ 6DPSOH

Seismic Refraction Survey

\$

&RRUGLQDWH 61VWHP, %ULWLVK 1DWLRQDO 7ULG

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0HWUHV

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5HY	'DWH	%1	&KNG	\$SSG

ARUP

3LHUKHDG 6WUHHW &DHUG1GG &DUGL11 &1 43 - - - 7HO ZZZ DUXS FRP

&OHLHQW &OLHQW

Cyfoeth Naturiol Cymru

Natural Resources Wales

(QZ D 5KLI \ 3URVLHFW &1& 15: 3URMHFW 10PH DQG 1X

S4T2 Newbridge

7HLWO /OXQLDG 'UDZLQJ 7LWOH

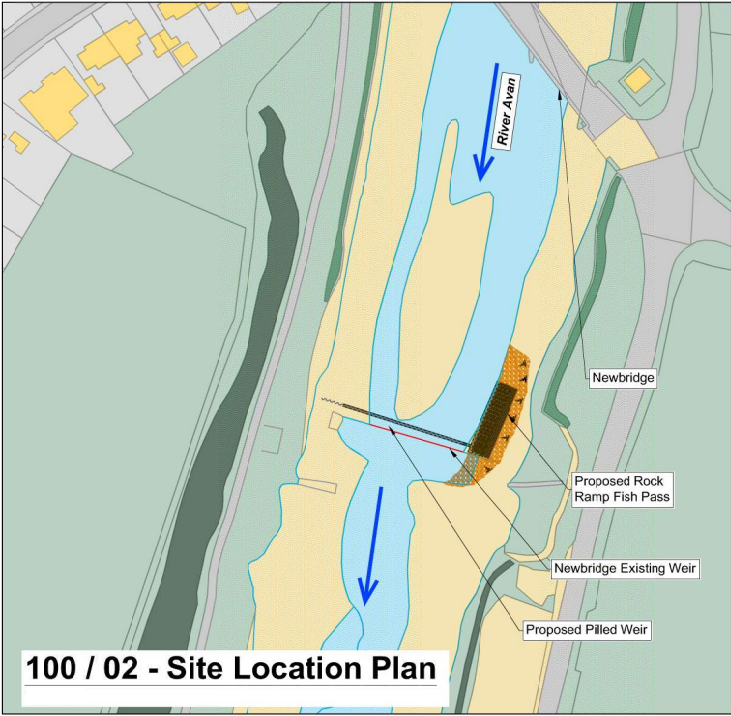
GI Locations

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bing

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SAFETY HEALTH & ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the type of work detailed on this drawing, note the following risks and information.

Risks listed here are not exhaustive. Refer to Designer's Risk Assessment and pre-construction phase plan.

CONSTRUCTION

C1

Managing flow & s/sage levels in River Avan.

- Monitor flow levels & flood warnings.
- Check adequacy of cut-off & stability of cofferdams.

C2

Managing seepage flows through weir

- Monitor seepage
- Ensure cofferdams are suitable and are properly maintained. To be inspected by competent person before every shift / after event that may affect suitability.
- Ensure operatives can gain shelter or escape if water enters

C3

Working near water

- Produce suitable RAMS
- Avoid working near water where possible
- Contractor to establish 2.0m min. control zone adjacent to watercourse. Additional controls required within control zone.
- Allow provision for fixed edge protection to eliminate falls into water
- Allow provision for systems for work positioning and fall arrest
- Assess bank stability / conditions considering access for personnel and machinery

For information relating to Use, Cleaning and Maintenance see the Health and Safety File

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

C4

Risk of Falls from Height

- Ensure adequate edge protection is installed and provide safe access routes to the works areas.

C5

Access & Lifting

- Check craneage lifting facilities & constraints

C6

Services

- Check for identified & unidentified services. Clearly highlight any services that may affect works
- Ground penetrating activities must be carried out in accordance with HSE guidance document HSG47 & PAS 128/214 Specification for underground utility detection, verification and location

C7

Interface with Public & other site operations

- Risk to the public must be assessed on site.
- Erect suitable fencing to secure the site boundary (e.g. Heras fencing) if required.

D1

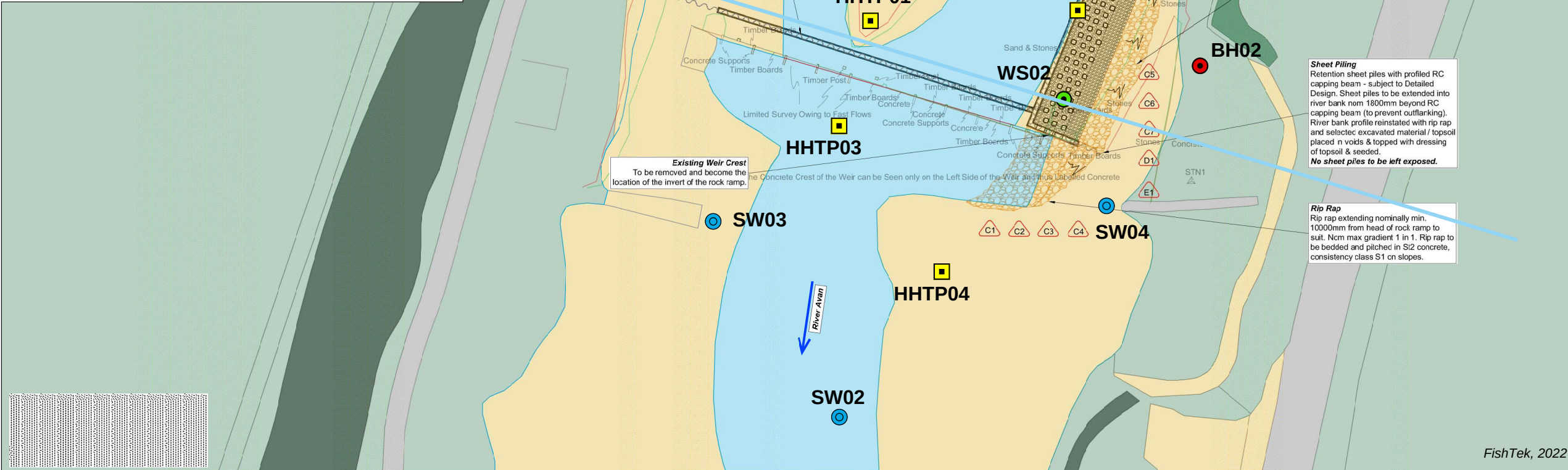
Demolition - risk of operatives experiencing hand arm vibration.

- Monitor and limit trigger time.

E1

Pollution o/ Watercourse

- Create a suitable dry working area for the casing of concrete
- Store and dispose of products in accordance with manufacturers' guidance and SWMP
- Refer to 'Guidance for Pollution Prevention 2018'
- Have a suitable Incident Response Plan in place



%RUHKROH

+DQGKHOG 7ULDO 3LW

6XUIDFH :DWHU 6DPSOH

:LQGRZ 6DPSOH

Seismic Refraction Survey

&RRUGLQDWH 61VWHP, %ULWLVK 1DWLRQDO 7ULG

\$WJ1QK1UFKZIG k FKDQLDWKG 1U \$UROZJ 2UGDDQV DU UD 0DZUK1GL % +DZOIUDLQW D KDZOLDX FURQID GGDWD1U 7UZIGGHG 1U \$UROZJ 2UGDDQV 5HSURGXFHG EV SHUPLVLRQ RI 2UGDDQFH 6XUYH1 RQ E &URZQ &RS1ULJKW DQG GDWDEDVH ULJKW 2UGDDQFH QXPEHU &1QQZ1V JZ1ERGDPHWK &11RHWK 1DWXULRO &1PUX % &11RHWK &1PUX D KDZOLDX FURQID GGDWD &RQWDLQV 1DWXUDO 5HVRXUFHV :DOHV LQIRUPDWLRQ % :DOHV DQG GDWDEDVH ULJKW % *HWPDSSLQJ 3OF DQG %OXHVN1 QWHUQDWLRQDO /LPH

0HWUHV

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5HY	DWH	%1	&KNG	SSG

ARUP

3LHUKHGD 6WUHHW &DHUGGG &DUGLII &) 43 - - - 7HO ZZZ DUXS FRP

&OHLQW &OLHQW

Cyfoeth Naturiol Cymru

Natural Resources Wales

(QZ D 5KLI \ 3URVLHFW &1& 15: 3URMHFW 1DPH DQG 1X

S4T2 Newbridge

7HLWO /OXQLDG 'UDZLQJ 7LWOH

Proposed Works and GI Locations

*UDGGID 1Q \$ 6FDOH DW \$

Not to Scale

5KDQ 5ROH

\$GGDVUZ1GG 6XLWDELWLW1

5KLI \ 3URVLHFW \$UXS \$UXS 3URVLHFW 1XPEHU

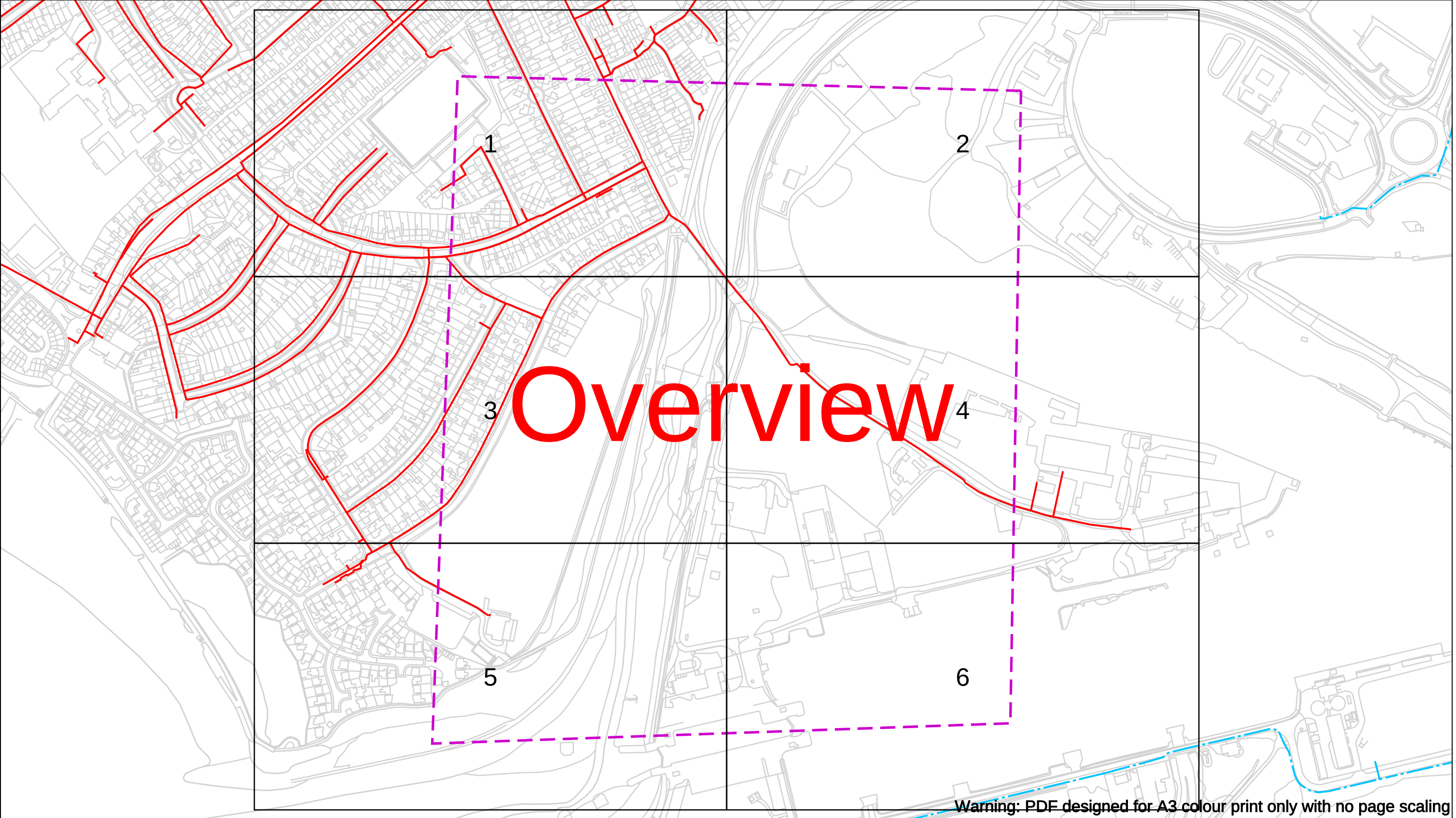
5KLI \ /OXQLDG 'UDZLQJ 1XPEHU

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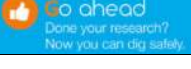
0DH U F1Q00XQ D U 00X0LDG 1PD 1Q 311ULQDFKRO 0DH SRE KDZO R6GL IHZO LGGR 1Q F1Q0Z1V 1U KDZOIUDLQW 1Q HLGGR L &11RHWK 1DWXULRO &1PUX DF 7KLVL GHVLJQ DQG GUDZLQJ LV FRQILGHQWLDO DQG DOO ULJKWV WKHUHLQ LQFOXGLQJ FRS1ULJKW DQG GHVLJQ ULJKW DUH WKH SURSHUW1 RI 1DWXUDO 5HVRXUFHV

APPENDIX B - SERVICE LOCATION PLANS, PERMIT TO DIG & UNDERGROUND SERVICE FLOW CHART

- ☐ Gas
- ☐ Electricity
- ☐ Telecommunications
- ☐ Water/Sewerage
- ☐ Oil
- ☐ Other

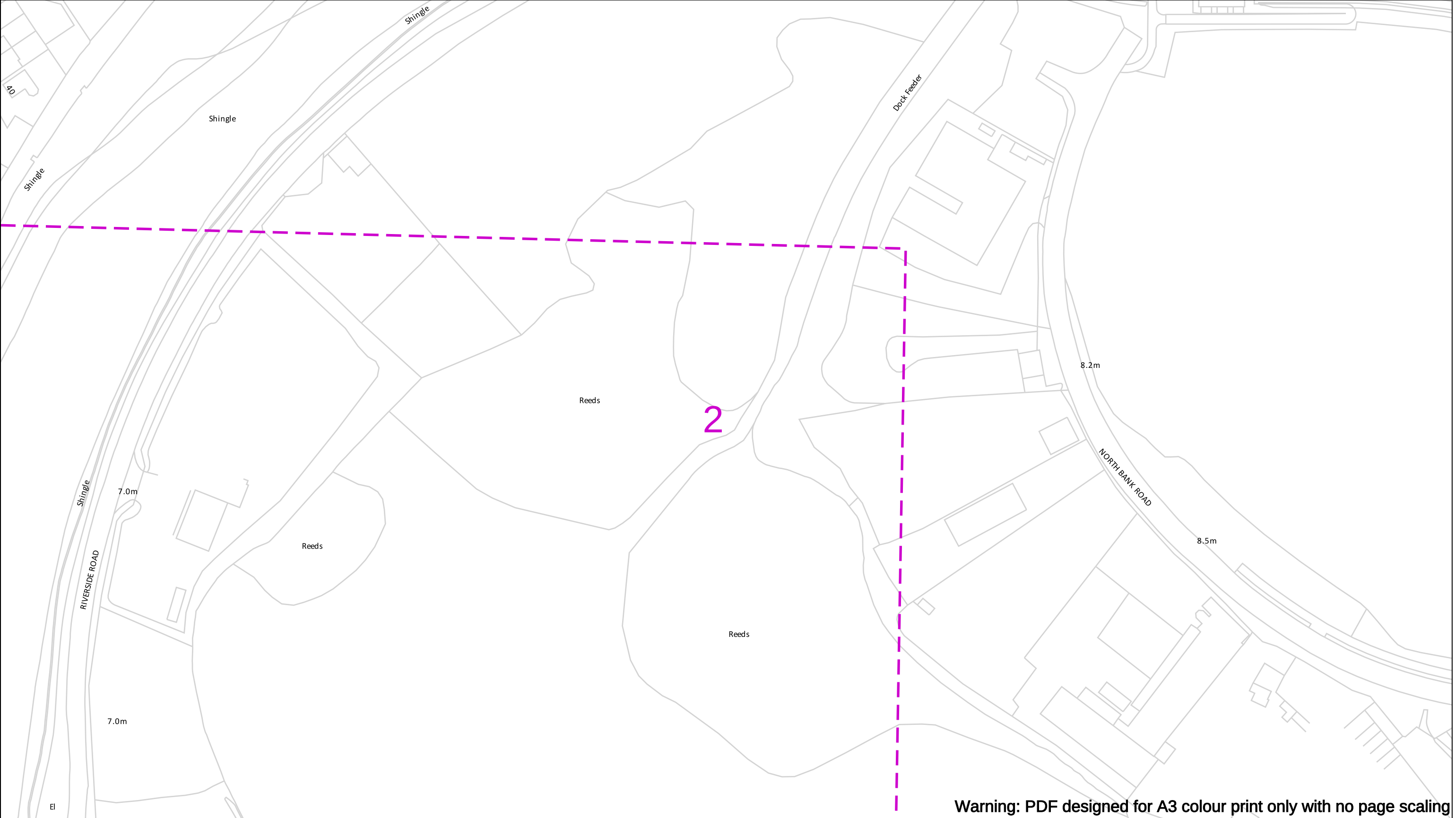


Warning: PDF designed for A3 colour print only with no page scaling

Contact Us Mapping Enquiries: 02920 278 912 General Enquiries: 0800 912 2999 Date Requested: 05/01/2023 Job Reference: 28079615 Site Location: 275571 189163 Requested by: Mr Jake handley-parkin Your Scheme/Reference: CEN26861 Scale: 1:3844 (When plotted at A3)	IMPORTANT NOTICES • This information is given as a guide only and its accuracy cannot be guaranteed • The plan only shows those pipes owned by Wales & West Utilities (WWU) as its role as a licensed Gas Transporter • Service pipes, valves, syphons, stub connections etc. may not be shown but their presence should be anticipated • You must use safe digging practices in accordance with HS(G)47 to establish the actual position of mains, services and other apparatus before any mechanical excavation is used • It is your responsibility to ensure this information is provided to all persons working near our plant • If in doubt call the WWU dig team on 02920 278912	In case of an emergency call 0800 111 999 <table><tr><td>Dig Sites</td><td>Area:  Line: </td><td> Line/Fire Valve</td></tr><tr><td></td><td>Low Pressure (LP) 21mbar – 75mbar</td><td> Governor Station</td></tr><tr><td></td><td>Medium Pressure (MP) 350mbar – 2bar</td><td> Change of Diameter</td></tr><tr><td></td><td>Intermediate Pressure (IP) 2bar – 7bar</td><td> End Cap</td></tr><tr><td></td><td>High Pressure (HP) >7bar</td><td> Depth of cover</td></tr></table>	Dig Sites	Area:  Line: 	 Line/Fire Valve		Low Pressure (LP) 21mbar – 75mbar	 Governor Station		Medium Pressure (MP) 350mbar – 2bar	 Change of Diameter		Intermediate Pressure (IP) 2bar – 7bar	 End Cap		High Pressure (HP) >7bar	 Depth of cover	 WALES & WEST UTILITIES  Dial before you dig  Smell gas? Call the Gas Emergency Service on 0800 111 999.  Dial 029 2027 8912 before you start work.  Investigate Before you dig, make sure you know what's below.  Go ahead Done your research? Now you can dig safely.
Dig Sites	Area:  Line: 	 Line/Fire Valve																
	Low Pressure (LP) 21mbar – 75mbar	 Governor Station																
	Medium Pressure (MP) 350mbar – 2bar	 Change of Diameter																
	Intermediate Pressure (IP) 2bar – 7bar	 End Cap																
	High Pressure (HP) >7bar	 Depth of cover																



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General Enquiries: 0800 912 2999

Date Requested: 05/01/2023
Job Reference: 28079615
Site Location: 275571 189163
Requested by:
Mr Jake Handley-Parkin
Your Scheme/Reference: CEN26861

Scale: 1:1250 (When plotted at A3)

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- If in doubt call the WWU dig team on 02920 278912

In case of an emergency call 0800 111 999

100m

Dig Sites	Area: 	Line: 
	Low Pressure (LP) 21mbar – 75mbar	
	Medium Pressure (MP) 350mbar – 2bar	
	Intermediate Pressure (IP) 2bar – 7bar	
	High Pressure (HP) >7bar	

	Line/Fire Valve
	Governor Station
	Change of Diameter
	End Cap
	Depth of cover

WALES & WEST UTILITIES

Dial before you dig

We need 10 days' notice

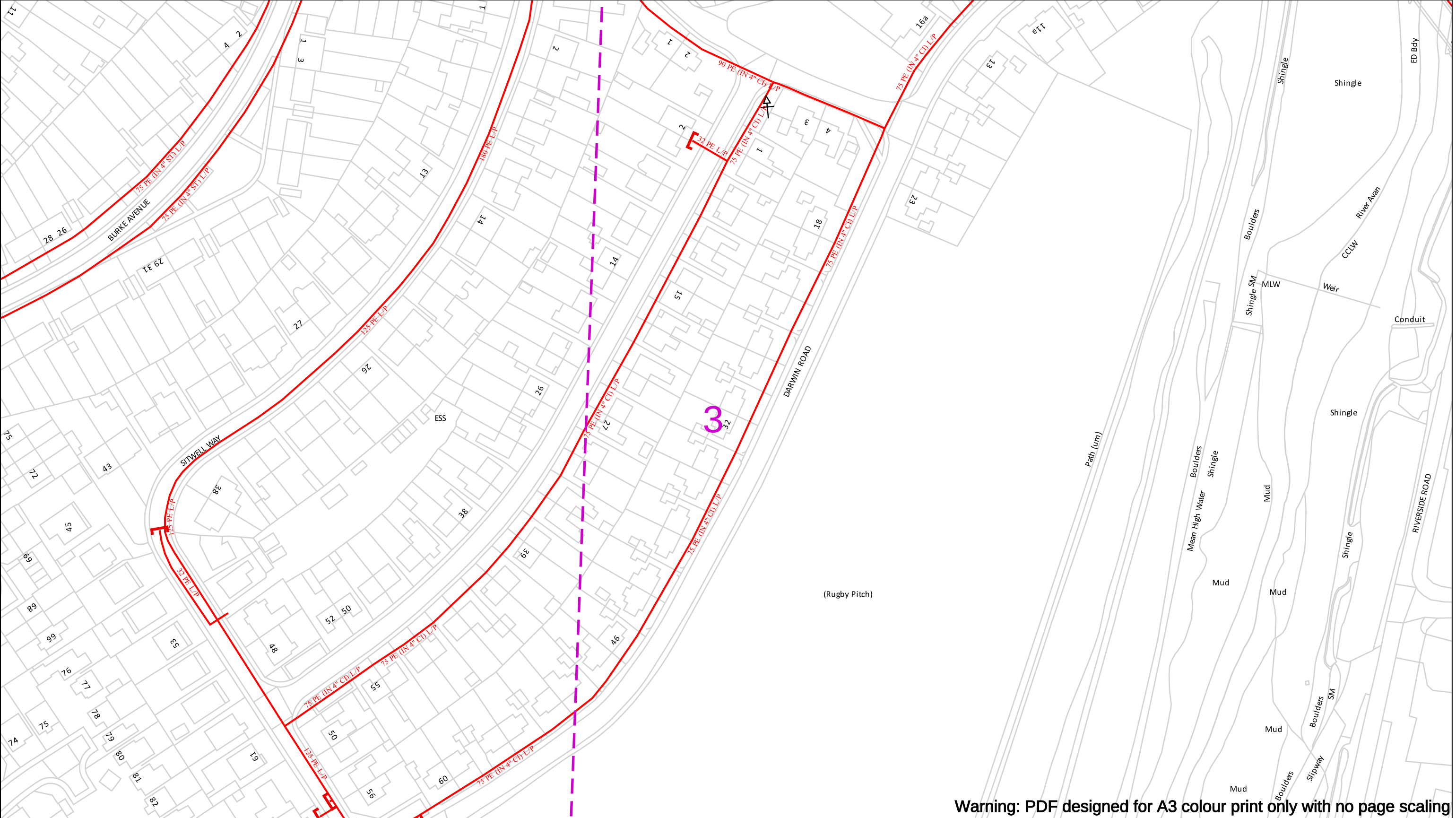
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Call the Gas Emergency Service on 0800 111 999.

Dial
Call 029 2027 8912 before you start work.

Investigate
Before you dig, make sure you know what's below.

Go ahead
Done your research? Now you can dig safely.

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100m

Dig Sites	Area:	Line:
	Low Pressure (LP) 21mbar – 75mbar	
	Medium Pressure (MP) 350mbar – 2bar	
	Intermediate Pressure (IP) 2bar – 7bar	
	High Pressure (HP) >7bar	

	Line/Fire Valve
	Governor Station
	Change of Diameter
	End Cap
	Depth of cover

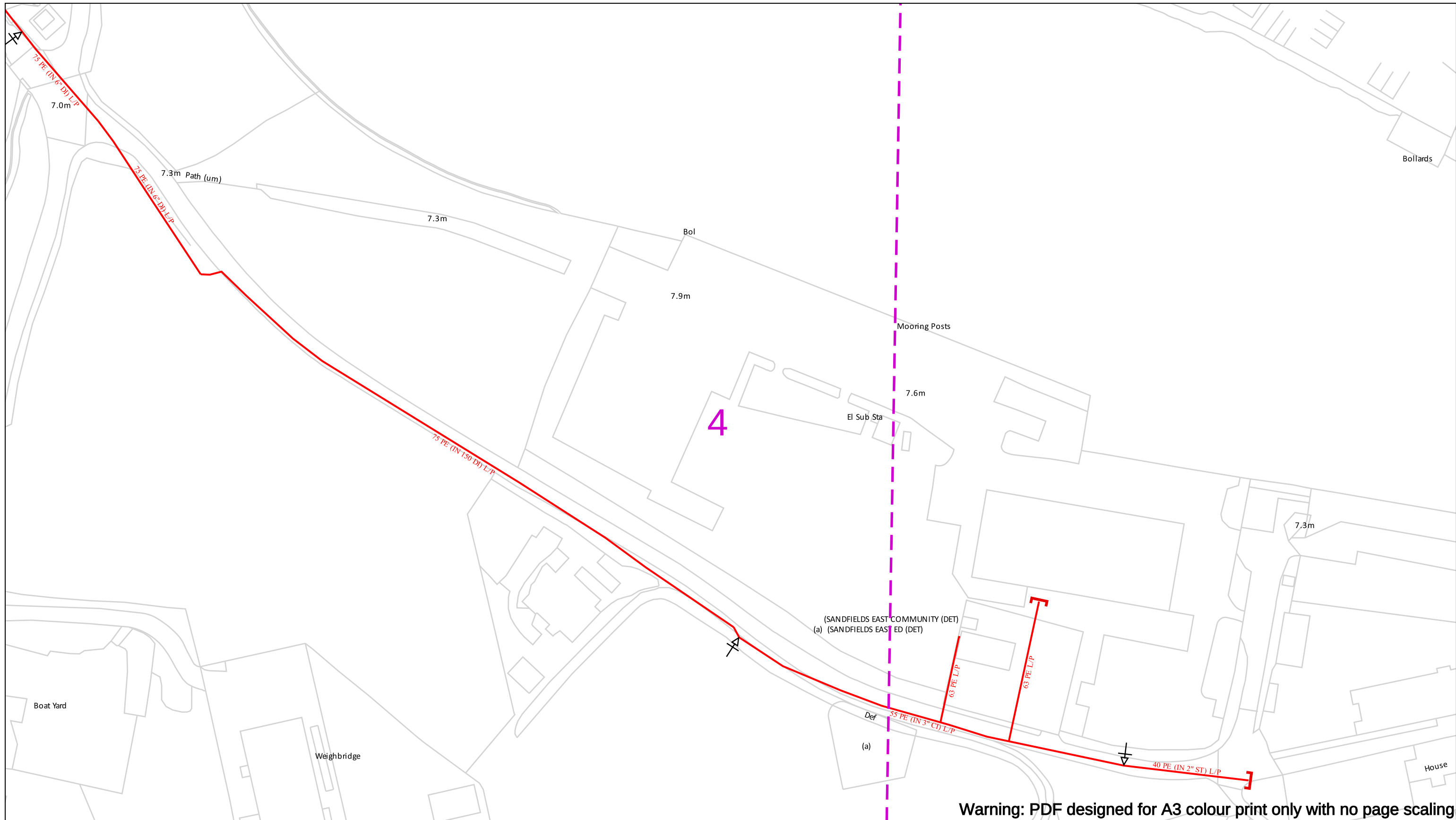
WALES & WEST UTILITIES

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Dial before you dig

We need 10 days' notice

Go ahead
Done your research? Now you can dig safely.



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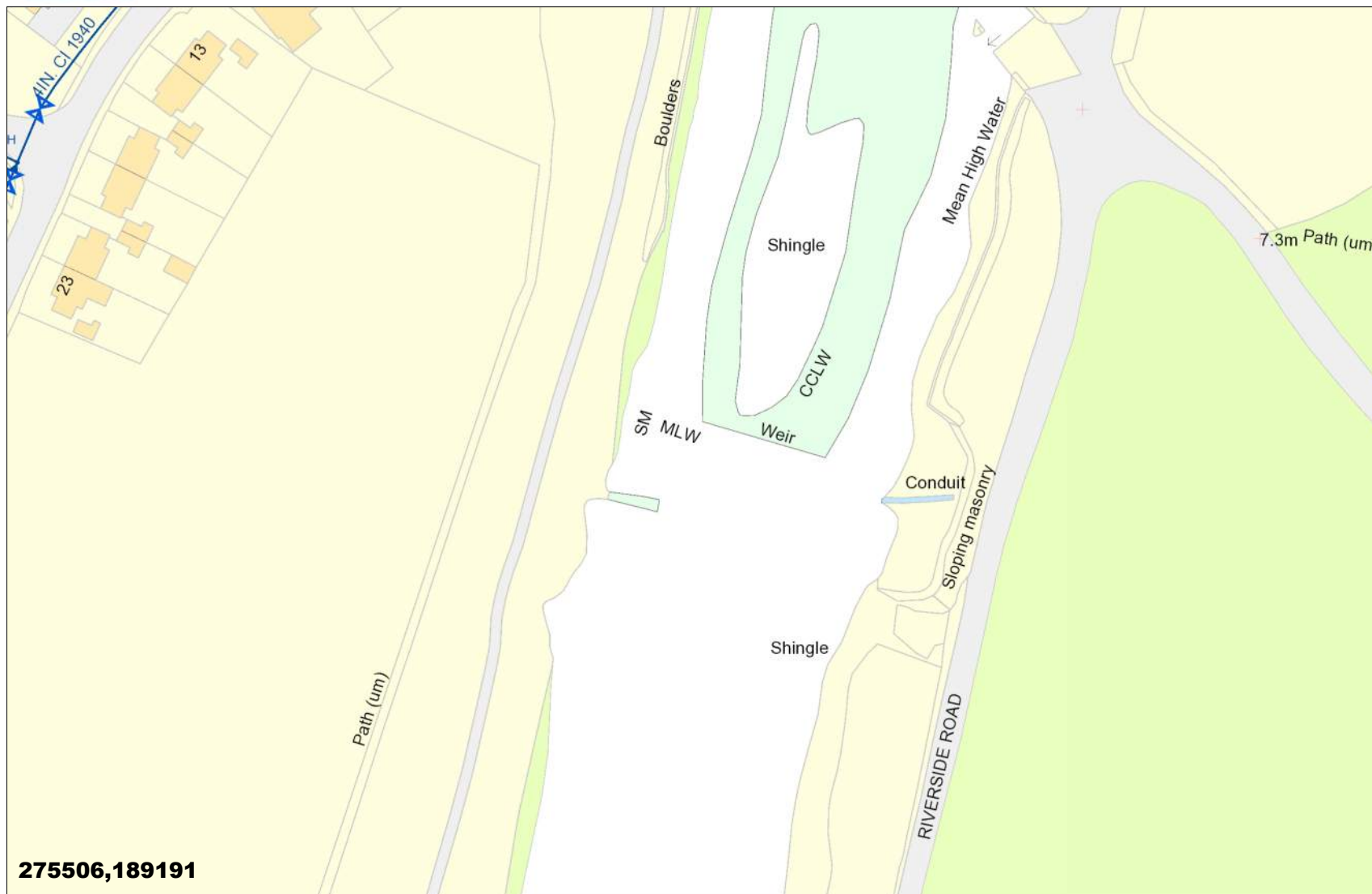
Contact Us Mapping Enquiries: 02920 278 912 General Enquiries: 0800 912 2999	IMPORTANT NOTICES - This information is given as a guide only and its accuracy cannot be guaranteed - The plan only shows those pipes owned by Wales & West Utilities (WWU) as its role as a licensed Gas Transporter - Service pipes, valves, syphons, stub connections etc. may not be shown but their presence should be anticipated - You must use safe digging practices in accordance with HS(G)47 to establish the actual position of mains, services and other apparatus before any mechanical excavation is used - It is your responsibility to ensure this information is provided to all persons working near our plant - If in doubt call the WWU dig team on 02920 278912	In case of an emergency call 0800 111 999 100m Dig Sites Low Pressure (LP) 21mbar – 75mbar Medium Pressure (MP) 350mbar – 2bar Intermediate Pressure (IP) 2bar – 7bar High Pressure (HP) >7bar Area: Line: Line/Fire Valve Governor Station Change of Diameter End Cap Depth of cover	WALES&WEST UTILITIES Dial before you dig We need 10 days' notice Smell gas? Call the Gas Emergency Service on 0800 111 999. Dial Call 029 2027 8912 before you start work. Investigate Before you dig, make sure you know what's below. Go ahead Done your research? Now you can dig safely.
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LEGEND

Clean Water

- Sluice Val
- Air Val, SINGLE
- Tap
- Pressure Reducing Valve
- Meter
- BULK Meter
- FH
- Cap
- Existing Main
- NON COMPANY

Sewerage External

- Foul
- Surface Water
- Combined
- Rising Main
- Private
- Treatment Works
- Pumping Station
- Special Purpose
- Unknown End
- Change, Combined Overflow
- Outfall, FOUL
- Lamp Hole, Foul
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

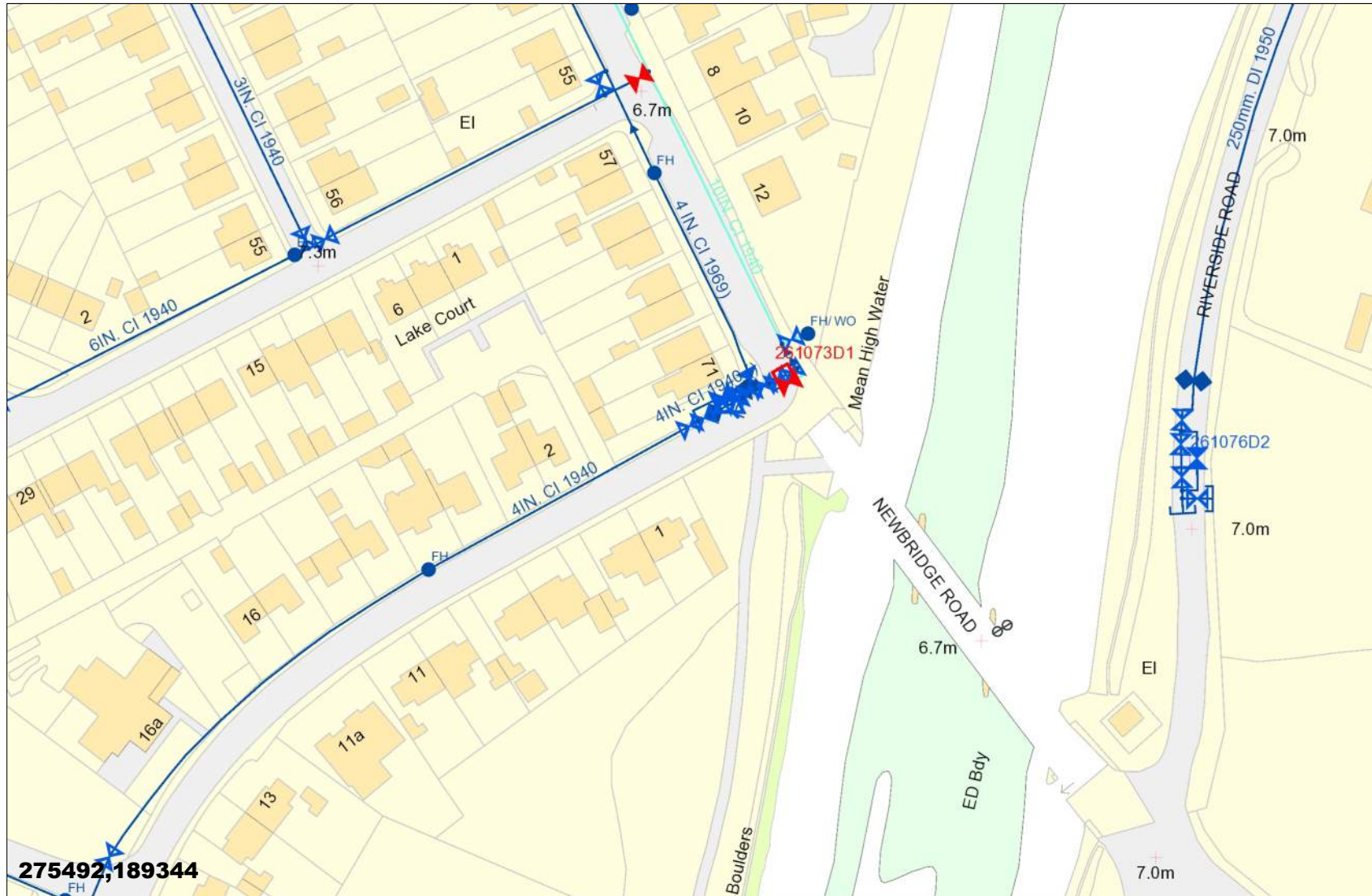
275506,189191

Dwr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. The information which is supplied hereby the company, is done so in accordance with statutory requirements of sections 198 and 199 of the water industry Act 1991 based upon the best information available and in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a drain sewer or disposal main laid before 1 September 1989, or if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the company's right to be compensated for any damage to its apparatus.

**EXACT LOCATION OF
ALL APPARATUS TO
BE DETERMINED ON
SITE**

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Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be Asbestos Cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation



LEGEND

Clean Water

-  Sluice Val
-  Air Val, SINGLE
-  Tap
-  Pressure Reducing Valve
-  Meter
-  BULK Meter
-  FH
-  Cap
-  Existing Main
-  NON COMPANY

Sewerage External

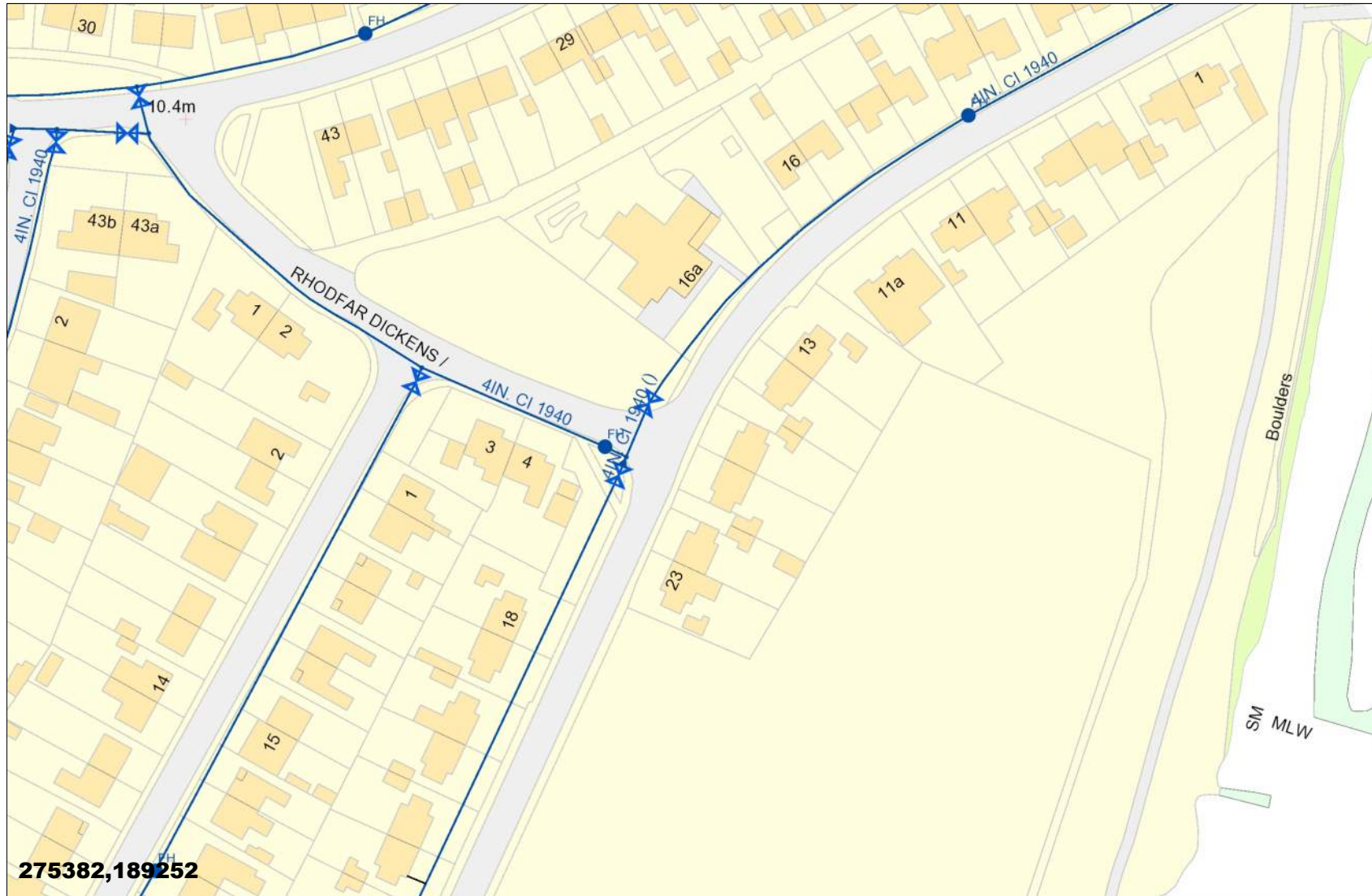
-  Foul
-  Surface Water
-  Combined
-  Rising Main
-  Private
-  Treatment Works
-  Pumping Station
-  Special Purpose
-  Unknown End
-  Change, Combined Overflow
-  Outfall, FOUL
-  Lamp Hole, Foul
-  Private Sewer Transfer
-  Lateral Drain
-  Inspection Chamber

Dwr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. The information which is supplied hereby by the company, is done so in accordance with statutory requirements of sections 198 and 199 of the water industry Act 1991 based upon the best information available and in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a drain sewer or disposal main laid before 1 September 1989, or if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the company's right to be compensated for any damage to its apparatus.

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LEGEND

Clean Water

-  Sluice Val
-  Air Val, SINGLE
-  Tap
-  Pressure Reducing Valve
-  Meter
-  BULK Meter
-  FH
-  Cap
-  Existing Main
-  NON COMPANY

Sewerage External

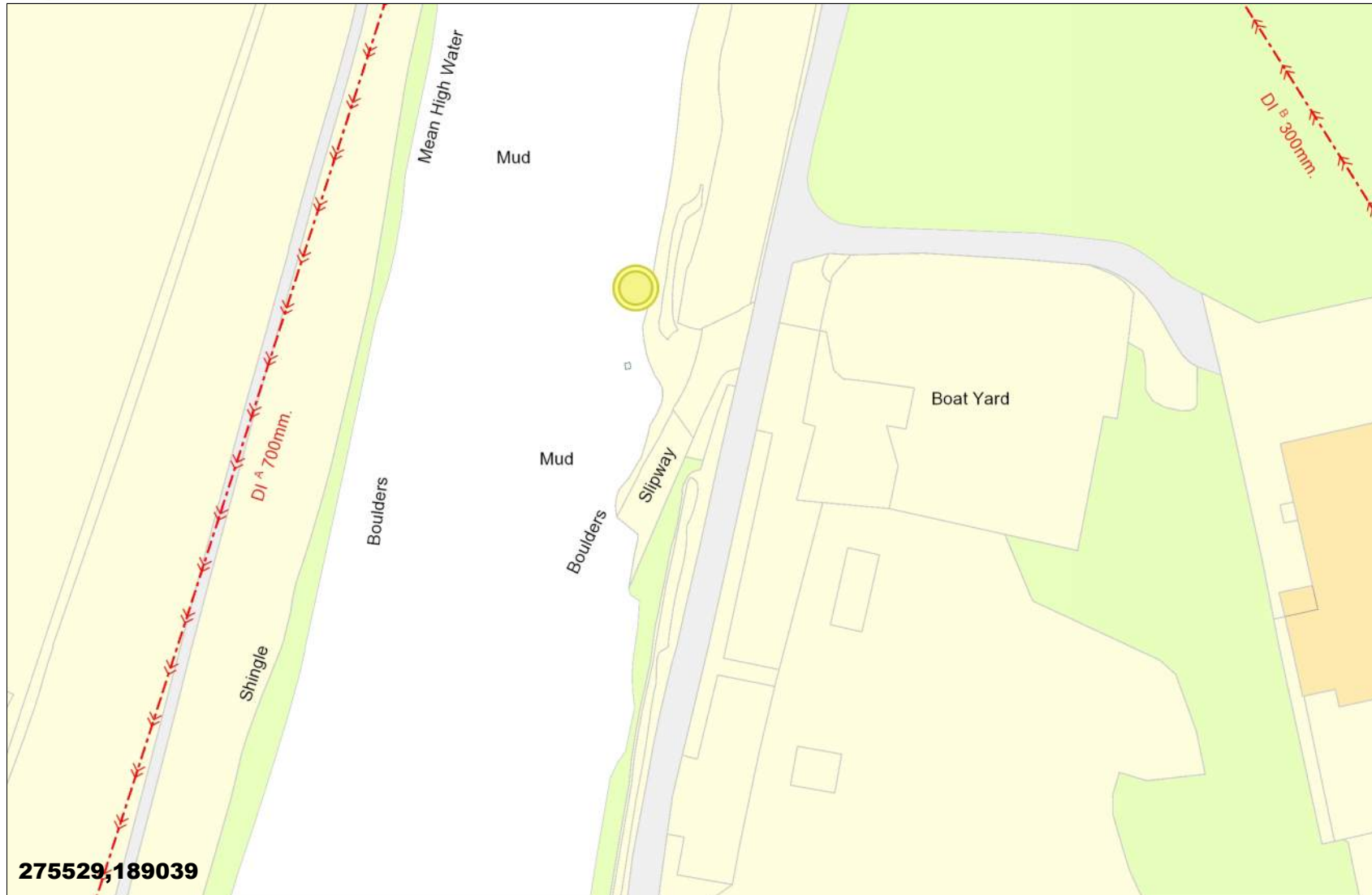
-  Foul
-  Surface Water
-  Combined
-  Rising Main
-  Private
-  Treatment Works
-  Pumping Station
-  Special Purpose
-  Unknown End
-  Change, Combined Overflow
-  Outfall, FOUL
-  Lamp Hole, Foul
-  Private Sewer Transfer
-  Lateral Drain
-  Inspection Chamber

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LEGEND

Clean Water

-  Sluice Val
-  Air Val, SINGLE
-  Tap
-  Pressure Reducing Valve
-  Meter
-  BULK Meter
-  FH
-  Cap
-  Existing Main
-  NON COMPANY

Sewerage External

-  Foul
-  Surface Water
-  Combined
-  Rising Main
-  Private
-  Treatment Works
-  Pumping Station
-  Special Purpose
-  Unknown End
-  Change, Combined Overflow
-  Outfall, FOUL
-  Lamp Hole, Foul
-  Private Sewer Transfer
-  Lateral Drain
-  Inspection Chamber

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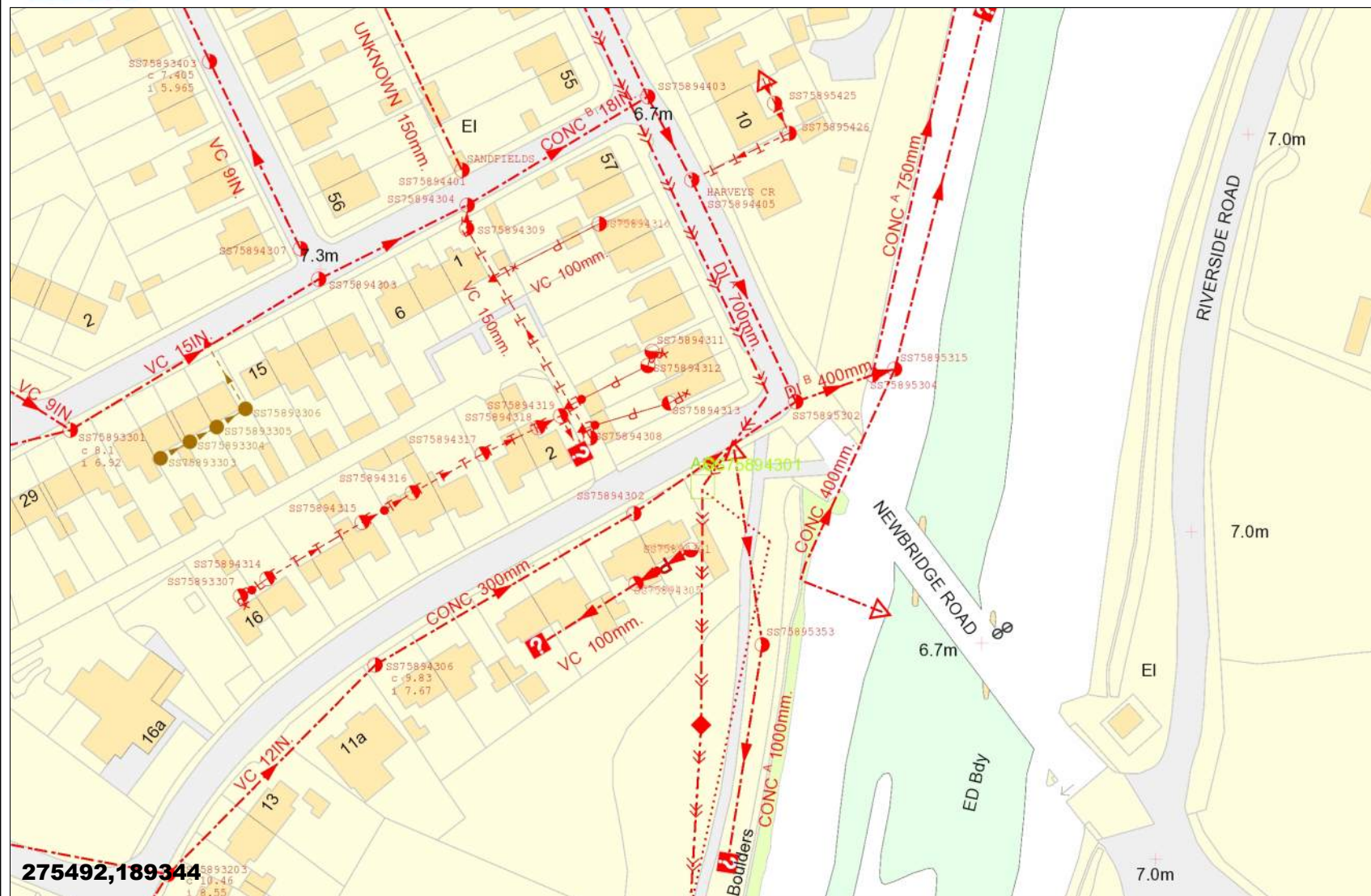
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Scale: 1: 1250



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LEGEND

Clean Water

-  Sluice Val
-  Air Val, SINGLE
-  Tap
-  Pressure Reducing Valve
-  Meter
-  BULK Meter
-  FH
-  Cap
-  Existing Main
-  NON COMPANY

Sewerage External

-  Foul
-  Surface Water
-  Combined
-  Rising Main
-  Private
-  Treatment Works
-  Pumping Station
-  Special Purpose
-  Unknown End
-  Change, Combined Overflow
-  Outfall, FOUL
-  Lamp Hole, Foul
-  Private Sewer Transfer
-  Lateral Drain
-  Inspection Chamber

275415,188882

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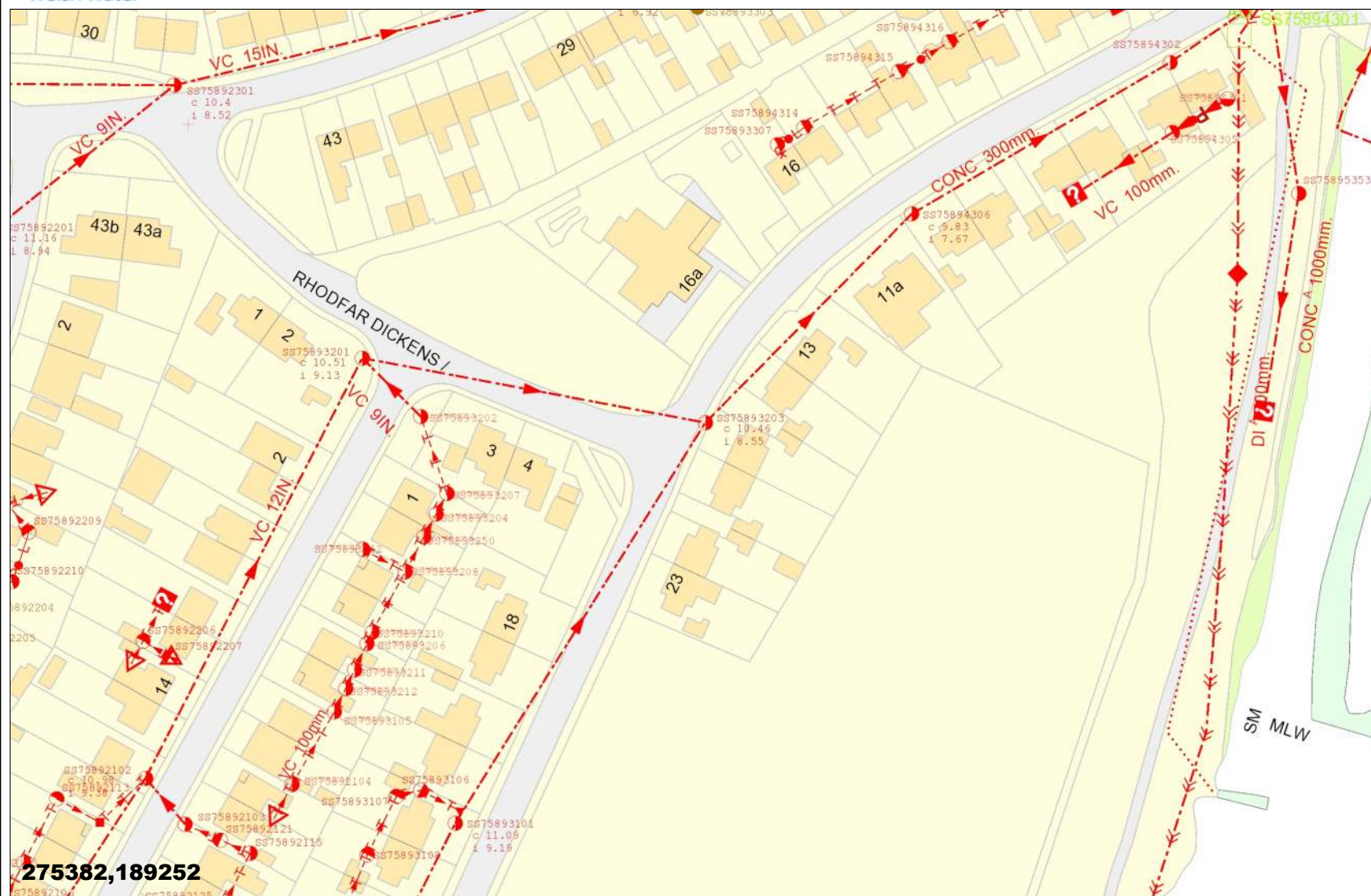
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25/01/2023

Scale: 1: 1250



LEGEND

Clean Water

-  Sluice Val
 -  Air Val, SINGLE
 -  Tap
 -  Pressure Reducing Valve
 -  Meter
 -  BULK Meter
 -  FH
 -  Cap
 -  Existing Main
 -  NON COMPANY
- Sewerage External**
-  Foul
 -  Surface Water
 -  Combined
 -  Rising Main
 -  Private
 -  Treatment Works
 -  Pumping Station
 -  Special Purpose
 -  Unknown End
 -  Change, Combined Overflow
 -  Outfall, FOUL
 -  Lamp Hole, Foul
 -  Private Sewer Transfer
 -  Lateral Drain
 -  Inspection Chamber

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275511,189019

Newbridge

Scale: 1:2000

25/01/2023



LEGEND

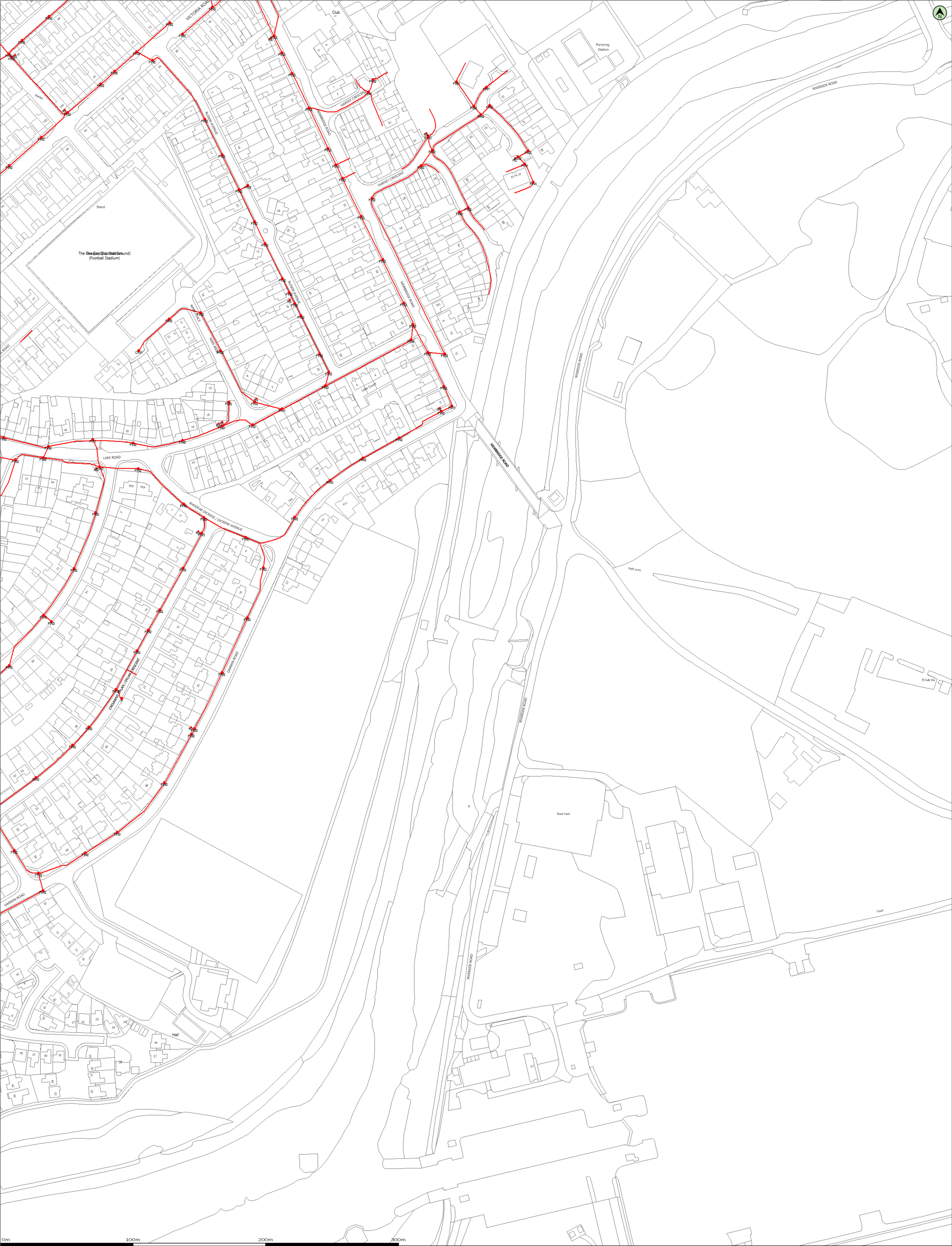
	Sluice Valve		Gravity Sewer
	Air Valve SINGLE		Rising Main
	Tap		Outfall
	Pressure Reducing Valve		Pumping Station
	Meter		Lampole
	Bulk Meter		Combined Sewer Overflow
	Fire Hydrant		Special Purpose Chamber
	Cap		Treatment Works
	Non Dwr Cymru		Private Sewer Transfer
	Existing Distribution Main		Lateral Drain
	Inspection Chamber		NB
			Sewer symbol colour indicates the sewer type.
			RED - Combined
			GREEN - Surface Water
			BROWN - Foul

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Data updated: 01/12/22

Scale: 1:1250
Map Centre: 275521.189195

Date: 09/01/23
Our Ref: 1650131 - 1

Telecoms Plan A1
Powered by digiplus

Duct, Trench	Chamber / Pole	Cabinet

craig.cockerham@centara-ltd.com	
CEN26861	



Important Information - please read The purpose of this plan is to identify Virgin Media apparatus. We have tried to make it as accurate as possible but we cannot warrant its accuracy. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. Further details can be found using the "Affected Properties.pdf", which can be downloaded from this website. Therefore, you must not rely solely on this plan if you are carrying out any excavation or other works in the vicinity of Virgin Media apparatus. The actual position of any underground service must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. Accordingly, unless it is due to the negligence of Virgin Media, its employees or agents, Virgin Media will not have any liability for any omissions or inaccuracies in the plan or for any loss or damage caused or arising from the use of and/or any reliance on this plan. This plan is produced by Virgin Media Limited (© Crown copyright and database rights 2023 Ordnance Survey 100019209).

Mapping Enquiries:

0121 623 9780

All areas

0800 096 3080

Report damage immediately – KEEP EVERYONE AWAY FROM THE AREA
0800 6783 105

Date Requested: 05/01/2023

Job Reference: 28079615

Site Location: 275566 189152

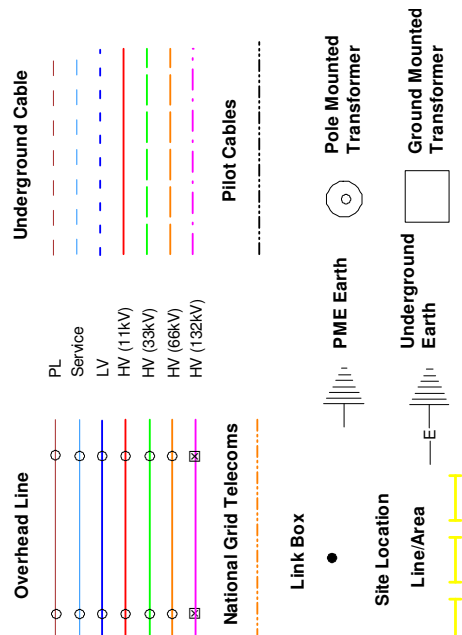
Requested by: Mr Jake handley-parkin

Your Scheme/Reference: CEN26861

IMPORTANT NOTICES

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- When working within 10m of any overhead electric line you should follow the requirements of HSE Guidance Note GS6.
- For further advice on working near our electricity cables or lines, call our Contact Centre on 0800 096 3080.
- Advice should be sought from the National Grid

0800 096 3080



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ocation: 275566 189

Bested by: Mr lake handlev-narkin

Schema/Reference: CEN26861

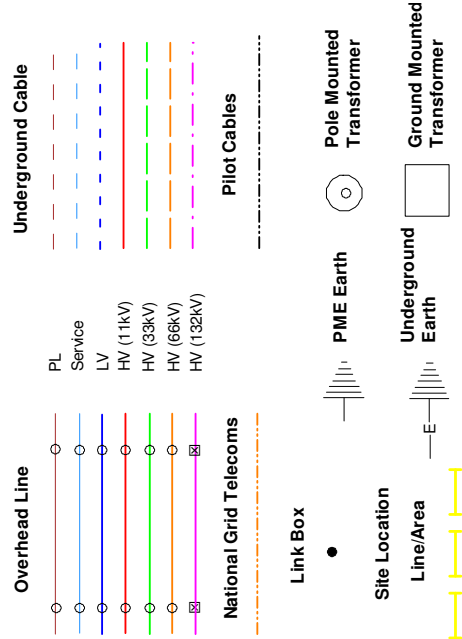
Cooper

Scales:

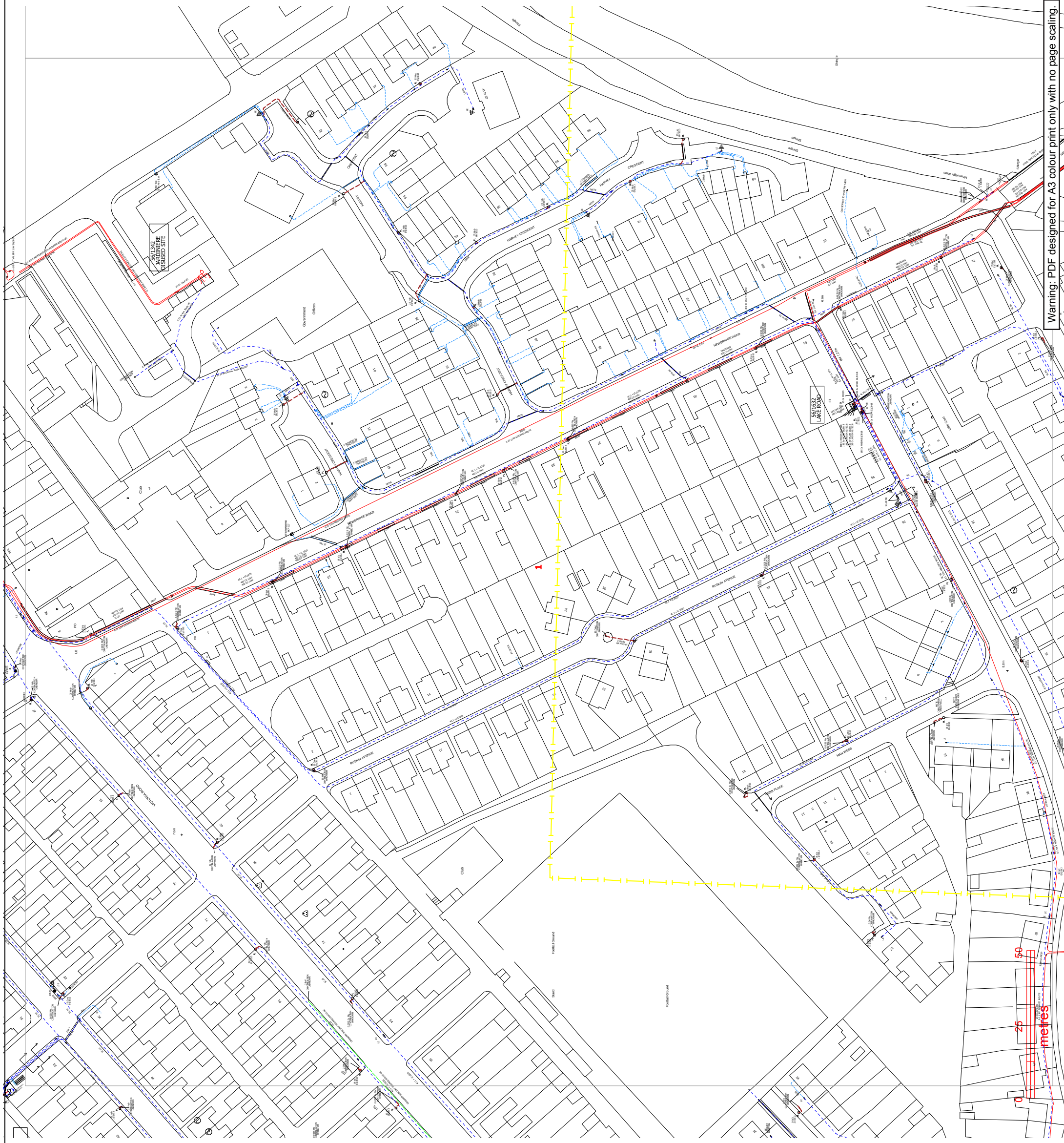
Area or Circle dig site

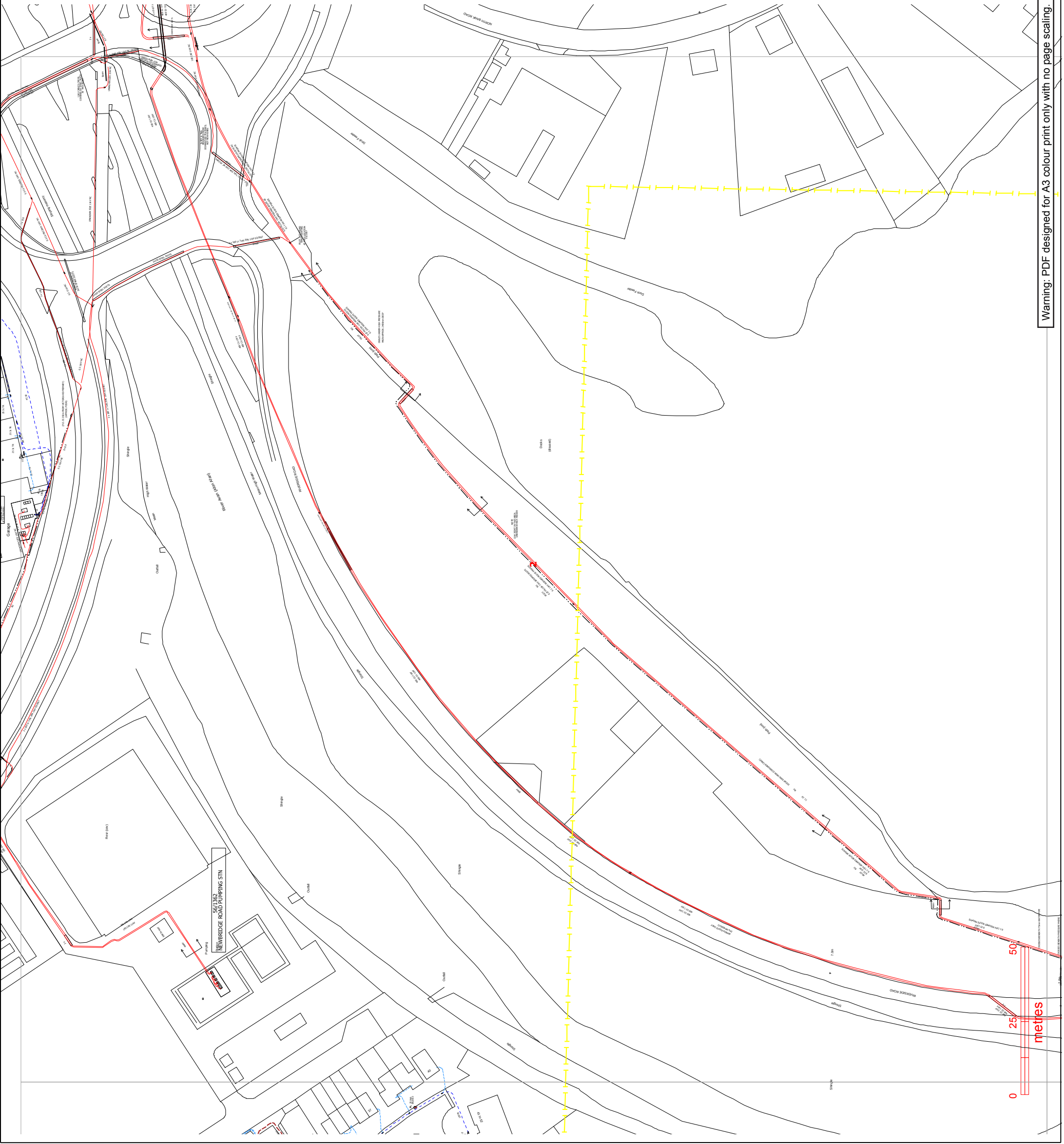
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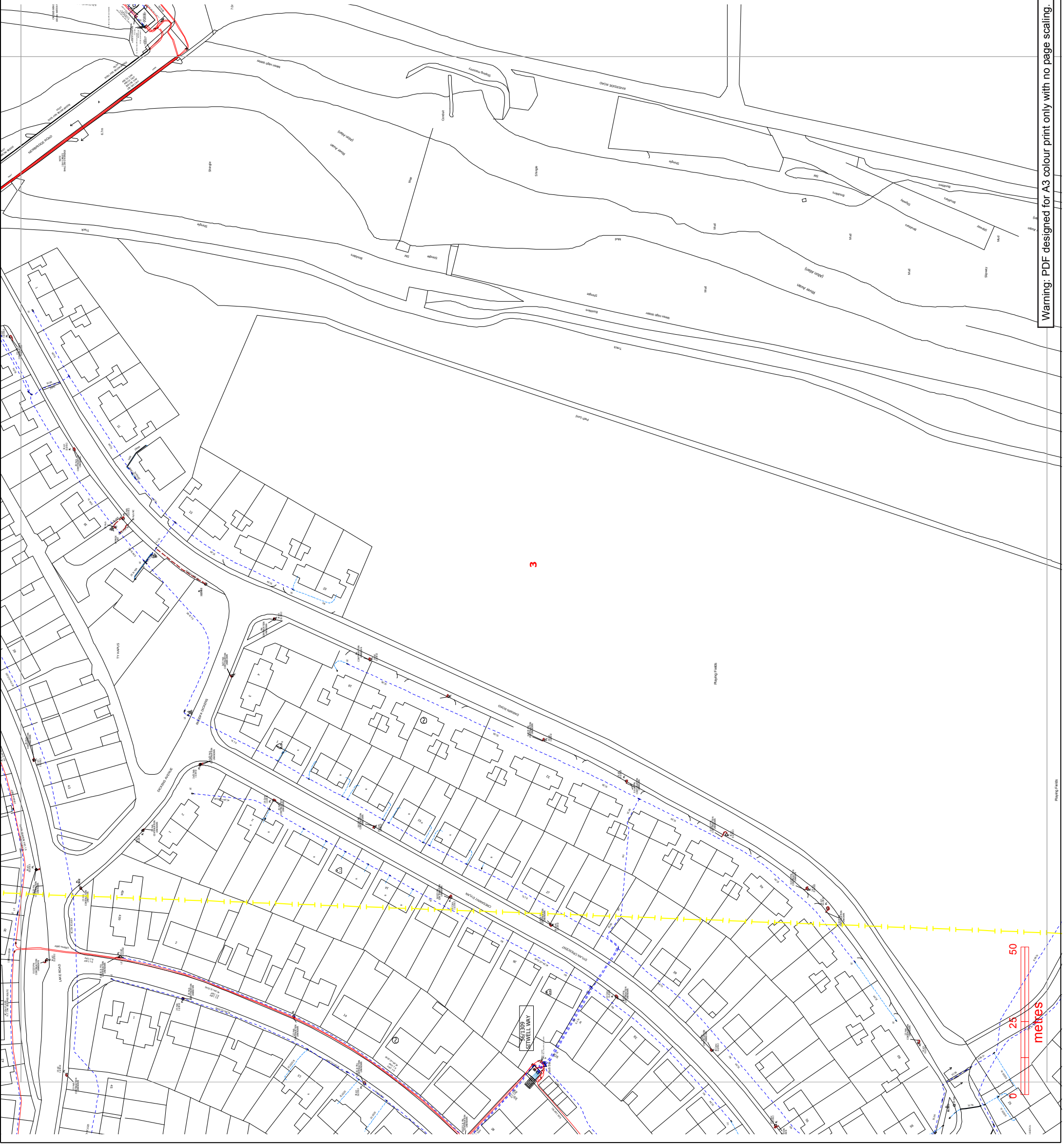
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1:500 Line dig site

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Overhead Line	PL Service LV HV (11kV) HV (33kV) HV (66kV) HV (132kV)	Underground Cable	PL Service LV HV (11kV) HV (33kV) HV (66kV) HV (132kV)
National Grid Telecoms		Pilot Cables	
Link Box		PME Earth	Pole Mounted Transformer
Site Location		Underground Earth	Ground Mounted Transformer
Line/Area			

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Overhead Line

PL

Service

LV

HV (11kV)

HV (33kV)

HV (66kV)

HV (132kV)

Underground Cable

PL

Service

LV

HV (11kV)

HV (33kV)

HV (66kV)

HV (132kV)

Pilot Cables

National Grid Telecoms

Link Box

PME Earth

Pole Mounted Transformer

Site Location

Line/Area

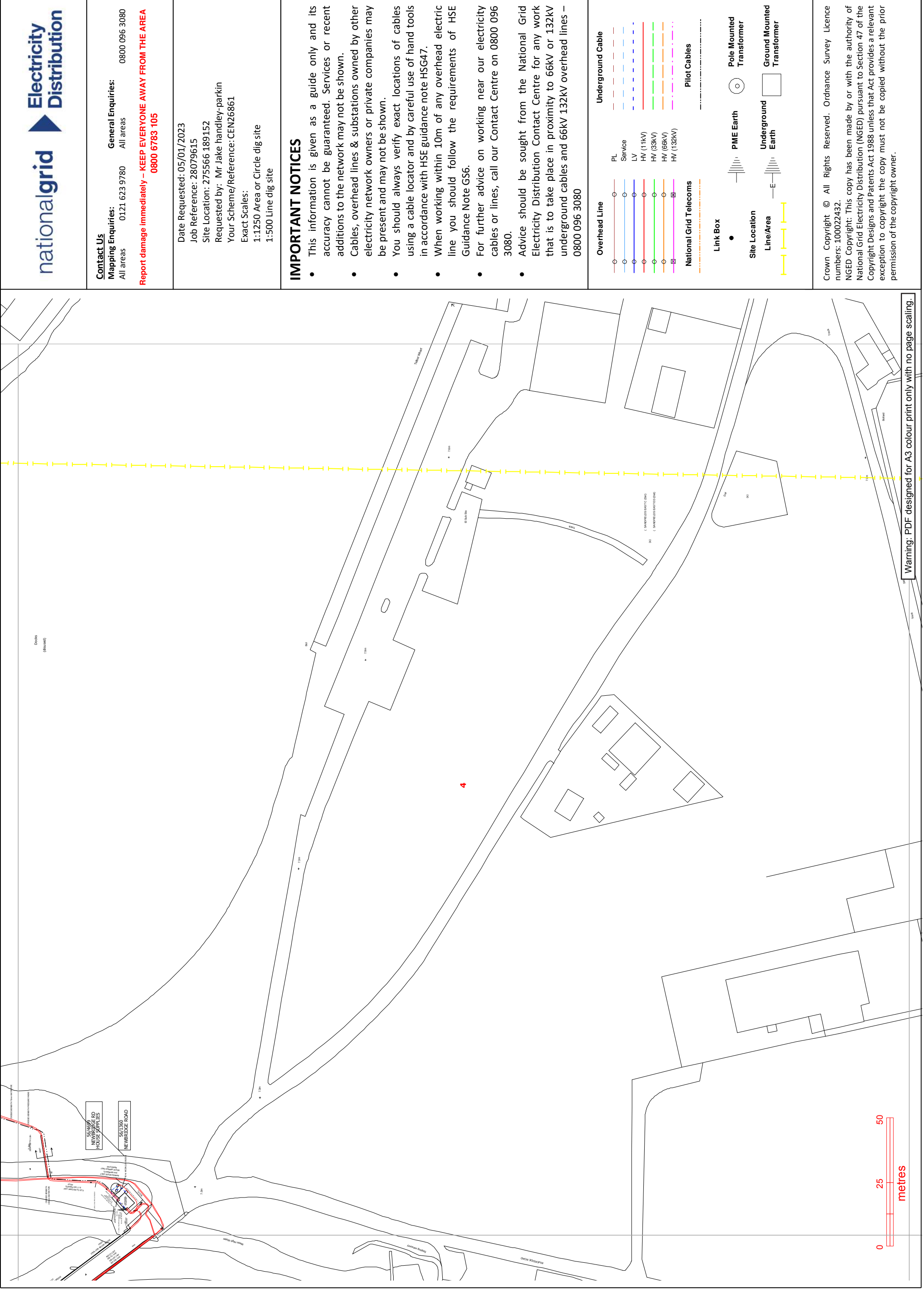
Underground Earth

Ground Mounted Transformer

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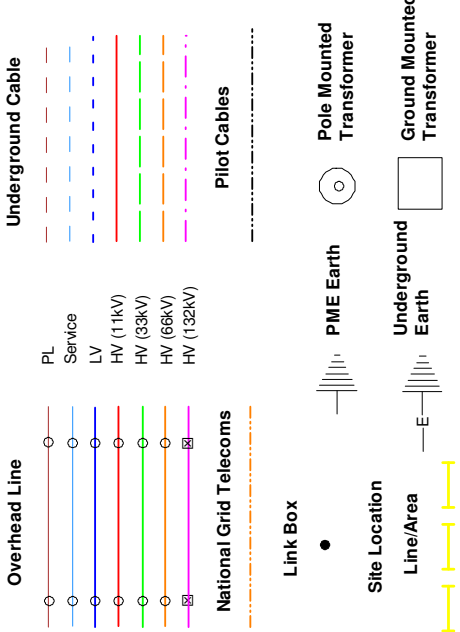


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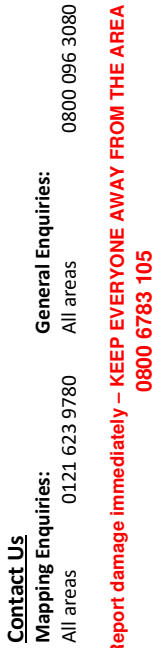
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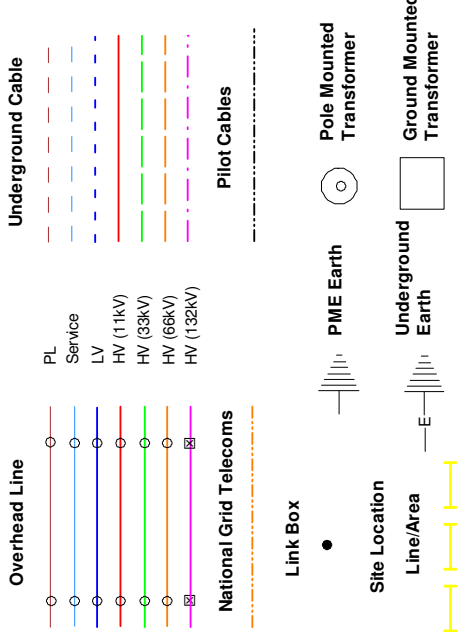
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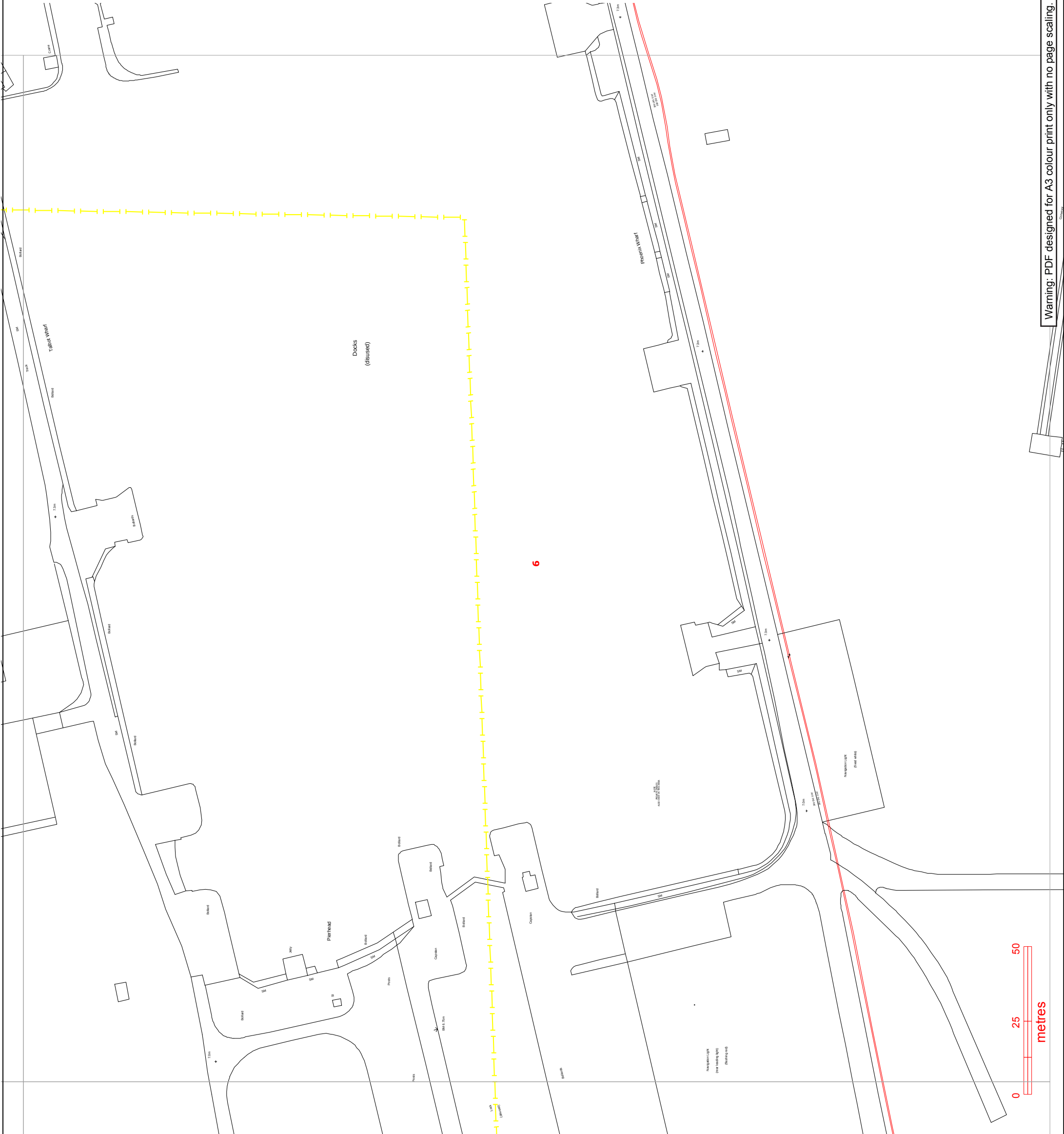
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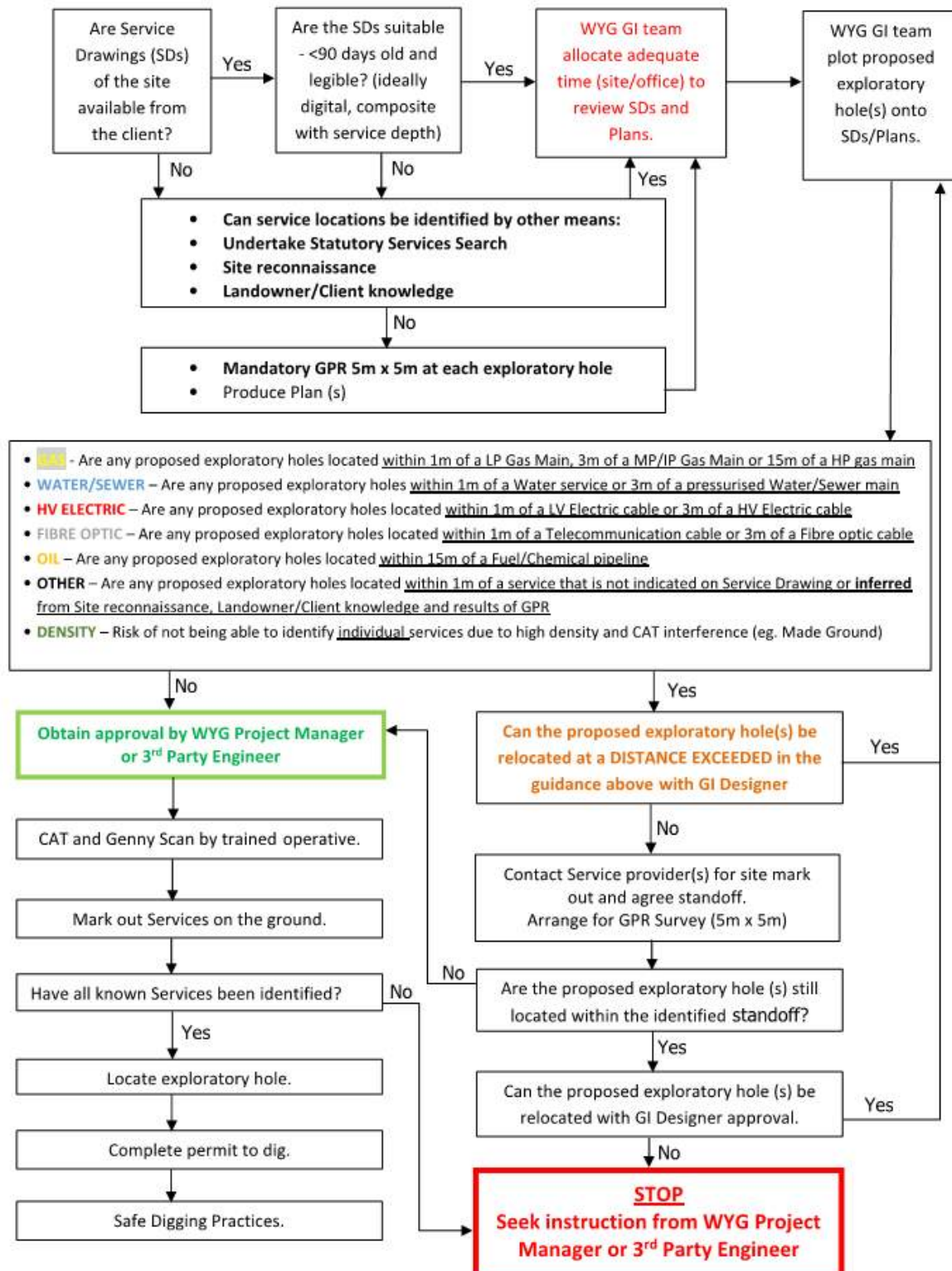
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Date:		Permit Number:		
Project:		Project Number:		
“THINK SAFETY AND ACT SAFELY”				
When Planning to Disturb Ground - Remember to Look <u>UP</u> as well as <u>DOWN</u>! Overhead Services can Kill! Will the Equipment Being Used Contact <u>ANY</u> Services:				
Has a visual inspection been carried out on site for any service runs, taking into account any powered temporary accommodation, wires exiting buildings into the ground etc.				
Reason for Permit Issue:	Exploratory Holes: Trial Pits, Bore Holes, Window Samples, Service Pits etc (Detail Number and Locations)	Ground Disturbance: Any other processes that involve disturbing the ground e.g. driving in pins etc	Inspection Pit: Extracted by hand or Vacuum only	
Description of Work and Location(s):				
Tetra Tech Contact Number in Case of Emergency:				
Sketch Detailing Location or Attached Drawing Reference: Show details of all services etc. additional precautions taken and the extent of any excavation				
Services:	Present?	Marked on Site?	By Whom:	Comments:
National Grid		If yes by:		
Electricity		If yes by:		
Gas		If yes by:		
Water		If yes by:		
Fibre optics		If yes by:		
BT		If yes by:		
Strategic Pipelines		If yes by:		
Sewers/Drains		If yes by:		
Tunnels		If yes by:		
Rail Services		If yes by:		
Other		If yes by:		
1.	Have protective measures been taken for Known/Charted services?			
2.	Have exposed services been Identified and Supported if necessary?			

3.	Has a method statement been produced including a briefing and does it meet current site conditions?	
4.	Has all work equipment been inspected, thoroughly examined, checked for calibration and entered onto the approved Work Equipment Inspection report as applicable?	
Rail Work Section		
Note: For works adjacent to rail lines, plant should only be utilised in positions where it is not be possible to topple into the 'on or near the line' zone. where this is not possible or where work is being undertaken 'on or near the line', the safe system of work must be agreed and planned in advance with the appropriate Tetra Tech Rail manager'		
1.	Does the design drawing show the required plant offset distances?	
2.	For Drilling Rigs: Is the rig positioned a distance from the track greater than the mast/derrick + at least 3m?	
3.	For Excavators: Is the plant positioned a distance from the track greater than the plant height + the arm reach + 3m?	
4.	For Lifting Plant: Is the plant positioned a distance from the track greater than the plant height + boom length + load length + 3m?	
If the answer to any of the above questions is 'NO', have the method statement, risk assessment and Work Package Plan and Task Briefing Sheet been amended to manage the additional risks and has the Tetra Tech Rail Project Manager authorised the changes?		
If in doubt - STOP - Consult with your Project Manager and/or Design Team - End Rail Section		
Permits are to be briefed to all those involved in the work and records attached to this Permit		
Permit Issue and Acceptance Section		
Permit Valid From:	Time:	Date:
Name of issuer:	Employer:	Tetra Tech
Signed:	Date:	
I hereby accept responsibility for ensuring that I and all operatives under my control will fully comply with this ground disturbance permit. I will return this permit on completion having made the area safe.		
Recipient:	Employer:	
Signed:	Date:	
Permit Return and Clearance		
Return:	I hereby declare that the works stated on this permit has been completed or stopped and the area left safe. All persons under my control have been withdrawn from the area.	
Name:	Signed:	Time: Date:
Clearance:	I Hereby Declare This Permit Cancelled:	
Name:	Signed:	Time: Date:
Confirmed Final Site Conditions (Note Services Encountered, Backfill Details etc) That Details Have Been Added to Service Drawings		
Name:	Signed:	Date:

FLOW CHART FOR UNDERGROUND SERVICE CLEARANCE



SAFE DIGGING PRACTICES
Use insulated hand tools
Avoid the use of breaker within 0.50m of known utility
Use rounded edge spades and shovels – preferably with foot pressure and NOT thrown/spiked into the ground
Use toothless bucket where practical
Picks, pins and forks may be used with care to break up hard ground
Picks should not be used in soft ground
Remain vigilant for services during excavation
Repeat CAT and Genny as excavation is progressed
Report all unknown services uncovered
Treat all services as “live”
A live cable/pipe may be contained in an old pipe or conduit
Report any damage to services – DO NOT attempt repairs
Excavate alongside the service and avoid excavating from above
Consider methods including Vac Ex, Water Jetting, Air Lance

GROUND PENETRATING RADAR (GPR)
GPR is a method which is capable of detecting anomalies in the ground by emitting electromagnetic energy into the ground and interpreting the echoes. When these anomalies are plotted into a continuous line may indicate a cable, duct or pipe. The presence of metal generates a major change in electrical properties and the technology is sensitive to other materials such as plastic. This technique alone would not determine the precise nature of the services and should be supported by other information (e.g. service plans) along with support from more conventional techniques (e.g. CAT and Genny). Knowledge of the expected ground conditions is important as the false readings are likely where there are obstructions (e.g. boulders), layers of concrete, metallic objects (including re-bar) and ground disturbance.

GENERAL GUIDANCE ON SERVICE IDENTIFICATION AND DEPTH

	Cable/Duct Colour	Depth – INDICATIVE	NOTES
Electric	Black	0.45 – 1.00m	
Electric - HV	Red	0.45 – 1.00m	Consult the provider when working within 15m
Street lighting and traffic control (Eng and Wal)	Orange	Generally shallow <1.00m	
Road lighting (Sco)	Purple	Generally shallow <1.00m	
Mains water and sewers	Blue	>0.90m	Water and Sewers can be at depths much greater than 1.20m and at high pressure – consult with the provider when working within 3m
Domestic water and sewers	Blue	<0.75m	Utilise local knowledge for domestic supply routes
Gas	Yellow	0.60 – 0.75m	Utilise local knowledge for domestic supply routes
Gas – MP and above	Yellow	0.90m	Don't rely on HP marker posts as they can be accidentally moved Consult the provider when working within 3m of a MP/IP and 15m of HP main Excavations can be undertaken within 3m if the service has been clearly located and marked out by provider
Telecomms	Grey	Generally shallow <1.00m	Consult the provider when working within 3m of a Fibre Optic cable
Cable TV and some Telecomms	Green	Generally shallow <1.00m	Utilise local knowledge for domestic supply routes
Oil Pipeline	Generally welded steel	Generally >1.00m	Consult the provider when working within 15m

SERVICE IDENTIFICATION
A wide variety of materials and colours have been used for services over the years and some services may be very similar in appearance.
- Assume that any black plastic service is a live electricity cable - Iron and steel pipes should be treated as if they are gas pipes - Continuously welded pipes should be treated as containing high pressure/hazardous fluid - Where there is any doubt about the identity the service should be treated as electric or gas until proved otherwise

SERVICE DRAWINGS
Drawings are RARELY ACCURATE and SHOULD NOT be relied upon to obtain distances
The position of reference points (eg. kerb line) may have changed since plan production
Regrading of the surface may mean that depths shown are incorrect
Services may have been moved without knowledge of the owner
Plans may show spare ducts
The routes of older services may not be recorded

LOCATING SERVICES WITH CAT AND GENNY
This approach incorporates electronic detection of underground services using the principle of electromagnetism. The technique works on the basis that a current flowing along the conductor creates a magnetic field. When a receiver is swept across the field it will detect the signal. In principle the centre line of the buried service is where the response from the field is shown at its maximum strength on the receiver. This technique makes use of both active and passive radiated energy to detect buried services. An active signal is one that has been artificially generated (Genny) by the transmitter by either direct connection or induction. A passive signal relates to the naturally transmitted signal on a buried conductor and is detected by observing the 50-60Hz energy or reradiated radio energy already present. A disadvantage of electronic location is its inability to locate non-metallic services.

APPENDIX C - TETRA TECH RISK ASSESSMENTS & DYNAMIC RISK ASSESSMENT

- ☐ Tetra Tech Group Activity Risk Assessment
- ☐ Tetra Tech Dynamic Risk Assessment

Method Statement

PROJECT/BACKGROUND INFORMATION:		
Project Number:	784-B048567	
Project Name:	Newbridge GI	
Location of Activity/Site Address:	Western River Bed	
Project Description:	Geophysical Survey	
Date of Activity/Task:	TBC by Marine License	
Start and Finish Times:	08:00 to 17:00	
Project Manager/Supervisor of Activity/Task	PM: Nicholas Bool SS: James Craddock	
Document Version:	1.0	
Document Location:	A:\784-B048567_Newbridge_GI\30 SSHE\32 H and S\App C - TT RAMS	
Risks (Taken from the Project Specific Risk Assessment): <i>Risks and Controls measures here are determined in the Risk Assessment.</i>		
Risk and to Whom:	Control Measure(s):	Add additional detail below?
Environmental Constraints	Minimal disturbance to riverbed by geophones.	
Driving to site	Drivers should take breaks before and during journey to work to alleviate fatigue. If a driver feels tired during a journey they should pull over at the nearest safe location for a rest before continuing the journey. Drivers should not operate under the influence of drugs or alcohol. Drivers should respect other road users at all times.	
Poor manual handling resulting in Injury	All equipment to be set out by Atlas Geophysical in line with their RAMS	See Atlas Geophysical RAMS
Exposure to contaminated water, sediments or soils.	If potentially grossly contaminated material is identified by the Tetra Tech engineer during works operation will be stopped and a RED site operation will take effect with requirement for jet washing of equipment in suitable wash down area and provision of further PPE including RPE equipment and Tyvek suits.	
Slips, trips and falls.	Care to be taken when traversing steps down to boat set down area and riverbed. Algae to be cleared from set down area by shovel scrape ahead of WS access.	
Drowning	Works to be undertaken at low tide and under low flow, water no more than knee height. Atlas geophysical operatives and TT Engineer to wear lifejackets when working in and near the river channel. TT Engineer in attendance to have lifebuoy available and to hold guideline to workers in the channel.	
Details of any Additional Control Measure(s)/Details:		
<i>This section is to be used to capture any ADDITIONAL measures/details not already covered in the above. Always ensure to make it clear which risk they relate to.</i>		

Summary of Key Issues/Considerations			
Provide additional details where appropriate.			
Previous RAMS to consider?	No	Urban or rural site?	Urban
Other Contractor Activity?	No.	Working at height?	Yes working in river channel
Interface with Public?	Unlikely	Asbestos consideration?	Not anticipated
Night-time Working?	No	Confined space working?	No
Working Near Water?	Yes	[Additional Issue]	No

Method Statement/Sequence of Activity/Task:

Access Arrangements

- Access to the geophysical survey line will be via a small set of concrete steps onto a concrete set down area.
- Set down area to be cleared of algae prior to accessing with geophysical equipment.
- WS rig to be pushed by hand onto WS locations at low tide.
- River channel to only be accessed at low tide and under low flow conditions where water is below knee height.
- Operatives to wear lifejackets when working in or near the river channel.
- TT Engineer to be in attendance with life buoy and guidelines.

Geophysical Survey

- Geophysical survey in channel to be undertaken in line with Atlas Geophysical RAMS.
-

Site Map (If Applicable):

Including parking and site access details/access routes/activity locations.



Details of any Permits/Licences:

Tetra Tech Permit to Dig.

Personnel and Contact Numbers:

TT PM: Nicholas Bool, 07917 735669

TT Supervisor: James Craddock, 07966 534346

Details of Equipment, Materials and Plant

Please list each item and include responsible persons.

Item	Responsible Person(s)	Item	Responsible Person(s)
Geophysical Survey Equipment Geophones, reaction plate, hammer and Computation Units.	Atlas Geophysical		
Vans/4x4	Atlas Geophysical, James Craddock		

Details of Mandatory Personal Protective Equipment (PPE):

Please tick all checkboxes that apply.

					
Eye protection	Face Shield	Foot Protection	Hand Protection	Head Protection	Hearing Protection
☐	☐	☒	☒	☒	☐
					
Protective clothing	Respiratory protection	Safety Harness	High visibility clothing	Face mask	Life jacket
☐	☐	☐	☒	☐	☒

Other required PPE / Specific details of PPE:

Details of any Security Arrangements:

Please include details of security requirements. e.g. Codes, Security clearance, Escort details.

Attend ABP induction prior to works commencing.

Welfare Arrangements:

Nearest onsite/public welfare facilities.

Groundhog unit will be available for TT engineer and Operatives on Riverside Road outside ABP gate.

Nearest Hospital:

Morrison Hospital, Heol Maes Eglwys, Morrison, Swansea, SA6 6NL

Tel: 01792 702222

Buddy Details (if applicable):

Buddy Name and Contact Details:	Name: Nicholas Bool Mobile: 07917 735669 Signature to confirm aware:	Check-ins: <i>Check-ins should be conducted as follow:</i>	Arriving on site When leaving the site for home
Lone Working Arrangements: NA			
Emergency Contact Details/Emergency Arrangements:			
Site/Client Contact: Elinor Meloy NRW, 07817 026477 TT Contact #1: Nicholas Bool 07917 735669 TT Contact #2: Chris Pugh 07711 086236 SSHEQ Out of Hours Emergency Support Line: 07920 703 197 SSHEQ Near-Miss Reporting Form: SSHEQ (sharepoint.com)			
Quality Control and Method Statement Approvals:			
Prepared by:	Nicholas Bool	Signed & Dated:	 10/10/23
Approved by:	Chris Pugh	Signed & Dated:	 10/10/23
By signing below, I confirm that: - I have read, understood, and had the opportunity to ask questions regarding the risks and method statement associated with this activity/task - I will follow all the measures detailed above to control and mitigate the risks associated with this activity/task - In the event of any deviations from this Method Statement, I understand I must STOP, reassess the activity/task and escalate to the Project Manager/Site Supervisor - I acknowledge that failure to do so could compromise my own health and safety and that of others which could result in action being taken			

Name:	Date:	Signature:

Doc Ref Number:	SSHEQ-H&S-008b	Version:	2
Owner:	Group SSHEQ	Department:	SSHEQ
Date of last review:	April 2022	Date of next review:	April 2024

Geophysical Survey

Description (Project Title)	Newbridge GI	Project Number	784-B048567	Issue date	10/10/23
Initially Prepared by	Nicholas Bool	Specific assessment	Cable Percussive Drilling	Approved by	Chris Pugh
Address/Site Location	Riverside Road, Port Talbot, SA6 6NL	Tel:	07817 026477	E-mail	elinor.meloy@cyfoethnaturiolcymru.gov.uk
Scope of Activity	Geophysical Survey				

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
1.	Environmental Constraints	2	2	4	Minimal disturbance to riverbed by geophones.	1	2	2	
2.	Driving to site	2	5	10	Drivers should take breaks before and during journey to work to alleviate fatigue. If a	1	5	5	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					driver feels tired during a journey they should pull over at the nearest safe location for a rest before continuing the journey. Drivers should not operate under the influence of drugs or alcohol. Drivers should respect other road users at all times.				
2.	Poor manual handling resulting in Injury	3	3	9	All equipment to be set out by Atlas Geophysical in line with their RAMS	1	3	3	
3.	Exposure to contaminated water, sediments or soils.	1	3	3	If potentially grossly contaminated material is identified by the Tetra Tech engineer during works digging will be stopped and a RED site operation will take effect with	1	1	1	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					requirement for jet washing of equipment in suitable wash down area and provision of further PPE including RPE equipment and Tyvek suits.				
4.	Slips, trips and falls.	3	3	9	Care to be taken when traversing steps down to boat set down area and riverbed. Algae to be cleared from set down area by shovel scrape ahead of WS access.	1	3	3	
5.	Drowning	2	4	8	Works to be undertaken at low tide and under low flow, water no more than knee height. Atlas geophysical operatives and TT Engineer to wear lifejackets when working in and near the river channel. TT	1	4	4	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					Engineer in attendance to have lifebuoy available and to hold guideline to workers in the channel.				

By signing below, I confirm that:

- I have read, understood, and had the opportunity to ask questions regarding the risks associated with this activity/task
- I will follow all the measures detailed above to control and mitigate the risks associated with this activity/task
- In the event of any deviations from this Risk Assessment and any associated Method Statement, I understand I must **STOP**, reassess the activity/task and escalate to the Project Manager/Director/Site Supervisor
- I acknowledge that failure to do so could compromise my own security, safety, health or wellbeing and that of others which could result in action being taken

Print Name:	Date:	Signature:
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		Likelihood of exposure to hazard					Consider ERIC <u>ELIMINATE</u> the hazard completely <u>REDUCE</u> the risk to a more acceptable level <u>INFORM</u> workforce/others <u>CONTROL</u> the residual risk Also consider the 'General Principles of Prevention' (See CDM ACoP: Appendix 7)
		Likely (5)	Probable (4)	Possible (3)	Remote (2)	Improbable (1)	
Severity of foreseeable consequences		Exposure to the hazard will occur frequently during the activity (more than 10 events per year)	Exposure to the hazard can be expected to occur during the activity (2 to 10 events per year)	Exposure to the hazard will occur occasionally during the activity (1 event every 1 to 10 years)	Exposure to the hazard will seldom occur during the activity (1 event every 10-100 years)	Exposure to the hazard is highly unlikely during the activity (1 event every 100+ years)	
Catastrophic (5)	Accident involving one or more fatalities	25	20	15	10	5	
Major (4)	Major accident under RIDDOR, or permanent ill health reportable	20	16	12	8	4	
Serious (3)	Accident necessitating time off work, or chronic or acute	15	12	9	6	3	
Minor Injury (2)	Accident not necessitating time off work, or minor health	10	8	6	4	2	
Incident (1)	Near miss, no injury sustained, or ill health	5	4	3	2	1	

Note: If the risk level after control measures remains in the Red zone (a residual score of between 20 and 25), then the activity should not proceed until the risk(s) are escalated through Line Management and further controls are identified, agreed and implemented.

If after escalation the risk(s) cannot be reduced further, it may be decided by the Project team that the activity/project does not commence.

Doc ref number:	SSHEQ-H&S-002f	Version:	4
Owner:	Group SSHEQ	Department:	SSHEQ
Date of last review:	November 2022	Date of next review:	November 2024

Sediment and Surface Water Sampling



Description (Project Title)	Newbridge GI	Project Number	784-B048567	Issue date	10/10/23
Initially Prepared by	Nicholas Bool	Specific assessment	Sediment Sampling and Surface Water Sampling	Approved by	Chris Pugh
Address/Site Location	Riverside Road, Port Talbot, SA6 6NL	Tel:	07817 026477	E-mail	elinor.meloy@cyfoethnaturiolcymru.gov.uk
Scope of Activity	4no. HHTP sediment sampling locations 4no. Surface water sampling locations.				

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
1.	Environmental Constraints	3	3	9	Works to be undertaken in line with Marine License. No risks from hand tools or sampling equipment. Van Veen Grab to be used to take the HHTP03 sample from	1	2	2	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					deep part of the channel using a throw rope.				
2.	Driving to site	2	5	10	Drivers should take breaks before and during journey to work to alleviate fatigue. If a driver feels tired during a journey they should pull over at the nearest safe location for a rest before continuing the journey. Drivers should not operate under the influence of drugs or alcohol. Drivers should respect other road users at all times.	1	5	5	
3.	Poor manual handling resulting in Injury	3	3	9	Engineer should be comfortable with any load from the hand tools and sampling equipment and employ the correct lifting technique	1	3	3	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					outlined in the Tetra Tech COPS.				
4.	Exposure to contaminated water, sediments or soils.	1	3	3	If potentially grossly contaminated material is identified by the Tetra Tech engineer during works digging will be stopped and a RED site operation will take effect with requirement for jet washing of equipment in suitable wash down area and provision of further PPE including RPE equipment and Tyvek suits.	1	1	1	
5.	Exposure to asbestos containing materials (ACM)	2	5	10	If possible ACMs are encountered, the asbestos risk assessment procedure will be followed, as included in Appendix D. Namely,	1	5	5	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					additional PPE may be required, namely Tyvek suits and RPE equipment. Damping down of soil will be undertaken as required to limit potential for release of fibres				
6.	Slips, trips and falls.	3	3	9	Care to be taken when traversing riverbank and steps down to the river channel. Algae to be removed from concrete set down area prior to access.	1	3	3	
7.	Drowning	2	5	10	Works to be undertaken at low tide. TT Engineer and second TT Engineer to wear lifejackets when working in the river channel. TT Engineer in	1	5	5	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					attendance to have lifebuoy available.				

By signing below, I confirm that:

- I have read, understood, and had the opportunity to ask questions regarding the risks associated with this activity/task
- I will follow all the measures detailed above to control and mitigate the risks associated with this activity/task
- In the event of any deviations from this Risk Assessment and any associated Method Statement, I understand I must **STOP**, reassess the activity/task and escalate to the Project Manager/Director/Site Supervisor
- I acknowledge that failure to do so could compromise my own security, safety, health or wellbeing and that of others which could result in action being taken

Print Name:	Date:	Signature:
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		Likelihood of exposure to hazard					Consider ERIC <u>ELIMINATE</u> the hazard completely <u>REDUCE</u> the risk to a more acceptable level <u>INFORM</u> workforce/others <u>CONTROL</u> the residual risk Also consider the 'General Principles of Prevention' (See CDM ACoP: Appendix 7)
		Likely (5)	Probable (4)	Possible (3)	Remote (2)	Improbable (1)	
Severity of foreseeable consequences		Exposure to the hazard will occur frequently during the activity (more than 10 events per year)	Exposure to the hazard can be expected to occur during the activity (2 to 10 events per year)	Exposure to the hazard will occur occasionally during the activity (1 event every 1 to 10 years)	Exposure to the hazard will seldom occur during the activity (1 event every 10-100 years)	Exposure to the hazard is highly unlikely during the activity (1 event every 100+ years)	
Catastrophic (5)	Accident involving one or more fatalities	25	20	15	10	5	
Major (4)	Major accident under RIDDOR, or permanent ill health reportable	20	16	12	8	4	
Serious (3)	Accident necessitating time off work, or chronic or acute	15	12	9	6	3	
Minor Injury (2)	Accident not necessitating time off work, or minor health	10	8	6	4	2	
Incident (1)	Near miss, no injury sustained, or ill health	5	4	3	2	1	

Note: If the risk level after control measures remains in the Red zone (a residual score of between 20 and 25), then the activity should not proceed until the risk(s) are escalated through Line Management and further controls are identified, agreed and implemented.

If after escalation the risk(s) cannot be reduced further, it may be decided by the Project team that the activity/project does not commence.

Doc ref number:	SSHEQ-H&S-002f	Version:	4
Owner:	Group SSHEQ	Department:	SSHEQ
Date of last review:	November 2022	Date of next review:	November 2024

Method Statement

PROJECT/BACKGROUND INFORMATION:		
Project Number:	784-B048567	
Project Name:	Newbridge GI	
Location of Activity/Site Address:	Western River Bed	
Project Description:	4no. HHTP sediment sampling locations 4no. Surface water sampling locations.	
Date of Activity/Task:	TBC by Marine License	
Start and Finish Times:	08:00 to 17:00	
Project Manager/Supervisor of Activity/Task	PM: Nicholas Bool SS: James Craddock	
Document Version:	1.0	
Document Location:	A:\784-B048567_Newbridge_GI\30 SSHE\32 H and S\App C - TT RAMS	
Risks (Taken from the Project Specific Risk Assessment): <i>Risks and Controls measures here are determined in the Risk Assessment.</i>		
Risk and to Whom:	Control Measure(s):	Add additional detail below?
Environmental Constraints	Works to be undertaken in line with Marine License. No risks from hand tools or sampling equipment	Van Veen Grab to be used to take the HHTP03 sample from deep part of the channel using a throw rope.
Driving to site	Drivers should take breaks before and during journey to work to alleviate fatigue. If a driver feels tired during a journey they should pull over at the nearest safe location for a rest before continuing the journey. Drivers should not operate under the influence of drugs or alcohol. Drivers should respect other road users at all times.	
Poor manual handling resulting in Injury	Engineer should be comfortable with any load from the hand tools and sampling equipment and employ the correct lifting technique outlined in the Tetra Tech COPS.	
Exposure to contaminated water, sediments or soils.	If potentially grossly contaminated material is identified by the Tetra Tech engineer during works digging will be stopped and a RED site operation will take effect with requirement for jet washing of equipment in suitable wash down area and provision of further PPE including RPE equipment and Tyvek suits.	
Exposure to asbestos containing materials (ACM)	If possible ACMs are encountered, the asbestos risk assessment procedure will be followed, as included in Appendix D. Namely, additional PPE may be required, namely Tyvek suits and RPE equipment. Damping down of soil will be undertaken as required to limit potential for release of fibres	
Slips, trips and falls.	Care to be taken when traversing river bank and steps down to the river channel. Algae to be removed from concrete set down area prior to access.	

Drowning	Works to be undertaken at low tide. TT Engineer and second TT Engineer to wear lifejackets when working in the river channel. Second TT Engineer in attendance to have lifebuoy available.	
Details of any Additional Control Measure(s)/Details: <i>This section is to be used to capture any ADDITIONAL measures/details not already covered in the above. Always ensure to make it clear which risk they relate to.</i>		
Summary of Key Issues/Considerations <i>Provide additional details where appropriate.</i>		
Previous RAMS to consider?	No	Urban or rural site? Urban
Other Contractor Activity?	No.	Working at height? Yes working on riverbank.
Interface with Public?	Possible boat users and ABP Workers	Asbestos consideration? Not anticipated
Night-time Working?	No	Confined space working? No
Working Near Water?	Yes	[Additional Issue] No
Method Statement/Sequence of Activity/Task:		
Access Arrangements - Access to the HHTP and SW locations will be via a small set of concrete steps onto a concrete set down area. - HHTP01 and SW01 to be accessed using wellingtons at low tide and during low flow conditions; - SW03 to be accessed from the South Wales Coastal Path; - Set down area to be cleared of algae prior to accessing with the WS rig; - WS rig to be pushed by hand onto WS locations at low tide.		
Hand Pitting - Prior to excavation Permit to Dig will be issued. - Hand pits will be excavated at each borehole location to 1.20m bgl. - Sub sampling and in-situ testing to be undertaken from the spoil material only.		
Windowless Sample Drilling - Window Sample rig to be operated in line with SWGT RAMS. - TT Engineer to stay clear of windowless sample rig when in operation.		
Reinstatement		

- HHTP locations to have discreet sample taken from river bed.
- Surface water samples do not require reinstatement.

Site Map (If Applicable):

Including parking and site access details/access routes/activity locations.



Details of any Permits/Licences:

Tetra Tech Permit to Dig.

Personnel and Contact Numbers:

TT PM: Nicholas Bool, 07917 735669

TT Supervisor: James Craddock, 07966 534346

Details of Equipment, Materials and Plant

Please list each item and include responsible persons.

Item	Responsible Person(s)	Item	Responsible Person(s)
CAT & Genny	James Craddock	Hand Vane	James Craddock
Van	James Craddock		

Details of Mandatory Personal Protective Equipment (PPE):

Please tick all checkboxes that apply.

 Eye protection ☐	 Face Shield ☐	 Foot Protection ☒	 Hand Protection ☒	 Head Protection ☒	 Hearing Protection ☐
 Protective clothing ☐	 Respiratory protection ☐	 Safety Harness ☐	 High visibility clothing ☒	 Face mask ☐	 Life jacket ☒

Other required PPE / Specific details of PPE:

Details of any Security Arrangements:

Please include details of security requirements. e.g. Codes, Security clearance, Escort details.

Attend ABP induction prior to works commencing.

Welfare Arrangements:

Nearest onsite/public welfare facilities.

Groundhog unit will be available for TT engineer and Operatives on Riverside Road outside ABP gate.

Nearest Hospital:

Morrison Hospital, Heol Maes Eglwys, Morrison, Swansea, SA6 6NL

Tel: 01792 702222

Buddy Details (if applicable):

Buddy Name and Contact Details:	Name: Nicholas Bool Mobile: 07917 735669 Signature to confirm aware:	Check-ins: <i>Check-ins should be conducted as follow:</i>	Arriving on site When leaving the site for home
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Lone Working Arrangements: NA			
Emergency Contact Details/Emergency Arrangements:			
Site/Client Contact: Elinor Meloy NRW, 07817 026477 TT Contact #1: Nicholas Bool 07917 735669 TT Contact #2: Chris Pugh 07711 086236 SSHEQ Out of Hours Emergency Support Line: 07920 703 197 SSHEQ Near-Miss Reporting Form: SSHEQ (sharepoint.com)			
Quality Control and Method Statement Approvals:			
Prepared by:	Nicholas Bool	Signed & Dated:	 10/10/23
Approved by:	Chris Pugh	Signed & Dated:	 10/10/23
By signing below, I confirm that: - I have read, understood, and had the opportunity to ask questions regarding the risks and method statement associated with this activity/task - I will follow all the measures detailed above to control and mitigate the risks associated with this activity/task - In the event of any deviations from this Method Statement, I understand I must STOP, reassess the activity/task and escalate to the Project Manager/Site Supervisor - I acknowledge that failure to do so could compromise my own health and safety and that of others which could result in action being taken			
Name:	Date:	Signature:	

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Doc Ref Number:	SSHEQ-H&S-008b	Version:	2
Owner:	Group SSHEQ	Department:	SSHEQ
Date of last review:	April 2022	Date of next review:	April 2024

Method Statement

PROJECT/BACKGROUND INFORMATION:		
Project Number:	784-B048567	
Project Name:	Newbridge GI	
Location of Activity/Site Address:	Western River Bed	
Project Description:	2no. Windowless Sample Boreholes	
Date of Activity/Task:	TBC by Marine License	
Start and Finish Times:	08:00 to 17:00	
Project Manager/Supervisor of Activity/Task	PM: Nicholas Bool SS: James Craddock	
Document Version:	1.0	
Document Location:	A:\784-B048567_Newbridge_GI\30 SSHE\32 H and S\App C - TT RAMS	
Risks (Taken from the Project Specific Risk Assessment): <i>Risks and Controls measures here are determined in the Risk Assessment.</i>		
Risk and to Whom:	Control Measure(s):	Add additional detail below?
Risk of member of the public or site personnel being struck by equipment whilst it is in transit.	Windowless sampler is wheeled and will be pushed by hand by two operatives from the support vehicle with TT Banksman in attendance.	Sampler will need to be wheeled down small set of steps onto concrete set down area below road level.
Environmental Constraints	Windowless Sample generator to be left at road level on drip tray away from river bed.	
Driving to site	Drivers should take breaks before and during journey to work to alleviate fatigue. If a driver feels tired during a journey they should pull over at the nearest safe location for a rest before continuing the journey. Drivers should not operate under the influence of drugs or alcohol. Drivers should respect other road users at all times.	
Striking of known or unknown utilities/services.	Pre-start assessment of exploratory hole locations by TT Supervisor. GPR and CAT & Genny location of the site by Midland Survey.	
Environmental risk (fuel spillage whilst refueling)	Refueling not to be undertaken on site.	
Poor manual handling resulting in Injury	Large bulks will be broken down into two separate bulks to ensure they are below the 20kg. Engineer should be comfortable with any load and employ the correct lifting technique outlined in the Tetra Tech COPS.	
Cut Injuries	ReAkta safety blade to be used to split liners.	
Exposure to contaminated water, sediments or soils.	If potentially grossly contaminated material is identified by the Tetra Tech engineer during works digging will be stopped and a RED site operation will take effect with requirement for jet washing of equipment in suitable wash down area and provision of further PPE including RPE equipment and Tyvek suits.	

Exposure to asbestos containing materials (ACM)	If possible ACMs are encountered, the asbestos risk assessment procedure will be followed, as included in Appendix D. Namely, additional PPE may be required, namely Tyvek suits and RPE equipment. Damping down of soil will be undertaken as required to limit potential for release of fibres	
Slips, trips and falls.	Care to be taken when traversing steps down to boat set down area. TT Supervisor and second man below and first man above to guide windowless sampler. Algae to be cleared from set down area by shovel scrape ahead of WS access.	
Moving parts of machinery	TT Engineer not to approach windowless sampler rig while in operation.	See SWGT RAMS for additional detail on drilling operations
Drowning	Works to be undertaken at low tide. Windowless sampler operatives and TT Engineer to wear lifejackets when working in the river channel. TT Engineer in attendance to have lifebuoy available.	

Details of any Additional Control Measure(s)/Details:

*This section is to be used to capture any **ADDITIONAL** measures/details not already covered in the above. Always ensure to make it clear which risk they relate to.*

Summary of Key Issues/Considerations

Provide additional details where appropriate.

Previous RAMS to consider?	No	Urban or rural site?	Urban
Other Contractor Activity?	No.	Working at height?	Yes working on riverbank.
Interface with Public?	Possible boat users and ABP Workers	Asbestos consideration?	Not anticipated
Night-time Working?	No	Confined space working?	No
Working Near Water?	Yes	[Additional Issue]	No

Method Statement/Sequence of Activity/Task:

Access Arrangements

- Access to the WS locations will be via a small set of concrete steps onto a concrete set down area.
- Set down area to be cleared of algae prior to accessing with the WS rig.
- WS rig to be pushed by hand onto WS locations at low tide.

Buried Service Clearance

- TT Engineer and Midland Survey Ltd to assess the location of the of service scaring and coverers and scan using GPR CAT & Signal Generator and agree an offset for exploratory hole locations required nearby.

- All exploratory holes to be scanned using GPR, CAT and Genny and marked up prior to excavation.

Hand Pitting

- Prior to excavation Permit to Dig will be issued.
- Hand pits will be excavated at each borehole location to 1.20m bgl.
- Sub sampling and in-situ testing to be undertaken from the spoil material only.

Windowless Sample Drilling

- Window Sample rig to be operated in line with SWGT RAMS.
- TT Engineer to stay clear of windowless sample rig when in operation.

Reinstatement

- Exploratory windowless sample positions will be backfilled with bentonite pellets.

Site Map (If Applicable):

Including parking and site access details/access routes/activity locations.



Details of any Permits/Licences:

Tetra Tech Permit to Dig.

Personnel and Contact Numbers:

TT PM: Nicholas Bool, 07917 735669

TT Supervisor: James Craddock, 07966 534346

Details of Equipment, Materials and Plant

Please list each item and include responsible persons.

Item	Responsible Person(s)	Item	Responsible Person(s)
Ground Penetrating Radar	Midland Survey	CAT & Genny	Midland Survey
CAT & Genny	James Craddock	Hand Vane	James Craddock
Vans/4x4	Midland Survey, SWGT, James Craddock	Wheeled Windowless Sampler	SWGT

Details of Mandatory Personal Protective Equipment (PPE):

Please tick all checkboxes that apply.

					
Eye protection	Face Shield	Foot Protection	Hand Protection	Head Protection	Hearing Protection
☐	☐	☒	☒	☒	☐
					
Protective clothing	Respiratory protection	Safety Harness	High visibility clothing	Face mask	Life jacket
☐	☐	☐	☒	☐	☒

Other required PPE / Specific details of PPE:
Details of any Security Arrangements:

Please include details of security requirements. e.g. Codes, Security clearance, Escort details.

Attend ABP induction prior to works commencing.

Welfare Arrangements:

Nearest onsite/public welfare facilities.

Groundhog unit will be available for TT engineer and Operatives on Riverside Road outside ABP gate.

Nearest Hospital:

Morrison Hospital, Heol Maes Eglwys, Morrison, Swansea, SA6 6NL

Tel: 01792 702222

Buddy Details (if applicable):

Buddy Name and Contact Details:	Name: Nicholas Bool Mobile: 07917 735669 Signature to confirm aware:	Check-ins: <i>Check-ins should be conducted as follow:</i>	Arriving on site When leaving the site for home
--	--	--	--

Lone Working Arrangements:

NA

Emergency Contact Details/Emergency Arrangements:

Site/Client Contact: Elinor Meloy NRW, 07817 026477

TT Contact #1: Nicholas Bool 07917 735669

TT Contact #2: Chris Pugh 07711 086236

SSHEQ Out of Hours Emergency Support Line: 07920 703 197

SSHEQ Near-Miss Reporting Form: [SSHEQ \(sharepoint.com\)](#)

Quality Control and Method Statement Approvals:

Prepared by:	Nicholas Bool	Signed & Dated:	 10/10/23
Approved by:	Chris Pugh	Signed & Dated:	 10/10/23

By signing below, I confirm that:

- I have read, understood, and had the opportunity to ask questions regarding the risks and method statement associated with this activity/task
- I will follow all the measures detailed above to control and mitigate the risks associated with this activity/task

- In the event of any deviations from this Method Statement, I understand I must STOP, reassess the activity/task and escalate to the Project Manager/Site Supervisor
- I acknowledge that failure to do so could compromise my own health and safety and that of others which could result in action being taken

Name:	Date:	Signature:

Doc Ref Number: SSHEQ-H&S-008b	Version: 2
Owner: Group SSHEQ	Department: SSHEQ
Date of last review: April 2022	Date of next review: April 2024

Windowless Sample Boreholes

Description (Project Title)	Newbridge GI	Project Number	784-B048567	Issue date	10/10/23
Initially Prepared by	Nicholas Bool	Specific assessment	Windowless Sample Drilling	Approved by	Chris Pugh
Address/Site Location	Riverside Road, Port Talbot, SA6 6NL	Tel:	07817 026477	E-mail	elinor.meloy@cyfoethnaturiolcymru.gov.uk
Scope of Activity	2 No. Windowless Sample Boreholes				

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
1.	Risk of member of the public or site personnel being struck by equipment whilst it is in transit.	3	3	9	Windowless sampler is wheeled and will be pushed by hand by two operatives from the support vehicle with TT Banksman in attendance.	1	2	2	Review on Arrival
2.	Driving to site	2	5	10	Drivers should take breaks before and during journey to	1	5	5	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					work to alleviate fatigue. If a driver feels tired during a journey they should pull over at the nearest safe location for a rest before continuing the journey. Drivers should not operate under the influence of drugs or alcohol. Drivers should respect other road users at all times.				
3.	Striking of known or unknown utilities/services.	3	5	15	Pre-start assessment of exploratory hole locations by TT Supervisor. GPR and CAT & Genny location of the site by Midland Survey.	1	5	5	
4.	Environmental risk (fuel spillage whilst refuelling)	3	2	6	Refueling not to be undertaken on site.	1	2	2	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
5.	Poor manual handling resulting in Injury	3	3	9	Large bulks will be broken down into two separate bulks to ensure they are below the 20kg. Engineer should be comfortable with any load and employ the correct lifting technique outlined in the Tetra Tech COPS.	1	3	3	
6.	Cut Injuries	3	4	12	ReAkta safety blade to be used to split liners.	1	4	4	
7.	Exposure to contaminated water, sediments or soils.	1	3	3	If potentially grossly contaminated material is identified by the Tetra Tech engineer during works digging will be stopped and a RED site operation will take effect with requirement for jet washing of equipment in suitable wash	1	1	1	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					down area and provision of further PPE including RPE equipment and Tyvek suits.				
8.	Exposure to asbestos containing materials (ACM)	2	5	10	If possible ACMs are encountered, the asbestos risk assessment procedure will be followed, as included in Appendix D. Namely, additional PPE may be required, namely Tyvek suits and RPE equipment. Damping down of soil will be undertaken as required to limit potential for release of fibres	1	5	5	
9.	Slips, trips and falls.	3	3	9	Care to be taken when traversing steps down to boat set down area. TT Supervisor and second man below and	1	3	3	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					first man above to guide windowless sampler. Algae to be cleared from set down area by shovel scrape ahead of WS access.				
10.	Moving parts of machinery	2	4	8	TT Engineer not to approach windowless sampler rig while in operation.	1	4	4	
11.	Falls from Height	3	4	12	TT Engineer to stay away from embankment edges as far as is reasonably practicable. Apex crew to stay clear of riverbank edges as far as is reasonably practicable. HERAS fencing to act as physical barrier with riverbank edge.	1	4	4	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
12.	Drowning	2	5	10	Works to be undertaken at low tide. Windowless sampler operatives and TT Engineer to wear lifejackets when working in the river channel. TT Engineer in attendance to have lifebuoy available.	1	5	5	

By signing below, I confirm that:

- I have read, understood, and had the opportunity to ask questions regarding the risks associated with this activity/task
- I will follow all the measures detailed above to control and mitigate the risks associated with this activity/task
- In the event of any deviations from this Risk Assessment and any associated Method Statement, I understand I must **STOP**, reassess the activity/task and escalate to the Project Manager/Director/Site Supervisor
- I acknowledge that failure to do so could compromise my own security, safety, health or wellbeing and that of others which could result in action being taken

Print Name:	Date:	Signature:

		Likelihood of exposure to hazard					Consider ERIC <u>ELIMINATE</u> the hazard completely <u>REDUCE</u> the risk to a more acceptable level <u>INFORM</u> workforce/others <u>CONTROL</u> the residual risk Also consider the 'General Principles of Prevention' (See CDM ACoP: Appendix 7)
		Likely (5)	Probable (4)	Possible (3)	Remote (2)	Improbable (1)	
Severity of foreseeable consequences		Exposure to the hazard will occur frequently during the activity (more than 10 events per year)	Exposure to the hazard can be expected to occur during the activity (2 to 10 events per year)	Exposure to the hazard will occur occasionally during the activity (1 event every 1 to 10 years)	Exposure to the hazard will seldom occur during the activity (1 event every 10-100 years)	Exposure to the hazard is highly unlikely during the activity (1 event every 100+ years)	
Catastrophic (5)	Accident involving one or more fatalities	25	20	15	10	5	
Major (4)	Major accident under RIDDOR, or permanent ill health reportable	20	16	12	8	4	
Serious (3)	Accident necessitating time off work, or chronic or acute	15	12	9	6	3	
Minor Injury (2)	Accident not necessitating time off work, or minor health	10	8	6	4	2	
Incident (1)	Near miss, no injury sustained, or ill health	5	4	3	2	1	

Note: If the risk level after control measures remains in the Red zone (a residual score of between 20 and 25), then the activity should not proceed until the risk(s) are escalated through Line Management and further controls are identified, agreed and implemented.

If after escalation the risk(s) cannot be reduced further, it may be decided by the Project team that the activity/project does not commence.

Doc ref number:	SSHEQ-H&S-002f	Version:	4
Owner:	Group SSHEQ	Department:	SSHEQ
Date of last review:	November 2022	Date of next review:	November 2024

Method Statement

PROJECT/BACKGROUND INFORMATION:		
Project Number:	784-B048567	
Project Name:	Newbridge GI	
Location of Activity/Site Address:	Eastern and Western Banks of the Afan River	
Project Description:	2no. Cable Percussive Boreholes	
Date of Activity/Task:	TBC by Marine License	
Start and Finish Times:	08:00 to 17:00	
Project Manager/Supervisor of Activity/Task	PM: Nicholas Bool SS: James Craddock	
Document Version:	1.0	
Document Location:	A:\784-B048567_Newbridge_GI\30 SSHE\32 H and S\App C - TT RAMS	
Risks (Taken from the Project Specific Risk Assessment): <i>Risks and Controls measures here are determined in the Risk Assessment.</i>		
Risk and to Whom:	Control Measure(s):	Add additional detail below?
Risk of member of the public or site personnel being struck by equipment whilst it is in transit.	Cable Percussive Rig to be tracked at walking pace to BH01 along the existing footpath on the western bank with suitably qualified TT banksman present at all times. Access to BH02 is from the highway. Cable percussive rig to be driven onto the location with the TT banksman in attendance.	BH01 - JCB 3CX to be used to remove boulder from South Wales Coastal Path entrance location off Darwinn Road
Driving to site	Drivers should take breaks before and during journey to work to alleviate fatigue. If a driver feels tired during a journey they should pull over at the nearest safe location for a rest before continuing the journey. Drivers should not operate under the influence of drugs or alcohol. Drivers should respect other road users at all times.	
Striking of known or unknown utilities/services.	Pre-start assessment of exploratory hole locations by TT Supervisor. GPR and CAT & Genny location of the site by Midland Survey.	
Environmental risk (fuel spillage whilst refueling)	Refueling of cable percussive rigs to be undertaken with the deployment of a drip tray and plant nappy below.	
Poor manual handling resulting in injury	Large bulks will be broken down into two separate bulks to ensure they are below the 20kg. Engineer should be comfortable with any load and employ the correct lifting technique outlined in the Tetra Tech COPS.	
Exposure to contaminated water, sediments or soils.	If potentially grossly contaminated material is identified by the Tetra Tech engineer during works digging will be stopped and a RED site operation will take effect with requirement for jet washing of equipment in suitable wash down area and provision of further PPE including RPE equipment and Tyvek suits.	

Exposure to asbestos containing materials (ACM)	If possible ACMs are encountered, the asbestos risk assessment procedure will be followed, as included in Appendix D. Namely, additional PPE may be required, namely Tyvek suits and RPE equipment. Damping down of soil will be undertaken as required to limit potential for release of fibres	
Slips, trips and falls.	Care to be taken when traversing footpath verges. Care to be taken when accessing stockpile. TT Engineer to assess easiest access route prior to traversing.	
Moving parts of machinery	TT Engineer not to approach cable percussive rig while in operation. HERAS fence panels to be deployed around the drilling rig to prevent access to moving parts when in operation.	See Apex RAMS for additional detail on drilling operations
Falls from Height	TT Engineer to stay away from embankment edges as far as is reasonably practicable. Apex crew to stay clear of riverbank edges as far as is reasonably practicable. HERAS fencing to act as physical barrier with riverbank edge.	
Drowning	TT Engineer to stay away from embankment edges as far as is reasonably practicable. Apex crew to stay clear of riverbank edges as far as is reasonably practicable. HERAS fencing to act as physical barrier with riverbank edge.	

Details of any Additional Control Measure(s)/Details:

*This section is to be used to capture any **ADDITIONAL** measures/details not already covered in the above. Always ensure to make it clear which risk they relate to.*

Summary of Key Issues/Considerations

Provide additional details where appropriate.

Previous RAMS to consider?	No	Urban or rural site?	Urban
Other Contractor Activity?	No.	Working at height?	Yes working on riverbank.
Interface with Public?	Yes – footpath used by walkers and cyclists	Asbestos consideration?	Not anticipated
Night-time Working?	No	Confined space working?	No
Working Near Water?	Yes	[Additional Issue]	No

Method Statement/Sequence of Activity/Task:

Access Arrangements

- Access and egress to BH01 will be from Darwin Road and the South Wales Coastal Path
- Council bollards to be removed from South Wales Coastal Path Access of Darwin Road.

- Following removal of bollards JCB 3CX will access the footpath with TT Banksman in attendance to remove boulders blocking vehicle access.
- Following removal of the boulder the Cable Percussive Rig will be driven along the South Wales Coastal path at walking pace with TT banksman in attendance. Should a member of the public need to pass the rig will be stopped and the member of the public guided safely around the stationary rig before continuing to BH01.
- BH02 accessed from Riverside Road. Cable percussive rig will be driven onto the location with TT banksman in attendance.

Buried Service Clearance

- TT Engineer and Midland Survey Ltd to assess the location of the of service scaring and coverers and scan using GPR CAT & Signal Generator and agree an offset for exploratory hole locations required nearby.
- All exploratory holes to be scanned using GPR, CAT and Genny and marked up prior to excavation.

Hand Pitting

- Prior to excavation Permit to Dig will be issued.
- Hand pits will be excavated at each borehole location to 1.20m bgl.
- BH02 will require concrete breaking out with a hydraulic breaker prior to advancing handpit.
- Sub sampling and in-situ testing to be undertaken from the spoil material only.

Cable Percussive Drilling

- Cable Percussive rig to be operated in line with Apex Drilling Services RAMS.
- TT Engineer to stay clear of cable percussive rig at all times.

Reinstatement

- Exploratory cable percussive positions will be backfilled with bentonite pellets.
- Turf removed will be replaced.
- Concrete broken out will be replaced with concrete.

Site Map (If Applicable):

Including parking and site access details/access routes/activity locations.



Details of any Permits/Licences:

Tetra Tech Permit to Dig.

Personnel and Contact Numbers:

TT PM: Nicholas Bool, 07917 735669

TT Supervisor: James Craddock, 07966 534346

Details of Equipment, Materials and Plant

Please list each item and include responsible persons.

Item	Responsible Person(s)	Item	Responsible Person(s)
Ground Penetrating Radar	Midland Survey	CAT & Genny	Midland Survey
CAT & Genny	James Craddock	Hand Vane	James Craddock
Vans/4x4	Midland Survey, Apex Drilling Services James Craddock	Cable Percussive Rig	Apex Drilling Services

Details of Mandatory Personal Protective Equipment (PPE):

Please tick all checkboxes that apply.

					
Eye protection	Face Shield	Foot Protection	Hand Protection	Head Protection	Hearing Protection
☐	☐	☒	☒	☒	☐
					
Protective clothing	Respiratory protection	Safety Harness	High visibility clothing	Face mask	Life jacket
☐	☐	☐	☒	☐	☐

Other required PPE / Specific details of PPE:

Details of any Security Arrangements:

Please include details of security requirements. e.g. Codes, Security clearance, Escort details.

Attend ABP induction prior to works commencing.

Welfare Arrangements:

Nearest onsite/public welfare facilities.

Groundhog unit will be available for TT engineer and Operatives on Riverside Road outside ABP gate.

Nearest Hospital:

Morrison Hospital, Heol Maes Eglwys, Morrison, Swansea, SA6 6NL

Tel: 01792 702222

Buddy Details (if applicable):

Buddy Name and Contact Details:	Name: Nicholas Bool	Check-ins:	Arriving on site
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	Mobile: 07917 735669 Signature to confirm aware:	<i>Check-ins should be conducted as follow:</i>	When leaving the site for home
Lone Working Arrangements: NA			
Emergency Contact Details/Emergency Arrangements:			
Site/Client Contact: Elinor Meloy NRW, 07817 026477 TT Contact #1: Nicholas Bool 07917 735669 TT Contact #2: Chris Pugh 07711 086236 SSHEQ Out of Hours Emergency Support Line: 07920 703 197 SSHEQ Near-Miss Reporting Form: SSHEQ (sharepoint.com)			
Quality Control and Method Statement Approvals:			
Prepared by:	Nicholas Bool	Signed & Dated:	 10/10/23
Approved by:	Chris Pugh	Signed & Dated:	 10/10/23
By signing below, I confirm that: - I have read, understood, and had the opportunity to ask questions regarding the risks and method statement associated with this activity/task - I will follow all the measures detailed above to control and mitigate the risks associated with this activity/task - In the event of any deviations from this Method Statement, I understand I must STOP, reassess the activity/task and escalate to the Project Manager/Site Supervisor - I acknowledge that failure to do so could compromise my own health and safety and that of others which could result in action being taken			
Name:	Date:	Signature:	

Doc Ref Number:	SSHEQ-H&S-008b	Version:	2
Owner:	Group SSHEQ	Department:	SSHEQ
Date of last review:	April 2022	Date of next review:	April 2024

Cable Percussive Boreholes

Description (Project Title)	Newbridge GI	Project Number	784-B048567	Issue date	10/10/23
Initially Prepared by	Nicholas Bool	Specific assessment	Cable Percussive Drilling	Approved by	Chris Pugh
Address/Site Location	Riverside Road, Port Talbot, SA6 6NL	Tel:	07817 026477	E-mail	elinor.meloy@cyfoethnaturiolcymru.gov.uk
Scope of Activity	2 No. Cable Percussive Boreholes				

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
1.	Risk of member of the public or site personnel being struck by equipment whilst it is in transit.	3	3	9	Cable Percussive Rig to be tracked at walking pace to BH01 along the existing footpath on the western bank with suitably qualified TT banksman present at all times.	1	2	2	Review on Arrival

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					Access to BH02 is from the highway. Cable percussive rig to be driven onto the location with the TT banksman in attendance. BH01 - JCB 3CX to be used to remove boulder from South Wales Coastal Path entrance location off Darwinn Road				
2.	Driving to site	2	5	10	Drivers should take breaks before and during journey to work to alleviate fatigue. If a driver feels tired during a journey they should pull over at the nearest safe location for a rest before continuing the journey. Drivers should not operate under the influence of	1	5	5	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					drugs or alcohol. Drivers should respect other road users at all times.				
3.	Striking of known or unknown utilities/services.	3	5	15	Pre-start assessment of exploratory hole locations by TT Supervisor. GPR and CAT & Genny location of the site by Midland Survey.	1	5	5	
4.	Environmental risk (fuel spillage whilst refuelling)	3	2	6	Refueling of able percussive rigs to be undertaken with the deployment of a drip tray and plant nappy below.	1	2	2	
5.	Poor manual handling resulting in Injury	3	3	9	Large bulks will be broken down into two separate bulks to ensure they are below the 20kg. Engineer should be comfortable with any load and	1	3	3	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					employ the correct lifting technique outlined in the Tetra Tech COPS.				
6.	Exposure to contaminated water, sediments or soils.	1	3	3	If potentially grossly contaminated material is identified by the Tetra Tech engineer during works digging will be stopped and a RED site operation will take effect with requirement for jet washing of equipment in suitable wash down area and provision of further PPE including RPE equipment and Tyvek suits.	1	1	1	
7.	Exposure to asbestos containing materials (ACM)	2	5	10	If possible ACMs are encountered, the asbestos risk assessment procedure will be followed, as included in	1	5	5	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					Appendix D. Namely, additional PPE may be required, namely Tyvek suits and RPE equipment. Damping down of soil will be undertaken as required to limit potential for release of fibres				
9.	Slips, trips and falls.	3	3	9	Care to be taken when traversing footpath verges. Care to be taken when accessing stockpile. TT Engineer to assess easiest access route prior to traversing.	1	3	3	Review access with site owner on arrival.
10.	Moving parts of machinery	2	4	8	TT Engineer not to approach cable percussive rig while in operation. HERAS fence panels to be deployed around	1	4	4	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					the drilling rig to prevent access to moving parts when in operation.				
11.	Falls from Height	3	4	12	TT Engineer to stay away from embankment edges as far as is reasonably practicable. Apex crew to stay clear of riverbank edges as far as is reasonably practicable. HERAS fencing to act as physical barrier with riverbank edge.	1	4	4	
12.	Drowning	2	5	10	TT Engineer to stay away from embankment edges as far as is reasonably practicable. Apex crew to stay clear of riverbank edges as far as is reasonably practicable.	1	5	5	

Hazard Ref No.	Hazard Description (Provide project specific details of the hazard, the task from which it originates, and identify who may be harmed)	Risk Level Before Control Measures			Control Measures Required (To eliminate hazard or reduce risk, consider the general principles of prevention. Identify who is responsible for completing the action. Identify if a more detailed risk assessment is required i.e. COSHH, DSEAR, Manual Handling, Noise)	Risk Level After Control Measures			Comments / Additional Information on Residual Risk (Reference more detailed risk assessment if completed i.e. COSHH, DSEAR, Manual Handling, Noise)
		Likelihood (1-5)	Severity (1-5)	Risk Rating		Likelihood (1-5)	Severity (1-5)	Risk Rating	
					HERAS fencing to act as physical barrier with riverbank edge.				

By signing below, I confirm that:

- I have read, understood, and had the opportunity to ask questions regarding the risks associated with this activity/task
- I will follow all the measures detailed above to control and mitigate the risks associated with this activity/task
- In the event of any deviations from this Risk Assessment and any associated Method Statement, I understand I must **STOP**, reassess the activity/task and escalate to the Project Manager/Director/Site Supervisor
- I acknowledge that failure to do so could compromise my own security, safety, health or wellbeing and that of others which could result in action being taken

Print Name:	Date:	Signature:
--------------------	--------------	-------------------

		Likelihood of exposure to hazard					Consider ERIC <u>ELIMINATE</u> the hazard completely <u>REDUCE</u> the risk to a more acceptable level <u>INFORM</u> workforce/others <u>CONTROL</u> the residual risk Also consider the 'General Principles of Prevention' (See CDM ACoP: Appendix 7)
		Likely (5)	Probable (4)	Possible (3)	Remote (2)	Improbable (1)	
Severity of foreseeable consequences		Exposure to the hazard will occur frequently during the activity (more than 10 events per year)	Exposure to the hazard can be expected to occur during the activity (2 to 10 events per year)	Exposure to the hazard will occur occasionally during the activity (1 event every 1 to 10 years)	Exposure to the hazard will seldom occur during the activity (1 event every 10-100 years)	Exposure to the hazard is highly unlikely during the activity (1 event every 100+ years)	
Catastrophic (5)	Accident involving one or more fatalities	25	20	15	10	5	
Major (4)	Major accident under RIDDOR, or permanent ill health reportable	20	16	12	8	4	
Serious (3)	Accident necessitating time off work, or chronic or acute	15	12	9	6	3	
Minor Injury (2)	Accident not necessitating time off work, or minor health	10	8	6	4	2	
Incident (1)	Near miss, no injury sustained, or ill health	5	4	3	2	1	

Note: If the risk level after control measures remains in the Red zone (a residual score of between 20 and 25), then the activity should not proceed until the risk(s) are escalated through Line Management and further controls are identified, agreed and implemented.

If after escalation the risk(s) cannot be reduced further, it may be decided by the Project team that the activity/project does not commence.

Doc ref number:	SSHEQ-H&S-002f	Version:	4
Owner:	Group SSHEQ	Department:	SSHEQ
Date of last review:	November 2022	Date of next review:	November 2024

Tetra Tech Group Activity Risk Assessment

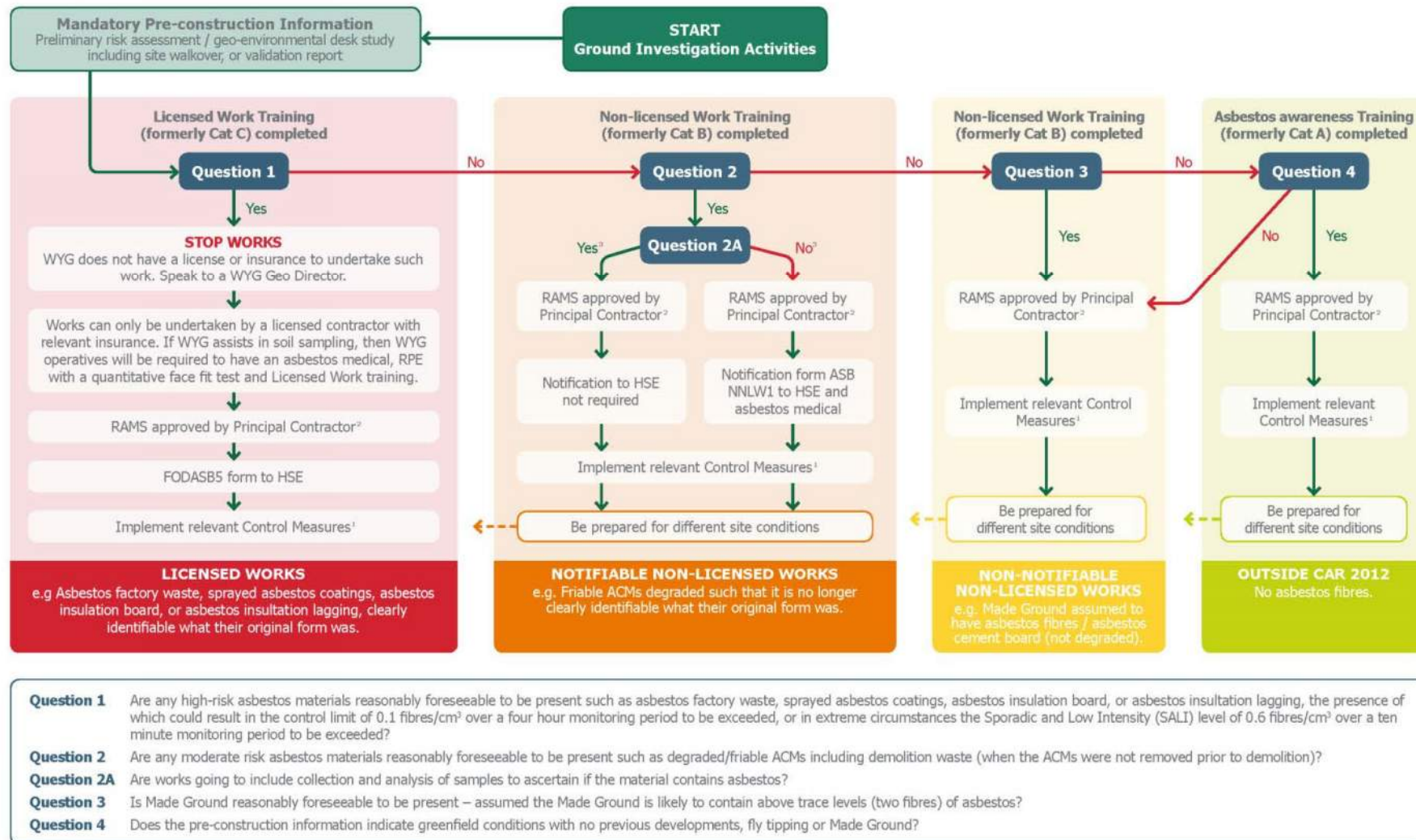
Project Name:			Produced/Revised by	Date:	Approved by: Line Manager
Project No:					
Site Address					
Date:					
Hazardous Activity	Duration		Persons at Risk	Required Control Measures	
	From	To			
Confined Spaces (Description)					
Working at height (Description)					
Lone working/working in remote locations (Description)					
Other (Description)					

Tetra Tech Group Activity Risk Assessment

Project Name:		Project Number:		Scope of Design Work				
Hazard Ref No. (Refer to DRA for Numbering. If Tetra Tech not acting as PD, ask for DRA from project PD)	Date	Hazard / Change in Method (include new hazards / change in method description if applicable)	Risk Level Before Design Alteration / Mitigation	Design Alteration / Action (to eliminate hazard or reduce risk)	New Hazards Associate with Design Alteration / Action (list new hazards potentially being presented as a result of change in method / action)	Overall Risk Level After Design Alteration / Action	Sub-Contractor Senior Management Approval (if applicable) Signature and Date	Senior Management Approval Signature & Date

APPENDIX D – ASBESTOS FLOW CHART & RISK ASSESSMENT

Ground Investigation Asbestos in Soil Risk Assessment



Asbestos in Soils - Risk Assessment for Ground Investigation

The Control of Asbestos Regulations (CAR) 2012 requires that a risk assessment is undertaken, prior to commencing works. The risk assessment is dynamic – i.e. it should be updated, immediately on site, if the situation changes (see section below on what to do if you encounter unexpected asbestos). Changes should be agreed with the Tetra Tech Project Manager. Both CAR-SOIL (p52) and the CAR 2012 'Approved Code of Practice (L143 2nd Ed: 2013) (p42-43) detail the requirements of the risk assessment. A copy of the risk assessment must be kept on site at all times. Following completion of the Phase I desk study with a site walkover, utilise the attached flow chart (and possibly the JIWG Decision Support Tool) and advise the following information which is required in order to decide which risk category the works fall into (see flow chart and Table 2 below).

Table 1: Risk Assessment

Risk Assessment Questions	Site Specific Data
The scope of the ground investigation works comprise (number of days, equipment, people)	5 days 2 No CP Boreholes 2 No. WS boreholes 5 No. Hand pits
What Pre-Construction Information have you received? The site-specific data this risk assessment is based on should include a Geo-environmental Desk Study & a Site Walkover (and a validation report if remediation has been carried out). If not received request from employer (See CarSoil Section 5.1)	GI Spec
The Pre-construction information indicates the type, condition and distribution of asbestos / ACMs expected on this site is:	Not Anticipated but not to be discounted given site setting.
Results of air monitoring from similar sites / activities. Consider working in summer / dry conditions will be higher risk than working on damp soils.	N/A
Are the works liable to exceed the control limit of 0.1 fibres / cm ³ in air averaged over a four hour period or exceeded 0.6 fibres /cm ³ over ten minutes (SALI)?	Below Trace
Is there potential for anyone other than Tetra Tech staff and sub-contractors to be exposed to asbestos on site?	Yes but not anticipated
The current asbestos risk level expected at this site is the <u>equivalent</u> of (select one option): - Below trace levels and outside CAR 2012. - Non-licensed work - Not notifiable. - Notifiable; - Licensed work (N.B. Tetra Tech do not hold a relevant licence).	Below Trace Levels
The ground investigation work is (select one option): - Below trace levels and outside CAR 2012. - Non-licensed work where the CAR 2012 3(2) exemption applies. - Licensed work (N.B. Tetra Tech do not hold a relevant licence).	Below Trace Levels

Table 2 – Actions and Control Measures (Select relevant option by highlighting)

Equivalent Level	Asbestos expected	Example Scenario	Actions / Control Measures
Outside CAR 2012 Negligible Risk	Below trace levels (max 1-2 fibres found in two PCOM sample slides). Isolated or random individual pieces of ACMS. Risk that control limit of 0.1 fibres / cm³ in air averaged over a four hour period OR 0.6 fibres /cm³ over ten minutes (SALI) is exceeded is negligible.	Desk study and site walkover done which indicates site is 100% greenfield	- Be prepared for the potential for asbestos to be encountered. - Have P3 mask (with quantitative face fit test certificate), disposable suit, and water spray* available.
Non-licensed (Not notifiable) Low Risk	ACMs such as cement sheets and floor tiles in good condition (intact or weathered / non-friable). Made Ground present – assumed to have a few fibres. Risk that control limit of 0.1 fibres / cm³ in air averaged over a four hour period OR 0.6 fibres /cm³ over ten minutes (SALI) is exceeded is very low.	Made Ground not thought to contain demolition material, or identified non-friable materials only.	- Be prepared for the potential for asbestos to be encountered. - Have P3 mask (with quantitative face fit test certificate), disposable suit, and water spray* available. - Any ACMs being sampled should be wetted, not broken up and placed in clearly labelled containers and bags. Warn the laboratory.
Notifiable Non-licensed Moderate Risk	ACMs in degraded condition that are friable. Risk that control limit of 0.1 fibres / cm³ in air averaged over a four hour period OR 0.6 fibres /cm³ over ten minutes (SALI) unlikely to be exceeded.	Made Ground containing demolition material, a site with fly tipped waste, or degraded ACMS.	- Wear P3 mask (with quantitative face fit test), - Wear disposable suit, washable safety boots (without laces, zips, or Velcro i.e. wellies) and gloves. - Use water spray to damp down soils / fibres*
Licensed (Notifiable) High Risk	STOP: Tetra Tech are not licensed or insured to undertake licensed work. Therefore, the measures below are for information only		
	Pipe lagging, asbestos insulation board, sprayed asbestos coatings such as around boiler tanks. Disaggregated material. Risk that control limit of 0.1 fibres / cm³ in air averaged over a four hour period OR 0.6 fibres /cm³ over ten minutes (SALI) likely to be exceeded.	Made Ground with high risk demolition material or relict structures including pipework, boilers, insulation. Dry soils allowing fibre release.	- Wear P3 mask (with quantitative face fit test), - Wear disposable suit, washable safety boots (i.e. wellies without laces, zips, or Velcro) and gloves. - Use water spray to damp down soils / fibres* - Use personal air monitoring. - Decontamination Unit / Shower access. - Decontaminate equipment (JCB, Drilling rig) possibly using jetwash. - Consider assistance from P402 qualified personnel (Tetra Tech Asbestos team).

* Water spray may comprise a hand held water spray, or if necessary, a water bowser with means of wetting (not jetting) the asbestos contaminated soils. Water must include a surfactant/detergent to aid wetting.

Actions

The following questions are a requirement of CARSOIL Section 182-183 / L143 Section 159-160 for all scenarios except greenfield sites that fall outside of CAR2012. Site specific responses are required.

Potential Actions	Site Specific Actions
What steps will be taken to control asbestos releases and exposure?	Damping down soils where asbestos is observed using a bowser / hand spray (not jetwash). Not leaving asbestos exposed at the surface following backfilling of an exploratory hole. Trial pits must have clean natural soils / turf at the surface.
Will any specific asbestos demarcation zones or enclosures be used?	Use of an enclosure (marquee / tent like structure) is not generally feasible for ground investigation. Ground investigation works could be undertaken in a separate demarked area.
How will the potential impact to others be controlled?	The working area will be demarcated using Chapter 8 (Red and White) barriers. Works will be halted if any person not site inducted enters the area.
Why is it not practical to use an enclosure?	The nature of the equipment (JCB, Drilling Rig etc) being used and the size of site, does not make the use of an enclosure a practical solution.
What action will be taken if there is an accidental release of asbestos fibres into the air?	The following three immediate steps are legally required (CAR 2012 15(1)): a) Mitigate the effects of the event; b) Restore the situation to normal; c) Inform any person who may be affected. Actions as specified in HSE Document EM8 – Personal Decontamination. Decontamination of personnel via removal of disposable suits (or outer clothes) and gloves, wipes on PPE such as hard hat, boots, eye protection, notes / maps / weather writer. Double bag items and seal for disposal. Use Class H (Hepa) vacuum cleaner if available. Use of decontamination unit / emergency shower if available (or improvised alternative if not available). Decontamination of equipment using jetwash, water spray (with detergent), wheel wash. Damping down of source material. Report to Tetra Tech SHEQ and Tetra Tech Project Manager immediately following completion of the above Speak to Tetra Tech Asbestos team for advice Leave area in safe condition.
How will waste and contaminated tools be removed from site.	As a minimum, tools that have been used on a licensed site should be assumed to be contaminated with asbestos fibres. Tools will not be removed from site without decontamination such as by washing. It is good practice to also do so on a notifiable non-licensed site. Waste soil deriving from the ground investigation that is potentially contaminated with asbestos will be double bagged and placed in a covered lockable skip and removed off-site by a suitable contractor. Contaminated waste PPE / RPE such as P3 filters, disposable suits, disposable gloves should be double bagged and placed in a covered lockable skip for off-site disposal by a suitable contractor.

Dealing with Unexpected Asbestos

Tetra Tech Geo-environmental staff should be sufficiently trained to handle situations where asbestos is encountered. This includes handling situations where licensed levels of asbestos is encountered. If the dynamic revised risk assessment (revised following encountering the unexpected asbestos) indicates works are non-licensed, Tetra Tech Geo-environmental staff should be able to proceed using the relevant control measures given in Table 2. If licensed conditions are encountered, Tetra Tech Geo-environmental staff should be able to react in a safe manner, stop works and demobilise from site.

The following field procedure should be followed if something suspected to be asbestos is encountered unexpectedly: (noting that asbestos is only dangerous when disturbed and fibres are released into the air and inhaled).

The most commonly found ACM is asbestos cement sheeting and this is not hazardous as long as it is not significantly disturbed, drilled or broken.

- Put on PPE and RPE and clear the area of any personnel without PPE & RPE. (PPE and RPE should have been kept available for such a situation). Revise the risk assessment you have available on site.
- Without disturbing it further, try to assess what condition the suspected asbestos is in, whether it is fibrous and loose or an ACM. Take a photograph and record notes possible in the exploratory hole log.
- Assess if the condition or the location means that the material is likely to be disturbed by any others in future (such as current / future site users / trespassers)?
- Dampen the suspected material where possible to minimise any potential fibre release. The water should be applied using a hand-held sprayer or another water source so as to minimize any disturbance. The water spray should not disturb the asbestos with the power of the spray. A jetwash could be sprayed into the air above the area.
- If the material is an isolated fragment of ACM then you may sample it as part of the soil sampling process provided that it is safe to do so. Do not break up the material to sample it. Place the soil sample in a secure container and, in addition to normal labelling, label the sample as suspected of containing asbestos material. Place the sample container in a sealed sample bag and label this again. This is for the benefit of those involved in transport, storage or laboratory testing.
- Do not remove or disturb any asbestos other than for sampling unless absolutely necessary. Always leave it where found as disturbing it may lead to the release of fibres.
- If the material is visibly fibrous and loose or there is a significant amount of suspect material, then work should stop immediately as there is a potential risk of spreading the asbestos and of a wider exposure. Such a scenario may comprise licensed work. In this case, appropriate steps should be taken to isolate the exposure and upon completion of the works appropriate decontamination protocols to be followed. A sample should still safely be taken. Man-made mineral fibres may be encountered in fibrous large quantities that are not asbestos.
- Decide whether and how the intended fieldwork activity can be continued safely in line with a revised risk assessment. If in doubt, do not proceed until a further assessment by a specialist (e.g. from Tetra Tech's asbestos team) has been made. Inform the Project Manager. Send photographs of the suspected asbestos.

APPENDIX E - SUB-CONTRACTOR RISK ASSESSMENTS AND METHOD STATEMENTS

- ☐ Risk Assessments and Method Statements
- ☐ Method Statement/Risk Assessment Review Form
- ☐ Sub-Contractor Rig Check Sheet
- ☐ Project RAMS Register

DESCRIPTION OF WORKS: Newbridge (Afan Avan) Seismic Survey

SITE LOCATION: Riverside Road, Port Talbot, SA12 6BT

What3Words: ///yours.tens.caves

OSGB: SS75523,89202

Lat/Long: 51°35'16"N , 003°47'53"E

AtlasGeo Project Code: AG1860

Atlas Office Address: Unit 12 Swansea Valley Business Park,
Ystalyfera, Swansea, SA9 2EB

CLIENT: Tetra Tech, Cardiff.

CONTACT: Mr N Bool
Telephone: 02920 829 200

METHOD STATEMENT PREPARATION

3

The following method statement has been prepared and checked by the following:

	Name	Date	Signature
Prepared by:	Alex Birtwisle	06/10/2023	
Checked & authorised by:	Sarah Birtwisle Newson	06/10/2023	
Accepted by: (Client)			

AMENDMENT CONTROL

Amendment No.	Details of Amendment	Authorised By	Date

HEALTH AND SAFETY BRIEFING

Names and signatures of all persons attending safety/MS briefing to indicate that they have had and understood the briefing in full by Atlas Geophysical survey supervisor.

Name	Company	Date	Signature

If the working method changes before or during the shift, the work should stop until a new method statement has been written and briefed to the entire workforce.

INDEX

1. Site location
2. Objectives and methods of working
3. Risk assessments
4. Labour force
5. Equipment
6. Training
7. Portable equipment
8. Mechanical equipment
9. Materials
10. Storage and handling of substances and materials
11. Temporary structures/shoring
12. Working at Height
13. Permits to work/dig
14. Working Near Water
15. Control of work with hazardous substances and processes
16. First aid
17. Fire
18. Personal Protective Equipment (PPE)
19. Housekeeping
20. Staff welfare facilities
21. Site access and egress
22. Warning/hazard signs and notices
23. Waste management
24. Road Closures and Blocks
25. Accident reporting
26. Lone working
27. Briefing
28. Site risks and control measures
29. Emergency action plan

1. SITE LOCATION

- 1.1. The Seismic survey will be undertaken within the areas highlighted in the aerial photographs below.



Fig 1. Survey area at Oak Weir Lock

2. OBJECTIVE AND METHODS OF WORKING

- 2.1. This investigation aims to use non-intrusive methods to determine the geological structure of the riverbed and bedrock beneath.

2.2. **Survey Preparation**

1. The survey team will arrive at a predetermined meeting point for a safety briefing from the site supervisor.
2. After the survey team has completed site inductions, they will prepare the GPR equipment. This will involve:
 - Removing the testing equipment from the vehicle and preparing equipment for the survey.
 - The survey team will reach the locations through the designated access point.
 - Acquisition settings will be checked, and the survey will commence.
3. The water level within the river channel will be assessed, and a decision will be made as to whether the level is suitable for the survey to commence.

2.3. **Survey Data Acquisition**

1. GNSS will be used to locate the geophone positions along the survey profile. The positions will be marked with ranging poles or marker flags.
2. A rope will be stretched across the river channel and anchored at both ends. The rope will be used to keep data acquisition cables away from water.
3. Geophones will be placed on the riverbed and coupled to the cables suspended on the rope traversing the river channel.
4. The cables will be connected to acquisition computers placed on the river bank.
5. The use of a sledgehammer will initiate seismic events. Events will be undertaken at appropriate points along the survey profile and recorded on the acquisition computers.

2.4. EQUIPMENT DEMOBILISATION

Demobilisation is the reverse procedure to setting up the system. When the site has been inspected for cleanliness, the team will inform the Client and depart. If the above method changes before or during the shift, work should stop until a new method statement has been written and briefed to the survey team.

3. RISK ASSESSMENTS

3.1. Risk assessments for all works are presented in Appendix 1.

4. LABOUR FORCE

4.1. Qualified geophysicists will undertake the GPR data acquisition.

Alex Birtwisle BSc Hons FGS

Sarah Birtwisle Newson BSc Hons

4.2. The Client will be responsible for controlling any permits to work and initial site inductions and escorts (if required).

5. EQUIPMENT

5.1. All equipment used for the survey is hand-held and powered by an internal 6V battery.

5.2. Geode Seismograph with associated geophones and cables.

5.3. RTK-GNSS

6. TRAINING

6.1. All AtlasGeo staff will have been trained in general health and safety awareness and issued with the company health and safety policy. The team also carry current CSCS certification.

7. PORTABLE EQUIPMENT

7.1. The proposed equipment will be listed in 5.1 and used as detailed in the appropriate testing procedures.

7.2. Only approved and calibrated equipment will be used, with their inspection, service or calibration records available on request.

7.3. The user must thoroughly check all equipment before starting work; any damaged equipment is to be placed beyond use and a replacement sourced. Staff are reminded that no modification or misuse of equipment is acceptable.

7.4. The proposed equipment for this investigation phase does not produce excessive noise or cause vibration.

8. MECHANICAL PLANT

8.1. No mechanical plant is required for this investigation.

9. MATERIALS

10.1 None.

10. STORAGE AND HANDLING OF SUBSTANCES AND MATERIALS

- 10.1. None

11. TEMPORARY STRUCTURES / SHORING

- 11.1. Not applicable

12. WORKING AT HEIGHT

- 12.1. Not applicable

13. PERMITS TO WORK

- 13.1. Any work permits remain the responsibility of the Client. Should permits be required, these shall be briefed to the team at the start of the shift, and staff are to ensure they comply with the permits as briefed.

14. WORKING NEAR WATER

- 14.1. Inflatable buoyancy jackets will be worn at all times.
14.2. A 'life ring' floatation aid is on hand and will be placed outside the survey vehicle for ease of access during the survey.
14.3. Lone working will not be permitted, and a buddy system will be in place.

15. CONTROL OF WORK WITH HAZARDOUS SUBSTANCES AND PROCESSES

- 15.1. COSHH data sheets will be available in the site file for all commercially purchased goods as follows:-

- 15.1.1. None

- 15.2. COSHH hazard sheets shall be prepared for the following substances generated on-site as follows:-

- 15.2.1. None

16. FIRST AID

- 16.1. Each works vehicle will carry a travel first aid box, and all first aiders should make themselves known during the daily brief. Atlas Geophysical First Aiders are Alex Birtwisle and Momoto Craddock.
- 16.2. The nearest hospital with an accident and emergency facility is shown below and is approximately 11 miles from the site. Should emergency medical treatment be required, staff should consider contacting the emergency services by calling 112 or 999, stating the nature of the emergency and the exact location of the casualty.

Morrison Hospital,
Heol Maes Eglwys,
Morrison,
Cwmrhydyceirw,
Swansea
SA6 6NL

17. FIRE

- 17.1. Powder fire extinguisher provided within survey vehicle.

18. PERSONAL PROTECTIVE EQUIPMENT (PPE)

- 18.1. The team leader will ensure that all operatives have been issued and wear all the appropriate PPE. The standard PPE for investigations shall be as follows:
- 18.1.1. Class 3 High visibility clothing (jacket or sleeved waistcoat and trousers)
 - 18.1.2. Buoyancy Aid
 - 18.1.3. Safety footwear
 - 18.1.4. Safety helmet
 - 18.1.5. Eye protection
 - 18.1.6. Ear protection (when required for background noise using the 2m rule)
 - 18.1.7. Gloves
 - 18.1.8. Class 3 Waterproofs (if/when required)

19. HOUSEKEEPING

- 19.1. All staff shall maintain a clean and tidy working environment while working on-site. Particular care should be taken to avoid creating slip/trip hazards.

20. STAFF WELFARE FACILITIES

- 21.1 Welfare facilities will be available locally.

21. SITE ACCESS AND EGRESS

- 21.1. Access to the site will be granted by the Client and follow the procedures dictated by the Client.

22. WARNING / HAZARD SIGNS AND NOTICES

- 22.1. No specific hazards are known to exist; however, staff must remain vigilant in their presence. If identified, then the possible impact that the warning/hazard may have should be considered, and if necessary, advice should be sought.

23. WASTE MANAGEMENT

- 23.1. No waste is expected to be created during this investigation; however, staff are reminded that all waste and rubbish should be removed from the site and returned to the laboratory for environmentally sound disposal.

24. ROAD CLOSURES

- 24.1. Not applicable.

25. ACCIDENT REPORTING

- 25.1. All accidents and near misses will be reported to the client's representative.
- 25.2. On return, all accidents and near misses shall be duplicated following AtlasGeo's internal accident reporting procedures.

26. LONE WORKING

- 27.1 Lone working shall not take place at any time during these works.

27. BRIEFING

- 27.1. At each site, a copy of the Method Statement and Risk Assessments will be circulated to all team members, who will acknowledge that they have read and understood the requirements by signing sheet 3 of this document. Alex Birtwisle, Atlas Geophysical survey supervisor, will give the briefing.

28. SITE RISKS AND CONTROL MEASURES

- 28.1. Risk assessments for work activities are shown in Appendix 1. In addition to those already produced, the Site Supervisor/Lead Technician should review the risks assessed and ensure that this satisfactorily covers the site conditions as found; should additional risks be identified, a point of work risk assessment should be completed. If the site team cannot mitigate any additional risks encountered to a satisfactory level, work may not proceed; in this case, the client's representative must be notified, and advice from the Project Manager must be sought.

29. EMERGENCY ACTION PLAN

- 29.1. The contact telephone numbers of all personnel pertinent to this project are listed below:

Name	Position	Company	Contact Number
Alex Birtwisle	Director	AtlasGeo	07798 673 108
Sarah Birtwisle Newson	Technician	AtlasGeo	07881 360 208

APPENDIX 1

Risk Assessments

RISK ASSESSMENT FOR SEISMIC INVESTIGATION NEAR WATER

Likelihood (L)

1. Very Unlikely
2. Likely
3. Inevitable

Severity (S)

1. Minor Injury
4. Serious Injury
- . Fatality

Operational activity	Possible Hazard	Primary Risk			Who is at risk	Measures to reduce risk	Persons responsible for controlling risks	Residual risk		
<i>General Inspection / Investigation</i>		(L)	(S)	RF				(L)	(S)	RF
General site working	Trips, falls and other injuries	2	1	2	Site personnel	- Good housekeeping is to be maintained at all times. - The site working area is to be kept clean and tidy, with the surrounding areas always kept clear. - All site personnel are to wear suitable PPE as detailed in method statement section 19. - Site-specific briefings are to be given to all site staff before commencement on-site. - First aid kits shall be supplied and available at all times.	Site personnel	1	1	1
Access, egress & site movements	Collision with other vehicles/personnel/plant	2	3	6	Site personnel	- Only use approved access and egress routes as explained at the site induction - Always observe speed limits and directions whilst on site. - Use double flashing beacons situated on the highest point of the vehicle. - Always use a banksman for vehicle/plant movements.	Site personnel	1	3	3
General testing activities	Personal collision/damage from other site vehicles	2	3	6	Site Personnel	- Ensure others are aware of your movements - Never work in unlit areas where site movements are taking place without the cover of your vehicle or portable lighting. - Be aware of other activities in your surrounding area.	Site personnel	1	3	3
Manual Handling	Back Injury Crushing injuries Muscle and ligament damage	2	2	4	Site personnel	- If necessary, use a trolley or wheelbarrow to transport samples and equipment to and from the van. - Park near the working area to reduce the distance carrying samples. - Everyone has their safe limit. Assess your own, ask for assistance and <u>never exceed your safe limit</u>. - If required, use team lifting practice	Site personnel	1	2	2

RISK ASSESSMENT FOR SEISMIC INVESTIGATION NEAR WATER

Likelihood (L)

1. Very Unlikely
2. Likely
3. Inevitable

Severity (S)

1. Minor Injury
2. Serious Injury
3. Fatality

Operational activity	Possible Hazard	Primary Risk			Who is at risk	Measures to reduce risk	Persons responsible for controlling risks	Residual risk		
General Inspection / Investigation		(L)	(S)	RF				(L)	(S)	RF
Transmission of the SARS-CoV-2 virus	The transmission of the SARS-CoV-2 virus leads to the symptoms of the Covid-19 disease. This may lead to further infection of staff and may lead to medical complications.	2	2	4	Staff, Site personnel,	- Always keep 2m from other people - Where 2m is impossible, or in a closed space, a. Face covering will be used. - Wash/sanitise hands regularly. - Wash surfaces and equipment with an anti-viral solution.	Site personnel	1	2	2
Leptospirosis/Weils Disease	The transmission of bacteria is typically from vermin.	3	3	4	Staff, Site personnel,	- Wash hands before and after the shift. - Disinfect cuts and grazes immediately. - Wear protective clothing - Wash hands before drinking or eating.	Site personnel	1	2	2
Working within Traffic Management	Accidental contact with live traffic Personal injury to staff Damage to equipment Risk to members of public	2	3	4	Staff, Site personnel, Members of the public	- While working within the confines of the survey area, one survey team member will act as a 'look-out' and warn of traffic in proximity. - Place temporary barrier tape between cones in the work area to provide a physical barrier that should not be crossed.	Site personnel	1	1	2
Drowning	Falling into water.	1	3	4	Site personnel,	- Do not work within 2m of water without floatation aid. - No loan-working near water. - The water level in the lock is to be at the upstream level - No working near fast-flowing water (without handrails or safety boat) - Lifebuoy/throw lines to be located in the work area (Volker to supply)	Site personnel	1	1	2

RISK ASSESSMENT FOR SEISMIC INVESTIGATION NEAR WATER

- Likelihood (L)**

 - 1. Very Unlikely
 - 2. Likely
 - 3. Inevitable
- Severity (S)**

 - 1. Minor Injury
 - 2. Serious Injury
 - 3. Fatality

Operational activity	Possible Hazard	Primary Risk			Who is at risk	Measures to reduce risk	Persons responsible for controlling risks	Residual risk		
Additional risk assessment		(L)	(S)	RF				(L)	(S)	RF

NOTE: Should you be on site and additional risks not covered within the risk assessment, please complete the boxes above, detailing the activities, potential hazards and the measures adopted to reduce the risks. When completed, please submit a copy to your line manager, who will review and update the risk assessment if necessary.

Pre Start Documents



Site	Newbridge GI, Port Talbot. Tetra Tech				SA12 6BT			
Scope Of Work	BH #	Base Depth		Inclination		Instrumentation		
	2no boreholes drilled by cable percussion	Approximately 20m		Vertical		Boreholes to be backfilled to ground level or completed with a 50mm installation c/w seals, filters and security cover		
Drilling Contractor	Apex Drilling Services Limited Sturmi Way, Village Farm Industrial Estate, Pyle, Bridgend						CF33 6BZ	
	Roger Martin	Director	roger.martin@apex-drilling.com			07768 146 639		
	Thomas Martin	Director	thomas.martin@apex-drilling.com			07974 685 274		
	Keith Richards	Contracts Manager	keith.richards@apex-drilling.com			07974 309 072		
Supervising Engineer	Nic Bool	07917 735669						
Deployment	Start Date	Monday 21 st August 2023						
	Deployment	Dando 2000		Serial Number		2000/0775		
	Driller	Alun Jones						
	Crewman	Lee Bincham						
	Fitter(s)	Huw Barwick		07976 962417				
	Support Plant	Water bowser						
	Rig Operation	Monday to Friday				08:00 - 16:30		
BDA Classification	Green							
Security	To be agreed first day on site							
Materials	Drilling Operations	Water to operational drilling plant					Apex	
Minimum P.P.E.								
	Description	Overalls	Gloves	Ear Plugs	Vest	Helmet	Glasses	Safety boot
	Colour	Orange	Red	Yellow	Yellow	Blue	Clear	Black
	Misc.	High Vis.			High Vis.			Wellington
Induction	Company	Induction Type		Operational Drilling Crew		Support Crew		
	Tetra Tech	Generic			Required		Required	
		Site specific			Required		Required	
	Apex Drilling	RAMS		Completed		Completed		
Apex Drilling	Insurance	Employers Liability					£ 10,000,00.00	
		Public / Products Liability					£ 10,000,00.00	
		Contractors All Risk					£ 1,000,00.00	
		Hired Plant					£ 550,00.00	
		Professional Indemnity					£ 2,000,00.00	
	Accreditation	Avetta (PICS)		SMAS	CBH Scheme		BDA	
Constructionline		Outsource Safety	ISO 9001					
Project Goals		Zero lost hours			No major or minor injuries			
		Improve efficiency			Increase awareness of Health and Safety on site			
		Improve the working environment			Work with the local community / integrate where possible			

APEX
DRILLING
SERVICES

SA12 6BT

Pre Start Documents



Site	Newbridge GI, Port Talbot Tetra Tech		SA12 6BT																																	
Work Activity	Daily Pre Start Check Sheet																																			
Guidance	• Complete this borehole check sheet for each borehole on the site regardless of proximity etc. • Read through the points below - tick as appropriate • If elaboration on points as required, please list on the back of the sheet. • If there are any hazards not identified, please list on the back of the sheet and correlate with numbers. • If you are satisfied to proceed with site work, please tick and sign below. • In the event that a hazard has been identified and cannot be rectified contact Tetra Tech immediately • Upon completion this sheet is to be stored in the site health and safety file and available for viewing.																																			
Required P.P.E.	<table border="1"> <thead> <tr> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>Description</td> <td>Overalls</td> <td>Gloves</td> <td>Ear Plugs</td> <td>Vest</td> <td>Helmet</td> <td>Glasses</td> <td>Safety boot</td> </tr> <tr> <td>Driller</td> <td>Y N</td> <td>Y N</td> <td>Y N</td> <td>Y N</td> <td>Y N</td> <td>Y N</td> <td>Y N</td> </tr> <tr> <td>Crewman</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>												Description	Overalls	Gloves	Ear Plugs	Vest	Helmet	Glasses	Safety boot	Driller	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Crewman							
Description	Overalls	Gloves	Ear Plugs	Vest	Helmet	Glasses	Safety boot																													
Driller	Y N	Y N	Y N	Y N	Y N	Y N	Y N																													
Crewman																																				
Visual Inspection	Item	OK NO NA	PTO	Item	OK NO NA	PTO																														
	Engine cover locks			No sign of vandalism																																
	Drilling & winch rope																																			
Level Inspection	Item	OK NO NA	%	Item	OK NO NA	%																														
	Engine oil			Diesel																																
Operation Check	Item	OK NO NA	PTO	Emergency stop																																
	Winch guard																																			
4x4	Item	OK NO NA	%	Item	OK NO NA	PTO																														
	Engine oil			Handbrake																																
	Hydraulic oil			Visual inspection																																
	Water levels																																			
Water Bowser	Item	OK NO NA	%	Item	OK NO NA	PTO																														
	Wheel condition			Tap condition																																
Proceed	Site work is safe to proceed			Site work is not safe to proceed																																

Pre Start Documents



Site	Newbridge Gl, Port Talbot Tetra Tech		SA12 6BT									
Work Activity	Getting plant and support materials to borehole position											
Required P.P.E.												
	Description	Overalls	Gloves	Ear Plugs	Vest	Helmet	Glasses	Safety boot				
	Colour	Orange	Red	Yellow	Yellow	Blue	Clear	Black				
	Misc.	High Vis.			High Vis.			Wellington				
Persons At Risk	Driller	•	Crewman	•	Supervisor		Geologist	•	Client		Public	
Supporting doc.	Method	•	Risk	•	Permits	•	Pre-Start	•	Inductions	•	Site	•
Calculation	Colour Key	Green Low Risk - Proceed		Amber Proceed With Caution		High Risk Control Measures Required						
	Example Calculation											
	Severity	1	Minor injury			Severity (S)	2					
		2	Over 3 day injury			Likelihood (L)	3					
	3	Severe Injury		S x L		6						
Likelihood	1	Unlikely			6 High Risk Control Measures Required							
	2	Possible										
	3	Probable										
Persons At Risk	Before Control Operations				After Control Operations							
		Severity (S)	3			Severity (S)	3					
		Likelihood (L)	2			Likelihood (L)	1					
		S x L	6			S x L	3					
	6 High Risk Control Measures Required			3 Amber Proceed With Caution								
Risk	•	Hidden services / ruts				•	Undulating typography accessing borehole					
	•	Crew man access to boreholes				•	Failure to stop / loss of control					
	•	Interaction with site traffic				•	Sliding on fields					
	•	Interaction with public				•	Items of plant rolling away					
Control	•	All plant to be parked cross slope				•	No movement of vehicles without pre-start checks.					
	•	Signs to be displayed to indicate operational drilling area				•	Crewman to walk in front of vehicles - clear route for unforeseen issues.					
	•	Movement routes to be pre-agreed prior to move, with route walked for familiarisation.				•	Site to be aware of Apex movements - radio to be provided if required.					
Method	- Pre-start checks sheets to be undertaken at the start of the shift. - Borehole access routes to be pre-agreed and walked prior to any plant movement. - Communication methodology will be established with the site engineer upon induction. - Crewman to walk in front of all vehicles to clear for unforeseen ruts / services. - No riding as a passenger on plant without designated second seat. - Tetra Tech to be made aware of Apex daily movements. - No horseplay within the site. - All vehicles not in use to be turned off with keys removed from the ignition. - Only certified operators to use plant.											

APEX
DRILLING
SERVICES

SA12 6BT

Pre Start Documents



Site	Newbridge GI, Port Talbot Tetra Tech						SA12 6BT		
Work Activity	Hand dig inspection pit to 1.20 metres below ground level (or rock head)								
Required P.P.E.									
Description	Overalls	Gloves	Ear Plugs	Vest	Helmet	Glasses	Safety boot		
Colour	Orange	Red	Yellow	Yellow	Blue	Clear	Black Wellington		
Misc.	High Vis.			High Vis.					
Persons At Risk	Driller	• Crewman	• Supervisor	Geologist	Client	Public			
Supporting Reqs.	Method	• Risk	• Permits	• Pre-Start	• Inductions	• Site			
Calculation	Colour Key	Green Low Risk - Proceed		Amber Proceed With Caution		High Risk Control Measures Required			
	Example Calculation								
	Severity	1	Minor injury			Severity (S)	2		
		2	Over 3 day injury			Likelihood (L)	3		
		3	Severe Injury			S x L	6		
	Likelihood	1	Unlikely			6 High Risk Control Measures Required			
		2	Possible						
		3	Probable						
Persons At Risk	Before Control Operations				After Control Operations				
		Severity (S)		3		Severity (S)		3	
		Likelihood (L)		2		Likelihood (L)		1	
		S x L		6		S x L		3	
		6 High Risk Control Measures Required				3 Amber Proceed With Caution			
Risk	• Digging in the wrong position • Intersecting services • Not digging deep enough				• Electrocutation • Slips, trips and falls • Interaction with hazardous substances				
Control	• Demarcation to be provided as required. • Pre-borehole set up sheet to be completed. • Borehole map to be provided. • Insulated tools to be used at all times • All materials to be stored next to the borehole				• Pre-start check sheet to be completed daily. • Borehole map to be correlated with site. • 5 gallons of water to be available. • Pit to be measured prior to termination • Early termination only to be instructed by Tetra Tech				
Method	• Borehole position to be clearly marked. • Service drawings to be obtained and correlated where necessary. • Method - • Hand digging to be undertaken using both shovola and standard shovels. • In the event of hard digging a pitting bar will be required • If the following are encountered digging to cease and Tetra Tech be contacted immediately: • Services / water / contamination / asbestos. • Upon reaching 1.20 metres • Inspection pit depth dipped / measured. • Base of the pit to be logged if required. • Backfill pit.								

Pre Start Documents



Site	Newbridge GI, Port Talbot Tetra Tech						SA12 6BT	
Work Activity	Cable Percussive Drilling							
Required P.P.E.								
	Description	Overalls	Gloves	Ear Plugs	Vest	Helmet	Glasses	Safety boot
	Colour	Orange	Red	Yellow	Yellow	Blue	Clear	Black
	Misc.	High Vis.			High Vis.			Wellington
Persons At Risk	Driller	•	Crewman	•	Supervisor		Geologist	
Supporting Reqs.	Method	•	Risk	•	Permits	•	Pre-Start	•
Calculation	Colour Key	Green Low Risk - Proceed		Amber Proceed With Caution		High Risk Control Measures Required		
	Example Calculation							
	Severity	1	Minor injury			Severity (S)	2	
		2	Over 3 day injury			Likelihood (L)	3	
	3	Severe Injury		S x L		6		
Likelihood	1	Unlikely			6 High Risk Control Measures Required			
	2	Possible						
	3	Probable						
Persons At Risk	Before Control Operations				After Control Operations			
		Severity (S)	3			Severity (S)	3	
		Likelihood (L)	2			Likelihood (L)	1	
		S x L	6			S x L	3	
	6 High Risk Control Measures Required			3 Amber Proceed With Caution				
Risk	•	Entanglement within drill string			•	Trapping fingers within the casing/tools		
	•	Manual handling injury			•	Damage to drill string		
	•	Cuts and grazes			•			
Control	•	Demarcation to be provided as required.			•	Aforementioned PPE to be worn.		
	•	Pre-borehole set up sheet to be completed.			•	No loose clothing to be worn		
	•	Pre-start check sheet to be completed daily.			•	All guards to be fully operational.		
	•	Rods to be stored on rack or trestles only.			•	All threads to be lubricated.		
	•	Crewman to be experienced in suitable drilling procedure.			•	Working area to be clear		
Method	•	The appropriate tool is to be secured to the sinker bars						
	•	Drilling to be carried out by percussive methods						
	•	SPT.s U4's & Bulk samples to be taken when required						
	•	Drilling tool be changed depending on ground conditions						
	•	200mm Steel casing will be installed to keep the borehole open whilst drilling.						
	•	Final depth to be confirmed with client						
	•	200mm Casing to be with withdrawn and borehole to be backfilled to ground level or completed with a 50mm installation c/w seals, filters and cover						
	•	Rig to be lowered using auxillary winch						
	•	Rig loaded with drilling equipment and moved off borehole position						
	•	Borehole position to be left tidy, spoil levelled/removed.						

Pre Start Documents



Site Newbridge GI, Port Talbot
Tetra Tech

SA12 6BT

ANY EMERGENCY TO BE CO-ORDINATED WITH APEX/TETRA TECH SUPERVISOR

Medical Emergency

Procedure	- Check for danger and make the area safe. - Seek help. - Apply first aid if able to do so, or contact the site first aider or emergency services (if required). - Keep the person safe and warm until assistance arrives. - Report the accident - inform your supervisor who will inform the manager. - Record the incident as instructed.
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Fire

Procedure	- Raise the alarm - shout 'Fire' and / or sound the emergency signal (e.g. air horn). - If you are trained and competent to fight a small fire, and it is safe to do so, tackle the fire with the correct fire extinguisher to aid your escape. - Do not put yourself at risk - get out and stay out. - Call the fire service immediately in the event of any uncontrolled fire. - Report the fire to your supervisor who will inform the manager. - Gather at the local muster point and await further instructions. - Record the incident as instructed.
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Contact With Contamination

Procedure	- Stop work. - Remove contaminated clothing. - Wash area with water, use emergency washing / decontamination facilities. - Inform your supervisor and the Site Manager / Engineer. - Administer first aid as necessary. - Seek further medical advice if required. - Record the incident as instructed.
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Unforeseen Utility Services

Procedure	- Stop work. - Assume the service is live until proven otherwise. - Do not approach or touch the affected service. - Inform your supervisor and the Site Manager / Engineer. - Stand for advice from the statutory providers and determine the next course of action. - Evacuate the area and await further instructions.
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Spillage

Procedure	- Do not approach or clean up the affected area unless you are competent to do so. - Report the incident to your supervisor who will inform the manager. - Assess the risk - Identify the spilled material (use MSDS or COSH) and quantity - If flammable, extinguish all sources of ignition. - Determine primary dangers - drains, surface waters, potential for fumes, people etc. - Stop the spill at source, if safe to do so, or otherwise attempt to confine the spill using the correct spill kit. - Clean up the spill. - Decontaminate and dispose of the waste (used spill kit and PPE) in accordance with site waste procedures. - In most cases the spilled material will be hazardous waste.
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Release To Water / Drains

Procedure	- Stop work. - Report the incident to your supervisor - Contain or divert the substance away from the water course / drain (using earth dams, sand bags etc.) - Trace any drain to find the outfall / discharge point, consider blocking the drain. - Review method statement, design or the works and resources before commencing work.
-----------	--

Pre Start Documents



Site	Newbridge GI, Port Talbot Tetra Tech		SA12 6BT	
Records	- Pre-borehole check sheet to be completed at the start of each borehole. - Pre-start daily check sheets to be completed at the start of each shift or new site. - Borehole logs to be maintained within a field log book and written on to daily drill logs each evening. - All records available for viewing at any point of the operational day. - Daily drilling logs available for submission in triplicate at the start of the following day.			
	Blue - Tetra Tech	Yellow - Tetra Tech	White - Retained By Apex	
	Daily drilling logs to contain the following information.			
	Contract name	Newbridge GI, Port Talbot,		
	Client	Tetra Tech		
	Supervising geologist (s)	Nic Bool		
	Date	.../.../ 2023		
	Sheet number / working day	 of / Working day		
	Method of drilling	Cable Percussive		
	Type of casing	150mm/200mm/250mm diameter		
	Depth, description, with identification of the stratum and whether it is intact or broken (where possible)			
	Depths at which groundwater is encountered (if apparent)			
	Details of voids or suspected anomalies or artificial obstructions.			
	Standing time and reasoning for which.			
	Sample numbers / depths			
	Static water levels at the start and end of each shift.			
	Details of support plant			
	All sheets to be signed by Tetra Tech			
	Samples	- Samples to be taken at intervals instructed - Samples to be bagged in clear polythene bags and sealed using cable ties. - All samples to be labelled indicated bh number and depth at which sample is taken. - Sample labels to correlate with daily drilling logs.		
Site Completion	- Walk borehole position with Tetra Tech representative. - All permits and passes to be surrendered back to Tetra Tech			
Communication	- Drilling crew available for daily tool box talks as required. - Driller to enquire if there are any changes to daily operations. - Drill crew to sign in and out of each shift. - Site radio to be provided as required. - Driller equipped with mobile phone. - Vehicle fitted with Navman tracking system. - Driller communicates with his drilling manager frequently throughout the day.			
Breakdown	- Stop work. - Follow isolation procedure detailed within this pack.			

Pre Start Documents



Site	Newbridge Gl, Port Talbot Tetra Tech						SA12 6BT	
Work Activity	Isolation Procedure							
Required P.P.E.								
	Description	Overalls	Gloves	Ear Plugs	Vest	Helmet	Glasses	Safety boot
	Colour	Orange	Red	Yellow	Yellow	Blue	Clear	Black
	Misc.	High Vis.			High Vis.			Wellington
Persons At Risk	Driller	• Crewman	• Supervisor	• Geologist	• Client	• Public		
Supporting Reqs.	Method	• Risk	• Permits	• Pre-Start	• Inductions	• Site		
Isolation Key								
	Box	Hasp	Cable hasp	Driller	Crewman	Fitter	Sign	Point
Communication	- All padlocks are unique to each individual - named and single keyed - Once isolated padlock keys not to be put into isolation box - they are to be retained by the individual.							
Calculation	Colour Key	Green Low Risk - Proceed		Amber Proceed With Caution		High Risk Control Measures Required		
	Example Calculation							
	Severity	1	Minor injury		Severity (S)	2		
		2	Over 3 day injury		Likelihood (L)	3		
		3	Severe Injury		S x L	6		
Likelihood	1	Unlikely		6 High Risk Control Measures Required				
	2	Possible						
	3	Probable						
Persons At Risk	Before Control Operations				After Control Operations			
		Severity (S)	3		Severity (S)	3		
		Likelihood (L)	2		Likelihood (L)	1		
		S x L	6		S x L	3		
		6 High Risk Control Measures Required			3 Amber Proceed With Caution			
Risk	- Kinetic energy stored within the system - Indirect plant interfering with repair				- Use of machine without knowing its faulty - Machine activation during repair			
Control	- Plant to be turned off - all keys and immobilisers to be stored in isolation box. - Levers to be actuated to ensure all energy is released. - Hasp to be fitted to isolation point and individual padlocks fitted. - Individual keys to be retained by individual personnel. - Signs clearly to denote that rig is not fit for operation. - Air and water hoses to be disconnected and left permanently disconnected. - If required plant not affected by breakdown to be removed from operational area to agreed position.							
Method	Turn off all plant immediately.						Driller and crewman	
	Release all kinetic energy and stored system							
	Collect isolation box from van						Crewman	
	Remove all ignition and isolation keys and place into isolation box						Driller	
	Fit hasp, sign and personal padlocks to isolation point						Driller and crewman	
	Padlock keys to be individual and remain with that individual at all times.							
	The hasp has 6 ports - additional ports for any person who has to work / access the machine.							
	If required move all plant to a safe location, isolate and lock panels						Driller and crewman	
	Isolation box to be placed in secure location - van or quarry managers office						Driller	
	Report the incident to your supervisor who will inform the quarry manager.							
Wait for instruction.								

Pre Start Documents



Site Newbridge GI, Port Talbot
Tetra Tech

SA12 6BT

Declaration

I confirm that I have read and fully understood the RAMS document for operational work at the project detailed above.

I understand that failure to comply with any of the points within this document may lead to dismissal from site and if the severity requires it Apex Drilling Services Limited.

Any questions regarding this document must be made apparent prior to signing this declaration.

Signed

Name (PRINTED)

Position

Signed

Date

Month

Year

23

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GROUND CLEARANCE

Office:	Site address:
Midland Survey Ltd Cromwell House Westfield Road Southam Warwickshire CV47 0JH	Newbridge Bridge, Port Talbot, SA12 6BT

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
Moving vehicles / plant	3	Contact with moving vehicles including forklift trucks, excavators, lorries etc	3	9	Wear Hi Visibility clothing and protective footwear in accordance with site rules. Ensure that you have informed all on site of your presence. Follow pedestrian Routes provided, Do not work behind stationary vehicles. Pay attention on sites with moving vehicles and in warehouses and especially when wearing hearing protection. One man to prevent entry from vehicles if appropriate. Stick to man routes on site. Erect no entry signs where practicable. Fence off. No work in the main carriage way will be carried out. Any measurements will be taken from the safety of the verge.	Site	Wear suitable PPE at all times. High vis to be worn at all times.	3	
Car Parks (presence of moving vehicles)	3	Being struck by moving vehicles, or injuring a car park user	3	9	Drive slowly to allow for unexpected vehicle movement. Ensure area is adequately lit with daylight, street lamps, fixed lighting or head lights from the vehicle. If possible use the car park during a low occupancy time. Make sure all drivers are appropriately licensed and experienced. Ensure all roads are free from moving traffic before exiting the vehicle, and ensure the roads are free from moving traffic when unloading / loading equipment from the vehicles. Use a full 360 degree check of the vehicle before driving away, and adopt Lucion's RISE program - Reverse Into Spaces Every Time, to ensure safety when later pulling away from a parking space. Stick to designated safe walkways if present.	Site, client, public	Ensure driving licence is kept on record and that the personnel have undergone the H&S induction, including driver training. Keep to 5mph when driving within car parks. Work wearing Hi Vis clothing (vest or jacket) to ensure maximum visibility. Use designated walkways.	3	

GROUND CLEARANCE

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
Slips, trips falls - floor obstructions - loose / uneven surfaces		3 Poor housekeeping, debris in location/area, poor visibility, wet / slippery surfaces, floor coverings in poor condition, trailing cables, loose wires, open hatches . Erection of access equipment on uneven or slippery surfaces.	3	9	Clear working area of obstacles, debris and be vigilant at all times of presence of trip hazards. Take care when working in wet / slippery areas. Maintain good housekeeping, make sure all trip hazards are tidied away. Ensure all hatches are closed. Ensure surface for erection of ladders / steps must be level and clear of debris. Ladders must be footed or tied at all times. Scaffolds/Podiums to be used and erected by PASMA trained operatives.	Site	Wear PPE including appropriate footwear. Use adequate lighting in poorly lit areas. Cable ties & regular inspections. Audits. Careful ladder siting and footing at all times.	3	☒
Substances hazardous to health		3 Incorrect use and control of substances hazardous to health	1	3	COSHH data sheets should be obtained for all chemicals present on site or vessel. Avoid contact with substances potentially hazardous to health. Wash hands before breaks	Site	Follow COSHH Guidelines. Wear PPE	3	
Used hypodermic needles		3 Puncturing skin with needles	1	3	Carry out visual inspection / risk assessment prior to commencement of work. Wear safety foot wear and gloves at all times. Needles to be removed by specialist company - if encountered STOP work and inform manager or client.	Site	Safety footwear / gloves / eye protection to be worn.	3	
Darkness/ poor visibility (surveys)		3 Working in environments where darkness and/or poor lighting is present greatly increases risk of injury by other means i.e. slips, falls, cuts etc	3	9	Assess conditions before entry to dark or poorly lit areas, consider specific hazards that may be present i.e. debris, hot pipes that may be obscured by darkness / poor lighting. Provide adequate lighting in dark / poorly lit areas. Hand torches and head / helmet mounted torches should suffice for smaller areas. Where larger areas are to be accessed consider provision of lighting such as tripod mounted systems. Do not work in traffic	Site	Hard hat to prevent head injury. Wear high vis.	3	
Climate - heat (heat/sun stroke, sunburn, fire risk)		3 Heat from hot climates. Remember can be amplified in confined spaces.	2	6	Reduce work during hottest periods of day (12pm-3pm). Carry out works during cooler hours of the day. Share work load, alternate shift patterns. Allow for regular work breaks in cooler areas. Ensure constant water supply for rehydration is available. Work under shade/shelter where possible. Be aware of fire ignition risk from glass (bottles etc.) Do not take vehicles, machines, electrical equipment etc. on to areas at risk	Site	Wear PPE. Vented hard hats. Adequate supply of cool water. Wear sunscreen as required. Use thermometers for temperature monitoring. Carry out works during appropriate times of day. Work-rest	3	

GROUND CLEARANCE

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
					from fire (dry grassland/ forests etc. Where a RED WEATHER WARNING HAS BEEN ISSUED BY THE MET OFFICE IF YOU ARE WORKING OUTSIDE, IN LOFTS/ ROOF SPACES, CONFINED SPACES etc. AN ADDITIONAL RISK ASSESSMENT SHOULD BE CARRIED OUT for the work/project to ensure all possibilities have been examined.		balance required. DO NOT work alone. Erect a cover for shade where appropriate.		
Climate - heat (heat/sun stroke, sunburn, fire risk)	3	Heat from hot climates. Remember can be amplified in confined spaces.	2	6	Reduce work during hottest periods of day (12pm-3pm). Carry out works during cooler hours of the day. Share work load, alternate shift patterns. Allow for regular work breaks in cooler areas. Ensure constant water supply for rehydration is available. Work under shade/shelter where possible. Be aware of fire ignition risk from glass (bottles etc.) Do not take vehicles, machines, electrical equipment etc. on to areas at risk from fire (dry grassland/ forests etc. Where a RED WEATHER WARNING HAS BEEN ISSUED BY THE MET OFFICE IF YOU ARE WORKING OUTSIDE, IN LOFTS/ ROOF SPACES, CONFINED SPACES etc. AN ADDITIONAL RISK ASSESSMENT SHOULD BE CARRIED OUT for the work/project to ensure all possibilities have been examined.	Site	Wear PPE. Vented hard hats. Adequate supply of cool water. Wear sunscreen as required. Use thermometers for temperature monitoring. Carry out works during appropriate times of day. Work-rest balance required. Erect a cover for shade where appropriate. If alone, maintain contact with manager.	3	
Climate - rain, ice, snow	2	Exposure to wet weather. Excessive exposure to wet weather conditions increasing the likelihood of slips trips & falls, as well as the potential for a decrease in body temperature whilst working in wet weather	2	4	Assess & monitor weather conditions & suspend or alter work activities to suit weather conditions (ie carry out work in indoor or sheltered areas) in the event of excessive rainfall or presence of ice or snow. Take regular breaks & ensure that welfare facilities are kept warm.	Site	Welfare facility heating, waterproof clothing, thermal undergarments.	2	
Flooding	3	Sudden flooding of a work area has possibility to cause death by drowning.	1	3	No works permitted in flooded areas. Flood prone areas to be assessed prior to entry and rapid escape routes established. Sources of water should be identified i.e. ground water, water tanks, pressurised pipework etc. Works are not to disturb any items that may give rise to flooding if	Site	As per site requirements	3	☒

GROUND CLEARANCE

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
					damaged i.e. badly degraded pipework, large water tanks etc. Where there is a significant risk of flood, works are not to continue until suitable control measures have been put in place. Clear escape route to be maintained at all times when working in areas where flooding may occur. If areas begin to flood, all staff to evacuate to safe area as soon as possible.				
Lone working - loss of contact with employee	2	Failure to contact office. Mobile phone not charged. No signal for mobile phone.	2	4	Contact office prior to commencement of work with details of time on job and location. Make arrangements to phone in to office at pre-determined times. If no mobile signal available use landline.	Site	Ensure mobile phone is charged at all times. Line manager to arrange site visit if pre-determined call-ins have been missed	2	
Sharp and jagged items	2	Site hazards such as broken glass, jagged metal, barbed wire etc also have potential to cause injury Sharp cutting tools have potential to cause injury.	3	6	If possible remove sharp hazards from area of work or render safe by boxing in etc. Where excessive sharp hazards are present on site or vessel a specialist subcontractor to be employed to clean up area and render safe.	Site	Gloves with appropriate cut and puncture resistance rating to be worn when working with cutting tools and handling sharp materials. Protective footwear with sole protection to be worn on all sites or vessels.	2	
Highly infectious disease (Covid-19)	3	An illness that can affect lungs and airways caused by coronavirus	2	6	*Do not touch your eyes, nose or mouth if your hands are not clean *Avoid close contact with people who have symptoms of coronavirus *Avoid unnecessary direct physical contact (shaking hands) or by touching surfaces *Social distancing - maintain personal space AFARP. https://www.gov.uk/government/publications/covid-19-guidance-on-social-distancing-and-for-vulnerable-people/guidance-on-social-distancing-for-everyone-in-the-uk-and-protecting-older-people-and-vulnerable-adults	All	*Wash your hands with soap and water often – do this for at least 20 seconds *Always wash your hands when you get home or into work *Clean down work station, equipment with anti-bacterial wipes (this includes vehicles) *Use hand sanitiser gel if soap and water are not available *Use of nitrile-type gloves *Cover your mouth and nose with a tissue or your sleeve (not your hands) when you cough or sneeze *Put used tissues in the bin immediately and wash your hands afterwards *Follow client and	3	

GROUND CLEARANCE

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
							specific guidelines - some may require the wearing of face coverings whenever you are moving around their site or within buildings or in spaces where social distancing is difficult, in particular retail premises		
Presence of animals including rodents and insects.	2	Being attacked / stung by bees / wasps when disturbing their environments. Animals not secured or under the control of owner. Possibility of being bitten by rodents	1	2	Ensure area is free from insect, animal (including bats) and bird nests. Do not enter area if suffer allergic reactions to insect bites / stings. Do not enter any area where there is an uncontrolled animal. If animal cannot be controlled / secured contact your line Manager for advice. If you are at risk leave the area immediately in a calm and orderly manner. Be aware of signs of rodent infestation, in particular the presence of rodent droppings, chewed items, nests etc. Avoid contact with rodents generally. Heavy infestations may require extermination by specialist contractors before work can commence.	Site	PPE, lighting, and insect sting cream. Ask if there are uncontrolled animals at the site, if a bat survey has been performed and are they present and are pigeons / sea birds etc present before commencement of work. Consider whether or not to proceed at this point. Wear PPE.	2	
Disturbances by the general public	1	Members of the public causing obstructions and/or interference with site teams or equipment	2	2	Ensure safe working zone is erected to prevent contact with the public (including hospital patients). Ensure all tools and equipment are monitored and kept within the working zone boundaries at all time. Use appropriate signage. If required, segregation fencing can be erected prior to works commencing. Work in pairs. Try to arrange for works to be carried out at a time when the presence of the public is at a minimum	Site, public	Understand the purpose of the presence of the public to help predict movements (through traffic, waiting area etc). Use of temporary boundary markers or fencing and/or warning signs (eg yellow floor standing) as appropriate to warn members of the public/occupants to keep away.	1	☒
Risk of violence	3	Presence of persons prone to violence	2	6	Assess the risk on arrival at site. Is the person (or persons) angry, intoxicated, under the influence of drugs or involved in criminal activities such as theft? Is the person (or persons) attempting to intimidate or threaten you in any way during the course of your work? (Note - this may include site staff / contractors as well as members of the public).	Site	IMMEDIATELY leave site if you think you are at risk. Do not provoke the situation. Contact your line Manager for advice.	3	
Manual handling of	2	Incorrect manual handling may result	3	6	Manual handling training provided to all staff as part of basic training, refreshed every 2 years. Follow guidelines in HSE document INDG 143	Site	Wear gloves with good grip if required. Protective footwear in the	2	☒

GROUND CLEARANCE

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
heavy and awkward objects, repetitive handling of smaller loads		in musculoskeletal injuries or pain in the body's joints, ligaments, muscles, nerves, tendons, and structures that support limbs, neck and back. These can be long term and debilitating.			Figure 1 for individual person lifting. For heavy or awkward loads summon assistance, do not attempt to lift solo. For large/awkward loads plan the works using the TILE approach (Task, Individual, Load, Environment) - see www.hse.gov.uk/msd/pushpull/risks.htm		event of dropped loads etc.		
Unstable/slippery footing on banks and verges (slippery surfaces, loose soil, concealed animal burrows hidden by vegetation, etc)	2	Unstable footing can result fall injuries, particularly on inclined surfaces.	3	6	Caution when working on banks and verges, particularly on inclined verges. Walk slowly and steadily, do not run. Do not attempt to traverse steep (30 degrees plus) slopes unless sure footing is available. Consider alternative routes from safer locations, use insitu steps if present.	Site	Safety boots with ankle support and metal sole. Standard highways PPE	2	☒
Falls into trial pits and hand digs	3	Potential of persons to fall into pits resulting in injuries up to fatality level	2	6	Open trial pits not to be left unattended during works. Safe working procedures and segregation from other site staff during excavation to minimise fall risks. Appropriate secure barriers/warning signs to be considered. The steps in the excavation limited to a height of 0.8m each. Do not stand at the edge. Excavations are limited to 1.2m lengths.	Site		3	
Biological hazards- Tetanus, Leptospirosis and Lyme disease (tick	3	Exposure to and infection by Leptospirosis and Lyme disease although not life threatening in most	2	6	Tetanus - All site staff to have up to date tetanus vaccinations Leptospirosis - Staff should be aware of leptospirosis (Weil's disease) symptoms and report to their doctor if they suspect they have been exposed and might have it. The disease enters the body via open cuts and wounds Initial symptoms include mild flu-like symptoms, such as a headache, chills and muscle pain. In 10% of cases the infection is more	Site	Leptospirosis - Wear gloves when handling/ working in areas where animal faeces and urine could be present. Ensure any exposed cuts and wounds are protected and that protective gloves are worn. Lyme	3	

GROUND CLEARANCE

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
borne disease)		cases can be potentially fatal to susceptible individuals.			severe and can cause life-threatening problems, including organ failure and internal bleeding. Avoid potential exposure on site by avoiding contact with faeces, sewage and dead and live animals. Known animal carriers include cattle, pigs, dogs and rodents, particularly rats. Lyme disease - Carried by ticks - potential to be in any greenfield sites. If bitten personnel should see their GP if they develop the following symptoms - a pink or red rash, often clear in the clear in the centre (a bulls eye) - a temperature of 38°C (100.4°F) or above - other flu-like symptoms, such as a headache or joint pain - swollen lymph nodes.		disease - avoid being bitten by (i) tucking trousers into socks (ii) use of insect repellent (iii) wearing long sleeved shirts		
Invasive plant species (Environmental)	2	Uncontrolled site investigation work could inadvertently assist the spread of invasive plant species causing an environmental impact.	3	6	Presence and extent of plant invasive species to be verified prior to works commencement. Seek information from client and other sources. Most common in UK are Japanese knotweed, giant hog weed, Himalayan balsam, rhododendron ponticum and New Zealand pigmyweed. Wherever possible avoid work in areas where invasive species are present, demarcate if necessary to prevent accidental incursion of work activities. If work is unavoidable. If disturbance is unavoidable comply with current requirements for control and disposal, see www.gov.uk/guidance/prevent-the-spread-of-harmful-invasive-and-non-native-plants for specific guidance and incorporate into Method Statement.	Environmental risk	N/A	2	
Protected species (Environmental)	2	Uncontrolled site works could harm protected species causing an environmental impact.	3	6	Refer to www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals for current lists of protected species and current requirements, and incorporate into method statement. Consult competent ecologist if required.	Environmental risk	N/A	2	
Nesting birds (Environmental Risk)	2	Uncontrolled site works could harm nesting birds causing an environmental impact	3	6	All wild birds (including both eggs and nests) are protected by law. Works should not intentionally kill or injure or take any wild bird or damage or destroy the nest whilst it is in use or being built or destroy the egg of any wild bird unless a mitigation survey and plan have been approved by the EA and implemented via consultation with a competent ecologist. Where work in the vicinity is possible without disturbing nests, establish the locations of bird nest sites (i.e. in trees, on the ground etc) and maintain a demarcation zone within which no works are to intrude	Environmental risk	N/A	2	☒

GROUND CLEARANCE

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
					upon.				
Restricted access / egress - survey locations	2	Basements, loft spaces, enclosed areas, alleyways, ducts, undercrofts not being readily accessible or exited	2	4	Ensure exit and entry points are known before entry and are visible / navigable from within locations	Site	Clear entry exit routes and adequate lighting	2	
Unsafe buildings	3	Poor structural integrity of building / location - carrying out work without appropriate barriers	2	6	Prior to arrival on site, at the commercial stage of the works, a structural survey will be requested from the client and guidance offered. If structural integrity is not known carry out a "point of work" structural safety assessment concentrating on integrity of floors & ceiling / roof structures by careful visual inspection prior to commencement of work. Remain vigilant at all times during survey. If in doubt DO NOT proceed with survey, contact Line Manager for advice.	Site	Read and understand any previously submitted documents of structural safety and entry procedures to building. Wear appropriate PPE for site (hard hat, gloves, boots, safety glasses etc). Segregate off identified structural weaknesses (missing floor boards etc) prior to works commencing and avoid during works. Inform client.	3	
Fire	3	Ignition of flammable substances	1	3	Sites - Avoid sources of ignition. No smoking on site. Consult the fire safety plan for property and discuss arrangements with the team. No hot working.	All	Be aware of plan or emergency evacuation procedure for site, ship or office.	3	
Electrical Wiring, cables, and electrical equipment (bus-bars, transformers etc)	3	Contacting live electrical components / equipment	2	6	Do not touch electrical or move into close proximity of electrical, wiring, cables, and electrical equipment. Please be aware that electricity can arc from high voltage exposed cables and equipment.	Site	n/a	3	
Biohazards including faeces and guano	3	Ingestion / inhalation / contamination / infection by animal/ human faeces	2	6	If infestation is severe i.e. faeces and guano layering across floor do not proceed any further, inform client and request them to contact specialist removal company. Wear gloves and RPE in infested areas and wash hands on exit if working in an area where faeces/guano is present. Avoid	Site	Wear Gloves (latex or similar). Use respirator with P3 filter where risk of inhaling spores or dust is present. Type 5/6 coveralls. Reinforced anti-	3	

GROUND CLEARANCE

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
(including in water)		including bird guano.			all direct contact with all biohazards including animal carcasses, faeces and guano.		slip overshoes. Anti bacterial wash / spray / hand gel / wipes to disinfect footwear. Follow decontamination procedure in SOP16.02.01 Do not eat or drink until PPE removed and hands thoroughly cleaned and washed		
Manholes	3	Lifting injuries/ falls down open manholes/ toxic gases/ access/ egress/ movement of liquids and free moving solids	3	9	Manholes should not be left unattended and covers to be replaced correctly when inspection is complete. Always lift with feet apart and with straight back. Do not twist or bend your back. Pick up your feet to pivot and turn. All manhole inspection is done from the surface. Before information is collated the manhole must aired to allow any noxious gases to dissipate. Do not enter chambers. A hydraulic lifter may be used. Under no circumstance must manhole covers be lifted using a forklift truck. When a cover is replaced it should sit stable and level with the ground to avoid accidents. Under no circumstance should an open manhole be left unattended. Barriers to are to be used to protect the Surveying team from intrusion and the public from falls. Unless trained or qualified in how to operate in confined spaces DO NOT ENTER manhole chambers or allow anyone else to. This includes bending down and leaning into the open chamber	Site, client , public	PPE including protective gloves, eye protection, work boots. Hydraulic lifter. Signage and Barriers	3	☒
Confined space - entry	3	Areas of limited access / egress. Areas of little activity and probable build up of gas and depletion of oxygen. Low light levels. Areas of limited space to move freely.	2	6	Decide whether entry into the confined space can be avoided. Obtain information from client about previous use.	Site	Operatives to have appropriate confined space training. Gas Free certs must be given prior to entry. Access / Egress must be suitably assessed and be adequate before entering. Gas monitors must be worn when entering a confined space. 3 man rule – 2 within area, 1 outside man. Additional lighting		☒

GROUND CLEARANCE

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
							maybe needed. 2 way radios must be provided to all personnel involved in area and outside area. Consult with client/site owner to ascertain as to what their procedure is for entering confined spaces & ensure that all operatives also adhere to this.		
Toxic gases or oxygen deprivation	3	Gas depletion, flammable, explosive or toxic gases present, also possibility of low oxygen levels. Typical in tanks / shafts / compartments where air circulation is poor.	3	9	Ensure all operatives are confined space trained to appropriate level. Request gas free certification from client where applicable. Vent compartment thoroughly prior to entrance if possible. Prior to all confined space entries a gas detector must be used to assess the suitability of the atmosphere - this can be lowered using a rope or similar. Allow the gas detector to take readings at representative locations (i.e. upper, middle and lower levels). Allow 5 minutes for each location to give the gas detector sufficient time to get a reliable reading. If the alarm sounds do not enter the space; apply additional ventilation if possible and repeat gas detector checks before attempting entry. Do not enter if the alarm sounds again. Two person minimum teams - one topside / outside. and one inside. Escape breathing set to be provided on Class NC2 and NC3 spaces. Tripod / harness winch required on NC2 class confined spaces where practical.	Site	Wear appropriate PPE.		
Confined space - communication	3	Loss of communication between those in inside and those outside the confined space.	2	6	Provide confined space inside persons with communication systems if out of voice contact. Maintain regular communication between topside and inside person.	Site	Wear appropriate PPE		
Emergency incidents in confined space	3	Incidents within confined space may require rapid rescue to prevent injuries or incapacitation escalating.	2	6	Classify confined space as NC1, NC 2 or NC 3 and incorporate sufficient and site specific emergency response procedure into method statement. Examples - NC 2 will require tripod, winch and harness system, NC 3 may require provision of rescue team from approved supplier i.e. Mines Rescue. Do not rely on Emergency Services as the sole option. Appropriate levels of confined space training to be provided.	Site	Wear appropriate PPE and RPE.		

GROUND CLEARANCE

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
Flooding or water present in space		3 Potential for drowning if standing water or flooding occurs.	2	6	Assess flood risk before entry - do not enter if significant flood risk is present. Do not enter confined spaces where standing water is present. Consider pumping out water if practicable.	Site	Wear appropriate PPE and RPE.		
High temperatures and/or humidity		3 High temperatures may cause dehydration (resulting in impaired decision making) heat exhaustion or heat stroke.	3	9	Assess heat levels before entry, reduce temperature if possible by isolating hot pipes, providing ventilation, air conditioning, barriering off hot pipes etc. Do not allow vulnerable individuals to work in hot confined spaces (i.e. those with heart conditions) Take regular breaks from hot conditions, slow work rates to a steady comfortable pace. Give the body chance to adapt to higher temperatures. Provide water and encourage workers to drink it.	Site	Wear appropriate PPE and RPE.		
Structural collapse		3 Structural collapse in a confined space could result in injuries up to fatality level	2	9	No entry into confined spaces where any evidence of instability is present i.e. possible collapse of ceiling or walls. If instability becomes evident with space then vacate immediately.	Site	Wear appropriate PPE and RPE		
Solid or semi solid materials capable of flow or engulfment		3 Potential to bury/drown or trap persons, examples include sand, muds, liquids with a solid crust on top such as sewage	3	9	Assess risk beforehand; do not enter spaces where such risks are present. Note that crusts over liquid may appear solid until "stepped on" so be vigilant and cautious if such hazards may be present in a working area.	Site	Wear appropriate PPE and RPE.		☒
Poor lighting		2 Poor illumination could lead to slips, trips, falls resulting in various injuries	3	6	Provide adequate illumination, use hands free head torches and supplement if necessary with lighting rigs.	Site	Wear appropriate PPE and RPE		
Fire/gas explosion		3 Fire or gas explosion has potential to cause fatality	2	6	Assess danger beforehand using gas detectors. Do not enter where gas detectors indicate gas buildup above safe levels. Carry gas detectors within space. Do not create sources of ignition such as sparks. Where a potential gas risk is present and entry is unavoidable use intrinsically safe lighting systems.	Site	Wear appropriate PPE and RPE		

GROUND CLEARANCE

Hazard	Consequence (A)	Risk Cause	Likelihood (B)	Risk Factor (A×B)	Preventive Action	Personnel Exposed	PPE / RPE / Control Measure Used	Residual Risk	Tick (All that apply)
Open water	3	Drowning/water borne disease	2	6	Do not enter the water. Keep at least 1 metre away from the waters edge. Wash hands after survey.	Surveyor		2	☒
Overgrown areas	2	Leading to awkward falls causing strains/broken bones	3	6	Overgrown areas are to be cleared before being entered. This can be done using a hacker or strimmer. In areas where vegetation is too dense to clear avoid the area and discuss an alternative approach with the Directors at Midland Survey and the site manager	Site	Full PPE must be used for this (over-trousers, jacket, gloves, work boots, hard hat, ear defenders and safety glasses)	2	

Signature(s) - Please include all persons present on site such as contractors, subcontractors, auditors, visitors

Name Printed	Signature	Company/ Position	Date



Method Statement

Ground Clearance Survey

Site name: Newbridge Bridge, Port Talbot, SA12 6BT

Client: Tetrattech

Special precaution: Drilling plant/open water

The purpose of this activity is to make sure an immediate area of land is clear from submerged pipes and cables before the drilling of boreholes can begin.

On Arrival at site

1. On attending site, the surveyor will report to the site engineer
2. Surveyor and assistant will be briefed on site safety before commencement of survey and a test approach agreed.
3. The surveyor should spend some time carefully walking round the site and making an informed judgement on any possible / existing safety risks. If there are significant risks, then this must be reported to the office immediately.
4. Surveyor and assistant will be expected to wear appropriate safety clothing as described below.
5. The Surveyor and assistant are to carefully read through all documentation with regards the survey requirements.
6. Site knowledge and any known records to be studied and investigated. The Surveyor should use this information to consider what services to expect to be present due to the nature of the site.

Commencement of ground clearance survey

The survey will consist of the surveyor identifying the services in close vicinity of the location to be drilled. These will be done using radio detection methods and Ground Probe Radar. The identified services will be marked on the ground.

Start of Services – Walk the site with locator looking for passive frequencies identifying covers and street furniture that will give an indication of services below ground. If stats are supplied these are used in conjunction with onsite information.

All services including those that are made of a conductible metallic material are located using electromagnetic techniques this consists of using a direct connection, transmitting clamp or inducing a signal along the service. These are normally traced from surface features such as lampposts, signs and manhole covers.

All services including those not made of a conductible metallic material are located using ground penetrating radar.

Drainage

Start of drainage – Lift manhole covers in the vicinity of each location and provide invert levels, flow direction, pipe diameter and sewer type flow direction being storm foul or combined. This will be carried out using manhole keys (or in some circumstances a hydraulic lifter).

Begin by clearing immediate area. Erect barriers and warning signs if necessary. For covers in carriage-ways traffic management may be needed-see Risk Assessment for more detail. Lift manhole cover and place to the side in the work area. Leave manhole to air for a few minutes before commencing survey. Do not leave work area unattended and do not enter manhole chamber at any time.

Link drainage runs from start of run to finish, this is done using flexi drainage rod with a locatable Sonde to accurately locate run position and depth where applicable.

Also depending on condition of drainage, environmentally safe dye is used to determine the correct run of individual pipes.

On clear and flowing runs tapping the up or down stream manhole will give an audible connection, this is only a link indication and is not relied upon.

Steel pipe work: If all above techniques are not successful electromagnetic location is used in the same way services are traced.

Draw up drainage check over all information gained once complete in conjunction with stats if supplied.

When all the above methods have been utilised, the Surveyor will carry out a power sweep of each location along with a GPR sweep. Once the location has been deemed safe enough to dig our Surveyor will mark a target symbol with 2/4 filled in.

Replace cover as found and remove barriers and signage.

Before Leaving Site

Before leaving site, a check should be made to ensure all possible services have been located and that all manholes and inspections covers have been safely replaced. Flexi-rods are to be cleaned on return to the office as described in the risk assessment.

The client should then be informed of any problems encountered or services that were unable to be identified. If possible, a site walk should be carried out to confirm that the correct areas have been fully surveyed and that the client understands the information provided. The client will sign the job sheet to confirm this.

Upon returning to the office all information should be handed in along with a brief report highlighting any problems or difficulties. The office is to be informed of any deadline requirements for the work carried out and any other client requests.

Personal Protective Equipment to be used

Yellow Jackets/Vests

Hard Hats

Steel toe-capped boots

Gloves

Goggles

Ear defenders



Resources

No mechanical plant is required to carry out this work.

No work will that we carry out is sub-contracted to another company.

No materials are needed to complete this work.

Equipment used will consist of;

1 x Surveyor

RD8000 locating tool.

GPR locating tool.

Manhole cover lifting tools (including keys, crowbar, hammer, screwdriver, separate tape, hydraulic lifter)

GPS and total station to record utilities locations.

Permits Required

No permits are required at this time.

Site Plan





Emergency Procedure & First Aid

In the event of any emergency incident the Senior Surveyor is to assess the situation and take the appropriate action, informing the emergency services where necessary.

All incidents should be reported back to a Director at Midland Survey at the earliest convenience. The site contact or client should be notified.

All vehicles contain First Aid Kits.

Nearest Hospital

Neath Port Talbot Hospital
Baglan Way
Port Talbot
SA12 7BX
Tel: 01639 862000

Date & Signature:
26/09/2023

Director

South Wales Ground Testing

Method Statement Wheeled Probing Rig

Equipment:

Wheeled rig
Hand jacking equipment
Samplers and probe rods
Hand tools

PPE required:

Overalls, hard hat, steel toe capped safety boots, ear defenders.

Training:

Training given by in house experienced personnel.
CSCS Card usually required on construction sites.
NVQ Land Drilling for lead driller

Pre Work Checks:

Integrity of winch cable
Engine and gear oil levels
Tyres for punctures
Integrity of pick up blocks and release mechanism, lubricate central rod and moving parts.

Method:

The rig is wheeled by hand to the borehole location and positioned vertically supported on boards. The weight is raised by means of the winch and either the first sampler or probe rod is positioned beneath the weight. The winch cable is disconnected from the weight and the engine is started. The chain then moves around the mast and the weight is raised and when it reaches the top of the mast is released and dropped. The sample tube or probe rod is therefore driven percussively into the ground. In the case of probing the blows required to drive the cone each successive 100mm is recorded. When the metre rod is driven into the ground, the engine should be stopped, the cable reconnected to the weight, the weight raised to the top of the mast and another rod attached. The process is repeated until the desired depth is achieved or refusal on hard strata. In the case of soil sampling once the tube is driven into the ground the rig is lowered horizontally resting on a trestle, the sample tube is withdrawn by means of hand jacks, the next sample tube is lowered into the ground and the rig repositioned vertically. Drill rods are attached to the sampler and the process repeated until the desired depth or refusal on hard strata is achieved.

Method statement read and understood:

.....
Signed by operative

Risk Matrix

Risk Rating Likelihood (L) X Severity (S)			Severity should an accident occur (S)				
			1	2	3	4	5
			Negligible Impact or personal injury	Slight Minor injury, damage or business impact	Moderate Lost time injury Moderate damage or business impact	High Fatality, serious injury, damage or business impact	Very high Multiple fatalities, serious injuries, damage or business impact
Likelihood of hazard occurring (L)	1	Very unlikely A n unusual combination of factors would be required for an accident or incident to occur	Low	Low	Low	Low	Low
	2	Unlikely A rare combination of factors would be required for an accident or incident to occur	Low	Low	Low	Medium	Medium
	3	Possible Could happen if a combination of accidental factors are present	Low	Low	Medium	High	High
	4	Likely Not certain to happen but additional factors may result in an accident or incident	Low	Medium	High	High	High
	5	Very likely Almost inevitable that an accident or incident would result	Low	Medium	High	High	High

Risk Level = Severity x Likelihood

Low Risk (Score 1-6)	Work may proceed providing specified controls are carried out to ensure principle of "As Low As Reasonably Practicable" (ALARP) is followed
Medium Risk (Score 8-10)	Consider revisiting the methodology to reduce risks, task may only proceed after consultation with specialist personnel and or HSE team
High Risk (Score 12-25)	Task may not proceed, revisit methodology to reduce risks to acceptable levels

South Wales Ground Testing

Risk Assessment and Control Measures for Drilling Operations

Project:		Pre mitigation risk			Mitigation Measures.	Post mitigation risk		
Hazard	Those at Risk	L	S	R		L	S	R
Sampling Rig General	Operatives				Conduct pre site safety check and operation of rig and equipment			
Hydraulic rams and moving parts trapping appendages.	Public	4	4	12	Lead operative suitably experienced, qualified and trained	1	4	4
Noise, and fumes.	Other site users				PPE as per method statement as minimum			
Entrapment while tracking unit.					Observe good housekeeping.			
					Ensure others not associated with rig operation cannot encroach into working area by means of barriers or other suitable means.			
Underground Services	Operatives				Ensure the proximity of services are noted			
Physical injury or asphyxiation due to contact with damaged buried pipe or cable.	Public	3	5	15	from up to date service plans.	1	5	5
	Other site users				Engineer to CAT scan working area.			
					Inspection pit to be hand excavated to 1.20m unless it is certain that there are no buried services in proximity.			
Contaminated land	Operatives				If the ground is anticipated to be contaminated then a site specific risk assessment will be created highlighting the anticipated pollutants and appropriate measures.			
Poisoning or asphyxiation due to contact with noxious or toxic substances from the sub substrata.	Public	2	4	8	In general operatives should observe any unusual odours or colours in the soil or groundwater. If any of these are encountered then drilling should cease and the supervising engineer notified.	1	3	4
	Other site users				Standard PPE should be worn at all times and hands should be washed prior to food, drinking or smoking breaks.			
Slips, trips and falls	Operatives				Keep working area as tidy as possible. Stack tools away from area immediately in front of the rig and control panel.			
Injury due to falling over items of equipment. Slipping on wet or uneven ground.	Other site users	4	3	12	Wherever possible set the rig up on even ground.	1	3	3
					Where the ground is particularly soft or wet place mats or boards around the rig to provide firm footing.			
Spitting of liner sleeves	Operatives				Ensure that appropriate gloves and safety goggles are worn			
It is required to split the plastic sample tube with a hooked bladed Stanley knife.		4	4	16	Ensure no part of the body placed is in the direction of the cut.	1	4	4
Possible injury due to contact with the blade or cur plastic edge.					Place Stanley blade at an angle so as not to snag on material within liner.			
					Ensure that no one else is in the vicinity			
Tracking of rig	Operatives				When tracking between positions, conduct a prior walkover to check for uneven ground, obstacles or depressions.			
Potential for rig to topple when tracking over uneven ground causing injury.	Public	3	5	15	Ensure that there is sufficient room for the rig to pass by any static obstacles.	1	4	4
Possible entrapment of persons between rig and other objects	Other site users							

APPENDIX F - COSHH RISK ASSESSMENTS

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COSHH Risk Assessment - – Natural Aggregate



PART 1 – ASSESSMENT DETAILS	
Discipline / Office: Geo-Environmental and Waste & Resource Management	
Assessment Date: April 2022	Next Review Date: April 2024
Describe the activity / what is the substance used for: Used for backfilling boreholes as a filter medium, making concrete, general purpose.	
Frequency of use: Weekly	Is it necessary to use this substance? ☒ Yes ☐ No
Persons at risk: ☒ Employee ☐ Contractors ☐ Public	
PART 2 – HAZARD DETAILS	
Name of Substance: Natural Aggregates	Supplier: Various (Jewson, MGS, Local builders Merchants)
Any colloquial names (such as 'Blue Billy'): Pea Gravel, 10/20mm Gravel, Building sand, sharp sand, 20mm Ballast, Kiln dried sand.	
Physical Nature: (Tick Box) ☐ Liquid ☐ Dust ☒ Solid ☐ Fume ☐ Mist ☐ Vapour ☐ Gas ☐ Other:	
Classification: (Check the label for any warnings, e.g. Toxic, Harmful, Irritant, Corrosive, etc) (Tick Box) ☐ Moderate hazard ☐ Acutely toxic ☐ Corrosive ☐ Health Hazard ☐ Flammable ☐ Oxidising ☐ Explosive ☐ Gas under pressure ☐ Harmful to the aquatic environment	
Signal Word: (Tick Box) ☐ Warning ☐ Danger	Hazard Statement: Not classified as hazardous according to Regulation (EC) No. 1272/2008.
Will the substance react with any others in present (include any additive or synergistic effects particularly of mutagens and carcinogens: Stable at normal temperatures and under recommended storage conditions. Incompatible materials: Strong acids (limestone-based aggregates). Hazardous decomposition products: Generally none. However, with specific reference to limestone-based aggregates, these may react with acidic groundwater to release carbon dioxide gas.	
Route of Exposure: (Tick Box) ☒ Inhalation ☐ Ingestion ☒ Skin Contact ☒ Contact with Eyes ☐ Other :	
Known Adverse Health Effects: Silicosis (respirable) Dermatitis (contact) Eye Irritation (dusts). Aggregates have no hazardous ingredients. The main health hazards are from airborne dust and the inhalation of respirable dust over prolonged period. Where respirable dust contains high quantities of silica (quartz) there is a risk of silicosis.	

Workplace Exposure Limits (WEL's) (indicate n/a where not applicable):		
Long-term exposure level (8hr TWA): MEL = Respirable Silica 0.1mg/m ³ / 8hr TWA OES = Respirable dust 4mg/m ³ / 8hr TWA OES = Total Inhalable dust 10mg/m ³ / 8hr TWA CHAN35 states that it should be reasonably practicable to control respirable crystalline silica to 0.1mg/m ³ (8-hour TWA)	Short-term exposure level (15 minutes):	
PART 3 – CONTROL MEASURES		
Detail control Measures: (e.g. extraction, ventilation, training, supervision) Reliable source to be used for aggregates. Suitable work wear and PPE to be worn during handling. Dust masks to be used as necessary. The main risk with substance is dust inhalation. Material generally arrives damp and sealed within plastic bags. The risk from dusts for the exposure frequency is therefore very low. Should dust be considered a problem then PPE such as dust masks and dust proof goggles should be worn.		
EMERGENCY ARRANGEMENTS (FIRST AID RECOMMENDED ACTIONS)		
Inhalation: Remove to fresh air, seek medical attention if required.	Ingestion: If ingestion causes problems seek medical attention.	
Skin Contact: After repeated or prolonged skin contact wash with mild soap and water.	Eye Contact: Irrigate eye with eyewash solution or clean water. If symptoms persist obtain medical attention.	
Other (where applicable): Personal precautions, protective equipment and emergency procedures: Avoid breathing dusts and excessive physical contamination. Environmental precautions: Entry into watercourses should be avoided so far as is possible. Methods and materials for containment and cleaning up: Spray with water to prevent the generation of dust. Do not dry sweep residues. Contain so as to avoid the generation of dust (i.e. cover or enclose).		
Is any Health Surveillance or Monitoring Required for this substance?		☐ Yes ☒ No

PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIREMENTS (tick applicable and state type required)			
☐ Dust Mask  Wear dust mask		☐ Visor  Face protection must be worn	
☒ Respirator  Respiratory protection must be worn	Respiratory Protection to protect against inhalation.	☒ Goggle  Eye protection must be worn	Eye protection to prevent dust entering eyes.
☒ Gloves  Hand protection must be worn		☒ Overalls  Safety Overalls must be worn	
☐ Footwear  Foot protection must be worn		☐ Other 	
STORAGE AND DISPOSAL			
Storage: Stored in vehicles or storage cabins for limited periods only. Should be stored outdoors where possible to minimise the creation of airborne dust. Quantity Held in stock: 20 (maximum) Container Sizes: 25kg bags			
Disposal – How is excess / waste disposed of? (Give details): ☐ Hazardous Waste ☒ Skip ☐ Returned to Supplier ☒ Returned to Storage ☒ Other: Disposal not considered necessary, excess materials to be re- used on other projects as and when required. If disposed of this should be within a skip provided by a licensed waste carrier.			

PART 4 – ADDITIONAL ACTION REQUIRED			
List any further action required to reduce the risks to the lowest level reasonably practicable			
Action	By Whom	By When	Completed
N/A			

PART 5 – LEVEL OF RISK
Taking into account the Control Measures currently in place, do you consider the risk to be: ☐ Low ☐ Medium ☐ High If you have indicated MEDIUM or HIGH please indicate what additional action will be taken to reduce the risk.

PART 6 – MANAGER'S DECLARATION		
Name(s) of Assessor(s)	Signature(s) of Assessor(s)	Date
I have reviewed the assessment(s) with the assessor and accept its findings; I will ensure that the required actions are completed in a timely manner.		
Name of Manager	Signature of Manager	Date

Associated Training & Documents

COSHH Substances Hazardous to Health
 COSHH Know the Symbols
 PPE Half Face – Full Face Respirators
 PPE Goggles
 PPE Non-Disposable Gloves

available on SSHEQ SharePoint
 available on SHEQ SharePoint
 training module available on Brainier
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Doc ref number:	SSHEQ-H&S-019	Version:	3
Owner:	Group SSHEQ	Department:	SSHEQ
Date of last review:	April 2022	Date of next review:	April 2024

COSHH Risk Assessment – Bentonite Pellets



PART 1 – ASSESSMENT DETAILS	
Discipline / Office: Geo-Environmental and Waste & Resource Management	
Assessment Date: April 2022	Next Review Date: April 2024
Describe the activity / what is the substance used for: Sealing borehole installations. Backfilling of exploratory holes.	
Frequency of use: N/A	Is it necessary to use this substance? ☒ Yes ☐ No
Persons at risk: ☒ Employee ☒ Contractors ☒ Public	
PART 2 – HAZARD DETAILS	
Name of Substance: Bentonite Pellets	Supplier: MGS (product supplier Mikolit)
Any colloquial names (such as 'Blue Billy'): Mikolit 300	
Physical Nature: (Tick Box) ☐ Liquid ☐ Dust ☒ Solid ☐ Fume ☐ Mist ☐ Vapour ☐ Gas ☒ Other: Bacterial	
Classification: (Check the label for any warnings, e.g. Toxic, Harmful, Irritant, Corrosive, etc) (Tick Box) ☐ Moderate hazard ☐ Acutely toxic ☐ Corrosive ☐ Health Hazard ☐ Flammable ☐ Oxidising ☐ Explosive ☐ Gas under pressure ☐ Harmful to the aquatic environment	
Signal Word: (Tick Box) ☐ Warning ☐ Danger	Hazard Statement:
Will the substance react with any others in present (include any additive or synergistic effects particularly of mutagens and carcinogens: No. If Yes then remember the hierarchy of controls. Expands in contact with water..	
Route of Exposure: (Tick Box) ☐ Inhalation ☒ Ingestion ☒ Skin Contact ☐ Contact with Eyes ☐ Other :	
Known Adverse Health Effects: The respirable free silica component is classified as a potential hazard to health by prolonged inhalation.	

Workplace Exposure Limits (WEL's) (indicate n/a where not applicable):		
Long-term exposure level (8hr TWA): Montmorillonite total inhalable dust 10 mg/m ³ (OES) Respirable dust 5 mg/m ³ (OES) Silica, Crystalline: Respirable dust 0.4 mg/m ³ (MEL)	Short-term exposure level (15 minutes):	
PART 3 – CONTROL MEASURES		
Detail control Measures: (e.g. extraction, ventilation, training, supervision) Handle material to avoid creation of dust. Store in dry place, out of sunlight and stacked safely.		
EMERGENCY ARRANGEMENTS (FIRST AID RECOMMENDED ACTIONS)		
Inhalation: Remove to fresh air	Ingestion: Seek medical attention	
Skin Contact: No measures required – undesirable clean off with soap and water.	Eye Contact: Irrigate with plenty of cold clean water	
Other (where applicable): There are no known risks associated with the products in contact with water or water. Accidental spillages should be recovered in a manner that minimises the creation of dust or slippery		
Is any Health Surveillance or Monitoring Required for this substance?	☒ Yes	☐ No

PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIREMENTS (tick applicable and state type required)			
☐ Dust Mask  Wear dust mask		☐ Visor  Face protection must be worn	
☒ Respirator  Respiratory protection must be worn	Appropriate RPE should be worn where exposure to dust occurs	☐ Goggle  Eye protection must be worn	
☐ Gloves  Hand protection must be worn		☐ Overalls  Safety Overalls must be worn	
☐ Footwear  Foot protection must be worn		☐ Other 	
STORAGE AND DISPOSAL			
Storage: Substance stored as a solid in sealed bags. Control of access not required. Store out of sunlight and stack safely Quantity Held in stock: 15 Container Sizes: 25kg			
Disposal – How is excess / waste disposed of? (Give details): ☐ Hazardous Waste ☒ Skip ☐ Returned to Supplier ☒ Returned to Storage ☒ Other: Disposal of excess is not generally required as sealed excess quantities can be re-used. Where disposed of, product should be disposed of as solid non-hazardous waste by a suitably licensed waste carrier.			

PART 4 – ADDITIONAL ACTION REQUIRED

List any further action required to reduce the risks to the lowest level reasonably practicable

Action	By Whom	By When	Completed
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PART 5 – LEVEL OF RISK

Taking into account the Control Measures currently in place, do you consider the risk to be:

☒ Low ☐ Medium ☐ High

If you have indicated **MEDIUM** or **HIGH** please indicate what additional action will be taken to reduce the risk.

PART 6 – MANAGER'S DECLARATION

Name(s) of Assessor(s)	Signature(s) of Assessor(s)	Date
I have reviewed the assessment(s) with the assessor and accept its findings; I will ensure that the required actions are completed in a timely manner.		
Name of Manager	Signature of Manager	Date

Associated Training & Documents

- COSHH Substances Hazardous to Health available on SSHEQ SharePoint
- COSHH Know the Symbols available on SSHEQ SharePoint
- Asbestos at Work available on SSHEQ SharePoint
- Asbestos Toolkit SharePoint on Project Lifecycle/Technical Toolkits
- PPE Half Face – Full Face Respirators training module available on Brainier

Doc ref number:	SSHEQ-H&S-011	Version:	3
Owner:	Group SSHEQ	Department:	SSHEQ

Date of last review:	April 2022	Date of next review:	April 2024
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COSHH Risk Assessment – Diesel



PART 1 – ASSESSMENT DETAILS	
Discipline / Office: Geo-Environmental and Waste & Resource Management	
Assessment Date: April 2022	Next Review Date: April 2024
Describe the activity / what is the substance used for:	
Frequency of use: Weekly	Is it necessary to use this substance? ☒ Yes ☐ No
Persons at risk: ☒ Employee ☒ Contractors ☒ Public	
PART 2 – HAZARD DETAILS	
Name of Substance: Diesel	Supplier: Various
Any colloquial names (such as 'Blue Billy'):	
Physical Nature: (Tick Box) ☒ Liquid ☐ Dust ☐ Solid ☐ Fume ☐ Mist ☐ Vapour ☐ Gas ☐ Other:	
Classification: (Check the label for any warnings, e.g. Toxic, Harmful, Irritant, Corrosive, etc) (Tick Box) ☒ Moderate hazard ☐ Acutely toxic ☐ Corrosive ☒ Health Hazard ☐ Flammable ☐ Oxidising ☐ Explosive ☐ Gas under pressure ☐ Harmful to the aquatic environment	
Signal Word: (Tick Box) ☐ Warning ☒ Danger	Hazard Statement: Combustible liquid. Harmful if inhaled. Causes skin irritation. Suspected of causing cancer. May be fatal if swallowed and enters airways
Will the substance react with any others in present (include any additive or synergistic effects particularly of mutagens and carcinogens:	
Route of Exposure: (Tick Box) ☒ Inhalation ☒ Ingestion ☒ Skin Contact ☐ Contact with Eyes ☐ Other :	
Known Adverse Health Effects:	

Workplace Exposure Limits (WEL's) (indicate n/a where not applicable):		
Long-term exposure level (8hr TWA):	Short-term exposure level (15 minutes):	
PART 3 – CONTROL MEASURES		
Detail control Measures: (e.g. extraction, ventilation, training, supervision) Approved containers to be used only and clearly labelled. Caps to be placed on filling containers to prevent vapours. Use to be limited to filling small plant and equipment only (1/2 hour to 2-hour limits per day). Appropriate PPE to be used during re-fuelling (gloves, mask etc). Purpose made filling attachments to be used to prevent spills and splashes. Refuel in well ventilated areas.		
EMERGENCY ARRANGEMENTS (FIRST AID RECOMMENDED ACTIONS)		
Inhalation: If inhaled, remove to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention.	Ingestion: Do not induce vomiting. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Aspiration hazard if swallowed. Can enter lungs and cause damage. Get medical attention immediately.	
Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention.	Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.	
Other (where applicable): No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Spillages: Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Dike spill area and do not allow product to reach sewage system and surface or ground water. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Use spark-proof tools and explosion-proof equipment. Contaminated absorbent material may pose the same hazard as the spilled product. The method and equipment used must be in conformance with appropriate regulations and industry practice on explosive atmospheres. Dispose of via a licensed waste disposal contractor.		
Is any Health Surveillance or Monitoring Required for this substance?	☐ Yes	☒ No

PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIREMENTS (tick applicable and state type required)			
☐ Dust Mask  Wear dust mask		☐ Visor  Face protection must be worn	
☒ Respirator  Respiratory protection must be worn	Where necessary	☐ Goggles  Eye protection must be worn	
☒ Gloves  Hand protection must be worn		☐ Overalls  Safety Overalls must be worn	
☒ Footwear  Foot protection must be worn		☒ Other 	
STORAGE AND DISPOSAL			
Storage: Stored in vehicles or locked storage area as a liquid in approved containers. Quantity Held in stock: 5 litres Container Sizes: 5 litres proprietary containers.			

PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIREMENTS
(tick applicable and state type required)

Disposal – How is excess / waste disposed of? (Give details):

- ☐ Hazardous Waste
 ☐ Skip
 ☐ Returned to Supplier
 ☐ Returned to Storage
☒ Other: Proprietary containers mean no excess or disposal is required. Should disposal be required: dispose of surplus and non-recyclable products via a licensed waste disposal contractor.

PART 4 – ADDITIONAL ACTION REQUIRED

List any further action required to reduce the risks to the lowest level reasonably practicable

Action	By Whom	By When	Completed

PART 5 – LEVEL OF RISK

Taking into account the Control Measures currently in place, do you consider the risk to be:

- ☒ Low
 ☐ Medium
 ☐ High

If you have indicated **MEDIUM** or **HIGH** please indicate what additional action will be taken to reduce the risk.

PART 6 – MANAGER'S DECLARATION

Name(s) of Assessor(s)	Signature(s) of Assessor(s)	Date

I have reviewed the assessment(s) with the assessor and accept its findings; I will ensure that the required actions are completed in a timely manner.

Name of Manager	Signature of Manager	Date

Associated Documents

- COSHH Substances Hazardous to Health available on SSHEQ SharePoint

- COSHH – Know the Symbols
- PPE Half Face – Full Respirators
- PPE Non-Disposable Gloves
- PPE Safety Boots

available on SSHEQ SharePoint
training module available on Brainier
training module available on Brainier
training module available on Brainier

Doc ref number:	SSHEQ-H&S-014	Version:	3
Owner:	Group SSHEQ	Department:	SSHEQ
Date of last review:	April 2022	Date of next review:	April 2024

COSHH Risk Assessment – Petrol



PART 1 – ASSESSMENT DETAILS	
Discipline / Office: Geo-Environmental and Waste & Resource Management	
Assessment Date: April 2022	Next Review Date: April 2024
Describe the activity / what is the substance used for: Fuel for motor vehicles	
Frequency of use: Weekly	Is it necessary to use this substance? ☒ Yes ☐ No
Persons at risk: ☒ Employee ☒ Contractors ☒ Public	
PART 2 – HAZARD DETAILS	
Name of Substance: Petrol	Supplier: Various
Any colloquial names (such as 'Blue Billy'):	
Physical Nature: (Tick Box) ☒ Liquid ☐ Dust ☐ Solid ☐ Fume ☐ Mist ☐ Vapour ☐ Gas ☐ Other:	
Classification: (Check the label for any warnings, e.g. Toxic, Harmful, Irritant, Corrosive, etc) (Tick Box) ☒ Moderate hazard ☐ Acutely toxic ☐ Corrosive ☒ Health Hazard ☒ Flammable ☐ Oxidising ☐ Explosive ☐ Gas under pressure ☐ Harmful to the aquatic environment	
Signal Word: (Tick Box) ☐ Warning ☒ Danger	Hazard Statement: R12- Extremely flammable. R45- May cause cancer. R46- May cause heritable genetic damage. R63- Possible risk of harm to the unborn child. R65- Also harmful: may cause lung damage if swallowed. R38- Irritating to skin. R67- Vapours may cause drowsiness and dizziness. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S2- Keep out of the reach of children. S16- Keep away from sources of ignition - No smoking. S23- Do not breathe gas/fumes/vapour/spray. S24- Avoid contact with skin. S29- Do not empty into drains. S36/37- Wear suitable protective clothing and gloves. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S61- Avoid release to the environment. Refer to special

instructions/safety data sheet. S62- If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.	
Will the substance react with any others in present (include any additive or synergistic effects particularly of mutagens and carcinogens: Reactive or incompatible with the following materials: oxidising materials. Avoid all possible sources of ignition (spark or flame). Avoid excessive heat.	
Route of Exposure: (Tick Box) ☒ Inhalation ☒ Ingestion ☒ Skin Contact ☒ Contact with Eyes ☐ Other :	
Known Adverse Health Effects: Carcinogen. Toxic by inhalation, ingestion and skin contact. Causes eye and skin irritation and/or dermatitis. Inhalation of vapour/aerosol concentrations above the recommended exposure limits causes headaches, dizziness, and nausea and may lead to unconsciousness or death.	
Workplace Exposure Limits (WEL's) (indicate n/a where not applicable):	
Long-term exposure level (8hr TWA):	Short-term exposure level (15 minutes):
PART 3 – CONTROL MEASURES	
Detail control Measures: (e.g. extraction, ventilation, training, supervision) Approved containers to be used only and clearly labelled. Caps to be placed on filling containers to prevent vapours. Use to be limited to filling small plant and equipment only (1/2 hour to 2-hour limits per day). Appropriate PPE to be used during re-fuelling (gloves, mask etc). Purpose made filling attachments to be used to prevent spills and splashes. Refuel in well ventilated areas. For refuelling appropriate nozzle should be fitted and item being refuelled should be placed beneath a drip tray. An emergency spill kit should be available to mop up any spillages.	
EMERGENCY ARRANGEMENTS (FIRST AID RECOMMENDED ACTIONS)	
Inhalation: Get medical attention immediately. If inhaled, remove to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If exposure to vapour, mists or fumes causes drowsiness, headache, blurred vision or irritation of the eyes, nose or throat, remove immediately to fresh air. Keep patient warm and at rest. If any symptoms persist obtain medical advice.	Ingestion: Get medical attention immediately. Do not induce vomiting. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Aspiration hazard if swallowed. Can enter lungs and cause damage.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Drench contaminated clothing with water before removing. This is necessary to avoid the risk of sparks from static electricity that could ignite contaminated clothing. Contaminated clothing is a fire hazard. Contaminated leather, particularly footwear, must be discarded. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention.	Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention if irritation occurs.
Other (where applicable): Personal Precautions: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk-through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8). Environmental Precautions: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Large Spill: Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Small Spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.	
Is any Health Surveillance or Monitoring Required for this substance?	☐ Yes ☒ No

PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIREMENTS (tick applicable and state type required)			
☐ Dust Mask  Wear dust mask		☐ Visor  Face protection must be worn	
☒ Respirator  Respiratory protection must be worn	Where necessary	☒ Goggles  Eye protection must be worn	Safety glasses with side shields.
☒ Gloves  Hand protection must be worn	Wear gloves that cannot be penetrated by chemicals or oil	☐ Overalls  Safety Overalls must be worn	
☐ Footwear  Foot protection must be worn		☒ Other 	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location.
STORAGE AND DISPOSAL			
Storage: Stored in vehicles or locked storage area as a liquid in approved containers.			
Disposal – How is excess / waste disposed of? (Give details): ☐ Hazardous Waste ☐ Skip ☐ Returned to Supplier ☐ Returned to Storage Proprietary containers mean no excess or disposal is required. ☒ Other: Should disposal be required: dispose of surplus and non- recyclable products via a licensed waste disposal contractor.			

PART 4 – ADDITIONAL ACTION REQUIRED List any further action required to reduce the risks to the lowest level reasonably practicable			
Action	By Whom	By When	Completed
N/a			

PART 5 – LEVEL OF RISK

Taking into account the Control Measures currently in place, do you consider the risk to be:

☒ Low

☐ Medium

☐ High

If you have indicated **MEDIUM** or **HIGH** please indicate what additional action will be taken to reduce the risk.

PART 6 – MANAGER'S DECLARATION

Name(s) of Assessor(s)

Signature(s) of Assessor(s)

Date

I have reviewed the assessment(s) with the assessor and accept its findings; I will ensure that the required actions are completed in a timely manner.

Name of Manager

Signature of Manager

Date

Associated Training & Documentation

- | | |
|---|--------------------------------------|
| • COSHH Substances Hazardous to Health | Available on SSHEQ SharePoint |
| • COSHH Know the Symbols | Available on SSHEQ SharePoint |
| • PPE Half Face – Full Face Respirators | Training module available on Brainer |
| • PPE Goggles | “ “ “ “ “ |
| • PPE Non-disposable Gloves | “ “ “ “ “ |

Doc ref number:	SSHEQ-H&S-020	Version:	3
Owner:	Group SSHEQ	Department:	SSHEQ
Date of last review:	April 2022	Date of next review:	April 2024

APPENDIX G - SCHEDULE 2

Schedule 2 – Exploratory Holes

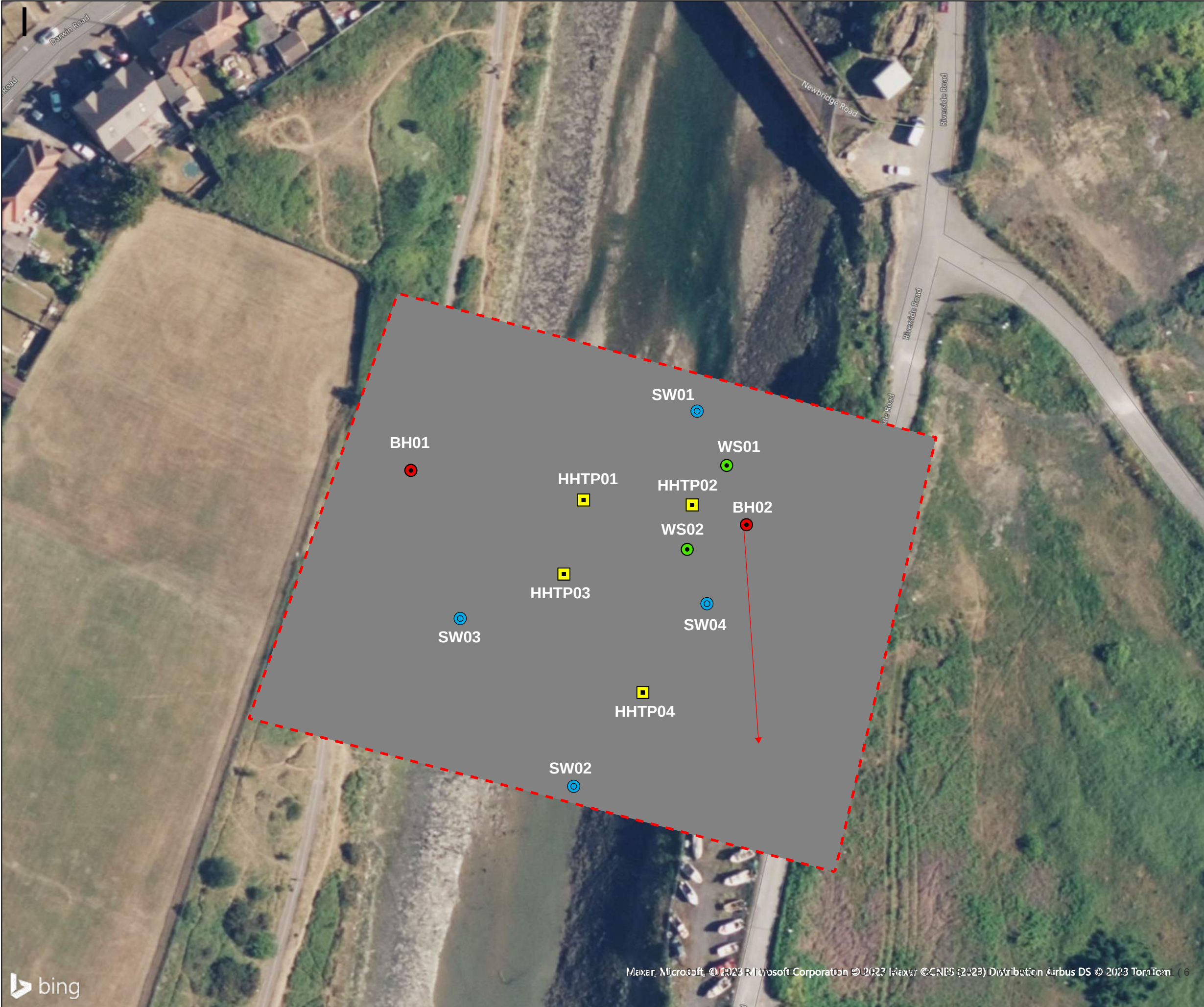
Hole Number (reference)	Type	Scheduled depth	National Grid Reference		Approximate ground level/ surface	In situ testing	Remarks
			Easting (m)	Northing (m)			
BH01	Cable Percussive	Refusal or 25m	275484	189212	Grassed area adjacent to a footpath by the river	Geotechnical and Geo-environmental sampling SPTs to be undertaken	BH to be undertaken using a rig capable of reaching the rockhead or competent material. Access via the footpath off Darwin Road. Limited level area for the works with the potential for the extent of the works to obstruct the pedestrian footpath. Therefore, pedestrian management may be required. If the borehole cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative location to be agreed with the investigation supervisor.
BH02	Cable Percussive	Refusal or 25m	275552	189201	Hard surface (concrete) between the road and river level	Geotechnical and Geo-environmental sampling SPTs to be undertaken	BH to be undertaken using a rig capable of reaching the rockhead or competent material. Access via the Riverside Road. If the borehole cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative location to be agreed with the investigation supervisor.
WS01	Cable Percussive	5m or refusal	275548	189213	Riverbed (Clayey silt)	Geotechnical and Geo-environmental sampling SPTs to be undertaken	WS to be undertaken using small tracked dynamic sampling rig, capable of reaching the required depth. Access via the shallower riverbank to the North, Drawing 2. Risk of soft deposits on the riverbed so an assessment of the risk to machinery and personnel should be undertaken.

							If WS cannot be undertaken at the location due to the site conditions and constraints the Contractor should propose an alternative method to be agreed with the Investigation Supervisor. If WS cannot be undertaken at the location due to the site conditions and constraints the Contractor should propose an alternative method to be agreed with the Investigation Supervisor.
WS02	Cable Percussive	5m or refusal	275540	189196	Riverbed (Clayey silt)	Geotechnical and Geo-environmental sampling SPTs to be undertaken	WS to be undertaken using small tracked dynamic sampling rig, capable of reaching the required depth. Access via the shallower riverbank to the North, Drawing 2. Risk of soft deposits on the riverbed so an assessment of the risk to machinery and personnel should be undertaken. If WS cannot be undertaken at the location due to the site conditions and constraints the Contractor should propose an alternative method to be agreed with the Investigation Supervisor.
HHTP01	TP (Hand excavated)	0.5m	275519	189206	Riverbed (Clayey silt with gravels)	Geo-environmental sampling	If a trial pit cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative method to collect shallow ground samples for geoenvironmental testing to be agreed with the investigation supervisor. Any obstructions should be noted with a record of the size, depth and location, which should be passed onto the Investigation Supervisor to inform the potential obstruction risk to the proposed sheet piling. Risk of soft deposits on the riverbed so an assessment of the risk to personnel should be undertaken.
HHTP02	TP (Hand excavated)	0.5m	275541	189205	Riverbed (Clayey silt)	Geo-environmental sampling	If a trial pit cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative method to collect shallow ground samples for geoenvironmental testing to be agreed with the investigation supervisor. Any obstructions should be noted with a record of the size, depth and location, which should be passed

							onto the Investigation Supervisor to inform the potential obstruction risk to the proposed sheet piling. Risk of soft deposits on the riverbed so an assessment of the risk to personnel should be undertaken.
HHTP03	TP (Hand excavated)	0.5m	275515	189191	Riverbed (Structural Slag with clayey silt)	Geo-environmental sampling	If a trial pit cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative method to collect shallow ground samples for geoenvironmental testing to be agreed with the investigation supervisor. Any obstructions should be noted with a record of the size, depth and location, which should be passed onto the Investigation Supervisor to inform the potential obstruction risk to the proposed sheet piling. Risk of soft deposits on the riverbed so an assessment of the risk to personnel should be undertaken.
HHTP04	TP (Hand excavated)	0.5m	275531	189167	Riverbed (Clayey silt)	Geo-environmental sampling	If a trial pit cannot be undertaken at the location due to the site conditions and constraints, the Contractor shall propose an alternative method to collect shallow ground samples for geoenvironmental testing to be agreed with the investigation supervisor. Any obstructions should be noted with a record of the size, depth and location, which should be passed onto the Investigation Supervisor to inform the potential obstruction risk to the proposed sheet piling. Risk of soft deposits on the riverbed so an assessment of the risk to personnel should be undertaken.
SW01	Surface Water Sample	N/A	275542	189224	River Afan	Geo-environmental sampling	Water sample from the River Afan upstream of proposed works area to establish baseline conditions. Sample to be taken from a safe access point upstream identified by the Contractor. Three rounds of sampling proposed (fortnightly intervals, post completion of the fieldwork), with a

							view to reduce to two rounds based on the sampling findings.
SW02	Surface Water Sample	N/A	275517	189148	River Afan	Geo-environmental sampling	Water sample from the River Afan downstream of proposed works area to establish baseline conditions. Sample to be taken from a safe access point downstream identified by the Contractor. Three rounds of sampling proposed (fortnightly intervals, post completion of the fieldwork), with a view to reduce to two rounds based on the sampling findings.
SW03	Surface Water Sample	N/A	275494	189182	Western Outfall	Geo-environmental sampling	Water sample from the western outfall into the River Afan to establish baseline conditions. Sample to be taken from a safe access point identified by the Contractor. Three rounds of sampling proposed (fortnightly intervals, post completion of the fieldwork), with a view to reduce to two rounds based on the sampling findings.
SW04	Surface Water Sample	N/A	275544	189185	Eastern Outfall	Geo-environmental sampling	Water sample from the eastern outfall into the River Afan to establish baseline conditions. Sample to be taken from a safe access point identified by the Contractor. Three rounds of sampling proposed (fortnightly intervals, post completion of the fieldwork), with a view to reduce to two rounds based on the sampling findings.
SEIS01	Seismic Refraction (S-wave)	N/A	Start:275469 End: 275579	Start:189218 End:189184	Level - Varied Multiple types (Grass, River Afan and hard surface)	None	Line Length 120m.
	Additional notes:						

APPENDIX H - EXPLORATORY HOLE LOCATION PLAN



Site Boundary

%RUHKROH

+DQGKHOG 7ULDO 3LW

6XUIDFH :DWHU 6DPSOH

:LQGRZ 6DPSOH

Seismic Refraction Survey

\$

&RRUGLQDWH 6\ VWHP %ULWLVK 1DWLRQDO 7ULG

\$WJLQ\IUFKZIG K FKDQLDWKG \U \$UROZJ 2UGDDQV DU UD 0DZUKIGL < +DZOIUDLQW D KDZOLDX FURQID GGDWD\U * 7UZIGGHG \U \$UROZJ 2UGDDQV 5HSURGXFHG EI SHUPLVLRLQ RI 2UGDDQFH 6XUYH\ RQ E &URZO &RSIULJKW DQG GDWDEDVH ULJKW 2UGDDQFH QXPEHU &IQQZIV JZIERGDHWK &IRHWK 1DWXULRO &IPUX < &IRHV &IPUX D KDZOLDX FURQID GGDWD &RQWDLQV 1DWXUDO 5HVRXUFHV :DOHV LQIRUPDWLRQ < :DOHV DQG GDWDEDVH ULJKW < *HWPDSSSLQJ 3OF DQG %OXHVNI ,QWHUQDWLRQDO /LPL

0HWUHV

	04/04/23	PS	DR	DR
5HY	'DWH	%\	&KNG	\$\$SG

ARUP

3LHUKHDG 6WUHHW &DHUG\GG &DUGLII &) 43 7HO ZZZ DUXS FRP

&OHLHQW &OLHQW

Cyfoeth Naturiol Cymru

Natural Resources Wales

(QZ D 5KLI \ 3URVLHFW &1& 15: 3URMHFW 10PH DQG 1X

S4T2 Newbridge

7HLWO /OXQLDG 'UDZLQJ 7LWOH

GI Locations

*UDGGID \Q \$ 6FDOH DW \$

5KDQ 5ROH

\$GGDVUZIGG 6XLWDELOLW\

5KLI \ 3URVLHFW \$UXS \$UXS 3URVLHFW 10PH DQG 1X

5KLI \ 3URVLHFW \$UXS \$UXS 3URVLHFW 10PH DQG 1X

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0DH U FIOQOXQ D U OOXQLDG \PD \Q JIULQDFKRO 0DH SRE KDZO RGGL IHZO LGGR \Q FIOQZIV \U KDZOIUDLQW \Q HLGGR L &IRHWK 1DWXULRO &IPUX DF 7KLW GHVLJQ DQG GUDZLQJ LV FRQILGHQWLDO DQG DOO ULJKWV WKHUHLQ LQFOXGLQJ FRSIULJKW DQG GHVLJQ ULJKW DUH WKH SURSHUW\ RI 1DWXUDO 5HVRXUFHV

APPENDIX I - OTHER SITE-SPECIFIC INFORMATION

☐ Other details as required not otherwise listed

ADD MARINE LICENSE WHEN AVAILABLE

APPENDIX J - SITE INDUCTION REGISTER & SITE INDUCTION TEMPLATE FORM

Project Number: Project Name: Date: Person in Control of Site: Emergency Contact Number: First Aider: First Aid Available at: Fire Assembly Point: The Information contained herein is given to you in the interests of both yours and everyone's Health and Safety. Compliance with it is a condition of your employment on this and any Tetra Tech Environment Planning Transport Ltd's sites. At the end of your induction you will retain part of this document, please keep it on your person and read it as a reminder. Notes: 1. Tetra Tech is in direct control of your works for this project. 2. Our aim is that everyone leaves the site in the same condition that they arrived and without being exposed to injury or any exposure to potential health problems. We can only achieve this with your direct cooperation. 3. The general arrangements that have been implemented on this site will be explained during this induction. Further information is available on the notice boards; please check these frequently for any updates and the latest safety alerts. 4. Do you understand the specific control measures which are required for your work and have you read, signed, printed and dated your employers' method statement?	5. Do you have any medical condition that may affect your ability to work as covered in your risk assessment/method statement? Yes or No? (If yes then this needs to be clarified with your employer). 6. At Tetra Tech have a strict drugs and alcohol policy. Any persons found under the influence will be removed from this site. 7. If you are below 18 years of age, DO NOT proceed until you have made the Tetra Tech person in charge aware you are classified as a YOUNG PERSON, and provided them with your name and who is your dedicated mentor. You will not be able to work on site unless your employer has completed a young person risk assessment. DO NOT start work on site until you know and understand the contents of this specific risk assessment. You will not be able to operate any plant or equipment unless under direct supervision of your mentor and only for the purposes of training. 8. You are not to operate any piece of plant or equipment unless you can prove to Tetra Tech that you are competent to do so 9. If you do find a problem that could endanger someone's Health and Safety then this must be immediately reported to a member of the Tetra Tech site team. 10. DO NOT attempt to undertake any of the following activities unless you are fully trained and have been <u>authorised</u> by Tetra Tech: - Confined Spaces Entry - Undertake any Hot Works - Any act of Ground Disturbance Permits must be in place for these Activities 11. All Accidents, Incidents and Near Misses must be reported to Tetra Tech 12. Welfare Facilities are provided for your benefit, DO NOT let anyone misuse them. Good hygiene practices should be used and if it's your mess then please clean it up. <u>PPE STANDARDS</u> 13. Safety helmets, High visibility vests, Protective footwear and eye protection must be worn at all times on site unless otherwise agreed with Tetra Tech 14. The correct PPE must be worn appropriate for the task, as supplied by your employer and in compliance with your risk assessment/method statement.	Project Number: Project Name: Project Induction Number: Inductee Name: Employer: Employers Contact Number: CPCS / CSCS Card Number(s): Age if Under 18: Any Declared Medication - YES/NO* If Yes please give details: Emergency Contact: Emergency Contact Number: Inducted By: I Understand and will comply with all measures included within this Tetra Tech induction. I hereby agree to the site rules that have been given to me and I will comply with my employers risk assessment(s) and method statement(s). Signed: _____ Remove and Retain this section after Induction
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APPENDIX K- SITE TOOL BOX TALK RECORDS

			Project Number:			
Type:			Duration:			
Subject:			Page 1			
Method Statement/Risk Assessment/Tool Box Talk Ref (If Applicable):						
Name:	Employer:	Signed:			Contact Tel	
				Date		
			CSCS Number			
Undertaken By (Print):			Signed:			