



THE
ENVIRONMENT
PARTNERSHIP



WHISTON ROAD KNOWSLEY GROUND FLORA RAMMS

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APPENDIX A:

Guided Auger Method Statement

DRAWINGS

Whiston - SW Outfall - Enabling Works (Rev A).pdf

Adoptable Drainage Layout

1.0 Introduction

Background

- 1.1 This ground flora Reasonable Avoidance Measures Method Statement (RAMMS) has been prepared by The Environment Partnership (TEP) on behalf of Bloor Homes (hereafter referred to as 'the Client') of a proposed residential-led development at Land North of M62 Motorway, Off Windy Arbor Road/Whiston Road, Halsnead, Knowsley.
- 1.2 A hybrid application comprising a full application for the erection of 123 dwelling, as well as associated construction of vehicular/pedestrian access, laying out of public space and associated works. And an outline application for erection of up to 237 dwellings, car park and associated works was granted in 2021.
- 1.3 A submission to discharge conditions associated with these works was submitted in late 2021. Following assessment, further information was required to fully discharge Condition 44 - Habitat Management Plan.
- 1.4 This document is associated with the proposals for an outfall/swale feature in the east of the site, near to the woodland and brook.
- 1.5 During a site visit of 3 March 2022, MEAS informed Bloor Homes North West that a population of Thin-spiked wood sedge *Carex strigosa* had been identified within the likely footprint of the proposed swale. This species was previously thought extinct in Merseyside and is therefore of county level importance. English bluebell and other Ancient Woodland indicator species are also likely to be present in this area.
- 1.6 This document has been produced in order to outline reasonable avoidance measures associated with these works and the protected ground flora in the vicinity.
- 1.7 The Habitat Management Plan will be updated following the proposed outflow works.

Development Proposals

- 1.8 The works involve the installation of an outfall pipe using a guided auger bore (Method statement included in Appendix A of this document). A small SUDs/exit pit will then be dug to allow any run off to soak away to the existing watercourse.

2.0 Reasonable Avoidance Measures

- 2.1 The protected ground flora on site, including the thin spiked wood sedge and any native bluebell are predominantly retained and protected as part of the proposed development. However, protection measures will need to be out into place during the swale/outfall construction works so as not to damage any of the protected ground flora within the woodland area. Reasonable Avoidance Measures for the ground flora protection are set out below.
- 2.2 An Ecological Clerk of Works (ECoW) will be appointed and be available, as and when required throughout the construction phase.

Protection Method Statement

- 2.3 Machines will track from the site compound supervised by an Ecological Clerk of Works (ECoW) using only the designated routes outlined in the drawings below - "HALSNEAD (ACCESS) LOCATION PLAN REV D" & "Whiston - SW Outfall Enabling Works Rev A". These designated routes have been discussed and assessed alongside MEAS consultants at a site meeting with TEP Ecologists and Bloor Engineer.
- 2.4 The designated routes will be assessed by the ECoW on site and adjusted where necessary so as to avoid protected ground flora and to take the least intrusive route. This route will also consider a root protection buffer for the existing trees within the woodland. No trees will need to be removed as part of these works.
- 2.5 Machinery and vehicles should not be permitted to move outside the agreed access routes and working areas. Designated routes will be covered with steel road plates, where necessary so as not to disturb or churn up the ground flora and earth underneath.
- 2.6 The bore hole will be drilled in line with the Method Statement provided in appendix A, and the created outfall pipe will then be covered with natural materials in keeping with the nature of the woodland. Some materials, such as rocks and earth can be taken from the existing area, ditch and culvert so as to disguise the outfall pipe and blend it in with the current environment. This will provide a naturalist approach to the design.
- 2.7 Works to the existing ditch will remove silt from culvert exit to alleviate the flow. Material removed will be left in situ, and rubbish remove from site. If any Thin-spiked wood sedge plants are to be impacted, then these will be translocated to a safe area has instructed and supervised by the ECoW. These areas will be identified prior to removal of plants by ECoW.
- 2.8 All materials that are to be removed during construction works can be recycled and re-used in situ.
- 2.9 Within the ditch, after the area is dug out, a terram membrane should be laid and a temporary ballast ramp put in place so as to allow safe access down the slope for machinery and contractors. Once work has finished, this should be removed and reinstated. ECoW will inspect this work prior to sign off.

- 2.10 After works are finished, all bare earth should be left, and natural woodland species should be allowed to colonise and self-seed.
- 2.11 Any other clumps of the thin-spiked wood sedge which are to be impacted to allow access or during the works, particularly from the swale area and adjacent to the culvert location, will be dug up under supervision and relocated to a suitable area adjacent to the existing stands where appropriate.

Avoidance Measures

- 2.12 All construction materials should be stored in the site compound area and not within the woodland. Good construction site management is necessary, ensuring that construction materials are stored away from the woodland and within the site compound, ideally on bare ground or off the ground on pallets or in large sacks.
- 2.13 All hazardous materials and substances will be kept away from the works area, off the ground or otherwise stored in protected and fenced area.
- 2.14 Herras fencing should be installed around the works area.
- 2.15 A protection fence should be installed with signage around any population of thin spiked wood sedge and other protected ground flora outside of the working area to ensure no accidental encroachment during construction. This protection fence should be maintained throughout the works. No works of any kind should take place within this area.
- 2.16 A toolbox talk should be delivered to all contractors prior to the commencement of construction activities. All staff on site should be made aware of the presence of protected ground flora within the site and their legal protection status. The tool box talk will include identification of ground flora, details of the legislative protection afforded to certain species, details of this, and what to do in the eventuality that any protected ground flora is found during the construction works.
- 2.17 Night-time works should be avoided, and all machinery should be stored at the site compound overnight.
- 2.18 All machinery should have installed drip trays so as to avoid construction equipment dripping oil, fuel and chemicals that will pollute the soil and cause damage to the woodland environment.
- 2.19 At the end of each day, the site should be inspected by the appointed contractor to ensure that the above guidelines are being complied with. A log of the inspections should be kept.
- 2.20 At the end of the construction works an ecologist will attend site and sign off the works so as to ensure all of the above guidelines have been complied with.

APPENDIX A: GUIDED AUGER METHOD STATEMENT

ISSUE: 2

DATE: 29/06/2020

PROJECT reff: Bloor Homes

Installation of
375mm OD Sacrificial Steel Sleeve with Fully Butt-Welded Joints
at
Proposed Residential Development, Halsnead Garden Village, Whiston
via
GAB 85v Guided Auger Bore (GAB)

CLIENT **Bloor Homes North West (BHNW)**
CONTRACTOR **Allen Watson Limited (AWL)**

Prepared by:

S.J. MARSH



PROJECT MANAGER

Checked by:

M.L. WATSON
Martin Watson

H&S DIRECTOR





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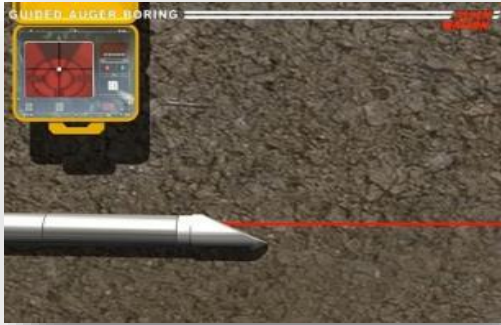
Appendix G: Welding Procedure MIG

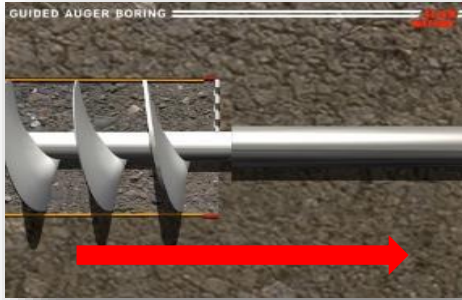
Appendix H: - Hyperlink to copies of COSHH data sheets

Description of Works	Responsibility
1.0 Site Location: Halsnead Garden Village L35 3SD	BHNW
2.0 Description of the Works and Method	
Supply and install 375mmOD sacrificial steel sleeve with fully butt-welded joints via AWL GAB.85v Guided Auger Bore machine with optical electronic navigation. The type of works is required due to the installation needs to be carried out in an area including an Ancient Woodland and to avoid impacts on protected species	

Description of Works	Responsibility
2.1 Shaft Construction	
2.1.1 Drive shaft: For the 305mmOD sacrificial steel sleeve with fully butt-welded joints a shaft construction with clear internal 2.75m long x 2.75m wide is required with a concrete base being 950mm below pipe CENTRELINE to run parallel with line/level of bore and able to support the auger boring machine. A concrete thrust wall designed under the temporary shaft works to be constructed inside the shaft trench sheets capable of supporting 85 tons of jacking force transferred through the GAB rear thrust plate. A front concrete bracing wall to also be constructed inside the front trench sheets capable of supporting <46 ton of pulling force. Any voids between rear and/or front trench sheets outside the shaft excavation MUST be in-filled with concrete to prevent any flexing/shaft movement during the auger boring process. A 450-diameter sump hole is required in the shaft base for pumping purposes.	 TYPICAL GAB SHEETED DRIVE SHAFT 2.75m LONG x 2.75m WIDE CLEAR INTERNAL AFTER INSTALLATION OF FRONT & REAR CONCRETE WALLS BHNW
2.1.2 Exit area: Exit of the GAB will be directly into the bank of the surface water course to be identified by the client's engineer. Any works can only be carried out using equipment which can be carried as no machinery or vehicles will be taken into the Ancient Woodland. Access to the exit area and Old Wood North Ancient Woodland is on foot only and confined to the Bloor Homes Outfall (Access) Location Plan'.	BHNW

Description of Works		Responsibility
2.2 Mobilisation		
2.2.1 Auger Boring Equipment, ancillary items and materials will be delivered on 45ft open back artic or rigid trucks unless otherwise agreed.		AWL
2.2.2 The client will provide a qualified slinger signaller and banksman who will supervise all unloading of auger plant and ancillary items in accordance with a client approved lifting plan detailed to AWL prior or during initial site induction.		BHNW
2.2.3 The client will supply suitable equipment to lower our auger machine and ancillary items into the drive shaft under the supervision of a qualified slinger signaller and banksman supplied by the client. The clients engineer to confirm line and gradient of bore. (see Appendix B: Setting out requirements).		BHNW
2.2.4 Alignment rod with machined flat on which an electronic level is placed to set line and grade prior to being tightly jacked between front and rear thrust walls. Illuminated target housing, steering head and alignment rod are assembled on the boring machine.		AWL
2.2.5 Auger boring work will not start until the client as validated and recorded any exiting services which may be affected by our work and approve/confirm the correct line, level and gradient of the bore has been set by AWL personal on the Appendix F: Permit to Drill .		BHNW
2.2.6 Navigation unit is set up on independent base plate and focuses through the alignment rod to view target in the steering head. Lens focus and camera position are adjusted until front target is clearly shown on centre of target cross hairs which are displayed on the monitor.		AWL

Description of Works		Responsibility
2.2.7 Alignment is repeated for rear target until both are displayed on centre of cross hairs and therefore exactly on line, level and gradient of the centre line of required bore installation.		AWL
2.3 Pilot operation for the installation of sacrificial steel sleeve with fully butt-welded joints		
2.3.1 A trench sheet is lifted to allow steering head of pilot rod system to be pushed and rotated forward into the ground.		BHNW
2.3.2 Pilot string is formed by connecting additional lengths of pilot rod, steered via the tapered head which displaces the ground in its path.		AWL
2.3.3 By maintaining target on centre line of cross hairs the steering engineer is able to retain accuracy. Should the pilot bore deviate from the intended line, level or gradient the steering engineer can correct the alignment by stopping rotation and with pushing only recover alignment until target is centralised.		AWL
2.3.4 Water with lubrication additive may need to be pumped through pilot rods to steering head during works to reduce friction on pilot string.		AWL
2.3.5 On arrival at the exit area, the navigation/steering head is removed. Client's engineer to validate the correct line, level and gradient of bore has been achieved, before the temporary sacrificial steel sleeve with fully butt-welded joints will be installed following the pilot bore.		BHNW

Description of Works		Responsibility
2.4 Auger operation for the installation of sacrificial steel sleeve with fully butt-welded joints		
2.4.1 The client will supply suitable equipment and a qualified slinger signaller and banksman to lower the sacrificial steel sleeve with flight auger and together with the cutting head into the drive shaft.		BHNW
2.4.2 The cutting head is connected to the rear of the pilot rod and the flight auger connected to rotary drive of auger boring machine.		AWL
2.4.3 Boring commences with auger filled sacrificial steel sleeve with fully butt-welded joints pushed into the ground whilst simultaneously rotating augers, ejecting the pilot rod in the exit shaft where disconnected and manually removed.		AWL
2.4.4 The client will supply additional manpower to manually handle the pilot rods from the exit area to a location where a qualified slinger signaller will supervise the loading of the pilot rods in to AWL stillages in readiness to be returned to the drive shaft by mean of suitable equipment supplied by the client. No machinery or vehicles are to be taken into the woodland.		BHNW
2.4.5 Spoil from casings is discharged into drive shaft and loaded into skips/bags which are lifted to the surface where emptied. The client will supply suitable equipment and a qualified slinger signaller and banksman to lift skips/bags out of the drive shaft.		BHNW
2.4.6 The client will supply suitable equipment and a qualified slinger signaller and banksman to lower a sacrificial steel sleeve with a flight auger into the drive shaft.		BHNW

Description of Works		Responsibility
2.4.7 As each section of sacrificial steel sleeve is bored into the ground, additional sacrificial steel sleeves are added with each joint being fully welded in accordance with Appendix G: Welding Procedure MIG This process continues until all sacrificial steel sleeve have been installed between drive shaft and exit shaft/pit.		AWL
2.4.8 On arrival of the sacrificial steel sleeve at the exit area the auger cutting head is disconnected and removed. The client will supply additional manpower to manually handle cutting head from the exit platform to an area where a qualified slinger signaller will supervise the loading of the pilot rods in to AWL stillages in readiness to be returned to the drive shaft by mean of suitable equipment supplied by the client.		BHNW
2.4.9 The flight augers are rotated and retracted back into the drive shaft clearing any loose spoil remaining from inside the sacrificial steel sleeve, as each section of flight auger arrives in the drive shaft they are disconnected and lifted to the surface. The client will supply suitable equipment and a qualified slinger signaller and banksman to lift flight augers out of the drive shaft.	 <i>Note 4: Slinging method shown is indicative only and care must be taken to</i>	AWL
2.4.10 The client will supply suitable equipment and a qualified slinger signaller and banksman to lift auger machine and ancillary items out of the drive shaft.		BHNW

Description of Works	Responsibility
3. Sequence of Works	
The overall sequence and areas of work are detailed on the Master Programme. To be issued prior to project commencement.	
4. Minimum Safety Measures	
4.1 All AWL operatives will be provided with appropriate PPE for their task (by AWL) and shall be mandatory to wear during the works, as a minimum this will comprising: hard hat, long sleeve high-viz jacket and trousers or overalls, safety footwear, gloves and safety glasses. AWL will supply harnesses for all persons and will be worn when working in the confined space. All personnel deployed by AWL shall be trained in their respective duties as part of the guided auger boring crew and will carry out their elements of the works in a co-operative, safe and tidy manner in accordance with the requirements. As a minimum all operatives will hold a current CSCS and CS1 card, AWL to provide evidence to the client of training provided. AWL will not supply any operative who holds either a SSSTS or SMSTS certificates.	AWL
4.2 All AWL operatives will undertake client site induction prior to commencing work on site. The induction shall include an explanation of the method statement and risk assessment for the auger boring work and all emergency procedures. The client's clerk of works (arboriculturist/ecologist) will also conduct a toolbox talk regarding the importance of and potential for impacts to the Ancient Woodland and to protected specie's during the works.	BHNW
4.3 Shaft classification will be the client's safety team responsibility and all appropriate safety / rescue equipment provided along with a qualified top man at each shaft.	BHNW
4.4 Shaft will be protected with suitable hand railings, fences and stop boards around top of the excavations. Access and egress to shafts will be by shaft ladder or as agreed prior to AWL arrival.	BHNW
4.5 Client will issue a communication plan for the 'top man' and all shaft personnel using hand signals, or two-way radio. Topman must remain in position throughout the duration operatives are in the shaft / confined space.	BHNW
4.6 When equipment or material are being lifted in or out of the shaft operatives in the shaft must be stationed into an agreed safety zone	BHNW
4.7 Should an operative become injured or unconscious whilst working in the shaft and cannot exit unaided they shall be rescued by using the best ergonomic principle possible, attach the operative harness to the winch cable, and hoisted to the surface using the manually operated Davit arm. A practise rescue and rescue equipment familiarisation will be undertaken on site if required.	AWL



Description of Works	Responsibility
4.8 Where necessary exhaust/ventilation ducting and/or air moving equipment will be used within the shafts. Ducting to exhaust any fumes at surface level.	BHNW
4.9 Power units generating exhaust fumes to be located downwind at ground level and not within the shaft.	AWL
4.10 A daily briefing and a record will be kept. A Confined Space permit will be issued daily by the client.	BHNW
4.11 COSHH data information will be issued to the AWL supervisor for materials and consumables required for the works. The protective measures recommended in the use of these materials and consumables will be adhered to by all AWL personnel. COSHH equipment needs to be securely stored in a bunded stores which can be locked. Appendix H: - Copies of COSHH data sheets	BHNW
4.12 Welfare facilities, i.e. toilets, canteen, drying room will be provided at the designated location. AWL personnel will be permitted to share these facilities. Breaks will be staggered if required.	BHNW



Description of Works	Responsibility
5. Fire and Emergency Procedures	
5.1 The following information will be displayed in the site office. (a) Nearest Accident and Emergency Hospital. (b) Instructions on action in the event of a fire or emergency. (c) Emergency and Contact telephone numbers. (d) Accident and Emergency First Aid: Site office. (e) In the event of an emergency the AWL site supervisor will ensure. (f) All work immediately stops. (g) All personnel are sent to the designated assembly point or a place of safety. (h) Comply with the client's incident procedures.	BHWN
5.2 Accident and Emergency Hospital Details Whiston Hospital Warrington Rd, Rainhill, Prescot L35 5DR TEL 01514261600	
6. Labour	
AWL will provide skilled and trained operatives including a working Supervisor.	
7. Resource	
This guided auger boring work will be undertaken using AWL Guided Auger Bore machine and associated equipment.	
8. List of Associated Risk Assessments	
Specific Risk Assessment associated with these works must be read in conjunction with this method statement.	



Description of Works	Responsibility
9. Communication and Management of the Works	
The AWL Health and Safety Director has overall responsibility for the Safe implementation of the boring works and will be assisted by AWL Technical Director to ensure duties and arrangements within the Company Policy on Health and Safety at work are implemented effectively. The Company's Health and Safety Advisor is James Laramy CMIOSH Director of Safety Health and Wellbeing of the Cappagh Group will provide any necessary support to AWL supervisor who is responsible for site safety arrangements on an ongoing day to day basis ensuring instructions for correct and safe working methods are complied with and any safety precautions identified from Risk Assessments are fully implemented.	
10 Life Saving Rules	
During inductions, all operatives will be made aware of the Life Saving Rules which are as follows: (a) Be fit for work (b) Always receive a briefing or if unsure ask (c) Report all unsafe acts and conditions (d) Stop work if anything changes	
11. The client will supply a suitably licenced and qualified clerk of works (arboriculturist/ecologist) to supervise all works to protect trees and species to prevent any damaged / disturbed during the works.	



PROJECT CONTACT NUMBERS		
NAME	POSITION	MOBILE
TBC	Site Supervisor	TBC
Simon Marsh	Project Manager	07500 939613
Martin Watson	H and S Director	07836 700923
Peter Hodgson	Technical Director	07802 271231
Emergency Contact Numbers		
Environmental Agency	0875 80 70 60	24hr incident hotline
British Telecom	0800 917 3993	
Electricity Board	0845 708 090	
UK Power Networks	0800 31 63 105	

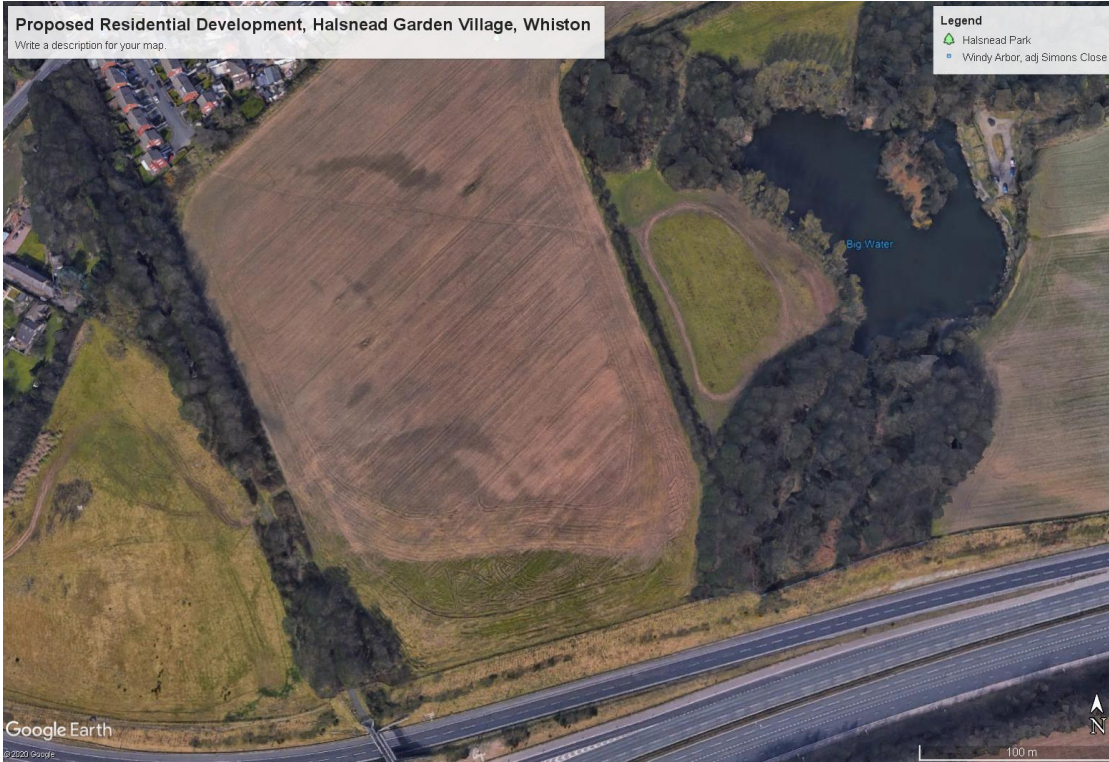
Appendix A: - GAB 85V Guided Auger Bore (GAB) Plant and Specification

GAB.85v Guided Auger Bore (GAB) Plant Weights			
Item	Dimension	Weight (kgs)	Example
Auger Bore Machine (master frame)	2.40m x 1.71m x 1.80m	1225	
Power Pack	2.65m x 1.46m x 1.70m	2345	
Stillage Pilot Rods	2.65m x 1.46m x 1.70m	1750	
20 ft Steel Container For Ancillary Equipment	6.00m x 2.50m x 2.60m	2500	
Stillage containing Flight Augers and Casings	2.65m x 1.46m x 1.70m	2300	



Appendix B: Setting out Requirements
1. Centre line
• Saw cuts at top of the trench sheets for locating a string line to hang plumb bobs. • Setting out is achieved by sighting through drive and exit shaft centres with a theodolite or setting out the centreline by coordinate surveying. Setting out error needs to be considered in relation to the required accuracy at the Exit point as the plumb bob baseline will be short compared to the drive length. • For this reason, GPS setting out is generally not advisable. It may also be prudent to set out reference points on the centre line where they will not be interfered with.
2. Starting level
• A bore centre line level mark on the front trench sheets of the shaft is required. • The boring machine will be set up using a digital spirit level working from the mark on the trench sheet.
3. Gradient
• The gradient of the auger bore drive is required in mm/m clearly stating up-hill or down-hill. This should be written on the permit to drill. The boring machine will be set to gradient using a digital spirit level.
4. Exit shaft arrival position
• Suitable reference marks should be put to the sides of the arrival point so accuracy can easily be checked by site personnel to avoid delays or return visit of the setting out engineer. • For gravity sewers, the most relevant arrival requirement is for level so a horizontal line or lines on the shaft wall provide the simplest way of checking accuracy. • Alternatively, a reference point above with a dip to centre line would work.
5. Final checks
• The client's setting out engineer is required to check the machine set-up before boring commences in order to further reduce the risk of errors and misunderstandings.

Appendix C: Indicative Map and General Works Location



Google Earth



Appendix D: AWL Safety Checklist
SITE SAFETY REPORT
Contract:
Date:
Foreman/Supervisor:
Equipment type: GAB.85v Guided Auger Bore
Daily Plant Check/Defect Report:
Daily Hand Tools (Powered and Non-powered) Check/Defect Report:
Crew attended site induction before commencement of work: Yes/No Crew read and understood method statements/risk assessments/COSHH data Signatures:
Permit to Work issued before Commencement of Work: Yes/No
Tool Box Talks Given (Subject): Accident/Incident Details:
Head Office Notified: Yes/No Main Contractor Notified: Yes/No

Appendix E: Briefing Register		
THE INFORMATION IN THIS METHOD STATEMENT WILL BE CLEARLY COMMUNICATED TO ALL SITE PERSONNEL		
I confirm I have read and understood this method statement and the work will be carried out in accordance with it, should the method of working require amendment the site supervisor must approve and amend the statement accordingly before work can recommences.		
Name	Signature	Date

Signature of Foreman/Supervisor:

Appendix F: PERMIT TO DRILL**PERMIT TO DRILL**

Client/Contractor

Project/Site Location

Installation Gradient Required (if applicable) % mm/m

We confirm the site of the Sub-Contract Works being undertaken by Allen Watson Limited on this Project has been checked for both underground and overhead Statutory Undertakers equipment other services or hazards and, where applicable, their locations clearly marked and/or exposed as follows:

SERVICE	MATERIAL	DIAMETER	DEPTH	LOCATION/POSITION	INSTRUCTED BORE DEPTH
WATER					
GAS					
ELECTRICITY					
TELECOM					
FOUL WATER					
SURFACE WATER					
OTHER					

Depth below ground or depths at critical points

Allen Watson Ltd has the Contractor's permission to commence the Sub-Contract Works

Signed on behalf of the Client/Contractor by his authorised representative

Signature

Print Name

Date

Note: The Sub-Contract Works to be undertaken by Allen Watson Ltd will not commence unless and until this Permit is signed or a similar Permit is issued by the Contractor

Appendix F: - WELDING PROCEDURE FOR STEEL RE-USABLE CASINGS

Introduction

This document examines the demands made on welds of steel sleeve casing and on the basis of best current information the effect of the weld defect levels and sizes on service performance. Acceptance levels of welds are also suggested. The aim is to ensure that for the application specified satisfactory welds are produced at an economic cost.

Two main types of weld are used [i] Primary welds used to form tubular sections [ii] Splice welds to connect an extra length of casing to an existing length prior to installation.

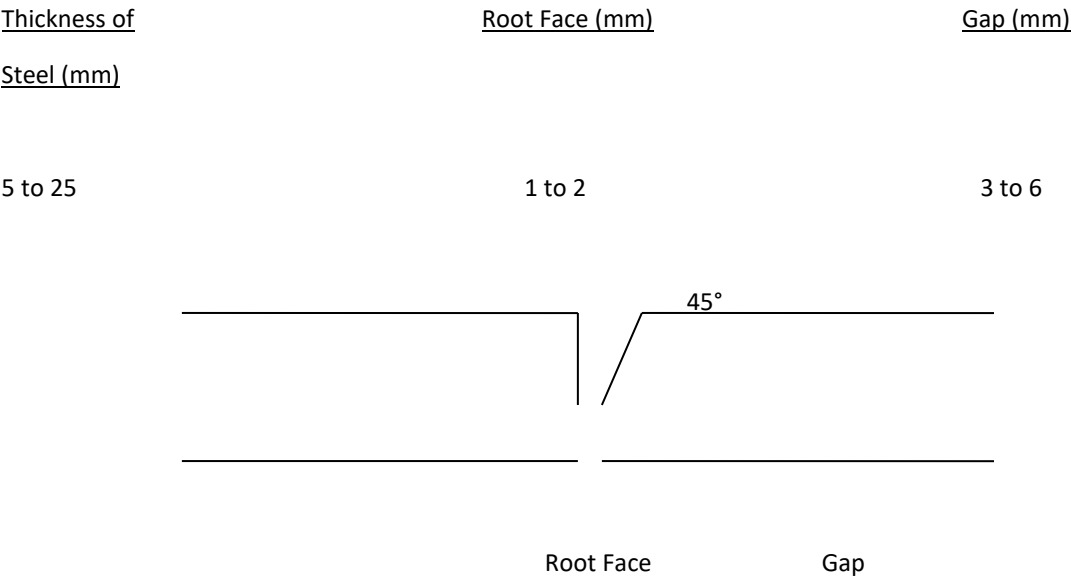
This procedure covers item [ii] Splice welds using **MIG Wire**. There has been no generally agreed Standard or Code of Practice which stipulates weld quality level for use with steel casings. This has led to standards being adopted which do not relate to such application, e.g. BS5500 1994, which was developed for pressure vessels. Since the Weld Quality Standards for more stringent applications are readily available there has been a natural tendency to select a standard that is far too strict for casing application which does not need to be pressure tested. Over specification leads to higher labour and welding consumable costs, testing costs, rectification costs and consequent delays to the overall construction programme

It is likely that the dominant stress generated in all sizes of casing at the splice joint during installation will be shear and is therefore tolerant of weld defects. The prime function of the splice will be to maintain alignment of the casing and its extension such that pulling loads from the horizontal directional drill string are axial to the section during the installation process and conversely jacking loads exerted when pushing with an auger boring machine. Thus, for satisfactory installation performance the weld is required to transmit the pulling forces without failure. By the very nature of the splice joint it is rare that they will occur at the position of maximum shear due to the pulling forces which will be on the towing head located at the front of the pipe connected to the drill string during installation.

Welding Practice & Consumables

Selection of the welding method and consumables for splice welds will be dependent upon what is to be welded and where. The application covered by this procedure assumes site work. The method adopted will be Metal Inert Gas (MIG). MIG has the advantage of producing splice joints using simple robust equipment which is capable of being operated by most welders.

Weld preparations to be used should be selected to suit the work to be carried out. For the splice welding of casings, the sketch below provides details of an appropriate weld preparation. It is normal to carry out these welds without backing plates as these could foul the installation of the cable.



WELDING PROCEDURE FOR STEEL RE-USABLE CASINGS (continued)

General

- [1] Areas to be welded must be free of oil, grease, coatings etc.
- [2] Casing lengths must be properly aligned before welding and secured in position during welding.
- [3] As casing sections are subject to rolling tolerances every effort should be made to match ends of casing prior to welding.
- [4] MIG wire will be provided to meet the specification requirements of BS 2901 part 1 A18 AWS A5.18 ER70S-6 in conformance with DIN 8559 SG2 and to the approval of AFNOR A35-056FG 12 MS6 this is a general-purpose copper coated mild steel material suitable for steel up to 20mm nominal thickness.
- [5] All weld metal mechanical properties (as welded) are:

Tensile Strength of 520 N/mm

0.2% Proof Stress of 440 N/mm

Elongation of 4d 28%
- [6] MIG wire will be provided in 0.8 mm, 1.0mm or 1.2mm thickness. For casings exceeding 15mmWT it is recommended a 1.2mm wire is used.

Weld Defect Acceptance Levels

It is imperative that the basis for setting weld defect acceptance levels must be the criterion of fitness for purpose in order that needless expense of excessive high-quality standards and their associated non-destructive testing etc. is avoided.

Consequently, weld acceptance standards will vary for different welds in a structure. The criteria used for splice welds on casings is broadly based on BS5135:1984 Appendix H Category D or ISO 5817:1992 Quality Level D

Type of Weld	Slag Inclusion	Porosity	Planar Defects
Splice Weld, Circumferential weld	One line of slag along the full length of the weld with a maximum width of 3mm will be permitted. The total length may be aggregated from inclusions at differing depths in the weld i.e. occurring between different runs provided no more than two lines of slag should overlap at any point in the cross-section.	The maximum permitted porosity level is 5% of the projected weld area averaged over any 75mm of weld run with a maxim: individual pore size of 6mm or one quarter thickness whichever is the smaller	A single buried defect indication of maxim: height 4mm or one quarter thickness whichever is the smaller of unlimited length intermittent defects may not overlap. Any surface cracks will be cause for repair or re-welding.

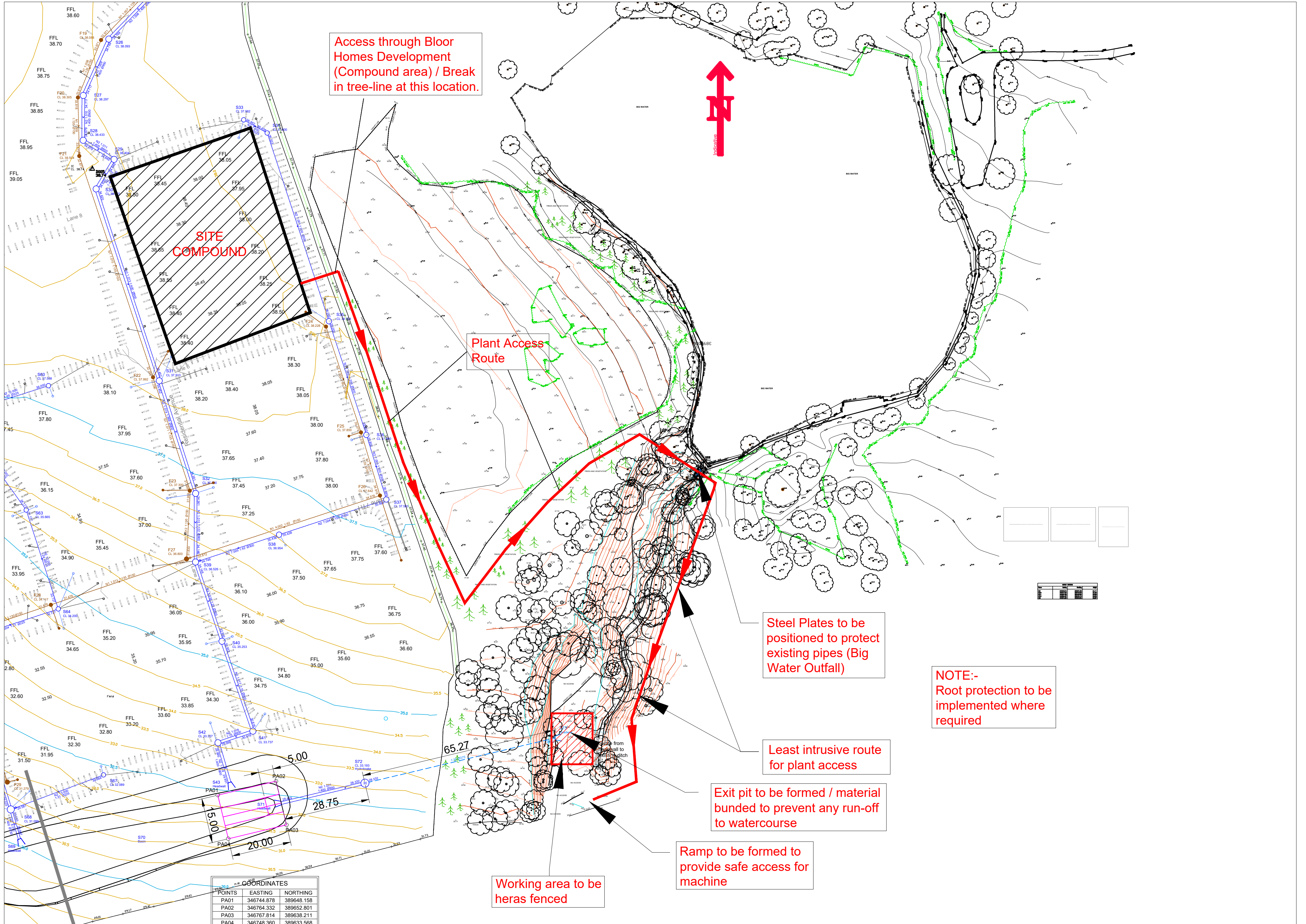
Joints which are subject to fatigue loading during service always show reduced lives compared with parent material because of the presence of geometrical irregularities such as overfill, undercut and over penetration. A high level of attention must therefore be paid to external fractures before even sizable internal defects begin to control the fatigue behaviour.

Appendix H: - Hyperlink to copies of COSHH data sheets

- <https://www.morrislubricants.co.uk/products/9f86fdd6547938598e895773953cca24.pdf>
- <https://www.morrislubricants.co.uk/products/6c3a47080700ab3350bad6f21f825d0f.pdf>
- <https://www.morrislubricants.co.uk/products/dddd866281e851728057f5f25be27693.pdf>
- www.mudtech.co.uk/media/29672/pds_tk60_powder_drilling_v1.pdf
- <https://www.hse.gov.uk/pubns/guidance/wl2.pdf>
- <https://www.hse.gov.uk/pubns/guidance/wl3.pdf>

Drawings

Whiston - SW Outfall - Enabling Works (Rev A).pdf





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