

**Installation of 5 no bores of 250mm SDR 11 ECD
under A2 – approx. 262m – gyro steering**

“NO-DIG”

DIRECTIONAL DRILLING TECHNIQUE

INDICATIVE METHOD
STATEMENT

For: ERITH CONNECT

Method Statement Title: 001/CJB/T2627				
Method Statement No: MS/CJB/T2627/HDD1				
Location: A2 Northfleet				
Prepared By: Chris Brodie	Position: Business Development Manager	Company: GMAC Utilities Ltd	Signed: 	Date: 23 rd Jan 2025
Checked By: Gerald McCloskey	Position: Director	Company: GMAC Utilities Ltd	Signed: 	Date: 23 rd Jan 2025

DECLARATION

I confirm that I have been briefed and understand the contents of this Risk Assessment & Method Statement. I have been made aware of the risks involved and agree to abide by the control measures and method of work.

I will inform my site supervisor immediately of any changes which may affect the health and safety of me/us or others likely to be affected by the works:

Print Name	Signed	Date

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1.0 INTRODUCTION

- 1.1 Method Statements are produced to a Company standard written by the senior safety officer, and prepared as contract specific by the contract engineer and are intended as instructions for undertaking specific, identified work. Where there may be included within the method statement, reference to other instructions, etc, due regard must also be given to any Health and Safety issues raised in such documents.
- 1.2 Method statements are further supported by arrangements set out in company health and safety procedures that are issued as controlled documentation to all operatives.
- 1.3 GMAC undertakes to co-operate with ERITH CONNECT in upholding contractual safety requirements for ensuring a safe system of work.
- 1.3.1 Exploratory points such as bore holes, trial pits or other survey points can by their nature only provide information on a relatively limited area., in general the conditions encountered may vary between exploratory points, GMAC cannot be held responsible for any change in ground.
- 1.3.2 ALL WORKS WILL BE CARRIED OUT IN CONJUNCTION WITH ERITH CONNECT SITE RULES.

2.0 METHOD OF WORK

GMAC Site Agent to ensure that Method Statement has been briefed to all operatives. All operatives to sign and date page 2.

ERITH CONNECT will check service drawings & provide a safe drill path for the work.

ERITH CONNECT will create compound 50m x 30m off Station Rd Southfleet Gravesend DA13 9PA with haul road suitable for artic and lowloaders to access.
Gmac will excavate entyr pit

Erith Connect to supply all fencing around work areas.

Service drawings to be provided by ERITH CONNECT

- 2.1 Ditch Witch JT120 (60t) Directional Drilling rig will be transported to site via specialist low loader. Recycling system, mud holding tanks, drill rods, mixing system, generator.
- 2.2 Upon arrival of drilling equipment, the lorry will be parked within a safe working area for the offloading of the drilling rig. The drill rig is a self-contained tracked machine, delivered on a plant trailer; the trailer has ramps that will be lowered thus allowing off-loading of the drill rig..
- 2.3 Due to the force created by the drilling equipment, it is important that the Gmac designer has satisfied himself that the surrounding ground is capable of withstanding the loads imparted upon it, in order to avoid ground heave and damage to items in the vicinity of the pipe. Responsibilities for damage to existing utilities are the responsibility of Gmac It should also be remembered that drill fluid can seep through the ground and come to the surface, this is most prevalent where ground is fissured, or natural

/ artificial conduits are present. Please refer to break out procedures plan in No 17 further down document

2.4 PERMIT TO DIG WILL BE OBTAINED FROM ERITH CONNECT & GMAC WILL USE THEIR PERMIT WITHIN APP ON OPERATIVES PHONE/PERMIT BOOKLET

2.5 Upon completion of Permit to dig, work will then proceed. Utility plans will be checked. Area will be cat scanned (gCAT4+) by Erith Connect

2.6 Once the launch pit has been excavated, work will then commence on the pilot bore.

2.7 Water will be added to the mixing system and additives added to required mud design.

2.8 The gyro steering engineer will be provided with GPS co ordinates and cad design drawing. The engineer will construct the down the hole assembly with an approx. 175mm drill bit on a jetting assembly in front of the gyro steering system.

2.9 A 6mm wire will be threaded through the 4" diameter drill rods and rig drive chuck assembly.

2.10 As the drill head progress through the ground, the engineer will make small adjustments to steering to ensure bore line remains on design path. After each drill rod has been installed, the cable connection is broken, a new drill rod will be lifted on to rig bed with cable installed. The cable will be crimped, heat shrunk to ensure insulated and then rod attached to drill string.

2.11 Drilling slurry will be pumped at approx. 150 litres a minute to spin the drill bit and carry cuttings back along the annulus of the bore. During the pilot operation drilling fluid will be used to remove cuttings, support and lubricate bore path. The drilling fluid will be monitored to ensure that there are constant returns to the excavated pits, thus reducing hydraulic pressure within the bore.

2.12 Once drill head had reached the exit pit, the steering assembly will be removed and a 350mm reamer attached to the drill string in the exit pit adjacent to slip lane. As the reamer is pulled back to drill rig, drilling slurry will flow to the exit pit. This will be transported to rig side by tractor and bowser and recycled. Upon completion of the pre-reaming, the 250mm duct will be pulled into the bore.

2.13 The pilot bore process will be repeated. Drilling slurry will be cleaned at exit side and pumped back to rig side (through the installed duct)

2.14 The drill rig will be repositioned for 2nd bore and pilot bore process repeated, then pipe installed.

2.15 Upon completion of the final installation, the drilling slurry will be removed by tanker and/or excess slurry hydrated using a mudd dry additive and inert solids removed to licensed tip site.

2.16 DRILLING FLUIDS

2.17 During all drilling operations the fluids pumped through the drill string will be closely monitored, this is monitored by checking volume of returns flowing back to the launch pit, visual checks across the drill line for frac-outs. The monitoring personnel are in constant communication with the drill rig operator by means of two-way radios, thus able to cease all pumping activities quickly. In addition the

gyro steering system monitors mud pressure down the hole during pilot operations (pressure dropping significantly during reaming operations as hole much larger)

3 PORTABLE TOOLS (Noise & Vibration)

- 3.1 Operatives and supervisors within the work zones will be obliged to use ear defenders during noisy operations based on monitoring of similar operations – to establish threshold limits and noise levels at/away from workforce. Warning signage will be posted to remind operatives/supervisors and visitors that noise zones are in operation.

When in close proximity to the directional drilling rig, ear defenders will be used (approximate noise level of 76dB).

4 MECHANICAL PLANT

- 4.1 Drilling Rig
- 4.2 Recycling system and generator, stores cabin
- 4.3 Mud Mixing System and holding tanks
- 4.4 Support Vehicles
- 4.6 15 and 20t excavators

5 MATERIALS

- 5.1 Pipework as required
- 5.2 Emergency spill kits
- 5.3 Bentonite Drilling Fluids

6 CONTROL OF WORK (HAZARDOUS SUBSTANCES AND PROCESSES)

- 6.1 Diesel (Gas Oil)
- 6.2 Bentonite
- 6.3 Grease

7.0 HOUSEKEEPING & WELFARE

- 7.1 GMAC will ensure that the workplace is kept tidy and dispose of any waste material on a regular basis.
- 7.2 ERITH CONNECT will provide welfare at main compound

8 SIGNS, BARRIERS & TRAFFIC MANAGEMENT

- 8.1 Where required by the presence of overhead lines, excavations or whenever road conditions dictate or vehicle load or off load requires it; signage, barriers and/or traffic management will be provided by ERITH CONNECT in line with GS6, HSG47, Traffic Signs Manual Chapter 8, their Excavation Procedures and/or Traffic Management Plan.

9 SITE RULES

- 9.1 The site person in charge ERITH CONNECT shall ensure all persons under his control are made aware of the contract site rules and, where practicable, these rules shall be displayed at site.

10 RESPONSIBILITIES

- 10.1 The project manager is overall responsible for contract safety management. Duties include ensuring adequate resources, equipment, training and supervision for safe undertaking of the work. Supervisors and foreman/site persons in charge are responsible for site ensuring work is conducted in accordance with this method statement, and that operatives are aware and comply with the safety arrangements, particularly the safety precautions and site rules, as given in the Appendices and Erith Connect minimum training requirements.

11 METHOD OF WORK

11.1 Labour force (Gmac Utilities Ltd)

- 1 Site agent full time
- 1 Rig operator
- 7 Site operatives including mud engineer, excavator drivers, tractor drivers

11.2 Permit to Work/Authorization

Details of issue and control of permits, as applicable to the Works.

GMAC agent / operator will have a permit to dig and permit to drill form that must be signed by **ERITH CONNECT** representative prior to excavation and drilling commencing.

The form has details of all relevant services and utilities and any extra requirements.

12.0 SITE AND ACCESS

- 12.1 Attention will be given to ensuring a safe site, including safe access and egress for all persons who may be affected by the works, including:
- Employees
 - Other workers
 - Visitors
 - General Public (Inc the infirm, partially sighted and children)
 - Emergency Services

ERITH CONNECT should make arrangements for and carry out the following items, which are **EXCLUDED**

- 1) All traffic management required to carry out the works safely.
- 2) The protection or diversion of all services and statutory undertakers' apparatus which may affect the Works.

- 3) Obtaining of all licences and Permits, the giving of notices and the payment of all fees required under law by any organisation affected by the Works.
- 4) Identifying all services and all trial holes on existing services as require

13 RISK ASSESSMENT/SAFETY PRECAUTIONS/FIRST AID

A documented risk assessment (identified hazards and safety precautions for controlling risk) will precede all working activities.

Identified hazards and risk control measures (as identified from the Risk Assessment) shall be brought to the attention of the site person in charge of site works in the course of method statement inductions carried out by the site engineer.

First Aid

A first aid kit is located in each Gmac vehicle and the ERITH CONNECT Welfare Offices. In addition to the Gmac First Aiders and a list of other First Aiders is available in the ERITH CONNECT Welfare Units. All injuries will be reported to ERITH CONNECT at the first available opportunity

Fire

If you discover a fire, raise the alarm and make your way to the Muster Point. Details of the nearest site muster point is to be recorded on the daily risk assessment.

No one is to fight the fire unless they are trained and it is safe to do so. All fires will be reported to ERITH CONNECT at the first available opportunity

Asbestos

If asbestos or suspected asbestos is discovered, work will stop and ERITH CONNECT informed immediately

Contaminated Land

If you know or it is suspected that the work area is contaminated, work will stop and ERITH CONNECT informed immediately

Accident/Incident Reporting

All Accidents, Incidents, Near Miss's and Hazards will be reported to ERITH CONNECT immediately

14.0 TRAINING

Persons shall be trained as competent for duties they are to undertake. Competency certificate and qualifications are held with Gmac

15.0 PERSONAL PROTECTIVE EQUIPMENT

PPE and RPE appropriate to the undertakings and as per the ERITH CONNECT site rules will be worn

16.0 EMERGENCY PROCEDURES

Site specific emergency procedures will be given to operatives at the Erith Connect site induction and Gmac talk box talks/Daily Dynamic RA briefing at start of day

17.0 ENVIROMENT

GMAC undertakes to conduct its contractual activities with full respect for safeguarding the environment.

Particular environmental attention will be directed at effective containment and disposal of waste. The contract work may give rise to a small quantity of non-hazardous waste, which Gmac shall dispose of through an approved supplier.

MUD BREAK OUT PROCEDURE:

In the event of mud break out to surface along the bore, all drilling operations will stop. The location of break out will be identified and a containment pit will be excavated with excavated material creating a small bund around excavation. Drilling slurry will be transported back to hdd entry pit using a pump and overland 6" hoses or tractor and bowser depending on location. If break out is only small and circulation along bore re-established, then Mudd Dry additive will be used to hydrate slurry and solids removed for disposal by grab wagon at entry or exit pit.

18.0 METHOD STATEMENT REVIEW

This Method Statement shall be subject to a review of its effectiveness by the site engineer together with the site person in charge. The frequency of the review shall be determined by an assessment of potential risk and consequences. Method statements and risk assessments relating to activities with high risk shall be subject to initial, frequent and regular reviews

19.0 CONTRACT DOCUMENT CLAUSE

This document shall form part of any contract entered into.

Appendix 1

Permit to Dig/Drill:

Location:

Date:.....

Actual Crossing Point: From.....To:.....

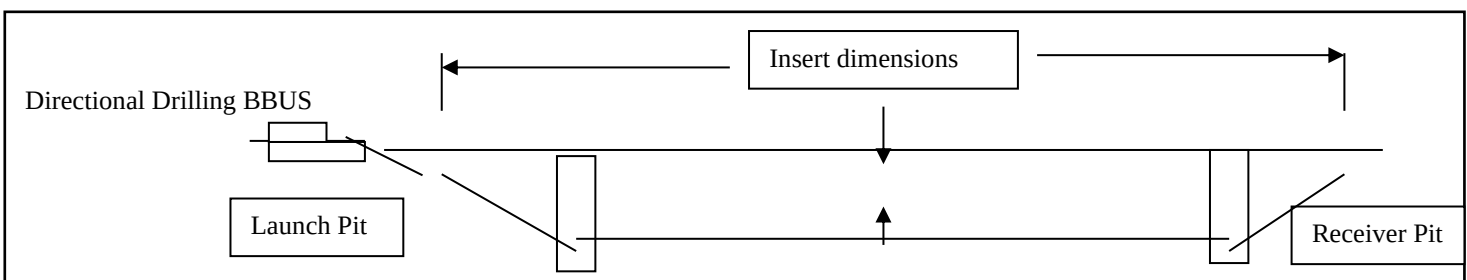
Length of shot between Launch and Receiver Pits

Pipe /Duct Dia.: No: of pipes;

Underground Services / Obstructions

Gas	Yes ☐	No ☐	Size.....	
Position Identified?	Yes ☐	No ☐	Depth Gas Co. Notified?	Yes ☐ No ☐
Electricity	Yes ☐	No ☐	Size.....	
Position Identified?	Yes ☐	No ☐	Depth...Elect Co. Notified?	Yes ☐ No ☐
Water	Yes ☐	No ☐	Size.....	
Position Identified?	Yes ☐	No ☐	Depth....Water Co. Notified ?	Yes ☐ No ☐
Telecomm	Yes ☐	No ☐	Size.....	
Position Identified?	Yes ☐	No ☐	Depth...Comms Co. Notified?	Yes ☐ No ☐
Cable	Yes ☐	No ☐	Size.....	
	☐	☐		☐ ☐

Position Identified? Yes No Depth....Elect Co. Notified Yes No



Have trial holes been dug? Yes ☐ No ☐

ERITH CONNECT Authority to proceed with respect to above conditions

Signed..... Print

Title:..... Date

Directional Drilling Appendix 3

RISK ASSESSMENT FORM

ACTIVITY: Directional Drilling

(C) Environmental Consequence

- E1 Insignificant (No Effect)
- E2 Marginal (Minor Effect)
- E3 Serious (Major Effect)
- E4 Critical (Irreversible)
- E5 Catastrophic

(C) Health & Safety Consequence

- S1 Insignificant (No Effect) 1
- S2 Marginal (Minor Injuries) 2
- S3 Serious (Major Injuries) 3
- S4 Critical (Fatalities) 4
- S5 Catastrophic 5

(F) Frequency

- 1 Improbable
- 2 Unlikely
- 3 As Likely As Not
- 4 Probable
- 5 Highly Probable

(RR) Risk Rating (Consequence x Frequency)

- 1-5 Insignificant
- 6-8 Acceptable **PROCEED**
- 9-15 Unacceptable **WORK SHALL NOT START**
- 16-25 Intolerable

No	Activity/ Event/ Feature/ Situation	Hazard/Issue/ Interaction (Cause)	Undesired Event	Consequences	Before Control			CONTROL	After Control		
					(C)	(F)	(RR)		(C)	(F)	(RR)
1	Access to / from site	General Public & local Residents.	Gaining Access to site	Fatality, or major injury. Damage to equipment & plant. Oil/diesel Spillage	S4	4	S16	Site to be delineated from public and footpaths to be diverted away from compound / working area by Signage to be erected to warn of dangers. Local residents to be fully informed of our works. By ERITH CONNECT Spill response kits on site by GMAC Emergency procedures in place by GMAC	S4	2	S8
					E2	3	E6		E2	2	E4
2	Site Movements	Plant & Vehicle movements	Collision with operatives & public. Collision with other plant and equipment.	Fatality, or major injury. Damage to equipment & plant. Oil/diesel Spillage	S4	3	S12	Designated vehicle and pedestrian routes by ERITH CONNECT Trained operatives and signallers. Use of signaller / banksman when plant in motion by GMAC Spill response kits on site. By GMAC Emergency procedures in place. ERITH CONNECT & GMAC	S4	2	S8
					E2	3	E6		E2	2	E4
3	Drilling	Re-Fuelling mobile plant	Diesel oil spillage	Contamination of ground, watercourses and sewers Irritants- Dermatitis	E3	3	E9	Authorised personnel to operate only Spill response kit on site. By GMAC Drip Trays Emergency procedures in place. COSHH procedures.	E3	2	E6
					S2	3	S6		S2	2	S4
4	Drilling	Hydraulic hose leak /failure	Hydraulic oil spillage	Contamination of ground, watercourses and sewers Irritants- Dermatitis	E3	3	E9	Correctly maintained equipment. Daily vehicle inspection carried out and copies available on site and in the ERITH CONNECT Site Office Authorised personnel to operate only. Spill kits on site at all times	E3	2	E6
					S2	3	S6		S2	2	S4
5	Moving PE pipe at exit pit	Falling / crushing of operatives	Collision with operatives & public.	Fatality, major injury. Damage to equipment & plant	S4	3	S12	Certified Plant & Lifting Gear by GMac where required AG WILSON to position pipe close to exit pit	S4	2	S8
					E2	3	E6		E2	3	E6

Directional Drilling Appendix 3

RISK ASSESSMENT FORM

ACTIVITY: Directional Drilling

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- E2 Marginal (Minor Effect)
- E3 Serious (Major Effect)
- E4 Critical (Irreversible)
- E5 Catastrophic

(C) Health & Safety Consequence

- S1 Insignificant (No Effect) 1
- S2 Marginal (Minor Injuries) 2
- S3 Serious (Major Injuries) 3
- S4 Critical (Fatalities) 4
- S5 Catastrophic 5

(F) Frequency

- 1 Improbable
- 2 Unlikely
- 3 As Likely As Not
- 4 Probable
- 5 Highly Probable

(RR) Risk Rating (Consequence x Frequency)

- 1-5 Insignificant
- 6-8 Acceptable PROCEED
- 9-15 Unacceptable **WORK SHALL NOT START**
- 16-25 Intolerable

No	Activity/ Event/ Feature/ Situation	Hazard/Issue/ Interaction (Cause)	Undesired Event	Consequences	Before Control			CONTROL	After Control		
					(C)	(F)	(RR)		(C)	(F)	(RR)
6	Setting up Directional Drill Rig	Crushing of operatives /public	Collision with operatives & public	Fatality, major injury. Damage to equipment & plant	S4 E2	3 3	S12 E6	Exclusion Zone Trained Operator working within Herras fenced area supplied by Gmac / fencing by Erith Connect Kerbs etc to be protected by Gmac	S4 E2	2 3	S8 6
7	Drilling	Rotating rods out of ground	Entanglement with personnel	Fatality, major injury. Damage to equipment & plant	S4 E2	3 3	S12 E6	Barriers to prevent access supplied Gmac Permit to Drill to be completed prior to work commencing. Trained personnel Only	S4 E2	2 3	S6 E6
8	Pulling back Reamer & Pipe	Crushing of operatives /public	Collision with operatives & public	Fatality, major injury. Damage to equipment & plant	S4 E2	3 3	S12 E6	Barriers to prevent access supplied by Erith Connect Trained personnel Only	S4 E2	2 3	S8 E6
9	Drilling	Underground services	Drill rod/drill head/reamer hitting buried underground services (gas, watermain, hv and lv electric cables)	Catastrophic event, Fatalities, serious injury	S5	3	S15	ERITH CONNECT to obtain all drawings and locate and trial hole as necessary to locate all buried services. Excavate on services near entry and exit points. If SERVICE location unknown, DRILLING CANNOT COMMENCE. Permit to Drill system in place. Follow Emergency Procedures 16 in Method Statement	S5	1	S5
10	Drilling	Works traffic/general public traffic	Collision/struck by moving vehicle	Fatality serious injury	S4 E2	3 3	S12 E6	Traffic management undertaken by ERITH CONNECT and use of high visibility clothing for all personnel.	S3 E2	1 1	S3 E2
11	Drilling	Small tools SMALL Tools Cont.	Electrocution of operator due to faulty equipment	Electrocution causing death or burns	S4	3	S12	Use of safety glasses at all times Use of ear defenders Use of gloves at all times	S4	1	S4

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					(C)	(F)	(RR)		(C)	(F)	(RR)
			Injury from flying debris. Damage to hearing	Damage to eyes				All small tools to be P A T tested prior to use 110volts only			
12	Drilling	Pipe grease	Skin exposure	Causes dermatitis	S3	2	S6	Wear gloves Good hygiene before eating COSHH Assessment	S3	2	S6
13	Drilling	Diesel oil	Prolonged skin exposure Ingestion	Dermatitis and poisoning if ingested	3S	3	S9	Cover exposed skin and wear gloves COSHH Assessment	S3	1	S3
14	Drilling	Grease/diesel oil	Skin contact Eye contact Ingestion	Fatality Burns Dermatitis and asphyxiation	S4	3	S12	Identify all substances to be used Carry out COSHH assessment Provide adequate first aid facilities Only competent personnel to be used	S4	2	S8
15	Drilling	Eating & drinking	Increase contact with contaminant during meal breaks	Ingestion due to direct contact via hand & mouth	S3	4	S12	Provision of suitable welfare facilities ERITH CONNECT	S3	1	S3
16	Drilling	Drilling fluid break out at surface (frac-out)	Drilling slurry escaping from bore to surface	Pollution of nearby water course/drains/ditches	E3	3	E9	Drilling to industry standard. Excavator on site to excavate pits as required to contain slurry. Mudd Dry additive to hydrate slurry as required.	E3	2	E6
17	HDD activities / pipe welding	Slips trips and falls	Falling over	Injury to operatives/ lost time	S3	3	S9	Good house keeping and reporting of unsafe items. Follow pedestrian footpaths	S3	2	S6

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					(C)	(F)	(RR)		(C)	(F)	(RR)
18	Pipe welding/reaming/ hdd activities	Manual handling	Injury to operatives	Injury to operatives/ lost time	S3	3	S9	Loads assessed and where possible always use mechanical means for lifting. Excavator used to lift pipe into welding machine.	S3	2	S6
19	HDD Activities	Working at height near edge of hdd pits	Fall into pits	Injury to operatives	S3	3	S9	Pits fenced off to prevent access. Removal of hdd tooling at ground level behind pits.	S3	2	S6
