

The Seam, Barnsley

Drainage Strategy & FRA

November 2024



FAIRHURST

CONTROL SHEET

CLIENT: Willmott Dixon

PROJECT TITLE: The Seam, Barnsley

REPORT TITLE: Drainage Strategy & FRA

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Issue & Approval Schedule		Name	Signature	Date
	Prepared by	Frank Moore		30/10/24
	Checked by	Sujay Kumar		31/10/24
	Approved by	Jason McArdle		1/11/24

Revision Record	Rev.	Date	Status	Description	Signature	
	1	25/11/2024	Final	Amended to include FRA in the title and to summarise risk of surface water flooding	HW	On File
					JMM	On File
					JMM	On File
	2	26/11/2024	Final	Amended to suit comments	HW	On File
					MC	On File
					MC	On File

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1. Introduction

1.1 Background

- 1.1.1 Fairhurst have been appointed to produce a drainage strategy, on behalf of Willmott Dixon to support the planning application for the development of the existing carpark at Barnsley.
- 1.1.2 The proposed development involves the redevelopment of the existing car park. The northern part of the site will be retained as car park and resurfaced, while the southern part of the site will be developed into a public realm space. The proposed site plans are located in **Appendix A**.



Satellite image of the site

2. Surface Water Drainage Assessment

2.1 Hierarchy of Discharge

2.1.1 Following the hierarchy of discharge, in accordance with Paragraph 56 in Flood Risk and Coastal Change section of the PPG and Building Regulations, surface water flows should be discharged in the following order:

1. Discharge via infiltration, as the first priority where achievable. If this is not feasible move to step 2.
2. Discharge via watercourse / water feature, as the second priority. If this is not feasible, move to step 3.
3. Discharge to public surface water sewer, as the third priority. Where this is not feasible, move to step 4.
4. Discharge to the public combined / foul sewer.

2.1.2 The aim of this approach is to try mimic the existing natural drainage regime as a priority.

Method 1 – Infiltration

An Intrusive ground investigation has been carried out to confirm infiltration rates. The residual soil of the site is Pennine Middle Coal Measures Formation is defined as a good infiltration media, however there are cohesive deposits across site with poor infiltration media. There is also a presence of contamination within the groundwater and soils. Due to the contamination and inconsistent infiltration across the site this method is not suitable and method 2 has been reviewed.

Method 2 – Via Watercourse

The nearest watercourse is the River Dearne, located over 600m to the northeast of the site. To discharge into this river, a drainage network would need to be constructed beneath existing buildings and through land owned by third parties, or diverted around these obstacles. Both options would be prohibitively expensive, making this discharge method unfeasible. Therefore, Method 3 has been reviewed.

Method 3 – Via Surface Water Sewer

Two existing surface water sewers run beneath the pavement on Old Mill Lane Road to the north and Eldon Street North to the south of the site. The existing drainage network discharges into both sewers so the proposed drainage strategy will be adopting this method.

3. Proposed Drainage Strategy

The proposed drainage strategy is divided into two networks. The drainage from the carpark area will discharge into an existing Yorkshire Water asset to the north, and the public realm area will discharge to the south, also into an existing Yorkshire Water asset.

3.1 Flood Risk Assessment

- 3.1.1 The EA Flood Maps for planning shows that the site is entirely located in Flood Zone 1 (low risk) and is therefore at low risk from flooding including surface water flooding.

3.2 Northern Network

- 3.2.1 The northern section of the site involves the redevelopment of an existing carpark, with the majority of the existing levels retained, except for a middle section where levels are being raised by 300mm. The proposed levels have been raised to allow for the installation of a geocell system to protect existing tree roots from damage.
- 3.2.2 As this is considered a remediation of levels, the drainage is to be “as existing”, discharging at an unrestricted rate into Yorkshire Water manhole MH29 which is the current discharge point to the network. See **Appendix B** for the utility survey drawing.
- 3.2.3 There is a slight reduction in the unrestricted discharge rate, as the impermeable area served by the drainage network has been reduced. This includes a grass banking along the eastern site boundary and permeable parking bays above the geocell system for root protection. See **Appendix C** for the proposed drainage strategy.

The existing drainage runs along the eastern site boundary, passing through root protection zones. It is proposed instead that the drainage run along the western sit

The existing drainage runs along the eastern site boundary, passing through root protection zones. It is proposed instead that the drainage run along the western site boundary, beneath the access road, discharging into a petrol interceptor before connecting to the existing Yorkshire Water network.

3.3 Southern Network

- 3.3.1 The southern section of the site provides positive drainage for the proposed public realm.
- 3.3.2 The southern network discharges into an existing Yorkshire Water back drop along the retaining wall to the south, which then connects to the Yorkshire Water network beneath Eldon Street North.
- 3.3.3 Half of this network drains the southernmost car parking bays and access roads, passing through a petrol interceptor before discharging into the existing Yorkshire Water network along the Eldon Street North.
- 3.3.4 The whole network is restricted via a hydro brake to discharge into the existing backdrop at 15l/s.

3.4 Discharge Rates

- 3.4.1 Yorkshire water stipulated that the site must achieve a minimum 30% reduction in the discharge rate across the entire site. It was calculated that the existing maximum discharge rate of the site is 511.7l/s. This is based on an M5-60 (M5-60 minutes rainfall is the expected depth of rainfall in millimetres (mm) from a storm lasting 60 minutes (1 hour) with a return period of 5 years) of 20.000 and the existing impermeable area of the site.
- 3.4.2 During a 1 in 100-year storm event, plus 40% allowance for climate change, the maximum discharge rate of the northern network is 299.7l/s and the southern network is 21.4l/s. This results in a total maximum discharge rate of 321.1l/s reflecting a reduction of 37%.

4. Report Conditions

- 4.1 The report is based upon the information that has been acquired and/or made available to Fairhurst via the various searches and consultations completed as part of this assessment. In some cases, anecdotal information has been relied upon, where documented evidence has been absent.
- 4.2 The conclusions drawn in the above report are considered correct, although any subsequent additional information may allow refinement of the conclusions.
- 4.3 All work carried out in preparing this report has utilised Fairhursts' professional knowledge and understanding of the current UK standard and codes, terminology and legislation. Changes in this guidance may occur at any time in the future, and therefore cause any conclusions to become inappropriate or incorrect. Should this be the case then an updated assessment will be required based upon the latest released guidance.
- 4.4 This report has been produced using information contained within online mapping and documents prepared by others. Fairhurst can accept no liability or responsibility for the accuracy of the information provided.

Appendix A
Proposed Site Plan



©One-Environments Ltd. This drawing is not to be scaled. All dimensions to be verified on site prior to commencement of works. Discrepancies, ambiguities and/or omissions between this drawing & information supplied by others must be reported immediately for clarification before proceeding

- NOTES
- LEGEND

Existing Soft Landscape Area to be retained

Proposed Species Rich Grass

Proposed Planting to Raised Planters

Proposed Ground Planting

Proposed Hedgerow

Proposed Tree Planting

Existing Trees/ Vegetation to be retained

Existing Trees to be removed

Existing Area Retained - No Work

Proposed Paving - Type 1 / Concrete Block Paving Vehicular (100x200mm)

Proposed Paving - Type 2 / Yorkstone Occasional Vehicular Use

Proposed Paving - Type 3 / Granite Occasional Vehicular

Proposed Paving - Type 4 / Yorkstone Occasional Vehicular Use

Proposed Paving - Type 5 / Yorkstone Occasional Vehicular Use

Asphalt Vehicular Grade

Concrete Hard-standing

Existing Asphalt Surface to be Renewed

Permeable Block Paving

Free-draining Gravel

Tactile Blister Paving

Perforated Metal Featured Texts

Proposed Raised Planter Edge

Proposed Focal Point Sculpture

Proposed Louvred Fencing [with matching gates (manually lockable)]

Proposed 1.1m High Railing [with matching gates (manually lockable)]

Proposed 2.2m High Timber Fence [to Substation & feeder pillar]

Proposed Knee Rail

Palisade Fence to be Renewed [with existing posts & foundations retained]

Free-standing Metal Benches

Gabion Seating with Timber Top

Automatic Bollards

Fixed Bollards

Totem Signs

Litter Bins

Metal Tree Grill [weathering steel]

Space Allowance for Ticket Machine [to be supplied by BMBC]

EV Bays [infrastructure provided for Phase 1]

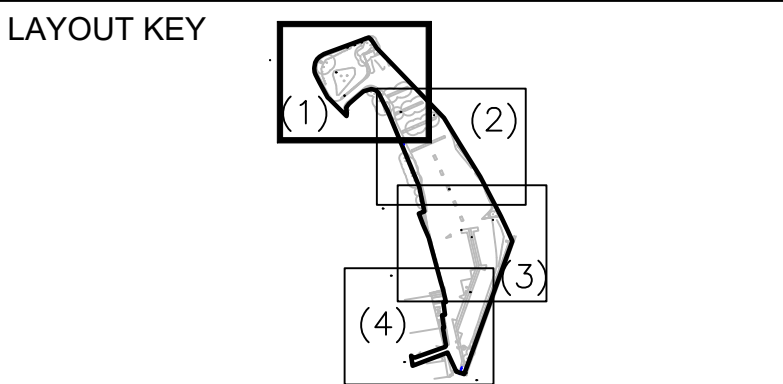
EV Bays [infrastructure provided for Phase 2]

REVISION	P20	DATE	12.11.24	BY	YL	CHECKED	PA
EV charging points removed; key updated to show phase 1 and 2 EV bays; ticket machine added							
REVISION	P19	DATE	16.10.24	BY	YL	CHECKED	PA
Existing cycle parking area revised to be retained							
REVISION	P18	DATE	02.10.24	BY	YL	CHECKED	PA
Car park paving type updated; EV charging points added; tactile blister paving added; seating type updated; tree grill added to key; grass grid around substation removed							
REVISION	P17	DATE	23.09.24	BY	YL	CHECKED	PA
Car park paving type updated; south service route revised to match existing; Substation relocated; Drawing title revised to match TIDP							
REVISION	P16	DATE	18.09.24	BY	YL	CHECKED	PA
Car park paving type updated; mound removed; two existing trees removed; additional soft landscape added to NWR boundary; service route paving type updated							
REVISION	P15	DATE	11.09.24	BY	YL	CHECKED	PA
Litter bins and totem signs added to plan; Paving type updated; size of parking bays revised							
REVISION	P14	DATE	10.09.24	BY	YL	CHECKED	PA
Fencing type updated; revised bollards location to south car park; paving type updated; substation location revised; bollards added to east side of substation; fence to Feeder Pillar revised							
REVISION	P13	DATE	15.08.24	BY	YL	CHECKED	PA
Size of accessible EV charging bays revised; Planting added to northern public realm entrance; feeder pillar location added; eastern boundary treatment updated; southern entrance paving pattern revised; added proposed fencing type to legend							
REVISION	P12	DATE	01.08.24	BY	YL	CHECKED	PA
Bollards location and type updated; revised proposed boundary treatment location; removed speed tables from existing car park area; northern car park pedestrian pathway changed to be painted walkway; EV bay updated to match EV charger locations							

CLIENT	Willmott Dixon		
PROJECT	The Seam, Barnsley		
TITLE	Landscape Site Plan		
DWG No.	SEAM-ONE-ZZ-XX-DR-L-00001	REV	P20
STATUS	PRELIMINARY		
SCALE	1:500	@ A1	DATE 20.02.24 DRN BY TL
051020metres1:500			



Appendix B
Utilities Survey



Background topographical information used for this drawing is from drawing 'P24-00416-MET-EXT-XX-TOP-M2-G' dated 23/05/24.
Datum : OS Level Datum.
Using the OS GPS Network and applying OSGM15 National Geoid Model to obtain local area corrections

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The data presented in this drawing have been collected using a combination of the following: consultation of utility asset information, visual survey & inspection of manholes and inspection chambers; electromagnetic location techniques; ground penetrating radar, and, where applicable, trial hole excavations. These techniques have been deployed in accordance with the BSI PAS128 Specification for the Detection, Verification and Location of Underground Utilities using the search methodologies indicated on sheet PAS1 and described in the accompanying report. This drawing should be used in conjunction with the accompanying report which details the limitations of these techniques and any hindering factors encountered during this survey.

Unless otherwise stated, all services shown on this plan have been surveyed using approved detectors and the connections between inspection chambers, if unable to be detected, are generally assumed to be direct unless there are indications to the contrary. The detection confidence for each utility segment is depicted in line with the PAS128 scheme outlined below. Information depicted as QL-C or QL-D cannot be guaranteed as it is based on utility record information which can be inaccurate and incomplete.

The service routes depicted may reflect the routes of multiple cables or pipes. It is not always possible to differentiate between buried construction features, utilities and other subsurface linear features due to the inherent limitations of the techniques employed. It is therefore possible that some features shown are not utility related. Due to the limitations of electromagnetic techniques all utility identifications should be treated with caution and verified prior to use during design or building works.

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Please note that not all buried pipes, cables and ducts can be detected and mapped in consideration of their depth, location, material type, geology and proximity to other utilities. Even an appropriate and professionally executed survey may not be able to achieve a 100% detection rate. Where an area of utilities is likely to affect client project requirements, it is strongly recommended that PAS128 Type A verification surveys are carried out to confirm the position or absence of of utilities where this is critical to the scheme.

No utility mapping survey can be considered a 100% accurate depiction of the sub-surface environment, and the use of these drawings does not remove the requirement for the use of safe digging techniques at all times, in line with the requirements of HSG47 and current CDM regulations.

Rev	Date	Drawn	Description	Check
-	-	-	-	-

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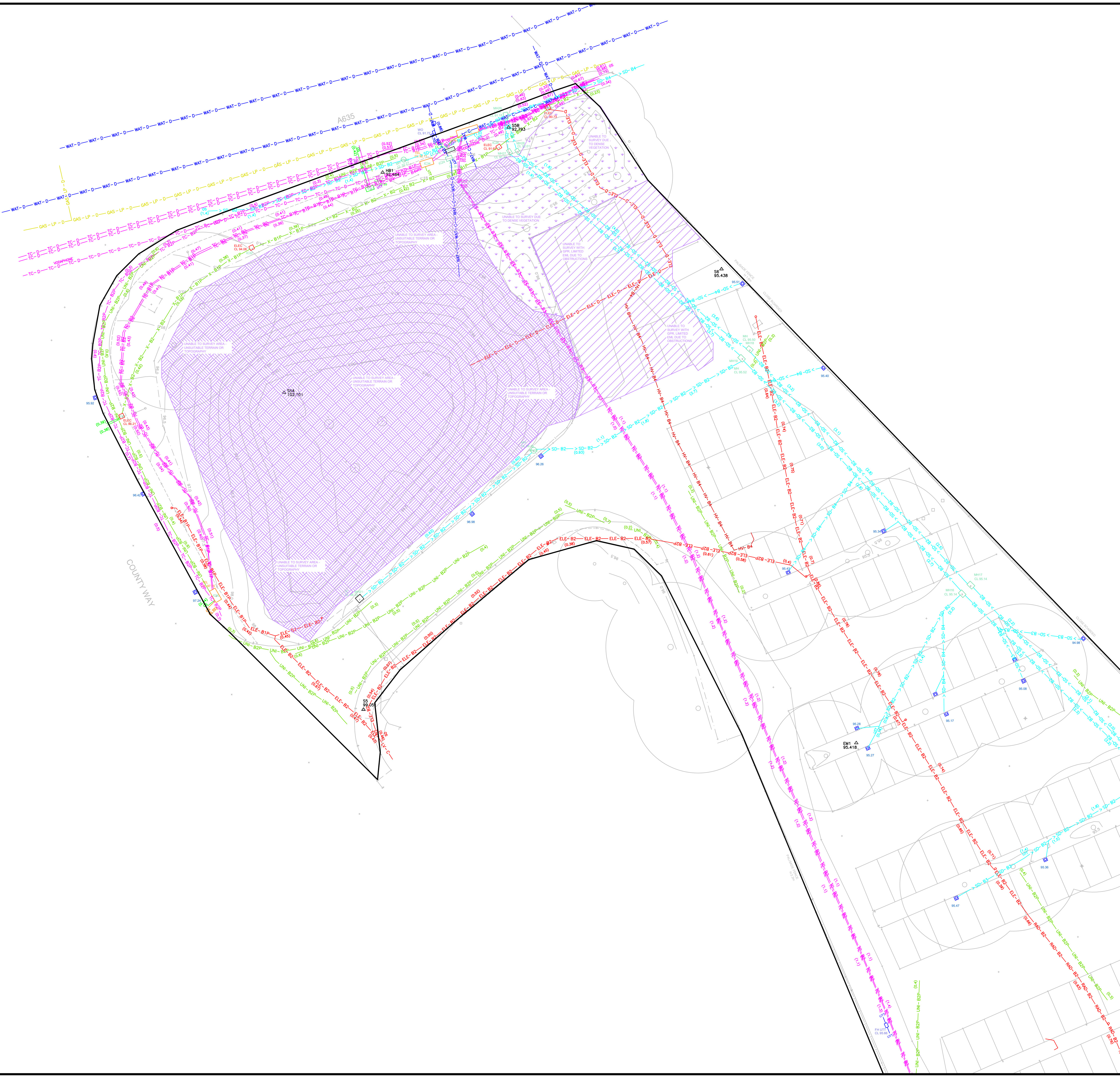
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Client
WILLMOTT DIXON CONSTRUCTION LIMITED

Site
County Way,
Barnsley, S70 2EQ

Title
UTILITY MAPPING
SURVEY

Surveyed	JA EM AP HB	Drawn	EM
Chk.	JPR	Date	28/05/2024 - 05/06/24
Scale	Job No	Sheet Size	Revision
1:200	P24-00416	A1	01
DWG Ref	Number	Originator	Zone
P24	00416	MET	EXT UMS
			M2 GU 001



SUB-SURFACE KEY

DRAINAGE

- > FD-B1P - FOUL
- > SD-B3 - SURFACE
- > RW-B2 - RISING MAIN
- GAS
- GAS-B2P - GAS (UNSPECIFIED)
- GAS-MP-D - MEDIUM PRESSURE
- ELECTRICITY
- ELE-B1 - ELECTRICITY CABLE(S) (UNSPECIFIED)
- HV-B1P - HIGH VOLTAGE
- TL-B3 - TRAFFIC LIGHT/CONTROL CABLE(S)
- PIPES, DUCTS & PIPELINES
- HEAT-B2 - DISTRICT HEATING/STEAM PIPE(S)
- FL-B1 - FUEL PIPELINE
- PIPE-B3 - UNIDENTIFIED PIPEWORK
- TELECOMMUNICATIONS
- WATER
- WAT-B1 - WATER SERVICE (UNSPECIFIED)
- WAT-MP-B3P - MEDIUM PRESSURE
- WAT-RAW-C - RAW WATER
- UNIDENTIFIED
- UNI-B1 - UNIDENTIFIED POTENTIAL UTILITY
- PWR-B2 - POWER (LINEAR RESPONSE DETECTED USING 'POWER' MODE OF EM LOCATOR - INDUCED 50 HZ GROUND CURRENTS)
- RAD-B3 - RADIO (LINEAR RESPONSE DETECTED USING 'RADIO' MODE OF EM LOCATOR - RE-RADIATED VLF RADIO WAVES)
- ELE-B2 - APPROXIMATE DEPTH BELOW GROUND LEVEL OF APPARATUS IN METRES

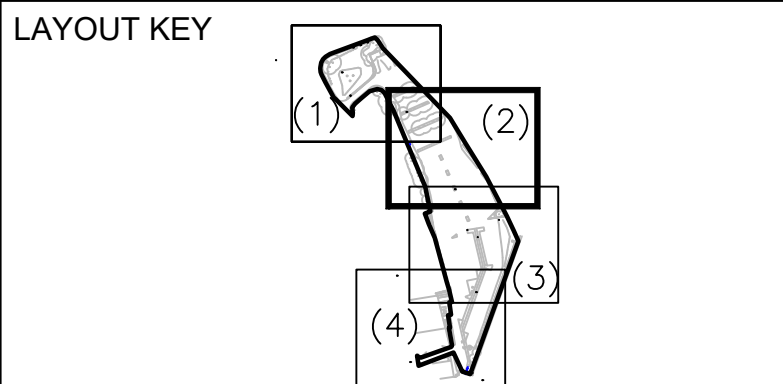
CONFIDENCE LEVELS

(D)	UNDETECTED	FROM SERVICE RECORDS ONLY
(C)	UNDETECTED	FROM SERVICE RECORDS ONLY - SUPPORTING EVIDENCE FROM VISUAL INSPECTION (UTILITY COVERS, SCARS, ETC.)
(B4)	ASSUMED	UNDETECTED BY REMOTE LOCATION METHODS
(B3)(B3P)	DETECTED	HORIZONTAL POSITION ONLY ±500mm
(B2)(B2P)	DETECTED	HORIZONTAL POSITION ±250mm
(B1)(B1P)	DETECTED	VERTICAL POSITION ±40% OF DEPTH
(A)	VERIFIED	SERVICE HAS BEEN VISUALLY VERIFIED AND SURVEYED USING APPROPRIATE METHODS ±50mm IN POSITION & DEPTH
*	SEE REPORT FOR FULL DISCUSSION OF MAXIMUM ACHIEVABLE ACCURACY	
(P)	SUFFIX DENOTES DATA HAS BEEN PROCESSED POST COLLECTION	

OTHER POTENTIAL BURIED FEATURES

- AREA OF ELEVATED GPR AMPLITUDE RESPONSE CAUSED BY SUB-SURFACE FEATURE OR DISTURBED GROUND. MAY POSSIBLY BE RELATED TO UTILITY APPARATUS OR SERVICE TRENCH.
- AREA STRONG, REGULARLY SPACED GPR RESPONSES - LIKELY RELATED TO REINFORCED CONCRETE BUT SOMETIMES BURIED STONE SETTS (OR SIMILAR) MAY GIVE ANALOGOUS RESPONSE
- AREA OF MULTIPLE HYPERBOLA RESPONSES CAUSED BY SUB-SURFACE FEATURES. MAY POSSIBLY BE RELATED TO DISTURBED GROUND WITH CONCENTRATION OF DISCRETE REFLECTORS, AREAS OF TREE ROOTS, ANIMAL BURROWING OR SIMILAR.

WILLMOTT DIXON CONSTRUCTION LIMITED



Datum : OS Level Datum.
Using the OS GPS Network and applying OSGM15 National Geoid Model to obtain local area corrections

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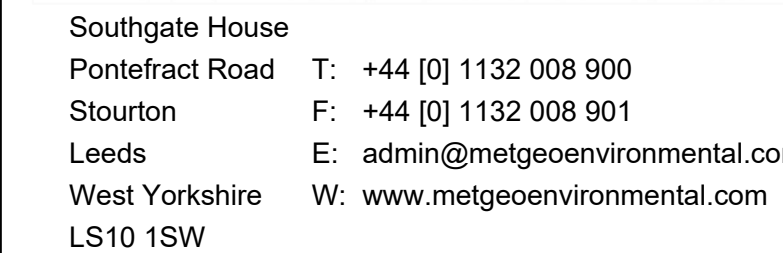
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-	06/06/2024	EM	--	-
Rev	Date	Drawn	Description	Ch



Client
WILLMOTT DIXON CONSTRUCTION LIMITED

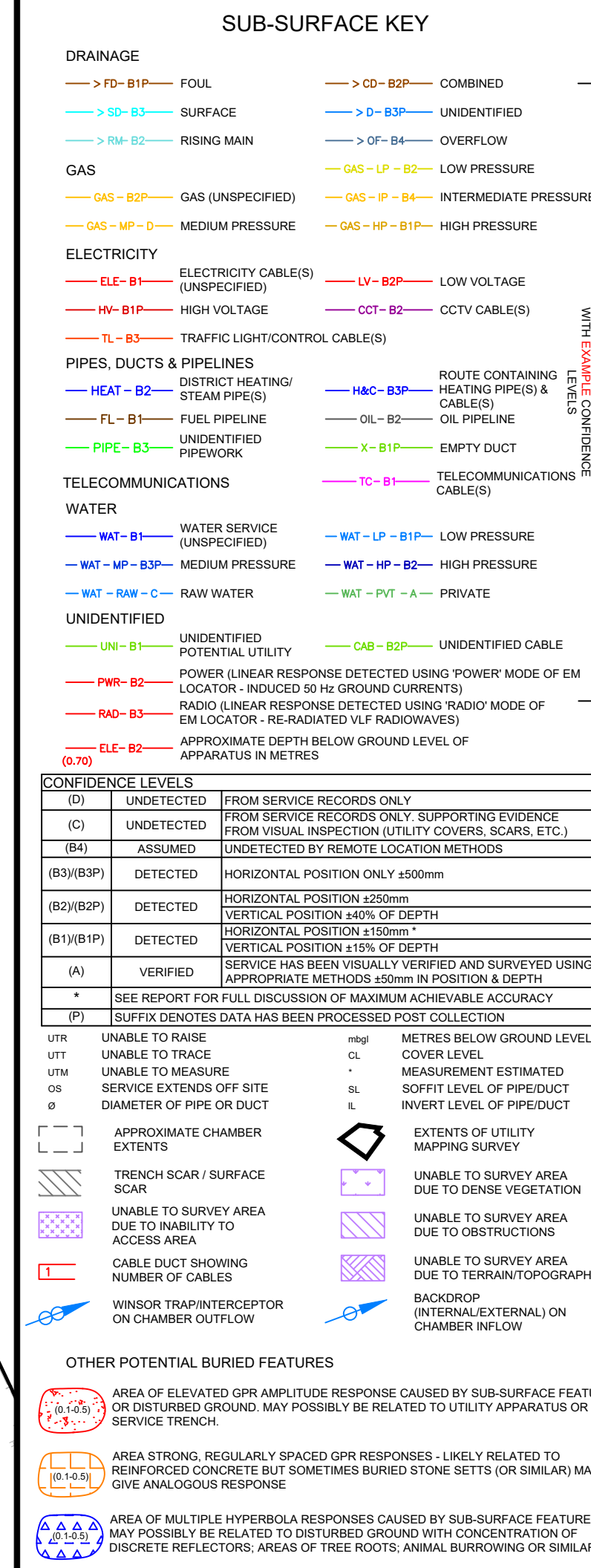
Site	County Way, Barnsley, S70 2EQ
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Title	UTILITY MAPPING SURVEY
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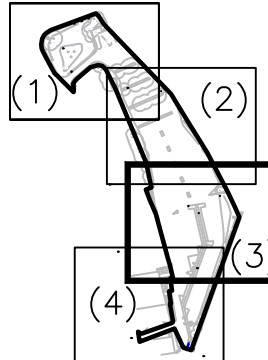
Surveyed	JA EM AP HB	Drawn	EM
Chk.	JPR	Date	05/06/24

Scale 1:200	Job No P24-00416	Sheet Size A1	Revision 01
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DWG Ref							
Year	Number	Originator	Zone	ID	Type	Role	She
P24	00416	MET	EXT	UMS	M2	GU	00



LAYOUT KEY



Background topographical information used for this drawing is from drawing 'P24-00416-MET-EXT-XX-TOP-M2-G' dated 23/05/24.
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Using the OS GPS Network and applying OSGM15 National Geoid Model to obtain local area corrections

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-	06/06/2024	EM	--	--
Rev	Date	Drawn	Description	Check



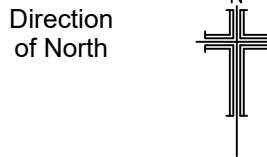
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LS10 1SW

Client
WILLMOTT DIXON CONSTRUCTION LIMITED

Site
County Way,
Barnsley, S70 2EQ

Title
UTILITY MAPPING
SURVEY

Surveyed	JA EM AP HB	Drawn	EM
Chk.	JPR	Date	28/05/2024 - 05/06/24
Scale	Job No	Sheet Size	Revision
1:200	P24-00416	A1	01
DWG Ref	Year	Number	Originator
P24	00416	MET	EXT UMS
			M2 GU 003



SUB-SURFACE KEY

DRAINAGE

- FD-B1P Foul
- SD-B3 Surface
- RM-B2 Rising Main
- GAS-B2P Gas (Unspecified)
- GAS-MP-M Medium Pressure
- ELECTRICITY
- ELC-B1 Electricity Cable(s) (Unspecified)
- HV-B1P High Voltage
- TL-B3 Traffic Light/Control Cable(s)
- PIPES, DUCTS & PIPELINES
- HEAT-B2 District Heating/Steam Pipe(s)
- FL-B1 Fuel Pipeline
- PIPE-B3 Unidentified Pipeline
- TELECOMMUNICATIONS
- WATER
- WAT-B1 Water Service (Unspecified)
- WAT-MP-B3P Medium Pressure
- WAT-RAW-C Raw Water
- UNIDENTIFIED
- UNI-B1 Unidentified Potential Utility
- PWR-B2 Power (Linear Response Detected Using 'Power' Mode of EM Locator - Induced 50 Hz Ground Currents)
- RAD-B3 Radio (Linear Response Detected Using 'Radio' Mode of EM Locator - Re-Radiated VLF Radio Waves)
- ELC-B2 Approximate Depth Below Ground Level of Apparatus in Metres

CONFIDENCE LEVELS

(D)	UNDETECTED	FROM SERVICE RECORDS ONLY
(C)	UNDETECTED	FROM SERVICE RECORDS ONLY SUPPORTING EVIDENCE FROM VISUAL INSPECTION (UTILITY COVERS, SCARS, ETC.)
(B4)	ASSUMED	UNDETECTED BY REMOTE LOCATION METHODS
(B3)(B3P)	DETECTED	HORIZONTAL POSITION ONLY ±500mm
(B2)(B2P)	DETECTED	HORIZONTAL POSITION ±250mm
(B1)(B1P)	DETECTED	VERTICAL POSITION ±40% OF DEPTH
(A)	VERIFIED	HORIZONTAL POSITION ±150mm*
(P)	SEE REPORT FOR FULL DISCUSSION OF MAXIMUM ACHIEVABLE ACCURACY	VERTICAL POSITION ±15% OF DEPTH

* SERVICE HAS BEEN VISUALLY VERIFIED AND SURVEYED USING APPROPRIATE METHODS ±50mm IN POSITION & DEPTH

(P) SEE REPORT FOR FULL DISCUSSION OF MAXIMUM ACHIEVABLE ACCURACY

SUFFIX DENOTES DATA HAS BEEN PROCESSED POST COLLECTION

UTR	UNABLE TO RAISE	mg	METRES BELOW GROUND LEVEL
UT	UNABLE TO TRACE	CL	COVER LEVEL
UTM	UNABLE TO MEASURE	ME	MEASUREMENT ESTIMATED
Ø	SERVICE EXTENDS OFF SITE	SL	SOFFIT LEVEL OF PIPE/DUCT
Ø	DIAMETER OF PIPE OR DUCT	IL	INVERT LEVEL OF PIPE/DUCT

APPROXIMATE CHAMBER EXTENTS

TRENCH SCAR / SURFACE SCAR

UNABLE TO SURVEY AREA DUE TO DENSE VEGETATION

UNABLE TO SURVEY AREA DUE TO OBSTRUCTIONS

CABLE DUCT SHOWING NUMBER OF CABLES

UNABLE TO SURVEY AREA DUE TO TERRAIN/TOPOGRAPHY

WINSOR TRAP/INTERCEPTOR ON CHAMBER OUTFLOW

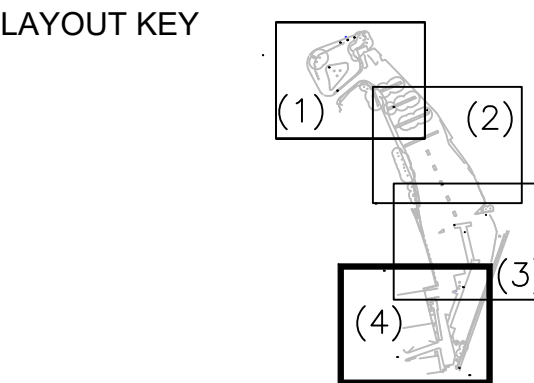
BACKDROP (INTERNAL/EXTERNAL) ON CHAMBER INFLOW

OTHER POTENTIAL BURIED FEATURES

- AREA OF ELEVATED GPR AMPLITUDE RESPONSE CAUSED BY SUB-SURFACE FEATURE OR DISTURBED GROUND. MAY POSSIBLY BE RELATED TO UTILITY APPARATUS OR SERVICE TRENCH.
- AREA STRONG, REGULARLY SPACED GPR RESPONSES - LIKELY RELATED TO REINFORCED CONCRETE BUT SOMETIMES BURIED STONE SETTS (OR SIMILAR) MAY GIVE ANALOGOUS RESPONSE
- AREA OF MULTIPLE HYPERBOLA RESPONSES CAUSED BY SUB-SURFACE FEATURES. MAY POSSIBLY BE RELATED TO DISTURBED GROUND WITH CONCENTRATION OF DISCRETE REFLECTORS, AREAS OF TREE ROOTS, ANIMAL BURROWING OR SIMILAR.

WITH EXAMPLE CONFIDENCE

- CD-B2P COMBINED
- D-B3P UNIDENTIFIED
- OF-B4 OVERFLOW
- GAS-IP-B2 LOW PRESSURE
- GAS-IP-B4 INTERMEDIATE PRESSURE
- GAS-HP-B1P HIGH PRESSURE
- LV-B3P LOW VOLTAGE
- CCTV-B2 CCTV CABLE(S)
- ROUTE CONTAINING HEATING PIPE(S) CABLE(S)
- OIL-B2 OIL PIPELINE
- X-B1P EMPTY DUCT
- TELECOMMUNICATIONS CABLE(S)
- WAT-LP-B1P LOW PRESSURE
- WAT-HP-B2 HIGH PRESSURE
- WAT-PVT-A PRIVATE
- CAB-B2P UNIDENTIFIED CABLE



Background topographical information used for this drawing is from drawing 'P24-00416-MET-EXT-XX-TOP-M2-G' dated 23/05/24.
Datum : OS Level Datum.
Using the OS GPS Network and applying OSGM15 National Geoid Model to obtain local area corrections

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The data presented in this drawing have been collected using a combination of the following: consultation of utility asset information, visual survey & inspection of manholes and inspection chambers; electromagnetic location techniques; ground penetrating radar, and, where applicable, trial hole excavations. These techniques have been deployed in accordance with the BSI PAS128 Specification for the Detection, Verification and Location of Underground Utilities using the search methodologies indicated on sheet PAS1 and described in the accompanying report. This drawing should be used in conjunction with the accompanying report which details the limitations of these techniques and any hindering factors encountered during this survey.

Unless otherwise stated, all services shown on this plan have been surveyed using approved detectors and the connections between inspection chambers, if unable to be detected, are generally assumed to be direct unless there are indications to the contrary. The detection confidence for each utility segment is depicted in line with the PAS128 scheme outlined below. Information depicted as QL-C or QL-D cannot be guaranteed as it is based on utility record information which can be inaccurate and incomplete.

The service routes depicted may reflect the routes of multiple cables or pipes. It is not always possible to differentiate between buried construction features, utilities and other subsurface linear features due to the inherent limitations of the techniques employed. It is therefore possible that some features shown are not utility related. Due to the limitations of electromagnetic techniques all utility identifications should be treated with caution and verified prior to use during design or building works.

If the location or depth of services or features is of particular importance to a project then it is recommended that discussions are held with Met Geo Environmental Ltd. regarding any further considerations that may have arisen due to the nature and methods employed to ascertain the location data presented as part of this survey.

Please note that not all buried pipes, cables and ducts can be detected and mapped in consideration of their depth, location, material type, geology and proximity to other utilities. Even an appropriate and professionally executed survey may not be able to achieve a 100% detection rate. Where an area of utilities is likely to affect client project requirements, it is strongly recommended that PAS128 Type A verification surveys are carried out to confirm the position or absence of of utilities where this is critical to the scheme.

No utility mapping survey can be considered a 100% accurate depiction of the sub-surface environment, and the use of these drawings does not remove the requirement for the use of safe digging techniques at all times, in line with the requirements of HSG47 and current CDM regulations.

Rev	Date	Drawn	Description	Check
-	--	--	--	--

Met
GEO ENVIRONMENTAL

Southgate House
Pontefract Road
Stourton
Leeds
West Yorkshire
LS10 1SW

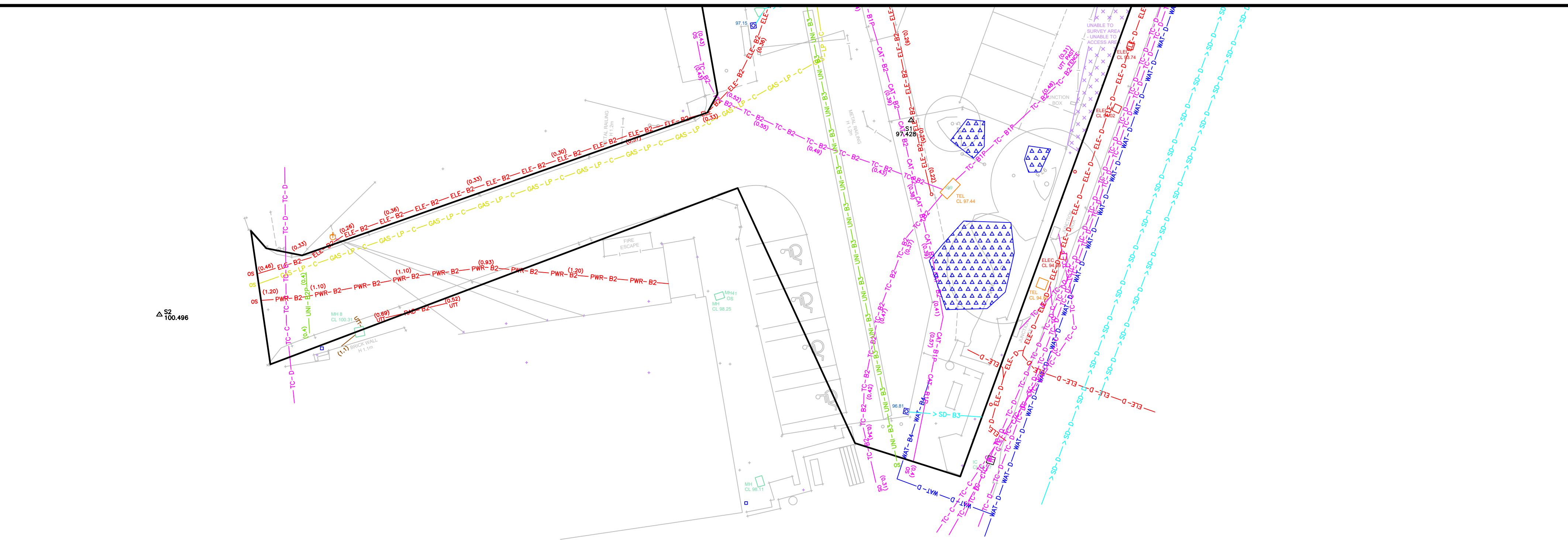
T: +44 [0] 1132 008 900
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E: admin@metgeoenvironmental.com
W: www.metgeoenvironmental.com

Client
WILLMOTT DIXON CONSTRUCTION LIMITED

Site
**County Way,
Barnsley, S70 2EQ**

Title
**UTILITY MAPPING
SURVEY**

Surveyed	JA EM AP HB	Drawn	EM
Chk.	JPR	Date	28/05/2024 - 05/06/24
Scale	1:200	Job No	P24-00416
Sheet Size	A1	Revision	01
DWG Ref	Year	Number	Originator
P24	00416	MET	EXT UMS M2 GU 004



MH1 SURFACE CHAMBER: 0.60m x 0.85m PIPE X: IL 95.95 PIPE A: IL 96.34 PIPE B: IL 96.28 PIPE C: IL 96.43 CL 97.26 PIPES X:225ø ALL OTHER PIPES: 150ø	MH2 SURFACE CHAMBER: 0.65m x 1.02m PIPE X: IL 95.17 PIPE A: IL 95.35 PIPE B: IL 95.59 CL 97.13 ALL PIPES: 150ø SILT: 1.98mbgl	MH3 SURFACE CHAMBER: 0.95m x 0.97m PIPE X: IL 93.44 PIPE A: IL 93.92 PIPE B: IL 93.85 CL 96.69 ALL PIPES: 225ø DTS: 2.67mbgl DTS: 3.02mbgl	MH4 SURFACE CHAMBER: 1.40m x 1.31m PIPE X: IL 94.08 PIPE A: IL 95.43 CAPPED PIPE B: IL 94.17 CL 96.89 ALL OTHER PIPES: 150ø SILT: 3.10mbgl WATER: 2.98mbgl	MH5 SURFACE CHAMBER: 1050mmø PIPE X: 225ø IL 95.61 PIPE A: 225ø IL 95.67 PIPE B: 150ø IL 95.83 CL 97.05	MH7 SURFACE CHAMBER: 1.20m x 1.20m PIPE X: 225ø IL 94.69 PIPE A: 225ø IL 94.74 PIPE B: 150ø IL 95.00 CL 96.80	MH8 FOUL CHAMBER: 0.90m x 0.60m PIPE X: UTMø IL 98.81 PIPE A: 150ø IL 99.31 CL 100.31	MH10 SURFACE CHAMBER: 0.90m x 0.90m PIPE X: 150ø IL 94.24 PIPE A: 150ø IL 94.31 CL 95.80	MH11 SURFACE CHAMBER: 0.80m x 1.10m PIPE X: IL 93.51 PIPE A: IL 93.51 PIPE B: IL 93.51 PIPE C: IL 93.61 CL 95.69 ALL OTHER PIPES: 150ø	MH12 SURFACE CHAMBER: 900mmø PIPE X: IL 93.15 PIPE A: IL 93.45 PIPE B: IL 93.70 CL 95.62 ALL OTHER PIPES: 150ø SILT: 2.38mbgl WATER 2.18mbgl	MH13 SURFACE CHAMBER: 0.90m x 0.90m PIPE X: 150ø IL 94.35 PIPE A: 150ø IL 94.41 CL 95.71	MH14 SURFACE CHAMBER: 1.20m x 0.90m PIPE X: IL 93.00 PIPE A: IL 93.03 PIPE B: IL 93.01 CL 95.21 ALL PIPES: 150ø	MH15 SURFACE CHAMBER: 0.90m x 1.20m PIPE X: 150ø IL 93.16 PIPE A: 150ø IL 93.18 CL 95.20	MH16 SURFACE CHAMBER: 1.20m x 0.90m PIPE X: 150ø IL 92.57 PIPE B: IL 92.61 CL 95.14 ALL OTHER PIPES: 150ø	MH17 SURFACE CHAMBER: 0.90m x 1.20m PIPE X: 150ø IL 92.71 PIPE A: 150ø IL 92.73 CL 95.14	MH18 SURFACE CHAMBER: 0.90m x 1.20m PIPE X: 150ø IL 92.08 PIPE A: 150ø IL 92.10 CL 95.50	MH19 SURFACE CHAMBER: 1.20m x 0.90m PIPE X: IL 92.06 PIPE A: IL 92.07 PIPE B: IL 92.12 CL 95.52 ALL PIPES: 150ø	MH20 SURFACE CHAMBER: 0.65m x 0.65m PIPE X: 100ø IL 95.82 PIPE A: 150ø IL 95.78 CL 96.46	MH21 SURFACE CHAMBER: 0.60m x 0.60m PIPE X: 150ø IL 97.80 CL 98.33	MH22 SURFACE CHAMBER: 1.00m* x 0.70m PIPE X: 450ø IL 91.01 PIPE A: 450ø IL 91.05 CL 92.21	MH27 SURFACE CHAMBER: 0.45m x 0.60m PIPE X: 150ø IL 91.25 PIPE A: 150ø IL 91.18 CL 91.88	MH28 SURFACE CHAMBER: 0.45m x 0.60m PIPE X: 150ø IL 91.43 PIPE A: 150ø IL 91.30 CL 92.01	MH29 ASSUMED DRAINAGE COVER BROKEN CL 91.15 UTR	MH40 SURFACE CHAMBER: 0.80m x 0.80m PIPE X: 150ø IL 96.44 PIPE A: 150ø IL 96.57 CL 97.19	MH41 FOUL CHAMBER: 0.90m x 0.45m PIPE X: 275ø PIPE A: 100ø PIPE B: 225ø CL 98.25
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IC6 CATV CHAMBER: 0.60m x 0.60m DUCT A: SL 96.79 DUCTS B: SL 96.77 ALL DUCTS: 50ø SILT 0.59mbgl CL 97.12	IC9 BT CHAMBER: 1.40m x 0.70m DUCT A: SL 97.23 DUCT B: SL 97.15 DUCT C: SL 97.11 ALL DUCTS: 100ø SILT 0.49mbgl CL 97.44	IC23 VODAPHONE CHAMBER: 0.95m x 0.45m DUCT A: SL 91.48 DUCT B: SL 91.53 ALL DUCTS: 50ø SILT 0.35mbgl CL 91.79	IC24 WATER METER CHAMBER: 0.70m x 0.40m PIPE A: 50ø* IL 91.31 CL 91.99	IC25 BT CHAMBER: 2.40m x 0.80m DUCTS A: SL 90.64 TOP: SL 91.25 BOTTOM: SL 91.13 SILT 1.04mbgl WATER: 0.77mbgl CL 91.54	IC26 TL/SL CHAMBER: 0.45m x 0.45m DUCT A: SL 91.22 DUCT B: SL 91.23 ALL DUCTS: 100ø SILT 0.53mbgl CL 91.65	IC30 BT CHAMBER: 0.60m x 1.30m DUCT A: SL 97.18 DUCT B: SL 97.13 TOP: SL 97.22 BOTTOM: SL 97.07 SILT 0.68mbgl WATER: 0.63mbgl CL 97.55	IC31 TL/SL CHAMBER: 0.45m x 0.45m DUCT A: SL 95.86 TOP: SL 95.99 BOTTOM: SL 95.86 SILT 0.46mbgl CL 96.21	IC32 TL/SL CHAMBER: 0.45m x 0.45m DUCT A: SL 93.78 DUCT B: SL 93.80 ALL DUCTS: 100ø SILT 0.39mbgl CL 94.08	IC33 CATV CHAMBER: 0.90m x 0.50m DUCTS A: SL 91.61 DUCT B: SL 91.58 ALL DUCTS: 100ø SILT 0.50mbgl CL 92.69	IC34 BT CHAMBER: 1.30m x 0.60m DUCT A: SL 91.61 DUCT B: SL 91.58 TOP: SL 91.86 MIDDLE: SL 91.74 BOTTOM: SL 91.61 SILT 0.66mbgl CL 92.11	IC35 ELEC CHAMBER: 0.45m x 0.60m DUCT A: SL 96.31 DUCT B: SL 96.36 ALL DUCTS: 100ø SILT 0.68mbgl CL 96.87	IC36B TL/SL CHAMBER: 0.45m x 0.45m DUCT A: SL 90.45 ALL DUCTS: 100ø SILT 0.40mbgl CL 90.73
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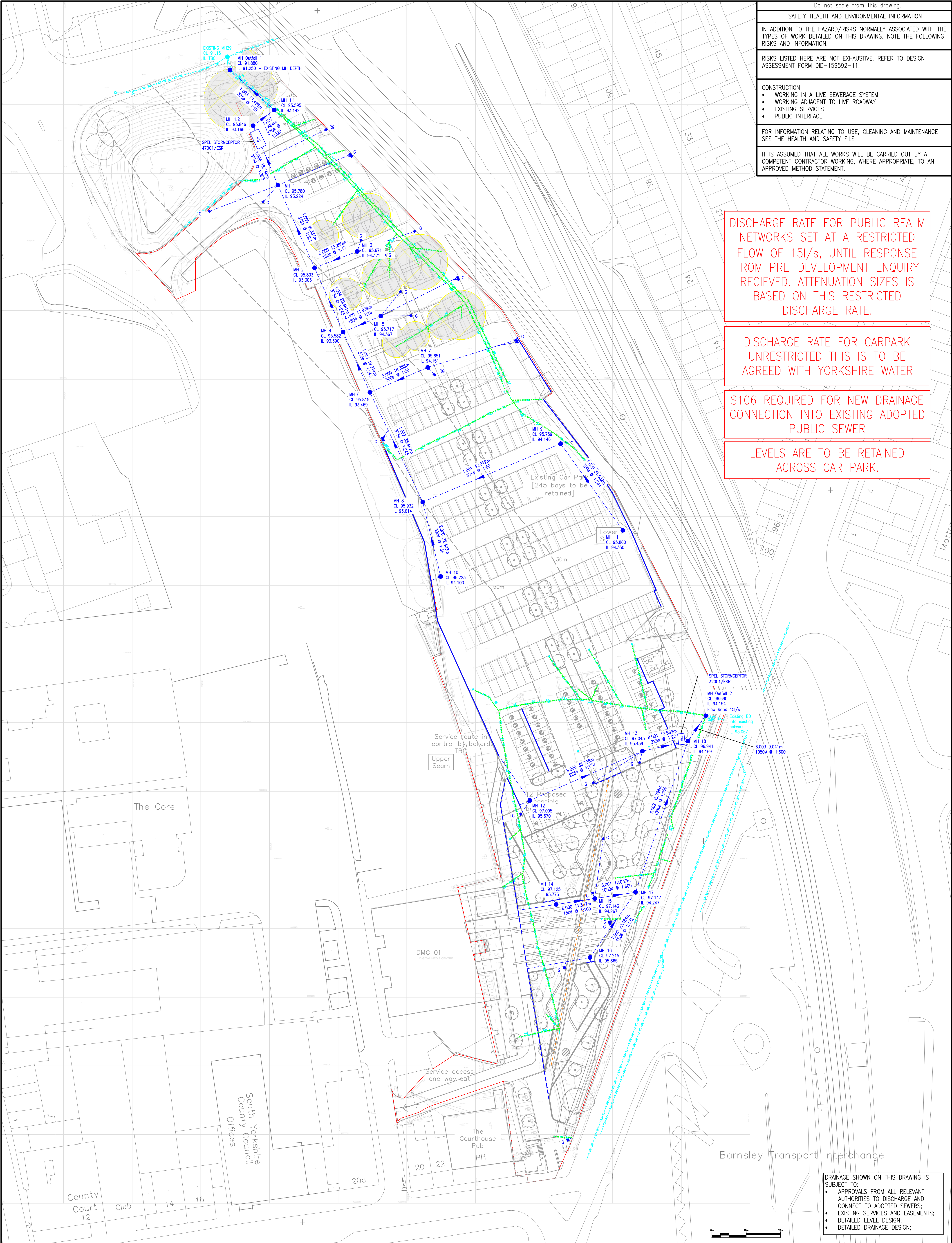
SUB-SURFACE KEY

DRAINAGE

- > FD-B1P- Foul
- > SD-B3- SURFACE
- > RM-B2- RISING MAIN
- GAS-B2P- GAS (UNSPECIFIED)
- GAS-MP-0- MEDIUM PRESSURE
- ELECTRICITY
- ELE-B1- ELECTRICITY CABLE(S) (UNSPECIFIED)
- HW-B1P- HIGH VOLTAGE
- TL-B3- TRAFFIC LIGHT/CONTROL CABLE(S)
- PIPES, DUCTS & PIPELINES
- FL-B1- FUEL PIPELINE
- PIPE-B3- UNIDENTIFIED PIPEWORK
- TELECOMMUNICATIONS
- WATER
- WAT-B1- WATER SERVICE (UNSPECIFIED)
- WAT-MP-B3P- MEDIUM PRESSURE
- WAT-RAW-C- RAW WATER
- UNIDENTIFIED
- UNH-B1- UNIDENTIFIED POTENTIAL UTILITY
- PWR-B2- POWER (LINEAR RESPONSE DETECTED USING 'POWER' MODE OF EM LOCATOR - INDUCED 50 Hz GROUND CURRENTS)
- RAD-B3- RADIO (LINEAR RESPONSE DETECTED USING 'RADIO' MODE OF EM LOCATOR - RE-RADIATED VLF RADIO WAVES)
- ELE-B2- APPROXIMATE DEPTH BELOW GROUND LEVEL OF APPARATUS IN METRES
- CONFIDENCE LEVELS
- (D) UNDETECTED
- (C) UNDETECTED
- (B4) ASSUMED
- (B3)(B3P) DETECTED
- (B2)(B2P) DETECTED
- (B1)(B1P) DETECTED
- (A) VERIFIED
- (P) SEE REPORT FOR FULL DISCUSSION OF MAXIMUM ACHIEVABLE ACCURACY
- UTR UNABLE TO RAISE
- UTT UNABLE TO TRACE
- UTM UNABLE TO MEASURE
- Ø SERVICE EXTENDS OFF SITE
- Ø DIAMETER OF PIPE OR DUCT
- EXTENTS OF UTILITY MAPPING SURVEY
- TRENCH SCAR / SURFACE SCAR
- UNABLE TO SURVEY AREA DUE TO DENISE VEGETATION
 UNABLE TO SURVEY AREA DUE TO OBSTRUCTIONS | UNABLE TO SURVEY AREA DUE TO TERRAIN/TOPOGRAPHY | BACKDROP (INTERNAL/EXTERNAL) ON CHAMBER INFLOW | OTHER POTENTIAL BURIED FEATURES | AREA OF ELEVATED GPR AMPLITUDE RESPONSE CAUSED BY SUB-SURFACE FEATURE OR DISTURBED GROUND. MAY POSSIBLY BE RELATED TO UTILITY APPARATUS OR SERVICE TRENCH. | AREA STRONG, REGULARLY SPACED GPR RESPONSES - LIKELY RELATED TO REINFORCED CONCRETE BUT SOMETIMES BURIED STONE SETTS (OR SIMILAR) MAY GIVE ANALOGOUS RESPONSE | AREA OF MULTIPLE HYPERBOLA RESPONSES CAUSED BY SUB-SURFACE FEATURES. MAY POSSIBLY BE RELATED TO DISTURBED GROUND WITH CONCENTRATION OF DISCRETE REFLECTORS, AREAS OF TREE ROOTS, ANIMAL BURROWING OR SIMILAR. |

Appendix C

Proposed Drainage Strategy



Do not scale from this drawing.
SAFETY HEALTH AND ENVIRONMENTAL INFORMATION
IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.
RISKS LISTED HERE ARE NOT EXHAUSTIVE. REFER TO DESIGN ASSESSMENT FORM DID-159592-11.
CONSTRUCTION - WORKING IN A LIVE SEWERAGE SYSTEM - WORKING ADJACENT TO LIVE ROADWAY - EXISTING SERVICES - PUBLIC INTERFACE
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.

DISCHARGE RATE FOR PUBLIC REALM NETWORKS SET AT A RESTRICTED FLOW OF 15l/s, UNTIL RESPONSE FROM PRE-DEVELOPMENT ENQUIRY RECIEVED. ATTENUATION SIZES IS BASED ON THIS RESTRICTED DISCHARGE RATE.

DISCHARGE RATE FOR CARPARK UNRESTRICTED THIS IS TO BE AGREED WITH YORKSHIRE WATER

S106 REQUIRED FOR NEW DRAINAGE CONNECTION INTO EXISTING ADOPTED PUBLIC SEWER

LEVELS ARE TO BE RETAINED ACROSS CAR PARK.

DRAINAGE SHOWN ON THIS DRAWING IS SUBJECT TO:

- APPROVALS FROM ALL RELEVANT AUTHORITIES TO DISCHARGE AND CONNECT TO ADOPTED SEWERS;
- EXISTING SERVICES AND EASEMENTS;
- DETAILED LEVEL DESIGN;
- DETAILED DRAINAGE DESIGN;

Rev.	Date	Description	Drawn	Checked	Approved
P07	10/10/24	REVISED TO SUIT EXISTING SURFACE WATER DRAINAGE TO BE GROUTED OR GRUBBED	AN	FM	JMM
P06	02/10/24	SCALE BAR ADDED.	FM	MC	MC
P05	30/09/24	FLOW RESTRICTION INCREASED TO 15L/S, OVERSIZED PIPES USED INSTEAD OF OVERSIZED PIPES WITHIN PUBLIC REALM AREA.	FM	JMM	JMM
P04	26/09/24	UPDATED TO SUIT NEW SITE LAYOUT AND CLIENT COMMENTS. DRAINAGE UPDATED WITHIN PUBLIC REALM TO CLIENTS COMMENTS, AND TO THE NORTH AVOIDING RPZ.	FM	SKT	JG
P03	20/09/24	REVISED TO SUIT NEW SITE LAYOUT AND COMMENTS FROM CLIENT	FM	MC	MC
P02	23/08/24	REVISED TO SHOW DETAILED DESIGN.	FM	SKT	JMM

Notes: 1. This drawing is based on the following received information: - One Environment SEAM-ONE-ZZ-XX-DR-L-00001-P17 - Whole Site Plan - Met Geo Environment P24-00416-MET-EXT-UMS-MZ-GU Utility Mapping - Met Geo Environment P24-00416-MET-EXT-XX-TOP-M3-G-1-3D Topographical Survey	Client:  WILLMOTT DIXON
Key: - Site boundary - Proposed surface water drainage - Existing surface water drainage - Proposed Drainage Kerb - Proposed Aco-drain - Proposed Attenuation Crates (Polystorm) - Proposed Petrol Interceptor - Root Protection Zone - Drainage Pipe for "THE SEAM" feature path - Existing Surface Water Drainage to be grouted or grubbed	

Project Title:
THE SEAM, BARNSELY

Drawing Title:
PROPOSED DRAINAGE

Project Title:	
THE SEAM, BARNESLEY	
Drawing Title:	
PROPOSED DRAINAGE	

FAIRHURST

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