Drainage Strategy Report

Medicines Evaluation Unit Extension
Wythenshawe Hospital
Southmoor Road
Manchester M23 9QA

Client Name: Medicines Evaluation Unit

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Drainage Strategy Report

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1	Oct 2023	First Issue	JG	AD	MP
2	Nov 2023	Drainage Strategy updated	JG	AD	MP
3	Dec 2023	Site Layout updated	JG	AD	MP

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1. Introduction

1.1 As part of the planning process, it is necessary to prepare a site-specific drainage strategy for the extension of the Medicines Evaluation Unit, Wythenshawe.

1.2 The development area is less than 1 hectare and therefore a flood risk assessment is not a requirement of the National Planning Policy Framework (NPPF).

1.3 The site is situated in a zone of low flood risk as defined by the Environment Agency (see Environment Agency Flood Maps in Appendix B).

1.4 The National Planning Policy Framework (NPPF) seeks to promote development in areas at low risk of flooding and to reduce the flood risk resulting from development through the management of surface water runoff.

2. Development Description and Location

2.1 The proposed works involves the extension of the Langley Building and relocation of car parking bays.

The proposed site layout can be found in Appendix A.

2.2 The development site is located off Southmoor Road, Manchester.

Grid Reference: SJ 80675 88202
x: 380675 y: 388202
Area of works: 4,710 m^2 (0.47ha)

2.3 According to the NPPF Technical Guide Table 3, the development falls within the 'more vulnerable' risk classification. The 'more vulnerable' classification covers buildings used for dwelling houses, hospitals, student halls of residence, drinking establishments, nightclubs and hotels, etc.

2.4 The site is in Flood Zone 1 and is therefore suitable for all vulnerability classifications.

2.5 The proposed development is consistent with Local Development Documents. It is in a low flood risk area and therefore satisfies the sequential test as it is in a zone with a low probability of flooding.

3. Review of the Flood Risk

3.1 As part of the drainage strategy the current flood risk to the site has been assessed in the below Table 1.

Sources	Risk
Sea	Low (EA Flood Maps)
River	Low (EA Flood Maps)
Surface Water	Low (EA Flood Maps, Figure 1)
Groundwater	Low (MCC SFRA 2011)
Sewers	Low (MCC SFRA 2011)

Table 1: Summary of Sources of Flooding

3.2 Surface water flood risk will need to be considered in the drainage strategy.

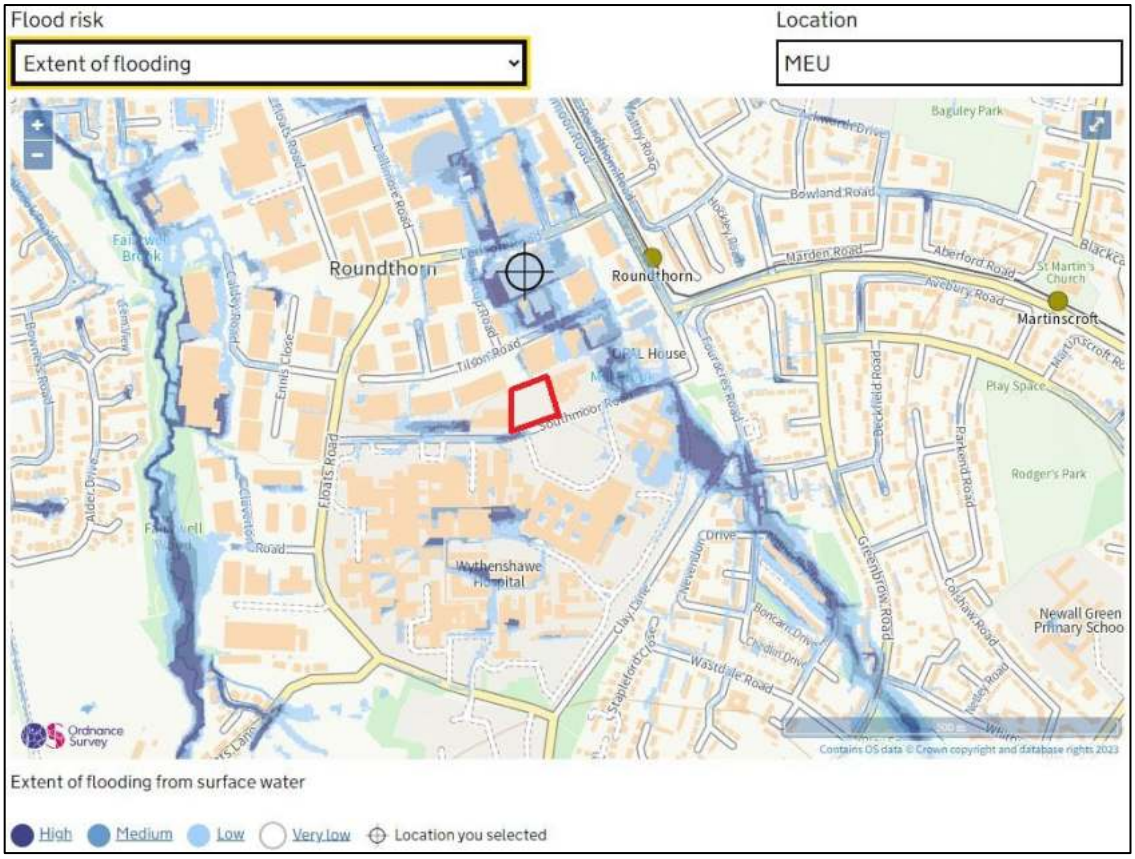

Figure 1: Extract from Surface Water Flood Map: Risk of Flooding from Surface Water

3.3 Careful consideration of proposed site levels and the general topography of the site will mitigate any future risk posed by surface and sewer flooding.

3.4 EA Flood maps and the maps contained within the SFRA confirm the development site is in Flood Zone 1.

3.5 No incidents of historic flooding are noted in the SFRA that affect the site. There are no other known risks to the site.

3.6 The NPPF requires the proposed drainage plan ensure that the runoff caused by the development does not contribute to flooding offsite; this approach will help mitigate off site flooding that could be attributed to the site.

4. Climate Change

4.1 As part of the drainage strategy is necessary to consider the impact of climate change on the proposed development.

4.2 Paragraph 153 of the National Planning Policy Framework (NPPF) requires that plans should take a proactive approach to mitigating and adapting to climate change.

4.3 Paragraph 161 of the NPPF requires all plans to adopt a risk based approach taking into account all sources of flood risk and future impacts of climate change.

4.4 To appropriately mitigate the increased flood risk caused by climate change the Government has published guidance (https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances) related to the appropriate climate change allowances.

4.5 The proposed development, situated on Southmoor Road area of Manchester, fall in the Upper Mersey Management Catchment (https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall?mgmtcatid=3106).

3.3% Annual Exceedance Rainfall Event		
Epoch	**Central Allowance**	**Upper End Allowance**
2050s	20%	35%
2070s	30%	40%
1% Annual Exceedance Rainfall Event		
Epoch	Central Allowance	Upper End Allowance
2050s	25%	40%
2070s	30%	45%

Table 2: Upper Mersey Management Catchment Peak Rainfall Allowances

4.6 For development with a lifetime between 2061 and 2125 the 2070s epoch data should be used.

4.7 To mitigate the impact of climate change on the development the upper end allowances should be considered for both the 1% and 3.3% annual exceedance probability events and the development should be designed for the 1% annual exceedance probability event so that there is:

- No increased flooding elsewhere;
- And the development is safe from surface water flooding.

5. Review of Discharge Hierarchy

5.1 The purpose of the strategy is to consider how the surface water runoff from the development site will be drained and managed throughout the lifetime of the development.

The site must, in the first instance, consider the use of SuDS in accordance with the National Planning Policy Framework.

The surface water discharge hierarchy is:

- Infiltration to ground
- Discharge to watercourse
- Discharge to surface water sewer network
- Discharge to a combined sewer network

Each level in the hierarchy is evaluated below.

5.2 Infiltration to ground

Infiltration to ground is typically provided by the provision of soakaways and permeable paving. To provide infiltration, the ground conditions must be suitable to allow infiltration to occur and the ground water table must be at least 1.0m below the base of any soakaways.

Intrusive ground investigation has not been carried out, soakaway tests need to be carried out in accordance with BRE365 to evaluate the potential for infiltration within the site. However, the website 'soilscapes' defines the soil type of the site as Soilscape 18 (Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils), which suggest that infiltration systems are unlikely to work.

Consideration should be given to the disconnection of paths and patios from the drainage network and allow them to free drain to surface SuDS features such as rain gardens, shallow depressions with water tolerant planting, where plant uptake and evaporation may occur. The inclusion of such features reduces the impermeable area treated through traditional drainage systems by encouraging the use of SuDS systems that mimic natural processes and it enables the management of surface water runoff at source. The use of these features should be informed by the results of the site investigation

5.3 Discharge to Watercourse

An inspection of the OS map confirms that the nearest watercourse (Mill Brook) identified is to the South-East of the site, approximately 190m away.

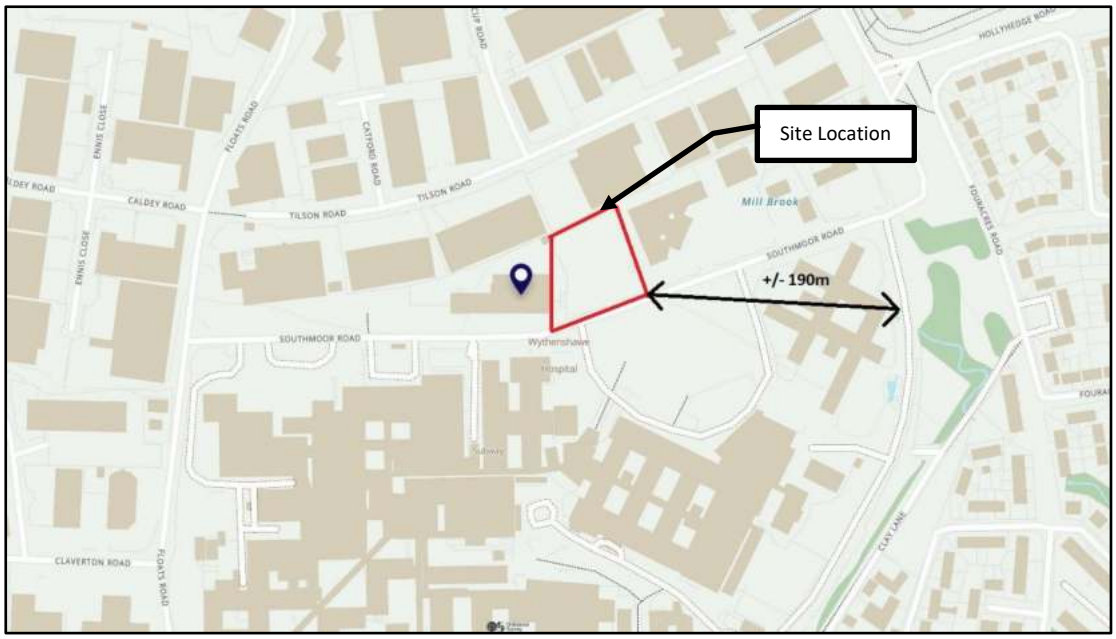

Figure 4: OS Map. Location

Discharge to a watercourse will not be viable due to the distance between our site and the nearest watercourse. There is an existing, live, private drainage network within the site.

5.4 Discharge to Surface Water Sewer

An extract of the utilities survey and United Utilities sewer records are provided in Appendix A. They indicate that there are existing surface water drains within the site and a surface water sewer along Southmoor Road.

The existing Medicines Evaluation Unit building surface water network currently discharges to the private surface water network in Southmoor Road.

Given the availability of surface water sewers/drains in the vicinity of the site, discharge to a surface water sewer/drain is viable.

5.5 Discharge to Combined Water Sewer

An extract of the public and private sewer record is provided in Appendix A.

The records indicate that there is a 600mm combined drain on the other side of Southmoor Road.

The foul water network from the new development will discharge into an existing outfall from the site, that discharges to this combined drain.

Given the combined sewers in the vicinity of the site, discharge to a combined water sewer is viable.

6. Detailed Development Drainage Proposals

6.1 Based on the review of the discharge hierarchy, the surface water runoff for the site will be managed via connection to an existing surface water drain, reusing existing connections where possible.

6.2 The greenfield rates for the site are presented in Table 3. The Windes calculations are provided in Appendix D.

	Site
Q_{Bar}	0.7 l/s
Q_1	0.6 l/s
Q_{30}	1.1 l/s
Q_{100}	1.4 l/s

Table 3: Greenfield Runoff Rates (Windes Greenfield Runoff Rate Estimation)

6.3 Existing drainage for the site and the surrounds are private sewers.

In line with current best practice, the proposed drainage will be a separate system with the surface water and foul water sewers on site discharging to their respective drains (see appendix A for drainage strategy).

Extract from the utilities survey and United Utilities sewer records are included in appendix A for reference.

6.4 Although the site is already developed, the discharge rate must be as close as reasonably practicable to the greenfield runoff rates as per stablished in the LLFA guidance. This betterment of the discharge rates will reduce the impact of the development on the sewers and not lead to an increased risk of sewer flooding.

Based on the existing greenfield runoff rates (0.7 l/s), the minimum discharge rate for the site will be 5.0 l/s, which is considered to be the discharge rate that can be suitably managed throughout the lifetime of the development, in order to mitigate against the risk of blockage due to vegetation/other materials as establish in the 'Rainfall runoff management for developments. Report – SC030219'.

The final storage volumes will be determined by the proposed drainage plan and the inclusion of SuDS within the scheme, where possible.

6.5 The proposed development increases the amount of impermeable area within the site. A surface water management strategy has been developed to address these increases and is included in the appendix A for reference.

It is proposed that the site will be of traditional construction, with a mix of permeable and impermeable surfaces with a network of pipes and gullies to collect and store, up to 1 in 100 years plus climate change, the runoff from the roofs, paths and car park to be managed by a flow control and the permeable surfaces.

Permeable paving will be used to reduce the water concentration and improve the water quality before entering the system.

The proposed surface water network will be divided in 2; one will be reusing the existing flow control and the other will use a new flow control. Both networks will discharge into the same drain within Southmoor Road. The existing network needs to be amended as the proposed building extension removes current drainage links between the front & rear of the building. The existing drainage areas to the rear of the building will be maintained but reallocated to the new network. To balance this, the equivalent design areas from the new proposed car park will be reallocated to the existing system ensuring that this does not exceed current discharge rate of 20 l/s or create flooding issues within this network.

A plan showing the proposed drainage layout with attenuation and flow control is included in the appendix with supporting calculations.

A SuDS maintenance and management checklist is provided in Section 9 confirming the type and frequency of inspection and maintenance required.

6.6 The proposed foul drainage system will be a separate gravity system within the site, discharging to an existing private foul drain (see Drainage Strategy Plan in appendix A for location).

6.7 A development enquiry has been sent to the LLFA, but an answer has not been received.

6.8 A predevelopment enquiry was sent to United Utilities and can be found in Appendix C. They have confirmed that the foul can be connected to private combined sewer in Southmoor Road and the surface water (in absence of infiltration method) can be discharged to the 300mm sewer located at the south of the site. For both outfalls, we are proposing to reuse existing connections to these sewer/drains.

7. Off Site Impacts

7.1 Run-off from the proposed development is managed within the development boundary through infiltration, therefore off-site impacts are mitigated by the proposed development of the site.

8. Residual Risks

8.1 Following implementation of the recommendations (flow control, permeable surfaces, raised floor levels, etc) residual flood risk to the site is considered low.

9. Future Surface Water Drainage Management and Maintenance

9.1 The proposed drainage system consists on a private system. The land/property owner will be responsible for the management and maintenance of the private proposed system.

9.2 Following construction there will be a 12-month defects/maintenance period during which the principal contractor will retain responsibility. Table 4 identifies the key management and maintenance requirements for the SuDS components shown on the drainage strategy. These requirements can be grouped in to three categories: regular maintenance, occasional maintenance, and remedial maintenance.

- Regular maintenance consists of the basic tasks that are carried out frequently and on a predictable schedule.
- Occasional maintenance consists of tasks that are predictable but are not required a frequently as those falling under the regular maintenance.
- Remedial maintenance is only required to rehabilitate the system when faults are identified during regular or occasional maintenance or pollution leads to contamination of the system.

Operation and Maintenance Activity	SuDS Component	
	Permeable Surfaces	Flow Control
Regular Maintenance		
Inspection	■	■
Litter and Debris Removal	□	■
Occasional Maintenance		
Sediment Management[1]	■	■
Remedial Maintenance		
Structure rehabilitation/repair	□	□
Infiltration surface reconditioning	□	□

Table 4: SuDS Maintenance Activities

■ will be required ; □ may be required ; [1] sediment should be collected and managed upstream of the main device.

After the initial hand-over inspection confirms the system has been constructed and installed as designed inspections should take place monthly for 12-months. The frequent initial inspections will help determine the optimum maintenance routine as well as identify performance issues such as silt build-up and poorer infiltration than expected.

The inspection checklist should cover the typical actions noted in Table 5. At a minimum, the maintenance regime will require the following:

- An annual inspection of the drainage network to ensure that gullies, gutters and other inlets to the drainage system are not blocked.
- An annual inspection of the sediment forebay to ensure that the system is in full working order and free from blockages.
- Any deficiencies identified during the annual inspections must be rectified immediately to ensure the continued function of the system.

Inspection Date:				
	Details	Y/N	Action Required	Date Completed
General Inspection Items				
Is there evidence of poor hydraulic performance (i.e. standing water)?				
Is there any evidence of accidental spillages (oils etc.)?				
Have any H&S risks been identified?				
Is there any deterioration of permeable paving surface?				
Silt/Sediment Accumulation				
Is there any sediment accumulation in the catch-pits? (If yes remove)				
Does the permeable paving need sweeping to remove silt?				
System Blockages				
Is there any evidence of litter within the system? Can it cause blockages?				
Is there any evidence of blockages in gullies and gutters?				
Infrastructure				
Is there any evidence of accidental damage (i.e. broken or misplace covers, settlement in vicinity of the cellular storage?)				
Is there any evidence of cross connections or other contamination (i.e. oils)				
Other observations				
Appended information (i.e. photos)				
Suitability of current maintenance regime				
Continue as current? Increase maintenance? Decrease maintenance?				
Next inspection				
Proposed date for next inspection				

Table 5: Inspection checklist

10. Conclusion

10.1 The drainage strategy has been prepared in accordance with local and national guidance in support of the proposed development of Medicines Evaluation Unit Extension, Manchester.

10.2 The site is Flood Zone 1 as identified by the Environment Agency.

10.3 The site is a low risk of all sources of flooding.

10.4 The proposed drainage strategy utilises permeable surfaces and flow control for the management of surface water runoff up to and including the 1 in 100 year plus 45%.

10.5 Surface water and foul water for the proposed development will be a private system maintained by land/property owner.

10.6 Based on the information contained herein the site can be deemed to satisfy sustainable objectives, through the use of SuDS techniques.

11. Appendices

11.1. Appendix A

Drawings:

Topographical Survey

Site Layout

Existing Areas

Proposed Areas

Flood Routing Plan

Drainage Strategy

Utilities Survey

United Utilities Sewer records

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PLAN GRID NORTH

SHEET LAYOUT

SCALE BAR

REV	DATE	DESCRIPTION

John Robinson Associates
Utility Survey Specialists & Consultants

Client
MEDICINES EVALUATION UNIT

Project Title
2D Topographical survey at:

The Langley Building,
Southmoor Road, Roundthorn Industrial Estate,
Wythenshawe, Greater Manchester, M23 9QZ

Surveyed	Drawn	Checked
JRA	JRA	JR

Scale	Date	Drawing Ref.	No.	Size	Rev
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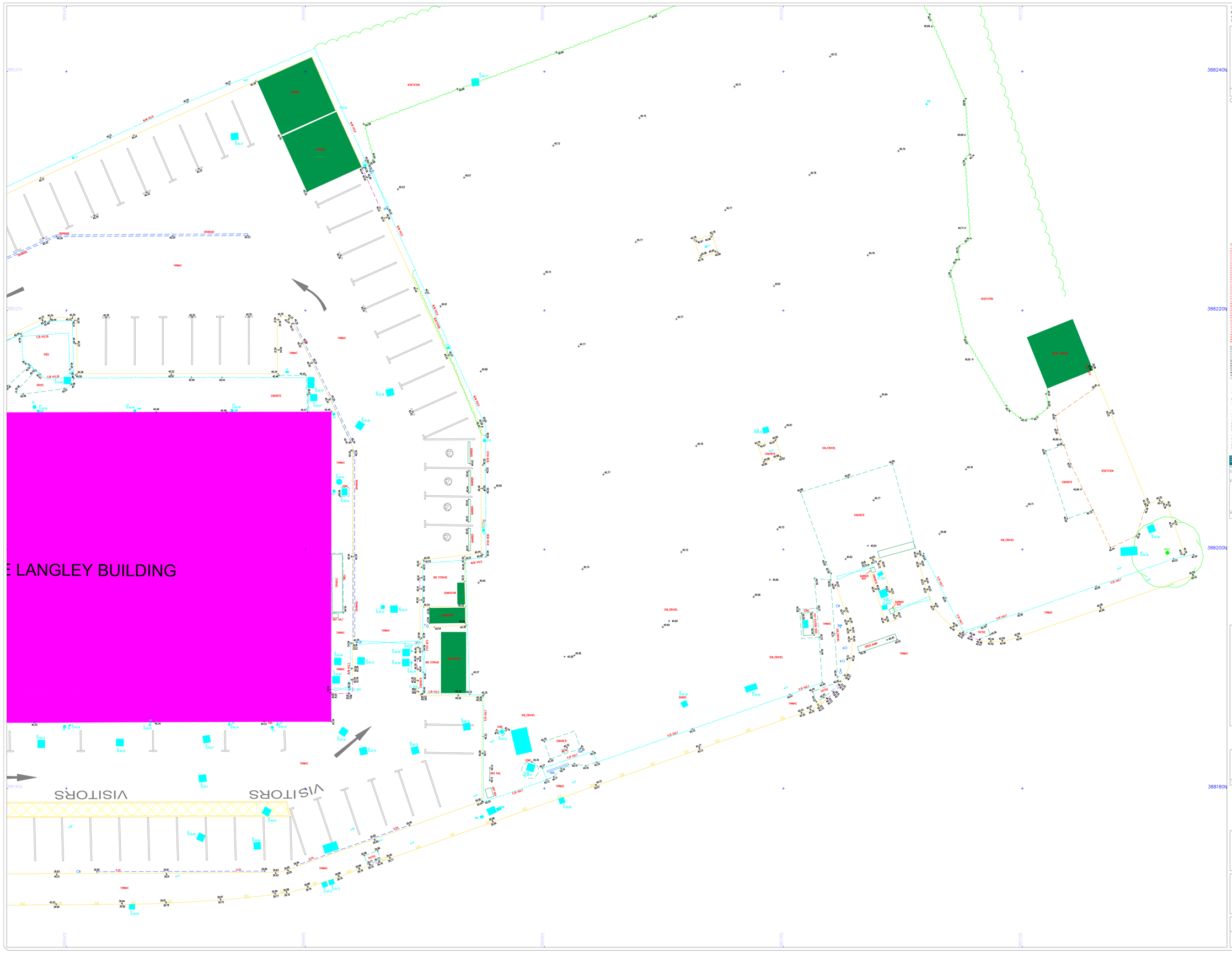

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PLAN GRID NORTH

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TOPOGRAPHICAL LEGEND

AHV	AIR VALVE
AB	ANTI-LANG BEACON
BOL	BOLLARD
BH	BOREHOLE
BM	BM
BM	BENCH MARK
BS	BUS STOP
BT	BT INSPECTION COVER
CB	CATCH PIT
CCTV	CCTV CAMERA POST
COL	COLUMN
COM	COMMUNICATIONS COVER
CST	CAR CHARGING STATION
CTV	CABLE TV COVER
CH	CHAINAGE (CHANNEL)
DP	DOWN PIPE
DC	DRAIN COVER
EIC	E.I.C. INSPECTION COVER
EM	ELECTRIC METER
ELB	ELECTRIC BOX
ER	EARTH ROD
FB	FLAG BASE / POLE
FL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
FP	FLAG POLE
G	GULLY
GL1	GROUND LIGHT
GM	GAS METER
GSV	GAS TAP
GIC	GAS INSPECTION COVER
HC	INSPECTION COVER
HL	HOSE LAYING
KO	KERB OUTLET
LAD	LADDER
LB	LANDING BRIDGE
LP	LAMP POST
PAL	PALISADE
W/B	WIRE MESH
B/W	BARBED WIRE
P/W	POST AND WIRE
P/R	POST AND RAIL
P/B	POST AND BAR
CLF	CLOSE BOARD
(TBL)	TOP OF BUILDING (TABLE)
(TW/BS)	TOP OF FEATURE (BASE)
ST	STATION
BH	BOREHOLE
MW	MONITORING WELL
LBT	LITTERBUGS
WB	WASTEBOX
MAST	MAST
MP	MOORING POINT
MPW	MOORING POINT WELL
NP	NAME PLATE
OP	OUTFALL PIPE
PB	PHONE/TELE BOX
PIL	PILLAR
PP	PETROL PUMP
PS	PSU
RE	RODDING EYE
RL	RIDGE LEVEL
RS	RISER SUPPORT
RTW	RETAINING WALL
SDP	SOIL/VENT PIPE
SAP	SAPLING
SIG	SIGNAGE
SOFFIT	SOFFIT LEVEL
SV	STOP VALVE
TB	TELEPHONE BOLLARD
TCB	TELEPHONE CALL BOX
TM	TE MAST
TL	TRAFFIC LIGHT
TLB	TRAFFIC LIGHT BOX
TM	TICKET MACHINE
VP	VENT PIPE (GAS)
VPT	VENT PIPE
WC	WATER COURSE
WGT	WASH OUT
WSC	WATER STOP TAP
WSV	WATER STOP VALVE
CG Bd	TREE GIRTH (1m.)
(BH/BS VELCE)	BEAM UNDER
	BUSHES
	EXPANSION JOINTS
	KERB
	FENCE
	SURFACE CHANGE
	WALL
	TOP RAIL
	TOP OF BANK
	BUILDING
	BUILDING CANOPY
	OVER HEAD ELECTRICAL
	OVER HEAD TELECOM
	HEDGE

PAS128 LEGEND

BT	BT
BT	BT INSPECTION COVER
CB	CONTROL BOX
CP	CATHODIC PROT. POST
COM	COMMUNICATIONS COVER
CTV	CABLE TV COVER
CH	CHAINAGE (CHANNEL)
DP	DOWN PIPE
DC	DRAIN COVER
EIC	E.I.C. INSPECTION COVER
ELB	ELECTRIC BOX
ER	EARTH ROD
EP	ELECTRICITY POLE
FL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
G	GULLY
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RE	RODDING EYE
SIG	SIGNAGE / SIGNPOST
SOF	SOFFIT LEVEL
SV	STOP VALVE
TCB	TELEPHONE CALL BOX
TL	TRAFFIC LIGHT
TLB	TRAFFIC LIGHT BOX
TM	TICKET MACHINE
WM	WATER METER
WCV	WATER COURSE TAP
BH	BEAM LEVEL
EOT	END OF TRACE
UTA	UNABLE TO ACCESS AREA
UTL	UNABLE TO LIFT
UTS	UNABLE TO SINGE
LCS	LOST CONTACT SIGN
LS	LOST SIGNAL
BLK	BLOCKED
NC	NO CONTACT (BPR CONTACTS
RD	RADIGRAP (WP)
SNP	NO SIGNAL (WP)
PL	PIPE LEVEL (WP)
WL	WATER LEVEL
LJ	LEAD JOINT
LJ	EOT SYMBOL
	CP
	CABLE DUCT
	FOB / SPLICE
	TELECOM
	EARTH CABLES
	ELECTRICAL
	CP
	CABLE DUCT
	ROAD MAIN
	MAINS WATER
	MAINS WATER
	GAS MAIN
	GAS MAIN
	SEWER FM
	VAPOUR RECOVERY
	UNIDENTIFIED CABLE
	UNIDENTIFIED PIPE
	SURVEY BOUNDARY
	TELEX
	COLLECTOR
	CHAPEL
	STEAM
	GAS
	WATER
	SEWER
	CHEMICALS
	CHEMICALS
	DIESEL
	UPVC
	UPVC 1 UPVC 2 UPVC 3
	UPVC 4 UPVC 5 UPVC 6

QUALITY LEVEL

A = Verification

B1 = Horizontal/Vertical location using multiple techniques

B2 = Horizontal/Vertical location using a single technique

B3 = Horizontal location using a single technique

B4 = Assumed route

C = Site Reconnaissance

D = Desktop utility records search

NOTES:

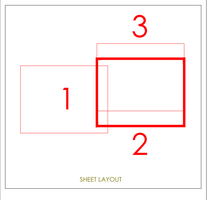
All levels relate to O.S. (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane local grid, orientated to National Grid.

Due to the high density of the vegetation on site (annotated on the drawing), it was impossible to get access to detail without suitable vegetation clearance prior to our site visit.

This Underground Utilities survey was conducted in compliance with the BS PAS128:2014 standards.
Services linetypes display text indicating first an abbreviation of the services function (eg. EL = Electric Cables) followed by the Quality Level to which that service was located (eg. B4 = Assumed route).
Lines annotated as GPR were located using only the Ground Penetrating Radar and should be considered as Quality Level B2.

Quality Level descriptions shown in the above legend are for reference purposes only and are not intended as detailed descriptions.
For full information on Quality Levels, please consult the BS PAS128:2014 standards document.

Quality level	Quality level description	Data collection	Data recording	Location accuracy		Supporting data
Quality level	Quality level description	Data collection	Data recording	Horizontal ±	Vertical ±	Supporting data
A	Verified, without need to excavate	Multi-sensor	-	+/-40mm	+/-40mm	-
B1	Multi-sensor location	B1-D	-	+/-40mm	+/-40mm	A signature of positional tolerance is demonstrated by design enhancements to asset monitoring, management, maintenance or renewal of previous, show benefit to the asset owner.
B2	Multi-sensor location	B2, C2D	Yes	+/-40mm	+/-40mm	A verifiable signature which is unaccepted or inaccurate has not been detected and is therefore shown as an accepted location.
B3	Multi-sensor location	B3, C3D	Yes	+/-40mm	+/-40mm	Assumed to be in one of the utility ducts/pipes, one of the geophysical techniques used.
B4	Assumed route	B4, C4D	Yes	+/-40mm to +/-500mm of detected depth	+/-40mm to +/-500mm of detected depth	Assumed route based on one of the utility ducts/pipes, one of the geophysical techniques used.
C	Site Reconnaissance	C1, C2, C3, C4	Yes	+/-500mm to +/-1000mm of detected depth	+/-500mm to +/-1000mm of detected depth	Reconnaissance conducted on behalf of the utility ducts/pipes, one of the geophysical techniques used.
D	Desktop utility records search	D1, D2, D3, D4	Yes	+/-1000mm	+/-1000mm	Information gathered on behalf of the utility ducts/pipes, one of the geophysical techniques used.



SHEET LAYOUT

0 2m 4m 8m 16m 20m

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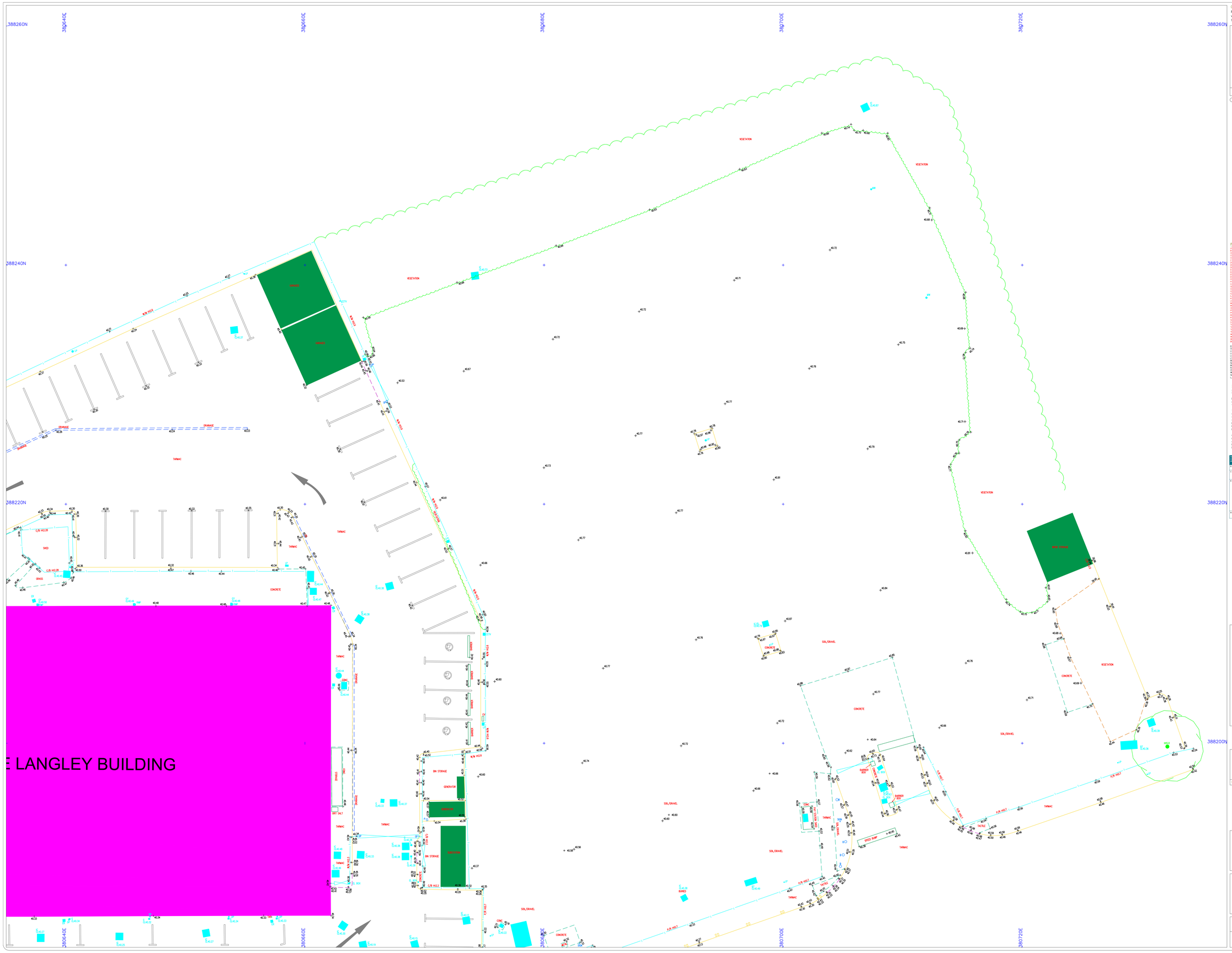

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CCTV	CCTV CAMERA POST
COL	COLUMN
COM	COMMUNICATIONS COVER
CEV	CAR CHARGING STATION
CTV	CABLE TV COVER
CHL	CHAINLINK FENCING
DP	DOWN PIPE
DR	DRAIN
EIC	E.I.C. INSPECTION COVER
ELB	ELECTRIC BOX
ELB	ELECTRIC BOX
ER	EARTH ROD
FP	FIRE HYDRANT
FL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
FT	FLAG POLE
G	GULLY
GL1	GROUND LIGHT
GRP	GRATED PIT
GSV	GAS VALVE
GT	GAS TAP
IC	INSPECTION COVER
KO	KERB OUTLET
LAD	LADDER
LP	LAMP PORTAL
LP	LAMP POST
PAL	PALISADE
R/W	WIRE MESH
B/W	BARBED WIRE
P/R	POST AND RAIL
P/W	POST AND WIRE
P/M	POST AND MESH
PIL	PILLAR
CB	CLOSE BOARDED
(TB-TB)	TOP OF FEATURE LEVELS
	STATION
	BOREHOLE
	MONITORING WELL

LBY	LAYBUTT
MKT	MARKOUT
MKR	MARKER
MST	MASTHEAD
MBP	MOORING POINT
MW	MONITORING WELL
NP	NAME PLATE
OP	OUTFALL PIPE
PB	PHONE/TELE BOX
PIL	PYLON
PP	PETROL PUMP
RE	RAIL
RE	RODDING EYE
RL	RIDGE LEVEL
RS	RISER
RTW	RETAINING WALL
SCP	SCREW PIPE
SAP	SAPLING
SIG	SIGNAGE
(SIL-SL)	SOFFIT LEVEL
SV	STOP VALVE
TBL	TELEPHONE BOLLARD
TCB	TELEPHONE CALL BOX
TE	TE MAST
TL	TRAFFIC LIGHT
TLB	TRAFFIC LIGHT BOX
TM	TOILET MACHINE
VP	VENT PIPE
VP	VENT PIPE
WB	WATER BOX
WCT	WASH OUT
WT	WATER TAP
WSV	WATER STOP VALVE
(D)-Bd	TREE GIRTH (DIA.)
(B+W)-(H)Ld	BEAM LEVEL BEAM UNDER
	BUSHES
	EXPANSION JOINTS
	KERB
	FENCE
	SURFACE CHANGE
	WALL
	TOP BANK
	FOOT BANK
	BUILDING
	CANOPY
	OVER HEAD ELECTRICAL
	OVER HEAD TELECOM
	HEDGE

PAS128 LEGEND

BT	BT
BT	BT INSPECTION COVER
CB	CONTROL BOX
CCTV	CCTV CAMERA POST
COM	COMMUNICATIONS COVER
CTV	CABLE TV COVER
CD	CABLE DUCT/CHANNEL
DP	DOWN PIPE
EIC	E.I.C. INSPECTION COVER
ELB	ELECTRIC BOX
ER	EARTH ROD
EP	ELECTRICITY POLE
FL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
G	GULLY
GL1	GROUND LIGHT
GST	GAS TAP
GSV	GAS VALVE
IC	INSPECTION COVER
IL	INVERT LEVEL
KO	KERB OUTLET
LP	LAMP POST
MK	MARKOUT
MH	MANHOLE
OP	OUTFALL PIPE
PB	PHONE/TELE BOX
PP	PETROL PUMP
RE	RODDING EYE
SIG	SIGNAGE/TELE BOX
SOF	SOFFIT LEVEL
SV	STOP VALVE
TCB	TELEPHONE CALL BOX
TL	TRAFFIC LIGHT
TLB	TRAFFIC LIGHT BOX
TM	TOILET MACHINE
WM	WATER METER
WCT	WASH OUT TAP
BH	BEAM LEVEL
EOT	END OF TRACE
UTA	UNABLE TO LIFT AREA
UTL	UNABLE TO LIFT
UTS	UNABLE TO SENSE
LOS	LOST SIGNAL/TRACE
LS	LOST SIGNAL
BLK	BLOCKED
ND	DOUBLE/OTHER DPR CONTACTS
RD	RAGGIDIGIT PIPE
SAP	SOLUTION PIPE
SP	SOIL STACK PIPE
WL	WATER LEVEL
LJ	JOINT BOX
LJ	EOT SYMBOL

CP	CABLE DUCT
CP	CABLE DUCT
FOD	FIBRE OPTIC DUCT
TELECOM	TELECOM
EARTH CABLES	EARTH CABLES
FIBRE OPTIC	FIBRE OPTIC
TELECOM	TELECOM
RAILWAY	RAILWAY
RAILWAY MAIN	RAILWAY MAIN
WATER MAIN	WATER MAIN
MAINS WATER	MAINS WATER
SEWER	SEWER
SEWER FOR	SEWER FOR
SEWER FOR	SEWER FOR
VAPOUR RECOVERY	VAPOUR RECOVERY
UNIDENTIFIED CABLE	UNIDENTIFIED CABLE
UNIDENTIFIED PIPE	UNIDENTIFIED PIPE
SURVEY BOUNDARY	SURVEY BOUNDARY

	TELKA
	COLLINGWOOD
	CONCRETE
	CHALK
	STONE
	CLAY
	TILE
	IRON
	STEEL
	WOOD
	PLASTIC
	CAST IRON
	CHRYSALIX
	UPVC
	DECCA
	PROT
	UPVC 1 channel
	UPVC 2 channel
	UPVC 3 channel

QUALITY LEVEL

A = Verification

B1 = Horizontal/Vertical location using multiple techniques

B2 = Horizontal/Vertical location using a single technique

B3 = Horizontal location using a single technique

B4 = Assumed route

C = Site Reconnaissance

D = Desktop utility records search

NOTES:

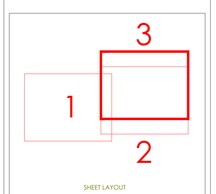
All levels relate to O.S (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane local grid, orientated to National Grid.

Due to the high density of the vegetation on site (annotated on the drawing), it was impossible to access to detail without suitable vegetation clearance prior to our site visit.

This Underground Utilities survey was conducted in compliance with the BS PAS128:2014 standard.
Services linetypes display text indicating first an abbreviation of the services' function (eg. EL = Electric Cable) followed by the Quality Level to which that service was located (eg. B4 = Assumed route).
Lines annotated as GPR were located using only the Ground Penetrating Radar and should be considered as Quality Level B2.

Quality Level descriptions shown in the above legend are for reference purposes only and are not intended as detailed specifications.
For full information on Quality Levels, please consult the BS PAS128:2014 standards document.

Issue/Rev	Quality level	Location accuracy (to nearest 100mm)	Line connectivity	Location method		Supporting data
Number with dash (Draft) or letter (Final)	Quality level achieved	Horizontal	Vertical	Method	Equipment	Description
0 - Desktop utility records search	D-0	>1m	>1m	unjustified	unjustified	-
1 - site reconnaissance	C-0	>1m	>1m	unjustified	unjustified	-
2 - Utilities	B1-B2	0m - 1m	0m - 1m	unjustified	unjustified	A signature of utilities whose location is demonstrated by clear references to asset features, topographical features or other services, and/or by a well maintained asset map
3 - Utilities 2	B3 - B4B	0m - 1m	0m - 1m	unjustified	unjustified	As utility signature of accuracy level 2 is verified by a single line of evidence (detection trace or as required note)
	B1-B2	0m - 1m	yes/no	unjustified	unjustified	Intersection results only of the utility connectivity (connectivity to other services)
	B3-B3P	1m	1m	unjustified	unjustified	Intersection and vertical location of the utility connectivity
	B1-B2	1m	yes/no	yes/no or unknown	yes/no or unknown	Intersection and vertical location of the utility connectivity
	B3-B3P	1m	1m	yes/no or unknown	yes/no or unknown	Intersection and vertical location of the utility connectivity
	B1-B2	0m - 1m	yes/no	yes/no or other	yes/no or other	Intersection and vertical location of the utility connectivity
	B3-B3P	1m	1m	yes/no or other	yes/no or other	Intersection and vertical location of the utility connectivity
4 - Verification	A1-A	1m	1m	yes/no	yes/no	Intersection and vertical location of the top cable - additional information is needed as specified in B3.3.3



SHEET LAYOUT

0 2m 4m 8m 16m 20m
SCALE BAR

REV	DATE	DESCRIPTION

John Robinson Associates
Utility Survey Specialists & Consultants

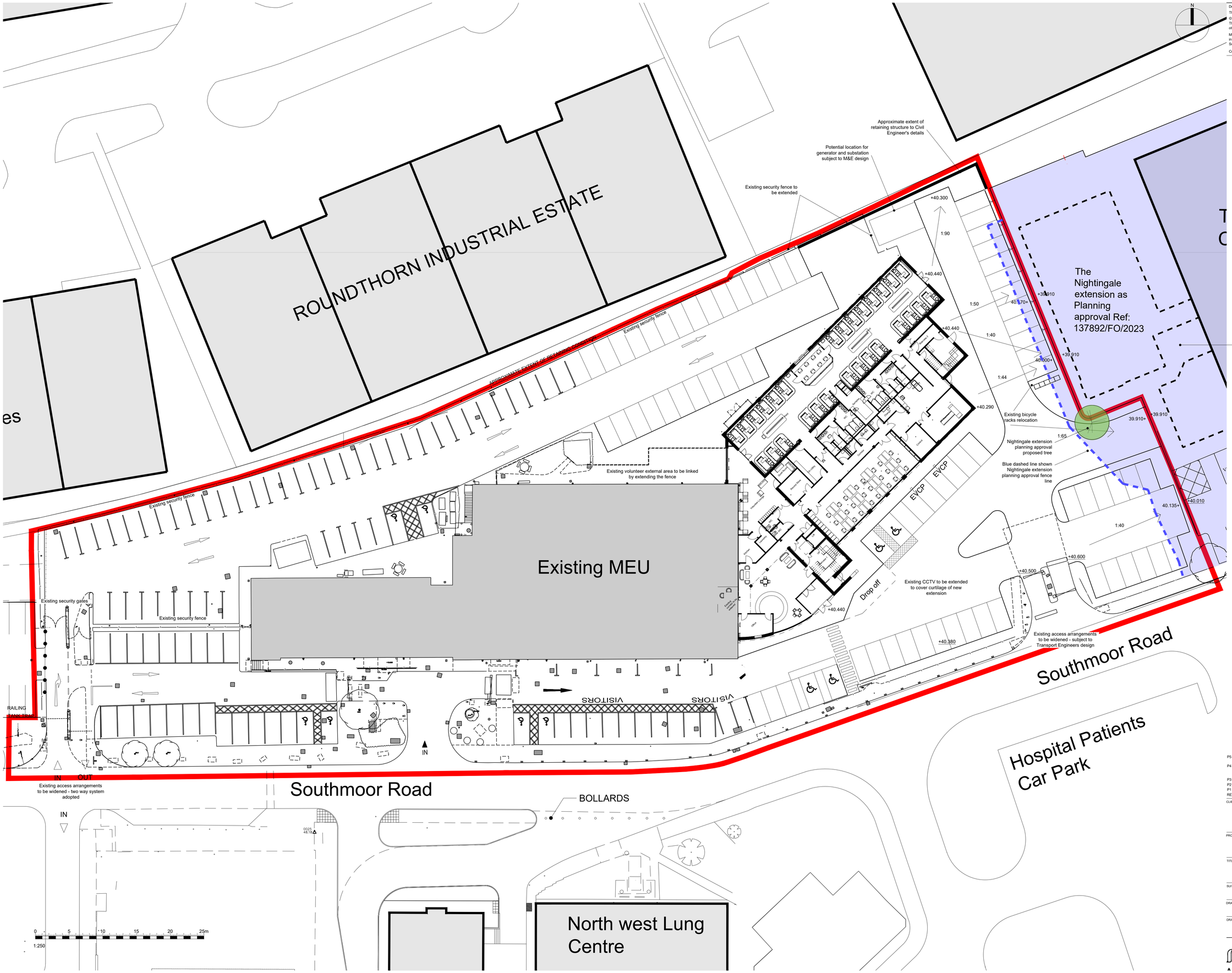
Client
MEDICINES EVALUATION UNIT

Project Title
2D Topographical survey at:

The Langley Building,
Southmoor Road, Roundthorn Industrial Estate,
Wythenshawe, Greater Manchester, M23 9QZ

Surveyed	Drawn	Checked
JRA	JRA	JR

Scale	Date	Drawing Ref.	No.	Size	Rev
1:100	09/23	230708	03	A0	-



Do not scale from this drawing.
The contractor is to check all dimensions on site and report any discrepencies to MHA.
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KEY

Denotes extents of planning application

+40.440 Proposed site levels

+40.010 Existing site levels retained

Refer to 1ME06-MHA-ZZ-ZZ-DR-01-xxx Landscape Strategy for details of hard and soft landscaping

Refer to 1ME06-MHA-ZZ-ZZ-DR-01-xxx Boundary Treatments plan for details of railings and fencelines

NOTE

Site plan shows ground floor plan. Refer to 1ME06-MHA-ZZ-ZZ-DR-02-xxx for full GA floor plans

PARKING

MEU Existing Parking Spaces:	129
Lost Parking Spaces:	25
New Parking Spaces:	75
Total MEU Parking Spaces	179

EVCP denotes charging point for electric vehicles, each positioned to serve one of two bays, to M&E engineers' details.

4 cycle parking spaces

REV	DATE	DESCRIPTION	DRN	CHK
P5	07/11/2023	Additional notation added regarding access & security fencing	YQ	JL
P4	31/10/2023	Red boundary updated, fence line added behind the building.	CS	JL
P3	25/10/2023	Enabling works added to existing site western entrance, Red boundary revised. Some extra information about nightingale extension planning extent added for info.	CS	JL
P2	2023-09-18	General updated	CS	JL
P1	2023-08-07	Initial issue	CS	JL

CLIENT
The Medicines Evaluation Unit Ltd

PROJECT TITLE
MEU Extension Phase 3

TITLE
Proposed Site Plan

SUITABILITY
Work In Progress

DRAWN / CHECKED	INITIAL ISSUE DATE	SCALE
CS / JL	Sept 2023	1:500 @ A1

DRAWING ID

Project	Originator	Volume	Level	Type	Role	Number	Status	Revision
1ME06 -	MHA -	ZZ -	ZZ -	DR -	A -	01-003 -	S0 -	P5

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e contact@mhaarchitects.com
w www.mhaarchitects.com

GENERAL NOTES

1. THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.
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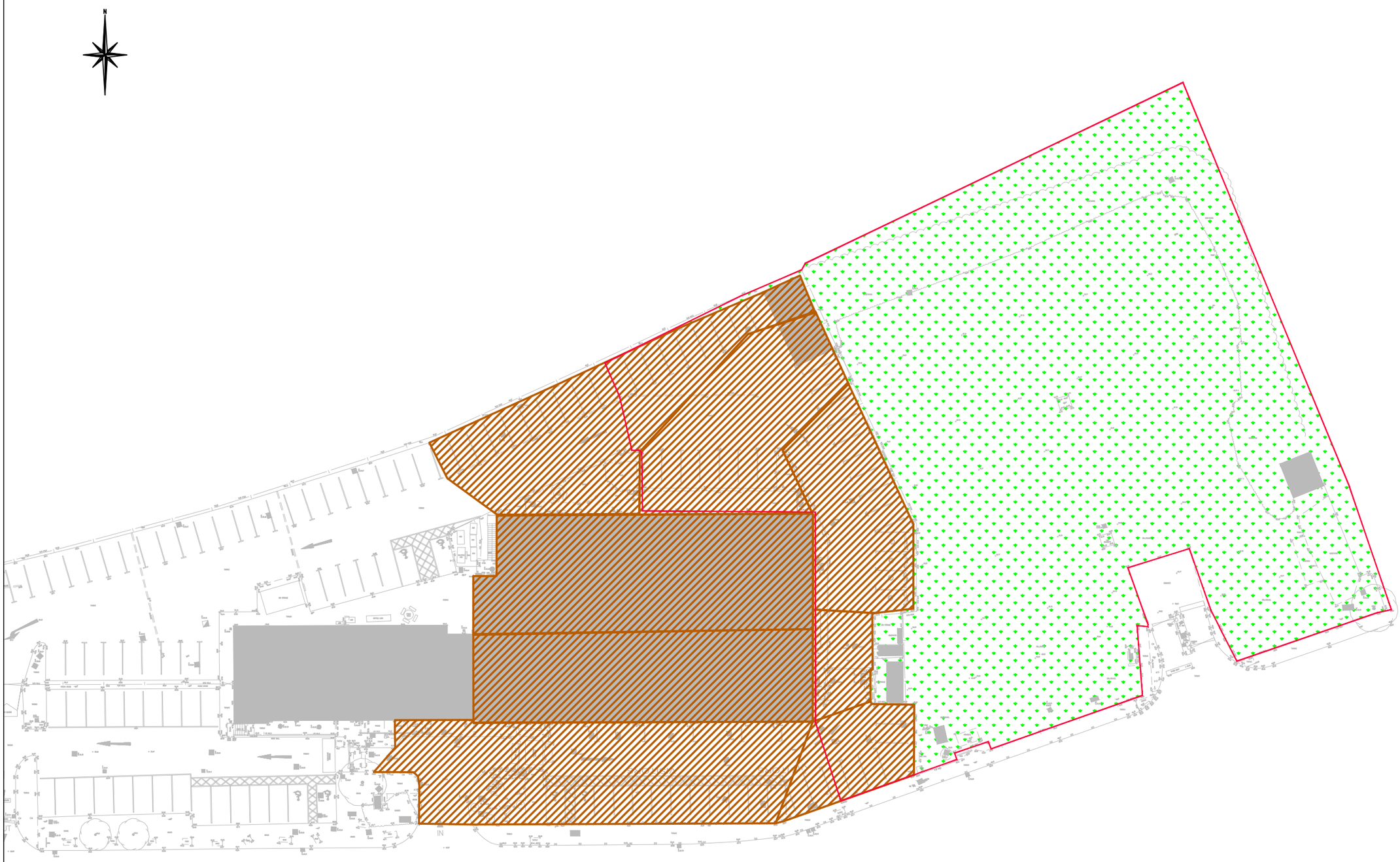

KEY

SITE BOUNDARY

PERMEABLE AREA: 3636 m² (0.36ha)

IMPERMEABLE AREA: 3160 m² (0.32ha)

SCALE BAR 1:500

0 10 20 30 40 50

Rev	Description	Date	By	Chkd
P01	ISSUE FOR INFORMATION	18.10.23	JG	AD

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Drawing Status

PRELIMINARY DRAWING

Client

MEDICINES EVALUATION UNIT

Project

MEU EXTENSION
SOUTHMOOR ROAD

Drawing Title

EXISTING CATCHMENT PLAN

Date	Drawn By	Checked By
OCT. 23	JG	AD

Scale at A3	Project Number
1:500	33631

Sheet Number	Revision
33631-SUT-ZZ-XX-DR-C-6000	P01

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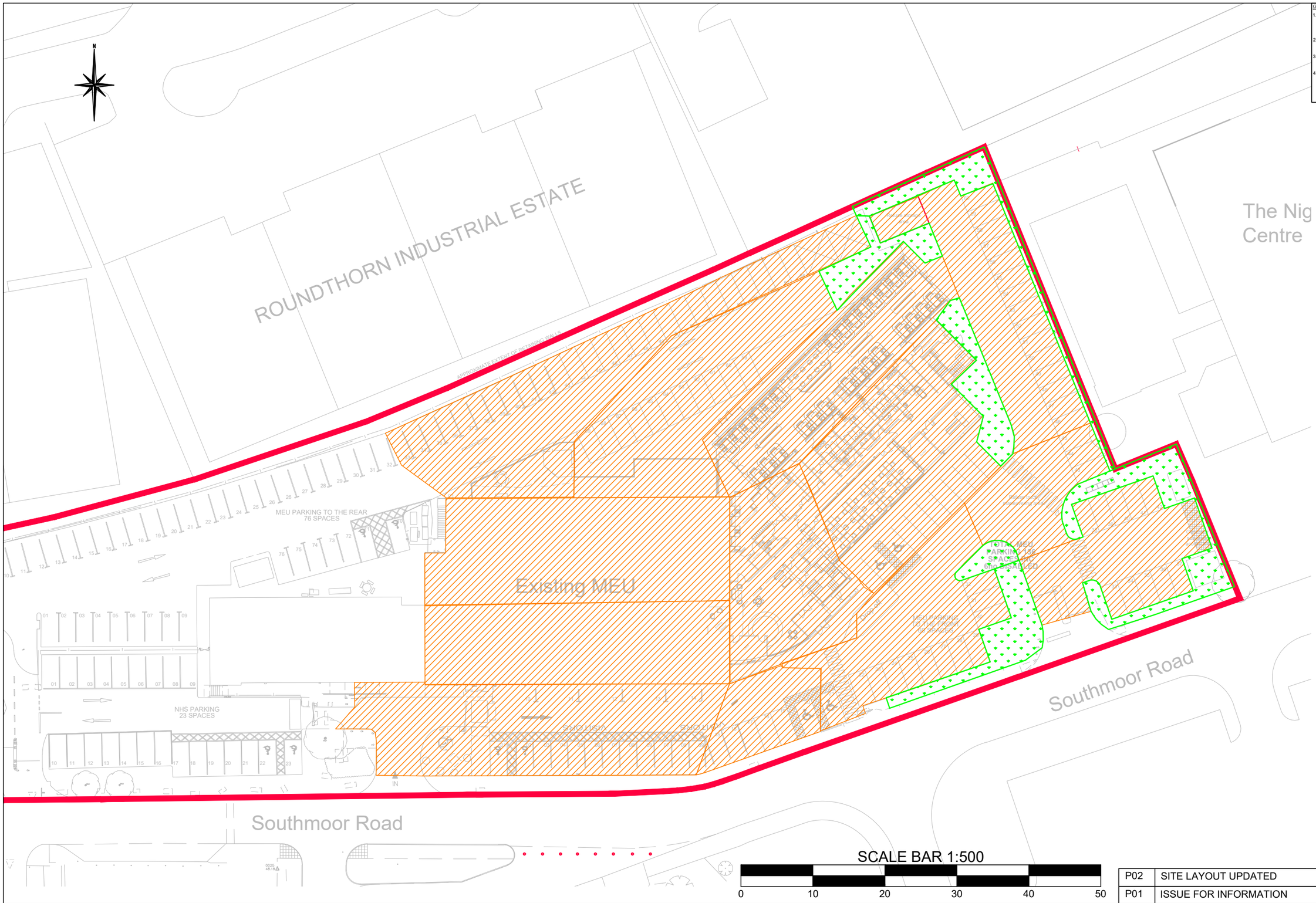

KEY

- SITE BOUNDARY
- IMPERMEABLE AREA: 5744 m² (0.57ha)
- PERMEABLE AREA: 1078 m² (0.11ha)

SCALE BAR 1:500

0 10 20 30 40 50

Rev	Description	Date	By	Chkd
P02	SITE LAYOUT UPDATED	01.12.23	JG	AD
P01	ISSUE FOR INFORMATION	18.10.23	JG	AD

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Client
MEDICINES EVALUATION UNIT

Project
MEU EXTENSION
SOUTHMOOR ROAD

Drawing Title
PROPOSED CATCHMENT PLAN

Drawing Status
PRELIMINARY DRAWING

Date	Drawn By	Checked By
OCT. 23	JG	AD

Scale at A3	Project Number
1:500	33631

Sheet Number	Revision
33631-SUT-ZZ-XX-DR-C-6001	P02

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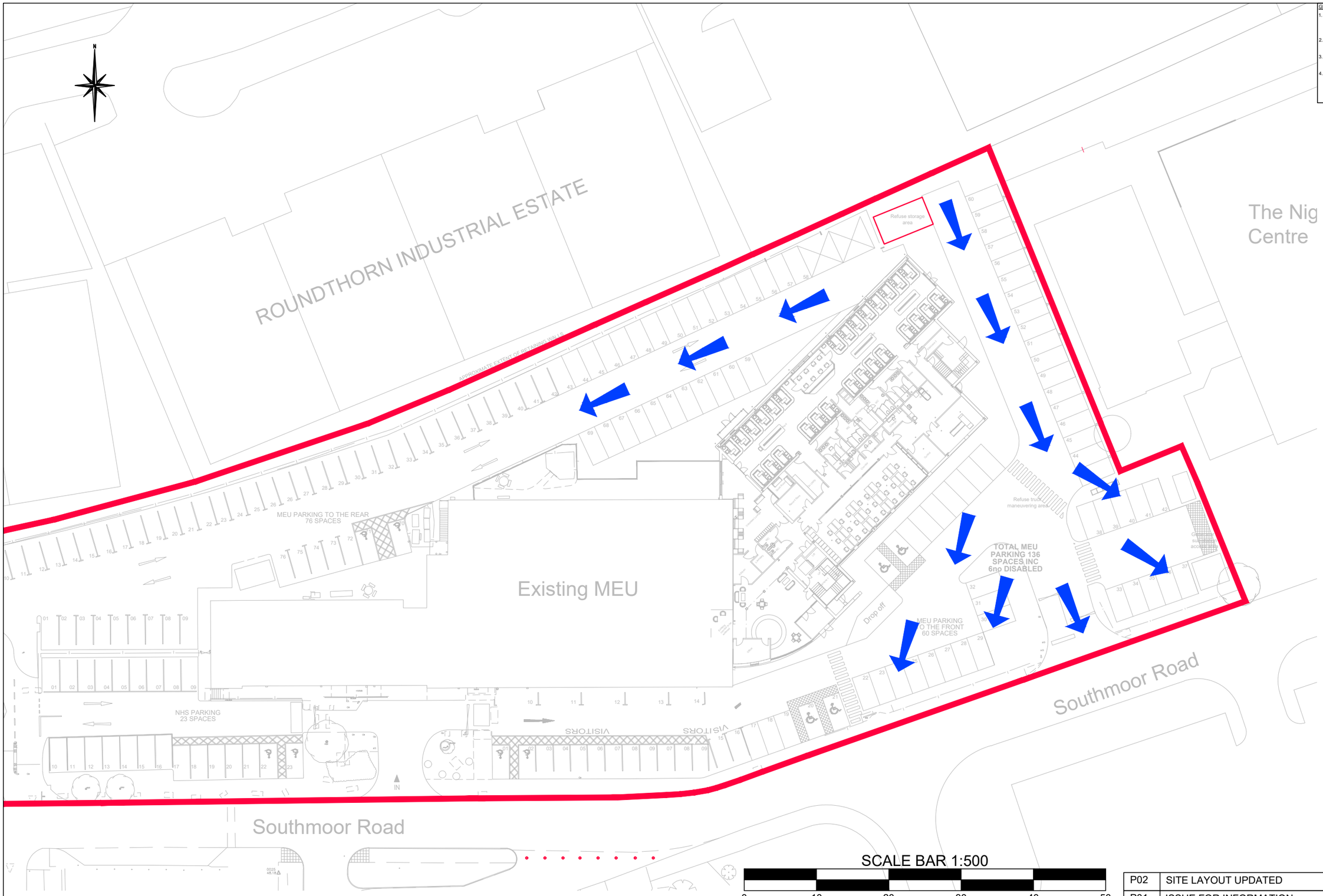
KEY

SITE BOUNDARY

FLOOD FLOW ROUTE



SCALE BAR 1:500

0 10 20 30 40 50

Rev	Description	Date	By	Chkd
P02	SITE LAYOUT UPDATED	01.12.23	JG	AD
P01	ISSUE FOR INFORMATION	05.10.23	JG	AD

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Drawing Status
PRELIMINARY DRAWING

Client
MEDICINES EVALUATION UNIT

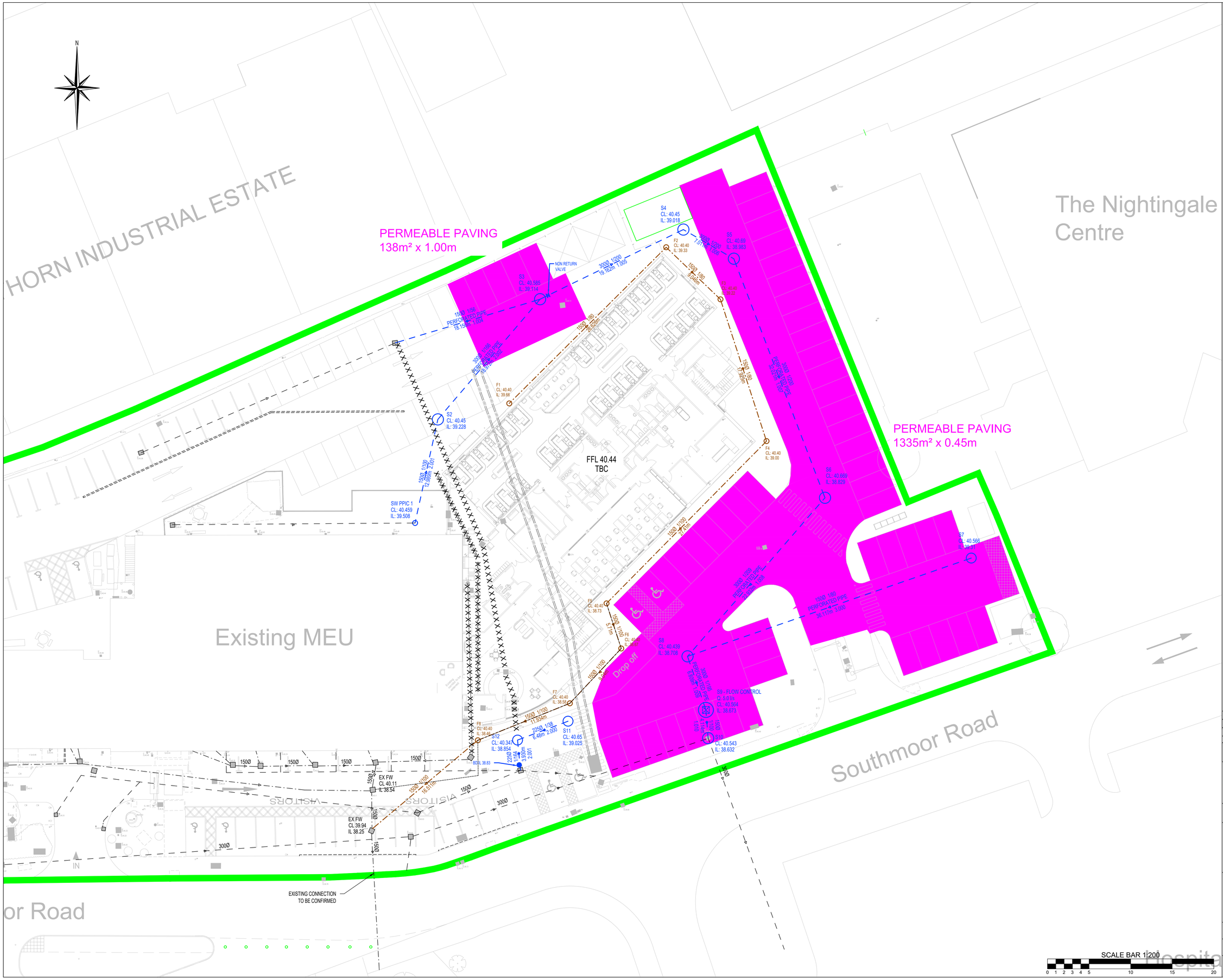
Project
MEU EXTENSION
SOUTHMOOR ROAD

Drawing Title
FLOOD FLOW ROUTE PLAN

Date: OCT. 23
Drawn By: JG
Checked By: AD

Scale at A3: 1:500
Project Number: 33631

Sheet Number: 33631-SUT-ZZ-XX-DR-C-6002
Revision: P02



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DRAINAGE KEY

- SITE BOUNDARY
- PROPOSED SURFACE WATER DRAIN/MH
- PROPOSED FOUL WATER DRAIN/MH
- EXISTING SURFACE WATER DRAIN/MH
- EXISTING FOUL WATER DRAIN/MH
- X X X X X X X X X X DRAIN TO BE ABANDONED
- PERMEABLE PAVING

Rev	Description	Date	By	Chkd
P03	SITE LAYOUT UPDATED	01.12.23	JG	AD
P02	PERMEABLE PAVING EXTENDED	14.11.23	JG	AD
P01	ISSUE FOR INFORMATION	16.10.23	JG	AD

Drawing Status
PRELIMINARY DRAWING

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Client
MEDICINES EVALUATION UNIT

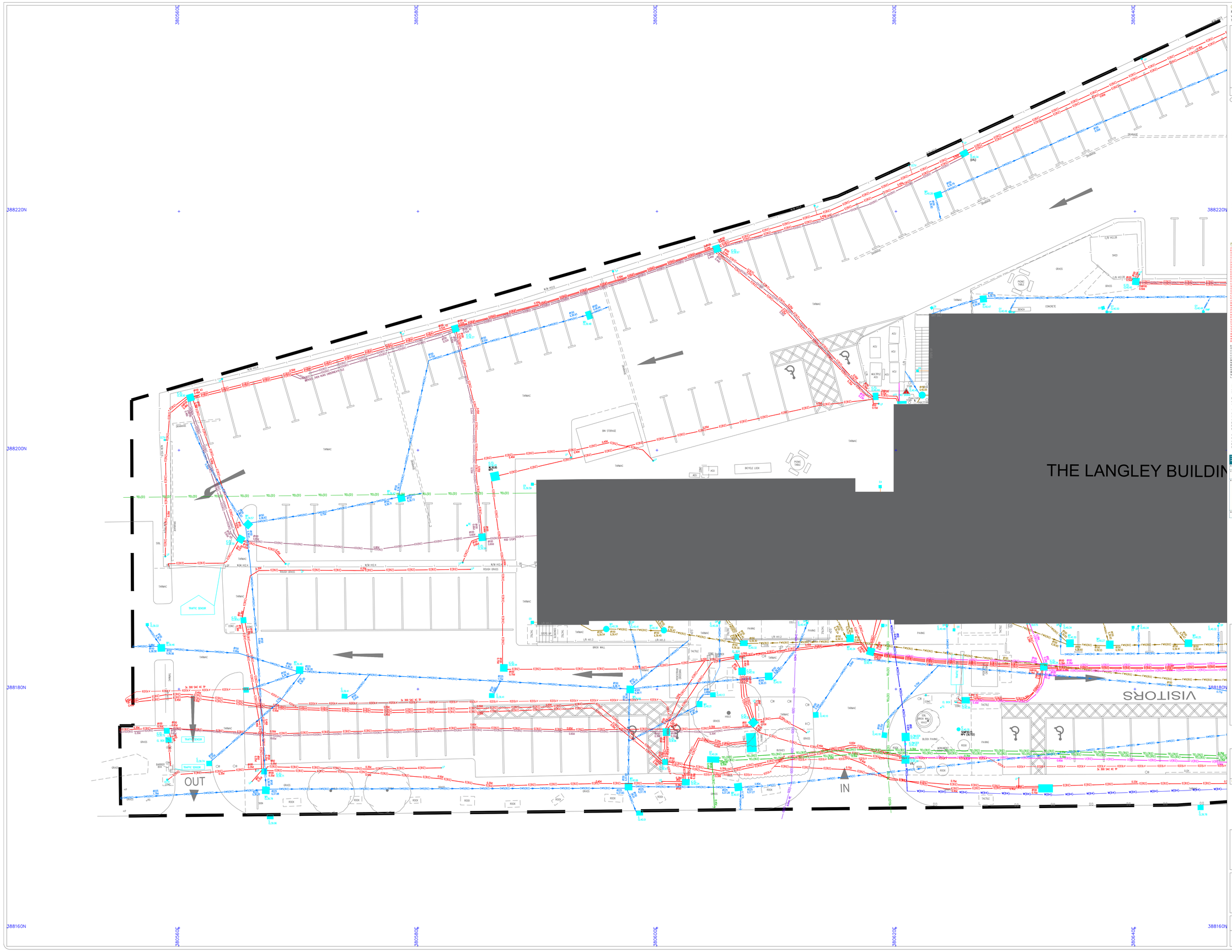
Project
MEU EXTENSION
SOUTHMOOR ROAD

Drawing Title
INDICATIVE DRAINAGE STRATEGY

Date	Drawn By	Checked By
OCT. 23	JG	AD

Scale at A1	Project Number
1:200	33631

Sheet Number	Revision
33631-SUT-ZZ-XX-DR-C-6020	P03



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W. www.jrassoc.co.uk E. John.Robinson@JRAssoc.co.uk

N

PLAN GRID NORTH

File name: 230708 Utility Survey (03-09-23).dwg

TOPOGRAPHICAL LEGEND

AV	AIR VALVE	LBY	LITTERBUOY
BCN	BELISHA BEACON	MH	MANHOLE
BOL	BOLLARD	WM	WATERMAIL
BOU	BOREHOLE	WS	WATERSTAND
BRK	BRICK	MP	MOORING POINT
BM	BENCH MARK	MW	MONITORING WELL
BS	BUS STOP	NP	NAME PLATE
BT	BT INSPECTION COVER	OF	OUTFALL PIPE
CCTV	CCTV CAMERA	PB	PUSH BUTTON BOX
CCV	CCTV CAMERA POST	PIL	PILLAR
COL	COLUMN	PP	PETROL PUMP
CO	COMMUNICATIONS COVER	RE	REDDING
CST	CAR CHARGING STATION	RL	REDDING EYE
CTL	CABLE TV COVER	RL	RIDGE LEVEL
CV	CONTROL VALVE	RW	RAINWATER
DP	DRAIN PIPE	RW	RETAINING WALL
DR	DRAIN	SP	SOIL/VENT PIPE
EIC	E.I.C. INSPECTION COVER	SAP	SAPLING
EL	ELECTRIC BOX	SIG	SIGNAL BOX
ELB	ELECTRIC BOX	SOFFIT	SOFFIT LEVEL
ER	EARTH ROD	SV	STOP VALVE
FB	FIBRE BOX POLE	TB	TELEPHONE BOLLARD
FL	FINISHED FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FH	FIRE HYDRANT	TW	TE WIND
F	FLAG POLE	TL	TRAFFIC LIGHT
G	GULLY	TLB	TRAFFIC LIGHT BOX
GL	GROUND LIGHT	TM	TICKET MACHINE
GP	GAS PIPE	VP	VENT PIPE
GT	GAS TAP	VPT	VENT PIPE TOP
GV	GAS VALVE	WC	WATER CUT
IC	INSPECTION COVER	WO	WASH OUT
KO	KERB OUTLET	WT	WATER STOP TAP
KIO	KERB INLET OUTLET	WSV	WATER STOP VALVE
LAD	LADDER	CO.BA	TREE GIRTH (1m.)
LP	LAMP POST	BH(0.6)	BEAM LEVEL, BEAM UNDER
PAL	PALISADE		BUSHES
W/E	WIRE MESH		EXPANSION JOINTS
B/W	BARBED WIRE		HEDGE
P/W	POST AND WIRE		FENCE
P/R	POST AND RAIL		SURFACE CHANGE
P/M	POST AND MESH		WALL
C/B	CONC. BLOCK		TOP BANK
C/W	CLOSE BOARDED		BOTTOM BANK
(TS)	TOP OF STEP LEVEL		BUILDING
(SB)	TOP OF FEATURE		OVERHANG/CANOPY
	BENCH		OVER HEAD ELECTRICAL
	STATION		OVER HEAD TELECOM
	BOREHOLE		HEDGE
	MONITORING WELL		

PAS128 LEGEND

BT	BT	CP			
BT	BT INSPECTION COVER	CABLE DUCT		TELEX	
CR	CONTROL BOX	FUEL DEVOLVE		COAL	
CCTV	CCTV CAMERA POST	TELECOM		CHAPS	
COM	COMMUNICATIONS COVER	EARTH CABLES		STEAM	
CTV	CABLE TV COVER	ELECTRIC		TELEX	
CD	CONDUIT CHANNEL	FIBRE OPTIC		GAS	
DP	DRAIN PIPE			TELEC	
DR	DRAIN	FOUL		SEWER	
EIC	E.I.C. INSPECTION COVER	RADIO MAIN		SEWER	
ELB	ELECTRIC BOX	RADIO MAIN		WATER	
ER	EARTH ROD	BRAND WATER		WATER	
EP	ELECTRICITY POLE	SE MOS CM		CHRGAS	
FSL	FINISHED FLOOR LEVEL	SE MOS CM		CHRGAS	
FH	FIRE HYDRANT	SEWER FM		CHRGAS	
G	GULLY	VAPOUR RECOVERY		PIPE	
GL	GROUND LIGHT	UNIDENTIFIED CABLE		UGI.A	UGI.A
GT	GAS TAP	UNIDENTIFIED CABLE		UGI.A	UGI.A
GSV	GAS VALVE	UNIDENTIFIED PIPE		UGI.A	UGI.A
IC	INSPECTION COVER	SURVEY BOUNDARY			
IL	INVERT LEVEL				
KO	KERB OUTLET				
LP	LAMP POST				
MH	MANHOLE				
OF	OUTFALL PIPE				
PP	PETROL PUMP				
RE	REDDING EYE				
RP	REDDING PIPE				
SOFFIT	SOFFIT LEVEL				
SV	STOP VALVE				
TCB	TELEPHONE CALL BOX				
TL	TRAFFIC LIGHT				
TLB	TRAFFIC LIGHT BOX				
TM	TICKET MACHINE				
WM	WATER METER				
WO	WASH OUT				
WSV	WATER STOP VALVE				
EOT	END OF TRACE				
OUTA	OUTSIDE SURVEY AREA				
UTL	UNABLE TO LIFT				
UTS	UNABLE TO SINGE				
LS	LOST SIGNAL, TRACE				
LS	LOST SIGNAL				
BLK	BLOCKED				
NO	NO ANSWER (PPR CONTACTS				
RD	RAINGWATER PIPE				
SWP	SOIL/VENT PIPE				
AL	ALTITUDE (m.)				
WL	WATER LEVEL				
L.J	LEAD JOINT				
L.J	EOT SYMBOL				

QUALITY LEVEL

A – Verification

B1 – Horizontal/Vertical location using multiple techniques

B2 – Horizontal/Vertical location using a single technique

B3 – Horizontal location using a single technique

B4 – Assumed route

C – Site Reconnaissance

D – Desktop utility records search

NOTES:

All levels relate to O.S (Newlyn) Datum, Established using network RTK.
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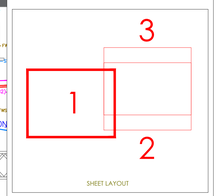
Due to the high density of the vegetation on site (annotated on the drawing), it may be necessary to detail-without suitable vegetation clearance prior to our site visit.

This Underground Utilities survey was conducted in compliance with the BS PAS128:2014 standards.
Services linetypes display text indicating first an abbreviation of the service: function (eg. EL = Electric Cable) followed by the Quality Level to which that service was located (eg. B4 = Assumed route).
Lines annotated as GPR were located using only the Ground Penetrating Radar and should be considered as Quality Level B2.

Quality Level descriptions shown in the above legend are for reference purposes only and are not intended as detailed specifications.
For full information on Quality Levels, please consult the BS PAS128:2014 standards document.

Surveyed location with depth information	Quality level	Line	Location accuracy		Supporting data
			Horizontal	Vertical	
1 Visible, either measured or inferred	B3-D	—	insufficient	insufficient	—
2 Not recommended	B2-D	—	insufficient	insufficient	a signature of utility whose route is demonstrated by clear evidence (road features, topographical features, manhole covers, etc.) and confirmed by interpretation and experienced eye
3 Inferred or ?	B2, B3B4	No	insufficient	insufficient	as utility signature which is interpreted (a similar feature which is known to be a service) but not confirmed
	B2, B3, B4	Yes	insufficient	insufficient	a utility signature which is interpreted (a similar feature which is known to be a service) and confirmed by a second note
	B2, B3, B4	No	sufficient only	insufficient	dimensional accuracy only of the utility irrespective of the quality of the detection method
	B2, B3, B4	Yes	sufficient only	insufficient	dimensional accuracy only of the utility irrespective of the quality of the detection method
	B2, B3	No	sufficient only	sufficient	measured and vertical location of the utility irrespective of the geophysical technique used ?
	B2, B3	Yes	sufficient only	sufficient	measured and vertical location of the utility irrespective of the geophysical technique used
4 Verification	B1-A	—	sufficient	sufficient	measured and vertical location of the top cable / pipe and depth of cover to the top cable / pipe additional information is needed for specified B1/A



SHEET LAYOUT

0 2m 4m 8m 16m 20m

SCALE BAR

REV	DATE	DESCRIPTION

John Robinson Associates
Utility Survey Specialists & Consultants

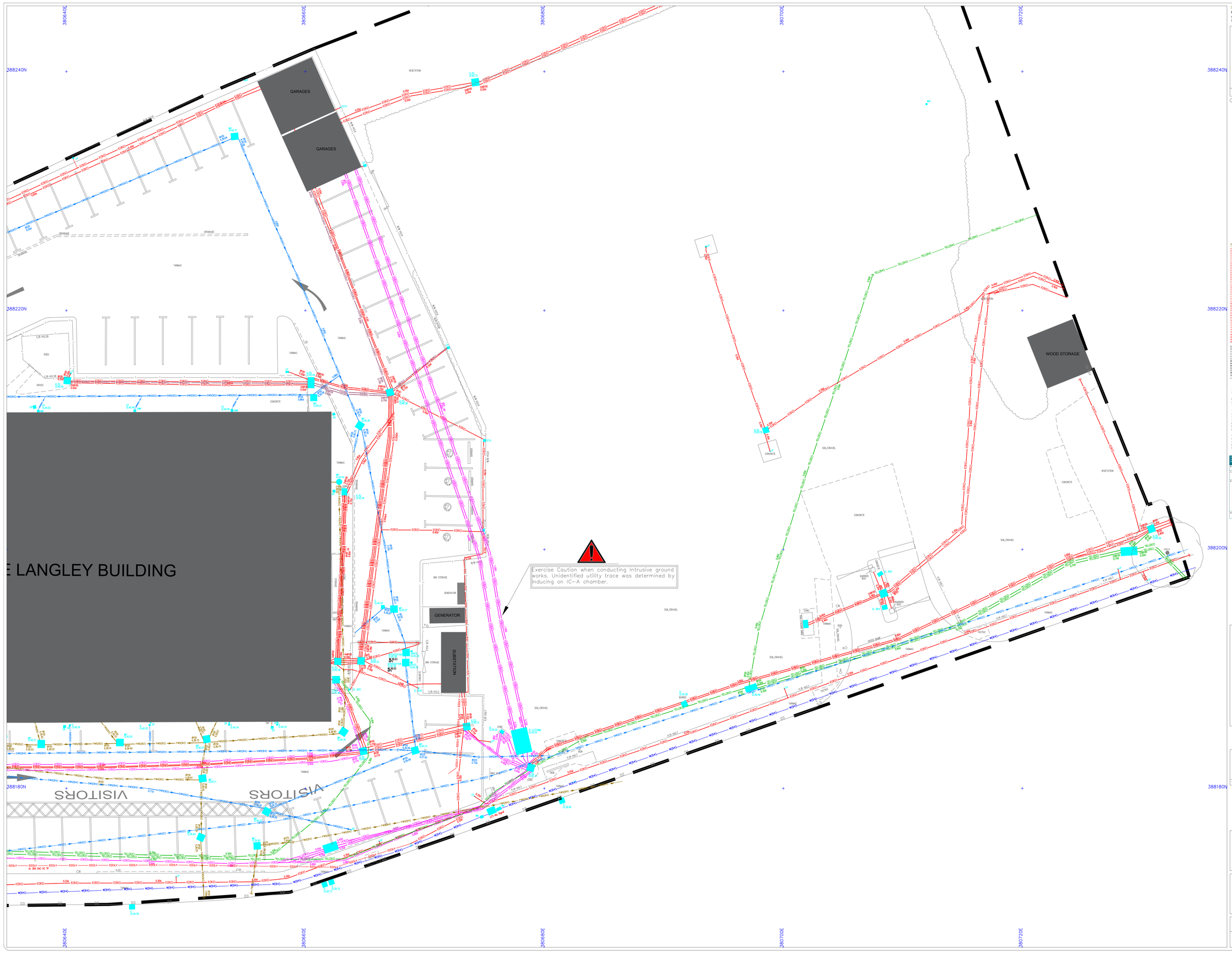
Client
MEDICINES EVALUATION UNIT

Project Title
Utility survey at:

The Langley Building,
Southmoor Road, Roundthorn Industrial Estate,
Wythenshawe, Greater Manchester, M23 9QZ

Surveyed	Drawn	Checked
JRA	JRA	JR

Scale	Date	Drawing Ref.	No.	Size	Rev
1:100	09/23	230708	01	A0	-



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W. www.jrassoc.co.uk E. John.Robinson@JRAssoc.co.uk

N

PLAN GRID NORTH

File name: 230708 Utility Survey (03-09-23).dwg

TOPOGRAPHICAL LEGEND

AP	AIR PIPE	LBY	LAYBUOY
AB	ANTI-LIMB BEACON	MH	MANHOLE
BH	BOREHOLE	MKP	MARKPOST
BOL	BOLLARD	MP	MILEPOST
BM	BM	MP	MOORING POINT
BM	BENCH MARK	MW	MONITORING WELL
BS	BUS STOP	NP	NAME PLATE
BT	BT INSPECTION COVER	OP	OUTFALL PIPE
CAB	CABINET	PB	PUSH BUTTON BOX
CCTV	CCTV CAMERA POST	PIL	PILLAR
COL	COLUMN	PP	PETROL PUMP
CO	COMMUNICATIONS COVER	RE	RODDING EYE
CST	CAR CHARGING STATION	RL	RIDGE LEVEL
CTV	CABLE TV COVER	RL	RIDGE LEVEL
DC	DOWN CLOSED CHANNEL	RW	RETAINING WALL
DP	DOWN PIPE	SP	SOIL VENT PIPE
EC	EC	SAP	SAMPLING
EC	E.C.I. INSPECTION COVER	SIG	SIGNPOST
EL	ELECTRIC BOX	SIV(C)	SOFFIT LEVEL
EE	ELECTRIC BOX	SV	STOP VALVE
EE	EARTH ROD	TB	TELEPHONE BOLLARD
FL	FLAG POLE	TCB	TELEPHONE CALL BOX
FFL	FINISHED FLOOR LEVEL	TC	TC MKD
FH	FIRE HYDRANT	TL	TRAFFIC LIGHT
F	FLAG POLE	TLB	TRAFFIC LIGHT BOX
G	GULLY	TM	TICKET MACHINE
GL	GROUND LIGHT	TP	TELEGRAPH POLE
GO	GAS VENT	VP	VENT PIPE
GT	GAS TAP	WC	WATER CLOSET
IC	INSPECTION COVER	WO	WASH OUT
IL	INVERT LEVEL	WT	WATER TAP
KO	KERB OUTLET	WSV	WATER STOP VALVE
LAD	LADDER	CO.Ba	TREE GIRTH (Dia.)
LC	LANDSCAPE BRAIN	BH.Bm	BEAM LEVEL BEAM UNDER
LP	LAMP POST		
PAL	PALISADE		BUSHES
M.W	MESH WIRE		EXPANSION JOINTS
B.W	BARBED WIRE		KERB
P.W	POST AND WIRE		FENCE
P.R	POST AND RAIL		SURFACE CHANGE
P.P	POST AND PAIL		WALL
C.L	CHAIN LINK		TOP BANK
C.W	CLOSE BOARDED		BOTTOM BANK
TOB	TOP OF BANK (LEVEL)		BUILDING
TOF	TOP OF FEATURE		OVER HEAD CANOPY
(38.98)	SPOT HEIGHT		OVER HEAD ELECTRICAL
	STATION		OVER HEAD TELECOM
	BOREHOLE		HEDGE
	MONITORING WELL		

PAS128 LEGEND

BT	BT	CP	
BT	BT INSPECTION COVER	CABLE DUCT	TELEX
CB	CONTROL BOX	FOB, DEVICE	COLLECTOR
CCTV	CCTV CAMERA POST	TELECOM	CATV
COM	COMMUNICATIONS COVER	TELECOM	TELEX
CTV	CABLE TV COVER	EARTH CABLES	STAT
DC	DOWN CLOSED CHANNEL	ELECTRIC	ELEC
DP	DOWN PIPE	ELECTRIC	ELEC
EC	EC	ROAD	TRAFFIC
EC	E.C.I. INSPECTION COVER	RAILWAY	SIGN
ELB	ELECTRIC BOX	RAILWAY MAIN	SIGN
EB	EARTH BOND	MAINS WATER	W.O.
EP	ELECTRICITY POLE	MAINS WATER	W.O.
FFL	FINISHED FLOOR LEVEL	12 MCB CB	CABLE
FH	FIRE HYDRANT	12 MCB CB	CABLE
G	GULLY	50 MCB CB	CABLE
GL	GROUND LIGHT	VAPOUR RECOVERY	PIPE
GST	GAS TAP	UNIDENTIFIED CABLE	UPVC
GSV	GAS VALVE	UNIDENTIFIED CABLE	UPVC
IC	INSPECTION COVER	UNIDENTIFIED PIPE	UPVC
IL	INVERT LEVEL	UNIDENTIFIED PIPE	UPVC
KO	KERB OUTLET	SURVEY BOUNDARY	
LP	LAMP POST		
MH	MANHOLE		
OP	OUTFALL PIPE		
OP	OUTFALL PIPE		
PP	PETROL PUMP		
RE	RODDING EYE		
SIG	SIGNAL BOX		
SIV	SOFFIT LEVEL		
SV	STOP VALVE		
TCB	TELEPHONE CALL BOX		
TL	TRAFFIC LIGHT		
TLB	TRAFFIC LIGHT BOX		
TP	TELEGRAPH POLE		
WM	WATER METER		
WO	WASH OUT		
WOT	WATER OUTLET TAP		
BH	BEAM LEVEL		
EOT	END OF TRACE		
UTA	UNABLE TO ENTER AREA		
UTL	UNABLE TO LIFT		
UTS	UNABLE TO SENSE		
LS	LOST SIGNAL - LIFT		
LS	LOST SIGNAL		
BLK	BLOCKED		
ND	NO DIGGER (PIPE CONTACTS		
ND	INADEQUATE PIPE		
SNP	NO SUITABLE PIPE		
NL	NO LEVEL - LIFT		
NL	NO LEVEL		
LJ	LOST JOINT		
LJ	EOT SYMBOL		

QUALITY LEVEL

A = Verification

B1 = Horizontal/Vertical location using multiple techniques

B2 = Horizontal/Vertical location using a single technique

B3 = Horizontal location using a single technique

B4 = Assumed route

C = Site Reconnaissance

D = Desktop utility records search

NOTES:

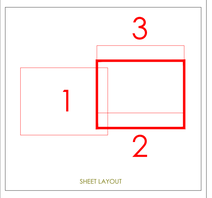
All levels relate to O.S (Newlyn) Datum, Established using network RTK. Survey plotted on a plane local grid, orientated to National Grid.

Due to the high density of the vegetation on site (annotated on the drawing), it was impossible to gain access to detail without suitable vegetation clearance prior to our site visit.

This Underground Utilities survey was conducted in compliance with the BS PAS128:2014 standards.
Services linetypes displays text indicating first an abbreviation of the services function (eg. EL = Electric Cables) followed by the Quality Level to which that service was located (eg. B4 = Assumed route). Lines annotated as GPR were located using only the Ground Penetrating Radar and should be considered as Quality Level B2.

Quality Level descriptions shown in the above legend are for reference purposes only and are not intended as detailed specifications.
For full information on Quality Levels, please consult the BS PAS128:2014 standards document.

Survey type (underground, wall, above ground or other)	Quality level (as defined in PAS 128 specification)	Line (as measured?)	Location accuracy (as measured?)	Location accuracy (as surveyed?)	Supporting data
1	Desktop utility records search	D	n/a	not defined	not defined	—
2	Site reconnaissance	C	—	not defined	not defined	—
3	Verification	A	—	not defined	not defined	A segment of utility whose location is demonstrated by direct exposure or physical access. Typically used for pipe entrances or pipes of various sizes inside manholes or other structures.
4	Detection 1	B1, B2, B3	Yes	not defined	not defined	A utility segment which is suspected to exist but has not been demonstrated. Linepipe shown as per detection data.
		B1, B2	Yes	yes	exceeded the limits specified in the standard	Horizontal location of the utility accurately as in the geophysical techniques used.
		B1, B2	Yes	yes	exceeded the limits specified in the standard	Horizontal and vertical location of the utility inferred by best of the geophysical techniques used.
		B1, B2	No	yes or no, or yes of depth but with unknown or greater accuracy	exceeded the limits specified in the standard	Horizontal and vertical location of the utility inferred by best of the geophysical techniques used.
		B1, B2	No	yes of depth but with unknown or greater accuracy	yes of exceeded the limits specified in the standard	Horizontal and vertical location of the utility inferred by best of geophysical techniques used.
5	Verification	B1, B2	—	yes	yes	Horizontal and vertical location of the top and/or bottom of the utility (additional information is required to specify the exact location).



SHEET LAYOUT

0 2m 4m 8m 16m 20m

SCALE BAR

REV	DATE	DESCRIPTION

John Robinson Associates
Utility Survey Specialists & Consultants

Client
MEDICINES EVALUATION UNIT

Project Title
Utility survey at:

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Surveyed	Drawn	Checked
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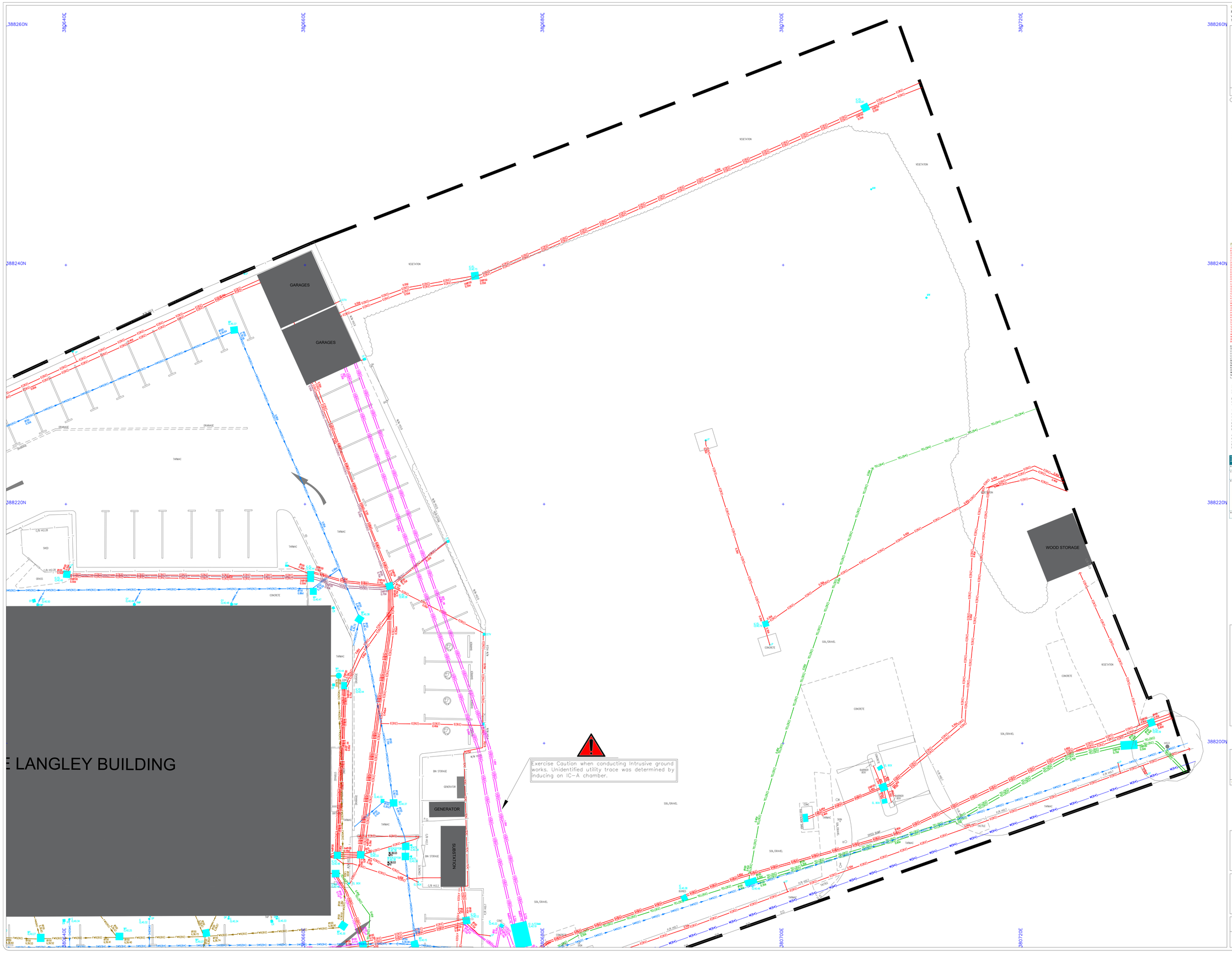

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N

PLAN GRID NORTH

File Name: 230708 Utility Survey (03-09-23).dwg

TOPOGRAPHICAL LEGEND

AV AIR VALVE
BCN BLIND BEACON
BH BOREHOLE
BOL BOLLARD
BM BM
BN BENCH MARK
BS BUS STOP
BT BT INSPECTION COVER
CCTV CCTV CAMERA POST
COL COLUMN
CP COMMUNICATIONS COVER
CSP CAR CHARGING STATION
CTV CABLE TV COVER
DCH DRAIN CHANNEL
DP DOWN PIPE
EC ELEC INSPECTION COVER
EM ELEC METER
ELB ELECTRIC BOX
ER EARTH ROD
FL FLAGPOLE / POLE
FLL FINISHED FLOOR LEVEL
FH FIRE HYDRANT
G GULLY / TILE
GULY GULLY
GL GROUND LIGHT
GM GAS METER
GSV GAS TAP
IC INSPECTION COVER
IL INVERT LEVEL
KO KERB OUTLET
LADD LADDER
LB LAMP BRAN
LP LAMP POST
PAL PALISADE
M/W MRC MESH
B/W BARBED WIRE
P/W PLAIN WIRE
P/W POST AND WIRE
P/R POST AND RAIL
C/L CHAIN LINK
GLB GLOBE BUARDED
(TB) TOP OF BANK (TBC LEVEL)
(TB-BS) TOP OF FEATURE BELOW
STATION
BOREHOLE
MONITORING WELL
LBT LITTERBUST
WM WARNING MARKERS
MP MARKERS
MP MOORING POINT
MW MONITORING WELL
NP NAME PLATE
OP OUTFALL PIPE
PB PHONE CALL BOX
PYLON PYLON
PP PETROL PUMP
RE RODDING EYE
RL RIDGE LEVEL
RP RIVER POST
RW RETAINING WALL
SP SIGN POST / PIPE
SAP SAPLING
SV STOP VALVE
(SV-FL) SOFFIT LEVEL
SV STOP VALVE
TBL TELEPHONE BOLLARD
TCB TELEPHONE CALL BOX
TC TC BIRD
TL TRAFFIC LIGHT
TLB TRAFFIC LIGHT BOX
TM TOILET MACHINE
VP VENT PIPE
VPI VENT PIPE
WC WATER COLLECTOR
WO WASH OUT
WT WATER TAP
WSV WATER STOP VALVE
CO-BH TREE GIRTH (1m)
(BH-BS) (FLEVEL) BEAM UNDER
BUSHES
EXPANSION JOINTS
HEDGE
FENCE
SURFACE CHANGE
WALL
TOP BANK
BOTTOM BANK
BUILDING
OVER HEAD CANOPY
OVER HEAD ELECTRICAL
OVER HEAD TELECOM
HEDGE

PAS128 LEGEND

AT ATMOS
BT BT INSPECTION COVER
CB CONTROL BOX
CCTV CCTV CAMERA POST
COM COMMUNICATIONS COVER
CTV CABLE TV COVER
DCH DRAIN CHANNEL
DP DOWN PIPE
EC ELEC INSPECTION COVER
ELB ELECTRIC BOX
ER EARTH ROD
EP ELECTRICITY POLE
FFL FINISHED FLOOR LEVEL
FH FIRE HYDRANT
G GULLY
GL GROUND LIGHT
GST GAS TAP
GSV GAS VALVE
IC INSPECTION COVER
IL INVERT LEVEL
KO KERB OUTLET
LP LAMP POST
MH MANHOLE
OP OUTFALL PIPE
PB PHONE BOX
PP PETROL PUMP
RE RODDING EYE
SCP SIGNAL CONTROL BOX
SVF SOFFIT LEVEL
SV STOP VALVE
TCB TELEPHONE CALL BOX
TL TRAFFIC LIGHT
TLB TRAFFIC LIGHT BOX
TP TELEGRAPH POLE
WM WATER METER
WT WATER TAP
WOT WATER OUTLET
BH BEAM LEVEL
EOT END OF TRACE
OTA OUTSIDE TRACE AREA
UTL UNABLE TO LIFT
UTS UNABLE TO SINGE
UTT UNABLE TO TRACE
LS LOST SIGNAL
BLK BLOCKED
CC CONNECTOR (BPR CONTACTS)
RD RAGGEDY PIPE
SNP NO SUITABLE PIPE
OC OPEN CHAMBER
WL WATER LEVEL
EL ELEVATION
LJ EOT SYMBOL
PY CABLE DUCT
PY CABLE DUCT
TELEC TELECOM
EARTH CABLES
FIBRE OPTIC
FOC
FOC
FOC
ROOT MAIN
RAW WATER
MAINS WATER
SEWER
SEWER
SEWER
VAPOUR RECOVERY
UNIDENTIFIED CABLE
UNIDENTIFIED PIPE
SURVEY BOUNDARY
TELEC
COLLAPSED
EARTH
STEAM
CHW(F)
CHW(R)
STEAM
FOC
SEWER
SEWER
SEWER
CHW(F)
CHW(R)
UPVC
UPVC
UPVC
UPVC
UPVC
UPVC

QUALITY LEVEL

A = Verification
B1 = Horizontal/Vertical location using multiple techniques
B2 = Horizontal/Vertical location using a single technique
B3 = Horizontal location using a single technique
B4 = Assumed route
C = Site Reconnaissance
D = Desktop utility records search

NOTES:

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Survey plotted on a plane local grid, orientated to National Grid.

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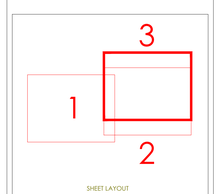
Investigation Location with Utility plant to be surveyed	Feasible Survey Techniques to determine Utility route and position	Can a Trace be established?	Can a Utility be Induced?	Inspection Pits Required?	Inspection Pits Size
A	Inspection pits to expose Utility plant	No	No	Not applicable	Not applicable	Not applicable
B	Ground Penetrating Radar	Yes	Yes	Not applicable	Not applicable	Not applicable
C	Electromagnetic Detection	Yes	Yes	Not applicable	Not applicable	Not applicable
D	Radiography *	No, YES	No	Not applicable	Not applicable	A minimum of pit(s) will be required to demonstrate that Radio radiography is a viable Radiography. Minimum size dimensions of pit(s) are: 2Metre x 2Metre x 2Metre
E	Radiography *	No, YES	No	Not applicable	Not applicable	A utility equipment which is composed of a non-ferrous tag and a Radio Wave transmitter is fitted to Utility in order to aid Radio Wave detection.
		No, NO	No	yes	Not applicable	Investigation location is one of the utility chamber(s), some of the non-destructive techniques could be applied.
		No, NO	Yes	yes	Not applicable	Investigation location is one of the utility chamber(s), some of the non-destructive techniques could be applied.
		Yes	Yes	yes, to a depth of 1Metre(or depth)	Not applicable	Minimum size dimensions required of the utility chamber(s) for multiple* geophysical techniques to work.
		No, NO	Yes	yes, to a depth of 1Metre(or depth)	yes, to a depth of 1Metre(or depth)	Minimum size dimensions required of the utility chamber(s) for multiple* geophysical techniques to work.
F	Hand Excavation	No, NO	Yes	yes	yes	Minimum size dimensions required of the tag cable(s) for detection of the cable(s)
						Minimum size dimensions required of the tag cable(s) for multiple* geophysical techniques to work.
G	Hand Excavation	No, NO	No	yes	yes	Minimum size dimensions required of the tag cable(s) for detection of the cable(s)
						Minimum size dimensions required of the tag cable(s) for multiple* geophysical techniques to work.



SHEET LAYOUT

0 2m 4m 8m 16m 20m

SCALE BAR

REV	DATE	DESCRIPTION

John Robinson Associates
Utility Survey Specialists & Consultants

Client

MEDICINES EVALUATION UNIT

Project Title

Utility survey at:

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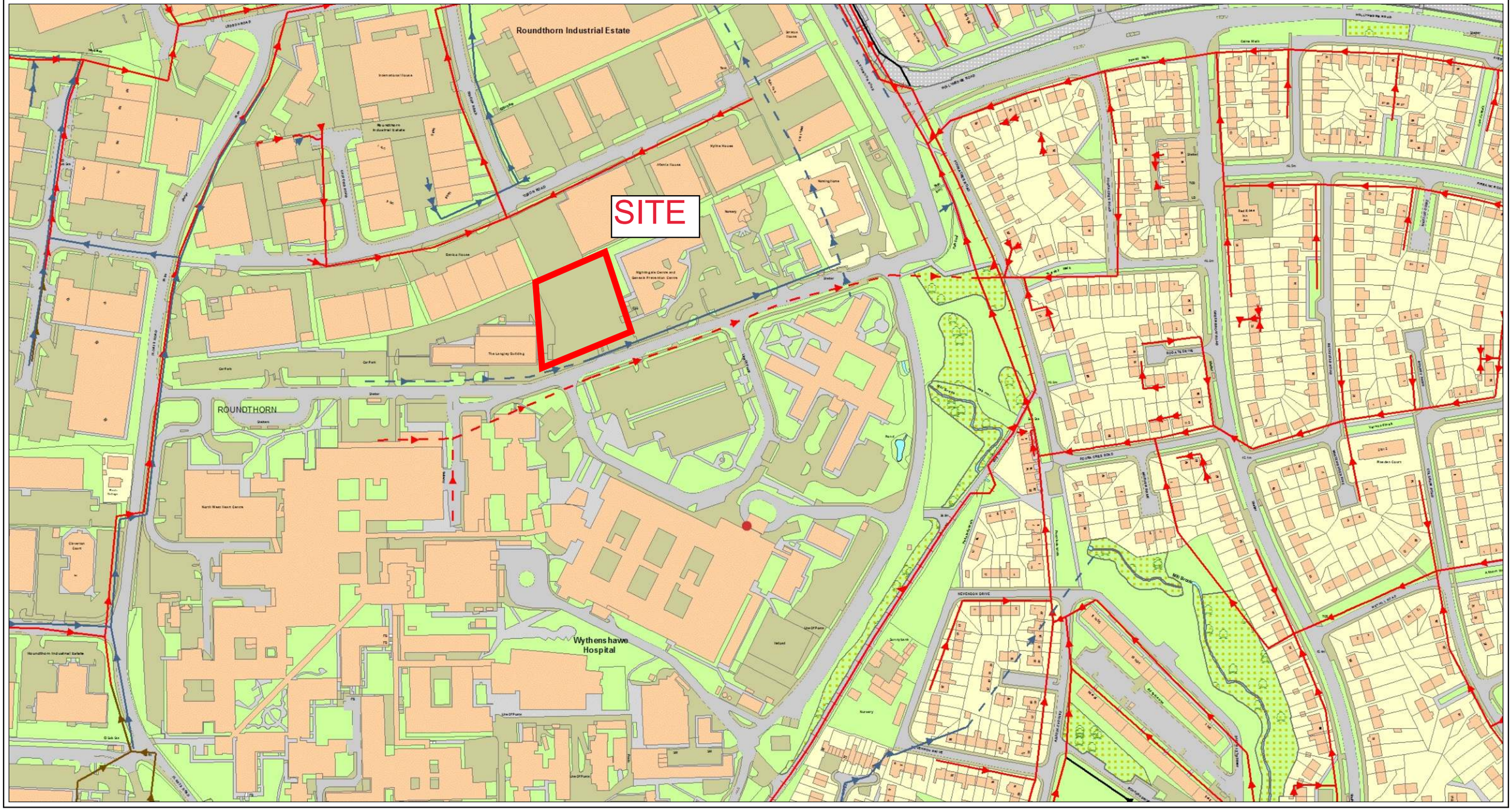
Surveyed	Drawn	Checked
JRA	JRA	JR

Scale	Date	Drawing Ref.	No.	Size	Rev
1:100	09/23	230708	03	A0	-

UU Maps for Safe Dig

Centre : X : 380815 Y : 388157	Date : 30/03/2016 15:17:01	Scale Approx : 2500.0000000003



Extract from maps of United Utilities' Underground Assets

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private service pipes may be shown by a blue broken line. United Utilities Water will not accept liability for any damage caused by the actual position being different from those shown.

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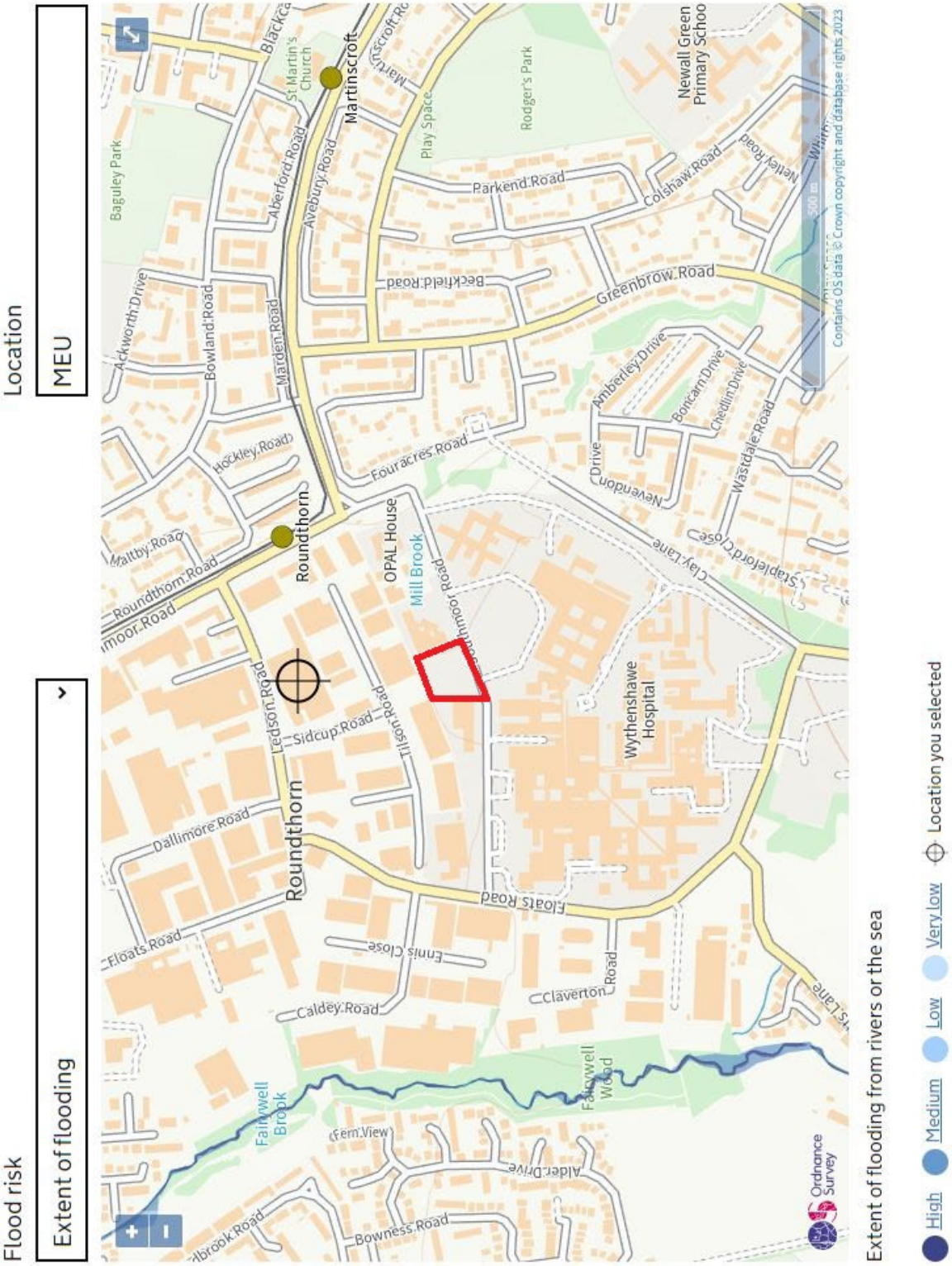
United Utilities

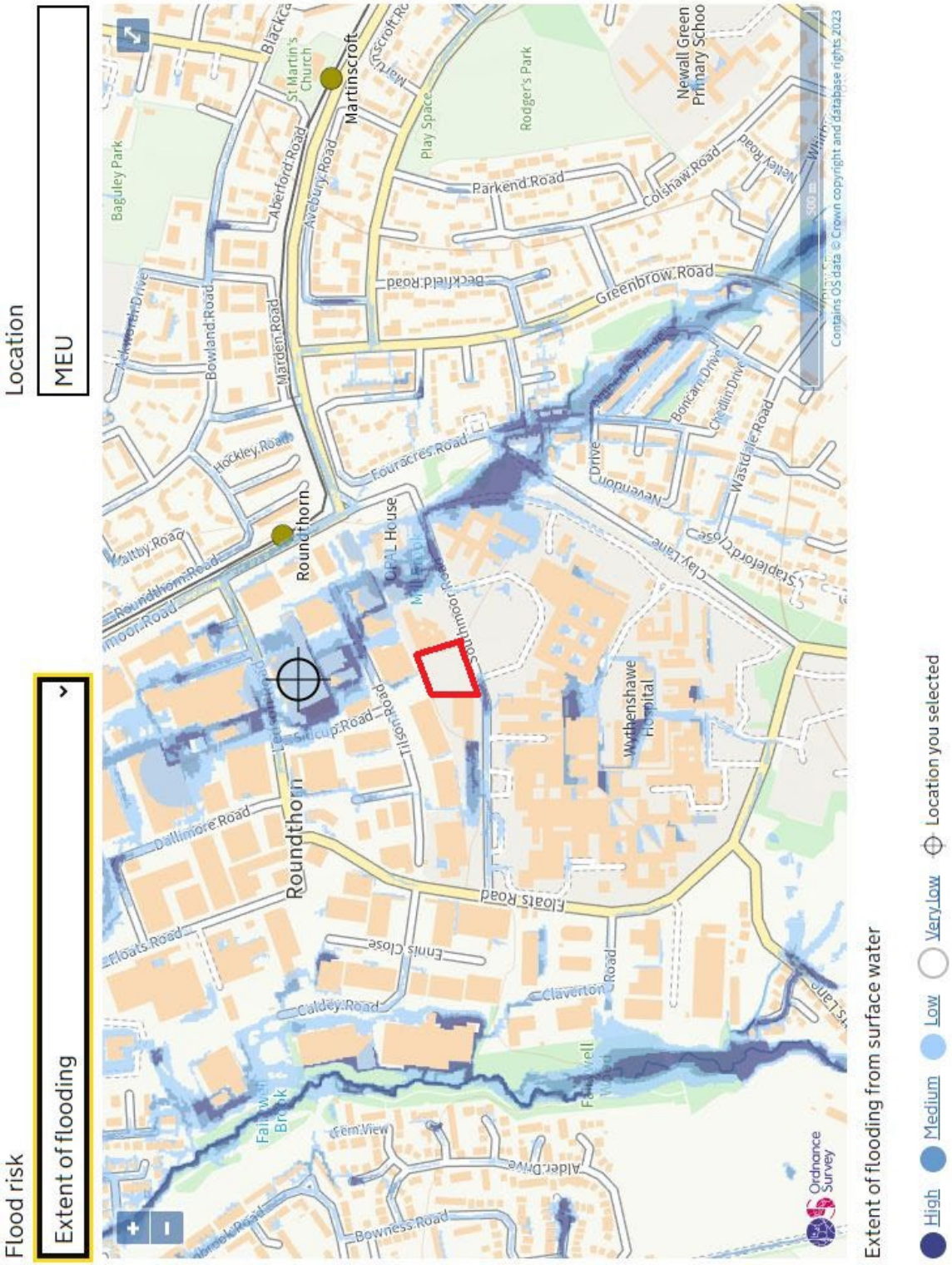
11.2. Appendix B

Environment Agency Flood Maps

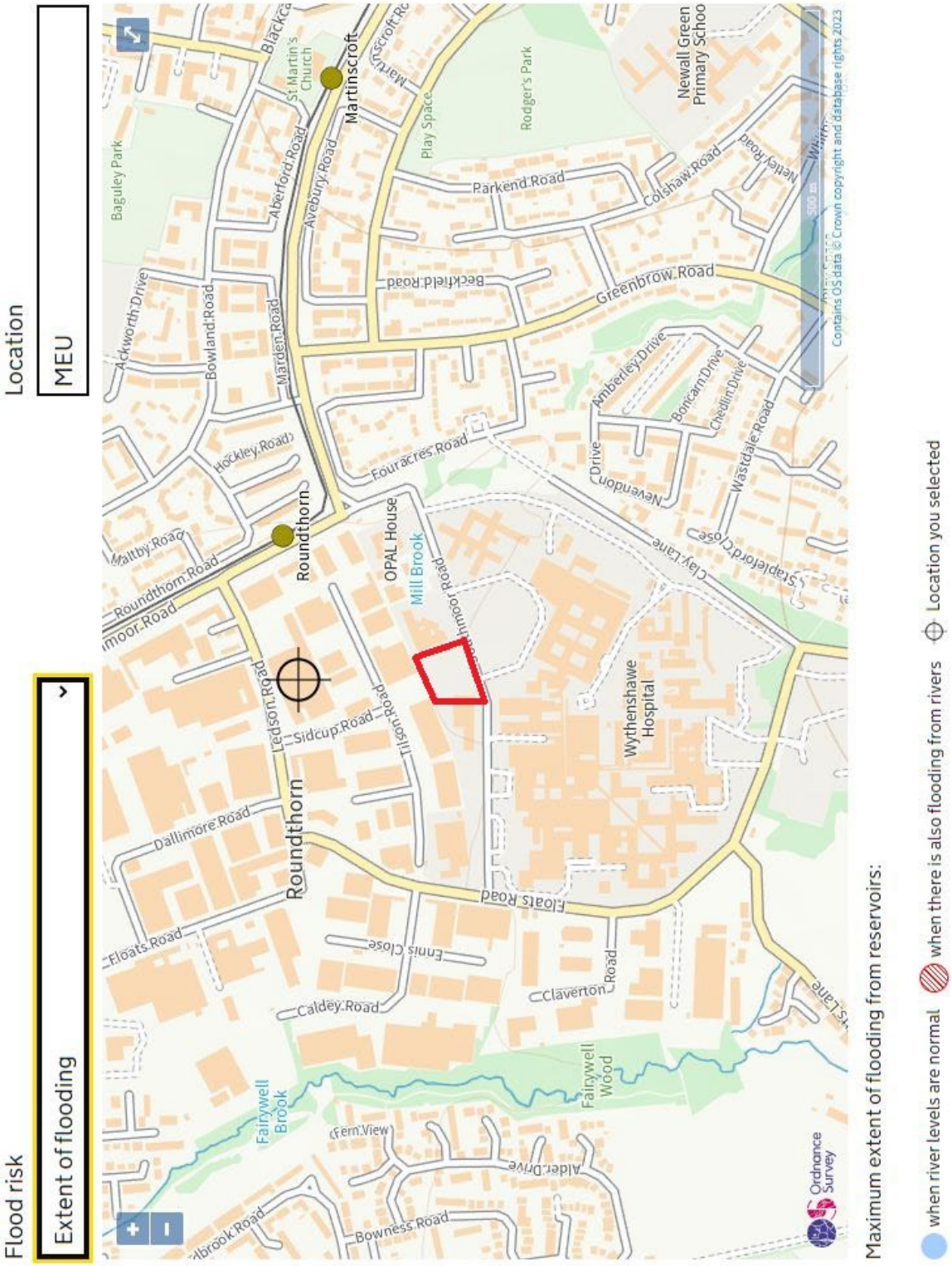
Flooding from River and Sea



Surface Water Flooding



Flooding from Reservoirs



11.3. Appendix C

Correspondence

From:	seweradoptions@uuplc.co.uk
To:	Javier Gonzalez
Subject:	Pre Development Enquiry for: Medicines Evaluation Unit Extension, M23 9QZ UU Reference Number : 04673203
Date:	27 September 2023 15:05:37

Good afternoon Javier ,
Pre Development Enquiry for: Medicines Evaluation Unit Extension, M23 9QZ UU Reference Number : 04673203

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.
If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:
https://www.unitedutilities.com/builders-developers/working-near-our-assets/

Foul Water
Please be advised there is a 600mm private combined sewer to the south of your development on Southmoor Road, we would recommend contacting the owner of this sewer and requesting consent to discharge.
If this is not possible your closest point of discharge would be to the 450mm diameter public combined sewer within Tilson Road located to the North of your proposed development at an unrestricted rate.
If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.
In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water
All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.
Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.
This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The **North West SuDS Pro-Forma** provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.
The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).
The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.
A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.
Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:
https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs
If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:
https://www.gov.uk/government/publications/groundwater-protection-position-statements
Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Highway Drainage
If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer
In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.
Once evidence is provided as outlined above, United Utilities will consider a connection to the 300mm diameter public surface water sewer within located South of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5l/s.
As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels
For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage
United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the pubic sewerage network under any circumstances

Existing Wastewater Assets Crossing the Site
We have reviewed our records and can confirm that there does not appear to be any charted public sewers located within the boundary of proposed development. However, due to the accuracy of the records and the public sewer transfer legislation in 2011, not all public sewers are shown on our records so we would ask that you proceed with caution and carry out your own site investigation works. If any uncharted sewers are identified while carrying out your works we would ask that you contact United Utilities at the earliest opportunity so that we can offer guidance and update our records.

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:
https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/
Kind Regards

Lewis Barr
Assistant Developer Engineer
Developer Services & Metering
Customer Services
07827286541
unitedutilities.com

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---------- Original Message ----------
From: seweradoptions@uuplc.co.uk [seweradoptions@uuplc.co.uk]
Sent: 21/09/2023 13:13
To: javier.gonzalez@sutcliffe.co.uk
Subject: Medicines Evaluation Unit Extension - ref 04673203

Dear Javier

PRE DEVELOPMENT APPLICATION AT: Medicines Evaluation Unit Extension – UU Ref 04673203

Please accept this email as receipt of your application received on 20 September 2023 for the above development. This has now been logged on our system and the job reference is 04673203 we would ask that you quote this reference in all future correspondence.

I have reviewed your application (and attachments) and can confirm this is suitable to be passed to Ashleigh Bellerby for technical assessment. Her contact number is 07826891650. You will receive their response on or before 4 October 2023.

Kind regards

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Did you know we now have a live chat facility available to you Mon to Friday 8 -5pm. You just click on the orange live chat box on our webpage and one of our advisors will be ready to chat to you and help you with your enquiry

11.4. Appendix D

Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	SAAR (mm)	815	Urban	0.000
Area (ha)	0.300	Soil	0.300	Region Number	Region 10

Results	**l/s**
QBAR Rural	0.7
QBAR Urban	0.7
Q100 years	1.4
Q1 year	0.6
Q30 years	1.1
Q100 years	1.4

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.400	Add Flow / Climate Change (%)	0
Ratio R	0.310	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	1.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Surface Network 2

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.177	4-8	0.154	8-12	0.004

Total Area Contributing (ha) = 0.336

Total Pipe Volume (m³) = 63.213

Network Design Table for Surface Network 2

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	16.005	0.064	250.1	0.048	5.00	0.0	0.600	MD4	-12	Pipe/Conduit	
1.001	24.811	0.099	250.6	0.057	0.00	0.0	0.600	MD4	-12	Pipe/Conduit	
1.002	8.794	0.035	251.3	0.000	0.00	0.0	0.600	MD4	-12	Pipe/Conduit	
1.003	33.312	0.150	222.1	0.000	0.00	0.0	0.600	[]	-75	Pipe/Conduit	
1.004	18.156	0.326	55.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	29.169	0.292	99.9	0.060	5.00	0.0	0.600	[]	-77	Pipe/Conduit	
2.001	12.989	0.130	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.47	40.000	0.048	0.0	0.0	0.0	0.57	11.4	8.7
1.001	50.00	6.20	39.936	0.105	0.0	0.0	0.0	0.57	11.4«	19.0
1.002	50.00	6.45	39.837	0.105	0.0	0.0	0.0	0.57	11.4«	19.0
1.003	49.90	6.82	39.790	0.105	0.0	0.0	0.0	1.54	1381.9	19.0
1.004	49.20	7.04	39.590	0.105	0.0	0.0	0.0	1.35	23.9	19.0
2.000	50.00	5.19	39.800	0.060	0.0	0.0	0.0	2.60	2081.8	10.8
2.001	50.00	5.40	39.508	0.060	0.0	0.0	0.0	1.00	17.8	10.8

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Network Design Table for Surface Network 2

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
2.002	18.972	0.114	166.4	0.004	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	19.162	0.096	200.0	0.001	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	7.011	0.035	200.0	0.045	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	30.765	0.154	200.0	0.035	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	25.237	0.121	208.6	0.048	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	36.117	0.451	80.0	0.015	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.009	6.981	0.035	200.0	0.023	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.010	4.114	0.041	100.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
2.002	50.00	5.66	39.228	0.064	0.0	0.0	0.0	1.22	86.0	11.5
1.005	48.32	7.33	39.114	0.170	0.0	0.0	0.0	1.11	78.3	29.6
1.006	48.01	7.43	39.018	0.215	0.0	0.0	0.0	1.11	78.3	37.2
1.007	46.71	7.90	38.983	0.250	0.0	0.0	0.0	1.11	78.3	42.1
1.008	45.68	8.28	38.829	0.298	0.0	0.0	0.0	1.08	76.7	49.1
3.000	50.00	5.54	39.310	0.015	0.0	0.0	0.0	1.12	19.9	2.7
1.009	45.41	8.39	38.708	0.336	0.0	0.0	0.0	1.11	78.3	55.0
1.010	45.24	8.46	38.673	0.336	0.0	0.0	0.0	1.00	17.7«	55.0

Conduit Sections for Surface Network 2

NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \/ open channel, oo dual pipe, ooo triple pipe, O egg.

Section numbers < 0 are taken from user conduit table

Section Number	Conduit Type	Major Dimn. (mm)	Minor Dimn. (mm)	Side Slope (Deg)	Corner Splay (mm)	4*Hyd Radius (m)	XSect Area (m^2)
-12	MD4	100	230			0.128	0.020
-75	[]	3000	300	90.0		0.545	0.900
-77	[]	2000	400	90.0		0.667	0.800

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Area Summary for Surface Network 2

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.048	0.048	0.048
1.001	-	-	100	0.057	0.057	0.057
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.060	0.060	0.060
2.001	-	-	100	0.000	0.000	0.000
2.002	-	-	100	0.004	0.004	0.004
1.005	-	-	100	0.001	0.001	0.001
1.006	-	-	100	0.045	0.045	0.045
1.007	-	-	100	0.035	0.035	0.035
1.008	-	-	100	0.048	0.048	0.048
3.000	-	-	100	0.015	0.015	0.015
1.009	-	-	100	0.023	0.023	0.023
1.010	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.336	0.336	0.336

Free Flowing Outfall Details for Surface Network 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.010	S17	40.543	38.632	0.000	1350	0

Simulation Criteria for Surface Network 2

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	2	Number of Storage Structures	5	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.400	Storm Duration (mins)	30
Ratio R	0.310		

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Online Controls for Surface Network 2

Non Return Valve Manhole: S9, DS/PN: 1.005, Volume (m³): 3.6

ACO Q-Brake Manhole: S16, DS/PN: 1.010, Volume (m³): 5.2

Design Head (m) 1.700 Design Flow (l/s) 5.0 Diameter (mm) 92 Invert Level (m) 38.673

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.9	0.800	3.4	2.000	5.4	4.000	7.6	7.000	10.0
0.200	4.1	1.000	3.8	2.200	5.6	4.500	8.1	7.500	10.4
0.300	4.9	1.200	4.2	2.400	5.9	5.000	8.5	8.000	10.7
0.400	5.0	1.400	4.5	2.600	6.1	5.500	8.9	8.500	11.1
0.500	4.6	1.600	4.8	3.000	6.6	6.000	9.3	9.000	11.4
0.600	3.9	1.800	5.1	3.500	7.1	6.500	9.7	9.500	11.7

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Storage Structures for Surface Network 2

Porous Car Park Manhole: S8, DS/PN: 2.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	18.9
Max Percolation (l/s)	52.5	Slope (1:X)	400.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	39.300	Membrane Depth (mm)	0

Porous Car Park Manhole: S13, DS/PN: 1.008

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	38.5
Max Percolation (l/s)	106.9	Slope (1:X)	400.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	40.200	Membrane Depth (mm)	0

Porous Car Park Manhole: S14, DS/PN: 3.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	28.6
Max Percolation (l/s)	79.4	Slope (1:X)	400.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	40.100	Membrane Depth (mm)	0

Porous Car Park Manhole: S15, DS/PN: 1.009

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	33.2
Max Percolation (l/s)	92.2	Slope (1:X)	400.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	39.900	Membrane Depth (mm)	0

Porous Car Park Manhole: S16, DS/PN: 1.010

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	33.2
Max Percolation (l/s)	92.2	Slope (1:X)	400.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	40.100	Membrane Depth (mm)	0

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Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	S1	0.329	0.320	0.000	0.649
1.001	S2	0.445	0.496	0.000	0.941
1.002	S3	0.560	0.176	0.000	0.736
1.003	S4	0.714	29.981	0.000	30.695
1.004	S5	1.104	0.321	0.000	1.424
2.000	S6	0.945	23.335	0.000	24.280
2.001	S7	1.361	0.230	0.000	1.591
2.002	S8	1.749	1.341	63.865	66.956
1.005	S9	2.106	1.354	0.000	3.460
1.006	S10	2.050	0.496	0.000	2.545
1.007	S11	2.443	2.175	0.000	4.618
1.008	S13	2.634	1.784	48.611	53.029
3.000	S14	1.421	0.638	36.915	38.974
1.009	S15	2.478	0.493	49.551	52.522
1.010	S16	4.812	0.073	42.081	46.966
Total		25.150	63.213	241.024	329.386

Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
1.000	S1	0.329	0.293	0.000	0.622
1.001	S2	0.445	0.469	0.000	0.914
1.002	S3	0.560	0.149	0.000	0.709
1.003	S4	0.714	28.766	0.000	29.480
1.004	S5	1.104	0.297	0.000	1.401
2.000	S6	0.945	22.255	0.000	23.200
2.001	S7	1.361	0.206	0.000	1.567
2.002	S8	1.749	1.246	63.865	66.860
1.005	S9	2.106	1.259	0.000	3.365
1.006	S10	2.050	0.400	0.000	2.450
1.007	S11	2.443	2.079	0.000	4.523
1.008	S13	2.634	1.688	48.611	52.933
3.000	S14	1.421	0.616	36.915	38.952
1.009	S15	2.478	0.382	49.551	52.411
1.010	S16	4.812	0.045	42.081	46.938
Total		25.150	60.150	241.024	326.324

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 5 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.400 Cv (Summer) 0.750
Region England and Wales Ratio R 0.310 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	S1	15 Winter	2	+0%	30/15 Summer	30/15 Summer			40.161	-0.069	0.000
1.001	S2	15 Winter	2	+0%	30/15 Summer	100/15 Winter			40.135	-0.031	0.000
1.002	S3	15 Winter	2	+0%	30/15 Summer				40.041	-0.026	0.000
1.003	S4	15 Winter	2	+0%					39.796	-0.294	0.000
1.004	S5	15 Winter	2	+0%	30/120 Winter				39.663	-0.077	0.000
2.000	S6	15 Winter	2	+0%					39.805	-0.395	0.000
2.001	S7	15 Winter	2	+0%	30/30 Winter				39.586	-0.072	0.000
2.002	S8	120 Winter	2	+0%	30/15 Summer				39.502	-0.026	0.000
1.005	S9	120 Winter	2	+0%	2/30 Winter				39.505	0.091	0.000
1.006	S10	120 Winter	2	+0%	2/15 Winter				39.596	0.278	0.000
1.007	S11	120 Winter	2	+0%	2/15 Summer				39.596	0.313	0.000
1.008	S13	120 Winter	2	+0%	2/15 Summer				39.594	0.465	0.000
3.000	S14	120 Winter	2	+0%	2/30 Winter				39.592	0.132	0.000
1.009	S15	120 Winter	2	+0%	2/15 Summer				39.590	0.582	0.000
1.010	S16	120 Winter	2	+0%	2/15 Summer				39.589	0.766	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	0.49			5.2	FLOOD RISK	14
1.001	S2	1.00			10.9	FLOOD RISK	1
1.002	S3	1.05			10.7	FLOOD RISK	
1.003	S4	0.01			10.7	OK	
1.004	S5	0.47			10.6	OK	
2.000	S6	0.01			9.1	OK	
2.001	S7	0.53			8.6	OK	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.002	S8	0.04		56	3.2	OK	
1.005	S9	0.12			7.9	SURCHARGED	
1.006	S10	0.16			9.3	SURCHARGED	
1.007	S11	0.15			10.5	SURCHARGED	
1.008	S13	0.14		132	9.3	SURCHARGED	
3.000	S14	0.02		50	0.4	SURCHARGED	
1.009	S15	0.11		140	6.5	SURCHARGED	
1.010	S16	0.39		134	5.0	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 5 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.400 Cv (Summer) 0.750
Region England and Wales Ratio R 0.310 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 0

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	S1	15 Winter	30	+0%	30/15 Summer	30/15 Summer			40.233	0.003	3.112
1.001	S2	15 Winter	30	+0%	30/15 Summer	100/15 Winter			40.246	0.080	0.000
1.002	S3	15 Winter	30	+0%	30/15 Summer				40.091	0.024	0.000
1.003	S4	15 Summer	30	+0%					39.799	-0.291	0.000
1.004	S5	360 Winter	30	+0%	30/120 Winter				39.797	0.057	0.000
2.000	S6	15 Winter	30	+0%					39.809	-0.391	0.000
2.001	S7	240 Winter	30	+0%	30/30 Winter				39.808	0.150	0.000
2.002	S8	240 Winter	30	+0%	30/15 Summer				39.814	0.286	0.000
1.005	S9	240 Winter	30	+0%	2/30 Winter				39.930	0.516	0.000
1.006	S10	120 Winter	30	+0%	2/15 Winter				40.055	0.737	0.000
1.007	S11	120 Winter	30	+0%	2/15 Summer				40.054	0.771	0.000
1.008	S13	120 Winter	30	+0%	2/15 Summer				40.051	0.922	0.000
3.000	S14	120 Winter	30	+0%	2/30 Winter				40.050	0.590	0.000
1.009	S15	120 Winter	30	+0%	2/15 Summer				40.047	1.039	0.000
1.010	S16	120 Winter	30	+0%	2/15 Summer				40.045	1.222	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	1.00			10.7	FLOOD	14
1.001	S2	1.29			14.0	FLOOD RISK	1
1.002	S3	1.37			14.0	FLOOD RISK	
1.003	S4	0.01			14.1	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.004	S5	0.23			5.1	SURCHARGED	
2.000	S6	0.01			17.2	OK	
2.001	S7	0.24			3.9	SURCHARGED	
2.002	S8	0.07		153	4.9	SURCHARGED	
1.005	S9	0.09			6.1	SURCHARGED	
1.006	S10	0.17			9.7	SURCHARGED	
1.007	S11	0.15			10.9	SURCHARGED	
1.008	S13	0.17			11.9	SURCHARGED	
3.000	S14	0.07		122	1.3	SURCHARGED	
1.009	S15	0.12		52	7.0	SURCHARGED	
1.010	S16	0.39			5.0	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 5 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.400 Cv (Summer) 0.750
Region England and Wales Ratio R 0.310 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 0

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	S1	30 Winter	100	+0%	30/15 Summer	30/15 Summer			40.237	0.007	6.612
1.001	S2	15 Winter	100	+0%	30/15 Summer	100/15 Winter			40.247	0.081	0.203
1.002	S3	15 Summer	100	+0%	30/15 Summer				40.091	0.024	0.000
1.003	S4	480 Winter	100	+0%					39.911	-0.179	0.000
1.004	S5	480 Winter	100	+0%	30/120 Winter				39.911	0.171	0.000
2.000	S6	360 Winter	100	+0%					39.917	-0.283	0.000
2.001	S7	360 Winter	100	+0%	30/30 Winter				39.917	0.259	0.000
2.002	S8	360 Winter	100	+0%	30/15 Summer				39.919	0.391	0.000
1.005	S9	360 Winter	100	+0%	2/30 Winter				40.029	0.615	0.000
1.006	S10	120 Winter	100	+0%	2/15 Winter				40.153	0.835	0.000
1.007	S11	120 Winter	100	+0%	2/15 Summer				40.152	0.869	0.000
1.008	S13	120 Winter	100	+0%	2/15 Summer				40.148	1.019	0.000
3.000	S14	120 Winter	100	+0%	2/30 Winter				40.145	0.685	0.000
1.009	S15	120 Winter	100	+0%	2/15 Summer				40.143	1.135	0.000
1.010	S16	120 Winter	100	+0%	2/15 Summer				40.141	1.318	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	1.01			10.9	FLOOD	14
1.001	S2	1.28			14.0	FLOOD	1
1.002	S3	1.39			14.2	FLOOD RISK	
1.003	S4	0.00			5.4	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.004	S5	0.23			5.1	SURCHARGED	
2.000	S6	0.00			3.8	OK	
2.001	S7	0.21			3.4	SURCHARGED	
2.002	S8	0.06		254	4.6	SURCHARGED	
1.005	S9	0.09			5.8	SURCHARGED	
1.006	S10	0.16			8.9	FLOOD RISK	
1.007	S11	0.15			10.3	SURCHARGED	
1.008	S13	0.24			16.6	SURCHARGED	
3.000	S14	0.10		36	1.8	SURCHARGED	
1.009	S15	0.13		80	7.4	FLOOD RISK	
1.010	S16	0.39			5.0	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 5 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.400 Cv (Summer) 0.750
Region England and Wales Ratio R 0.310 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 100
Climate Change (%) 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
1.000	S1	30 Winter	100	+45%	100/15 Summer	100/15 Summer			40.244	0.014	13.713
1.001	S2	15 Winter	100	+45%	100/15 Summer	100/15 Summer			40.250	0.084	3.303
1.002	S3	480 Winter	100	+45%	100/15 Summer				40.197	0.130	0.000
1.003	S4	480 Winter	100	+45%	100/360 Winter				40.193	0.103	0.000
1.004	S5	480 Winter	100	+45%	100/15 Summer				40.193	0.453	0.000
2.000	S6	480 Winter	100	+45%					40.191	-0.009	0.000
2.001	S7	480 Winter	100	+45%	100/15 Summer				40.191	0.533	0.000
2.002	S8	480 Winter	100	+45%	100/15 Summer				40.188	0.660	0.000
1.005	S9	360 Winter	100	+45%	100/15 Summer				40.224	0.810	0.000
1.006	S10	60 Winter	100	+45%	100/15 Summer				40.285	0.967	0.000
1.007	S11	60 Winter	100	+45%	100/15 Summer				40.279	0.996	0.000
1.008	S13	60 Winter	100	+45%	100/15 Summer				40.245	1.116	0.000
3.000	S14	240 Winter	100	+45%	100/15 Summer				40.235	0.775	0.000
1.009	S15	120 Winter	100	+45%	100/15 Summer				40.236	1.228	0.000
1.010	S16	120 Winter	100	+45%	100/15 Summer				40.234	1.411	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	1.04			11.1	FLOOD	10
1.001	S2	1.29			14.0	FLOOD	5
1.002	S3	0.76			7.8	FLOOD RISK	
1.003	S4	0.01			7.7	FLOOD RISK	
1.004	S5	0.26			5.9	FLOOD RISK	
2.000	S6	0.00			4.4	FLOOD RISK	
2.001	S7	0.19			3.1	FLOOD RISK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.002	S8	0.04		448	3.3	FLOOD RISK	
1.005	S9	0.07			4.9	SURCHARGED	
1.006	S10	0.24			13.5	FLOOD RISK	
1.007	S11	0.32			23.0	SURCHARGED	
1.008	S13	0.54			36.9	SURCHARGED	
3.000	S14	0.08		100	1.6	SURCHARGED	
1.009	S15	0.24			13.5	FLOOD RISK	
1.010	S16	0.39		78	5.0	SURCHARGED	

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