Appendix A Topographical Survey



Coordinate Table

Station	Description	Eastings	Northings	Height
G1	Nail	494096.7440	104195.4050	9.0150
G2	Nail	494122.7496	104200.4581	8.8855
G4	Nail	494131.9778	104220.5183	8.8498
X3	Nail	494160.5880	104198.6400	8.4000
X8	Nail	494122.4338	104146.5085	8.6788
W2	Nail	494021.3660	104195.3230	9.4000

Datum Details

Grid Datum: National Grid. Level Datum: Ordnance Datum

All levels refer to Permanent Ordnance Survey GPS Stations and related to Ordnance Datum Newlyn via the geoid model OSGM02.

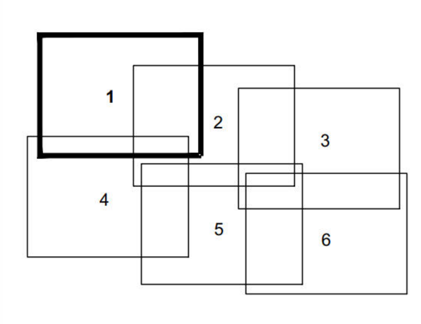
Surveyed 10/03/2020

Note

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N

Sheet Layout



LEGEND

SURVEY STATION — A
BANKING — TOP / BOTTOM
BUSHES
HEDGES
TREES — Species, Girth, Height (Spread to scale)
GATE — GP
BUILDING
FENCES

Fence	Code
POST & RAIL FENCE	PRF
BARBED WIRE FENCE	BWF
CHAIN LINK FENCE	CLF
CLOSE BOARD FENCE	CBF
POST & WIRE FENCE	PWF
IRON RAILING FENCE	IRF
WIRE MESH FENCE	WMF
LARCH LAP FENCE	LLF
CHESTNUT PALING FENCE	CPF
INTERWOVEN FENCE	IWF

SECURITY FENCE

Service	Symbol
DETECTED ELECTRIC	E
DETECTED GAS	G
DETECTED TELECOMS	T
EXISTING U/G SERVICES	US
DETECTED WATER	W
DETECTED STORM WATER	SW
DETECTED FOUL WATER	FW
DETECTED POWER CABLES	

ORDNANCE SURVEY BENCH MARK — OSBM Value 12.470
TEMPORARY BENCH MARK — TBM Value 87.55

Feature	Code
AIR VALVE	AV
BELISHA BEACON	BB
BOLLARD	BD
BORE HOLE	BHL
BED LEVEL	BL
BOUNDARY POST	BP
BUS STOP	BS
BT INSPECTION COVER	BT
BRITISH TELECOM BOX	BTB
CABLE TV INSPECTION COVER	CTV
CATCH PIT	CP
COVER LEVEL	CL
DOWN PIPE	DP
DROPPED KERB	DK
ELECTRICITY CABLE PIT	EC
ELECTRICITY CONTROL BOX	ECB
EAVES HEIGHT	EH
ELECTRICITY POLE	EP
EARTH ROD	ER
FIRE HYDRANT	FH
FINISHED FLOOR LEVEL	FFL
FOUL WATER	FW
GULLY	GY
GATE POST	GP
GAS VALVE	GV
INSPECTION COVER	IC
INVERT LEVEL	IL
KERB OUTLET	KO
LAMPPOST	LP
LITTER BIN	LB
MANHOLE	MH
SERVICE MARKER POST	MK
PIPE LINE	PL
ELECTRICITY PYLON	PYL
PARKING METER	PM
RODDING EYE	RE
RIDGE HEIGHT	RH
ROAD NAMEPLATE	RN
ROAD SIGN	RS
SOFFIT LEVEL	SF
STOP TAP	ST
STAY	SY
STORM WATER	SW
WATER TAP	Tap
TELEPHONE CALL BOX	TCB
THRESHOLD LEVEL	THL
TRAFFIC LIGHT	TL
TELEGRAPH POLE	TP
UNABLE TO LIFT	UTL
VENT PIPE	VP
WATER LEVEL	WL
WATER METER	WM
WASHOUT	WO
SPOT LEVEL	+ 127.13
OVERHEAD BT CABLES	T
OVERHEAD POWER CABLES	

Rev:	Notes:	Name:	Date:

GREEN WORLD SURVEYS LTD

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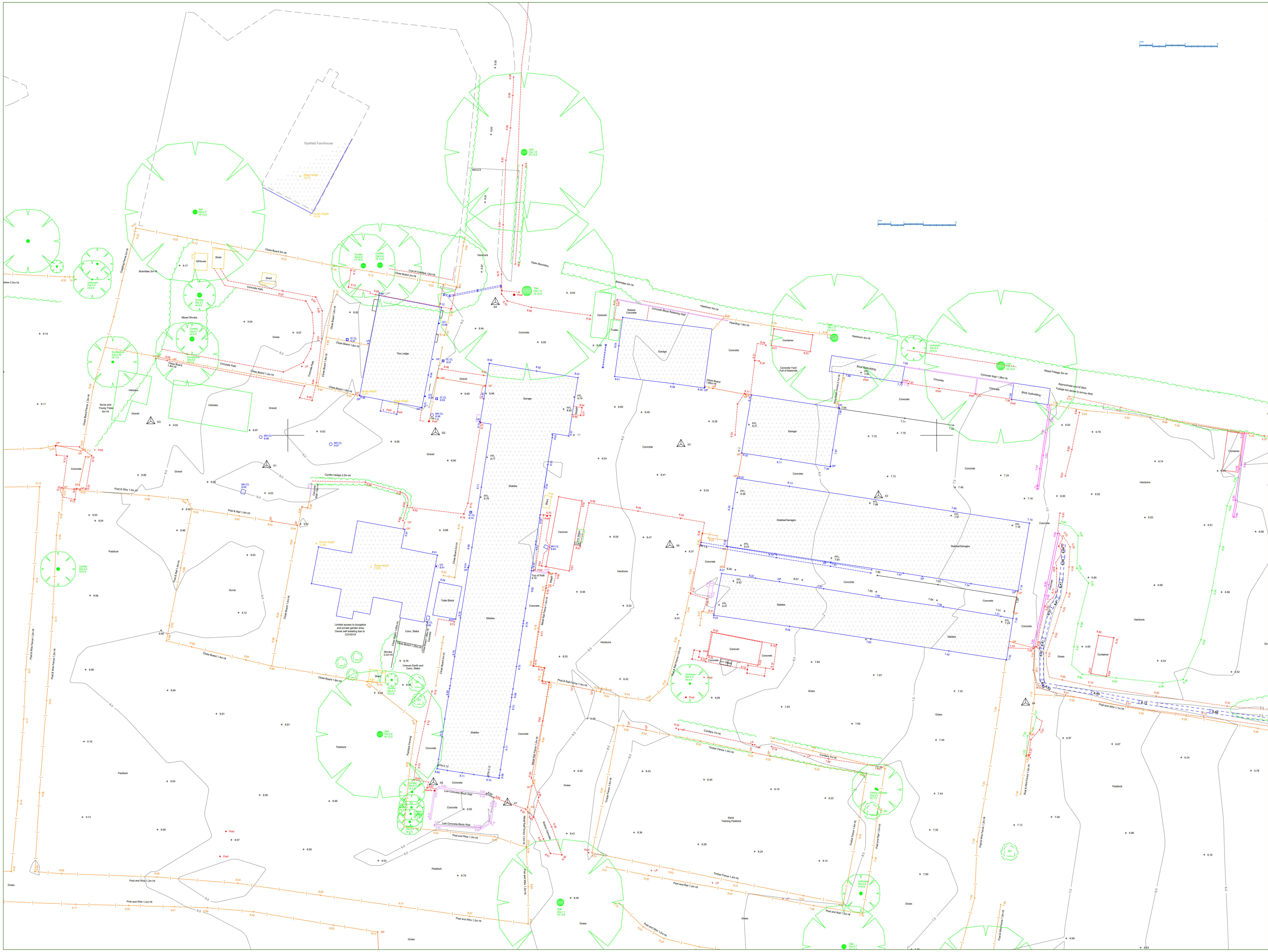
Title:

TOPOGRAPHICAL SURVEY
Land at Woodgate Centre
Westergate

Client:

PYE HOMES OFFICES
LANGFORD LOCKS
KIDLINGTON
OXON
OX5 1HZ

Drawing No:			Rev:
PYE/GW0164/1			
Drawn: CW	Checked: SPM	Scale: 1:200@A0	Date: 09/04/2020
CAD Reference: PYE-W0164-1.DWG	Sheet: 1 of 6		



Coordinate Table				
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Surveyed 10/03/2020

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N

Sheet Layout

1 2 3 4 5 6

LEGEND

SURVEY STATION A
BANKING TOP BOTTOM
BUSHES
HEDGES
TREES Species Girth Height (Spread to scale)
GATE GP
BUILDING
FENCES

POST & RAIL FENCE	PRF
BARBED WIRE FENCE	BWF
CHAIN LINK FENCE	CLF
CLOSE BOARD FENCE	CBF
POST & WIRE FENCE	PWF
IRON RAILING FENCE	IRF
WIRE MESH FENCE	WMF
LARCH LAP FENCE	LLF
CHESTNUT PALING FENCE	CPF
INTERWOVEN FENCE	IWF

SECURITY FENCE
DETECTED ELECTRIC — E —
DETECTED GAS — G —
DETECTED TELECOMS — T —
EXISTING U/G SERVICES — US —
DETECTED WATER — W —
DETECTED STORM WATER — SW —
DETECTED FOUL WATER — FW —
DETECTED POWER CABLES
ORDNANCE SURVEY BENCH MARK — OSBM Value 12.470
TEMPORARY BENCH MARK — TBM Value 87.55

AIR VALVE	AV
BELISHA BEACON	BB
BOLLARD	BD
BORE HOLE	BHL
BED LEVEL	BL
BOUNDARY POST	BP
BUS STOP	BS
BT INSPECTION COVER	BT
BRITISH TELECOM BOX	BTB
CABLE TV INSPECTION COVER	CTV
CATCH PIT	CP
COVER LEVEL	CL
DOWN PIPE	DP
DROPPED KERB	DK
ELECTRICITY CABLE PIT	EC
ELECTRICITY CONTROL BOX	ECB
EAVES HEIGHT	EH
ELECTRICITY POLE	EP
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FOUL WATER	FW
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INSPECTION COVER	IC
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KERB OUTLET	KO
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MANHOLE	MH
SERVICE MARKER POST	MK
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WATER LEVEL	WL
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WASHOUT	WO
SPOT LEVEL	+ 127.13
OVERHEAD BT CABLES	— T — T —
OVERHEAD POWER CABLES	

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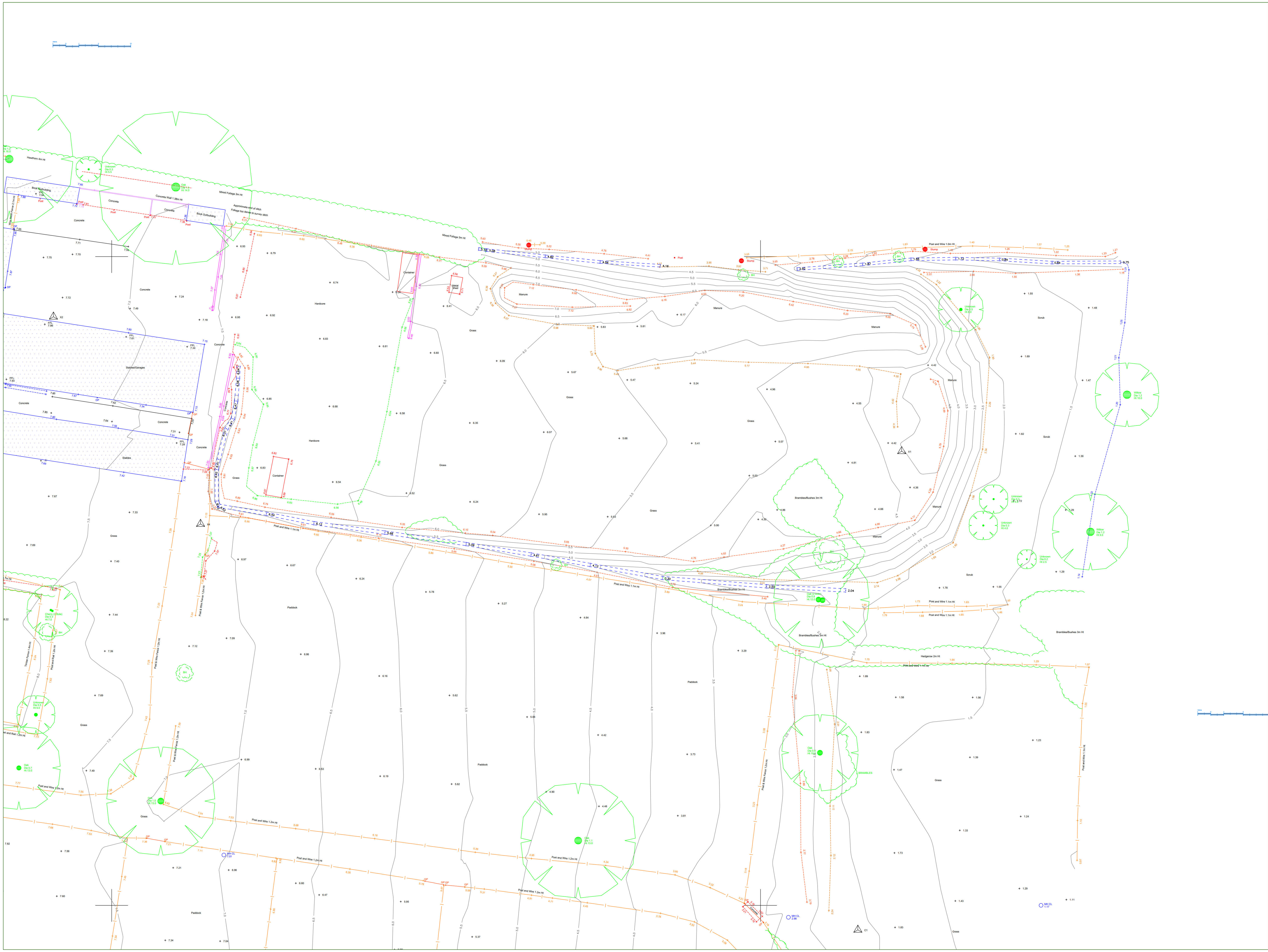
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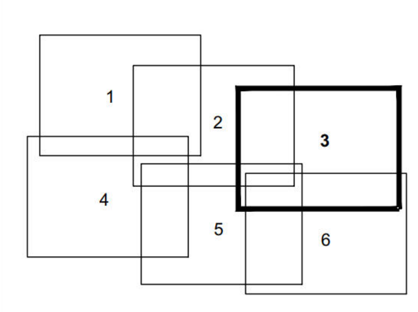
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LEGEND

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BANKING TOP BOTTOM
BUSHES
HEDGES
TREES Species Girth Height (Spread to scale)
GATE GP
BUILDING
FENCES

POST & RAIL FENCE	PRF
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CHESTNUT PALING FENCE	CPF
INTERWOVEN FENCE	IWF

SECURITY FENCE —x—x—

DETECTED ELECTRIC —E—
DETECTED GAS —G—
DETECTED TELECOMS —T—
EXISTING U/G SERVICES —US—
DETECTED WATER —W—
DETECTED STORM WATER —SW—
DETECTED FOUL WATER —FW—
DETECTED POWER CABLES

ORDNANCE SURVEY BENCH MARK — OSBM Value 12.470
TEMPORARY BENCH MARK — TBM Value 87.55

AIR VALVE	AV
BELISHA BEACON	BB
BOLLARD	BD
BORE HOLE	BHL
BED LEVEL	BL
BOUNDARY POST	BP
BUS STOP	BS
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BRITISH TELECOM BOX	BTB
CABLE TV INSPECTION COVER	CTV
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SOFFIT LEVEL	SF
STOP TAP	ST
STAY	SY
STORM WATER	SW
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WATER METER	WM
WASHOUT	WO
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OVERHEAD BT CABLES —T—T—
OVERHEAD POWER CABLES

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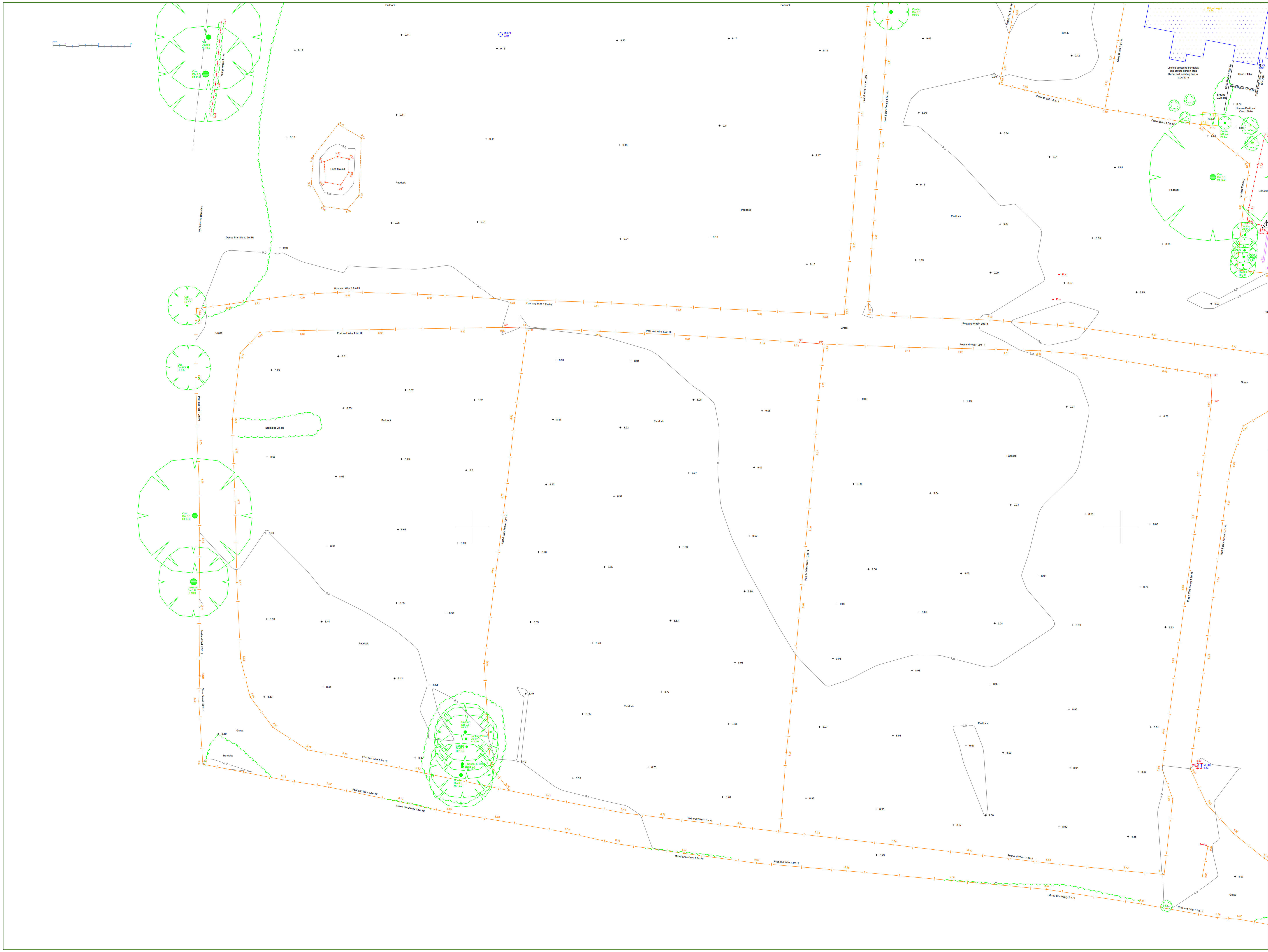
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PYE-W0164-1.DWG	3 of 6



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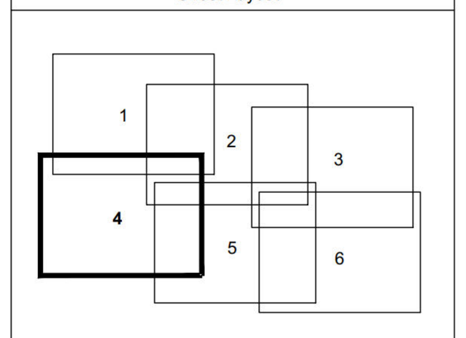
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OVERHEAD BT CABLES	— T — T —
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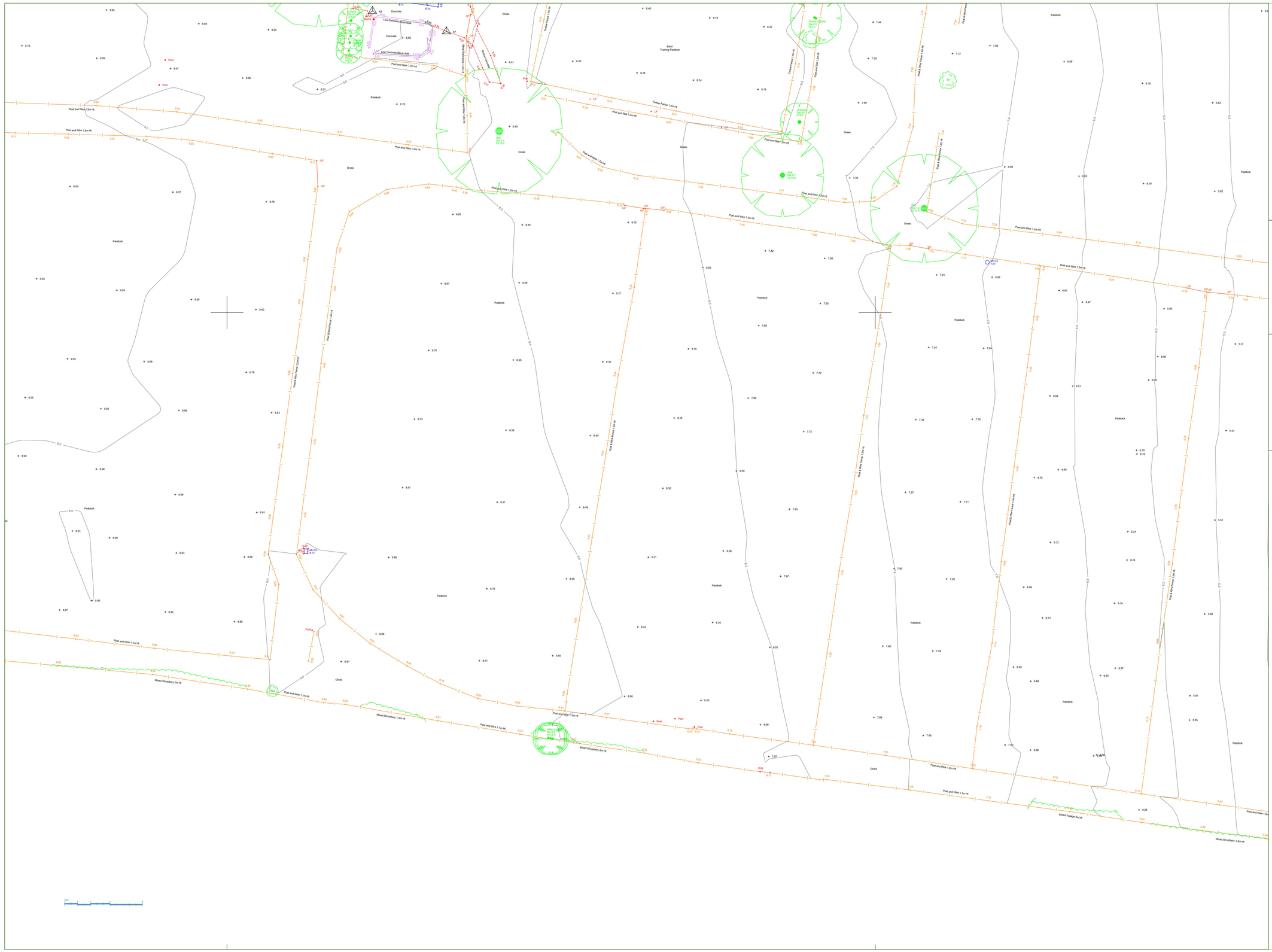
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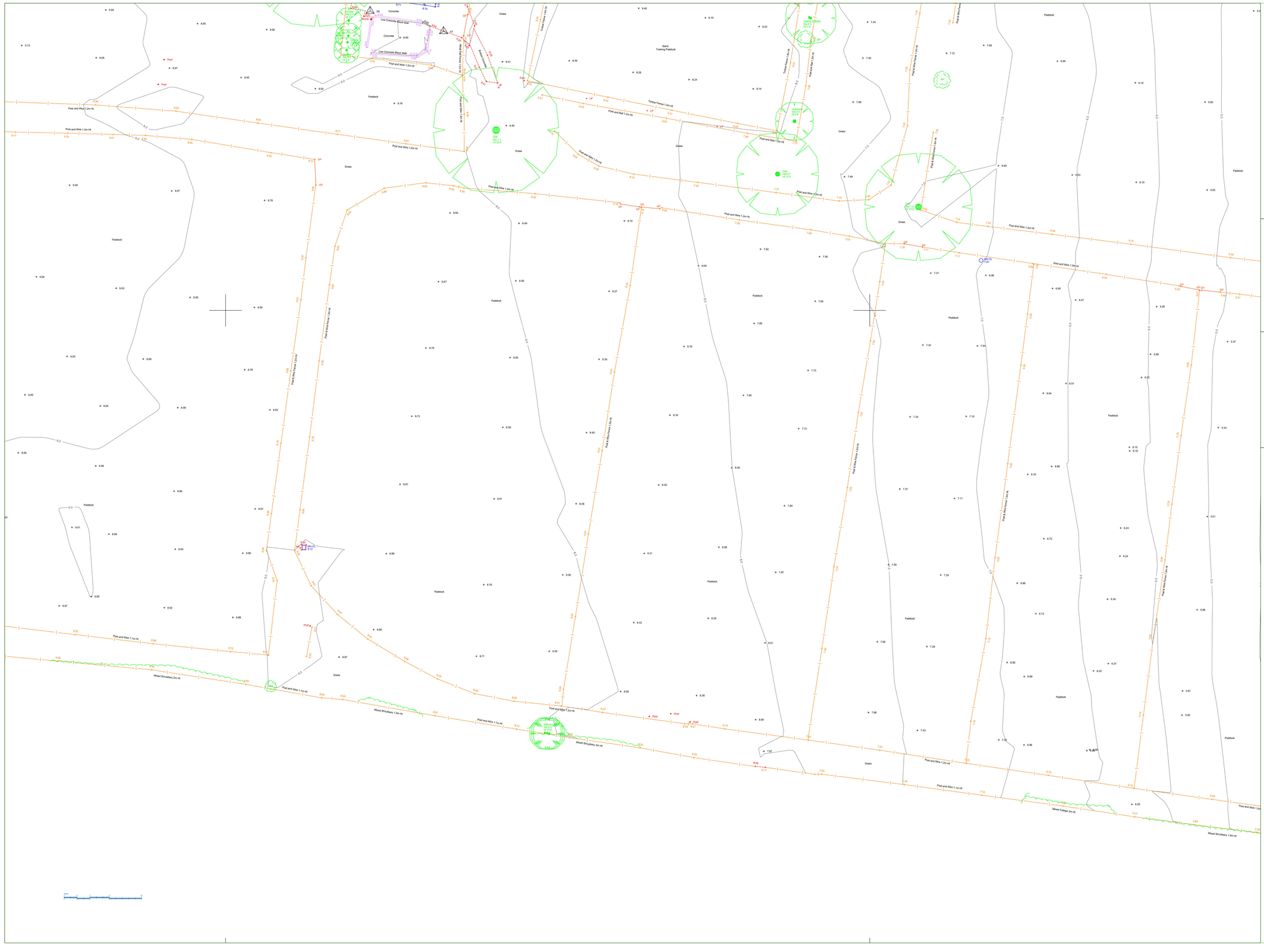
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4
5
6
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SURVEY STATION
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BT INSPECTION COVER BTI
BRITISH TELECOM BOX BTB
CABLE TV INSPECTION COVER CTV
CATCH PIT CP
COVER LEVEL CL
DRAIN DR
DROPPED KERB DK
ELECTRICITY CABLE PIT EC
ELECTRICITY CONTROL BOX ECB
EAVES HEIGHT EH
ELECTRICITY POLE EP
EARTH ROD ER
FLOOD LIGHT FL
FINISHED FLOOR LEVEL FFL
FOUL WATER FW
GULLY GY
GATE POST GP
GAS VALVE GV
INSPECTION COVER IC
INVERT LEVEL IL
KERB OUTLET KO
LAMPPOST LP
LITTER BIN LB
MANHOLE MH
MILEPOST / MARKER POST MP
PIPE LINE PL
ELECTRICITY PYLON PYL
PARKING METER PM
RODDING EYE RE
RIDGE HEIGHT RH
ROAD NAMEPLATE RN
SIGNPOST SP
SOFFIT LEVEL SF
STOP TAP ST
STAY SY
STORM WATER MANHOLE SW
TELEPHONE CALL BOX TCB
THRESHOLD LEVEL THL
TRAFFIC LIGHT TL
TELEGRAPH POLE TP
UNABLE TO LIFT UTL
VENT PIPE VP
WATER LEVEL WL
WATER METER WM
WASHOUT WO
SPOT LEVEL + 127.13
OVERHEAD BT CABLES
OVERHEAD POWER CABLES
Rev: | Notes: | Name: | Date:
GREEN WORLD SURVEYS LTD
GREEN WORLD SURVEYS LTD - Land & Engineering Surveyors
Unit 22, Stockwood Business Park, Stockwood
Redditch, Worcestershire, B98 6SX
Tel: 01386 791042
E-Mail: steve.mcbennett@greenworldsurveys.co.uk
Title:
TOPOGRAPHICAL SURVEY
Land at Woodgate Centre
Westergate
Client:
PYE HOMES OFFICES
LANGFORD LOCKS
KIDLINGTON
OXON
OX5 1HZ
Drawing No: PYE/GW0164/1
Rev:
Drawn: CW
Checked: SPM
Scale: 1:200@A0
Date: 09/04/2020
CAD Reference: PYE-W0164-1.DWG
Sheet: 6 of 6

Equipment Information

Equipment	Manufacturer	Model	Serial Number	MKS REF	Date of Calibration
EML Tx Transmitter	SPX Radiodetection	RD8000	10/TX-10B-5221	RD10	11/12/2020
EML Rx Receiver	SPX Radiodetection	RD8000	10/8KPDLB-14596	RD10	11/12/2020
GPR	Leica IDS	Opera DS2000	010-20-000637	GPR18	13/01/2021

DETECTION SURVEY REPORT

GENERAL
This survey was carried out in accordance with PAS 128:2014 (Publicly Available Specification from BSI). After a pre-survey consultation with the client it was agreed to carry out the detection survey using methodology M1 as per Table 2 of the PAS 128:2014. The survey boundary has been shown on the drawing; please see linestyle section of the key for reference.

DESKTOP UTILITY REPORT
In addition the client has provided MK Surveys with historical record information. As per PAS 128:2014 this record information is classed as historical and must be referenced with extreme caution. There is no guarantee of the completeness and accuracy of this information. Site staff provided further local knowledge.

DETECTION SURVEY
DRAINAGE
Drainage was lifted with pipe sizes and invert levels recorded. Wherever possible the chamber sizes have been recorded and positioned on the drawing. All connections from gullies, external rainwater pipes and external soil stacks have been proven wherever possible into manholes and sewer runs by radio sonde location and/or GPR. Where a saddle connection is present the position is assumed only until proven to QB2 or above. In instances where other detection methods were unsuccessful connections between manholes have been assumed to be straight and labelled as QB4. All drainage should be cross checked in critical areas by CCTV survey or verification survey type A. MH9102 was unable to be located with a metal detector. We have traced a foul water pipe out of MH8 but due to the pipe being blocked we were unable to trace the full route of the pipe.

WATER
Water utilities located using EML with electronically derived depths or GPR derived depths to the crown of the pipe. Where utilities have not been successfully detected, the position has been drawn in relation to the supplied utility records information. Recommend trial excavations to confirm depth and position in critical areas.

GAS
Gas utilities located using GPR derived depths to the crown of the pipe. Where utilities have not been successfully detected, the position has been drawn in relation to the supplied utility records information. Recommend trial excavations to confirm depth and position in critical areas.

ELECTRICITY
Electric cables within the survey area have been located using EML methods with electronically derived depths recorded. Unable to confirm amount of cables within ducts from surface inspection. Record information shows a 11KV HV cable in the caravan park to the south of the site. Survey result confirms this doesn't enter the site boundary. Recommend trial excavations to confirm depths and position in critical areas.

TELECOM
Telecom ducts have been traced with depths recorded. Due to laws protecting British Telecom apparatus all ducts have been located using remote detection techniques only and compared with record information. Chamber sizes have been recorded using GPR techniques wherever possible. For further information regarding BT apparatus please contact Openreach directly.

CATV
No evidence of CATV Network identified during the survey. Records information can confirm this.

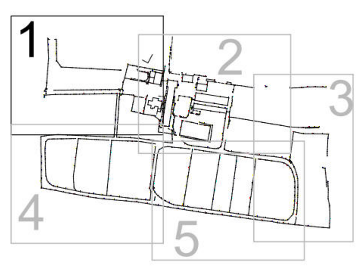
UNKNOWNS
Some unknown targets identified on the drawing using GPR are classified as "non-linear targets". These are not consistent with what we expect to see when identifying a buried utility, and appear on the drawing as single targets with depths (i.e. not linking two or more depth readings). This does not mean they are not utilities, we are just unable to positively identify them as a utility. We would strongly recommend that further verification surveys (PAS 128:2014 survey type A) are carried out to identify these targets in critical areas. All unknown anomalies were located using EML or GPR techniques. Recommend trial excavations to confirm identity position and depths in critical areas.

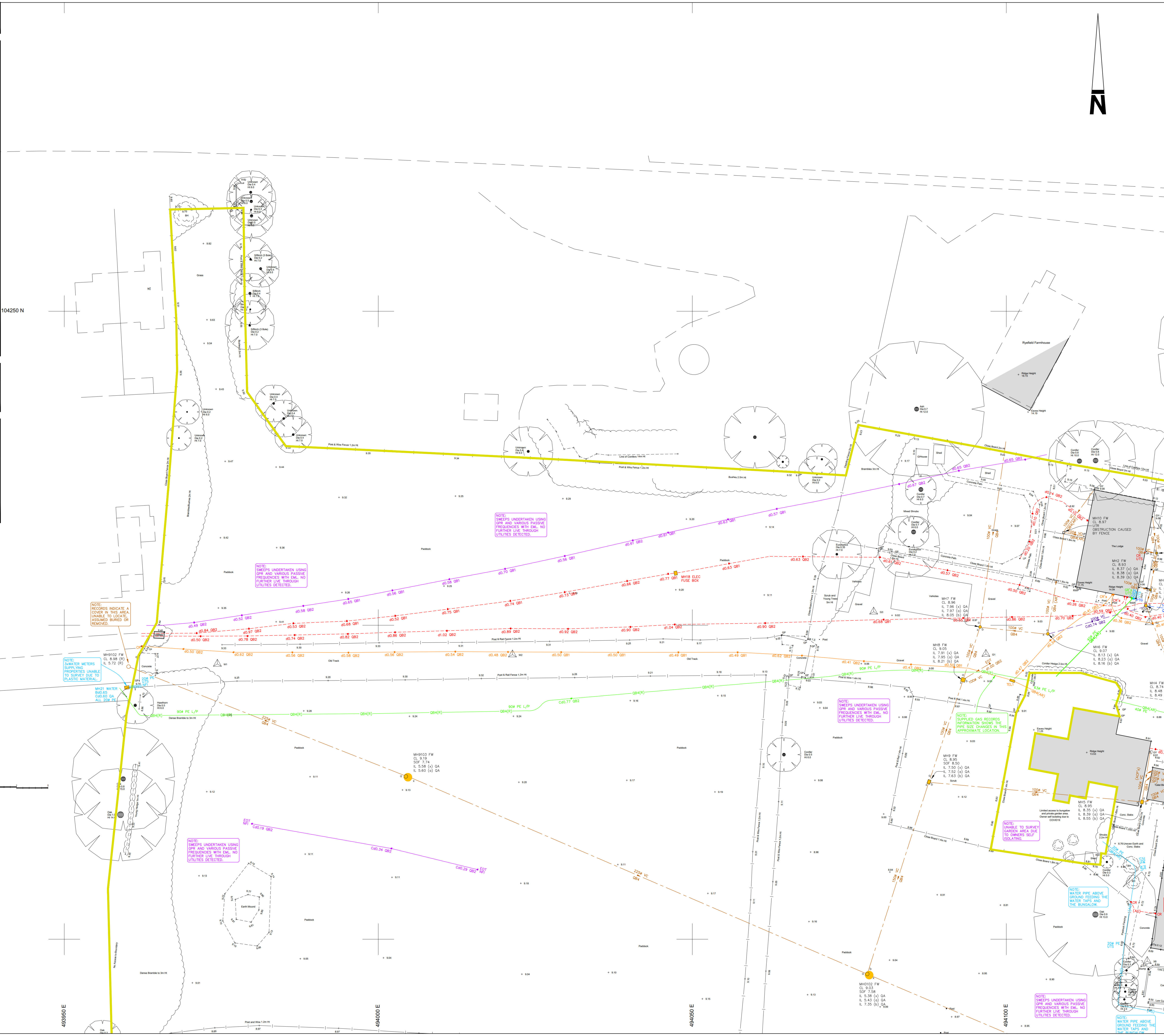
SEE CAUTIONARY NOTES WITHIN THE UTILITY KEY

Desktop Utility Records

Utility Type	Provider Details	Date Acquired
Drainage	Southern Water	25/11/2020
Water	Portsmouth Water	23/11/2020
Gas	Southern Gas Network	24/11/2020
Electricity	Scottish and Southern Electricity Networks	23/11/2020
Telecom	Openreach	24/11/2020
CATV	Virgin Media	Not Applicable

Sheet Layout: (Not to Scale)





Notes :

1. UTILITY AND SERVICE INFORMATION ADDED TO TOPOGRAPHICAL SURVEY PRODUCED BY GREEN WORLD SURVEYS LTD . JOB No.PYE/GW0164/1. DATE APRIL 2020. NO SITE VERIFICATION CARRIED OUT BY MK SURVEYS.
2. THIS SURVEY SHOULD ALWAYS BE READ IN CONJUNCTION WITH THE DESKTOP UTILITY REPORT, THAT WAS CARRIED OUT AS A PREREQUISITE TO THE DETECTION SURVEY.

KEY

GENERAL

Av.	AVERAGE
COW	CABLE ON WALL
CW	COMBINED WATER
DIS	DISUSED
DK	DROP KERB
EML	ELECTROMAGNETIC LOCATOR
EOT	END OF TRACE
FO	FIBRE OPTIC
FP	FOOTPATH
FW	FOUL WATER
GP	GATE POST
GPR	GROUND PENETRATING RADAR
HB	HARD BED
H/P	HIGH PRESSURE
HV	HIGH VOLTAGE
KV	KILO VOLT
I/P	INTERMEDIATE PRESSURE
L/P	LOW PRESSURE
LV	LOW VOLTAGE
M/P	MEDIUM PRESSURE
NDI	NO DEPTH INFORMATION
NFI	NO FURTHER INFORMATION
NDV	NO DUCTS VISIBLE
NPV	NO PIPES VISIBLE
OSBM	ORDNANCE SURVEY BENCHMARK
POW	PIPE ON WALL
P.BOX	POST BOX
RED	REDUNDANT SERVICE
RW	RETAINING WALL
SB	SOFT BED
SNP	STREET NAME PLATE
SW	SURFACE WATER
TAC	TACTILE PAVING
TOW	TOP OF WALL
TW	TRADE EFFLUENT WATER
UTL	UNABLE TO LOCATE
UTR	UNABLE TO RAISE
UTS	UNABLE TO SURVEY

APPARATUS

ACU	AIR CONDITIONING UNIT
AV	AIR VALVE
BB	BELISHA BEACON
BO	BOLLARD
BOL	BOLLARD LIGHT
BS	BUS STOP
CATV	CABLE TELEVISION
CB	CONTROL BOX
CCB	CROSSING CONTROL BUTTON
CP	CATCH PIT
CR	CABLE RISER
DCH	DRAINAGE CHANNEL
EB	ELECTRIC CONTROL BOX
EP	ELECTRIC POLE
ER	EARTH ROD
FD	FILTER DRAIN
FFP	FUEL TANK FILL POINT
FH	FIRE HYDRANT
GR	GAS RISER
GV	GAS VALVE
GY	GULLY
IC	INSPECTION COVER
INT	INTERCEPTOR
IT	INLET
KO	KERB OUTLET
LD	LOOP DETECTOR
LH	LAMP HOLE
LP	LAMP POST
MH	MANHOLE
MK	MARKER POST / PLATE
MT	METER
MW	MONITORING WELL
OL	OUTLET
OU	OUTFALL
PO	POST
PTG	PIPE TO GROUND
PTS	PIPE TO SURFACE
PU	PUMP
RE	RODDING EYE
RS	ROAD SIGN
RM	RISING MAIN
RWP	RAIN WATER PIPE
SC	STOP COCK
SO	SOAKAWAY
SP	SOIL PIPE
ST	STAY CABLE
SV	STOP / SLUICE VALVE
SVP	SOIL VENT PIPE
TCB	TELEPHONE CALL BOX
TEL	TELECOM INSPECTION COVER
TL	TRAFFIC LIGHT
TLC	TRAFFIC LIGHT COVER
TM	TICKET MACHINE
TP	TELECOM POLE
VP	VENT PIPE
WM	WATER METER
WO	WASH OUT
WR	WATER RISER
WT	WATER TAP
WW	WET WELL

DEPTHS

d	ELECTRONICALLY DERIVED
Pd	PASSIVELY DERIVED
Bd	BASE DEPTH
Cd	DEPTH TO CROWN
Id	DEPTH TO INVERT
Sd	DEPTH TO SOFFIT

PIPE MATERIALS

AC	ASBESTOS CEMENT
ALK	ALKATHENE
BK	BRICK
CI	CAST IRON
CO	CONCRETE
DI	DUCTILE IRON
HDPE	HIGH DENSITY PE
MDPE	MEDIUM DENSITY PE
PE	POLYETHYLENE
PF	PITCH FIBRE
PP	POLYPROPYLENE
PVC	POLYVINYL CHLORIDE
PVC-U	ULTRA RIB (PVC)
SI	SPUN IRON
ST	STEEL
VC	VITRIFIED CLAY

FENCES

B/W	BARBED WIRE FENCE
C/B	CLOSED BOARDED FENCE
CPL	CONCRETE PANEL FENCE
C/I	CORRUGATED IRON FENCE
CNP	CHESTNUT PAILING
C/L	CHAIN LINK FENCE
I/R	IRON RAILINGS
L/L	LARCH LAP FENCE
P/R	POST AND RAIL FENCE
P/W	POST AND WIRE FENCE
W/M	WIRE MESH FENCE

LEVELS

BD	BACKDROP LEVEL
BL	BASE LEVEL
CL	COVER LEVEL
CWL	CROWN LEVEL
DPC	DAMP PROOF COURSE
FL	FLOOR LEVEL
IL	INVERT LEVEL
PT	P TRAP LEVEL
RL	ROOF LEVEL
SL	SILT LEVEL
SOF	SOFFIT LEVEL
THL	THRESHOLD LEVEL
WL	WATER LEVEL

LINESTYLE

- INTERNAL METER (MT)
- POT ENDED SERVICE
- SEWER CAPPED RUN
- SURVEY ABANDONED
- INTERNAL VALVE
- UNKNOWN UNDERGROUND ANOMALY
- UNDERGROUND CHAMBERS
- POST PROCESSING AREA (FROZEN LAYER)
- VERIFICATION TRIAL HOLE/EXCAVATION
- ABOVE GROUND (AG)
- ASSUMED ROUTE (AR)
- EMPTY DUCTS (E)
- OVERHEAD (OH)
- BACK DROP
- P TRAP
- UTILITY CROSSOVER
- SURVEY BOUNDARY
- VERBAL INFORMATION (VI)
- RECORD INFORMATION (R)
- REDUNDANT SERVICE
- RISING MAIN

CCTV SECTION 4 AND 5 FAULTS ARE SHOWN IN RED

SERVICE TYPE

- CATV / DATA
- ELECTRICITY (HV)
- ELECTRICITY (LV)
- FUEL
- GAS
- HEATING
- OVERHEAD ELECTRIC
- OVERHEAD TELECOM
- TRADE EFFLUENT
- COMBINED SEWER
- FOUL SEWER
- SURFACE SEWER
- UNIDENTIFIED SEWER
- TELECOM
- UNKNOWN SERVICE
- WATER

SERVICES SURVEY WARNING

CAUTIONARY NOTES

1. EML techniques have been used in the detection of underground utilities as outlined in Table 2 of PAS 128:2014, the results are not infallible and trial excavations must be carried out in order to confirm identification, position and in particular depth of the utility.
2. GPR techniques has been used in the detection of non-metallic utilities as outlined in Table 2 of PAS 128:2014. The interpretation of these results is not infallible and success will depend on a number of factors including soil type, ground water levels and surface conditions, hence trial excavations must be carried out in order to confirm identification, position and in particular depth of the utility.
3. Depths derived via EML are taken to the centre of the conductor (cable, metallic pipe) and those derived via GPR are usually to the crown of the utility unless otherwise indicated.
4. Where cables cannot be detected individually an average depth has been obtained and trial excavations are recommended to confirm number and depths of cables banded together.
5. 'Pot-ended' cables are often difficult to detect and although we have made all reasonable efforts to locate or transpose this information from records, we cannot guarantee that all 'pot-ended' cables have been located.
6. Fibre optic cables are often difficult to detect, and commonly access chambers can be locked and thereby made inaccessible by the utility provider. All reasonable efforts have been made to locate these ducts using GPR. Cables not located have been transposed from records.
7. Within close proximity of electric substations and similar structures results using EML may become distorted. All reasonable efforts have been made to verify our results using GPR wherever conditions permitted.
8. Underneath overhead power lines results using EML may become distorted. All reasonable efforts have been made to verify our results using GPR wherever conditions permitted.
9. Drainage information has been obtained without man entry into the chamber.
10. Wherever possible we have attempted to locate the route of the sewer. Issues such as blockages, surcharging, flooding, sedimentation, sewer collapse, root ingress, excessive depth, obstructions or heavy traffic flow may have affected our ability to obtain meaningful results. In these cases recommendations have been made for further survey or maintenance work.
11. Pipe / duct sizes have been recorded from surface inspection or taken from record information. Pipe sizes have been recorded in millimetres and depths in metres, except in instances where sizes are indicated in imperial units on the record information.
12. Water and Gas utilities to individual properties are often of a size that cannot be detected using EML or GPR investigation, whenever possible the location has been added from surface evidence (pipe risers, valves, etc), but this should be viewed as a guide only.
13. All utilities detected by MK Surveys should be considered live unless confirmed otherwise by client or service provider.
14. MK Surveys cannot confirm when utilities are redundant unless there is visual or record evidence to indicate this. In addition MK Surveys cannot guarantee being able to detect all redundant utilities.
15. Wherever available the results of our investigations have been cross referenced with record information. If a utility shown on the record cannot be detected on site, the information has been added to the drawing and indicated as QB4 (R). However it should be noted that the completeness and accuracy of the records cannot be guaranteed.
16. The utility information has been obtained from non-intrusive survey techniques; it always remains possible that there are additional utilities within the survey boundary that we have not been able to detect. We recommend that care is taken on site and that all utility records are used in conjunction with this survey.
17. The responsibility for avoiding damage to assets and utilities on site shall be that of the persons proposing to excavate within the surveyed area, who shall be liable to the asset owner and any third party who may be affected in any way for any loss or damage.

ALWAYS EXERCISE CAUTION WHEN EXCAVATING.

PAS 128:2014 Quality Level Guide

Quality Level	Description	Accuracy
QB4	A utility is expected to exist but cannot be detected - (AR), (R), (VI)	Undefined
QB3 QB3P	Horizontal location only using one geophysical technique. No depth information - NDI.	+/- 500mm Horizontal Undefined Vertical
QB2 QB2P	Horizontal and vertical location only using one geophysical technique.	+/- 250mm or +/- 40% of depth whichever is greater
QB1 QB1P	Horizontal and vertical location only using two geophysical techniques.	+/- 150mm or +/- 15% of depth whichever is greater
QA	Service verified in an open excavation, inside an inspection chamber / draw pit, or at the point the service enters / exits the ground.	+/- 50mm Horizontal +/- 25mm Vertical

Revision	Description	Surv. by	Chk. by	Appr. by	Date

0m 2 4 6 8 10 12 14 16 18 20 22

mksurveys

Tel	Office	Email
Tel 01908 565561	Milton Keynes	enquiries@mksurveys.co.uk
Tel 01865 594979	Oxford	oxford@mksurveys.co.uk
Tel 0116 2849127	East Midlands	eastmidlands@mksurveys.co.uk
Tel 01384 404203	West Midlands	westmidlands@mksurveys.co.uk
Tel 01403 243162	Horsham	horsham@mksurveys.co.uk

www.mksurveys.com www.surveys4bim.co.uk

Pye Homes

Oak Tree Lane
Woodgate
West Sussex

PAS 128:2014 Utility Survey

Scale	Sheet Size:	Sheet Number:	Date:
1:200	A0	1	January 2021

Project Number:	Rev:	Surveyed By:	Checked By:	Approved By:
29395	-	HM	TW	CP

Equipment Information

Equipment	Manufacturer	Model	Serial Number	MKS REF	Date of Calibration
EML Tx Transmitter	SPX Radiodetection	RD8000	10/TX-108-5221	RD10	11/12/2020
EML Rx Receiver	SPX Radiodetection	RD8000	10/RXPOLB-14596	RD10	11/12/2020
GPR	Leica IDS	Opera DS2500	010-20-000637	GPR18	13/01/2021

DETECTION SURVEY REPORT

GENERAL
This survey was carried out in accordance with PAS 128:2014 (Publicly Available Specification from BSI). After a pre-survey consultation with the client it was agreed to carry out the detection survey using methodology M1 as per Table 2 of the PAS 128:2014. The survey boundary has been shown on the drawing; please see linestyle section of the key for reference.

DESKTOP UTILITY REPORT
In addition the client has provided MK Surveys with historical record information. As per PAS 128:2014 this record information is classed as historical and must be referenced with extreme caution. There is no guarantee of the completeness and accuracy of this information. Site staff provided further local knowledge.

DETECTION SURVEY
DRAINAGE
Drainage was lifted with pipe sizes and invert levels recorded. Wherever possible the chamber sizes have been recorded and positioned on the drawing. All connections from gullies, external rainwater pipes and external soil stacks have been proven wherever possible into manholes and sewer runs by radio sonde location and/or GPR. Where a saddle connection is present the position is assumed only until proven to QB2 or above. In instances where other detection methods were unsuccessful connections between manholes have been assumed to be straight and labelled as QB4. All drainage should be cross checked in critical areas by CCTV survey or verification survey type A. MH9102 was unable to be located with a metal detector. We have traced a foul water pipe out of MH8 but due to the pipe being blocked we were unable to trace the full route of the pipe.

WATER
Water utilities located using EML with electronically derived depths or GPR derived depths to the crown of the pipe. Where utilities have not been successfully detected, the position has been drawn in relation to the supplied utility records information. Recommend trial excavations to confirm depth and position in critical areas.

GAS
Gas utilities located using GPR derived depths to the crown of the pipe. Where utilities have not been successfully detected, the position has been drawn in relation to the supplied utility records information. Recommend trial excavations to confirm depth and position in critical areas.

ELECTRICITY
Electric cables within the survey area have been located using EML methods with electronically derived depths recorded. Unable to confirm amount of cables within ducts from surface inspection. Record information shows a 11KV HV cable in the caravan park to the south of the site. Survey result confirms this doesn't enter the site boundary. Recommend trial excavations to confirm depths and position in critical areas.

TELECOM
Telecom ducts have been traced with depths recorded. Due to laws protecting British Telecom apparatus all ducts have been located using remote detection techniques only and compared with record information. Chamber sizes have been recorded using GPR techniques wherever possible. For further information regarding BT apparatus please contact Openreach directly.

CATV
No evidence of CATV Network identified during the survey. Records information can confirm this.

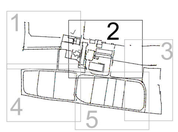
UNKNOWNS
Some unknown targets identified on the drawing using GPR are classified as "non-linear targets". These are not consistent with what we expect to see when identifying a buried utility, and appear on the drawing as single targets with depths (i.e. not linking two or more depth readings). This does not mean they are not utilities, we are just unable to positively identify them as a utility. We would strongly recommend that further verification surveys (PAS 128:2014 survey type A) are carried out to identify these targets in critical areas. All unknown anomalies were located using EML or GPR techniques. Recommend trial excavations to confirm identity position and depths in critical areas.

SEE CAUTIONARY NOTES WITHIN THE UTILITY KEY

Desktop Utility Records

Utility Type	Provider Details	Date Acquired
Drainage	Southern Water	29/1/2020
Water	Portsmouth Water	23/1/2020
Gas	Southern Gas Network	24/1/2020
Electricity	Scottish and Southern Electricity Networks	23/1/2020
Telecom	Openreach	24/1/2020
CATV	Virgin Media	Not Applicable

Sheet Layout: (Not to Scale)



Notes :

1. UTILITY AND SERVICE INFORMATION ADDED TO TOPOGRAPHICAL SURVEY PRODUCED BY GREEN WORLD SURVEYS LTD . JOB No.PYEGWS16/641. DATE APRIL 2020. NO SITE VERIFICATION CARRIED OUT BY MK SURVEYS.
2. THIS SURVEY SHOULD ALWAYS BE READ IN CONJUNCTION WITH THE DESKTOP UTILITY REPORT, THAT WAS CARRIED OUT AS A PREREQUISITE TO THE DETECTION SURVEY.

KEY

GENERAL

Av.	AVERAGE
COW	CABLE ON WALL
CW	COMBINED WATER
DIS	DISUSED
EA	ELECTRIC ARCH
EML	ELECTROMAGNETIC LOCATOR
EOT	END OF TRACE
FO	FIBRE OPTIC
FP	FOOTPATH
FW	FOUL WATER
GP	GATE POST
GPR	GROUND PENETRATING RADAR
HB	HARD BED
HIP	HIGH PRESSURE
HV	HIGH VOLTAGE
KV	KILO VOLT
IP	INTERMEDIATE PRESSURE
LP	LOW PRESSURE
MH	MANHOLE
MIP	MEDIUM PRESSURE
NDI	NO DEPTH INFORMATION
NFI	NO FURTHER INFORMATION
NDV	NO DUCTS VISIBLE
NPV	NO PIPES VISIBLE
OSBM	ORDNANCE SURVEY BENCHMARK
POW	PIPE ON WALL
P.BOX	POST BOX
PS	POWER SUPPLY SERVICE
RW	RETAINING WALL
SB	SOFT BED
SNP	STREET NAME PLATE
SW	SURFACE WATER
TAC	TACTILE PAVING
TOW	TOP OF WALL
UW	UNIDENTIFIED WATER
UTL	UNABLE TO LOCATE
UTR	UNABLE TO RAISE
UTS	UNABLE TO SURVEY

APPARATUS

ACU	AIR CONDITIONING UNIT
AV	AIR VALVE
BB	BELISHA BEACON
BO	BOLLARD
BOL	BOLLARD LIGHT
BS	BUS STOP
CATV	CABLE TELEVISION
CB	CONTROL BOX
CCB	CROSSING CONTROL BUTTON
CH	CATTLE HOOK
CR	CABLE RISER
DCH	DRAINAGE CHANNEL
EB	ELECTRIC CONTROL BOX
EP	ELECTRIC POLE
ER	EARTH ROD
FL	FLOOD LIGHT
FFP	FUEL TANK FILL POINT
FH	FIRE HYDRANT
GR	GAS RISER
GV	GAS VALVE
GY	GULLY
IC	INSPECTION COVER
INT	INTERCEPTOR
K	KERB
KO	KERB OUTLET
LD	LOOP DETECTOR
LH	LAMP HOLE
LP	LAMP POST
MH	MANHOLE
MK	MARKER POST / PLATE
MO	MOORING
MW	MONITORING WELL
OL	OUTLET
OU	OUTFALL
PO	POST
PTG	PIPE TO GROUND
PTS	PIPE TO SURFACE
PU	PUMP
RE	RODDING EYE
RG	RODDING GRGN
RM	RISING MAIN
RWP	RAIN WATER PIPE
SC	STOP COCK
SO	SOAKAWAY
SP	SOIL PIPE
ST	STAY CABLE
SVP	SOIL SERVICE VALVE
SVP	SOIL VENT PIPE
TCB	TELEPHONE CALL BOX
TEL	TELECOM INSPECTION COVER
TL	TRAFFIC LIGHT
TLC	TRAFFIC LIGHT COVER
TM	TICKET MACHINE
TT	TRAFFIC TABLE
VP	VENT PIPE
WM	WATER METER
WO	WASH OUT
WR	WATER RISER
WT	WATER TAP
WW	WET WELL

DEPTHS

d	ELECTRONICALLY DERIVED
Pd	PASSIVELY DERIVED
Bd	BASE DEPTH
Cd	DEPTH TO CROWN
Id	DEPTH TO INVERT
Sd	DEPTH TO SURFACE

PIPE MATERIALS

AC	ASBESTOS CEMENT
ALK	ALKATHENE
BK	BRICK
CI	CAST IRON
CO	CONCRETE
DI	DUCTILE IRON
HDPE	HIGH DENSITY PE
MDPE	MEDIUM DENSITY PE
PE	POLYETHYLENE
PF	PITCH FIBRE
PP	POLYPROPYLENE
PVC	POLYVINYL CHLORIDE
PVC-U	ULTRA RIB (PVC)
SI	SPUN IRON
ST	STEEL
VC	VITRIFIED CLAY

FENCES

BAW	BARBED WIRE FENCE
CB	CLOSED BOARDED FENCE
CL	CHAINLINK MESH FENCE
CF	CORRUGATED IRON FENCE
CNP	CHESTNUT PALING
CL	CHAIN LINK FENCE
IR	IRON RAILINGS
LL	LARCH LAP FENCE
PR	POST AND RAIL FENCE
PW	POST AND WIRE FENCE
WM	WIRE MESH FENCE

LEVELS

BD	BACKDROP LEVEL
BL	BASE LEVEL
CL	COVER LEVEL
CWL	CROWN LEVEL
FC	FLOOR TO CEILING COURSE
FL	FLOOR LEVEL
IL	INVERT LEVEL
PT	P TRAP LEVEL
RL	ROOF LEVEL
SL	SILT LEVEL
SOF	SOFFIT LEVEL
THL	THRESHOLD LEVEL
WL	WATER LEVEL

LINESTYLE

INTERNAL METER	(M)
POT ENDED SERVICE	
SEWER CAPPED RUN	
SURVEY ABANDONED	
INTERNAL VALVE	
UNKNOWN UNDERGROUND ANOMALY	
UNDERGROUND CHAMBERS	
POST PROCESSING AREA	(PROCESSED)
VERIFICATION TRIAL HOLE/EXCAVATION	
ABOVE GROUND	(AG)
ASSUMED ROUTE	(AR)
EMPTY DUCTS	(E)
OVERHEAD	(OH)
BACK DROP	
P TRAP	
UTILITY CROSSOVER	
SURVEY BOUNDARY	
VERBAL INFORMATION	(VI)
RECORD INFORMATION	(RI)
REDUNDANT SERVICE	
RISING MAIN	
CCTV SECTION 4 AND 5 FAULTS ARE SHOWN IN RED	

SERVICE TYPE

CATV / BSKY	
ELECTRICITY (HV)	
ELECTRICITY (LV)	
FUEL	
GAS	
HEATING	
OVERHEAD ELECTRIC	
OVERHEAD TELECOM	
TRADE EFFLUENT	
COMBINED SEWER	
FOUL SEWER	
SURFACE SEWER	
UNIDENTIFIED SEWER	
TELECOM	
UNKNOWN SERVICE	
WATER	
SERVICES SURVEY WARNING	

CAUTIONARY NOTES

1. EML techniques have been used in the detection of underground utilities as outlined in Table 2 of PAS 128:2014, the results are not infallible and trial excavations must be carried out in order to confirm identification, position and in particular depth of the utility.
2. GPR technique has been used in the detection of non-metallic utilities as outlined in Table 2 of PAS 128:2014. The interpretation of these results is not infallible and success will depend on a number of factors including soil type, ground water levels and surface conditions, hence trial excavations must be carried out in order to confirm identification, position and in particular depth of the utility.
3. Depths derived via EML are taken to the centre of the conductor (cable, metallic pipe) and those derived via GPR are usually to the crown of the utility unless otherwise indicated.
4. Where cables cannot be detected individually an average depth has been obtained and trial excavations are recommended to confirm number and depths of cables banded together.
5. *'Pot-ended' cables* are often difficult to detect and although we have made all reasonable efforts to locate or transpose this information from records, we cannot guarantee that all 'pot-ended' cables have been located.
6. Fibre optic cables are often difficult to detect, and commonly access chambers can be locked and thereby made inaccessible by the utility provider. All reasonable efforts have been made to locate these ducts using GPR. Cables not located have been transposed from records.
7. Within close proximity of electric substations and similar structures results using EML may become distorted. All reasonable efforts have been made to verify our results using GPR wherever conditions permitted.
8. Underneath overhead power lines results using EML may become distorted. All reasonable efforts have been made to verify our results using GPR wherever conditions permitted.
9. Drainage information has been obtained without man entry into the chamber.
10. Wherever possible we have attempted to locate the route of the sewer. Issues such as blockages, surcharging, flooding, sedimentation, sewer collapse, root ingress, excessive depth, obstructions or heavy traffic flow may have affected our ability to obtain meaningful results. In these cases recommendations have been made for further survey or maintenance work.
11. Pipe / duct sizes have been recorded from surface inspection or taken from record information. Pipe sizes have been rounded to the nearest millimetres and depths in metres, except in instances where sizes are indicated in imperial units on the record information.
12. Water and Gas utilities to individual properties are often of a size that cannot be detected using EML or GPR investigation, wherever possible the route has been added from surface evidence (pipe risers, valves, etc), but this should be viewed as a guide only.
13. All utilities detected by MK Surveys should be considered live unless confirmed otherwise by client or service provider.
14. MK Surveys cannot confirm when utilities are redundant unless there is visual or record evidence to indicate this. In addition MK Surveys cannot guarantee being able to detect all redundant utilities.
15. Wherever available the results of our investigations have been cross referenced with record information. If a utility shown on the records cannot be detected on site, the information has been added to the drawing and indicated as QB4 (R). However it should be noted that the completeness and accuracy of the records cannot be guaranteed.
16. The utility information has been obtained from non-intrusive survey techniques; it always remains possible that there are additional utilities within the survey boundary that we have not been able to detect. We recommend that care is taken on site and that all utility records are used in conjunction with this survey.
17. The responsibility for avoiding damage to assets and utilities on site shall be that of the persons proposing to excavate within the surveyed area, who shall be liable to the asset owner and any third party who may be affected in any way for any loss or damage.

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PAS 128:2014 Quality Level Guide

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QB4	A utility is expected to exist but cannot be detected - (AR), (R), (VI).	Undefined
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QB2 QB2P	Horizontal and vertical location only using one geophysical technique.	+/- 250mm or +/- 40% of depth whichever is greater
QB1 QB1P	Horizontal and vertical location only using two geophysical techniques.	+/- 150mm or +/- 15% of depth whichever is greater
QA	Service verified in an open excavation, inside an inspection chamber / draw pit, or at the point the service enters / exits the ground.	+/- 50mm Horizontal +/- 25mm Vertical

Revision	Description	Surv. by	Chk. by	Appr. by	Date

0m 2 4 6 8 10 12 14 16 18 20 22

mksurveys

Tel 01908 565561 — Milton Keynes — enquiries@mksurveys.co.uk
Tel 01865 594979 — Oxford — oxford@mksurveys.co.uk
Tel 0116 2640127 — East Midlands — eastmidlands@mksurveys.co.uk
Tel 01384 404203 — West Midlands — westmidlands@mksurveys.co.uk
Tel 01403 243182 — Horsham — horsham@mksurveys.co.uk

www.mksurveys.com — www.surveys4bim.co.uk

Pye Homes

Oak Tree Lane
Woodgate
West Sussex

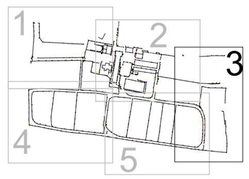
PAS 128:2014 Utility Survey

Scale	Sheet Size:	Sheet Number:	Date:
1:200	A0	2	January 2021

Project Number:	Rev:	Surveyed By:	Checked By:	Approved By:
29395	-	HM	TW	CP

494100 E
494150 E
494200 E
494250 E
104250 N
104200 N
104150 N

Sheet Layout: (Not to Scale)



Notes :

1. UTILITY AND SERVICE INFORMATION ADDED TO TOPOGRAPHICAL SURVEY PRODUCED BY GREEN WORLD SURVEYS LTD . JOB No.PYE/GW0164/1. DATE APRIL 2020. NO SITE VERIFICATION CARRIED OUT BY MK SURVEYS.
2. THIS SURVEY SHOULD ALWAYS BE READ IN CONJUNCTION WITH THE DESKTOP UTILITY REPORT, THAT WAS CARRIED OUT AS A PREREQUISITE TO THE DETECTION SURVEY.

N

104200 N

104150 N

104100 N

104050 N

104000 N

494250 E

494300 E

494350 E

KEY

GENERAL

Av.	AVERAGE
COW	CABLE ON WALL
CW	COMBINED WATER
DIS	DISUSED
DK	DROP KERB
EML	ELECTROMAGNETIC LOCATOR
EOT	END OF TRACE
FO	FIBRE OPTIC
FP	FOOTPATH
FW	FOUL WATER
GP	GATE POST
GPR	GROUND PENETRATING RADAR
HB	HARD BED
HP	HIGH PRESSURE
HV	HIGH VOLTAGE
KV	KILO VOLT
IP	INTERMEDIATE PRESSURE
LP	LOW PRESSURE
LV	LOW VOLTAGE
MP	MEDIUM PRESSURE
NDI	NO DEPTH INFORMATION
NFI	NO FURTHER INFORMATION
NDV	NO DUCTS VISIBLE
NPV	NO PIPES VISIBLE
OSBM	ORDNANCE SURVEY BENCHMARK
POW	PIPE ON WALL
P.BOX	POST BOX
RED	REDUNDANT SERVICE
RW	RETAINING WALL
SB	SOFT BED
SNP	STREET NAME PLATE
SW	SURFACE WATER
TAC	TACTILE PAVING
TOW	TOP OF WALL
TW	TRADE EFFLUENT WATER
UTL	UNABLE TO LOCATE
UTR	UNABLE TO RAISE
UTS	UNABLE TO SURVEY

APPARATUS

ACU	AIR CONDITIONING UNIT
AV	AIR VALVE
BB	BELISHA BEACON
BO	BOLLARD
BOL	BOLLARD LIGHT
BS	BUS STOP
CATV	CABLE TELEVISION
CB	CONTROL BOX
CCB	CROSSING CONTROL BUTTON
CP	CATCH PIT
CR	CABLE RISER
DCH	DRAINAGE CHANNEL
EB	ELECTRIC CONTROL BOX
EP	ELECTRIC POLE
ER	EARTH ROD
FD	FILTER DRAIN
FFP	FUEL TANK FILL POINT
FH	FIRE HYDRANT
GR	GAS RISER
GV	GAS VALVE
GY	GULLY
IC	INSPECTION COVER
INT	INTERCEPTOR
IT	INLET
KO	KERB OUTLET
LD	LOOP DETECTOR
LH	LAMP HOLE
LP	LAMP POST
MH	MANHOLE
MK	MARKER POST / PLATE
MT	METER
MW	MONITORING WELL
OL	OUTLET
OU	OUTFALL
PO	POST
PTG	PIPE TO GROUND
PTS	PIPE TO SURFACE
PU	PUMP
RE	RODDING EYE
RS	ROAD SIGN
RM	RISING MAIN
RWP	RAIN WATER PIPE
SC	STOP COCK
SO	SOAKAWAY
SP	SOIL PIPE
ST	STAY CABLE
SV	STOP / SLUICE VALVE
SVP	SOIL VENT PIPE
TCB	TELEPHONE CALL BOX
TEL	TELECOM INSPECTION COVER
TL	TRAFFIC LIGHT
TLC	TRAFFIC LIGHT COVER
TM	TICKET MACHINE
TP	TELECOM POLE
VP	VENT PIPE
WM	WATER METER
WO	WASH OUT
WR	WATER RISER
WT	WATER TAP
WW	WET WELL

DEPTHS

d	ELECTRONICALLY DERIVED
Pd	PASSIVELY DERIVED
Bd	BASE DEPTH
Cd	DEPTH TO CROWN
Id	DEPTH TO INVERT
Sd	DEPTH TO SOFFIT

CAUTIONARY NOTES

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16. The utility information has been obtained from non-intrusive survey techniques; it always remains possible that there are additional utilities within the survey boundary that we have not been able to detect. We recommend that care is taken on site and that all utility records are used in conjunction with this survey.
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ALWAYS EXERCISE CAUTION WHEN EXCAVATING.

PIPE MATERIALS

AC	ASBESTOS CEMENT
ALK	ALKATHENE
BK	BRICK
CI	CAST IRON
CO	CONCRETE
DI	DUCTILE IRON
HDPE	HIGH DENSITY PE
MDPE	MEDIUM DENSITY PE
PE	POLYETHYLENE
PF	PITCH FIBRE
PP	POLYPROPYLENE
PVC	POLYVINYL CHLORIDE
PVC-U	ULTRA RIB (PVC)
SI	SPUN IRON
ST	STEEL
VC	VITRIFIED CLAY

FENCES

B/W	BARBED WIRE FENCE
C/B	CLOSED BOARDED FENCE
CPL	CONCRETE PANEL FENCE
C/I	CORRUGATED IRON FENCE
CNP	CHESTNUT PALING
C/L	CHAIN LINK FENCE
I/R	IRON RAILINGS
L/L	LARCH LAP FENCE
P/R	POST AND RAIL FENCE
P/W	POST AND WIRE FENCE
W/M	WIRE MESH FENCE

LEVELS

BD	BACKDROP LEVEL
BL	BASE LEVEL
CL	COVER LEVEL
CWL	CROWN LEVEL
DPC	DAMP PROOF COURSE
FL	FLOOR LEVEL
IL	INVERT LEVEL
PT	P TRAP LEVEL
RL	ROOF LEVEL
SL	SILT LEVEL
SOF	SOFFIT LEVEL
THL	THRESHOLD LEVEL
WL	WATER LEVEL

LINESTYLE

INTERNAL METER (MT)
POT ENDED SERVICE
SEWER CAPPED RUN
SURVEY ABANDONED
INTERNAL VALVE
UNKNOWN UNDERGROUND ANOMALY
UNDERGROUND CHAMBERS
POST PROCESSING AREA (FROZEN LAYER)
VERIFICATION TRIAL HOLE/EXCAVATION
ABOVE GROUND (AG)
ASSUMED ROUTE (AR)
EMPTY DUCTS (E)
OVERHEAD (OH)
BACK DROP
P TRAP
UTILITY CROSSOVER
SURVEY BOUNDARY
VERBAL INFORMATION (VI)
RECORD INFORMATION (R)
REDUNDANT SERVICE
RISING MAIN

CCTV SECTION 4 AND 5 FAULTS ARE SHOWN IN RED

SERVICE TYPE

CATV / DATA
ELECTRICITY (HV)
ELECTRICITY (LV)
FUEL
GAS
HEATING
OVERHEAD ELECTRIC
OVERHEAD TELECOM
TRADE EFFLUENT
COMBINED SEWER
FOUL SEWER
SURFACE SEWER
UNIDENTIFIED SEWER
TELECOM
UNKNOWN SERVICE
WATER
SERVICES SURVEY WARNING

PAS 128:2014 Quality Level Guide

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QA	Service verified in an open excavation, inside an inspection chamber / draw pit, or at the point the service enters / exits the ground.	+/- 50mm Horizontal +/- 25mm Vertical

Equipment Information

Equipment	Manufacturer	Model	Serial Number	MKS REF	Date of Calibration
EML Tx Transmitter	SPX Radiodetection	RD8000	10/TX-10B-5221	RD10	11/12/2020
EML Rx Receiver	SPX Radiodetection	RD8000	10/8KPDLB-14596	RD10	11/12/2020
GPR	Leica IDS	Opera DS2000	010-20-00637	GPR18	13/01/2021

DETECTION SURVEY REPORT

GENERAL
This survey was carried out in accordance with PAS 128:2014 (Publicly Available Specification from BSI). After a pre-survey consultation with the client it was agreed to carry out the detection survey using methodology M1 as per Table 2 of the PAS 128:2014. The survey boundary has been shown on the drawing; please see linestyle section of the key for reference.

DESKTOP UTILITY REPORT
In addition the client has provided MK Surveys with historical record information. As per PAS 128:2014 this record information is classed as historical and must be referenced with extreme caution. There is no guarantee of the completeness and accuracy of this information. Site staff provided further local knowledge.

DETECTION SURVEY
DRAINAGE
Drainage was lifted with pipe sizes and invert levels recorded. Wherever possible the chamber sizes have been recorded and positioned on the drawing. All connections from gullies, external rainwater pipes and external soil stacks have been proven wherever possible into manholes and sewer runs by radio sonde location and/or GPR. Where a saddle connection is present the position is assumed only until proven to QB2 or above. In instances where other detection methods were unsuccessful connections between manholes have been assumed to be straight and labelled as QB4. All drainage should be cross checked in critical areas by CCTV survey or verification survey type A. MH9102 was unable to be located with a metal detector. We have traced a foul water pipe out of MH8 but due to the pipe being blocked we were unable to trace the full route of the pipe.

WATER
Water utilities located using EML with electronically derived depths or GPR derived depths to the crown of the pipe. Where utilities have not been successfully detected, the position has been drawn in relation to the supplied utility records information. Recommend trial excavations to confirm depth and position in critical areas.

GAS
Gas utilities located using GPR derived depths to the crown of the pipe. Where utilities have not been successfully detected, the position has been drawn in relation to the supplied utility records information. Recommend trial excavations to confirm depth and position in critical areas.

ELECTRICITY
Electric cables within the survey area have been located using EML methods with electronically derived depths recorded. Unable to confirm amount of cables within ducts from surface inspection. Record information shows a 11KV HV cable in the caravan park to the south of the site. Survey result confirms this doesn't enter the site boundary. Recommend trial excavations to confirm depths and position in critical areas.

TELECOM
Telecom ducts have been traced with depths recorded. Due to laws protecting British Telecom apparatus all ducts have been located using remote detection techniques only and compared with record information. Chamber sizes have been recorded using GPR techniques wherever possible. For further information regarding BT apparatus please contact Openreach directly.

CATV
No evidence of CATV Network identified during the survey. Records information can confirm this.

UNKNOWNS
Some unknown targets identified on the drawing using GPR are classified as "non-linear targets". These are not consistent with what we expect to see when identifying a buried utility, and appear on the drawing as single targets with depths (i.e. not linking two or more depth readings). This does not mean they are not utilities, we are just unable to positively identify them as a utility. We would strongly recommend that further verification surveys (PAS 128:2014 survey type A) are carried out to identify these targets in critical areas. All unknown anomalies were located using EML or GPR techniques. Recommend trial excavations to confirm identity position and depths in critical areas.

SEE CAUTIONARY NOTES WITHIN THE UTILITY KEY

Desktop Utility Records

Utility Type	Provider Details	Date Acquired
Drainage	Southern Water	25/11/2020
Water	Portsmouth Water	23/11/2020
Gas	Southern Gas Network	24/11/2020
Electricity	Scottish and Southern Electricity Networks	23/11/2020
Telecom	Openreach	24/11/2020
CATV	Virgin Media	Not Applicable

Revision	Description	Surv. by	Chk. by	Appr. by	Date

0m 2 4 6 8 10 12 14 16 18 20 22

mksurveys

Tel 01908 565561
Tel 01865 594979
Tel 0116 2849127
Tel 01384 404203
Tel 01403 243162

Milton Keynes
Oxford
East Midlands
West Midlands
Horsham

enquiries@mksurveys.co.uk
oxford@mksurveys.co.uk
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Pye Homes

Oak Tree Lane
Woodgate
West Sussex

PAS 128:2014 Utility Survey

Scale	Sheet Size:	Sheet Number:	Date:
1:200	A0	3	January 2021

Project Number:	Rev:	Surveyed By:	Checked By:	Approved By:
29395	-	HM	TW	CP

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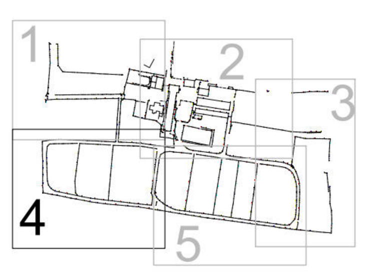
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CO	CONCRETE
DI	DUCTILE IRON
HDPE	HIGH DENSITY PE
MDPE	MEDIUM DENSITY PE
PE	POLYETHYLENE
PF	PITCH FIBRE
PP	POLYPROPYLENE
PVC	POLYVINYL CHLORIDE
PVC-U	ULTRA RIB (PVC)
SI	SPUN IRON
ST	STEEL
VC	VITRIFIED CLAY

FENCES

B/W	BARBED WIRE FENCE
C/B	CLOSED BOARDED FENCE
CPL	CONCRETE PANEL FENCE
C/I	CORRUGATED IRON FENCE
CNP	CHESTNUT PAILING
C/L	CHAIN LINK FENCE
I/R	IRON RAILINGS
L/L	LARCH LAP FENCE
P/R	POST AND RAIL FENCE
P/W	POST AND WIRE FENCE
W/M	WIRE MESH FENCE

LEVELS

BD	BACKDROP LEVEL
BL	BASE LEVEL
CL	COVER LEVEL
CWL	CROWN LEVEL
DPC	DAMP PROOF COURSE
FL	FLOOR LEVEL
IL	INVERT LEVEL
PT	P TRAP LEVEL
RL	ROOF LEVEL
SL	SILT LEVEL
SOF	SOFFIT LEVEL
THL	THRESHOLD LEVEL
WL	WATER LEVEL

LINESTYLE

INTERNAL METER (MT)
POT ENDED SERVICE
SEWER CAPPED RUN
SURVEY ABANDONED
INTERNAL VALVE
UNKNOWN UNDERGROUND ANOMALY
UNDERGROUND CHAMBERS
POST PROCESSING AREA (FROZEN LAYER)
VERIFICATION TRIAL HOLE/EXCAVATION
ABOVE GROUND (AG)
ASSUMED ROUTE (AR)
EMPTY DUCTS (E)
OVERHEAD (OH)
BACK DROP
P TRAP
UTILITY CROSSOVER
SURVEY BOUNDARY
VERBAL INFORMATION (VI)
RECORD INFORMATION (R)
REDUNDANT SERVICE
RISING MAIN

CCTV SECTION 4 AND 5 FAULTS ARE SHOWN IN RED

SERVICE TYPE

CATV / DATA
ELECTRICITY (HV)
ELECTRICITY (LV)
FUEL
GAS
HEATING
OVERHEAD ELECTRIC
OVERHEAD TELECOM
TRADE EFFLUENT
COMBINED SEWER
FOUL SEWER
SURFACE SEWER
UNIDENTIFIED SEWER
TELECOM
UNKNOWN SERVICE
WATER

SERVICES SURVEY WARNING

CAUTIONARY NOTES

1. EML techniques have been used in the detection of underground utilities as outlined in Table 2 of PAS 128:2014, the results are not infallible and trial excavations must be carried out in order to confirm identification, position and in particular depth of the utility.
2. GPR techniques has been used in the detection of non-metallic utilities as outlined in Table 2 of PAS 128:2014. The interpretation of these results is not infallible and success will depend on a number of factors including soil type, ground water levels and surface conditions, hence trial excavations must be carried out in order to confirm identification, position and in particular depth of the utility.
3. Depths derived via EML are taken to the centre of the conductor (cable, metallic pipe) and those derived via GPR are usually to the crown of the utility unless otherwise indicated.
4. Where cables cannot be detected individually an average depth has been obtained and trial excavations are recommended to confirm number and depths of cables banded together.
5. 'Pot-ended' cables are often difficult to detect and although we have made all reasonable efforts to locate or transpose this information from records, we cannot guarantee that all 'pot-ended' cables have been located.
6. Fibre optic cables are often difficult to detect, and commonly access chambers can be locked and thereby made inaccessible by the utility provider. All reasonable efforts have been made to locate these ducts using GPR. Cables not located have been transposed from records.
7. Within close proximity of electric substations and similar structures results using EML may become distorted. All reasonable efforts have been made to verify our results using GPR wherever conditions permitted.
8. Underneath overhead power lines results using EML may become distorted. All reasonable efforts have been made to verify our results using GPR wherever conditions permitted.
9. Drainage information has been obtained without man entry into the chamber.
10. Wherever possible we have attempted to locate the route of the sewer. Issues such as blockages, surcharging, flooding, sedimentation, sewer collapse, root ingress, excessive depth, obstructions or heavy traffic flow may have affected our ability to obtain meaningful results. In these cases recommendations have been made for further survey or maintenance work.
11. Pipe / duct sizes have been recorded from surface inspection or taken from record information. Pipe sizes have been recorded in millimetres and depths in metres, except in instances where sizes are indicated in imperial units on the record information.
12. Water and Gas utilities to individual properties are often of a size that cannot be detected using EML or GPR investigation, whenever possible the route has been added from surface evidence (pipe risers, valves, etc), but this should be viewed as a guide only.
13. All utilities detected by MK Surveys should be considered live unless confirmed otherwise by client or service provider.
14. MK Surveys cannot confirm when utilities are redundant unless there is visual or record evidence to indicate this. In addition MK Surveys cannot guarantee being able to detect all redundant utilities.
15. Wherever available the results of our investigations have been cross referenced with record information. If a utility shown on the records cannot be detected on site, the information has been added to the drawing and indicated as QB4 (R). However it should be noted that the completeness and accuracy of the records cannot be guaranteed.
16. The utility information has been obtained from non-intrusive survey techniques; it always remains possible that there are additional utilities within the survey boundary that we have not been able to detect. We recommend that care is taken on site and that all utility records are used in conjunction with this survey.
17. The responsibility for avoiding damage to assets and utilities on site shall be that of the persons proposing to excavate within the surveyed area, who shall be liable to the asset owner and any third party who may be affected in any way for any loss or damage.

ALWAYS EXERCISE CAUTION WHEN EXCAVATING.

PAS 128:2014 Quality Level Guide

Quality Level	Description	Accuracy
QB4	A utility is expected to exist but cannot be detected - (AR), (R), (VI)	Undefined
QB3 QB3P	Horizontal location only using one geophysical technique. No depth information - NDI.	+/- 500mm Horizontal Undefined Vertical
QB2 QB2P	Horizontal and vertical location only using one geophysical technique.	+/- 250mm or +/- 40% of depth whichever is greater
QB1 QB1P	Horizontal and vertical location only using two geophysical techniques.	+/- 150mm or +/- 15% of depth whichever is greater
QA	Service verified in an open excavation, inside an inspection chamber / draw pit, or at the point the service enters / exits the ground.	+/- 50mm Horizontal +/- 25mm Vertical

Revision	Description	Surv. by	Chk. by	Appr. by	Date

0m 2 4 6 8 10 12 14 16 18 20 22

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Tel 01908 565561 | Milton Keynes | enquiries@mksurveys.co.uk
Tel 01865 594979 | Oxford | oxford@mksurveys.co.uk
Tel 0116 2849127 | East Midlands | eastmidlands@mksurveys.co.uk
Tel 01384 404203 | West Midlands | westmidlands@mksurveys.co.uk
Tel 01403 243162 | Horsham | horsham@mksurveys.co.uk

www.mksurveys.com www.surveys4bim.co.uk

Pye Homes

Oak Tree Lane
Woodgate
West Sussex

PAS 128:2014 Utility Survey

Scale	Sheet Size:		Sheet Number:		Date:
1:200	A0		4		January 2021
Project Number:		Rev:	Surveyed By:	Checked By:	Approved By:
29395		-	HM	TW	CP

Equipment Information

Equipment	Manufacturer	Model	Serial Number	MKS REF	Date of Calibration
EML Tx Transmitter	SPX Radiodetection	RD8000	10/TX-108-5221	RD10	11/12/2020
EML Rx Receiver	SPX Radiodetection	RD8000	10/RKPOLB-14596	RD10	11/12/2020
GPR	Leica IDS	Opera DS2000	010-20-000637	GPR18	13/01/2021

DETECTION SURVEY REPORT

GENERAL
This survey was carried out in accordance with PAS 128:2014 (Publicly Available Specification from BSI). After a pre-survey consultation with the client it was agreed to carry out the detection survey using methodology M1 as per Table 2 of the PAS 128:2014. The survey boundary has been shown on the drawing; please see linestyle section of the key for reference.

DESKTOP UTILITY REPORT
In addition the client has provided MK Surveys with historical record information. As per PAS 128:2014 this record information is classed as historical and must be referenced with extreme caution. There is no guarantee of the completeness and accuracy of this information. Site staff provided further local knowledge.

DETECTION SURVEY
DRAINAGE
Drainage was lifted with pipe sizes and invert levels recorded. Wherever possible the chamber sizes have been recorded and positioned on the drawing. All connections from gullies, external rainwater pipes and external soil stacks have been proven wherever possible into manholes and sewer runs by radio sonde location and/or GPR. Where a saddle connection is present the position is assumed only until proven to QB2 or above. In instances where other detection methods were unsuccessful connections between manholes have been assumed to be straight and labelled as GB4. All drainage should be cross checked in critical areas by CCTV survey or verification survey type A. MH9102 was unable to be located with a metal detector. We have traced a foul water pipe out of MH8 but due to the pipe being blocked we were unable to trace the full route of the pipe.

WATER
Water utilities located using EML with electronically derived depths or GPR derived depths to the crown of the pipe. Where utilities have not been successfully detected, the position has been drawn in relation to the supplied utility records information. Recommend trial excavations to confirm depth and position in critical areas.

GAS
Gas utilities located using GPR derived depths to the crown of the pipe. Where utilities have not been successfully detected, the position has been drawn in relation to the supplied utility records information. Recommend trial excavations to confirm depth and position in critical areas.

ELECTRICITY
Electric cables within the survey area have been located using EML methods with electronically derived depths recorded. Unable to confirm amount of cables within ducts from surface inspection. Record information shows a 11KV HV cable in the caravan park to the south of the site. Survey result confirms this doesn't enter the site boundary. Recommend trial excavations to confirm depths and position in critical areas.

TELECOM
Telecom ducts have been traced with depths recorded. Due to laws protecting British Telecom apparatus all ducts have been located using remote detection techniques only and compared with record information. Chamber sizes have been recorded using GPR techniques wherever possible. For further information regarding BT apparatus please contact Openreach directly.

CATV
No evidence of CATV Network identified during the survey. Records information can confirm this.

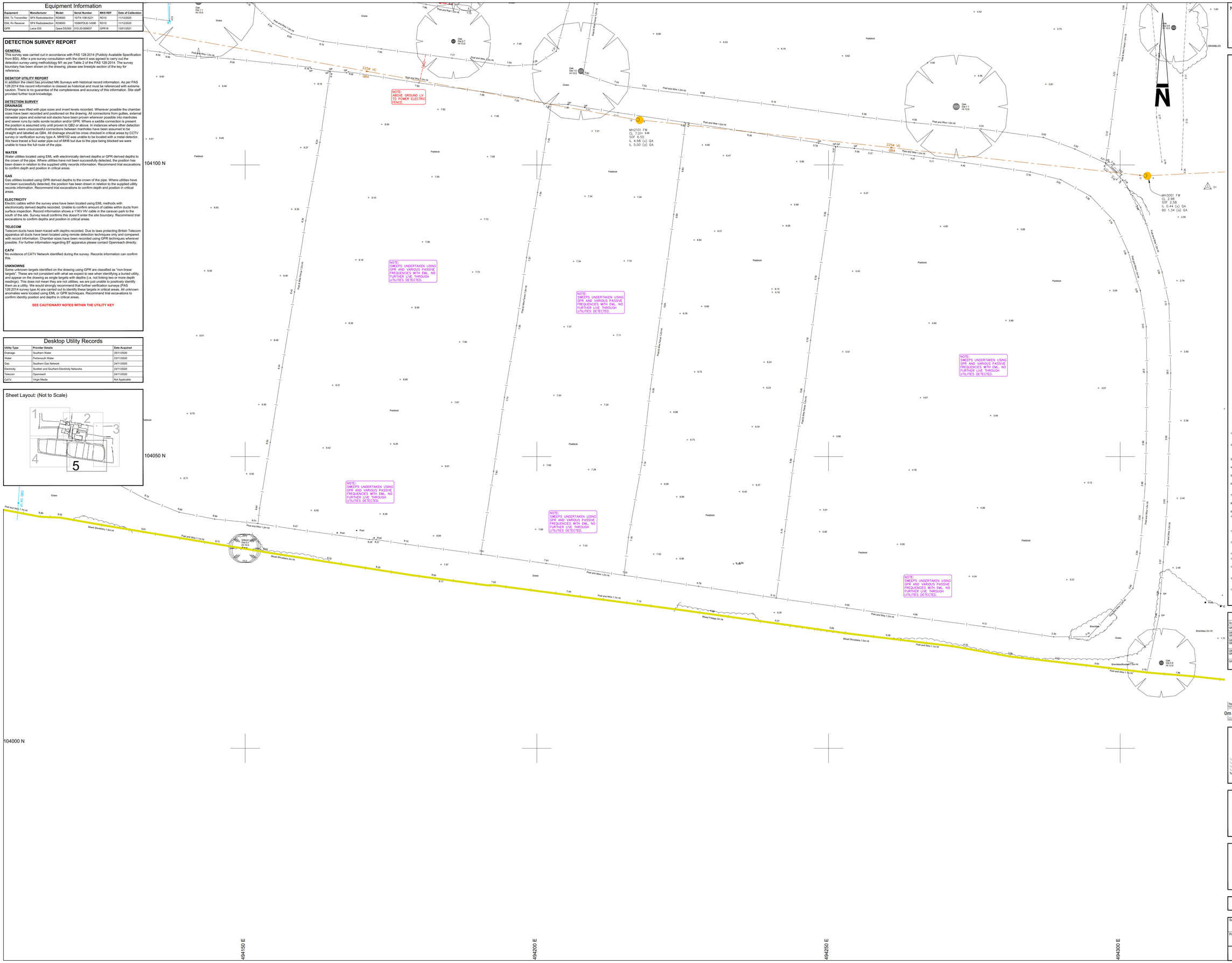
UNKNOWNS
Some unknown targets identified on the drawing using GPR are classified as "non-linear targets". These are not consistent with what we expect to see when identifying a buried utility, and appear on the drawing as single targets with depths (i.e. not linking two or more depth readings). This does not mean they are not utilities, we are just unable to positively identify them as a utility. We would strongly recommend that further verification surveys (PAS 128:2014 survey type A) are carried out to identify these targets in critical areas. All unknown anomalies were located using EML or GPR techniques. Recommend trial excavations to confirm identity position and depths in critical areas.

SEE CAUTIONARY NOTES WITHIN THE UTILITY KEY

Desktop Utility Records

Utility Type	Provider Details	Date Acquired
Drainage	Southern Water	25/11/2020
Water	Portsmouth Water	23/11/2020
Gas	Southern Gas Network	24/11/2020
Electricity	Scottish and Southern Electricity Networks	23/11/2020
Telecom	Openreach	24/11/2020
CATV	Virgin Media	Not Applicable

Sheet Layout: (Not to Scale)



Notes :

1. UTILITY AND SERVICE INFORMATION ADDED TO TOPOGRAPHICAL SURVEY PRODUCED BY GREEN WORLD SURVEYS LTD . JOB No.PYE/GWS/16421. DATE APRIL 2020. NO SITE VERIFICATION CARRIED OUT BY MK SURVEYS.
2. THIS SURVEY SHOULD ALWAYS BE READ IN CONJUNCTION WITH THE DESKTOP UTILITY REPORT, THAT WAS CARRIED OUT AS A PREREQUISITE TO THE DETECTION SURVEY.

KEY

GENERAL

Av.	AVERAGE
COW	CABLE ON WALL
CW	COMBINED WATER
DIS	DISUSED
DW	DRAIN WATER
EML	ELECTROMAGNETIC LOCATOR
EOT	END OF TRACE
FO	FIBRE OPTIC
FP	FOOTPATH
FW	FOUL WATER
GP	GATE POST
GPR	GROUND PENETRATING RADAR
HB	HARD BED
HIP	HIGH PRESSURE
HV	HIGH VOLTAGE
KV	KILO VOLT
IP	INTERMEDIATE PRESSURE
LP	LOW PRESSURE
MH	MANHOLE
MP	MEDIUM PRESSURE
NDI	NO DEPTH INFORMATION
NFI	NO FURTHER INFORMATION
NDV	NO DUCTS VISIBLE
NPV	NO PIPES VISIBLE
OSBM	ORDNANCE SURVEY BENCHMARK
POW	PIPE ON WALL
P.BOX	POST BOX
RS	REDUNDANT SERVICE
RW	RETAINING WALL
SB	SOFT BED
SNP	STREET NAME PLATE
SW	SURFACE WATER
TAC	TACTILE PAVING
TOW	TOP OF WALL
TSW	TREATED SEWAGE EFFLUENT
UTL	UNABLE TO LOCATE
UTR	UNABLE TO RAISE
UTS	UNABLE TO SURVEY

PIPE MATERIALS

AC	ASBESTOS CEMENT
ALK	ALKATHENE
BK	BRICK
CI	CAST IRON
CO	CONCRETE
DI	DUCTILE IRON
HDPE	HIGH DENSITY PE
MDPE	MEDIUM DENSITY PE
PE	POLYETHYLENE
PF	PITCH FIBRE
PP	POLYPROPYLENE
PVC	POLYVINYL CHLORIDE
PVC-U	ULTRA RIB (PVC)
SI	SPUN IRON
ST	STEEL
VC	VITRIFIED CLAY

FENCES

BW	BARBED WIRE FENCE
CB	CLOSED BOARDED FENCE
CL	CLOSED METAL FENCE
CR	CORRUGATED IRON FENCE
CNP	CHESTNUT PALING
CL	CHAIN LINK FENCE
IR	IRON RAILINGS
LL	LARCH LAP FENCE
PR	POST AND RAIL FENCE
PW	POST AND WIRE FENCE
WM	WIRE MESH FENCE

LEVELS

BD	BACKDROP LEVEL
BL	BASE LEVEL
CL	COVER LEVEL
CWL	CROWN LEVEL
FC	FINISHED COURSE
FL	FLOOR LEVEL
IL	INVERT LEVEL
PT	P TRAP LEVEL
RL	ROOF LEVEL
SL	SILT LEVEL
SOF	SOFFIT LEVEL
THL	THRESHOLD LEVEL
WL	WATER LEVEL

APPARATUS

ACU	AIR CONDITIONING UNIT
AV	AIR VALVE
BB	BELISHA BEACON
BO	BOLLARD
BOL	BOLLARD LIGHT
BS	BUS STOP
CATV	CABLE TELEVISION
CB	CONTROL BOX
CCB	CROSSING CONTROL BUTTON
CH	CATTLE HOOK
CR	CABLE RISER
DCH	DRAINAGE CHANNEL
EB	ELECTRIC CONTROL BOX
EP	ELECTRIC POLE
ER	EARTH ROD
FL	FILTER LADDER
FFP	FLUSH TANK FILL POINT
FH	FIRE HYDRANT
GR	GAS RISER
GV	GAS VALVE
GY	GULLY
IC	INSPECTION COVER
INT	INTERCEPTOR
JB	JUNCTION
KO	KERB OUTLET
LD	LOOP DETECTOR
LH	LAMP HOLE
LP	LAMP POST
MH	MANHOLE
MK	MARKER POST / PLATE
MO	MOORING
MW	MONITORING WELL
OL	OUTLET
OU	OUTFALL
PO	POST
PTG	PIPE TO GROUND
PTS	PIPE TO SURFACE
PU	PUMP
RE	RODDING EYE
RG	RAIN WATER GRGN
RM	RISING MAIN
RWP	RAIN WATER PIPE
SC	STOP COCK
SO	SOAKAWAY
SP	SOIL PIPE
ST	STAY CABLE
SV	SCOUR VALVE VALVE
SVP	SOIL VENT PIPE
TCB	TELEPHONE CALL BOX
TIL	TELECOM INSPECTION COVER
TL	TRAFFIC LIGHT
TLC	TRAFFIC LIGHT COVER
TM	TICKET MACHINE
TT	TRAFFIC TABLE
UP	VENT PIPE
WM	WATER METER
WO	WASH OUT
WR	WATER RISER
WT	WATER TAP
WW	WET WELL

DEPTHS

d	ELECTRONICALLY DERIVED
Pd	PASSIVELY DERIVED
Bd	BASE DEPTH
Cd	DEPTH TO CROWN
Id	DEPTH TO INVERT
Sd	DEPTH TO SOFFIT

LINESTYLE

INTERNAL METER	(M)
POT ENDED SERVICE	
SEWER CAPPED RUN	
SURVEY ABANDONED	
INTERNAL VALVE	
UNKNOWN UNDERGROUND ANOMALY	
UNDERGROUND CHAMBERS	
POST PROCESSING AREA	
VERIFICATION TRIAL HOLE/EXCAVATION	
ABOVE GROUND	(AG)
ASSUMED ROUTE	(AR)
EMPTY DUCTS	(E)
OVERHEAD	(OH)
BACK ONTOP	
P TRAP	
UTILITY CROSSOVER	
SURVEY BOUNDARY	
VERBAL INFORMATION	(VI)
RECORD INFORMATION	(R)
REDUNDANT SERVICE	
RISING MAIN	

GCTV SECTION 4 AND 5 FAULTS ARE SHOWN IN RED

SERVICE TYPE

CATV / BSTL	
ELECTRICITY (HV)	
ELECTRICITY (LV)	
FUEL	
GAS	
HEATING	
OVERHEAD ELECTRIC	
OVERHEAD TELECOM	
TRADE EFFLUENT	
COMBINED SEWER	
FOUL SEWER	
SURFACE SEWER	
UNIDENTIFIED SEWER	
TELECOM	
UNKNOWN SERVICE	
WATER	

SERVICES SURVEY WARNING

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PAS 128:2014 Quality Level Guide

Quality Level	Description	Accuracy
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QB2 QB2P	Horizontal and vertical location only using one geophysical technique.	+/- 250mm or +/- 40% of depth whichever is greater
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QA	Service verified in an open excavation, inside an inspection chamber / draw pit, or at the point the service enters / exits the ground.	+/- 50mm Horizontal +/- 25mm Vertical

Revision	Description	Surv. by	Chk. by	Appr. by	Date

0m 2 4 6 8 10 12 14 16 18 20 22

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Tel 01865 594979 — Oxford — oxford@mksurveys.co.uk
Tel 0116 2840127 — East Midlands — eastmidlands@mksurveys.co.uk
Tel 01384 404203 — West Midlands — westmidlands@mksurveys.co.uk
Tel 01403 243162 — Horsham — horsham@mksurveys.co.uk

www.mksurveys.com — www.surveys4bim.co.uk

Pye Homes

Oak Tree Lane
Woodgate
West Sussex

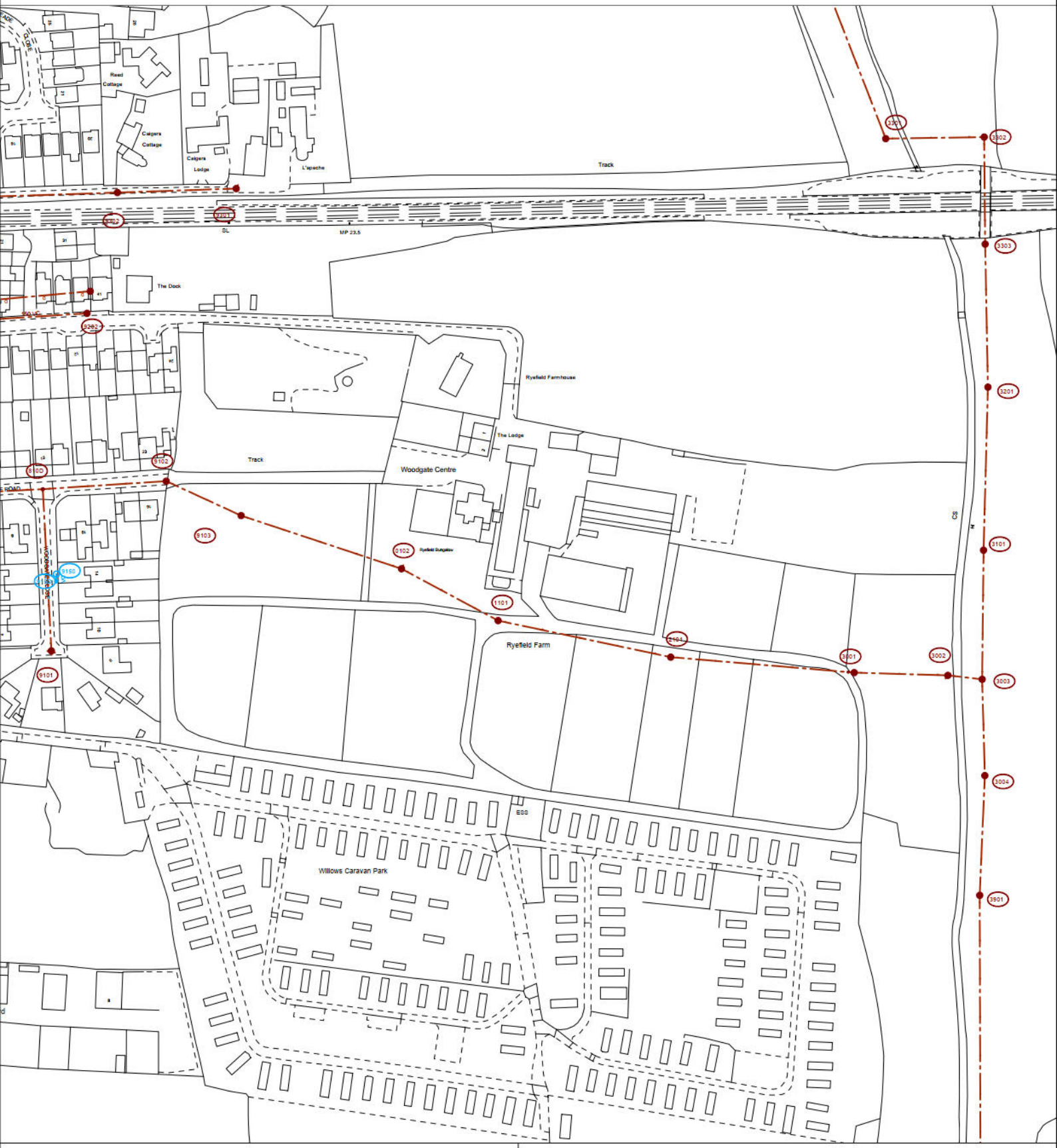
PAS 128:2014 Utility Survey

Scale	Sheet Size:	Sheet Number:	Date:
1:200	A0	5	January 2021

Project Number:	Rev:	Surveyed By:	Checked By:	Approved By:
29395	-	HM	TW	CP

Appendix B Public Sewer Records

SOUTHERN WATER



The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site.

Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530

Southern Water

O.S. REF: SU9404SW	Scale: 1:2500	Printed By: Mercy	Date: 17-11-2020
Sewer Plot		Site Plan	
WARNING: BAC pipes are constructed of Bonded Asbestos Cement		Requested By:	
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement			

Appendix C Geological Mapping



NOTES

1. Do not scale from this drawing.
2. All dimensions are in metres unless shown otherwise.

KEY

Site Boundary

Superficial deposits

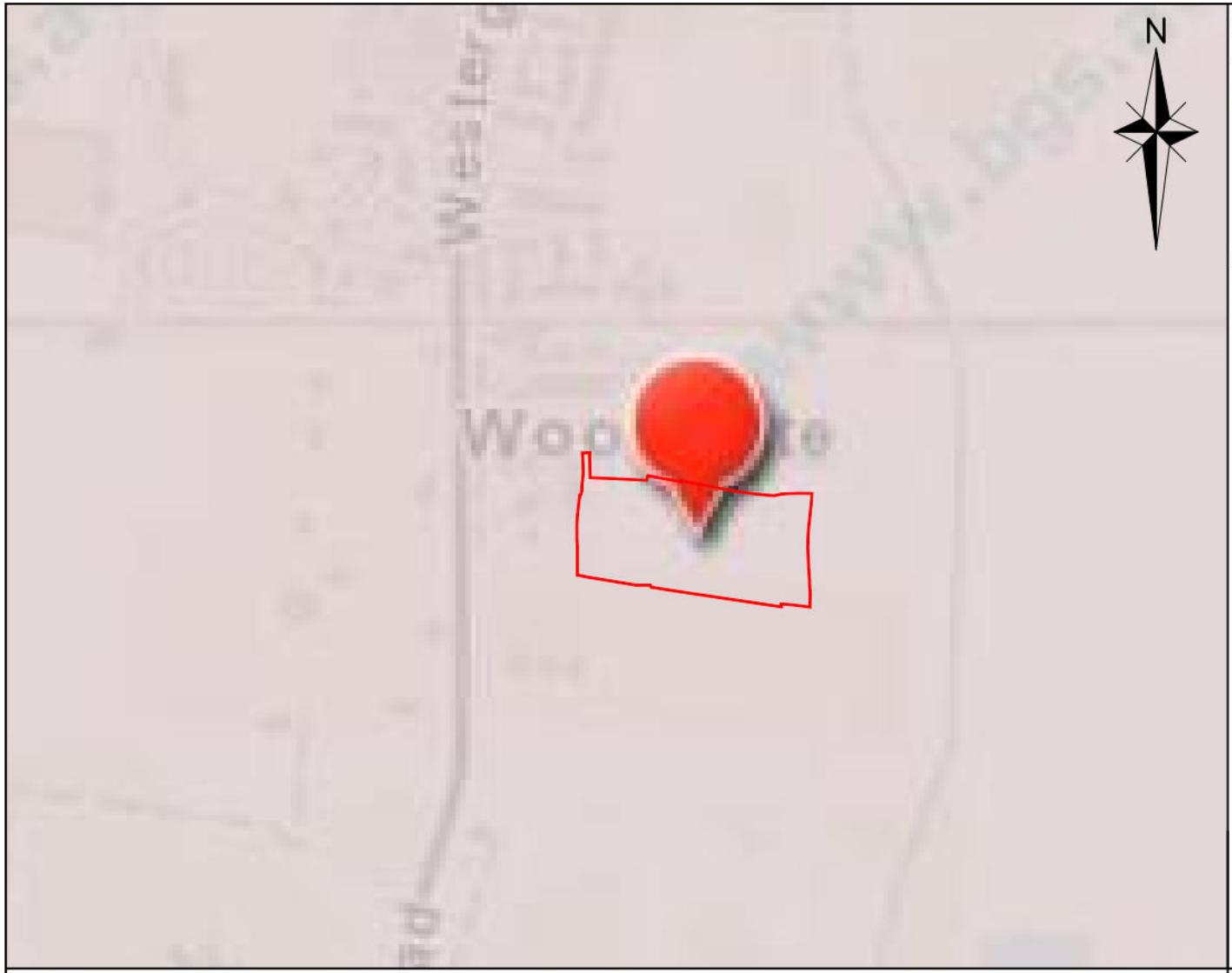
- TIDAL FLAT DEPOSITS - CLAY AND SILT
- BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED) - SAND, SILT AND CLAY
- HEAD - CLAY, SILT, SAND AND GRAVEL
- HEAD, 1 - CLAY AND SILT
- HEAD, 2 - CLAY AND SILT
- STORM BEACH DEPOSITS - SAND AND GRAVEL

Rev	Amendments	Drn	Chk	App	Date

Issued by
Charles & Associates
Landmark House
Station Road
Hook
Hampshire
RG27 9HA
01256 630420
Park House, Park Farm
East Malling Trust Estate
Bradbourne Lane
Aylesford, Kent ME20 6SN
01732 448120

Job Title: Land East of Woodgate Lane	Client: Pye Homes	Scale: 1:5000	Date: April 21	Designed: SC
Drawing Title: BGS Superficial Deposits Map		Drawn: SC	Checked: SAC	Approved: GAC
		Job No: 20-061	Figure No: FIGURE 2-3	Rev: -

20-061-025



NOTES

1. Do not scale from this drawing.
2. All dimensions are in metres unless shown otherwise.

KEY

Site Boundary

Bedrock geology

- LONDON CLAY FORMATION - CLAY, SILT AND SAND
- LAMBETH GROUP - CLAY, SILT AND SAND
- LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK FORMATION AND PORTSDOWN CHALK FORMATION (UNDIFFERENTIATED) - CHALK

Rev	Amendments	Drn	Chk	App	Date

Issued by

Charles & Associates

Landmark House
Station Road
Hook
Hampshire
RG27 9HA
01256 630420

Park House, Park Farm
East Malling Trust Estate
Bradbourne Lane
Aylesford, Kent ME20 6SN
01732 448120

Job Title: Land East of Woodgate Lane	Client: Pye Homes	Scale: 1:5000	Date: April 21	Designed: SC
Drawing Title: BGS Bedrock Map		Drawn: SC	Checked: SAC	Approved: GAC
		Job No: 20-061	Figure No: FIGURE 2-4	Rev: -

Appendix D Geotech Investigation Extract

EXECUTIVE SUMMARY

Project Information	
Project details	This Ground Investigation report has been prepared by T&P Regeneration Ltd (T&P) on behalf of Pye Homes for Oak Tree Lane, Woodgate PO20 3GU / NGR: 494160, 104140.
Site description and current land use	The site occupies approximately 8 hectares (ha), measuring approximately 390m east to west and 175m north to south. The site was found to be host to an arrangement of buildings located centrally, adjacent to the northern boundary comprising; two houses; three stable blocks together with some light commercial units, including a vehicle repair workshop located in the north east. The remaining area was broadly noted to be used as paddocks for horses. The north eastern field has been artificially raised. Anecdotal information suggests that a land filling/raising operation has been undertaken for a number of years and wastes may include animal carcasses, motor vehicles and animal wastes (faeces).
Proposed development	The proposed development is likely to comprise 159N° residential units including 36N° apartments and 123N° traditional two storey residential dwellings with associated areas of communal and private soft landscaping and hard landscaped access and parking.
Previous reports	This report has been prepared with reference to available previous reports including a Preliminary Investigation Report. The report comprised a Phase 1 Desk Study and development of a preliminary site conceptual model. (Soils Ltd. July 2019).
Site Setting	
Environmental setting	The environmental setting is summarised from previous third-party desk study information. The western and central portions of the site are shown to be underlain by Aeolian Deposits. These are described as mainly silt and formerly known as 'Brick earth'. The eastern site area is shown to be underlain by River Terrace Deposits that comprise sands and gravels. Beneath the superficial cover the London Clay Formation is indicated to be present. The underlying superficial deposits are classified as a Secondary A Aquifer. The bedrock geology is classified as an Unproductive Stratum. The site is not located within a groundwater Source Protection Zone. The nearest surface water feature is an undefined stream that forms the eastern site boundary. The majority of the site is located in a Flood Risk Zone 1, while the eastern site area is identified to cross Flood Risk Zone 2 and 3. Therefore, a Flood Risk Assessment will be required to support redevelopment. The site is not located within an environmentally sensitive area.
Site history	The earliest historical map of 1876 indicates the site to be undeveloped and spread across several agricultural fields. By 1974, Ryefields Piggeries is shown to have been constructed, comprising several rectangular buildings assumed to be housing pigs, two tanks are identified centrally within the buildings. The 1986 map shows the piggery is now identified as Ryefield Farm, the tanks are no longer shown. No further significant on-site changes are shown on the subsequent maps. The surrounding area is indicated to be broadly in agricultural use on the earliest map, with a railway track running from east to west approximately 100m north of the site. By 1937 an area of excavation is identified within 'Brick Field' located adjacent to the central section of the southern boundary. By 1979, the excavation is no longer shown and the 'Brick Field' is identified as a caravan park. No further significant changes other than the continued residential development of the area is shown to have occurred up to the present day.
Areas of potential concern	The following areas of potential concern were identified within the previous third-party desk study report: On-site: • Made ground associated with previous site development/activities. • Application of pesticides/herbicides associated with former agricultural practices. • Made ground associated with landfilling in the north eastern area of the site. • Historic tanks with unconfirmed storage/ contents. Off-site: • Potentially infilled pit located adjacent to the southern boundary. • Railway located 100m north of the site boundary.

Ground Investigation	
Scope of work	An intrusive ground investigation was undertaken on 25th November 2019 which comprised: • Excavation of 4N° trial pits to a maximum depth of 3.7 metres below ground level (mbgl). • Infiltration testing within 1N° trial pits. • Drilling of 7N° windowless soil sampling boreholes. Groundwater and gas monitoring points were installed in 4N° locations. • Three return groundwater and ground gas monitoring visits. The ground investigation coverage was restricted by the existing tenants due to the presence of animals across the fields and within the stables and restrictions in the active farm area. In order to minimise distress and possible injury to the animals, the area available for investigation was therefore considerably reduced as illustrated upon the attached GI plan. As a result, the main area of suspected infilled ground and the active farm area where the main contaminants sources were present were not accessible and require further investigation in due course.
Ground conditions	Made ground was only encountered in the north eastern site area at the edge of the area known to have been subject to landfilling. Made ground was found to comprise gravelly clay, which included brick, concrete, plastic and metal. Due to the anecdotal information that suggests further potentially significant sources of contamination may be present within the landfill area, additional more widespread investigation is required. Topsoil was encountered in the majority of exploratory locations with a typical thickness ranging between 0.15 and 0.20m. In general, the topsoil was found to comprise brown fine sand silt or silty clay. The western site area was found to be underlain by a succession of sandy, occasionally gravelly silt overlying silty fine, occasionally gravelly silty sandy gravel considered to represent the Aeolian deposits. In-situ density testing has indicated that the granular bands vary from very loose to medium dense. While, the eastern area was found to be underlain by a veneer of firm gravelly clay and loose clayey gravel considered to represent River Terrace Deposits to depths ranging from 0.70 to 1.50m. However, greater depths were recorded due to the raised levels within the north eastern field that has been subject to landfilling. Beneath the superficial cover firm to stiff and stiff silty clay was encountered considered to represent the London Clay Formation. With the exception of made ground within the north eastern field, no significant visible or olfactory evidence of any contamination was noted during the ground investigation.
Groundwater	Groundwater was encountered within the superficial deposits, with typical depths to groundwater strike ranging between 1.0 and 2.5mbgl.
Principal Findings and Conclusions	
Human health	All soil concentrations in made ground, topsoil and natural soils were recorded below adopted screening levels for residential use with vegetable uptake or considered not to present an unacceptable risk to human health. However, due to access restrictions during the ground investigation supplementary investigation will be required to assess the potential human health risk across the remaining areas of the site. It is recommended that provision of a clean capping layer in accordance with BRE guidance should be anticipated in the area of existing development and where development encroaches into the area of landfilling to mitigate human health risks.
Controlled waters	Due to the access restrictions encountered during the investigation the potential sources of contamination that include; historic tanks, vehicle repair workshop and landfill could not be fully investigated and characterised. Due to the presence of both surface and groundwater receptors and the presence of viable pathways and potential sources further investigation and assessment is warranted. It is recommended that supplementary investigation should comprise testing of surface waters up and down gradient of the landfill area to assess potential effects on surface water quality. Dependent of the findings of any supplementary investigation, groundwater monitoring and testing may also be required to evaluate the potential impacts to groundwaters.

Gas protection	Radon protection measures are not considered necessary for the proposed development. Based upon the findings of the monitoring completed, it is considered that gas resistant membranes are unlikely to be required throughout the development. However, an allowance should be made for the provision of Amber 1 gas mitigation measures in the north-eastern section where the marginally elevated concentrations of carbon dioxide have been recorded in WS04 and across the area of infilled ground until further monitoring can be completed. Based upon the current guidance together with the sensitivity of the residential development, it is advised the ground gas monitoring programme is continued for a further 3N^{o} rounds, making 6N^{o} in total, preferably with at least 1N^{o} completed during a period of low pressure <1000mB. This is also likely to be a regulator requirement to fully assess the ground gas regime beneath the inaccessible infilled parts of the site. Furthermore, and dependant on the findings during the demolition/supplementary ground investigation, it is likely that additional wells to increase coverage will be required.
Plant growth and buried potable supply pipework	Made ground and natural soils are not considered to pose a significant risk to the existing and proposed flora. However, with consideration of the physical composition of on-site made ground, which includes concrete, metal and plastic, that this will may be unsuitable to remain within areas of soft landscaping. It is considered likely that the majority of the site area will be suitable for standard pipework, however upgraded barrier pipework is considered likely to be required by the local water authority in the north eastern site area.
Waste	The made ground and natural soils are likely to be classified as non-hazardous waste. Based on the chemical data the soils should be treated as inert or stable non-reactive. The waste material present across the inaccessible north eastern section of the site may contain hazardous waste materials based upon the descriptions of the materials believed to have been placed there. Further evaluation post supplementary investigation is recommended. Further Waste Acceptance Criteria (WAC) testing may be required by the receiving site.
Infiltration testing	Based upon infiltration testing, site observations that recorded shallow groundwater, it is considered unlikely that traditional soakaways are likely to offer a viable solution for surface water discharge.
Engineering design	The cohesive soils have shown to be of medium to high shrinkage potential and as a result will be susceptible to the influence of trees. The western superficial deposits were found to be unstable below the groundwater level during the ground investigation. The instability suggests that the excavation of foundations to the formation level may not be achieved. CBR values of 3% are assumed for design purposes subject to firm clay being encountered at formation level. Sulphate testing of selected soil samples indicates that a suitable design mix for concrete for buried structures is likely to be DS1-AC1. It is noted that sulphate testing was limited to the shallow superficial deposits and any supplementary investigation should include further sulphate testing to fully characterise the London Clay beneath the site. Within the eastern area of the site, foundations could be overdeepened and placed depths of >1.0m within the London Clay Formation which was encountered at depths between 0.70 to 2.30m. Foundations placed within the firm to stiff and stiff London Clay may be designed for an allowable bearing capacity of 100kPa for acceptable settlement. However, when overdeepening foundations consideration should be given to the possibility of rapid groundwater ingress into excavations with may be problematic. In the western area, due to the thickness of superficial cover together with the instability and groundwater ingress observed within TP02 overdeepening of traditional foundations to a suitable formation is likely to be problematic and uneconomical. Given the above, it is likely that the western area of proposed development will require specialist foundations such as piles or that ground improvement could be carried out. The advice of specialist piling or ground improvement contractors should be sought to determine the most appropriate technique and method.

Considerations and Recommendations for Further Work	
Considerations	• The depth to competent founding strata was found to vary significantly across the site. • Relatively shallow groundwater was found in many areas across the site which may prove problematic for deeper foundation excavations and related construction. • The extent of investigation was limited by access restrictions, as a result supplementary investigation will be required. • Due to the restricted access further investigation will be required. • Infiltration testing was not undertaken in accordance with BRE Digest DG-365 (2016) as it was not possible to complete three infiltration tests at each location in the time available. However, because shallow groundwater was encountered in the monitoring wells, soakaways are unlikely to provide a viable drainage solution for this site. • The site is located within a Flood Risk Zone 2/3. As such, a Flood Risk Assessment will be required to support future development. • A large water supply pipeline is present within the central section of the site running north to south.

Recommendations	Human health/Controlled Waters/ Ground gas • It is recommended that further investigation and laboratory testing is undertaken in areas that have been identified as potential sources of contamination not accessible during this investigation. • It is recommended that that provision of a clean capping layer in accordance with BRE guidance should be anticipated in the area of existing development/farm and where development encroaches into the area of landfilling to mitigate human health risks. It is anticipated this will likely comprise up to 300mm in common areas of proposed public open space and up to 600mm in private garden areas with a geotextile separation/no-dig layer at the base/sides of excavations, where residual made ground is present. • Due to the access restrictions encountered during the investigation the potential sources of contamination that include; historic tanks, vehicle repair workshop and landfill could not be fully investigated and characterised. It is recommended that supplementary investigation should comprise testing of surface waters up and down gradient of the landfill area to assess potential effects on surface water quality. Dependent of the findings of any supplementary investigation, groundwater monitoring and testing may also be required to evaluate the potential impacts to groundwaters. • Subject to confirmation of physical suitability, it is considered that on-site made ground may be suitable for re-use within areas of shared soft landscaping or beneath hard landscaping. In the event that on-site re-use of soils is planned, a Materials Management Plan (MMP) may be required, in line with the CL:AIRE Definition of Waste Code of Practice. • Following the completion of supplementary investigation, a remediation strategy should be prepared detailing the recommended risk mitigation actions. • It is advised the ground gas monitoring programme is continued for a further 3N^{o} rounds, to increase the number to 6N^{o} in total, in line with CIRIA/NHBC guidelines. Furthermore, dependant on the findings during the supplementary ground investigation, additional wells may be required. Plant growth and potable water supply pipework • No significantly elevated phytotoxic contaminant compounds were detected in soils, and it was noted that existing vegetation was generally healthy. It should however be noted that further investigation is recommended to fully characterise the site. • It is recommended that testing in line with BS3882 requirements is undertaken to confirm suitability of site won topsoil for re-use aligned to the development landscaping proposals. • Elevated contaminants within the made ground with respect to the UKWIR guidelines indicate that upgraded water supply pipework will be required for any services installed in the made ground. • The statutory water provider should be consulted regarding suitable water supply pipework requirements. Engineering • Further investigation is recommended to provide further confidence in the extent and volume change potential of the near surface clay in the central northern section of the site. Following this a zonal plan should be produced to illustrate where differing floor slab solutions can be used. • Further investigation is also recommended to provide further confidence to the current foundation recommendations and to possibly zone areas of loose material which may lead to more favourable recommendations within the western area of the site. • Supplementary groundwater monitoring should be carried out to further assess the potential for significant groundwater ingress into foundation excavations. • The advice of specialist piling contractors should be sought to discuss the most cost-effective method of pile emplacement taking into account the ground and groundwater conditions described in this report. Piling contractors should also be made aware of very loose sand encountered beneath the water table in TP03 which could cause problems with rising/running sands within uncased boreholes. • Should any exceptionally soft spots or oversized material be noted during construction, they should be removed and replaced with compacted granular fill for road construction. • Based upon the recorded pH levels revealed on site when considered against the assessment levels in BRE Special Digest 1 (2005) a DS1-AC1 concrete design mix should be suitable for subsurface concrete across the site however, this should be confirmed following further assessment.

	General • Discussions should be held with local landfill/soil waste treatment facilities to agree material classification/pre-treatment required for any soils to be disposed off-site as a result of proposed construction works. • Ground workers should remain vigilant for visible and olfactory signs of contamination following demolition of on-site buildings. • Although no areas of made ground were encountered during the investigation vigilance should be employed by the groundworks contractor during works. In the event that significant made ground is encountered, advice from a specialist geoenvironmental consultancy should be sought. • On-site monitoring wells should be protected from damage until such time as additional gas/groundwater monitoring has been completed and conclusions/recommendations within this report are agreed with the regulators. • On-site monitoring installations should be decommissioned in accordance with Environment Agency guidelines. • A site-specific health and safety plan should be prepared to inform on risks posed from the previous site use and mitigations for ground workers developing the site e.g. requirements for appropriate PPE, hygiene practices, environmental monitoring and requirements for mitigation measures during construction works. • A copy of this report should be provided to the relevant regulatory authorities to confirm that they are in agreement with the report findings.

Appendix E Masterplans

N

CDM 2015 Health & Safety Information

This information relates only to 'Significant Hazards' identified on this drawing and is to be read in conjunction with the Designer's Hazard Register.



ACCOMMODATION SCHEDULE

Private Dwellings

No.	Dwelling Type	
15no.	2-Bed 3 Person Flats	
4no.	2-Bed 4 Person Flat Over Garage	Type A
3no.	3-Bed 4 Person Bungalow	Type C
11no.	2-Bed 4 Person House	Type D
19no.	2-Bed 4 Person House	Type E2
7no.	3-Bed 5 Person House	Type F
2no.	3-Bed 5 Person House	Type G
4no.	3-Bed 5 Person House	Type H
12no.	3-Bed 5 Person House	Type J
5no.	3-Bed 5 Person House	Type M
2no.	3-Bed 5 Person Chalet	Type U
19no.	3-Bed 5 Person House	Type S
1no.	4-Bed 6 Person House	Type K
14no.	4-Bed 6 Person House	Type T
3no.	4-Bed 7 Person House	Type L
6no.	4-Bed 8 Person House	Type R

Total 127 Dwellings

Affordable Rent Dwellings

No.	Dwelling Type	
9no.	1-Bedroom Flats	
2no.	2-Bed 4 Person Flat Over Garage	Type A
17no.	2-Bed 4 Person House	Type E1
10no.	3-Bed 5 Person House	Type I
2no.	4-Bed 6 Person House	Type K

Total 40 Dwellings

Intermediate Family Home Dwellings

No.	Dwelling Type	
6no.	1-Bedroom Flats	
1no.	2-Bed 4 Person Flat Over Garage	Type A
2no.	2-Bed 4 Person House	Type E1
3no.	3-Bed 5 Person House	Type I
1no.	4-Bed 6 Person House	Type K

Total 13 Dwellings

Totals

53	Affordable Dwellings (30%)
127	Private Dwellings (70%)

Total 180 Dwellings

M4(2)

* Denotes Part M4 compliant. Out of the total provision, 56 dwellings are Part M4(2) & M4(3) compliant equating to 31%

Car Parking - generally;

1no. spaces per 1 & 2 bedroom apartment
2no. spaces per House (one of which is an EV charging point)

36no. visitor parking spaces (20%)
37no. unallocated parking spaces
4no. unallocated EV charging spaces

Cycle Parking - generally;

1no. space per 1 bedroom Flat
2no. spaces per 2-bedroom Dwelling
2no. spaces per 3-bedroom Dwelling
2no. spaces per 4-bedroom Dwelling

Cycle storage generally provided within garages, rear garden sheds or communal cycle stores.

Site Area - 7.25ha

Rev	Date	Revision Details	Dr	Ch
Q	29.07.21	Highway amendments	LT	KE
P	26.07.21	Residential mix updated	LT	KE
O	22.07.21	Parking in front of plots update	LT	KE
N	25.06.21	Layout Updated	LT	KE
M	11.06.21	Layout Updated	LT	KE
L	03.02.21	Layout Updated	LT	KE
K	16.12.20	Layout Updated	LT	KE
J	16.12.20	Residential Mix Adjusted & No's Increase	LT	KE
I	25.11.20	Site Layout updated	LT	KE
H	25.11.20	Colour added	LT	KE
G	19.11.20	M4(2) positions reviewed	LT	KE
F	18.11.20	Layout adjusted to consultant comment	LT	KE
F	18.11.20	Layout adjusted to consultant comment	LT	KE
E	11.11.20	Affordable provision allocated	LT	KE
D	06.11.20	Site layout amended to tree & highway comments	LT	KE
C	18.09.19	Parking provision amended	LT	AK
B	18.09.19	Foul Sewer position added	LT	AK
A	06.09.19	Site layout updated	LT	AK

London: 76 Great Suffolk Street, London, SE1 0BL
T 0207 928 2773 E london@ecearchitecture.com
Sussex: Brooklyn Chambers, 11 Goring Road, Worthing, West Sussex, BN12 4AP
T 01903 248777 E sussex@ecearchitecture.com
Bristol: Westworks, Colston Tower, Colston Street, Bristol, BS1 4XE
T 0117 214 1101 E bristol@ecewestworks.com
ECE Architecture
www.ecearchitecture.com

Client's Name
Pye Homes

Job Title
Land east of Woodgate Lane, Woodgate

Drawing Title
Site Layout

Scale
1:500 @ A0 / 1:1000 @ A2
metres 10 20 30 40 50

Drawn	Checked	Date
KE	LT	02.03.21

Job No	Drawing No	Rev
6781	02	Q

Status
APPROVAL

CAD Plot date: 29/07/2021 - 09:49:04 6781 site.dwg

Appendix F WSCC & ADC Correspondence

Scott Collis

From: Paul Cann <Paul.Cann@arun.gov.uk>
Sent: 09 February 2021 13:09
To: Martin Riches
Cc: Sarah Burrow; Kevin Macknay; Colin Shackleford; Hannah Walters; Ashley Maltman; Glenn Charles
Subject: RE: Woodgate Centre - update

Categories: saved

Hi Martin

Since the groundwater level at W3 has not changed since the previous reading, either there is something wrong with the borehole or the stiffer clay in that area is preventing the groundwater rising. Based upon this, I would suggest the groundwater monitoring doesn't continue. With the monitoring to date showing groundwater virtually at the surface level, I think we should now completely rule out infiltration potential and rely on a attenuated system incorporating impermeable liners.

The groundwater levels will inform the floatation calculations. Due to the uncertainties in respect to W3, any structures in the vicinity of that borehole should assume similar groundwater levels to those found in the other boreholes.

Hope that all makes sense.

Regards

Paul Cann
Principal Drainage Engineer
Engineering Services

T: 01903 737819
E: **paul.cann@arun.gov.uk**

Arun District Council, Civic Centre, Maltravers Rd, Littlehampton, West Sussex, BN17 5LF
www.arun.gov.uk

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From: Martin Riches [redacted]
Sent: 05 February 2021 15:58
To: Paul Cann <Paul.Cann@arun.gov.uk>
Cc: Sarah Burrow <Sarah.Burrow@arun.gov.uk>; Kevin Macknay <kevin.macknay@westsussex.gov.uk>; Colin Shackleford [redacted] Hannah Walters [redacted] Ashley Maltman [redacted] Glenn Charles [redacted]
Subject: RE: Woodgate Centre - update

Hi Paul,

An update following groundwater monitoring readings taken on Wednesday 3rd February – please see attached. Water levels are now even higher at all locations except W3, where it remained at 0.92m below ground level. However it should be noted that the natural soil above the water table at W3 is clay, therefore soakage will be poor at best.

Soakage testing has therefore been stood down. Monitoring is ongoing for the moment, but with soakage potential ruled out do you require further readings?

Regards,

Martin Riches
BEng (Hons) Civil Engineering

Associate

ddt. 01732 606036

Website **LinkedIn**

Kent.
Park House, Park Farm,
East Malling Trust Estate, Bradbourne Ln.
Aylesford, Kent, ME20 6SN

Hampshire.
Landmark House,
Station Road, Hook,
Hampshire, RG27 9HA

[redacted]

Charles & Associates

Registered in England No. 08136641

From: Paul Cann <Paul.Cann@arun.gov.uk>
Sent: 01 February 2021 10:38
To: Martin Riches <[redacted]
Cc: Sarah Burrow <Sarah.Burrow@arun.gov.uk>; Kevin Macknay <kevin.macknay@westsussex.gov.uk>; Colin Shackleford <[redacted]>; Hannah Walters [redacted]
Ashley Maltma[redacted]>; Glenn Charles [redacted]
Subject: RE: Woodgate Centre - update

Hi Martin

I think opportunities for infiltration are certainly limited on this site. As you say W3 may have some potential.

I would suggest not undertaking an infiltration test in the vicinity of W3 but to continue the monitoring the groundwater (gw) levels into March as required. Please note that the current groundwater levels in the region are creeping up due to the recent rainfall, so levels are likely to get higher if we continue to get more rain.

Once we know the peak gw levels, then the final designs can be informed. Where possible, we would expect shallow structures to make use of infiltration by having permeable bases – appreciate this could be limited to the area of W3 but the further monitoring will dictate this. As a result of no infiltration testing, we wouldn't expect any infiltration to be accounted for in the hydraulic calculations, just accounted for in the construction details.

Please note that the gw monitoring will also inform floatation calcs for any suds structures with bases below peak gw levels.

Hope this all makes sense.

Regards

Paul Cann
Principal Drainage Engineer
Engineering Services

T: 01903 737819
E: paul.cann@arun.gov.uk

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www.arun.gov.uk

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From: Martin Riches [redacted]>
Sent: 29 January 2021 17:41
To: Paul Cann <Paul.Cann@arun.gov.uk>
Cc: Sarah Burrow <Sarah.Burrow@arun.gov.uk>; Kevin Macknay <kevin.macknay@westsussex.gov.uk>; Colin Shackleford [redacted] Hannah Walters [redacted] Ashley Maltman [redacted] Glenn Charles [redacted]com>
Subject: FW: Woodgate Centre - update

Hi Paul,

Please see below and attached latest information on groundwater at the Woodgate Centre site, which hopefully is self-explanatory. There is one small window of opportunity at WS W3 for a shallow soakage test.

Could you please advise early next week on whether soakage testing is still required and whether you still require groundwater monitoring to continue.

Thanks,

Regards,

Martin Riches
BEng (Hons) Civil Engineering

Associate

[redacted]

Website **LinkedIn**

Kent.
Park House, Park Farm,
East Malling Trust Estate, Bradbourne Ln.
Aylesford, Kent, ME20 6SN

Hampshire.
Landmark House,
Station Road, Hook,
Hampshire, RG27 9HA

[redacted]

Charles & Associates

Registered in England No. 08136641

From: Colin Shackleford <[redacted]uk>
Sent: 29 January 2021 16:55
To: Martin Riches <[redacted]
Cc: Ashley Maltman <[redacted]>; Hannah Walters <[redacted]
Subject: Woodgate Centre - update

Hi Martin

Please find attached the following information:

- Updated site plan with today's water level readings
- Borehole logs
- Dynamic Probe log
- Updated groundwater monitoring record

Groundwater everywhere is at its shallowest to date. Looking at the water levels with respect to ground conditions at each location, I think we have a few issues with respect to the soakage testing:

W1: water at 0.32m, made ground to 0.40m (topsoil w. flint) – water 80mm above top of natural ground (CLAY)
W2: water at 0.41m, made ground to 0.30m (topsoil w. brick & flint) – 110mm of natural ground (CLAY) above water level
W3: water at 0.92m, made ground to 0.35m (topsoil w. flint) – 570mm of natural ground (CLAY) above water level
W4: water at 0.11m, made ground (gravelly clay) to 1.00m – water 890mm above top of natural ground (CLAY)

At T&P Regen's locations:

WS01: water at 0.35m, topsoil to 0.15m – 200mm of natural ground (fine sandy, clayey silt) above water table (not counting topsoil)
WS02: water at 0.33m, topsoil to 0.20m – 130mm of natural ground (sandy silt) above water table (not counting topsoil)

We would not normally recommend soakage testing, or indeed discharging surface water into made ground (obviously inc. topsoil) long term, due to likely settlement issues. From the above comparison therefore it would seem that only location W3 has a reasonable thickness of natural soil to test, at 570mm, but we don't know how far above the water table the council expect the tests to be carried out, can you confirm please?

Where water is above the top of the natural ground (W1, W4) we would not recommend that testing proceeds, as we will be testing the made ground, and there seems little hope of infiltration drainage being possible in those areas.

At the other locations (W2, and T&P's WS01 & 02), we have 110-200mm thickness of natural ground above the water table so again there seems little hope of maintaining any unsaturated zone between the water table and infiltration features, unless levels are being raised for permeable paving.

In light of the above I think we need to urgently review the plans for the work on 15/02, please can you advise how you wish to proceed? As noted, we have accrued significant costs on these works to date and will need to recover those, whatever happens.

On another matter, we are having no luck in finding welfare facilities available for hire, from anyone that serves the area. We understand that there are toilets available on site so, with the landowner's agreement, we would propose to use these. We will obviously leave them as we find them and will take extra care with respect to covid-19, i.e. washing/sanitising hands before use. The costs for welfare hire will obviously not be charged.

The dynamic probe log shows fairly weak conditions near surface, with gradually increasing resistance below 1.50m, before it refused at 4.20m. This is generally consistent with the conditions found in the borehole adjacent, where firm and soft clays were found to 1.90m, with a thin layer of gravel at 1.90-2.00m, over more competent clay, and then the London Clay at 3.00m. As you anticipated, therefore, I think pile foundations will be required for the bridge structure, and a cable percussion borehole would be needed to provide full design data. We can price for this in due course, if required.

I hope that the above information is helpful. We can obviously discuss the way forward early next week.

Have a good weekend.

Regards

Colin

Colin Shackleford ***CEng MICE IMaPS***
Partner

[redacted]

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