KEY

TOPOGRAPHICAL KEY

SURVEY STATION	FENCE
BANKING (TOP / BOTTOM)	WALL
HEDGE SPREADS	BUILDING
WOODLAND CANOPY	OPEN SIDED BUILDING
ARROW ON STEPS / RAMPS INDICATES DIRECTION UPWARDS	OVERHANG / CANOPY
TREES (SPREAD & GIRTH SHOWN TO SCALE)	GLASSHOUSE
GATE	CONTOUR (25.50)
KERB CHANNEL	SPOT LEVEL + 127.13 / SONAR LEVEL ○ 127.13
ROAD UNKERBED	BORE HOLE (BH)
	TRIAL HOLE (TH)
	FOOTPATH
	CHANGE IN SURFACE

GENERAL

(ACP)	ASSUMED CONNECTION POINT
COW	CABLE ON WALL
CW	COMBINED WATER
DIS	DISUSED
EML	ELECTROMAGNETIC LOCATOR
EOT	END OF TRACE
FO	FIBRE OPTIC
FP	FOOTPATH
FW	FOUL WATER
GP	GATE POST
GPR	GROUND PENETRATING RADAR
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
R/MAIN	RISING MAIN
RW	RETAINING WALL
SNP	STREET NAME PLATE
SW	SURFACE WATER
TAC	TACTILE PAVING
TW	TRADE EFFLUENT WATER
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

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
FL	FLOOR LEVEL
IL	INVERT LEVEL
PT	P TRAP LEVEL
RL	ROOF LEVEL
SOF	SOFFIT LEVEL
WL	WATER LEVEL

APPARATUS

ACU	AIR CONDITIONING UNIT
AV	AIR VENT
BB	BELISHA BEACON
BO	BOLLARD
BOL	BOLLARD LIGHT
BS	BUS STOP
BT	BT INSPECTION COVER
CATV	CABLE TELEVISION
CB	CONTROL BOX
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
MK	MARKER POST / PLATE
MH	MANHOLE
MT	METER
M/WELL	MONITORING WELL
OL	OUTLET
OU	OUTFALL
PO	POST
PTG	PIPE TO GROUND
PTS	PIPE TO SURFACE
PU	PUMP
RE	RODDING EYE
RS	ROAD SIGN
RWP	RAIN WATER PIPE
SC	STOP COCK
SP	SOIL PIPE
ST	STAY CABLE
SVP	SOIL VENT PIPE
SV	STOP / SLUICE VALVE
TCB	TELEPHONE CALL BOX
TL	TRAFFIC LIGHT
TLC	TRAFFIC LIGHT COVER
TP	TELECOM POLE
VP	VENT PIPE
WM	WATER METER
WO	WASH OUT
WR	WATER RISER
W/WELL	WET WELL

LINESTYLE

INTERNAL METER (MT)
POT ENDED SERVICE
SEWER CAPPED RUN
SURVEY ABANDONED
INTERNAL VALVE
UNKNOWN UNDERGROUND ANOMALY
UNDERGROUND CHAMBERS
POST PROCESSING AREA (FROZEN LAYER)
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

DEPTHS

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

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.



Notes :

1. GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL GPS NETWORK. LOCAL SCALE FACTOR 0.99964 APPLIED.
2. TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.
3. THIS SURVEY SHOULD ALWAYS BE READ IN CONJUNCTION WITH THE DESKTOP UTILITY REPORT, THAT WAS CARRIED OUT AS A PREREQUISITE TO THIS DETECTION SURVEY.

Main Control Coordinate Table

Station	Description	Easting	Northing	Level
S1	Road Nail	345446.559	384411.957	22.649
S2	Road Nail	345505.658	384268.561	21.634
S3	Road Nail	345493.863	384114.939	21.597
S4	Road Nail	345490.706	383991.776	22.111
S5	Road Nail	345362.234	383913.452	21.933
S6	Road Nail	345191.490	383857.598	22.112
S7	Hilti Nail	344922.692	383726.531	23.141
S8	Road Nail	344690.851	383733.315	23.764
S9	Road Nail	344321.938	383722.173	24.450
S10	Road Nail	344173.029	383735.587	29.983
S11	Road Nail	343982.470	383780.562	34.054
S14	Road Nail	343976.468	384405.913	29.798
S15	Road Nail	344173.651	384427.605	23.647
S16	Road Nail	344396.281	384438.565	23.637
S17	Road Nail	344788.728	384458.167	23.694
S18	Road Nail	345164.092	384444.567	28.560

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
Prior to the survey commencing record information was gathered and compiled in a separate desktop utility report. This report should be read in conjunction with the information contained in this utility detection survey. Record information was at the time of the survey less than 90 days old in accordance with the requirements of the PAS 128:2014. For a full list of the providers searched, records received and the dates the information was obtained, please refer to the enclosures page of the desktop utility report.

DETECTION SURVEY
DRAINAGE
All drainage was lifted where possible with pipe sizes and invert levels recorded. A number of covers require mechanical lifting aids in order to lift safely. 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 otherwise. In instances where other detection methods were unsuccessful connections between manholes have been assumed to be straight and labelled as QB4. A number of chambers require confined space entry to obtain further information. All drainage should be cross checked in critical areas by CCTV survey or verification survey type A.

WATER
Water apparatus located in Phase 2A was located using GPR methods with derived depths recorded to the crown of the service. Apparatus located in Phase 2Bi using EML and GPR methods with derived depths recorded accordingly.

GAS
Gas apparatus located within both Phase's 1 and 2A is metallic and was located using EML signal induction methods with electronically derived depths recorded. Apparatus located in Phase 2Bi using EML and GPR methods with derived depths recorded accordingly.

ELECTRICITY
Electrical apparatus located in both Phase's 1 and 2A using EML methods with electronically derived depths recorded. A number of HV cable routes in Phase 2A area was located using passive sweep to initially locate, then EML signal induction methods used to locate route and obtain depths. Unable to locate full route of 2xHV cables along the north edge of Phase 2A due to the amount of ground water and vegetation in certain areas as stated on the drawing. Further investigation required in these areas prior to any works.

TELECOM
All 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
All CATV/Data apparatus was located using EML with electronically derived depths recorded. Empty duct routes from CATV8 in the west corner of Phase 2A was located using a flexi-trace sonde carrying EML induced signal.

UNKNOWNS
A number of unknown GPR responses located within the survey area of Phase 2A. Also a large number of GPR unknowns located in the staff car park north section of Phase 2Bi. Further investigation required with possible trial holes to identify status.

GPR
Maximum GPR signal penetration depth across the survey areas was <1.20m.

GENERAL
Unable to fully survey the trailer loading area to the east of Phase 2Bi due to the amount of trailers, stock and amount of vehicle or forklift truck movement. Further survey work required out of hours to enable the collection of further information safely.

SEE CAUTIONARY NOTES WITHIN THE UTILITY KEY

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

Desktop Utility Records

Utility Type	Provider Details	Date Acquired
Drainage	United Utilities	12/02/2016
Water	United Utilities	12/02/2016
Gas	National Grid	11/02/2016
Electricity	SP Energy Networks	05/02/2016
Telecom	Openreach	12/02/2016
CATV + Data	Virgin Media + Vodafone Limited	05/02/2016 + 15/02/2016

Sheet Layout: (Not to Scale)

Revision	Description	Surv. by	Check. by	Appr. by	Date
5	Topographical and utility survey added BIW extension area.	AMG/??	AJ	SGB	29/04/22
4	Topographical and utility survey added aluminium scrapyard.	AMG/JT	AJ	DSR	23/09/19
3	Topographical and utility survey updated around North Yard Area	AMG/DSR	AJ	DF	02/01/18
2	Topographical and utility survey extended on North Road.	AMG/DSR	AJ	TJF	11/07/16
1	Topographical and utility survey extended into Getrag (Phase 4).	AMG/DSR	GL	TJF	28/06/16

0m 5 10 15 20 25 30 35 40 45 50 55

Topographical and PAS 128:2014 Utility Survey

Client: JAGUAR LAND ROVER

Jaguar Land Rover
Halewood
Merseyside

Scale:	Sheet Size:	Sheet Number:	Date:
1:500	A0	9	February 2016

Project Number:	Rev:	Surveyed by:	Checked by:	Approved by:
21938	5	MKS	AJ/GL	AJ/GL

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