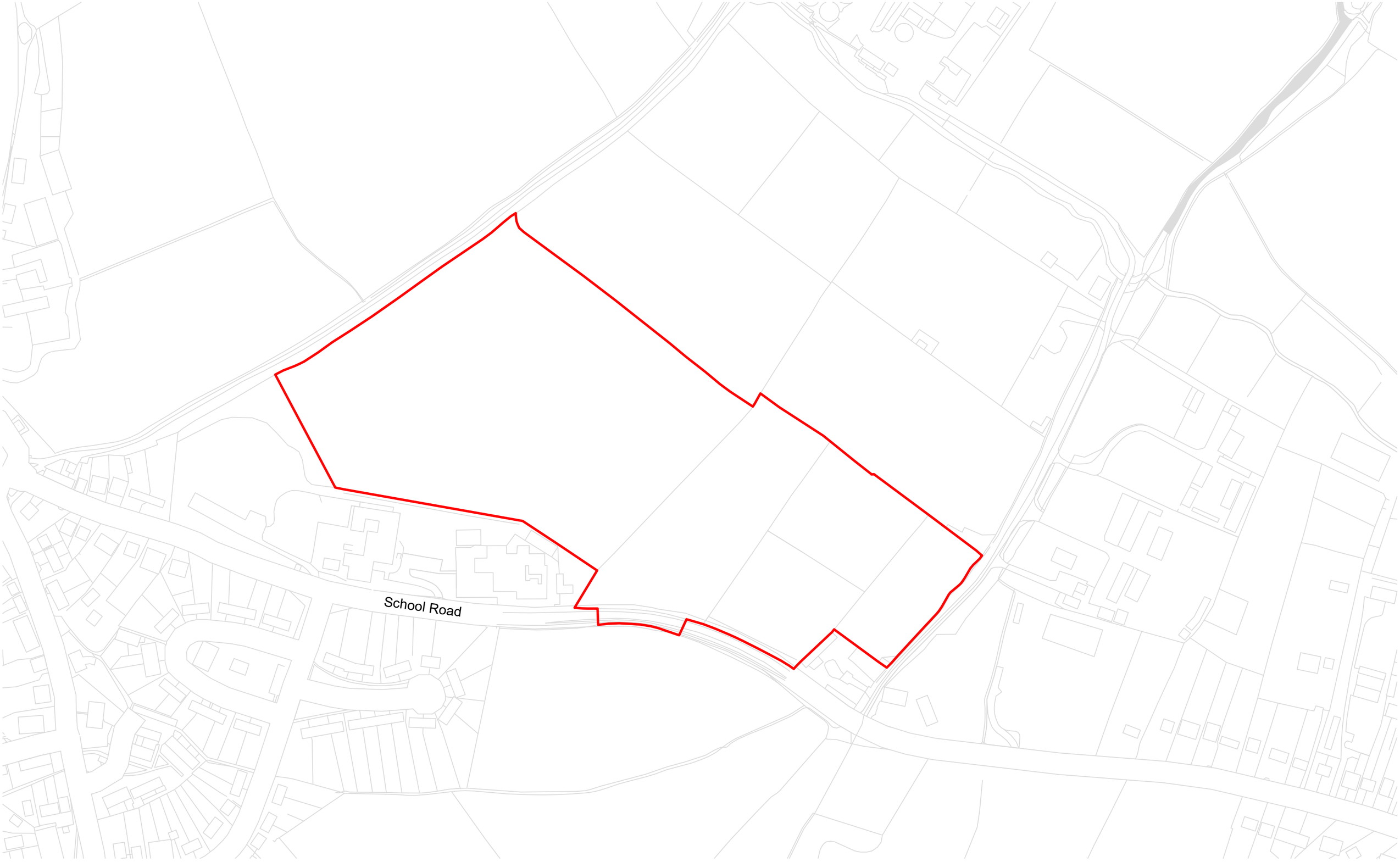
Appendices

Appendix 1 - Plans

Illustrative Masterplan

Topographic Survey

Thames Water Sewer Asset Plan



Site Boundary - 8.25Ha

Status **Final**

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This drawing is for planning purposes only and is not to be used as a basis for construction.
Do not scale from this drawing - use figured dimensions only.

Client:	Croudace Homes
Project title:	Land North of School Road, Arborfield Cross
Drawing title:	Site Boundary Plan

Scale:	1:2500@A3
Date:	12.08.2024
Drawn by:	DR
Checked by:	MV
Drawing no.:	2522477.4
Revision:	A

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Client:	Croudace Homes
Project title:	Land North of School Road, Arborfield Cross
Drawing title:	Ilustrative Masterplan

Scale:	1:1500@A2
Date:	09.08.2024
Drawn by:	DR
Checked by:	MV
Drawing no.:	2522477.4
Revision:	C

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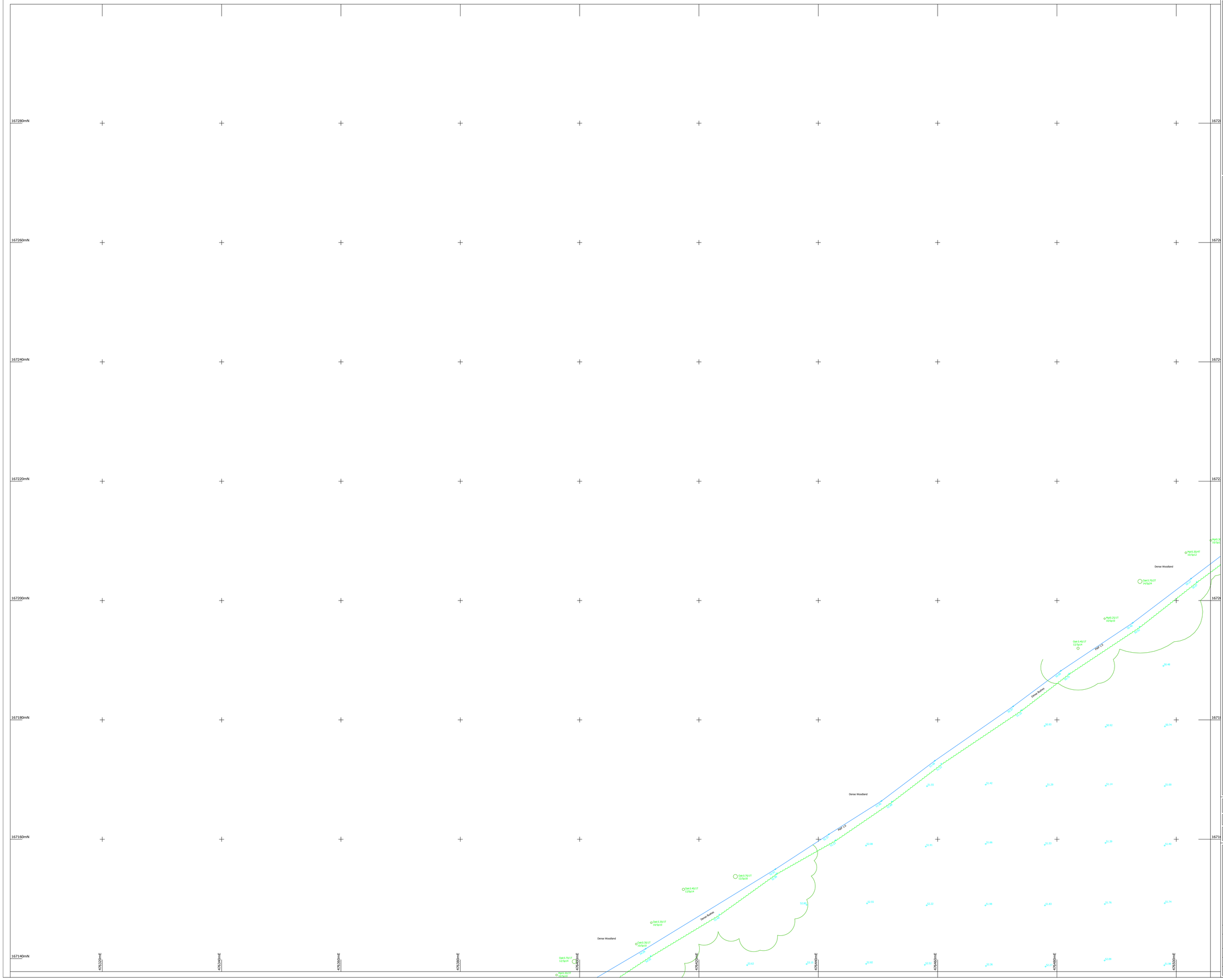
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476480mE
476500mE
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Dense Bushes
Dense Woodland
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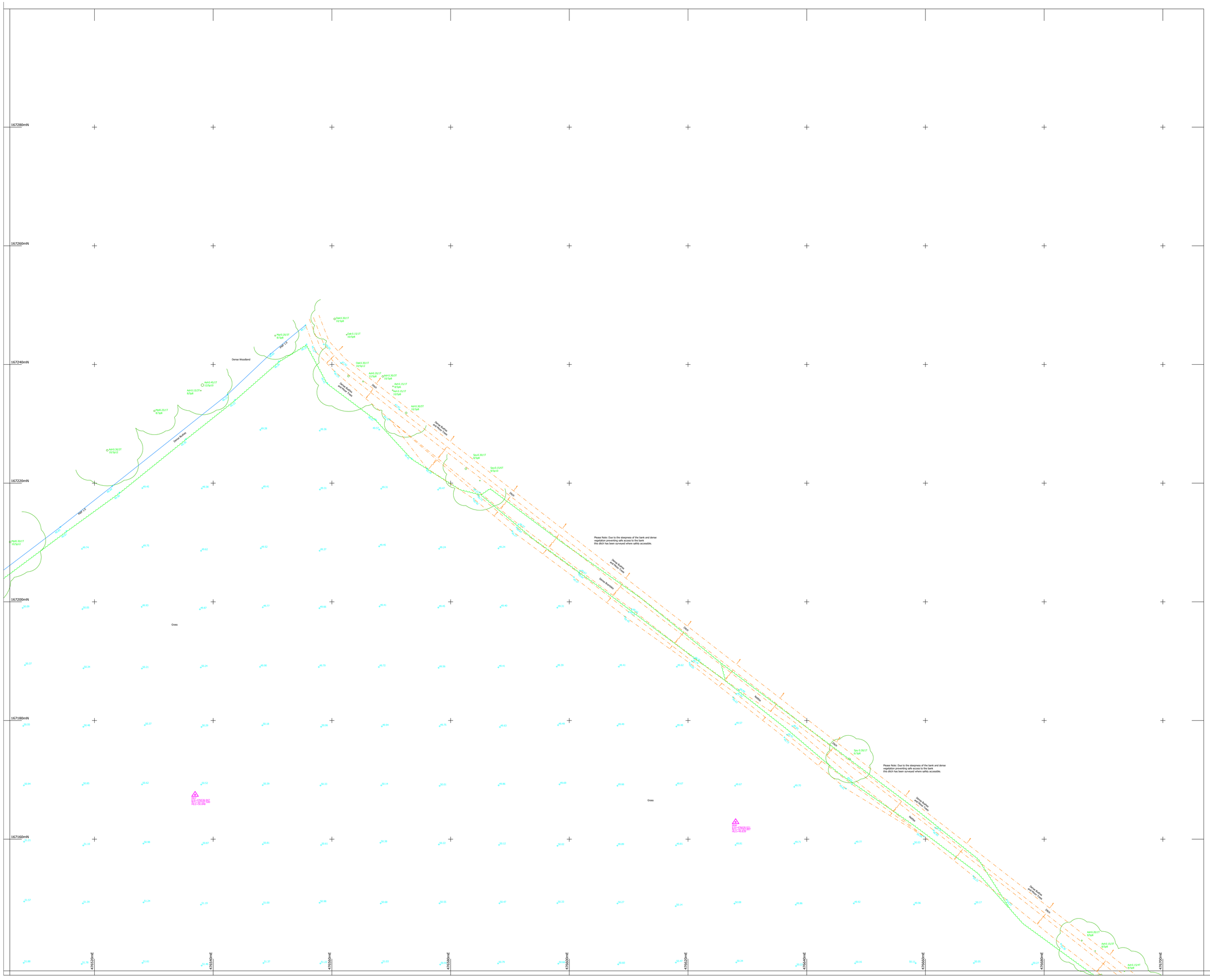
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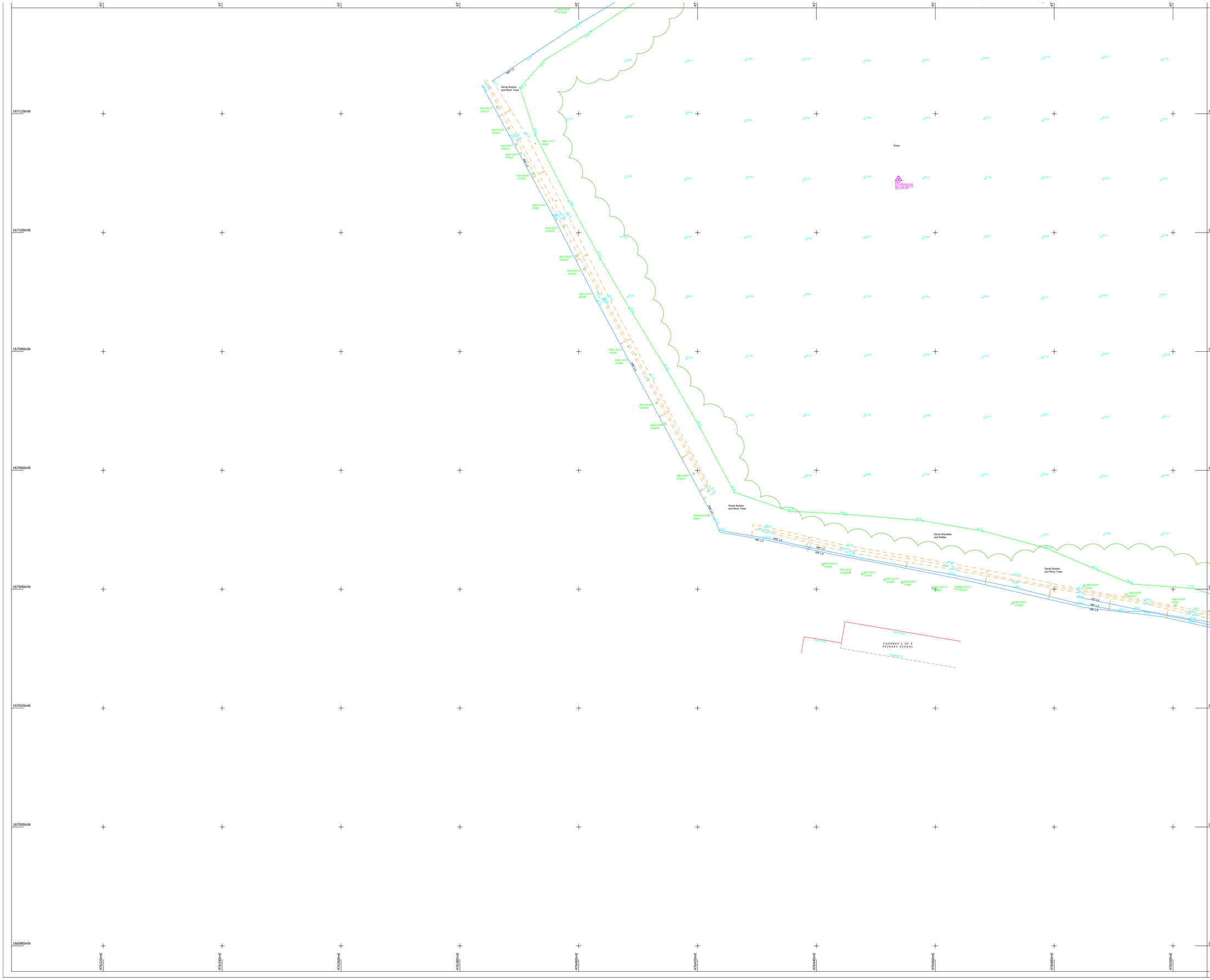

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LEGEND

OVERALL TREE SPECIES INFORMATION

ALDER	ALD	LONDON PLANE	LPN
ASH	ASH	MAGNOLIA	MAG
ASPEN	ASP	MAPLE	MPL
BEECH	BCH	OAK	OAK
CHERRY	CHY	PINE	PNE
ELM	ELM	POPLAR	POP
FIR	FIR	RHODODENDRONS	RDN
FRUIT	FRT	SYCAMORE	RWN
HAWTHORN	HAW	SILVER BIRCH	SBI
HAZEL	HAZ	SWEET CHESTNUT	SCH
HOLLY	HLY	WALNUT	WNT
HORSE CHESTNUT	HCH	WILLOW	WLW
LIME	LIM	YEW	YEW
LOCUST	LOC	SPECIES UNKNOWN	SPU
		COPPICED	COP

TREE ANNOTATIONS: Tree Species / Tree Bole Size / No of Boles
Tree Height / Tree Canopy Spread

FENCE INFORMATION

BARBED WIRE FENCE	BWF
CHAIN LINK FENCE	CLF
CHESTNUT PALING FENCE	CPF
CLOSE BOARD FENCE	CBF
CONCRETE SLAT FENCE	CCF
CORRUGATED IRON FENCE	CIF
CRASH BARRIER	CBR
HANDRAIL	HDL
IRON RAILINGS	IRF
MESH FENCE	MSF
MISCELLANEOUS FENCE	MSF
PALISADE FENCE	PSF
PICKET FENCE	PKF
POST AND CHAIN FENCE	PCF
POST AND RAIL FENCE	PRF
POST AND WIRE FENCE	PWF
SECURITY FENCE	SCF
STOCK WIRE FENCE	SWF
TRELLIS FENCING	TLF
WIRE MESH FENCE	WMF

LEVEL INFORMATION

BED LEVEL	BL
COVER LEVEL	CL
FLOOR LEVEL	FL
INVERT LEVEL	IL
OUTFALL LEVEL	OL
THRESHOLD LEVEL	THL
POOL WATER	PW
SURFACE WATER	SW
UNABLE TO LIFT	UTL
WATER LEVEL	WL

SURFACE INFORMATION

CONCRETE	Cc
BRICK PAVING	BP
FLOWERBED	FB
PAVING SLABS	PS
RETAINING WALL	RWall
SCALPINGS	Scalp
TACTILE PAVING	Tac

FEATURE INFORMATION

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BUS STOP	BS	POST	P
CABLE TELEVISION IC	CATV	RAIN WATER PIPE	RWP
EARTHING ROD	ER	ROAD SIGN	RS
ELECTRICITY CABLE PIT	ELCP	RODDING EYE	RE
ELECTRICITY POLE	EP	SERVICE MARKER POST	SMP
FIRE HYDRANT	FH	SOIL VENT PIPE	SVP
FLAG POLE	FP	STOP VALVE	SV
GUIDE POST	GP	TELEGRAPH POLE	TP
INSPECTION COVER	IC	TRAFFIC SIGNAL	TS
LAMP POST	LP	TRAFFIC SIGNALS IC	TSIC
LETTER BOX	LB	WASH OUT	WO
KERB OUTLET	KO	WATER METER	WM

REVISIONS

PLOT MAP

1	2	
3	4	5
	6	7

Level Datum:
Levels are related to OSGB15 derived from the GPS network

Grid:
Grid is related to OSGB15 derived from the GPS network

Northpoint:

ENCOMPASS SURVEYS

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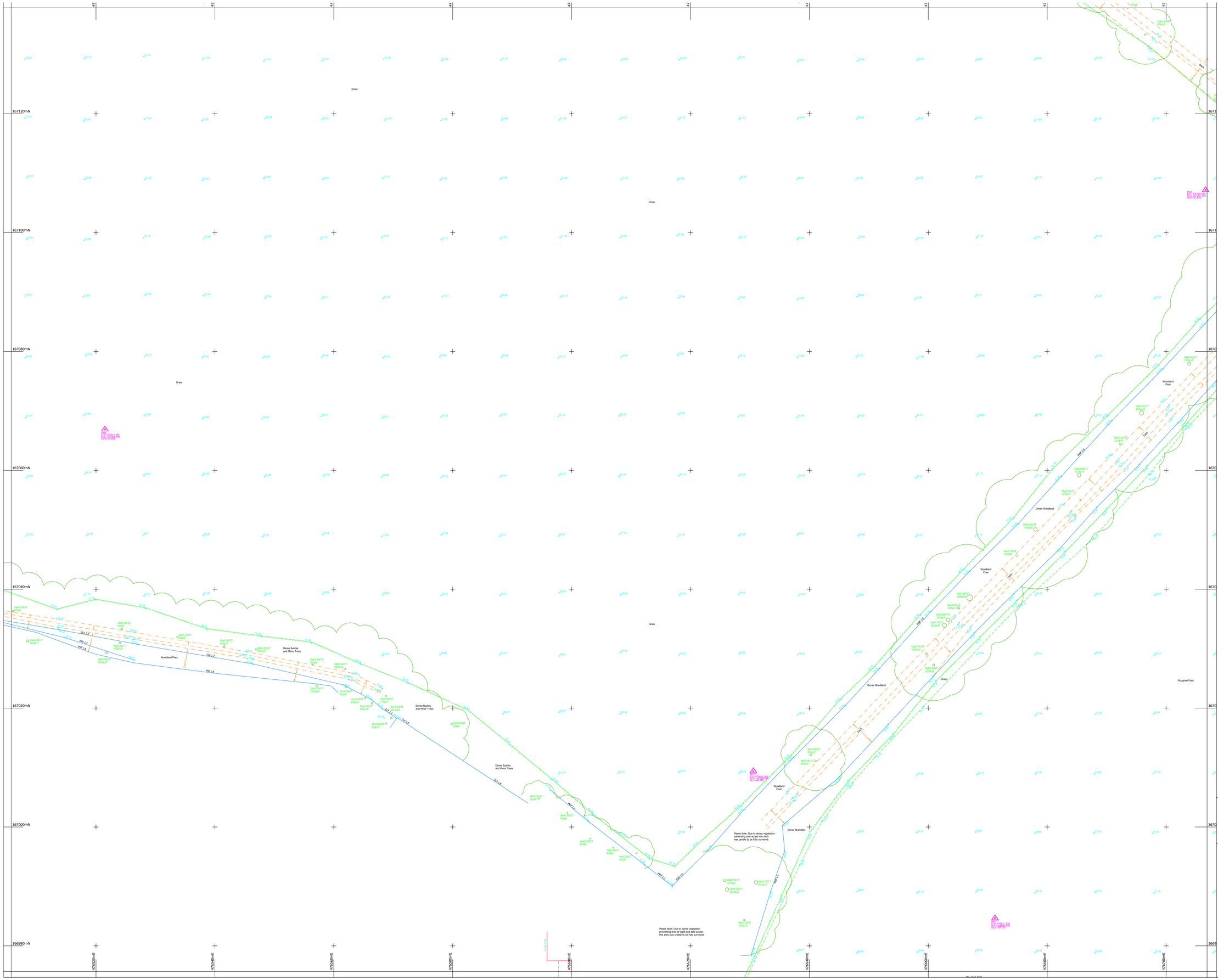
Website: encompass-surveys.co.uk

Client:	Croudace Homes		
Survey Location:	Land North of School Road Arborfield Cross Wokingham RG41 4TN		
Survey type:	Topographical	Scale:	1:200@A0
Drawing ref:	ENC/020524/3336-S1	Date:	May 2024
Drawn/QA:	MH/DH	Plot No.	3 of 7



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REVISIONS

PLOT MAP

1	2	
3	4	5
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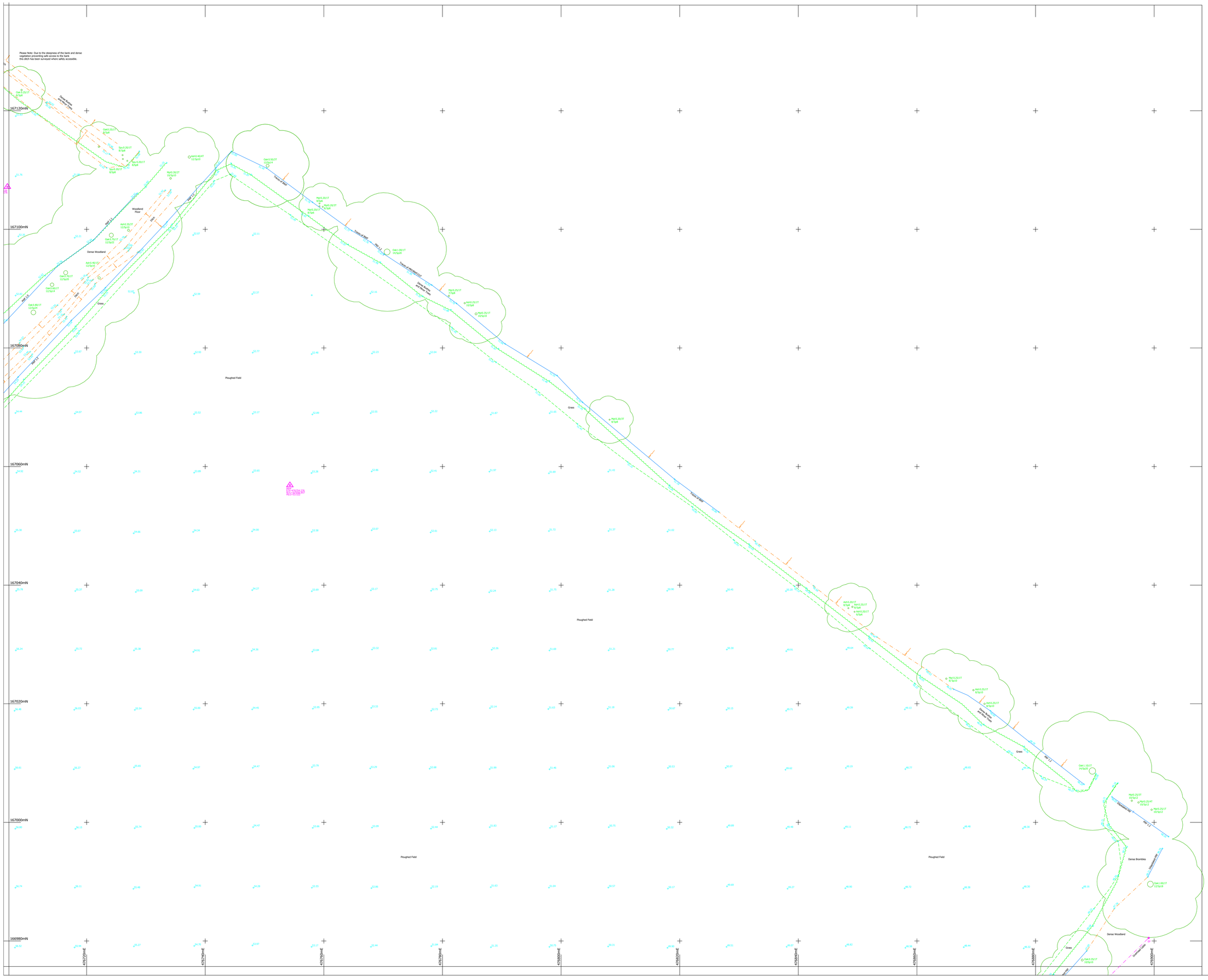
Survey Location:	Land North of School Road Arborfield Cross Wokingham RG41 4TN		
Survey type:	Topographical	Scale:	1:200@A0
Drawing ref:	ENC/0220524/3336-S1	Date:	May 2024
Drawn/QA:	MH/DH	Plot No.	4 of 7



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REVISIONS

PLOT MAP

1	2	
3	4	5
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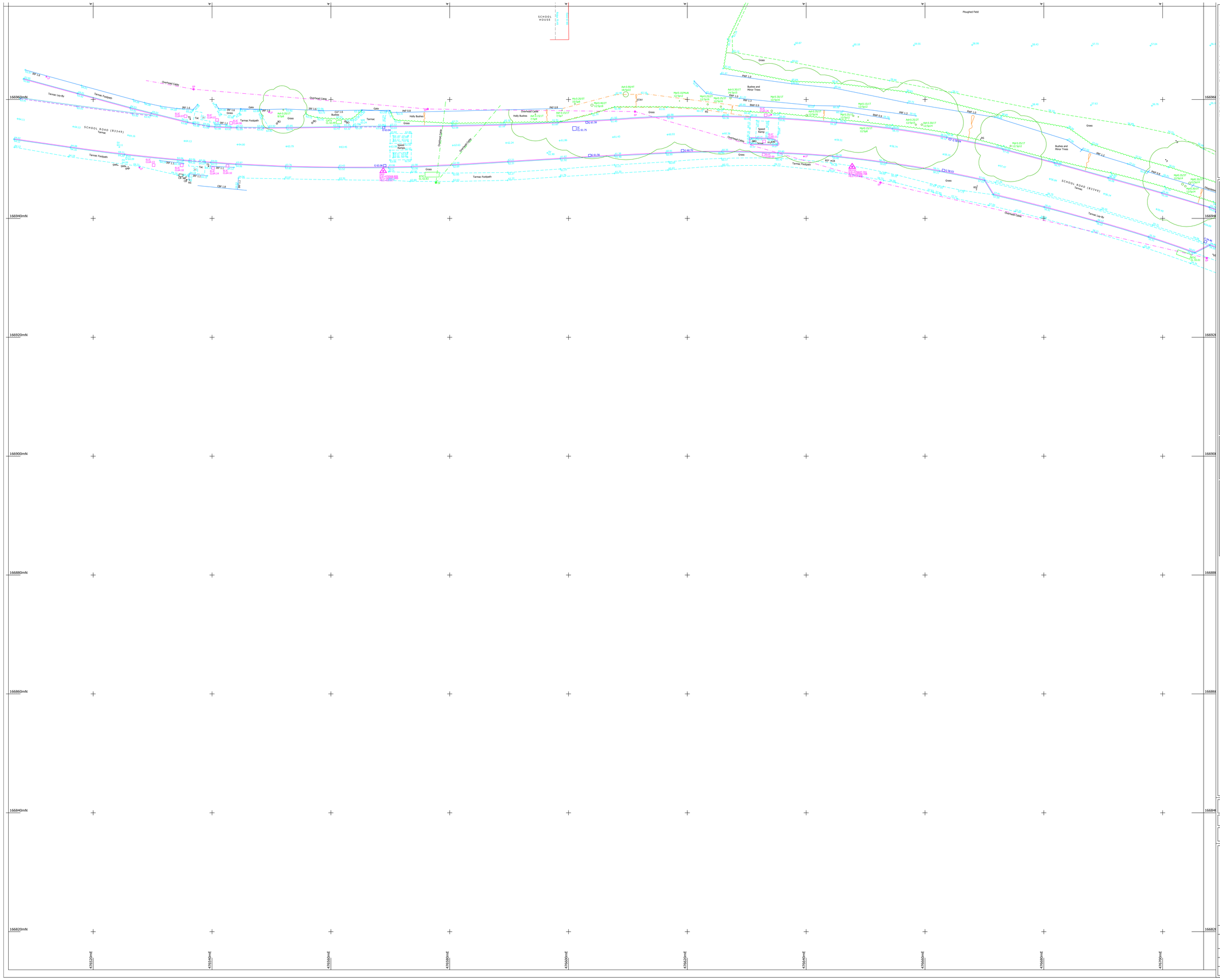

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SURFACE WATER	SW
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POST	P
RAIN WATER PIPE	RWP
ROAD SIGN	RS
RODDING EYE	RE
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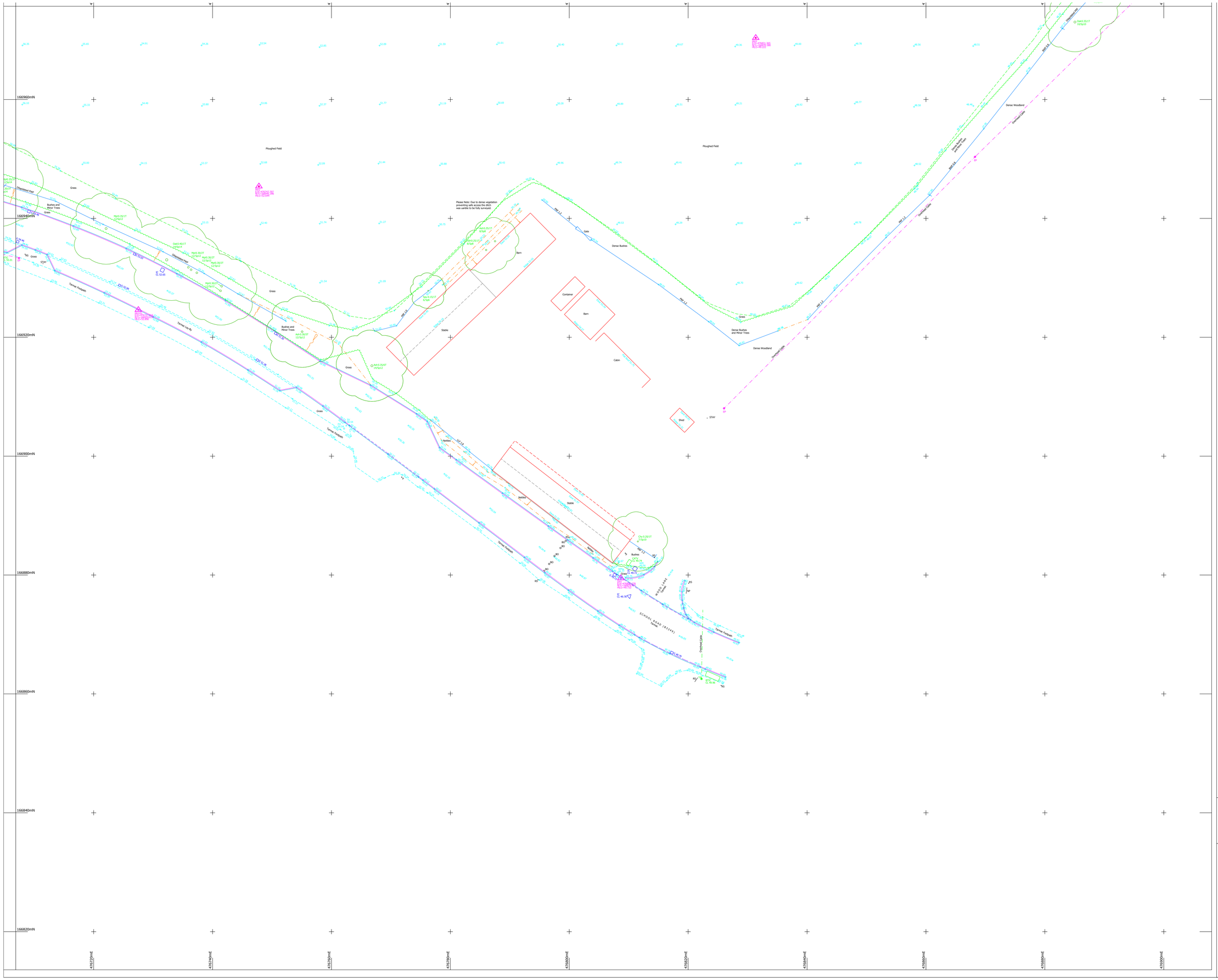

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Inspection Covers are lifted where possible and all drainage invert information has been obtained through visual inspection only, with no entry into manholes. Therefore the complete accuracy cannot be guaranteed. Where drainage is of critical importance we suggest the services of a specialist drainage expert be used.

Trees:
Every effort has been made to identify and detail all trees on site but where trees are of critical importance we suggest the use of a specialist such as an arborist. Tree spread and heights are indicative.

GPS:
GPS detail is relative to the time and date of survey. GPS levels and grid are obtained using industry standard guidelines and can vary according to the quality of the GPS network at the time of survey. Unless stated otherwise, surveys are Scale factor 1 and Horizontal and Vertical Datums are established from a central site fix and baseline orientation station utilising GNSS correction data.

Survey notes:
Survey specification is linked to the original purpose of the survey commissioned at source and is to be used for this purpose only. Survey is accurate within limitations of site conditions at the time of survey. In areas difficult to survey due to restricted access, lines of sight or dense vegetation, critical dimensions and positions should be verified following suitable clearance.
Survey detail obtained and shown is relative to the plotting scale.

Copyright:
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LEGEND

OVERALL TREE SPECIES INFORMATION

ALDER	ALD	LONDON PLANE	LPN
ASH	ASH	MAGNOLIA	MAG
ASPEN	ASP	MAPLE	MPL
BEECH	BCH	OAK	OAK
CHERRY	CHY	PINE	PNE
ELM	ELM	POPLAR	POP
FIR	FIR	RHODODENDRONS	RDN
FRUIT	FRT	ROWAN	RWN
HAWTHORN	HAW	SILVER BIRCH	SBI
HAZEL	HAZ	SWEET CHESTNUT	SCH
HOLLY	HLY	WALNUT	WNT
HORSE CHESTNUT	HCH	WILLOW	WLW
LIME	LIM	YEW	YEW
LOCUST	LOC	SPECIES UNKNOWN	SPU
		CORPICED	COP

TREE ANNOTATIONS: Tree Species / Tree Bole Size / No of Boles
Tree Height / Tree Canopy Spread

FENCE INFORMATION

BARBED WIRE FENCE	BWF
CHAIN LINK FENCE	CLF
CHESTNUT PALING FENCE	CPF
CLOSE BOARD FENCE	CBF
CONCRETE SLAT FENCE	CCF
CORRUGATED IRON FENCE	CIF
CRASH BARRIER	CBR
HANDRAIL	HDL
IRON RAILINGS	IRF
MESH FENCE	MSF
MISCELLANEOUS FENCE	MSF
PALISADE FENCE	PSF
PICKET FENCE	PKF
POST AND CHAIN FENCE	PCF
POST AND RAIL FENCE	PRF
POST AND WIRE FENCE	PWF
SECURITY FENCE	SCF
STOCK WIRE FENCE	SWF
TRELLIS FENCING	TLF
WIRE MESH FENCE	WMF

LEVEL INFORMATION

BED LEVEL	BL
COVER LEVEL	CL
FLOOR LEVEL	FL
INVERT LEVEL	IL
OUTFALL LEVEL	OL
THRESHOLD LEVEL	THL
FOUL WATER	FW
SURFACE WATER	SW
UNABLE TO LIFT	UTL
WATER LEVEL	WL

SURFACE INFORMATION

CONCRETE	Cc
BRICK PAVING	BP
FLOWERBED	FB
PAVING SLABS	PS
RETAINING WALL	RWall
SCALPINGS	Scalp
TACTILE PAVING	Tac

FEATURE INFORMATION

BOLLARD	BO	NAME PLATE	NP
TELECOMS JC	BTJC	NOTICE BOARD	NB
BUS STOP	BS	POST	P
CABLE TELEVISION JC	CATV	RAIN WATER PIPE	RWP
EARTHING ROD	ER	ROAD SIGN	RS
ELECTRICITY CABLE PIT	ELCP	RODDING EYE	RE
ELECTRICITY POLE	EP	SERVICE MARKER POST	SMP
FIRE HYDRANT	FH	SOIL VENT PIPE	SVP
FLAG POLE	FP	STOP VALVE	SV
GUIDE POST	GP	TELEGRAPH POLE	TP
INSPECTION COVER	IC	TRAFFIC SIGNAL	TS
LAMP POST	LP	TRAFFIC SIGNALS JC	TSJC
LETTER BOX	LB	WASH OUT	WO
KERB OUTLET	KO	WATER METER	WM

REVISIONS

PLOT MAP

1	2	
3	4	5
	6	7

Level Datum:
Levels are related to OSGB15 derived from the GPS network

Grid:
Grid is related to OSGB15 derived from the GPS network

Northpoint:

ENCOMPASS SURVEYS

Encompass Surveys Ltd
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1300 Parkway
Solent Business Park
Whiteley, Fareham
Hampshire, PO15 7AX

Tel: (+44)2380 692002 Email: info@encompass-surveys.co.uk
Website: encompass-surveys.co.uk

Client:	Croudace Homes		
Survey Location:	Land North of School Road Arborfield Cross Wokingham RG41 4TN		
Survey type:	Topographical	Scale:	1:200@A0
Drawing ref:	ENC/020524/3336-S1	Date:	May 2024
Drawn/QA:	MH/DH	Plot No.	7 of 7

Asset Location Search Sewer Map - ALS/ALS Standard/2024_4986248

SU7666NW

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 476250,166750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
3601	67.83	66.28
3703	67.77	65.84
3702	66.04	65.06
3701	66.34	64.8
3704	67.22	65.99
3810	65.84	64.58
381B	n/a	n/a
381C	n/a	n/a
381A	n/a	n/a
381D	n/a	n/a
381E	n/a	n/a
3806	65.31	64.06
3802	63.37	62.35
3805	n/a	n/a
3803	n/a	n/a
3804	65.12	63.56
3801	63.3	62
4803	n/a	n/a
4804	n/a	n/a
4801	61.86	60.93
4802	62.48	61.19
3808	65.25	64.13
4901	62.73	60.45
4902	62.71	60.55
4903	63.05	60.94
3901	62.62	61.38
1902	65.25	64.15
1953	65.26	64.08
1903	66.53	64.58
1951	66.67	65.46
1904	66.6	65.04
1952	67.23	66.09
1950	67.54	65.78
1901	67.38	66.19
191A	n/a	n/a
191B	n/a	n/a
1905	68.22	66.8
2902	67.91	66.02
2903	68	66.12
281B	n/a	n/a
291C	n/a	n/a
2901	67.62	65.7
291A	n/a	n/a
291E	n/a	n/a
3550	66.15	64.48
2650	67.38	65.69
2651	67.81	65.8
261A	n/a	n/a
2606	n/a	n/a
2605	67.73	67.29
2604	67.86	67.24
2603	67.82	66.92
2602	67.89	66.73
3602	67.5	66.63
2601	68.1	66.69
1701	73.66	72.29
2703	71.75	70.35
171C	n/a	n/a
171A	n/a	n/a
1703	70.62	69.41
3705	67.72	66.24
2701	68.38	67.15
2702	70.59	69.12
171E	n/a	n/a
171D	n/a	n/a
1702	70.15	69.03
0802	67.52	66.56
2805	67.91	67.21
1802	69.48	68.1
0801	67.24	66.39
2804	67.21	66.5
2803	66.78	66.12
2809	68.14	67.39
1807	67.5	66.09
1801	n/a	n/a
3809	66.73	65.82
2808	67.57	67
2807	66.61	66.14
2814	67.57	66.23
1806	67.28	65.88
2806	66.71	65.76
1805	67.21	65.85
2802	66.52	65.45
1804	67.17	65.71
2813	67.49	65.47
2812	n/a	n/a
2811	67.59	65.24
0806	65.32	62.9
1803	67.65	65.59
3807	65.75	64.54
281A	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2801	65.49	64.43
2810	66.7	64.86
2815	67.36	65.51
1850	64.58	62.41
1809	64.56	63.6
0854	63.93	62.07
1808	63.67	62.81
1851	64.78	63.16
2816	n/a	n/a
071C	n/a	n/a
071B	n/a	n/a
071A	n/a	n/a
081A	n/a	n/a
0853	65.39	63.02
0804	63.91	62.21
0852	64.22	61.66
0805	63.8	62.48
0851	63.46	61.55
0803	62.6	61.47
0850	62.77	61.05
0905	61.66	60.22
0955	61.6	60.09
0903	62.11	60.96
0904	60.78	59.4
0954	60.88	59.24
0906	61.25	60.17
0902	61.18	60.62
091B	n/a	n/a
091C	n/a	n/a
091A	n/a	n/a
0901	61.99	61.01
0957	n/a	n/a
0956	63.69	62.85

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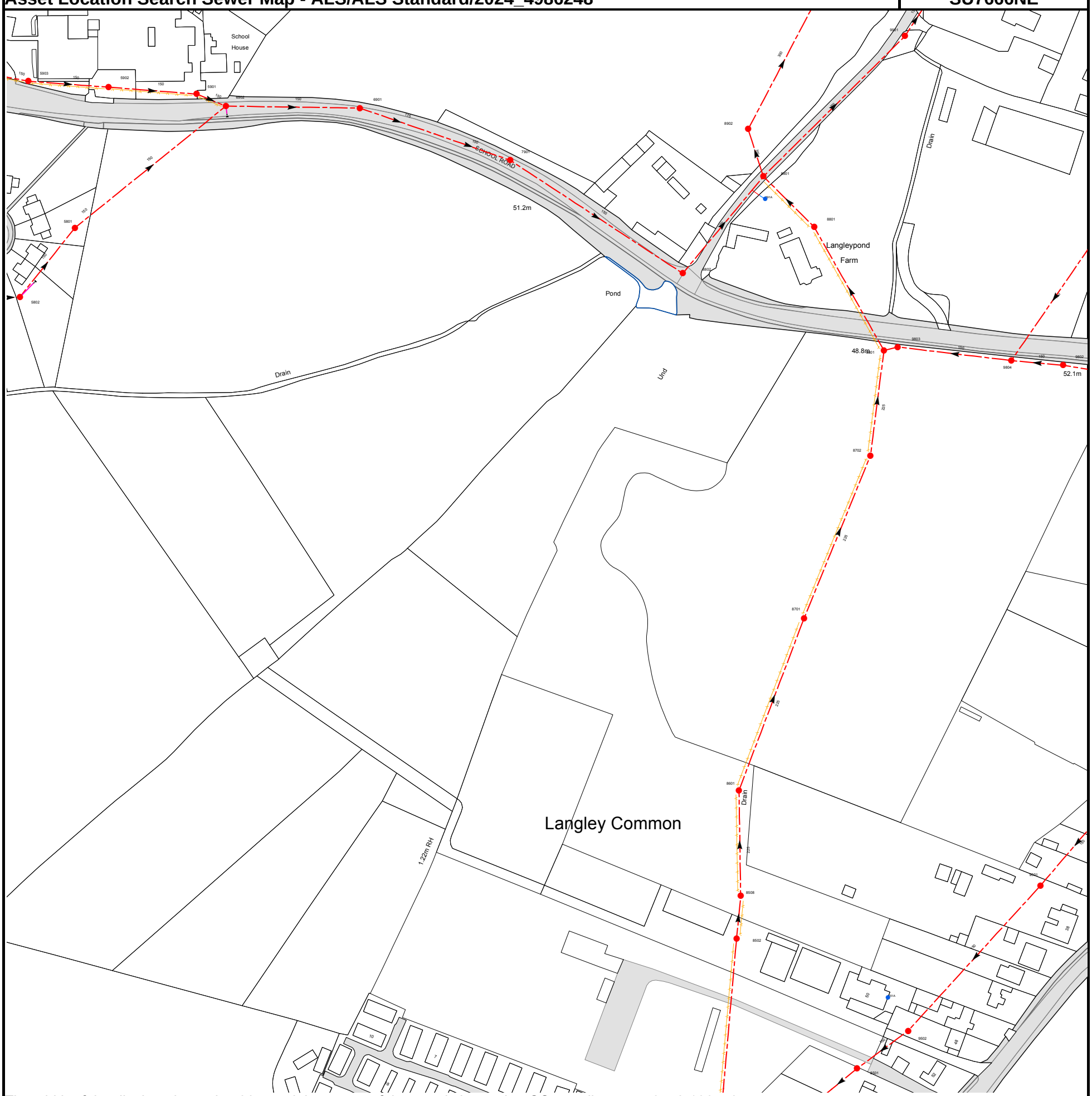
Asset Location Search Sewer Map - ALS/ALS Standard/2024_4986248

SU7666NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 476750,166750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8501	53.48	52.26
9502	n/a	n/a
951A	n/a	n/a
8502	51.11	49.75
8508	50.83	49.58
9501	53.98	52.78
8601	50.47	49.02
8701	49.69	48.53
8702	49.13	47.96
9802	51.66	50.51
9804	n/a	n/a
9801	48.64	47.48
9803	48.66	47.65
8802	49.76	47.34
8801	48.64	46.93
891A	n/a	n/a
8901	48.272	46.592
7901	52.62	50.7
8902	48.86	46.4
9901	47.55	46.09
5802	61.97	60.53
5801	63.31	60.2
6901	58.14	56.3
6902	61.5	59.21
5901	62.62	59.67
5902	63.53	60
5903	63.49	60.25

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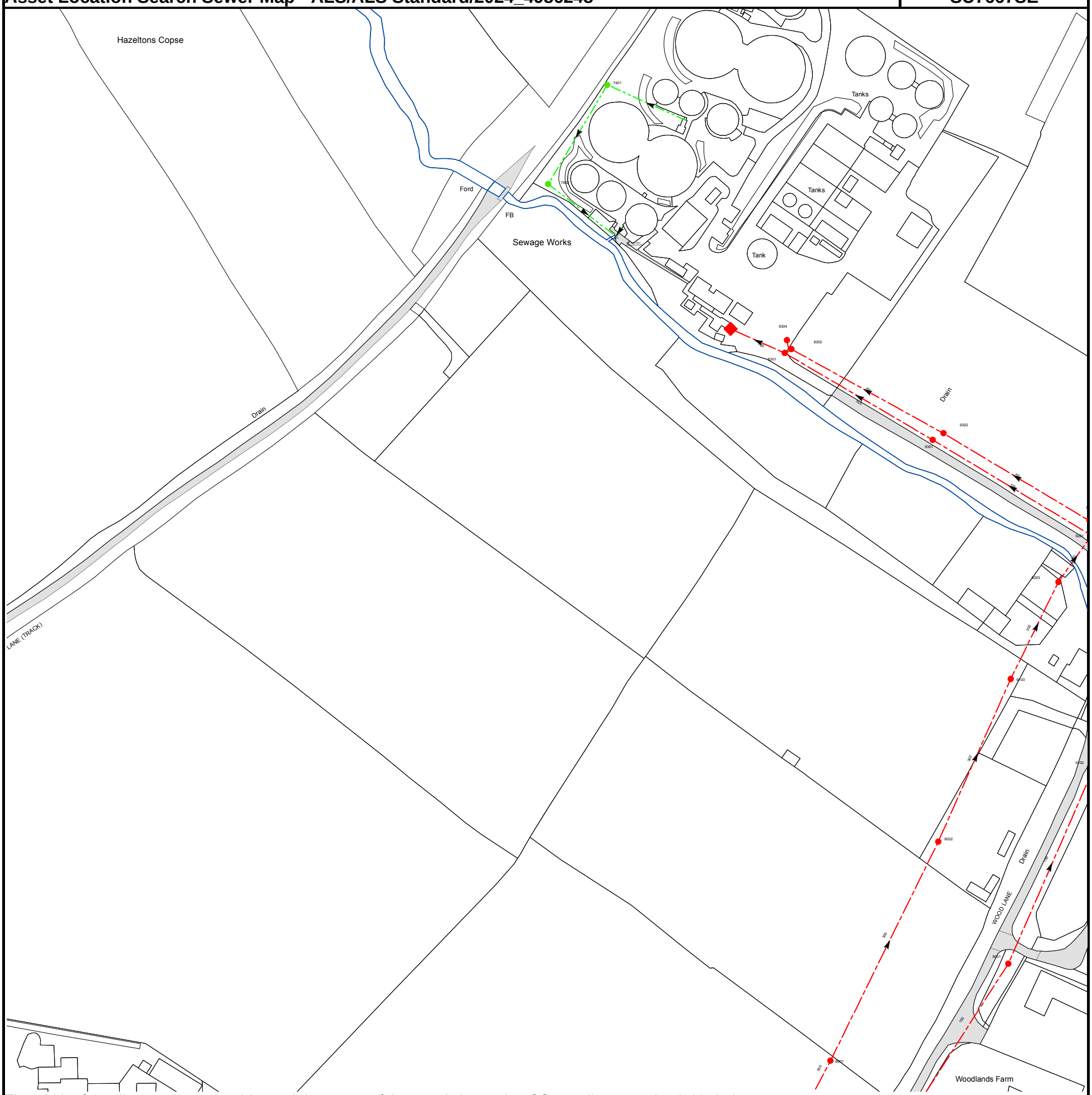
Asset Location Search Sewer Map - ALS/ALS Standard/2024_4986248

SU7667SE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 476750,167250

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8001	48.34	45.78
9001	46.85	45.41
9002	47.54	44.97
0102	n/a	n/a
9103	45.7	43.93
9203	45.64	43.35
9201	46.007	43.287
9202	46.142	43.232
9301	45.85	43.17
9302	46.019	43.119
8301	45.55	43.1
8302	45.66	43.04
8304	n/a	n/a
7402	n/a	n/a
7401	n/a	n/a

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Asset Location Search Sewer Map - ALS/ALS Standard/2024_4986248

SU7667SW

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 476250,167250

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Manhole Reference	Manhole Cover Level	Manhole Invert Level
3001	63.56	62.25
0001	64.13	62.55
1050	65.87	63.72
1001	67.08	65.55
1051	66.8	64.98
2004	65.7	63.85
201A	n/a	n/a
201B	n/a	n/a
2002	65.75	63.75
201C	n/a	n/a
2001	64.57	63.01

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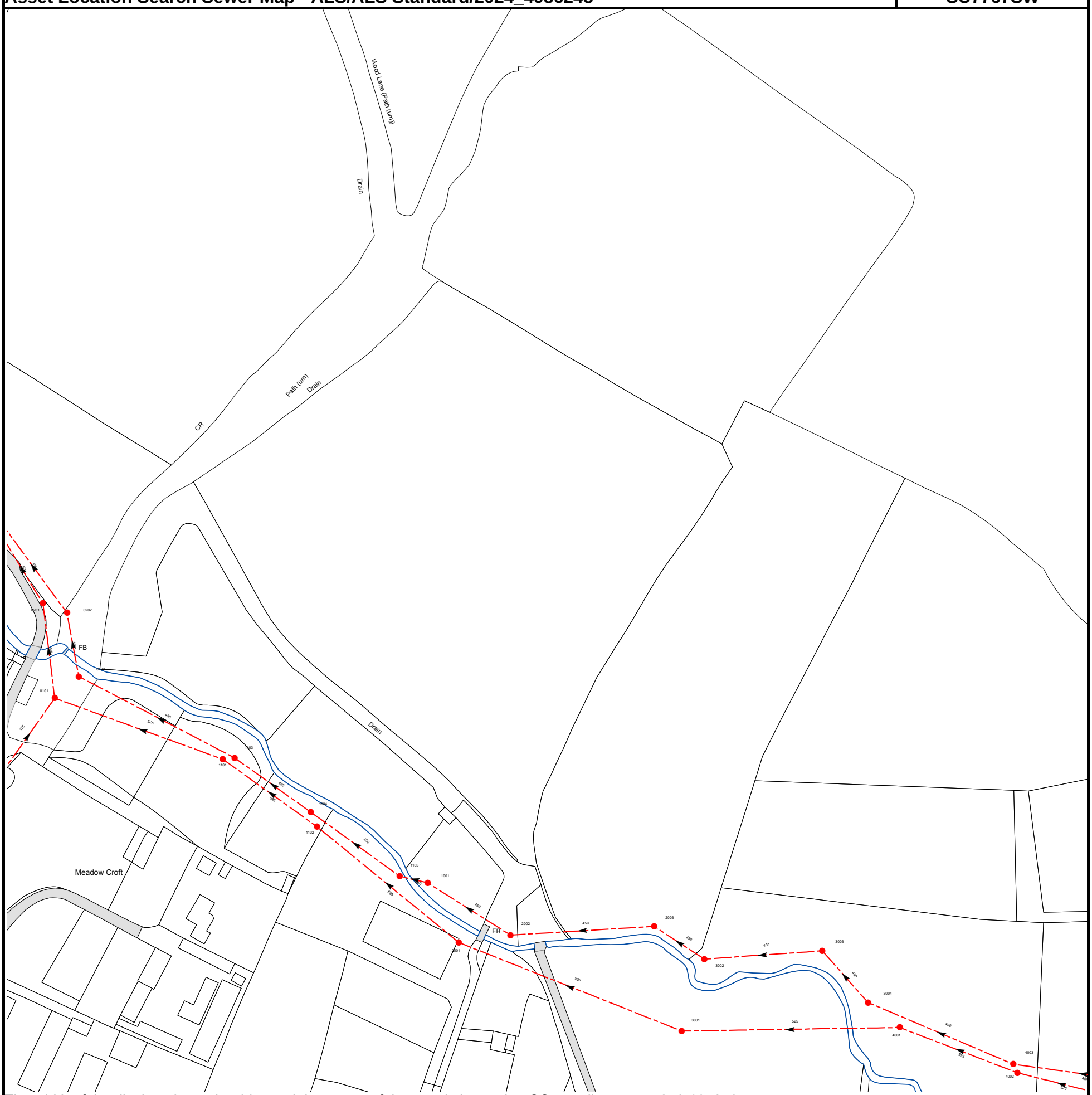
Asset Location Search Sewer Map - ALS/ALS Standard/2024_4986248 | **SU7767SW**



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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2003	47.45	43.92
3001	47.14	43.8
3002	46.61	43.97
3003	46.94	44.05
3004	46.74	44.09
4001	46.86	n/a
4003	47.41	44.31
4002	47.19	n/a
2001	47.03	n/a
2002	46.45	43.82
1001	46.27	43.75
1105	46.47	43.72
1102	n/a	n/a
1104	46.2	43.64
1101	46.49	n/a
1103	46.2	43.56
0101	45.99	43.4
0103	46	43.43
0202	46.101	43.311
0201	46.11	43.33

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Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Meter
- Dam Chase
- Vent
- Fitting

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Inlet
- Outfall
- Undefined End

Other Symbols

Symbols used on maps which do not fall under other general categories.

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

Ducts or Crossings

- Casement

Ducts may contain high voltage cables. Please check with Thames Water.

- Conduit Bridge
- Subway
- Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Asset Location Search Water Map - ALS/ALS Standard/2024_4986248

SU7666NW

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 476250,166750

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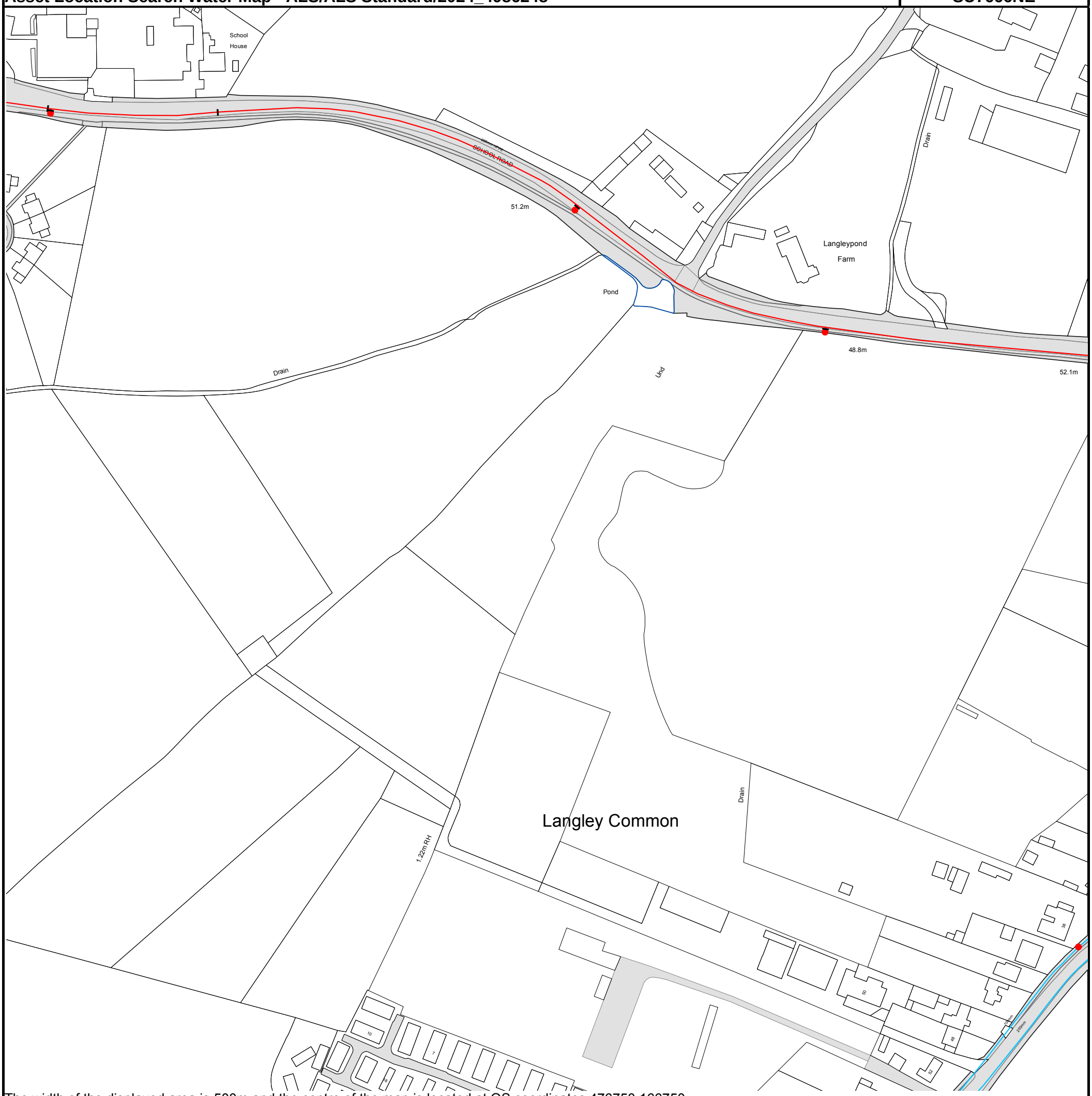
Asset Location Search Water Map - ALS/ALS Standard/2024_4986248

SU7666NE



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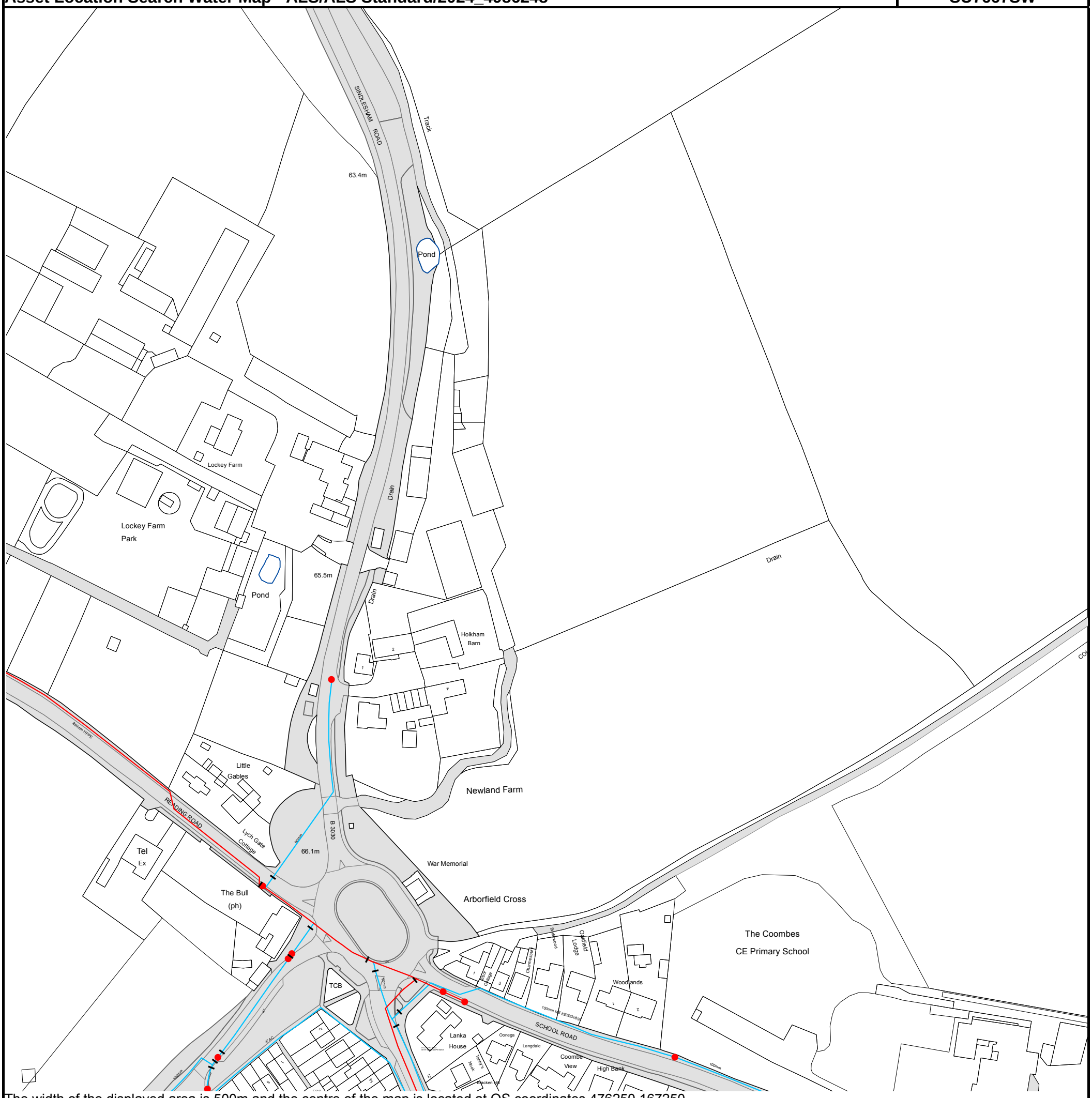
Asset Location Search Water Map - ALS/ALS Standard/2024_4986248

SU7667SW



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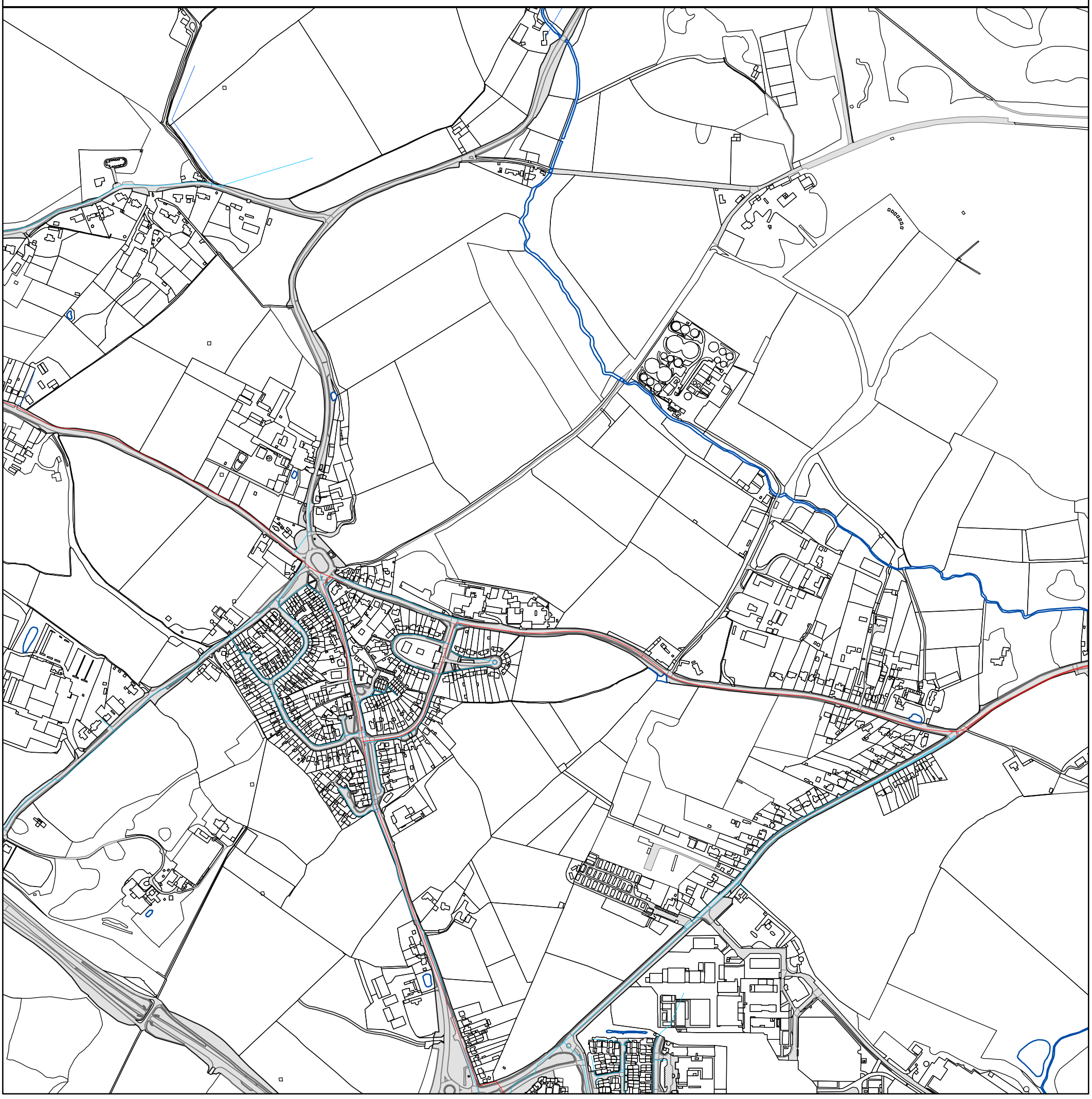
ALS/ALS Standard/2024_4986248



0 45 90 180 270 360 Meters

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Scale:	1:7161
Width:	2000m
Printed By:	ASuji
Print Date:	13/05/2024
Map Centre:	476585,167101
Grid Reference:	SU7667SE

Comments:

Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger

Casement: Ducts may contain high voltage cables. Please check with Thames Water.

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Payment Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment within 14 days of the date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service or will be held to be invalid.
4. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
5. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
6. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800.

If you are unhappy with our service, you can speak to your original goods or customer service provider. If you are still not satisfied with the outcome provided, we will refer the matter to a Senior Manager for resolution who will provide you with a response.

If you are still dissatisfied with our final response, and in certain circumstances such as you are buying a residential property or commercial property within certain parameters, The Property Ombudsman will investigate your case and give an independent view. The Ombudsman can award compensation of up to £25,000 to you if he finds that you have suffered actual financial loss and/or aggravation, distress, or inconvenience because of your search not keeping to the Code. Further information can be obtained by visiting www.tpos.co.uk or by sending an email to admin@tpos.co.uk.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0300 034 2222 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**
Please Call **0800 009 4540** quoting your invoice number starting CBA or ADS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.

Appendix 2 - LLFA Developer Checklist

Planning Application Drainage Checklists

Major Development Outline Applications

Outline planning applications for Major Developments must include the following information and details on the proposed drainage strategy and system(s).

Ref.	Documentation required	Requirement met/included
	The applicant shall submit a description of the proposed drainage system(s) with an explanation of key operating principles and design decisions including but not necessarily limited to:	
	■ Identification of the destination of discharge (in accordance with Building Regulation Part H hierarchy) with appropriate justification for the selection;	Met
	■ Identification of proposed points of connection(s) to water bodies, sewers, public surface water sewers or highway drains etc.;	Included
	■ Evidence of agreement in principal from key third parties whose systems the proposed drainage system will need to connect / impact (Environment Agency, Lead Local Flood Authority, Thames Water or adjacent landowner);	To be Confirmed
	■ Identification of the SuDS techniques that will be applied at the site with appropriate justification for the selection;	Met
	■ A description of how water will be collected and dealt with across the site by the proposed SuDS techniques including what volumes are to be stored where;	Included
	■ A description of the water quality treatment measures applied to surface water as it drains the site;	Included
	■ Where necessary a description of how the proposed system(s) will deal with surface water overland flow flooding originating from off-site areas;	Included
	■ Where necessary, an explanation of why it is not reasonably practicable to achieve any of the non-statutory technical standards for sustainable drainage systems (March 2015);	Included
	■ Where proposing discharge to ground; evidence to support proposed infiltration rates used in initial calculations. This should include nearby borehole logs, geological mapping and if available any geotechnical investigations, infiltration tests and records of groundwater monitoring. Consideration shall also be given to the implications of any local Source Protection Zones;	Included
	■ Where necessary, identification of any mechanical or electrical features necessary for the effective operation of the drainage strategy; and;	Met
	■ Proposals for the adoption and maintenance of the entire drainage system(s), including a schedule, with written agreement in principal from the adopting/maintaining body.	Included
	Plans & Drawings Required	

	The applicant shall submit plans defining the proposed drainage system including but not necessarily limited to: ■ Topographic survey of the site including local surface water drainage features; ■ Position of the site relative to surrounding flood sources, including where necessary identification of surface water/groundwater flows entering the development from adjacent land; ■ Where necessary definition of sub-catchments within the site; ■ A conceptual plan of the proposed drainage system(s) identifying the proposed point(s) of outfall, position of SuDS techniques / drainage features, the attenuation features, conveyance routes (including exceedence routes) comprising the drainage system(s); and ■ A thematic plan of the existing and proposed developments identifying land uses / coverings significant in informing discharge rates.	Included Included Included Included Included
	Calculations Required	
	Overview **design calculations** and **design parameters** to demonstrate conformity with the design criteria for the site. These should include: ■ Demonstration through calculation of the existing and proposed (unmitigated) development discharge rates for the 1, , 30 and 100 year (including allowance for the effects of climate change) design storm events; ■ Demonstration through calculation(s) of the volumes of surface water storage required to attenuate site discharges to pre-development / agreed discharge rates; ■ Demonstration through calculation(s) that the proposed drainage system(s) will not result in flooding off site under the 100 year return period design storm including allowance for climate change; and ■ Demonstration through calculation(s) that provision is made to meet long term storage volumes required for the site, unless discharge rates have been restricted to QBar for all storm events up to and including the 1 in 100 year including allowance for climate change	Included Included Included Included

Additional requirements for a large site or multi-plot development (including Strategic Development Locations).

Ref.	Detail required	Requirement met/included
	■ Plans demonstrating the phasing of drainage infrastructure (in keeping with wider development phasing proposals, demonstrating how flood risks and drainage will be managed throughout and on completion of the development.	Not Applicable

Appendix 3 - Drainage Strategy

Greenfield Runoff Rate Estimation

Greenfield Volumes

Western Basin

Eastern Basin

HD083 -001 P5 Drainage Strategy

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	GEORGIOS ROINAS
Site name:	HD083 School Road, Arborfield Cross
Site location:	School Road, Arborfield Cross

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.39722° N
Longitude:	0.89968° W
Reference:	1141134777
Date:	Jul 29 2024 11:46

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 1

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	651	651
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

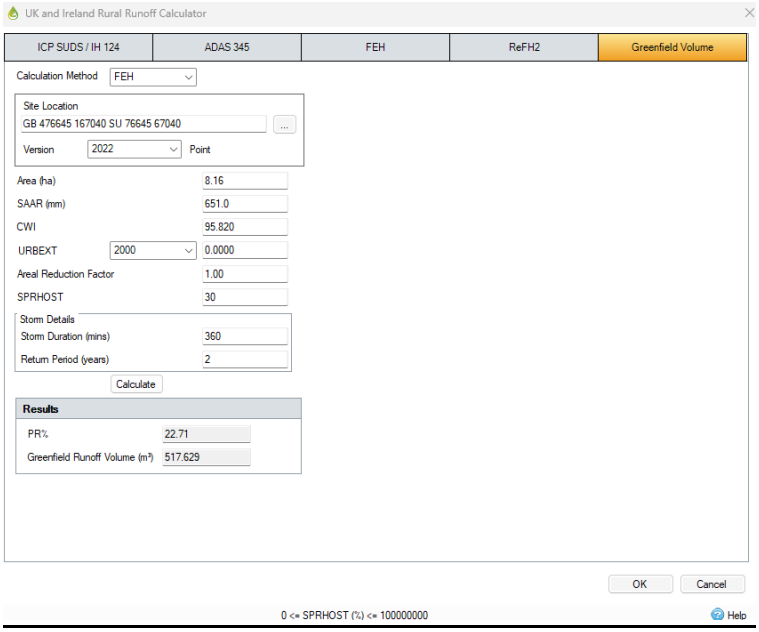
	Default	Edited

Q_{BAR} (l/s):	1.67	1.67
1 in 1 year (l/s):	1.42	1.42
1 in 30 years (l/s):	3.85	3.85
1 in 100 year (l/s):	5.34	5.34
1 in 200 years (l/s):	6.26	6.26

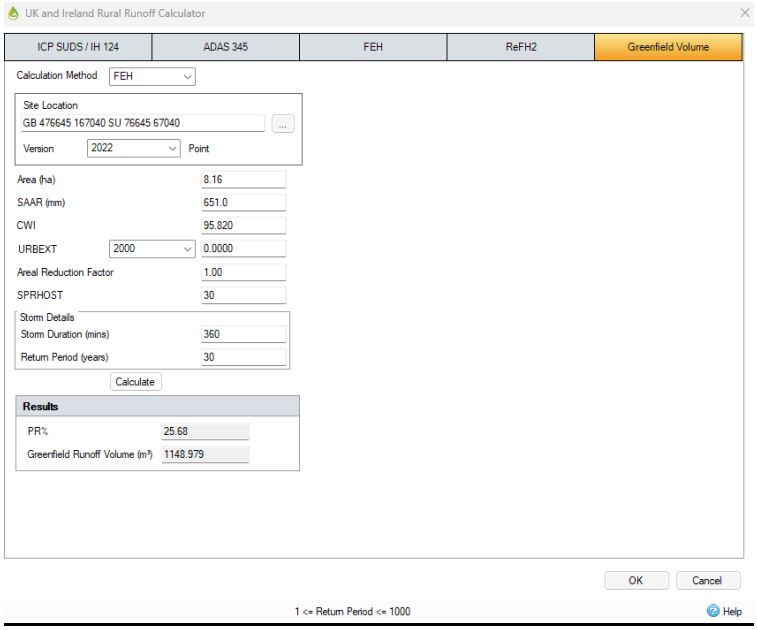
This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

GREENFIELD VOLUME

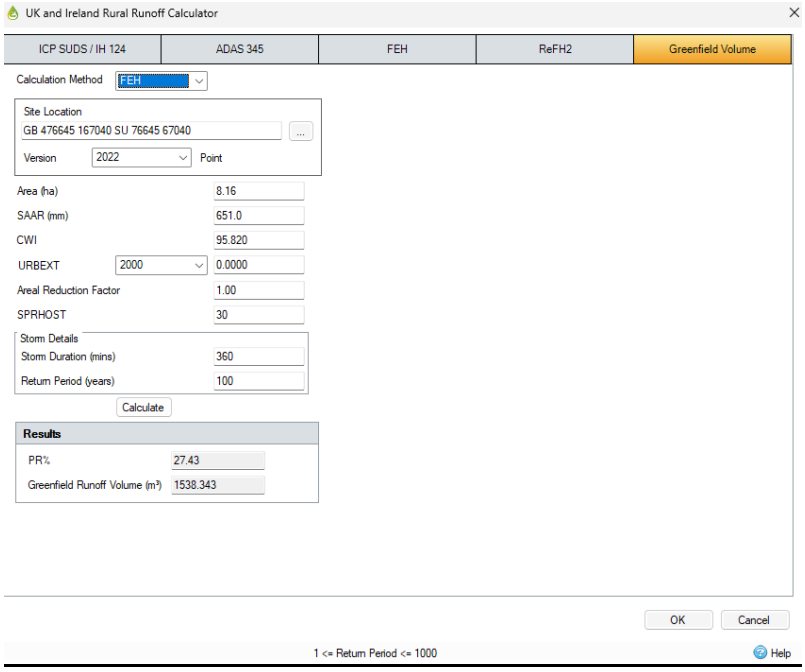
50% AEP



3.3% AEP



1% AEP


UK and Ireland Rural Runoff Calculator
ICP SUDS / IH 124
ADAS 345
FEH
ReFH2
Greenfield Volume
Calculation Method
FEH
Site Location
GB 476645 167040 SU 76645 67040
Version
2022
Point
Area (ha)
8.16
SAAR (mm)
651.0
CWI
95.820
URBEXT
2000
0.0000
Areal Reduction Factor
1.00
SPRHOST
30
Storm Details
Storm Duration (mins)
360
Return Period (years)
100
Calculate
Results
PR%
27.43
Greenfield Runoff Volume (m³)
1538.343
OK
Cancel
1 <= Return Period <= 1000
Help

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Inflows Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

Catchment Area

Type : Catchment Area

Area (ha)	1.72

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

Pond

Type : Pond

Dimensions

Exceedance Level (m)	100.000
Depth (m)	1.500
Base Level (m)	98.500
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	7.418
Total Volume (m³)	1943.573

Depth (m)	Area (m²)	Volume (m³)
0.000	1030.249	0.000
1.500	2685.248	2689.385

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

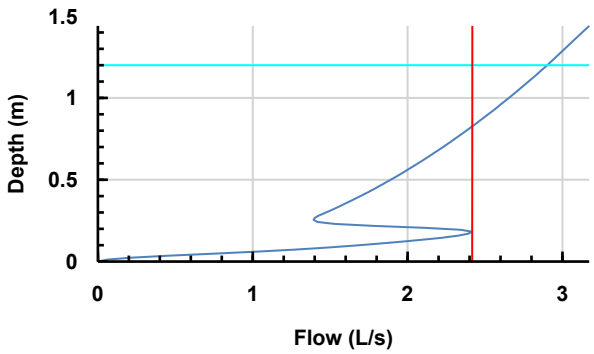
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	98.500
Design Depth (m)	1.200
Design Flow (L/s)	2.9
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference	CHE-0074-2900-1200-2900



Advanced

Perimeter	Circular
Length (m)	119.584
Friction Scheme	Manning's n
n	0.035

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Pond		Time of Concentration	1.72	100	0	100	1.72
TOTAL		**0.0**		**1.72**				**1.72**

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by:	Checked by:	Approved By:
	GR		
Report Details:	Company Address:		
Type: Network Design Criteria Storm Phase: Phase	Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Pipe Size Library

Default

Add. Increment (mm)	75
Max. Diameter (mm)	0

Diameter (mm)	Min. Slope (1:X)	Max. Slope (1:X)
100	0.00	0.00
150	0.00	0.00

Manhole Options

Apply Offset	☐

Manhole Size Library

Default

Diameter / Width

Connection (mm)	Diameter / Length (m)	Width (m)
0	1.200	0.000
375	1.350	0.000
500	1.500	0.000
750	1.800	0.000

Additional Sizing

Connection (mm)	900
Diameter / Length (m)	0.900
Width (m)	0.000

Depth

Depth (m)	Diameter / Length (m)	Width (m)
0.000	1.050	0.000
1.500	1.200	0.000

Access

Depth (m)	Ladder Protrusion (mm)
0.000	130
3.000	230

Benching Requirements

Landing Width (mm)	500
Benching Width (mm)	225

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Outfall Details Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
Pond	Free Discharge		

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH

Type: FEH

Site Location	GB 476645 167040 SU 76645 67040
Rainfall Version	2022
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	0.000
30.0	35.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH: 2 years: +0 %: 15 mins: Summer	1.72	348.7	151.422

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH: 30 years: +0 %: 15 mins: Summer	1.72	862.5	374.560

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH: 30 years: +35 %: 15 mins: Summer	1.72	1164.4	505.654

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH: 100 years: +45 %: 15 mins: Summer	1.72	1604.9	696.952

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FEH: 2 years: +0 %: 10080 mins: Summer	98.940	98.940	0.440	0.440	7.6	540.110	0.000	0.000	2.4	1172.302	72.210	OK

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FEH: 30 years: +0 %: 1440 mins: Winter	99.235	99.235	0.735	0.735	33.8	1008.740	0.000	0.000	2.4	336.443	48.099	OK

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FEH: 30 years: +35 %: 2160 mins: Winter	99.450	99.450	0.950	0.950	32.3	1408.793	0.000	0.000	2.6	569.690	27.515	OK

Project:	Date:		
HD083 School Road, Arborfield Cross Western Basin (Catchment A) 50%, 3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charman Park Hungerford, RG17 0YT		

FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FEH: 100 years: +45 %: 2160 mins: Winter	99.679	99.679	1.179	1.179	42.3	1896.673	0.000	0.000	2.9	634.717	2.413	OK

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Inflows Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

Catchment Area

Type : Catchment Area

Area (ha)	1.06

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Pond		Time of Concentration	1.06	100	0	100	1.06
TOTAL		**0.0**		**1.06**				**1.06**

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by:	Checked by:	Approved By:
	GR		
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Pipe Size Library

Default

Add. Increment (mm)	75
Max. Diameter (mm)	0

Diameter (mm)	Min. Slope (1:X)	Max. Slope (1:X)
100	0.00	0.00
150	0.00	0.00

Manhole Options

Apply Offset	☐

Manhole Size Library

Default

Diameter / Width

Connection (mm)	Diameter / Length (m)	Width (m)
0	1.200	0.000
375	1.350	0.000
500	1.500	0.000
750	1.800	0.000

Additional Sizing

Connection (mm)	900
Diameter / Length (m)	0.900
Width (m)	0.000

Depth

Depth (m)	Diameter / Length (m)	Width (m)
0.000	1.050	0.000
1.500	1.200	0.000

Access

Depth (m)	Ladder Protrusion (mm)
0.000	130
3.000	230

Benching Requirements

Landing Width (mm)	500
Benching Width (mm)	225

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Outfall Details Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
Pond	Free Discharge		

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by:	Checked by:	Approved By:
	GR		
Report Title:	Company Address:		
Rainfall Analysis Criteria	Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH

Type: FEH

Site Location	GB 476645 167040 SU 76645 67040
Rainfall Version	2022
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	0.000
30.0	35.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880
2160	4320
2880	5760
4320	8640
5760	11520
7200	14400
8640	17280
10080	20160

FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH: 2 years: +0 %: 15 mins: Summer	1.06	214.9	93.318

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH: 30 years: +0 %: 15 mins: Summer	1.06	531.5	230.832

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH: 30 years: +35 %: 15 mins: Summer	1.06	717.6	311.628

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH: 100 years: +45 %: 15 mins: Summer	1.06	989.0	429.520

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FEH: 2 years: +0 %: 10080 mins: Summer	98.929	98.929	0.429	0.429	4.7	339.613	0.000	0.000	1.3	723.261	73.711	OK

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FEH: 30 years: +0 %: 2160 mins: Winter	99.204	99.204	0.704	0.704	14.7	624.400	0.000	0.000	1.4	302.485	51.666	OK

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

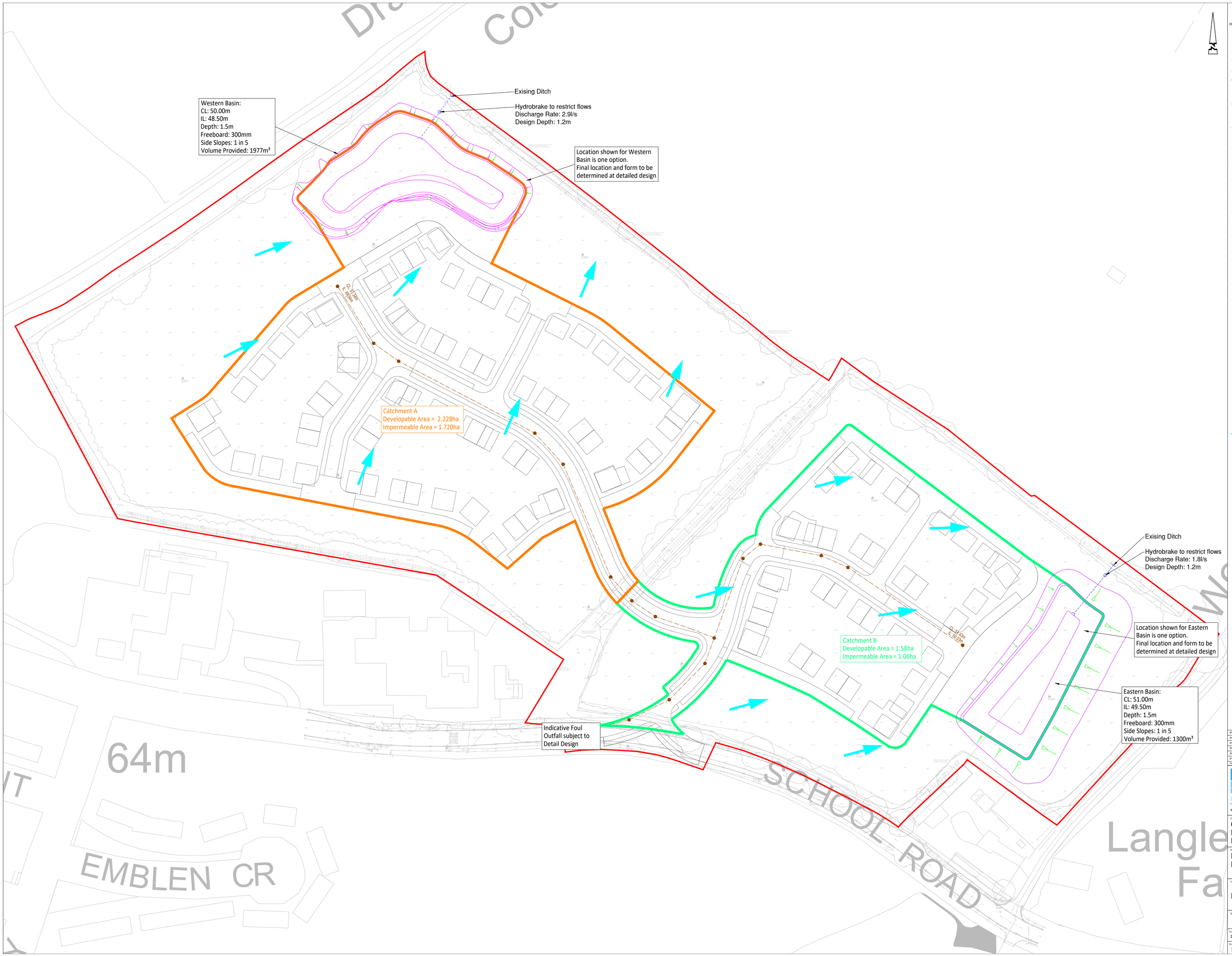
FEH: 30 years: Increase Rainfall (%): +35: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FEH: 30 years: +35 %: 2880 mins: Winter	99.408	99.408	0.908	0.908	15.7	873.732	0.000	0.000	1.6	455.662	32.365	OK

Project:	Date:		
HD083 School Road, Arborfied Cross Eastern Basin (Catchment B) 50%,3.3%, 3.3% plus 35% CC & 1% AEP plus 40% CC	19/07/2024		
	Designed by: GR	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Abley Letchford Partnership 3 Tealgate, Charnham Park Hungeford, RG17 0YT		

FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FEH: 100 years: +45 %: 2880 mins: Winter	99.624	99.624	1.124	1.124	20.4	1175.063	0.000	0.000	1.7	507.494	9.040	OK



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DRAINAGE NOTES:

1. Do not scale.
2. This drawing is to be read in conjunction with and checked against all other drawings, Engineering details, Specification and any structural, Geotechnical or other specialist document provided.
3. Site layout shown for context only, refer to other project drawings for details.
4. All adoptable drainage works to be constructed as detailed in design and construction guidance or as stipulated in the water authorities addendum.
5. All public sewers are to be the subject of a section 104 agreement of the water industry act 1991.
6. Invert levels of existing manholes and sewers are to be checked on site before construction commences and results reported to engineers.
7. The contractor is responsible for maintaining continuity of flow for all existing sewers within the site boundary and limit of works for the duration of the project.
8. All drainage ironworks to comply with bs en124, and be stamped with bsi kitemark. covers to suit loading as below;
   - carriageways and roads - d400
   - driveways and verges - c250
   - footways and pedestrian areas - b125
   - gardens/landscaping - a15
9. All sewer pipes, up to, and including 225mm are to be vitrified clay to BS EN295. All sewer pipes 300mm diameter and above to be concrete pipes to BS EN2916. Where agreed with adopting authority pipes up to and including 600mm diameter can be PVC-U to BS EN1404.
10. All drainage shall be installed and tested strictly in accordance with the manufacturers' printed instructions, bs en 752, bs en 1601, local water authority requirements and the building regulations.
11. All bedding shall be class s unless noted otherwise.
12. All trenches under existing and proposed public highways are to be backfilled with thoroughly compacted type 1 granular sub-base material.
13. Drainage laid beneath roads and areas of vehicular access (car parking etc) with less than 1200mm of cover shall be encased in concrete bed and surround with associated movement joints. drainage laid beneath paths, footways and pedestrian areas with less than 900mm of cover shall be similarly treated.
14. Chambers with outgoing pipes greater than 600mm diameter shall be fitted with guard bars, safety chains or other approved safety devices.
15. The use of precast concrete products made with sulphate resisting cement is mandatory, unless a laboratory report proves such precautions are not necessary.
16. All sewers to be abandoned must be surveyed to identify any lateral connections that are still live with any found to be reported to the engineer.
17. All foul and storm water drains which are not to be adopted as public sewers shall be in accordance with document h of the building regulations, together with nhbc standards chapter 5.3 and bs8301.
18. Where pipes pass through footings, retaining or screen walls, lintels to be provided over drains.
19. Where inverts are less than 0.6m deep inspection chambers (min dia. 190mm) or access fittings (225 x 100mm) to be used, elsewhere proprietary plastic, brick or pcc is to be used and sized in accordance with table 11 of document h of the building regulations [<0.6m to invert min dn300, >0.6m to invert min dn475].
20. Where required 1m deep root barrier of an approved type to be installed vertically along the back edging kerb of all areas of footway/ demarcation to protect from both proposed and future plantation.
21. Construction details subject to refinement through detailed design/technical approval process.

ALL PIPE BEDDING TO BE CLASS 'S' GRANULAR SURROUND UNLESS NOTED OTHERWISE ON THE DRAWING

Manhole cover levels are derived from a 3D digital terrain model, final cover levels to suit finished surfaces onsite.

Manhole covers to be located wholly within one surface i.e grass or hard standing/road. Manhole covers are to be fully accessible to users.

KEY

- Application Boundary
- Proposed adoptable surface water sewer & MH
- Indicative foul water sewer & MH
- Headwall
- Direction of excess flow
- Indicative size and location of basin; final arrangement will be confirmed at detailed design
- Catchment A
- Catchment B

0 5 10 15 20 25m
Scale 1:500

No.	Date	Description	Drawn	Checked
P5	09.24	Client Name Revised	GR	EP
P5	08.24	Client Name Revised	GR	EP
P4	08.24	Red line boundary & project name updated	LC	EP
P3	08.24	Notes added and key updated	LC	EP
P2	08.24	Eastern Basin Amended	GR	EP
P1	07.24	First Issue	AS	GR

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Client
CROUDACE HOMES,VORTAL HOMES LTD AND FALCON DEVELOPMENTS (SE) LTD

Project
LAND NORTH OF SCHOOL ROAD, ARBORFIELD CROSS.

Title
DRAINAGE STRATEGY

Status

Scale	Date	Drawn	Checked
1:150 @ A0	JULY 2024	AS	GR

Drawing No: HD083-001
Revision: P6