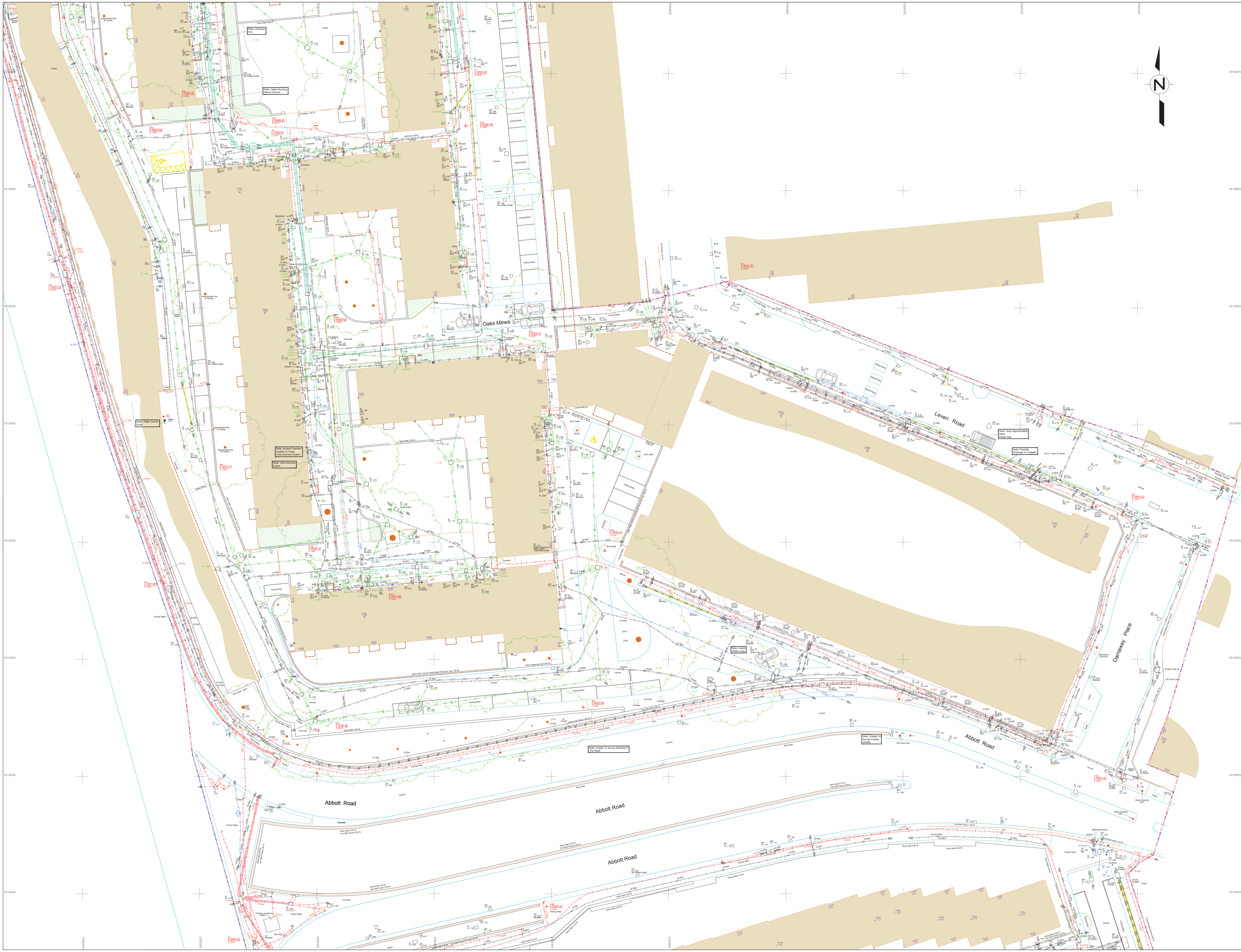

GENERAL NOTES

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Sewer and manhole details shown on this drawing have been obtained by observation and measurement from the surface and as such cannot be guaranteed

Vertical & Horizontal Position - Vertical position (depth) is indicative to the top of the utility/feature and is recorded as (x.xxd) i.e. (1.25d) - (depth to top of service) and should not be taken as exact, as this could be the surround to the service rather than the service itself. Where depth information from the technology is unclear, depth is not shown. Drains and piP/Es/ducts may have been detected using threading and the depth indicated could be between the top (soffit) and the bottom (invert). Horizontal position is indicative to the centre of the utility/feature and should not be taken as exact.

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This drawing does not provide an absolute representation of the sub-surface. Utilities have been detected using non-invasive technologies only and the P/Erformance can be adversely affected by ground, weather and site conditions outside of SUMO's control, therefore, some utilities may be undetectable. While SUMO uses reasonable endeavours to detect all utilities, it does not warrant that 100% detection will be achieved and that approximate depth P/Enetration of the technologies SUMO uses will not be greater than two metres.

SHEET LAYOUT

Sheet 01

Sheet 02

Sheet 03

Rev	Notes	Drawn	Date

Notes:

Survey is referenced to OS Grid and Level Datum.

Previous Sumo Survey "SOR016539.dwg" has been inserted into this model for reference.

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8 HAYWARD BUSINESS CENTRE
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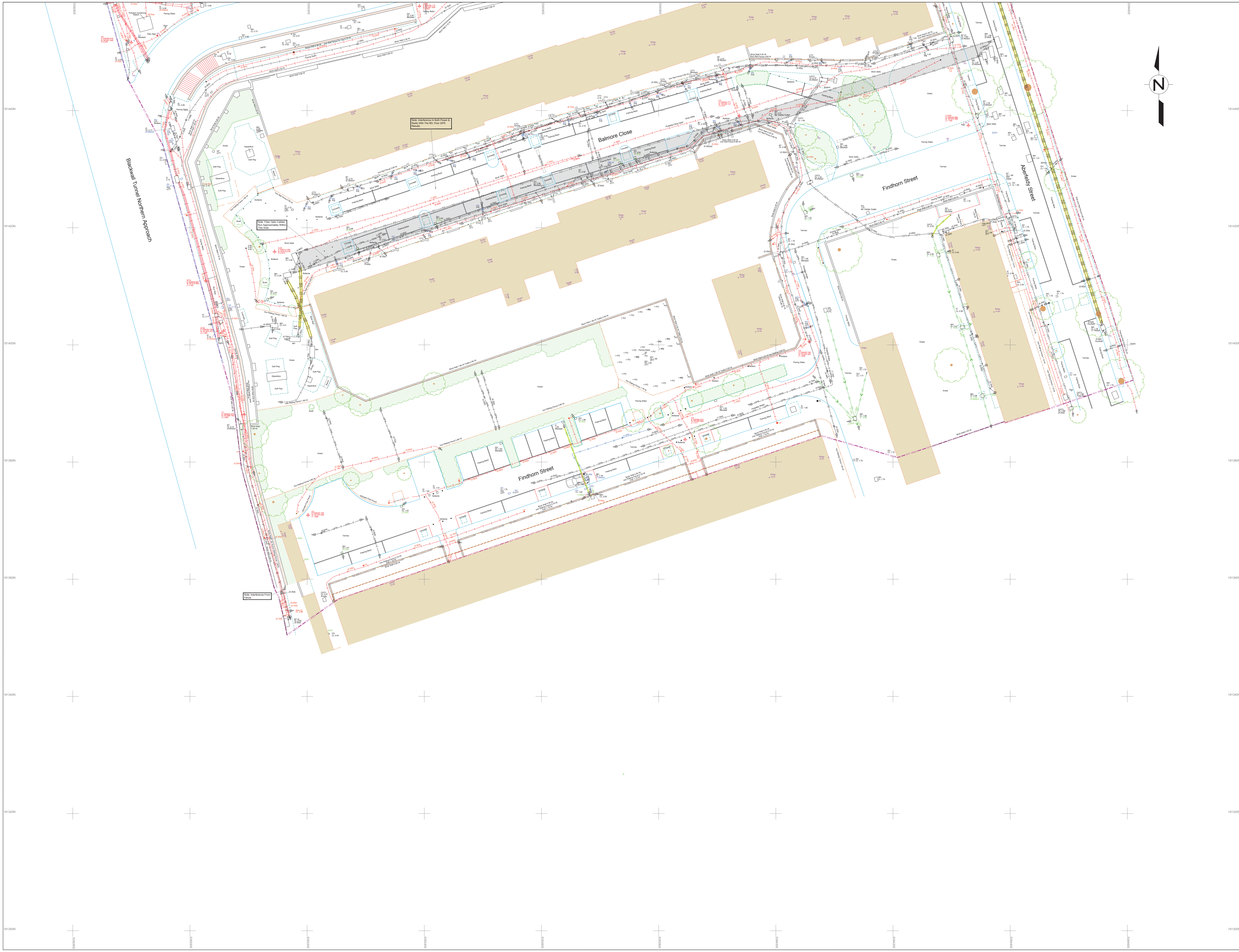
HAMPSHIRE
PO9 2NL
TEL: 0845 456 1104
www.sumoservices.com

Title: Utility Mapping

Client: Aberfeldy New Village LLP

Project: Aberfeldy Village, Tower Hamlets, London

Date Completed:	15/08/2020	Post Code:	E14 0ND
Surveyed:	DW, JHG, MW, CE	Scale: 1/200 (A0 Sheet)	
Drawn:	DM		
Checked:	DW, JHG, MW, CE		
Job No: SOR017679		Dwg No: 02	Rev:



LEGEND

UTILITY LINETYP/ES

British Telecom	BT	Gas	G
Cable Television	CATV	Heating PiP/Es	HP
Closed Circuit Television	CCTV	HV Cables	HV
Communications	C	Multiple Services Route	MSR
Drainage	DR	Oil	OIL
Drainage - Combined Water	CW	Oxygen	OXY
Drainage - Foul Water	FW	Street Lighting	SL
Drainage - Storm Water	SW	Traffic Signal Loop	TSL
Empty Duct	ED	Unknown found by GPR	GPR U
Electric	E	Unknown	U
Fire Hydrant Main	FH	Unknown Cable	UC
Fibre Optic	FO	Unknown PiP/Eline	UPL
Fuel	FUEL	Water	W

Assumed Service Route - See GENERAL NOTES (Using abbreviation of service and colour as above) — ASR—XXX —ASR—XXX

UTILITY SURVEY INFORMATION

Area of Concern	AOC	Unable to Survey	UTS
Contracted Survey Area	SVY AREA	Unable to Lift (cover)	UTL
Previous Survey Area	PREVIOUS	Unable to Trace	
Extent of (Post processed) GPR	GPR Survey	Unable to Trace (due to blockage)	B
Depth to Top of Service (metres)	(O.60d)	Unable to Trace Further	F
		End of Trace	E

ABREVIATIONS used on a PAS 128 Survey

(O.65d B2P) 0.65d = Depth in metres, B2 = Quality Level, P = Post processed GPR

TOPOGRAPHIC & UTILITY DETAILS

Barrier (symbol - sized)		PiP/E into Ground (symbol)	
Belisha Beacon (symbol)	BB	Post (symbol)	PO
Bollard (symbol)	B	Rain Water PiP/E (symbol)	RWP
Borehole (symbol)		Road Sign (symbol)	RS
British Telecoms IC (sized)	BTIC	Rodding Eye (symbol)	RE
Building (incomplete detail)		Sapling (symbol)	S
Cable into Ground (symbol)		Sign Post (symbol)	SP
Cable TV Box (symbol)	CTV	Spot Light (symbol)	SL
CCTV Camera (symbol)		Spot Height	50.00 +
Cover Level in metres	CL 50.00	Stop Cock (symbol)	SC
Direction of Flow (Drainage)		Stop Valve (symbol)	SV
Distribution Board (symbol)	DB	Survey Station (symbol)	
Earth Rod (symbol)	ER	Telephone Pole (symbol)	TP
Electric Cabinet (sized)	EC	Traffic Bollard (symbol)	B
Electric Pole (symbol)	EP	Tree (dimensions in metres - e.g.) Diameter at 1mh: (bole) Height: Spread: SP/Ecies:	Dia: 0.3 Sp: 7.5 Ht: 10.2 Maple
Electric Sign (symbol)	ES		
Embankment	Bottom / Top		
Feeder Pillar (sized)	FP	Traffic Light (symbol)	TL
Fire Hydrant (sized)	FH	Unknown Valve (symbol)	UV
Flag Pole (symbol)	FP	Vent PiP/E (symbol)	VP
Flat Roof Level in metres	FRL 50.00	Wall	
Flood Light (symbol)	FL	Waste PiP/E (symbol)	WP
Gas Valve (symbol)	GV	Water Meter (symbol)	WM
	Single / Double	Water Valve (symbol)	WV
Ground Level in metres	GL 50.00		
Gulley (sized)	GU	Building Canopy	
InsP/Ection Cover (sized)	IC	Crash Barrier	
Invert Level in metres	IL 50.00	Drainage Channel	Drainage Channel
Junction Box - BT (sized)	JB BT	Drop Kerb (level in metres)	50.00
Junction Box - Comms (sized)	JB COM	Edge Detail (level in metres)	50.00
Junction Box - Elec (sized)	JB	Footpath (level in metres)	50.00
Lamp Post (symbol)	LP	Fence	
Light Bollard (symbol)	LB	Heras Fence	
Light in ground (symbol)	LIG	Kerb channel (level in metres)	50.00
Manhole (sized)	MH	Kerb top (level in metres)	50.00Tk
Manhole CapP/Ed Port		Overhead Service Line	OHS
ParaP/Et Level in metres	PL 50.00	P/Edestrian Railing	
PiP/E Diameter in millimetres	Ø100		

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SHEET LAYOUT

Sheet 01
Sheet 02
Sheet 03

Rev	Notes	Drawn	Date

Notes:

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Previous Sumo Survey "SOR016539.dwg" has been inserted into this model for reference.

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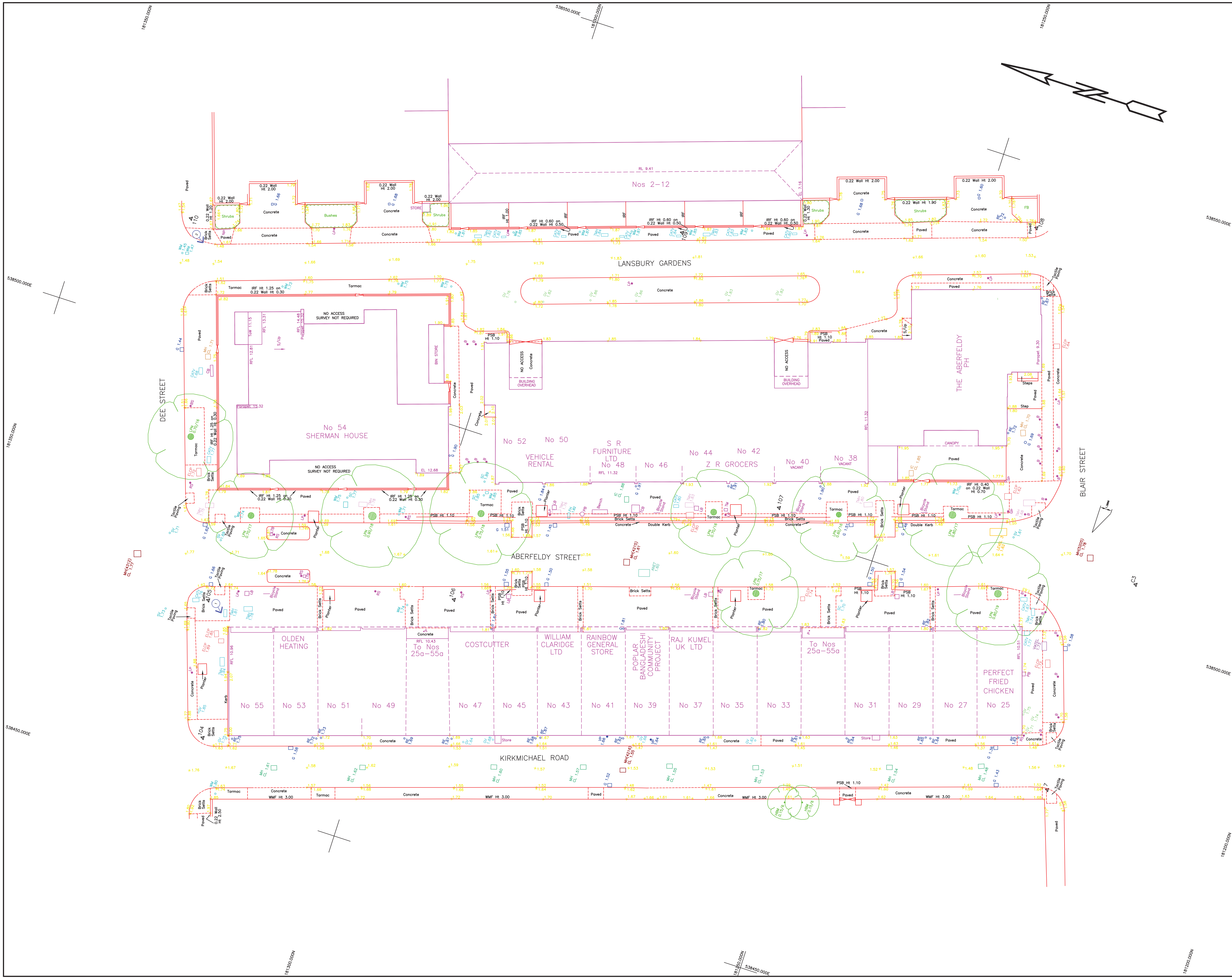
Client: Aberfeldy New Village LLP

Project: Aberfeldy Village, Tower Hamlets, London

Date Completed:	15/08/2020	Post Code:	E14 0ND
Surveyed:	DW, JHG, MW, CE	Scale:	1/200 (A0 Sheet)
Drawn:	DM		
Checked:	DW, JHG, MW, CE		
Job No:	SOR017679	Dwg No: 03	Rev:



Coordinate Table

STATION	DESCRIPTION	EASTING	NORTHING	LEVEL
7	PN	538480.864	181222.252	1.571
100	–	538634.795	181387.889	1.889
104	PNW	538456.201	181318.168	1.791
105	PNW	538471.710	181322.503	1.767
106	PKN	538480.626	181295.154	1.724
107	PNW	538502.572	181262.266	1.788
108	PN	538542.985	181243.685	1.646
109	PKN	538529.685	181282.973	1.849
110	PKN	538513.558	181338.185	1.587
C2	PN	538687.952	181279.286	1.783
C3	PKN	538506.884	181219.790	1.829

HN – Hilti® Nail
PM – Punch Mark
PKN – Parker Kalon® Nail
PN – Pipe Nail
PGM – Permanent Ground Marker
W – Washer (used with PKN and PN)

NOTE:
PHOTO POSITIONS SHOWN THUS: ← 1

FOR PHOTO'S REFER TO DRAWING 3553–2 SHEET 2.

NOTES

GRID THE SURVEY IS ON A PLANE LOCAL GRID RELATED TO OS NATIONAL GRID BY GPS USING OSTN02. THE LOCAL GRID ORIGIN IS STN C1, CO–ORDINATES 538663.947E, 181376.651N.

LEVELLING THE SURVEY LEVELS ARE BASED ON OS NEWLYN DATUM BY GPS USING OSGM02.

LLOYD'S REGISTER QUALITY ASSURANCE CERTIFICATED COMPANY

THE SURVEY ASSOCIATION

Aworth
SURVEY CONSULTANTS
LRQA Certificated Office
Norfolk House, Norfolk Way, Uckfield, TN22 1EP
Tel:– 01825 768319 Fax:– 01825 768310
www.aworth.co.uk als@aworth.co.uk
The Lansdowne Building, 2 Lansdowne Road
Croydon, CR9 2ER
Tel:– 020 8263 6046 Fax:– 020 8263 6146

Drawing No	Sheet	Revision
3553–2	1	
	Scale 1:200	@A1

Surveyed	NW
Drawn	DRF/TP
Checked	PDE
Date	18/12/09

Project

ABERFELDY VILLAGE
POPLAR
PHASE 2

Client

POPLAR HARCA
UNIT 3, QUEBEC WHARF
14 THOMAS ROAD
LONDON E14 7AF

LEGEND

AIR CONDITIONING UNIT	ACU	FENCE DESCRIPTIONS	
ADVERTISING BOARD	AB	BARBED WIRE FENCE	BWF
AIR VALVE	AV	CHAIN LINK FENCE	CLF
BOLLARD	B	CHESTNUT PALING FENCE	CPF
BELISHA BEACON	BB	CLOSE BOARD FENCE	CBF
BOREHOLE	BH	CONCRETE SLAB FENCE	CSF
BASEMENT LIGHT	BLT	CORRUGATED IRON FENCE	CIF
BOUNDARY POST/PEG	BP	CRASH BARRIER	CBR
BUS STOP	BS	IRON RAILINGS	IRF
CABLE TELEVISION PIT	CATV	INTERWOVEN FENCE	IWF
COAL HOLE	CH	LARCH LAP FENCE	LLF
CONTROL BOX	CB	MISCELLANEOUS FENCE	Misc F
DOG WASTE BIN	DWB	OPEN BOARD FENCE	OBF
DOWN PIPE	DP	PALING FENCE	PLF
EARTHING ROD	ER	PALISADE FENCE	PAL
ELECTRICITY CABLE PIT	ELCP	PEDESTRIAN SAFETY BARRIER	PSB
ELECTRICITY CONTROL BOX	CBE	POST AND CHAIN FENCE	PCF
ELECTRICITY INSPECTION COVER	ELIC	POST AND MESH FENCE	PMF
ELECTRICITY POLE	EP	POST AND RAIL FENCE	PRF
ELECTRICITY PYLON	EL PYLON	POST AND WIRE FENCE	PWF
FIRE HYDRANT	FH	TRELLIS	TLS
FLAG STAFF	FS	WIRE MESH FENCE	WMF
FLOODLIGHT	FLT	AVERAGE	Ave
FLOWER BED	FB	HEIGHT	Ht
FOOTPATH	FP	DRAINAGE	
GAS VALVE	GV	SURFACE WATER PIPE	0.15 SW
GUIDE POST	GP	FOUL WATER PIPE	0.15 FW
GULLY	G	NO VISIBLE CONNECTION	NVC
INSPECTION COVER	IC	UNABLE TO LIFT	UTL
INSPECTION COVER (UNKNOWN)	ICU	UNABLE TO SURVEY	UTS
KERB OUTLET	KO	TAKEN FROM RECORDS	TFR
LAMP HOLE	LH	DRAINAGE CHANNEL (OPEN)	DC
LAMP POST	LP	DRAINAGE CHANNEL (COVERED)	DC
LIGHTED BOLLARD	LTB	OVERHEAD WIRE	O/H W
LITTER BIN	LB	BANKING	
MANHOLE	MH	EXTENT OF VEGETATION	
MILESTONE	MS	HEDGES	
NAME PLATE	NP	MARSH	
NOTICE BOARD	NB	GATE	SINGLE DOUBLE
PARKING METER	PM	RETAINING WALL	RTW
POST	P	SLOPING MASONRY	
POST BOX	PB	STILE	
RAIN WATER PIPE	RWP	WALL (Width drawn to scale)	
REFLECTOR POST	RP	BUILDING	
ROAD SIGN	RS	OPEN SIDED/ BUILDING OVERHEAD	
RODDING EYE	RE	CANOPY	
SERVICE MARKER POST	SMP	GLASS ROOFED	
SIGN POST	SP	ARCHWAY	
SLUICE VALVE	SV	CONTOURS	25.50
SOIL & VENT PIPE	SVP	ORDNANCE SURVEY BENCH MARK	OSBM Value 12.47
SPOTLIGHT (GROUND)	SPLG	TEMPORARY BENCH MARK	TBM Value 50.00
SPOTLIGHT (TOWER)	SPLT	SURVEY STATION	
STOP COCK	SC		
TELECOM CONTROL BOX	CBT		
TELECOM INSPECTION CHAMBER	TIC		
TELECOM MANHOLE	TMH		
TELECOM PILLAR	TLP		
TELEGRAPH POLE	TP		
TELEPHONE CALL BOX	TCB		
TICKET MACHINE	TM		
TL CABLE INSPECTION COVER	TLIC		
TRAFFIC LIGHT	TL		
TRAFFIC LIGHT CONTROL BOX	CBTL		
TRAFFIC LIGHT CONTROL POST	CPTL		
VENT PIPE	VP		
WATER METER	WM		
WASH OUT	WO		
WATER CONTROL PILLAR	WCP		
WATER TAP	Tap		
WATER TROUGH	WT		

LEVELS

SPOT LEVEL(+indicates pos.)	+ 127.13
BASEMENT LEVEL	BTL
BED LEVEL	BL
COVER LEVEL	CL
EAVES LEVEL	EL
FLOOR LEVEL	FL
INVERT LEVEL	IL
ROOF LEVEL	RFL
RIDGE LEVEL	RL
SOFFIT LEVEL	SFL
SPRING LEVEL	SPL
THRESHOLD LEVEL	THL
TOP OF WALL LEVEL	ToW
WATER LEVEL	WL

TREE LEGEND

ALDER	ALD	MAPLE	MPL
ASH	ASH	OAK	OAK
ASPEN	ASP	PINE	PNE
BEECH	BCH	POPLAR	POP
CEDAR	CED	PRUNUS	PRU
CHERRY	CHY	RHODODENDRONS	RDN
CONIFEROUS	CON	ROWAN	RWN
CYPRESS	CYP	SALLOW	SLW
DECIDUOUS	DEC	SAPLING	SAP
DEAD	DED	SWEET CHESTNUT	SCH
ELDERBERRY	ELD	SILVER BIRCH	SIB
ELM	ELM	SPRUCE	SPR
EUCALYPTUS	EUC	SPECIES UNKNOWN	SPU
FIR	FIR	SYCAMORE	SYC
FRUIT	FRT	TREE OF HEAVEN	TOH
HAWTHORN	HAW	WELLINGTONIA	WEL
HAZEL	HZL	WHITEBEAM	WBM
HORNBEAM	HBM	WILLOW	WLW
HORSE CHESTNUT	HCH	WALNUT	WNT
HOLLY	HLY	YEW	YEW
INDIAN BEAN TREE	IBT	MULTI-TRUNK	MT
LARCH	LAR		
LABURNUM	LBM	0.2 / 6 / 3T	
LOCUST	LCS	Dia of Bole / Tree Height / No of Trunks	
LIME	LIM		
LONDON PLANE	LPN		
MAGNOLIA	MAG		

SIZES AND SPECIES ARE INDICATIVE ONLY, WITH THE MEAN SPREAD DRAWN TO SCALE.

Coordinate Table

STATION	DESCRIPTION	EASTING	NORTHING	LEVEL
50	PN	538723.408	181302.555	1.783
51	PN	538743.187	181255.906	1.653
52	PNW	538752.765	181230.150	1.729
53	PN	538777.386	181218.539	1.788
54	PN	538768.285	181195.695	4.223
55	PN	538823.444	181216.378	4.266
56	PN	538862.514	181229.780	4.289
57	PN	538889.518	181250.146	4.314
58	PN	538898.100	181276.217	3.382
59	PKN	538883.382	181285.090	2.634
60		538801.399	181318.471	1.922
61	PKN	538771.406	181319.327	1.852
62	PN	538777.714	181288.671	1.808
63	PKN	538848.013	181273.050	1.636
65	PNW	538783.642	181236.459	1.944
66	PEG	538811.387	181291.715	1.744
C1	PN	538663.947	181376.651	1.940
C2	PN	538687.952	181279.286	1.783

HN – Hilti® Nail PKN – Parker Kalon® Nail PGM – Permanent Ground Marker
PM – Punch Mark PN – Pipe Nail W – Washer (used with PKN and PN)

NOTE:
PHOTO POSITIONS SHOWN THUS: (1)

FOR PHOTO'S REFER TO DRAWING 3553–5 SHEET 2.

NOTES

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Aworth
SURVEY CONSULTANTS
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www.aworth.co.uk als@aworth.co.uk
The Lansdowne Building, 2 Lansdowne Road
Croydon, CR9 2ER
Tel:– 020 8263 6046 Fax:– 020 8263 6146

Drawing No	Sheet	Revision	Surveyed	CS
3553–5	1		Drawn	JBW
	Scale 1:200	@ A0	Checked	PDE
			Date	18/12/09

Project
ABERFELDY VILLAGE
POPLAR
PHASE 5

Client
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UNIT 3, QUEBEC WHARF
14 THOMAS ROAD
LONDON E14 7AF

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INVERT LEVEL	IL
ROOF LEVEL	RFL
RIDGE LEVEL	RL
SOFFIT LEVEL	SFL
SPRING LEVEL	SPL
THRESHOLD LEVEL	THL
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WATER LEVEL	WL

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CEDAR	CED	PRUNUS	PRU
CHERRY	CHY	RHODODENDRONS	RDN
CONIFEROUS	CON	ROWAN	RWN
CYPRESS	CYP	SALLOW	SLW
DECIDUOUS	DEC	SAPLING	SAP
DEAD	DED	SWEET CHESTNUT	SCH
ELDERBERRY	ELD	SILVER BIRCH	SIB
ELM	ELM	SPRUCE	SPR
EUCALYPTUS	EUC	SPECIES UNKNOWN	SPU
FIR	FIR	SYCAMORE	SYC
FRUIT	FRT	TREE OF HEAVEN	TOH
HAWTHORN	HAW	WELLINGTONIA	WEL
HAZEL	HZL	WHITEBEAM	WBM
HORNBEAM	HBM	WILLOW	WLW
HORSE CHESTNUT	HCH	WALNUT	WNT
HOLLY	HLY	YEW	YEW
INDIAN BEAN TREE	IBT		
LARCH	LAR	MULTI-TRUNK	MT
LABURNUM	LBM		
LOCUST	LCS	0.2 / 6 / 3T	
LIME	LIM	Dia of Bole / Tree Height / No of Trunks	
LONDON PLANE	LPN		
MAGNOLIA	MAG		

SIZES AND SPECIES ARE INDICATIVE ONLY, WITH THE MEAN SPREAD DRAWN TO SCALE.

Coordinate Table

Aworth SURVEY CONSULTANTS

STATION	DESCRIPTION	EASTING	NORTHING	LEVEL
100	PN	538634.795	181387.889	1.889
101	PKN	538514.670	181447.628	1.737
105	PNW	538471.710	181322.503	1.767
110	PKN	538513.558	181338.185	1.587
300	PKN	538463.462	181378.864	1.771
301	PN	538491.308	181399.170	1.700
302	PKN	538560.752	181415.049	1.811
303	PKN	538584.861	181360.978	1.582
600	PKN	538427.513	181308.490	1.990
601	PN	538391.334	181297.567	2.139
602	PN	538373.212	181302.329	2.239
603	PKN	538353.673	181294.721	2.329
604	HN	538339.098	181280.636	2.476
605	PN	538334.163	181259.767	2.593
606	HN	538321.900	181325.555	2.415
607	PN	538315.708	181356.368	2.973
608	PKN	538307.935	181397.113	3.182
609	PN	538297.372	181442.215	3.063
610	PN	538340.316	181458.161	2.433
611	PN	538387.155	181468.694	1.590
612	PN	538429.773	181450.741	1.801
613	PN	538402.553	181424.181	1.756
614	PN	538405.993	181397.949	1.873
615	PN	538355.834	181378.805	1.592
616	PN	538419.161	181368.113	1.830
617	PN	538385.738	181353.977	1.855
618	PKN	538378.350	181338.972	2.196
619	PKN	538346.946	181350.869	1.948
620	PN	538440.400	181424.358	1.632
C4	PNW	538429.831	181475.704	1.957

HN – Hilti® Nail
PM – Punch Mark
PKN – Parker Kalon® Nail
PN – Pipe Nail
PGM – Permanent Ground Marker
W – Washer (used with PKN and PN)

SHEET LAYOUT

1 2 3

NOTE:
PHOTO POSITIONS SHOWN THUS:
FOR PHOTO'S REFER TO DRAWING 3553-6 SHEET 4.

NOTES

GRID THE SURVEY IS ON A PLANE LOCAL GRID RELATED TO OS NATIONAL GRID BY GPS USING OSTN02. THE LOCAL GRID ORIGIN IS STN C1, CO-ORDINATES 538663.947E, 181376.651N.

LEVELLING THE SURVEY LEVELS ARE BASED ON OS NEWLYN DATUM BY GPS USING OSGM02.

LLOYD'S REGISTER QUALITY ASSURANCE CERTIFICATED COMPANY

THE SURVEY ASSOCIATION

Aworth
SURVEY CONSULTANTS
LRQA Certificated Office
Norfolk House, Norfolk Way, Uckfield, TN22 1EP
Tel:– 01825 768319 Fax:– 01825 768310
www.aworth.co.uk als@aworth.co.uk
The Lansdowne Building, 2 Lansdowne Road
Croydon, CR9 2ER
Tel:– 020 8263 6046 Fax:– 020 8263 6146

Drawing No	Sheet	Revision
3553-6	2	
Scale	1:200	@A0

Surveyed	DR/CS
Drawn	TP
Checked	PDE
Date	18/12/09

Project

ABERFELDY VILLAGE
POPLAR
PHASE 6

Client

POPLAR HARCA
UNIT 3, QUEBEC WHARF
14 THOMAS ROAD
LONDON E14 7AF

MEINHARDT

Appendix B – Thames Water Asset Records and Pre Development Enquiry Response

Thames Water

Mrs Maria Magdalena Burca
Ecoworld and Poplar Harca C/O Meinhardt (UK) Ltd
10 Aldersgate Street
London
EC1A 4HJ

Wastewater pre-planning
Our ref DS6080631

24 March 2021

Pre-planning enquiry: Confirmation of sufficient capacity

Dear Mrs Burca,

Thank you for providing information on your development:

Aberfeldy Village, Area known as Poplar Riverside, London, E14 0HT.

Existing: 297 dwellings, primary school and commercial space (2,217sqm).

Proposed: Demolition of existing site. Phase A – 250 residential units. Foul water discharging by gravity. 50 units to MH7303, 23 units to MH3605, 75 units to MH4301A, 102 units to MH4215. Surface water discharging by gravity attenuated to 8.59l/s to manholes 7303, 3605, 4301A and 4215.

Phase B – 573 residential units, 920.3sqm of workspace, 1,894.9sqm of residential hub, 344,8sqm of estate management space and 443.3sqm of retail space. Foul water discharging by gravity. 79 units to MH3605, 222 units to MH3517 and MH2536, 160 units to MH3516. Surface water discharging by gravity attenuated to 8l/s to manholes 3605, 3517, 2536 and 3516.

Phase C – 622 residential units and 4,816.7sqm workspace. Foul water discharging by gravity to manhole 4303. Surface water discharging by gravity attenuated to 6l/s to manhole 4303.

Phase D – Primary school. Foul water discharging by gravity to manhole 4302. Surface water discharging by gravity attenuated to 3l/s to manhole 4302.

Phase E – 427 residential units and 2,808.3sqm of workspace. Foul water discharging by gravity. 220 units to the manhole upstream of MH4203 in Blair Street, 151 units to MH4202 and 78 units to MH4216.

Overall surface water discharge rates for the development will be restricted to 33.59l/s.

We have completed the assessment of the foul water flows and surface water run-off based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

Foul Water

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent combined sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.

Surface Water

Please note that discharging surface water to the public sewer network should only be considered after all other methods of disposal have been investigated and proven to not be viable. In accordance with the Building Act 2000 Clause H3.3, positive connection to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. The disposal hierarchy being: 1st Soakaways; 2nd Watercourses; 3rd Sewers.

Only when it can be proven that soakage into the ground or a connection into an adjacent watercourse is not possible would we consider a restricted discharge into the public combined sewer network.

If the peak surface water run-off discharge is then restricted to Greenfield run-off rates/a maximum of 33.59l/s as your drainage strategy indicates, then we would have no objections to the proposals.

Thames Water Planning team would ask to see why it is not practicable on the site to restrict to Greenfield run-off rates if they are consulted as part of any planning application.

In considering your surface water needs, we support the use of sustainable drainage on development sites. You'll need to show the local authority and/or lead local flood authority how you've taken into account the surface water hierarchy that we've included.

Please see the attached 'Planning your wastewater' leaflet for additional information.

What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connection/s.

If you've any further questions, please contact me on 0203 577 9811.

Yours sincerely

Siva Rajaratnam - Adoptions Engineer

Thames Water

Asset location search

Thames Water Property Searches

Meinhardt (UK) Ltd
10

LONDON
EC1A 4HJ

Search address supplied	Aberfeldy Village Aberfeldy Street London London UK
Your reference	Aberfeldy Street Aberfeldy Village E14 0NU
Our reference	ALS/ALS Standard/2020_4292429
Search date	5 November 2020

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0845 070 9148

Search address supplied: Aberfeldy Village, Aberfeldy Street, London, London, UK,

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This searchprovides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

The following quartiles have been printed as they fall within Thames' sewerage area:

TQ3881NE
TQ3881SW
TQ3881NW
TQ3881SE

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an ‘as constructed’ record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

The following quartiles have been printed as they fall within Thames' water area:

TQ3881NE
TQ3881SW

TQ3881NW
TQ3881SE

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

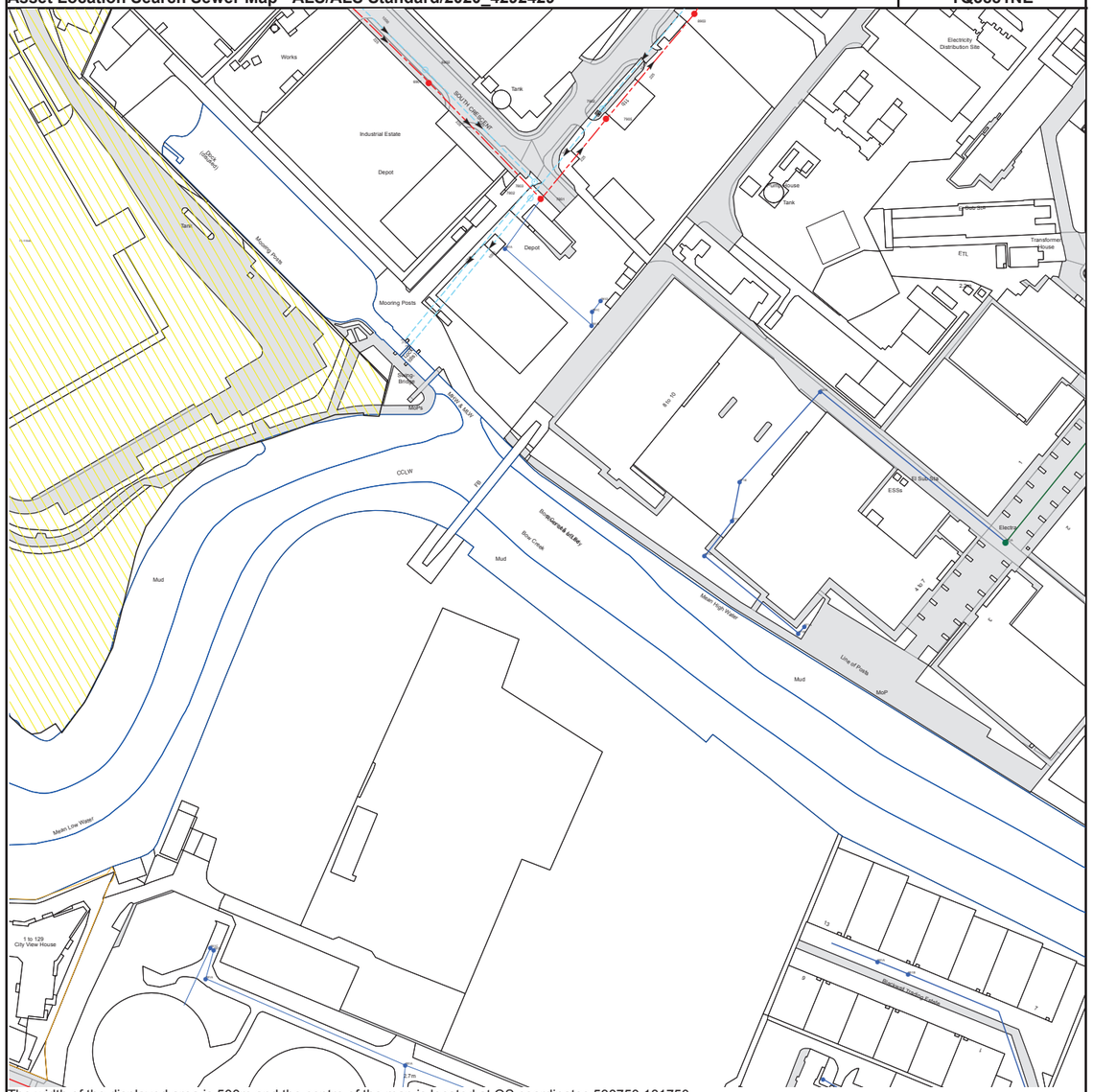
Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2020_4292429

TQ3881NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 538750,181750

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.

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
85AB	n/a	n/a
85AC	n/a	n/a
951A	n/a	n/a
951B	n/a	n/a
8904	n/a	n/a
8903	n/a	n/a
781A	n/a	n/a
7802	n/a	n/a
7803	n/a	n/a
7801	n/a	n/a
781B	n/a	n/a
781C	n/a	n/a
781D	n/a	n/a
871C	n/a	n/a
871D	n/a	n/a
871E	n/a	n/a
871B	n/a	n/a
871A	n/a	n/a
881A	n/a	n/a
971A	n/a	n/a
651A	n/a	n/a
6902	n/a	n/a
6901	n/a	n/a
7902	n/a	n/a
7905	n/a	n/a
551A	n/a	n/a
551C	n/a	n/a
551B	n/a	n/a

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.

Asset Location Search Sewer Map - ALS/ALS Standard/2020_4292429	TQ3881SW

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 538250,181250

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.

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
3407	2.25	.86
3402	1.92	-3.79
3403	1.94	-.54
2417	3	1.5
141A	n/a	n/a
2424	2.32	n/a
141G	n/a	n/a
411H	n/a	n/a
4203	1.7	-.48
4204	1.79	-.7
4202	1.71	-.9
4201	1.7	-.94
42DH	n/a	n/a
42DI	n/a	n/a
42DJ	n/a	n/a
42EA	n/a	n/a
4216	1.57	-1.33
42EE	n/a	n/a
4215	1.61	-2.24
42EG	n/a	n/a
42ED	n/a	n/a
43DB	n/a	n/a
33CH	n/a	n/a
4301A	1.77	-2.82
43DE	n/a	n/a
431E	n/a	n/a
43DD	n/a	n/a
43DF	n/a	n/a
4319	1.76	-1.28
43DG	n/a	n/a
44DB	n/a	n/a
44DA	n/a	n/a
44CI	n/a	n/a
44DC	n/a	n/a
44DD	n/a	n/a
44CH	n/a	n/a
44CJ	n/a	n/a
3432	1.68	-1.72
4420	1.59	-3.16
4419	1.7	-3.27
4408	1.75	-3.45
3405	1.72	.13
4407	1.97	-3.55
4401	1.76	-.05
3404	1.67	-.33
3222	2.36	.55
32CG	n/a	n/a
42EC	n/a	n/a
33EE	n/a	n/a
4313	2.04	-1.04
43DI	n/a	n/a
33ED	n/a	n/a
33EC	n/a	n/a
33EB	n/a	n/a
4312	1.73	-2.54
33EA	n/a	n/a
33DJ	n/a	n/a
431D	n/a	n/a
431C	n/a	n/a
33CE	n/a	n/a
4303	n/a	n/a
4302	n/a	n/a
431B	n/a	n/a
33DB	n/a	n/a
33DC	n/a	n/a
431A	n/a	n/a
33DD	n/a	n/a
3016	4.41	-1.42
3015	4.08	-1.55
3014	3.45	-1.74
3010	n/a	n/a
3023	4.25	1.24
3005	n/a	n/a
3009	3.98	1.27
3008	4.06	2.68
3007	4.16	-1.23
3006	6.19	2.89
2422	2.26	-4.27
2406	2.7	1.83
2409	2.99	2.3
2408	n/a	n/a
2304	2.49	1.07
2420	3.36	1.54
2303	2.35	.8
2305	2.66	1.02
2301	2.38	.73
3306	2.49	1.72
3310	2.57	.74
3406	2.76	1.11
3401	3.04	-8.94

Manhole Reference	Manhole Cover Level	Manhole Invert Level
3302	2.7	.54
3301B	2.29	-1.11
33CI	n/a	n/a
3205	2.35	-4.07
33CD	n/a	n/a
3202	n/a	n/a
33CJ	n/a	n/a
33DE	n/a	n/a
33DF	n/a	n/a
33DG	n/a	n/a
33DH	n/a	n/a
33DA	n/a	n/a
33DI	n/a	n/a
3316	n/a	n/a
2102	4.37	1.67
2012	4.38	1.37
2112	4.66	-8.47
3112	n/a	n/a
3101	n/a	n/a
3102	n/a	n/a
3103	n/a	n/a
3106	n/a	n/a
311C	n/a	n/a
311B	n/a	n/a
311A	n/a	n/a
4104	1.72	-.02
411E	n/a	n/a
411A	n/a	n/a
411J	n/a	n/a
411F	n/a	n/a
411B	n/a	n/a
411I	n/a	n/a
411G	n/a	n/a
411C	n/a	n/a
4103	1.85	-.11
411D	n/a	n/a
4011	4.17	1.55
4102	1.93	-.22
4101	1.93	-.49
12BD	n/a	n/a
12BE	n/a	n/a
2208	5.19	2.74
22CE	n/a	n/a
22CD	n/a	n/a
12BF	n/a	n/a
22BH	n/a	n/a
22BI	n/a	n/a
22BJ	n/a	n/a
22CA	n/a	n/a
22CB	n/a	n/a
22CC	n/a	n/a
2207	5.18	2.47
21CE	n/a	n/a
21CD	n/a	n/a
2203	5.2	2.35
21CC	n/a	n/a
2202	3.7	1.85
2204	3.93	2.12
2201	2.97	.77
2212	2.64	1.93
3218	2.85	1.21
3217	2.94	.53
3219	2.74	1.64
3201	2.44	-8.63
3204	2.34	-.83
3203	2.47	-1.25
12EB	n/a	n/a
12EA	n/a	n/a
121I	n/a	n/a
121F	5.7	4.88
121K	5.65	4.88
121T	5.98	3.89
121J	n/a	n/a
121G	5.7	4.55
12DJ	n/a	n/a
121E	n/a	n/a
121H	n/a	n/a
121D	5.7	3.04
121O	6.31	4.9
12DI	n/a	n/a
121C	5.99	3.08
121R	6.17	4.07
12DH	n/a	n/a
12FH	n/a	n/a
12FI	n/a	n/a
12BJ	n/a	n/a
12CA	n/a	n/a
12CB	n/a	n/a
12AI	n/a	n/a
12AJ	n/a	n/a
12BA	n/a	n/a
12BB	n/a	n/a
12BC	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
11ED	n/a	n/a
11EC	n/a	n/a
11EB	n/a	n/a
21BE	n/a	n/a
11CG	n/a	n/a
11EA	n/a	n/a
21CH	n/a	n/a
21BF	n/a	n/a
11CH	n/a	n/a
11DJ	n/a	n/a
11CI	n/a	n/a
11CJ	n/a	n/a
21BG	n/a	n/a
11DA	n/a	n/a
11DB	n/a	n/a
11DI	n/a	n/a
21BH	n/a	n/a
11DC	n/a	n/a
11DH	n/a	n/a
21BI	n/a	n/a
11DF	n/a	n/a
11DG	n/a	n/a
21BJ	n/a	n/a
2110	5.27	3.03
21CA	n/a	n/a
21CB	n/a	n/a
2109	4.66	2.72
10DF	n/a	n/a
20DC	n/a	n/a
101A	n/a	n/a
20CD	n/a	n/a
10CC	n/a	n/a
10CI	n/a	n/a
20CI	n/a	n/a
1017	5.67	2.64
10CD	n/a	n/a
1016	5.23	2.03
10FD	n/a	n/a
20CJ	n/a	n/a
2019	4.77	1.79
10FE	n/a	n/a
11EI	n/a	n/a
11EJ	n/a	n/a
11FA	n/a	n/a
11FB	n/a	n/a
11FC	n/a	n/a
11FE	n/a	n/a
11FH	n/a	n/a
1102B	5.81	2.58
11EG	n/a	n/a
11EF	n/a	n/a
1101A	5.8	2.17
11EE	n/a	n/a
2103	4.5	2.19
02CH	n/a	n/a
12GD	n/a	n/a
12DG	n/a	n/a
12BI	n/a	n/a
12DF	n/a	n/a
12DD	n/a	n/a
12DC	n/a	n/a
12BH	n/a	n/a
12DB	n/a	n/a
12DA	n/a	n/a
12CJ	n/a	n/a
12GF	n/a	n/a
1205	n/a	n/a
12CI	n/a	n/a
12BG	n/a	n/a
12CH	n/a	n/a
12CC	n/a	n/a
13DH	n/a	n/a
13DE	n/a	n/a
13DG	n/a	n/a
13DF	n/a	n/a
13DD	n/a	n/a
13DI	n/a	n/a
13DC	n/a	n/a
13DB	n/a	n/a
1303	n/a	n/a
1301	5.33	3.16
1004	n/a	n/a
1009	n/a	n/a
1003	n/a	n/a
1001A	n/a	n/a
1010	5.03	1.14
2004	5.3	2.58
1013	5.52	1.82
2005	4.86	3.56
2006	4.74	3.75
1011	5.33	1.55
001D	n/a	n/a
10DH	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2011	4.53	1.22
10FA	n/a	n/a
10EJ	n/a	n/a
10DG	n/a	n/a
10DE	n/a	n/a
10DB	n/a	n/a
101B	n/a	n/a
10DD	n/a	n/a
20DB	n/a	n/a
01FD	n/a	n/a
0102A	6.44	3.38
01FG	n/a	n/a
01FH	n/a	n/a
01FI	n/a	n/a
01FJ	n/a	n/a
01FF	n/a	n/a
01GA	n/a	n/a
01GB	n/a	n/a
01GC	n/a	n/a
01BE	n/a	n/a
01BF	n/a	n/a
0003	6.02	2.89
11CB	n/a	n/a
11GI	n/a	n/a
11GA	n/a	n/a
11CC	n/a	n/a
11GB	n/a	n/a
11GC	n/a	n/a
11GD	n/a	n/a
11GE	n/a	n/a
11GF	n/a	n/a
11GG	n/a	n/a
10FC	n/a	n/a
11HC	n/a	n/a
11HA	n/a	n/a
11HD	n/a	n/a
0302	5.99	3.98
0312	n/a	2.95
0402	5.17	2.45
0301	5.75	3.69
0311	5.81	2.78
1410	5.02	1.25
141E	n/a	n/a
1411	5.23	1.47
141D	n/a	n/a
1404	5.25	1.53
141C	n/a	n/a
1312	5.55	3.33
1405	5.47	2.46
1415	n/a	n/a
1311	5.43	2.97
1403	4.55	1.3
1414	n/a	n/a
1310	5.38	3.07
1302	n/a	n/a
141H	n/a	n/a
131A	n/a	n/a
1402	4.17	1.17
141B	n/a	n/a
1401	3.58	1.08
2315	4.46	1.69
2314	3.26	1.25
2403	2.27	-5.19
2407	2.81	2.25
0212	n/a	n/a
0201B	6.49	3.67
02CI	n/a	n/a
0202	6.24	3.38
12FD	n/a	n/a
1103B	5.94	3.13
12FC	n/a	n/a
11CD	n/a	n/a
121S	6.11	5.25
12FB	n/a	n/a
12FA	n/a	n/a
12EJ	n/a	n/a
12EI	n/a	n/a
12EH	n/a	n/a
12EG	n/a	n/a
121L	5.71	4.55
12EF	n/a	n/a
121M	5.73	4.28
121A	5.6	3.17
12EE	n/a	n/a

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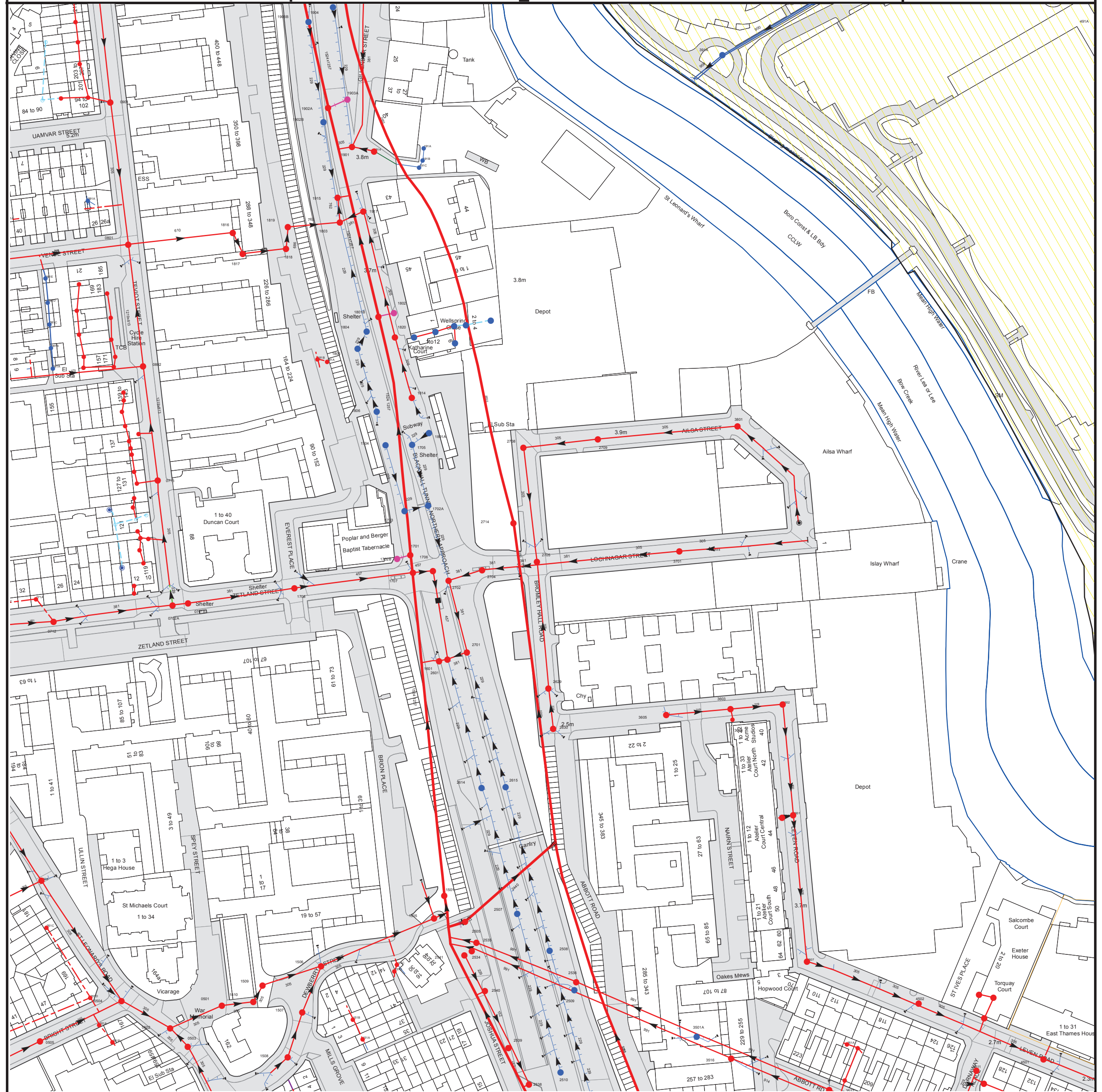
Asset Location Search Sewer Map - ALS/ALS Standard/2020_4292429	TQ3881NW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 538250,181750

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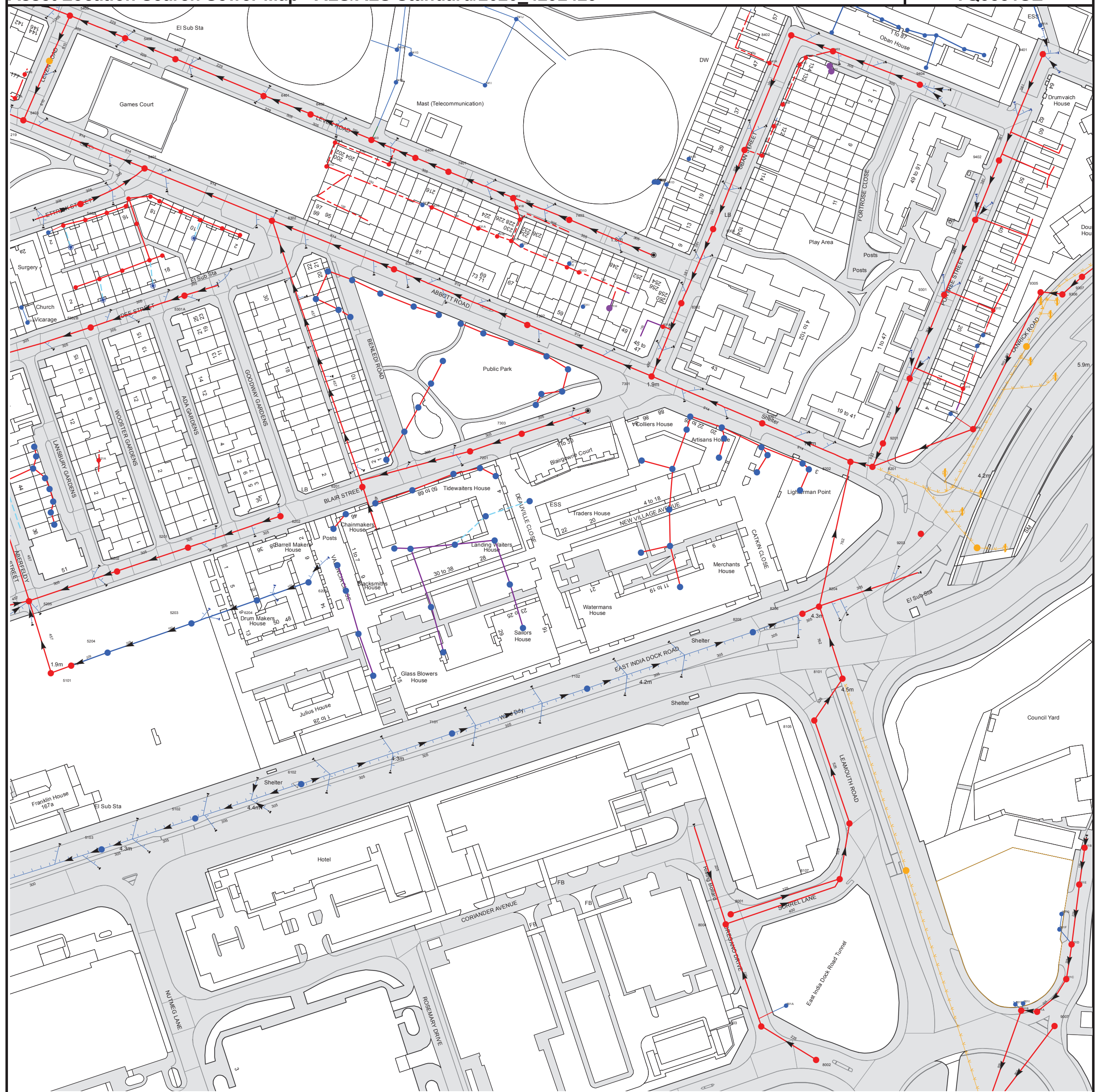
NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
3701	n/a	n/a
3501A	n/a	n/a
3603	3.19	1.1
3516	n/a	n/a
3604	3.24	n/a
361A	3.5	.4
3602	3.75	.78
3601	3.55	.29
3507	3.39	n/a
3517	n/a	n/a
35CH	n/a	n/a
351A	n/a	n/a
35CG	n/a	n/a
4502	n/a	n/a
4511	n/a	n/a
45BF	n/a	n/a
45CB	n/a	n/a
45BH	n/a	n/a
45BG	n/a	n/a
4501	n/a	n/a
1705	n/a	n/a
2709	n/a	n/a
1801A	n/a	n/a
3801	n/a	n/a
1806	n/a	n/a
1814	n/a	n/a
181A	n/a	n/a
181B	n/a	n/a
1805	n/a	n/a
28AB	n/a	n/a
18CI	n/a	n/a
1820	n/a	n/a
18CH	n/a	n/a
1804	n/a	n/a
28AC	n/a	n/a
28AE	n/a	n/a
28AD	n/a	n/a
1801B	n/a	n/a
1802	n/a	n/a
1817	n/a	n/a
1818	n/a	n/a
1816	n/a	n/a
1819	n/a	n/a
1803	n/a	n/a
1917	n/a	n/a
1915	n/a	n/a
191C	n/a	n/a
191B	n/a	n/a
1914	n/a	n/a
191A	n/a	n/a
1901	n/a	n/a
1902B	n/a	n/a
1902A	n/a	n/a
1903A	n/a	n/a
391A	n/a	n/a
1903B	n/a	n/a
491A	n/a	n/a
1904	n/a	n/a
391B	n/a	n/a
2538	n/a	n/a
2510	n/a	n/a
1508	n/a	n/a
2539	n/a	n/a
0503	n/a	n/a
151A	n/a	n/a
0502	n/a	n/a
151B	n/a	n/a
1507	n/a	n/a
0501	n/a	n/a
1510	n/a	n/a
2540	n/a	n/a
2509	n/a	n/a
1509	n/a	n/a
2536	n/a	n/a
151D	n/a	n/a
1506	n/a	n/a
151C	n/a	n/a
2541	n/a	n/a
2534	n/a	n/a
2508	n/a	n/a
2535	n/a	n/a
2505	2.25	-8.8
1505	n/a	n/a
2507	n/a	n/a
1501	2.32	-5.24
2614	n/a	n/a
2615	n/a	n/a
2630	n/a	n/a
3605	n/a	n/a
2629	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
1601	n/a	n/a
2601	n/a	n/a
2701	n/a	n/a
0702A	n/a	n/a
0701B	n/a	n/a
1708	n/a	n/a
2702	n/a	n/a
1707	n/a	n/a
1706	n/a	n/a
2704	n/a	n/a
2705	n/a	n/a
1702B	n/a	n/a
1701	n/a	n/a
2714	3.24	-9.46
1703	n/a	n/a
1702A	n/a	n/a
0713	n/a	n/a
2708	n/a	n/a
1704	n/a	n/a
07CH	n/a	n/a
07DB	n/a	n/a
07DD	n/a	n/a
07DE	n/a	n/a
07DJ	n/a	n/a
07EA	n/a	n/a
07EB	n/a	n/a
07DI	n/a	n/a
07DH	n/a	n/a
08BJ	n/a	n/a
08CA	n/a	n/a
08CB	n/a	n/a
08CC	n/a	n/a
08AH	n/a	n/a
081A	n/a	n/a
08EE	n/a	n/a
08DI	n/a	n/a
0802	n/a	n/a
08DH	n/a	n/a
08ED	n/a	n/a
081B	n/a	n/a
08DG	n/a	n/a
08EC	n/a	n/a
081C	n/a	n/a
08DF	n/a	n/a
08EB	n/a	n/a
081D	n/a	n/a
08DE	n/a	n/a
08EA	n/a	n/a
081E	n/a	n/a
0801	n/a	n/a
091A	n/a	n/a
0901	n/a	n/a
09BD	n/a	n/a
09BE	n/a	n/a
09BF	n/a	n/a
09CA	n/a	n/a
09BJ	n/a	n/a
09BC	n/a	n/a
09BI	n/a	n/a
09BH	n/a	n/a
071A	n/a	n/a
0506	n/a	n/a
051C	n/a	n/a
0712	n/a	n/a
051D	n/a	n/a
07CI	n/a	n/a
0504	n/a	n/a
07AH	n/a	n/a
07BJ	n/a	n/a
07CE	n/a	n/a
07CF	n/a	n/a
07CD	n/a	n/a
07CG	n/a	n/a
07CC	n/a	n/a
051B	n/a	n/a
0505	n/a	n/a
051A	n/a	n/a

Asset Location Search Sewer Map - ALS/ALS Standard/2020_4292429 | TQ3881SE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 538750,181250

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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
8401	n/a	n/a
841G	n/a	n/a
841A	n/a	n/a
841J	n/a	n/a
841B	n/a	n/a
8402	n/a	n/a
841C	n/a	n/a
841F	n/a	n/a
841H	n/a	n/a
841I	n/a	n/a
84DH	n/a	n/a
8403	n/a	n/a
94CI	n/a	n/a
94CH	n/a	n/a
94CJ	n/a	n/a
9404	n/a	n/a
94DA	n/a	n/a
94DC	n/a	n/a
94DB	n/a	n/a
9402	n/a	n/a
9401	n/a	n/a
7403	n/a	n/a
741A	n/a	n/a
741B	n/a	n/a
641C	n/a	n/a
641E	n/a	n/a
7402	n/a	n/a
841D	n/a	n/a
741E	n/a	n/a
741D	n/a	n/a
741H	n/a	n/a
741C	n/a	n/a
741G	n/a	n/a
741F	n/a	n/a
7401	n/a	n/a
641D	n/a	n/a
641B	n/a	n/a
841E	n/a	n/a
6404	n/a	n/a
641A	n/a	n/a
6403	n/a	n/a
6402	n/a	n/a
741I	n/a	n/a
641F	n/a	n/a
641G	n/a	n/a
641H	n/a	n/a
741J	n/a	n/a
5405	n/a	n/a
9203	n/a	n/a
82CD	n/a	n/a
82CH	n/a	n/a
82CE	n/a	n/a
8201	n/a	n/a
82CF	n/a	n/a
8202	n/a	n/a
82CJ	n/a	n/a
82CI	n/a	n/a
82CG	n/a	n/a
9201	n/a	n/a
83CF	n/a	n/a
9304	n/a	n/a
83CE	n/a	n/a
8301	n/a	n/a
931A	n/a	n/a
931E	n/a	n/a
9302	n/a	n/a
931C	n/a	n/a
931B	n/a	n/a
931D	n/a	n/a
9301	n/a	n/a
9306	n/a	n/a
9305	n/a	n/a
9307	n/a	n/a
9403	n/a	n/a
72AI	n/a	n/a
731B	n/a	n/a
73CI	n/a	n/a
731C	n/a	n/a
731F	n/a	n/a
7303	n/a	n/a
7302	n/a	n/a
72CD	n/a	n/a
73DD	n/a	n/a
73DB	n/a	n/a
73CG	n/a	n/a
73DA	n/a	n/a
731E	n/a	n/a
73CJ	n/a	n/a
731G	n/a	n/a
731D	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
731I	n/a	n/a
731H	n/a	n/a
72AH	n/a	n/a
7301	n/a	n/a
831A	n/a	n/a
82CB	n/a	n/a
82CC	n/a	n/a
8302	n/a	n/a
83CB	n/a	n/a
83CC	n/a	n/a
8303	n/a	n/a
8004	n/a	n/a
8003	n/a	n/a
801A	6.29	5.79
8002	n/a	n/a
9007	n/a	n/a
8001	n/a	n/a
8107	n/a	n/a
8106	n/a	n/a
6102	n/a	n/a
7101	n/a	n/a
8105	n/a	n/a
7102	n/a	n/a
8101	n/a	n/a
61BC	n/a	n/a
62DF	n/a	n/a
62CJ	n/a	n/a
8205	n/a	n/a
72CB	n/a	n/a
8206	n/a	n/a
62DE	n/a	n/a
8204	n/a	n/a
62DA	n/a	n/a
82BJ	n/a	n/a
72CA	n/a	n/a
6203	n/a	n/a
62DB	n/a	n/a
72AG	n/a	n/a
62DD	n/a	n/a
62DC	n/a	n/a
82CA	n/a	n/a
72BJ	n/a	n/a
72BI	n/a	n/a
6202	n/a	n/a
63DI	n/a	n/a
63DJ	n/a	n/a
62CA	n/a	n/a
63EI	n/a	n/a
62CB	n/a	n/a
63FA	n/a	n/a
63EA	n/a	n/a
6201	n/a	n/a
62CE	n/a	n/a
63ED	n/a	n/a
62EF	n/a	n/a
6301	n/a	n/a
63EG	n/a	n/a
62CD	n/a	n/a
63EC	n/a	n/a
63EF	n/a	n/a
63EH	n/a	n/a
63EB	n/a	n/a
63EE	n/a	n/a
72BA	n/a	n/a
73CF	n/a	n/a
7201	n/a	n/a
731A	n/a	n/a
72AJ	n/a	n/a
73CH	n/a	n/a
72CC	n/a	n/a
53AE	n/a	n/a
53BG	n/a	n/a
53BH	n/a	n/a
5402	n/a	n/a
54DI	n/a	n/a
5302B	n/a	n/a
521A	n/a	n/a
53BI	n/a	n/a
54BH	n/a	n/a
53BJ	n/a	n/a
5406	n/a	n/a
54DH	n/a	n/a
54DJ	n/a	n/a
53CC	n/a	n/a
5401	n/a	n/a
53CA	n/a	n/a
54EA	n/a	n/a
54EB	n/a	n/a
53CB	n/a	n/a
5407	n/a	n/a
54EC	n/a	n/a
5301A	n/a	n/a
54ED	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
53CD	n/a	n/a
63CF	n/a	n/a
6401	n/a	n/a
6302	n/a	n/a
5101	n/a	n/a
511B	n/a	n/a
5204	n/a	n/a
5203	n/a	n/a
5205	n/a	n/a
6204	n/a	n/a
5202	n/a	n/a
5201	n/a	n/a
52CH	n/a	n/a
52CI	n/a	n/a
52CJ	n/a	n/a
52DA	n/a	n/a
52DB	n/a	n/a
5403	n/a	n/a
541A	n/a	n/a
541B	n/a	n/a
52DC	n/a	n/a
52DE	n/a	n/a
52DD	n/a	n/a
531B	n/a	n/a
531A	n/a	n/a
5103	n/a	n/a
5102	n/a	n/a
901H	5.1	4.21
901B	5.1	2.1
901I	5.1	4.39
901A	4.91	2.2
901F	5.59	4.52
901G	5.59	2.97
901C	4.96	2.37
901D	4.82	2.43
901E	4.68	2.58
911B	4.6	3.15
94DF	n/a	n/a
94DE	n/a	n/a
941A	n/a	n/a

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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

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

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

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

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

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

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

Control Valve

Drop Pipe

Ancillary

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.

Outfall

Undefined End

Inlet

Other Symbols

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

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

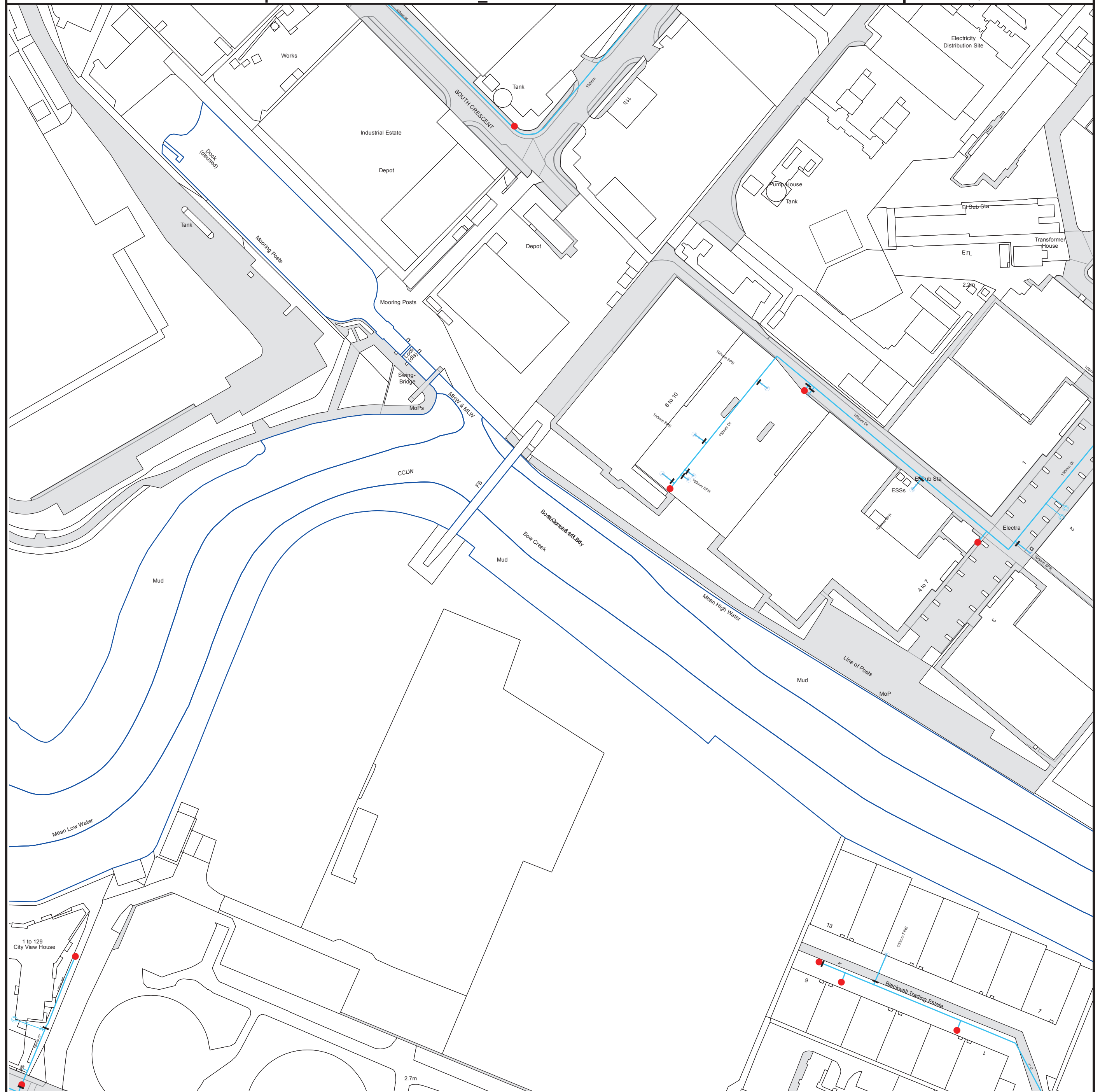
Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plans are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate 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 level indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. 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 present on the plan, please contact a member of Property Insight on 0845 070 9148.

Asset Location Search Water Map - ALS/ALS Standard/2020_4292429 | TQ3881NE



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 538750,181750

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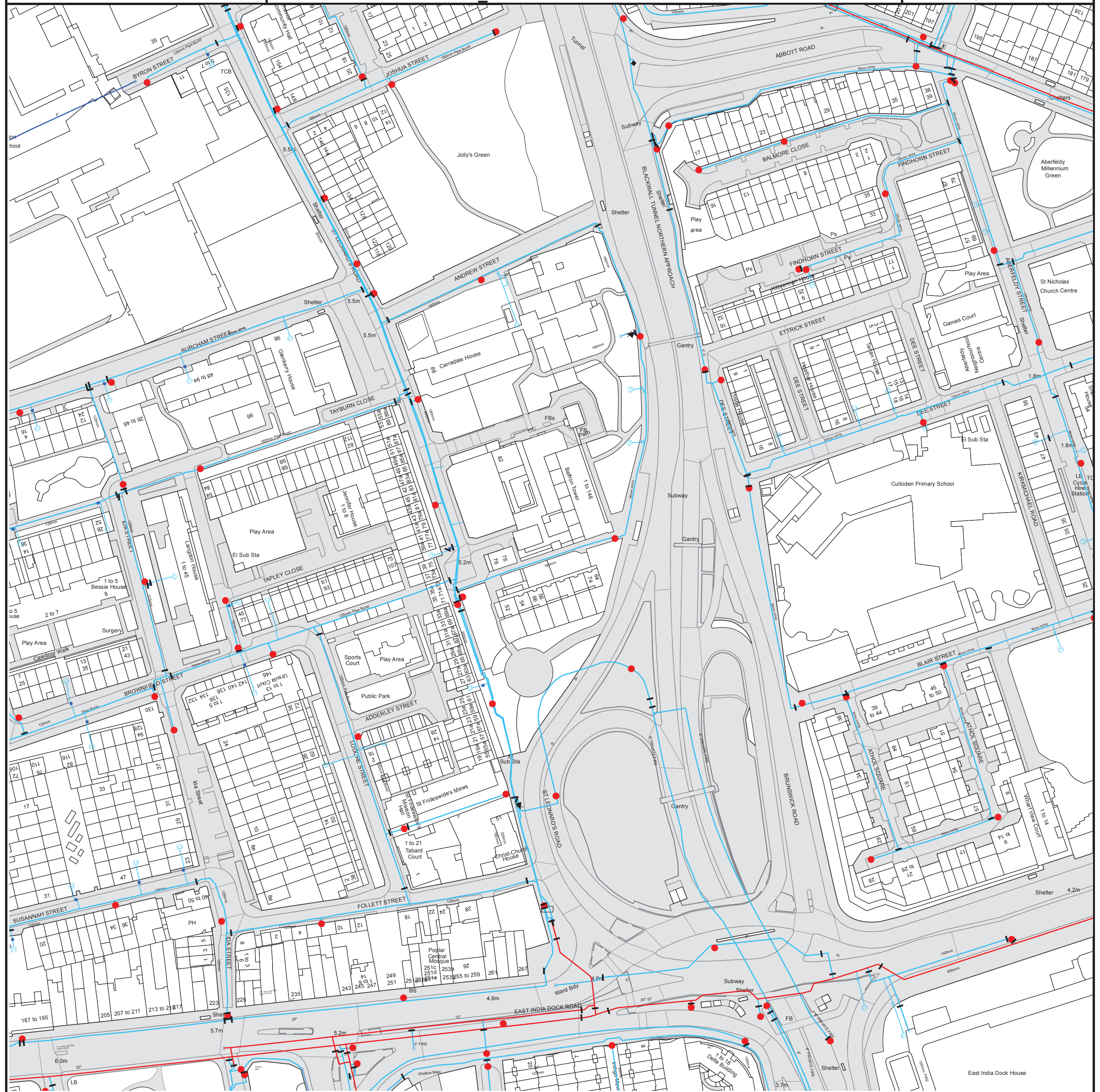
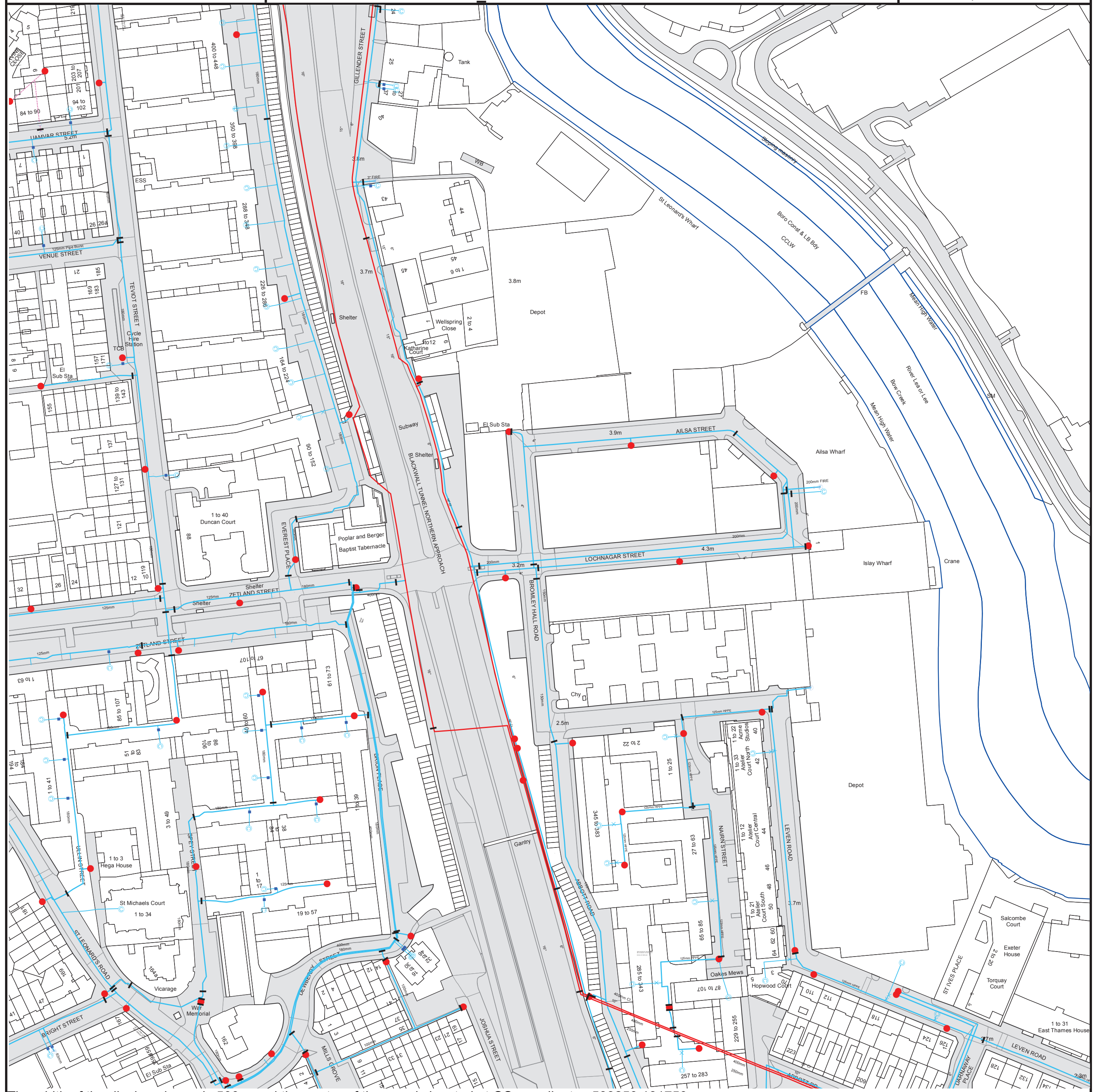
Asset Location Search Water Map - ALS/ALS Standard/2020_4292429 | TQ3881SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 538250,181250

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.

Asset Location Search Water Map - ALS/ALS Standard/2020_4292429 | **TQ3881NW**



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 538250,181750

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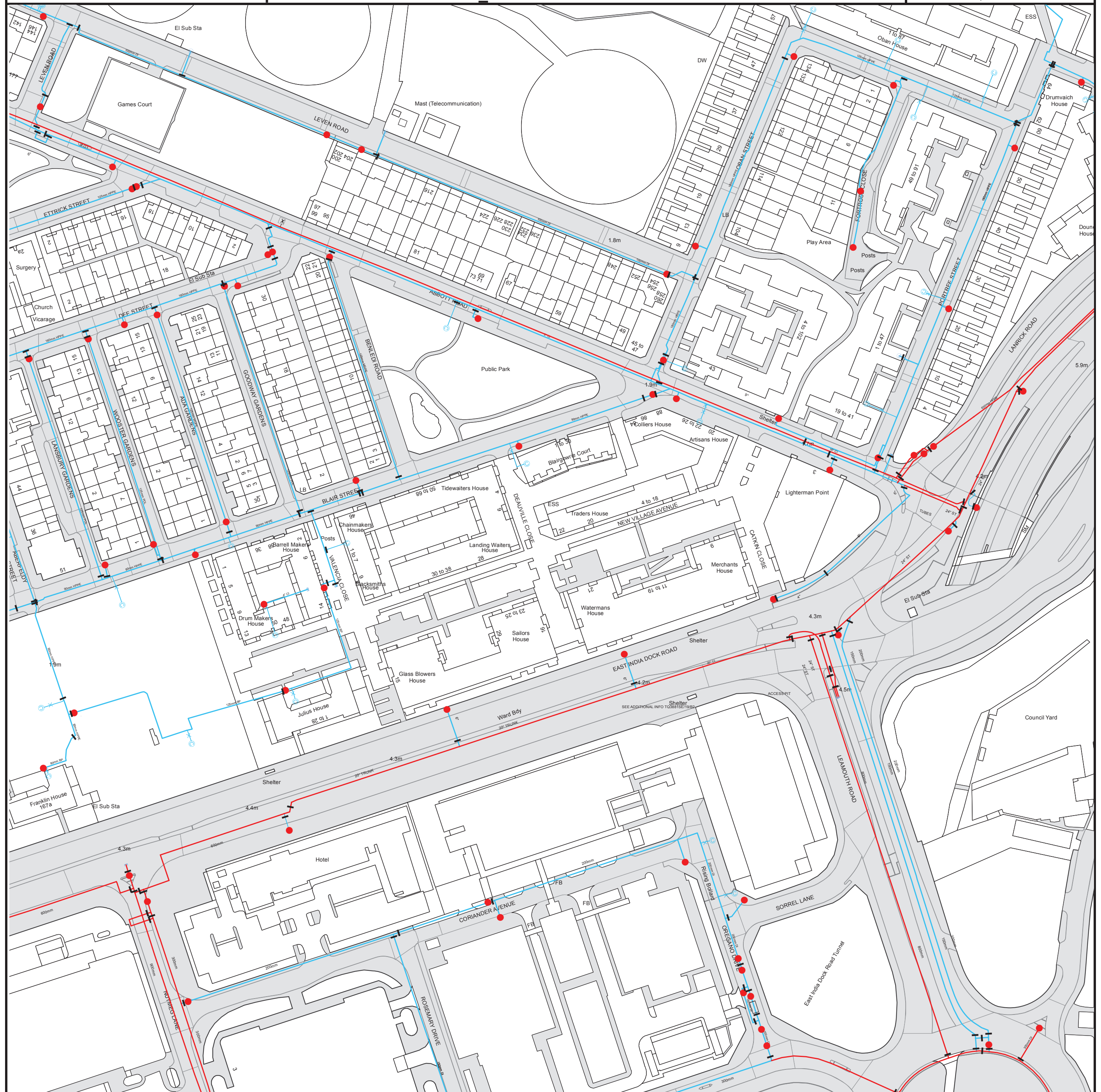
Asset Location Search Water Map - ALS/ALS Standard/2020_4292429 | **TQ3881SE**



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 538750,181250

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ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

4"

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

16"

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.

3" SUPPLY

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

3" FIRE

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

3" METERED

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

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.

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 14 days from due 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. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL`s terms and conditions shall apply.
6. 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'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. 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 not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

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 0121 345 1000 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**	**Cheque**
Call **0845 070 9148** quoting your invoice number starting CBA or ADS / OSS	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	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

Appendix C – Drainage Strategy Drawings and Calculations

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.286	0.286	1.4	91.5	O K
30 min Summer	9.374	0.374	1.4	119.5	O K
60 min Summer	9.463	0.463	1.4	148.2	O K
120 min Summer	9.551	0.551	1.4	176.3	O K
180 min Summer	9.598	0.598	1.4	191.3	O K
240 min Summer	9.627	0.627	1.4	200.6	O K
360 min Summer	9.664	0.664	1.4	212.3	O K
480 min Summer	9.685	0.685	1.4	219.3	O K
600 min Summer	9.698	0.698	1.4	223.5	O K
720 min Summer	9.705	0.705	1.4	225.7	Flood Risk
960 min Summer	9.708	0.708	1.4	226.7	Flood Risk
1440 min Summer	9.692	0.692	1.4	221.4	O K
2160 min Summer	9.660	0.660	1.4	211.2	O K
2880 min Summer	9.629	0.629	1.4	201.1	O K
4320 min Summer	9.568	0.568	1.4	181.6	O K
5760 min Summer	9.504	0.504	1.4	161.2	O K
7200 min Summer	9.440	0.440	1.4	140.8	O K
8640 min Summer	9.385	0.385	1.4	123.3	O K
10080 min Summer	9.337	0.337	1.4	107.9	O K
15 min Winter	9.320	0.320	1.4	102.5	O K
30 min Winter	9.419	0.419	1.4	134.1	O K
60 min Winter	9.520	0.520	1.4	166.4	O K
120 min Winter	9.619	0.619	1.4	198.2	O K
180 min Winter	9.673	0.673	1.4	215.2	O K
240 min Winter	9.706	0.706	1.4	226.0	Flood Risk
360 min Winter	9.749	0.749	1.4	239.8	Flood Risk
480 min Winter	9.776	0.776	1.4	248.3	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	85.6	19
30 min Summer	90.705	0.0	107.0	34
60 min Summer	56.713	0.0	148.6	64
120 min Summer	34.246	0.0	178.2	124
180 min Summer	25.149	0.0	194.4	184
240 min Summer	20.078	0.0	204.0	242
360 min Summer	14.585	0.0	211.9	362
480 min Summer	11.622	0.0	211.8	482
600 min Summer	9.738	0.0	210.3	602
720 min Summer	8.424	0.0	208.3	722
960 min Summer	6.697	0.0	203.9	960
1440 min Summer	4.839	0.0	195.0	1342
2160 min Summer	3.490	0.0	333.1	1704
2880 min Summer	2.766	0.0	350.3	2076
4320 min Summer	1.989	0.0	357.5	2900
5760 min Summer	1.573	0.0	403.6	3744
7200 min Summer	1.311	0.0	420.2	4464
8640 min Summer	1.129	0.0	433.9	5192
10080 min Summer	0.994	0.0	445.1	5952
15 min Winter	138.153	0.0	94.8	19
30 min Winter	90.705	0.0	112.5	34
60 min Winter	56.713	0.0	165.9	64
120 min Winter	34.246	0.0	197.3	122
180 min Winter	25.149	0.0	210.9	180
240 min Winter	20.078	0.0	214.7	240
360 min Winter	14.585	0.0	214.5	358
480 min Winter	11.622	0.0	212.9	474

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.793	0.793	1.4	253.7	Flood Risk
720 min Winter	9.803	0.803	1.4	256.9	Flood Risk
960 min Winter	9.811	0.811	1.4	259.6	Flood Risk
1440 min Winter	9.801	0.801	1.4	256.3	Flood Risk
2160 min Winter	9.760	0.760	1.4	243.1	Flood Risk
2880 min Winter	9.721	0.721	1.4	230.8	Flood Risk
4320 min Winter	9.638	0.638	1.4	204.3	O K
5760 min Winter	9.553	0.553	1.4	176.8	O K
7200 min Winter	9.452	0.452	1.4	144.7	O K
8640 min Winter	9.368	0.368	1.4	117.8	O K
10080 min Winter	9.298	0.298	1.4	95.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	211.1	590
720 min Winter	8.424	0.0	209.3	706
960 min Winter	6.697	0.0	205.9	932
1440 min Winter	4.839	0.0	200.0	1370
2160 min Winter	3.490	0.0	371.8	1776
2880 min Winter	2.766	0.0	387.9	2216
4320 min Winter	1.989	0.0	370.5	3152
5760 min Winter	1.573	0.0	452.0	4088
7200 min Winter	1.311	0.0	470.7	4832
8640 min Winter	1.129	0.0	486.1	5536
10080 min Winter	0.994	0.0	498.9	6256

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.357

Time From:	(mins) To:	Area (ha)
0	4	0.357

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	320.0	1.000	320.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0058-1500-1000-1500
Design Head (m)	1.000
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.5	Kick-Flo®	0.515	1.1
Flush-Flo™	0.253	1.4	Mean Flow over Head Range	-	1.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.2	0.800	1.4	2.000	2.0	4.000	2.8	7.000	3.7
0.200	1.4	1.000	1.5	2.200	2.1	4.500	3.0	7.500	3.8
0.300	1.4	1.200	1.6	2.400	2.2	5.000	3.1	8.000	3.9
0.400	1.3	1.400	1.7	2.600	2.3	5.500	3.3	8.500	4.0
0.500	1.2	1.600	1.9	3.000	2.5	6.000	3.4	9.000	4.1
0.600	1.2	1.800	2.0	3.500	2.7	6.500	3.5	9.500	4.2

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.329	0.329	0.8	32.3	O K
30 min Summer	9.429	0.429	0.8	42.1	O K
60 min Summer	9.528	0.528	0.8	51.7	O K
120 min Summer	9.618	0.618	0.8	60.5	O K
180 min Summer	9.660	0.660	0.8	64.7	O K
240 min Summer	9.682	0.682	0.8	66.8	O K
360 min Summer	9.701	0.701	0.9	68.7	Flood Risk
480 min Summer	9.703	0.703	0.9	68.9	Flood Risk
600 min Summer	9.696	0.696	0.8	68.2	O K
720 min Summer	9.687	0.687	0.8	67.3	O K
960 min Summer	9.667	0.667	0.8	65.4	O K
1440 min Summer	9.628	0.628	0.8	61.5	O K
2160 min Summer	9.571	0.571	0.8	56.0	O K
2880 min Summer	9.519	0.519	0.8	50.9	O K
4320 min Summer	9.414	0.414	0.8	40.5	O K
5760 min Summer	9.308	0.308	0.8	30.2	O K
7200 min Summer	9.233	0.233	0.8	22.9	O K
8640 min Summer	9.178	0.178	0.8	17.4	O K
10080 min Summer	9.139	0.139	0.8	13.6	O K
15 min Winter	9.369	0.369	0.8	36.2	O K
30 min Winter	9.482	0.482	0.8	47.2	O K
60 min Winter	9.593	0.593	0.8	58.2	O K
120 min Winter	9.696	0.696	0.8	68.2	O K
180 min Winter	9.746	0.746	0.9	73.1	Flood Risk
240 min Winter	9.773	0.773	0.9	75.8	Flood Risk
360 min Winter	9.800	0.800	0.9	78.4	Flood Risk
480 min Winter	9.808	0.808	0.9	79.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	32.4	19
30 min Summer	90.705	0.0	42.5	34
60 min Summer	56.713	0.0	53.8	64
120 min Summer	34.246	0.0	65.0	122
180 min Summer	25.149	0.0	71.6	182
240 min Summer	20.078	0.0	76.2	242
360 min Summer	14.585	0.0	83.0	362
480 min Summer	11.622	0.0	88.2	480
600 min Summer	9.738	0.0	92.3	594
720 min Summer	8.424	0.0	95.8	640
960 min Summer	6.697	0.0	101.4	760
1440 min Summer	4.839	0.0	109.5	1022
2160 min Summer	3.490	0.0	119.5	1432
2880 min Summer	2.766	0.0	126.3	1848
4320 min Summer	1.989	0.0	136.2	2680
5760 min Summer	1.573	0.0	143.8	3352
7200 min Summer	1.311	0.0	149.7	4040
8640 min Summer	1.129	0.0	154.7	4752
10080 min Summer	0.994	0.0	158.8	5352
15 min Winter	138.153	0.0	36.3	19
30 min Winter	90.705	0.0	47.5	33
60 min Winter	56.713	0.0	60.3	62
120 min Winter	34.246	0.0	72.8	122
180 min Winter	25.149	0.0	80.2	180
240 min Winter	20.078	0.0	85.3	238
360 min Winter	14.585	0.0	92.9	352
480 min Winter	11.622	0.0	98.7	466

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.805	0.805	0.9	78.9	Flood Risk
720 min Winter	9.797	0.797	0.9	78.1	Flood Risk
960 min Winter	9.770	0.770	0.9	75.4	Flood Risk
1440 min Winter	9.721	0.721	0.9	70.6	Flood Risk
2160 min Winter	9.642	0.642	0.8	62.9	O K
2880 min Winter	9.565	0.565	0.8	55.4	O K
4320 min Winter	9.403	0.403	0.8	39.5	O K
5760 min Winter	9.253	0.253	0.8	24.8	O K
7200 min Winter	9.162	0.162	0.8	15.8	O K
8640 min Winter	9.109	0.109	0.8	10.7	O K
10080 min Winter	9.080	0.080	0.7	7.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	103.3	576
720 min Winter	8.424	0.0	107.2	684
960 min Winter	6.697	0.0	113.4	802
1440 min Winter	4.839	0.0	121.5	1094
2160 min Winter	3.490	0.0	133.9	1556
2880 min Winter	2.766	0.0	141.4	2016
4320 min Winter	1.989	0.0	152.5	2892
5760 min Winter	1.573	0.0	161.1	3512
7200 min Winter	1.311	0.0	167.7	4112
8640 min Winter	1.129	0.0	173.2	4752
10080 min Winter	0.994	0.0	178.0	5344

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.127

Time From: (mins)	To:	Area (ha)
0	4	0.127

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	98.0	1.000	98.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0047-1000-1000-1000
Design Head (m)	1.000
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	47
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.0	Kick-Flo®	0.415	0.7
Flush-Flo™	0.205	0.8	Mean Flow over Head Range	-	0.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.8	0.800	0.9	2.000	1.4	4.000	1.9	7.000	2.4
0.200	0.8	1.000	1.0	2.200	1.4	4.500	2.0	7.500	2.5
0.300	0.8	1.200	1.1	2.400	1.5	5.000	2.1	8.000	2.6
0.400	0.7	1.400	1.2	2.600	1.5	5.500	2.2	8.500	2.7
0.500	0.7	1.600	1.2	3.000	1.6	6.000	2.3	9.000	2.7
0.600	0.8	1.800	1.3	3.500	1.8	6.500	2.3	9.500	2.8

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.315	0.315	1.4	56.7	O K
30 min Summer	9.411	0.411	1.4	73.9	O K
60 min Summer	9.507	0.507	1.4	91.2	O K
120 min Summer	9.596	0.596	1.4	107.4	O K
180 min Summer	9.640	0.640	1.4	115.3	O K
240 min Summer	9.665	0.665	1.4	119.6	O K
360 min Summer	9.689	0.689	1.4	124.1	O K
480 min Summer	9.698	0.698	1.4	125.6	O K
600 min Summer	9.697	0.697	1.4	125.4	O K
720 min Summer	9.690	0.690	1.4	124.2	O K
960 min Summer	9.673	0.673	1.4	121.1	O K
1440 min Summer	9.637	0.637	1.4	114.7	O K
2160 min Summer	9.584	0.584	1.4	105.2	O K
2880 min Summer	9.531	0.531	1.4	95.6	O K
4320 min Summer	9.421	0.421	1.4	75.7	O K
5760 min Summer	9.333	0.333	1.4	59.9	O K
7200 min Summer	9.263	0.263	1.4	47.4	O K
8640 min Summer	9.210	0.210	1.4	37.8	O K
10080 min Summer	9.170	0.170	1.3	30.6	O K
15 min Winter	9.354	0.354	1.4	63.6	O K
30 min Winter	9.461	0.461	1.4	83.0	O K
60 min Winter	9.570	0.570	1.4	102.6	O K
120 min Winter	9.672	0.672	1.4	120.9	O K
180 min Winter	9.723	0.723	1.4	130.1	Flood Risk
240 min Winter	9.752	0.752	1.4	135.3	Flood Risk
360 min Winter	9.783	0.783	1.4	141.0	Flood Risk
480 min Winter	9.797	0.797	1.4	143.4	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	56.3	19
30 min Summer	90.705	0.0	73.8	34
60 min Summer	56.713	0.0	94.2	64
120 min Summer	34.246	0.0	113.7	124
180 min Summer	25.149	0.0	125.2	182
240 min Summer	20.078	0.0	133.3	242
360 min Summer	14.585	0.0	145.1	362
480 min Summer	11.622	0.0	154.1	482
600 min Summer	9.738	0.0	161.3	600
720 min Summer	8.424	0.0	167.2	716
960 min Summer	6.697	0.0	176.7	818
1440 min Summer	4.839	0.0	188.6	1070
2160 min Summer	3.490	0.0	209.7	1476
2880 min Summer	2.766	0.0	221.5	1904
4320 min Summer	1.989	0.0	238.8	2640
5760 min Summer	1.573	0.0	252.4	3400
7200 min Summer	1.311	0.0	262.8	4104
8640 min Summer	1.129	0.0	271.4	4760
10080 min Summer	0.994	0.0	278.6	5448
15 min Winter	138.153	0.0	63.1	19
30 min Winter	90.705	0.0	82.5	33
60 min Winter	56.713	0.0	105.5	62
120 min Winter	34.246	0.0	127.3	122
180 min Winter	25.149	0.0	140.2	180
240 min Winter	20.078	0.0	149.2	238
360 min Winter	14.585	0.0	162.4	354
480 min Winter	11.622	0.0	172.3	468

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.800	0.800	1.4	144.0	Flood Risk
720 min Winter	9.797	0.797	1.4	143.4	Flood Risk
960 min Winter	9.779	0.779	1.4	140.2	Flood Risk
1440 min Winter	9.732	0.732	1.4	131.8	Flood Risk
2160 min Winter	9.662	0.662	1.4	119.2	O K
2880 min Winter	9.589	0.589	1.4	106.0	O K
4320 min Winter	9.422	0.422	1.4	75.9	O K
5760 min Winter	9.292	0.292	1.4	52.6	O K
7200 min Winter	9.202	0.202	1.4	36.3	O K
8640 min Winter	9.144	0.144	1.3	25.9	O K
10080 min Winter	9.107	0.107	1.2	19.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	180.2	582
720 min Winter	8.424	0.0	186.6	692
960 min Winter	6.697	0.0	196.4	904
1440 min Winter	4.839	0.0	201.0	1126
2160 min Winter	3.490	0.0	234.9	1600
2880 min Winter	2.766	0.0	248.0	2052
4320 min Winter	1.989	0.0	267.5	2852
5760 min Winter	1.573	0.0	282.7	3568
7200 min Winter	1.311	0.0	294.3	4184
8640 min Winter	1.129	0.0	304.0	4840
10080 min Winter	0.994	0.0	312.2	5448

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.223

Time (mins) From:	To:	Area (ha)
0	4	0.223

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	180.0	1.000	180.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0058-1500-1000-1500
Design Head (m)	1.000
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.5	Kick-Flo®	0.515	1.1
Flush-Flo™	0.253	1.4	Mean Flow over Head Range	-	1.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.2	0.800	1.4	2.000	2.0	4.000	2.8	7.000	3.7
0.200	1.4	1.000	1.5	2.200	2.1	4.500	3.0	7.500	3.8
0.300	1.4	1.200	1.6	2.400	2.2	5.000	3.1	8.000	3.9
0.400	1.3	1.400	1.7	2.600	2.3	5.500	3.3	8.500	4.0
0.500	1.2	1.600	1.9	3.000	2.5	6.000	3.4	9.000	4.1
0.600	1.2	1.800	2.0	3.500	2.7	6.500	3.5	9.500	4.2

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.298	0.298	1.1	38.8	O K
30 min Summer	9.388	0.388	1.1	50.4	O K
60 min Summer	9.477	0.477	1.1	62.1	O K
120 min Summer	9.558	0.558	1.1	72.6	O K
180 min Summer	9.596	0.596	1.1	77.5	O K
240 min Summer	9.615	0.615	1.1	79.9	O K
360 min Summer	9.630	0.630	1.1	81.9	O K
480 min Summer	9.630	0.630	1.1	81.9	O K
600 min Summer	9.622	0.622	1.1	80.9	O K
720 min Summer	9.612	0.612	1.1	79.6	O K
960 min Summer	9.593	0.593	1.1	77.0	O K
1440 min Summer	9.552	0.552	1.1	71.8	O K
2160 min Summer	9.492	0.492	1.1	63.9	O K
2880 min Summer	9.426	0.426	1.1	55.3	O K
4320 min Summer	9.319	0.319	1.1	41.4	O K
5760 min Summer	9.237	0.237	1.1	30.9	O K
7200 min Summer	9.180	0.180	1.1	23.4	O K
8640 min Summer	9.139	0.139	1.1	18.1	O K
10080 min Summer	9.111	0.111	1.0	14.5	O K
15 min Winter	9.335	0.335	1.1	43.5	O K
30 min Winter	9.436	0.436	1.1	56.7	O K
60 min Winter	9.537	0.537	1.1	69.9	O K
120 min Winter	9.630	0.630	1.1	81.8	O K
180 min Winter	9.674	0.674	1.1	87.6	O K
240 min Winter	9.697	0.697	1.1	90.6	O K
360 min Winter	9.718	0.718	1.1	93.4	Flood Risk
480 min Winter	9.723	0.723	1.1	94.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	38.9	19
30 min Summer	90.705	0.0	51.1	34
60 min Summer	56.713	0.0	64.7	64
120 min Summer	34.246	0.0	78.2	122
180 min Summer	25.149	0.0	86.1	182
240 min Summer	20.078	0.0	91.7	242
360 min Summer	14.585	0.0	99.9	362
480 min Summer	11.622	0.0	106.1	480
600 min Summer	9.738	0.0	111.1	582
720 min Summer	8.424	0.0	115.3	628
960 min Summer	6.697	0.0	122.2	752
1440 min Summer	4.839	0.0	132.1	1012
2160 min Summer	3.490	0.0	144.0	1432
2880 min Summer	2.766	0.0	152.1	1816
4320 min Summer	1.989	0.0	163.9	2552
5760 min Summer	1.573	0.0	173.2	3280
7200 min Summer	1.311	0.0	180.3	3960
8640 min Summer	1.129	0.0	186.3	4592
10080 min Summer	0.994	0.0	191.3	5336
15 min Winter	138.153	0.0	43.6	19
30 min Winter	90.705	0.0	57.3	33
60 min Winter	56.713	0.0	72.5	62
120 min Winter	34.246	0.0	87.6	122
180 min Winter	25.149	0.0	96.5	180
240 min Winter	20.078	0.0	102.7	238
360 min Winter	14.585	0.0	111.9	352
480 min Winter	11.622	0.0	118.8	466

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.719	0.719	1.1	93.5	Flood Risk
720 min Winter	9.709	0.709	1.1	92.2	Flood Risk
960 min Winter	9.682	0.682	1.1	88.6	O K
1440 min Winter	9.631	0.631	1.1	82.0	O K
2160 min Winter	9.548	0.548	1.1	71.2	O K
2880 min Winter	9.452	0.452	1.1	58.8	O K
4320 min Winter	9.288	0.288	1.1	37.4	O K
5760 min Winter	9.182	0.182	1.1	23.6	O K
7200 min Winter	9.120	0.120	1.1	15.6	O K
8640 min Winter	9.086	0.086	1.0	11.2	O K
10080 min Winter	9.071	0.071	0.9	9.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	124.4	576
720 min Winter	8.424	0.0	129.1	680
960 min Winter	6.697	0.0	136.7	788
1440 min Winter	4.839	0.0	147.5	1084
2160 min Winter	3.490	0.0	161.3	1556
2880 min Winter	2.766	0.0	170.4	1988
4320 min Winter	1.989	0.0	183.7	2684
5760 min Winter	1.573	0.0	194.0	3352
7200 min Winter	1.311	0.0	202.0	3968
8640 min Winter	1.129	0.0	208.7	4584
10080 min Winter	0.994	0.0	214.3	5240

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.153

Time From:	(mins) To:	Area (ha)
0	4	0.153

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	130.0	1.000	130.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1300-1000-1300
Design Head (m)	1.000
Design Flow (l/s)	1.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	53
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.3	Kick-Flo®	0.477	0.9
Flush-Flo™	0.236	1.1	Mean Flow over Head Range	-	1.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.0	0.800	1.2	2.000	1.8	4.000	2.4	7.000	3.2
0.200	1.1	1.000	1.3	2.200	1.9	4.500	2.6	7.500	3.3
0.300	1.1	1.200	1.4	2.400	1.9	5.000	2.7	8.000	3.4
0.400	1.1	1.400	1.5	2.600	2.0	5.500	2.8	8.500	3.5
0.500	1.0	1.600	1.6	3.000	2.1	6.000	2.9	9.000	3.6
0.600	1.0	1.800	1.7	3.500	2.3	6.500	3.1	9.500	3.6

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.320	0.320	0.8	32.0	O K
30 min Summer	9.417	0.417	0.8	41.7	O K
60 min Summer	9.513	0.513	0.8	51.3	O K
120 min Summer	9.601	0.601	0.8	60.1	O K
180 min Summer	9.642	0.642	0.8	64.2	O K
240 min Summer	9.663	0.663	0.8	66.3	O K
360 min Summer	9.682	0.682	0.8	68.2	O K
480 min Summer	9.684	0.684	0.8	68.4	O K
600 min Summer	9.677	0.677	0.8	67.7	O K
720 min Summer	9.668	0.668	0.8	66.8	O K
960 min Summer	9.649	0.649	0.8	64.9	O K
1440 min Summer	9.611	0.611	0.8	61.1	O K
2160 min Summer	9.556	0.556	0.8	55.6	O K
2880 min Summer	9.504	0.504	0.8	50.4	O K
4320 min Summer	9.396	0.396	0.8	39.6	O K
5760 min Summer	9.298	0.298	0.8	29.8	O K
7200 min Summer	9.225	0.225	0.8	22.5	O K
8640 min Summer	9.172	0.172	0.8	17.2	O K
10080 min Summer	9.135	0.135	0.8	13.5	O K
15 min Winter	9.359	0.359	0.8	35.9	O K
30 min Winter	9.469	0.469	0.8	46.9	O K
60 min Winter	9.577	0.577	0.8	57.7	O K
120 min Winter	9.677	0.677	0.8	67.7	O K
180 min Winter	9.726	0.726	0.9	72.6	Flood Risk
240 min Winter	9.752	0.752	0.9	75.2	Flood Risk
360 min Winter	9.778	0.778	0.9	77.8	Flood Risk
480 min Winter	9.786	0.786	0.9	78.6	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	32.1	19
30 min Summer	90.705	0.0	42.2	34
60 min Summer	56.713	0.0	53.4	64
120 min Summer	34.246	0.0	64.4	122
180 min Summer	25.149	0.0	71.0	182
240 min Summer	20.078	0.0	75.6	242
360 min Summer	14.585	0.0	82.3	362
480 min Summer	11.622	0.0	87.4	480
600 min Summer	9.738	0.0	91.6	594
720 min Summer	8.424	0.0	95.0	642
960 min Summer	6.697	0.0	100.6	760
1440 min Summer	4.839	0.0	108.6	1024
2160 min Summer	3.490	0.0	118.6	1444
2880 min Summer	2.766	0.0	125.3	1848
4320 min Summer	1.989	0.0	135.1	2640
5760 min Summer	1.573	0.0	142.7	3344
7200 min Summer	1.311	0.0	148.5	4040
8640 min Summer	1.129	0.0	153.4	4680
10080 min Summer	0.994	0.0	157.6	5352
15 min Winter	138.153	0.0	36.0	19
30 min Winter	90.705	0.0	47.1	33
60 min Winter	56.713	0.0	59.8	62
120 min Winter	34.246	0.0	72.2	122
180 min Winter	25.149	0.0	79.5	180
240 min Winter	20.078	0.0	84.6	238
360 min Winter	14.585	0.0	92.2	352
480 min Winter	11.622	0.0	97.9	466

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.783	0.783	0.9	78.3	Flood Risk
720 min Winter	9.775	0.775	0.9	77.5	Flood Risk
960 min Winter	9.749	0.749	0.9	74.9	Flood Risk
1440 min Winter	9.701	0.701	0.9	70.1	Flood Risk
2160 min Winter	9.624	0.624	0.8	62.4	O K
2880 min Winter	9.548	0.548	0.8	54.8	O K
4320 min Winter	9.384	0.384	0.8	38.4	O K
5760 min Winter	9.244	0.244	0.8	24.4	O K
7200 min Winter	9.156	0.156	0.8	15.6	O K
8640 min Winter	9.106	0.106	0.8	10.6	O K
10080 min Winter	9.078	0.078	0.7	7.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	102.5	576
720 min Winter	8.424	0.0	106.3	684
960 min Winter	6.697	0.0	112.5	810
1440 min Winter	4.839	0.0	120.6	1094
2160 min Winter	3.490	0.0	132.8	1556
2880 min Winter	2.766	0.0	140.3	2016
4320 min Winter	1.989	0.0	151.3	2852
5760 min Winter	1.573	0.0	159.8	3512
7200 min Winter	1.311	0.0	166.4	4112
8640 min Winter	1.129	0.0	171.9	4752
10080 min Winter	0.994	0.0	176.5	5344

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.126

Time (mins) From:	To:	Area (ha)
0	4	0.126

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	100.0	1.000	100.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0047-1000-1000-1000
Design Head (m)	1.000
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	47
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.0	Kick-Flo®	0.415	0.7
Flush-Flo™	0.205	0.8	Mean Flow over Head Range	-	0.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.8	0.800	0.9	2.000	1.4	4.000	1.9	7.000	2.4
0.200	0.8	1.000	1.0	2.200	1.4	4.500	2.0	7.500	2.5
0.300	0.8	1.200	1.1	2.400	1.5	5.000	2.1	8.000	2.6
0.400	0.7	1.400	1.2	2.600	1.5	5.500	2.2	8.500	2.7
0.500	0.7	1.600	1.2	3.000	1.6	6.000	2.3	9.000	2.7
0.600	0.8	1.800	1.3	3.500	1.8	6.500	2.3	9.500	2.8

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.384	0.384	0.8	7.7	O K
30 min Summer	9.488	0.488	0.8	9.8	O K
60 min Summer	9.566	0.566	0.8	11.3	O K
120 min Summer	9.592	0.592	0.8	11.8	O K
180 min Summer	9.579	0.579	0.8	11.6	O K
240 min Summer	9.559	0.559	0.8	11.2	O K
360 min Summer	9.517	0.517	0.8	10.3	O K
480 min Summer	9.476	0.476	0.8	9.5	O K
600 min Summer	9.434	0.434	0.8	8.7	O K
720 min Summer	9.387	0.387	0.8	7.7	O K
960 min Summer	9.306	0.306	0.8	6.1	O K
1440 min Summer	9.192	0.192	0.8	3.8	O K
2160 min Summer	9.105	0.105	0.8	2.1	O K
2880 min Summer	9.071	0.071	0.7	1.4	O K
4320 min Summer	9.050	0.050	0.5	1.0	O K
5760 min Summer	9.040	0.040	0.4	0.8	O K
7200 min Summer	9.035	0.035	0.3	0.7	O K
8640 min Summer	9.032	0.032	0.3	0.6	O K
10080 min Summer	9.030	0.030	0.3	0.6	O K
15 min Winter	9.434	0.434	0.8	8.7	O K
30 min Winter	9.552	0.552	0.8	11.0	O K
60 min Winter	9.644	0.644	0.8	12.9	O K
120 min Winter	9.684	0.684	0.8	13.7	O K
180 min Winter	9.667	0.667	0.8	13.3	O K
240 min Winter	9.642	0.642	0.8	12.8	O K
360 min Winter	9.584	0.584	0.8	11.7	O K
480 min Winter	9.525	0.525	0.8	10.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	8.3	18
30 min Summer	90.705	0.0	10.9	33
60 min Summer	56.713	0.0	13.6	62
120 min Summer	34.246	0.0	16.4	116
180 min Summer	25.149	0.0	18.1	144
240 min Summer	20.078	0.0	19.3	176
360 min Summer	14.585	0.0	21.0	246
480 min Summer	11.622	0.0	22.3	316
600 min Summer	9.738	0.0	23.4	386
720 min Summer	8.424	0.0	24.3	448
960 min Summer	6.697	0.0	25.7	568
1440 min Summer	4.839	0.0	27.9	796
2160 min Summer	3.490	0.0	30.1	1128
2880 min Summer	2.766	0.0	31.9	1472
4320 min Summer	1.989	0.0	34.4	2200
5760 min Summer	1.573	0.0	36.2	2936
7200 min Summer	1.311	0.0	37.7	3584
8640 min Summer	1.129	0.0	39.0	4368
10080 min Summer	0.994	0.0	40.1	5048
15 min Winter	138.153	0.0	9.3	18
30 min Winter	90.705	0.0	12.2	32
60 min Winter	56.713	0.0	15.2	60
120 min Winter	34.246	0.0	18.4	116
180 min Winter	25.149	0.0	20.3	162
240 min Winter	20.078	0.0	21.6	188
360 min Winter	14.585	0.0	23.5	266
480 min Winter	11.622	0.0	25.0	342

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.463	0.463	0.8	9.3	O K
720 min Winter	9.391	0.391	0.8	7.8	O K
960 min Winter	9.268	0.268	0.8	5.4	O K
1440 min Winter	9.129	0.129	0.8	2.6	O K
2160 min Winter	9.066	0.066	0.7	1.3	O K
2880 min Winter	9.050	0.050	0.5	1.0	O K
4320 min Winter	9.038	0.038	0.4	0.8	O K
5760 min Winter	9.032	0.032	0.3	0.6	O K
7200 min Winter	9.029	0.029	0.3	0.6	O K
8640 min Winter	9.026	0.026	0.2	0.5	O K
10080 min Winter	9.024	0.024	0.2	0.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	26.2	416
720 min Winter	8.424	0.0	27.2	484
960 min Winter	6.697	0.0	28.8	598
1440 min Winter	4.839	0.0	31.2	808
2160 min Winter	3.490	0.0	33.8	1120
2880 min Winter	2.766	0.0	35.7	1472
4320 min Winter	1.989	0.0	38.5	2164
5760 min Winter	1.573	0.0	40.6	2936
7200 min Winter	1.311	0.0	42.3	3640
8640 min Winter	1.129	0.0	43.7	4392
10080 min Winter	0.994	0.0	44.9	5016

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.032

Time From:	(mins) To:	Area (ha)
0	4	0.032

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	20.0	1.000	20.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0047-1000-1000-1000
Design Head (m)	1.000
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	47
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.0	Kick-Flo®	0.415	0.7
Flush-Flo™	0.205	0.8	Mean Flow over Head Range	-	0.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.8	0.800	0.9	2.000	1.4	4.000	1.9	7.000	2.4
0.200	0.8	1.000	1.0	2.200	1.4	4.500	2.0	7.500	2.5
0.300	0.8	1.200	1.1	2.400	1.5	5.000	2.1	8.000	2.6
0.400	0.7	1.400	1.2	2.600	1.5	5.500	2.2	8.500	2.7
0.500	0.7	1.600	1.2	3.000	1.6	6.000	2.3	9.000	2.7
0.600	0.8	1.800	1.3	3.500	1.8	6.500	2.3	9.500	2.8

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.221	0.221	1.4	154.5	O K
30 min Summer	9.289	0.289	1.4	202.3	O K
60 min Summer	9.359	0.359	1.4	251.6	O K
120 min Summer	9.430	0.430	1.4	301.0	O K
180 min Summer	9.470	0.470	1.4	328.8	O K
240 min Summer	9.496	0.496	1.4	347.2	O K
360 min Summer	9.533	0.533	1.4	372.8	O K
480 min Summer	9.558	0.558	1.4	390.5	O K
600 min Summer	9.576	0.576	1.4	403.2	O K
720 min Summer	9.590	0.590	1.4	412.7	O K
960 min Summer	9.608	0.608	1.4	425.4	O K
1440 min Summer	9.624	0.624	1.4	436.5	O K
2160 min Summer	9.623	0.623	1.4	436.0	O K
2880 min Summer	9.609	0.609	1.4	426.0	O K
4320 min Summer	9.578	0.578	1.4	404.3	O K
5760 min Summer	9.546	0.546	1.4	382.5	O K
7200 min Summer	9.515	0.515	1.4	360.2	O K
8640 min Summer	9.481	0.481	1.4	336.5	O K
10080 min Summer	9.450	0.450	1.4	314.8	O K
15 min Winter	9.247	0.247	1.4	173.1	O K
30 min Winter	9.324	0.324	1.4	226.7	O K
60 min Winter	9.403	0.403	1.4	282.1	O K
120 min Winter	9.483	0.483	1.4	338.0	O K
180 min Winter	9.528	0.528	1.4	369.7	O K
240 min Winter	9.558	0.558	1.4	390.7	O K
360 min Winter	9.600	0.600	1.4	419.8	O K
480 min Winter	9.629	0.629	1.4	440.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	108.0	19
30 min Summer	90.705	0.0	114.9	34
60 min Summer	56.713	0.0	218.1	64
120 min Summer	34.246	0.0	227.4	124
180 min Summer	25.149	0.0	225.6	184
240 min Summer	20.078	0.0	222.1	244
360 min Summer	14.585	0.0	213.9	364
480 min Summer	11.622	0.0	207.7	484
600 min Summer	9.738	0.0	203.0	602
720 min Summer	8.424	0.0	199.3	722
960 min Summer	6.697	0.0	193.6	962
1440 min Summer	4.839	0.0	186.3	1442
2160 min Summer	3.490	0.0	400.6	2160
2880 min Summer	2.766	0.0	385.5	2736
4320 min Summer	1.989	0.0	355.3	3416
5760 min Summer	1.573	0.0	669.5	4160
7200 min Summer	1.311	0.0	692.6	4976
8640 min Summer	1.129	0.0	706.6	5712
10080 min Summer	0.994	0.0	700.1	6464
15 min Winter	138.153	0.0	112.0	19
30 min Winter	90.705	0.0	116.1	34
60 min Winter	56.713	0.0	226.7	64
120 min Winter	34.246	0.0	226.1	122
180 min Winter	25.149	0.0	219.0	182
240 min Winter	20.078	0.0	213.5	242
360 min Winter	14.585	0.0	206.5	360
480 min Winter	11.622	0.0	202.2	478

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.650	0.650	1.4	454.7	O K
720 min Winter	9.666	0.666	1.4	465.9	O K
960 min Winter	9.688	0.688	1.4	481.3	O K
1440 min Winter	9.709	0.709	1.4	496.5	Flood Risk
2160 min Winter	9.714	0.714	1.4	500.0	Flood Risk
2880 min Winter	9.704	0.704	1.4	492.7	Flood Risk
4320 min Winter	9.664	0.664	1.4	464.8	O K
5760 min Winter	9.627	0.627	1.4	438.8	O K
7200 min Winter	9.587	0.587	1.4	411.0	O K
8640 min Winter	9.546	0.546	1.4	381.9	O K
10080 min Winter	9.498	0.498	1.4	348.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	199.3	596
720 min Winter	8.424	0.0	197.4	714
960 min Winter	6.697	0.0	195.6	946
1440 min Winter	4.839	0.0	195.1	1412
2160 min Winter	3.490	0.0	401.6	2096
2880 min Winter	2.766	0.0	389.5	2740
4320 min Winter	1.989	0.0	368.8	3592
5760 min Winter	1.573	0.0	743.8	4440
7200 min Winter	1.311	0.0	753.6	5400
8640 min Winter	1.129	0.0	733.8	6312
10080 min Winter	0.994	0.0	719.2	7168

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.600

Time (mins) From:	To:	Area (ha)
0	4	0.600

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	700.0	1.000	700.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0058-1500-1000-1500
Design Head (m)	1.000
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.5	Kick-Flo®	0.515	1.1
Flush-Flo™	0.253	1.4	Mean Flow over Head Range	-	1.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.2	0.800	1.4	2.000	2.0	4.000	2.8	7.000	3.7
0.200	1.4	1.000	1.5	2.200	2.1	4.500	3.0	7.500	3.8
0.300	1.4	1.200	1.6	2.400	2.2	5.000	3.1	8.000	3.9
0.400	1.3	1.400	1.7	2.600	2.3	5.500	3.3	8.500	4.0
0.500	1.2	1.600	1.9	3.000	2.5	6.000	3.4	9.000	4.1
0.600	1.2	1.800	2.0	3.500	2.7	6.500	3.5	9.500	4.2

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.471	0.471	0.6	4.7	O K
30 min Summer	9.586	0.586	0.6	5.9	O K
60 min Summer	9.659	0.659	0.7	6.6	O K
120 min Summer	9.664	0.664	0.7	6.6	O K
180 min Summer	9.640	0.640	0.7	6.4	O K
240 min Summer	9.609	0.609	0.6	6.1	O K
360 min Summer	9.549	0.549	0.6	5.5	O K
480 min Summer	9.492	0.492	0.6	4.9	O K
600 min Summer	9.438	0.438	0.6	4.4	O K
720 min Summer	9.383	0.383	0.6	3.8	O K
960 min Summer	9.267	0.267	0.6	2.7	O K
1440 min Summer	9.141	0.141	0.6	1.4	O K
2160 min Summer	9.071	0.071	0.5	0.7	O K
2880 min Summer	9.053	0.053	0.4	0.5	O K
4320 min Summer	9.038	0.038	0.3	0.4	O K
5760 min Summer	9.032	0.032	0.3	0.3	O K
7200 min Summer	9.028	0.028	0.2	0.3	O K
8640 min Summer	9.026	0.026	0.2	0.3	O K
10080 min Summer	9.024	0.024	0.2	0.2	O K
15 min Winter	9.531	0.531	0.6	5.3	O K
30 min Winter	9.666	0.666	0.7	6.7	O K
60 min Winter	9.758	0.758	0.7	7.6	Flood Risk
120 min Winter	9.767	0.767	0.7	7.7	Flood Risk
180 min Winter	9.737	0.737	0.7	7.4	Flood Risk
240 min Winter	9.693	0.693	0.7	6.9	O K
360 min Winter	9.604	0.604	0.6	6.0	O K
480 min Winter	9.520	0.520	0.6	5.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	5.2	18
30 min Summer	90.705	0.0	6.8	32
60 min Summer	56.713	0.0	8.5	60
120 min Summer	34.246	0.0	10.3	98
180 min Summer	25.149	0.0	11.3	130
240 min Summer	20.078	0.0	12.0	164
360 min Summer	14.585	0.0	13.1	234
480 min Summer	11.622	0.0	13.9	302
600 min Summer	9.738	0.0	14.6	370
720 min Summer	8.424	0.0	15.2	440
960 min Summer	6.697	0.0	16.1	550
1440 min Summer	4.839	0.0	17.4	768
2160 min Summer	3.490	0.0	18.8	1104
2880 min Summer	2.766	0.0	19.9	1468
4320 min Summer	1.989	0.0	21.5	2192
5760 min Summer	1.573	0.0	22.6	2904
7200 min Summer	1.311	0.0	23.6	3664
8640 min Summer	1.129	0.0	24.4	4392
10080 min Summer	0.994	0.0	25.0	5144
15 min Winter	138.153	0.0	5.8	18
30 min Winter	90.705	0.0	7.6	32
60 min Winter	56.713	0.0	9.5	60
120 min Winter	34.246	0.0	11.5	108
180 min Winter	25.149	0.0	12.7	138
240 min Winter	20.078	0.0	13.5	178
360 min Winter	14.585	0.0	14.7	254
480 min Winter	11.622	0.0	15.6	326

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.437	0.437	0.6	4.4	O K
720 min Winter	9.337	0.337	0.6	3.4	O K
960 min Winter	9.190	0.190	0.6	1.9	O K
1440 min Winter	9.076	0.076	0.5	0.8	O K
2160 min Winter	9.048	0.048	0.4	0.5	O K
2880 min Winter	9.038	0.038	0.3	0.4	O K
4320 min Winter	9.030	0.030	0.2	0.3	O K
5760 min Winter	9.026	0.026	0.2	0.3	O K
7200 min Winter	9.023	0.023	0.2	0.2	O K
8640 min Winter	9.021	0.021	0.1	0.2	O K
10080 min Winter	9.020	0.020	0.1	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	16.4	400
720 min Winter	8.424	0.0	17.0	464
960 min Winter	6.697	0.0	18.0	562
1440 min Winter	4.839	0.0	19.5	764
2160 min Winter	3.490	0.0	21.1	1104
2880 min Winter	2.766	0.0	22.3	1460
4320 min Winter	1.989	0.0	24.1	2140
5760 min Winter	1.573	0.0	25.4	2856
7200 min Winter	1.311	0.0	26.4	3592
8640 min Winter	1.129	0.0	27.3	4392
10080 min Winter	0.994	0.0	28.1	4960

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.020

Time From:	(mins) To:	Area (ha)
0	4	0.020

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	10.0	1.000	10.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0041-8000-1000-8000
Design Head (m)	1.000
Design Flow (l/s)	0.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	41
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	0.8	Kick-Flo®	0.369	0.5
Flush-Flo™	0.184	0.6	Mean Flow over Head Range	-	0.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.6	0.800	0.7	2.000	1.1	4.000	1.5	7.000	1.9
0.200	0.6	1.000	0.8	2.200	1.1	4.500	1.6	7.500	2.0
0.300	0.6	1.200	0.9	2.400	1.2	5.000	1.6	8.000	2.0
0.400	0.5	1.400	0.9	2.600	1.2	5.500	1.7	8.500	2.1
0.500	0.6	1.600	1.0	3.000	1.3	6.000	1.8	9.000	2.2
0.600	0.6	1.800	1.0	3.500	1.4	6.500	1.9	9.500	2.2

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.378	0.378	0.1	3.8	O K
30 min Summer	9.489	0.489	0.1	4.9	O K
60 min Summer	9.594	0.594	0.2	5.9	O K
120 min Summer	9.679	0.679	0.2	6.8	O K
180 min Summer	9.710	0.710	0.2	7.1	Flood Risk
240 min Summer	9.718	0.718	0.2	7.2	Flood Risk
360 min Summer	9.709	0.709	0.2	7.1	Flood Risk
480 min Summer	9.696	0.696	0.2	7.0	O K
600 min Summer	9.681	0.681	0.2	6.8	O K
720 min Summer	9.665	0.665	0.2	6.7	O K
960 min Summer	9.634	0.634	0.2	6.3	O K
1440 min Summer	9.576	0.576	0.2	5.8	O K
2160 min Summer	9.500	0.500	0.1	5.0	O K
2880 min Summer	9.434	0.434	0.1	4.3	O K
4320 min Summer	9.328	0.328	0.1	3.3	O K
5760 min Summer	9.245	0.245	0.1	2.5	O K
7200 min Summer	9.166	0.166	0.1	1.7	O K
8640 min Summer	9.101	0.101	0.1	1.0	O K
10080 min Summer	9.066	0.066	0.1	0.7	O K
15 min Winter	9.424	0.424	0.1	4.2	O K
30 min Winter	9.550	0.550	0.2	5.5	O K
60 min Winter	9.670	0.670	0.2	6.7	O K
120 min Winter	9.771	0.771	0.2	7.7	Flood Risk
180 min Winter	9.810	0.810	0.2	8.1	Flood Risk
240 min Winter	9.824	0.824	0.2	8.2	Flood Risk
360 min Winter	9.822	0.822	0.2	8.2	Flood Risk
480 min Winter	9.803	0.803	0.2	8.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	3.9	19
30 min Summer	90.705	0.0	5.1	33
60 min Summer	56.713	0.0	6.4	62
120 min Summer	34.246	0.0	7.7	122
180 min Summer	25.149	0.0	8.5	182
240 min Summer	20.078	0.0	9.0	240
360 min Summer	14.585	0.0	9.8	322
480 min Summer	11.622	0.0	10.5	382
600 min Summer	9.738	0.0	11.0	444
720 min Summer	8.424	0.0	11.4	510
960 min Summer	6.697	0.0	12.0	648
1440 min Summer	4.839	0.0	13.1	924
2160 min Summer	3.490	0.0	14.1	1324
2880 min Summer	2.766	0.0	14.9	1728
4320 min Summer	1.989	0.0	16.1	2504
5760 min Summer	1.573	0.0	17.0	3280
7200 min Summer	1.311	0.0	17.7	4032
8640 min Summer	1.129	0.0	18.3	4584
10080 min Summer	0.994	0.0	18.8	5240
15 min Winter	138.153	0.0	4.3	19
30 min Winter	90.705	0.0	5.7	33
60 min Winter	56.713	0.0	7.1	62
120 min Winter	34.246	0.0	8.6	120
180 min Winter	25.149	0.0	9.5	178
240 min Winter	20.078	0.0	10.1	234
360 min Winter	14.585	0.0	11.0	342
480 min Winter	11.622	0.0	11.7	406

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.787	0.787	0.2	7.9	Flood Risk
720 min Winter	9.767	0.767	0.2	7.7	Flood Risk
960 min Winter	9.724	0.724	0.2	7.2	Flood Risk
1440 min Winter	9.640	0.640	0.2	6.4	O K
2160 min Winter	9.530	0.530	0.2	5.3	O K
2880 min Winter	9.437	0.437	0.1	4.4	O K
4320 min Winter	9.293	0.293	0.1	2.9	O K
5760 min Winter	9.162	0.162	0.1	1.6	O K
7200 min Winter	9.066	0.066	0.1	0.7	O K
8640 min Winter	9.042	0.042	0.1	0.4	O K
10080 min Winter	9.035	0.035	0.1	0.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	12.3	470
720 min Winter	8.424	0.0	12.7	546
960 min Winter	6.697	0.0	13.5	702
1440 min Winter	4.839	0.0	14.6	996
2160 min Winter	3.490	0.0	15.8	1428
2880 min Winter	2.766	0.0	16.7	1844
4320 min Winter	1.989	0.0	18.0	2636
5760 min Winter	1.573	0.0	19.0	3408
7200 min Winter	1.311	0.0	19.8	3888
8640 min Winter	1.129	0.0	20.5	4408
10080 min Winter	0.994	0.0	21.0	5136

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.015

Time (mins) From:	To:	Area (ha)
0	4	0.015

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	10.0	1.000	10.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0020-2000-1000-2000
Design Head (m)	1.000
Design Flow (l/s)	0.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	20
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	0.2	Kick-Flo®	0.175	0.1
Flush-Flo™	0.084	0.1	Mean Flow over Head Range	-	0.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.1	0.800	0.2	2.000	0.3	4.000	0.4	7.000	0.5
0.200	0.1	1.000	0.2	2.200	0.3	4.500	0.4	7.500	0.5
0.300	0.1	1.200	0.2	2.400	0.3	5.000	0.4	8.000	0.5
0.400	0.1	1.400	0.2	2.600	0.3	5.500	0.4	8.500	0.5
0.500	0.1	1.600	0.2	3.000	0.3	6.000	0.4	9.000	0.5
0.600	0.2	1.800	0.3	3.500	0.3	6.500	0.4	9.500	0.5

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.228	0.228	1.4	136.6	O K
30 min Summer	9.298	0.298	1.4	178.8	O K
60 min Summer	9.370	0.370	1.4	222.3	O K
120 min Summer	9.443	0.443	1.4	265.6	O K
180 min Summer	9.483	0.483	1.4	289.8	O K
240 min Summer	9.510	0.510	1.4	305.7	O K
360 min Summer	9.546	0.546	1.4	327.6	O K
480 min Summer	9.570	0.570	1.4	342.3	O K
600 min Summer	9.588	0.588	1.4	352.6	O K
720 min Summer	9.600	0.600	1.4	360.1	O K
960 min Summer	9.616	0.616	1.4	369.6	O K
1440 min Summer	9.627	0.627	1.4	376.2	O K
2160 min Summer	9.618	0.618	1.4	371.1	O K
2880 min Summer	9.600	0.600	1.4	360.2	O K
4320 min Summer	9.565	0.565	1.4	338.7	O K
5760 min Summer	9.529	0.529	1.4	317.3	O K
7200 min Summer	9.490	0.490	1.4	293.8	O K
8640 min Summer	9.453	0.453	1.4	271.9	O K
10080 min Summer	9.420	0.420	1.4	252.0	O K
15 min Winter	9.255	0.255	1.4	153.1	O K
30 min Winter	9.334	0.334	1.4	200.4	O K
60 min Winter	9.415	0.415	1.4	249.3	O K
120 min Winter	9.497	0.497	1.4	298.3	O K
180 min Winter	9.543	0.543	1.4	326.0	O K
240 min Winter	9.574	0.574	1.4	344.1	O K
360 min Winter	9.615	0.615	1.4	368.9	O K
480 min Winter	9.643	0.643	1.4	385.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	104.8	19
30 min Summer	90.705	0.0	114.2	34
60 min Summer	56.713	0.0	205.0	64
120 min Summer	34.246	0.0	224.4	124
180 min Summer	25.149	0.0	224.3	184
240 min Summer	20.078	0.0	221.2	244
360 min Summer	14.585	0.0	214.2	364
480 min Summer	11.622	0.0	208.7	482
600 min Summer	9.738	0.0	204.5	602
720 min Summer	8.424	0.0	201.0	722
960 min Summer	6.697	0.0	195.4	962
1440 min Summer	4.839	0.0	187.3	1442
2160 min Summer	3.490	0.0	403.6	2160
2880 min Summer	2.766	0.0	388.8	2504
4320 min Summer	1.989	0.0	356.0	3244
5760 min Summer	1.573	0.0	596.4	4040
7200 min Summer	1.311	0.0	620.0	4824
8640 min Summer	1.129	0.0	638.5	5544
10080 min Summer	0.994	0.0	651.2	6352
15 min Winter	138.153	0.0	110.4	19
30 min Winter	90.705	0.0	115.7	34
60 min Winter	56.713	0.0	220.1	64
120 min Winter	34.246	0.0	224.7	122
180 min Winter	25.149	0.0	218.8	182
240 min Winter	20.078	0.0	214.3	240
360 min Winter	14.585	0.0	208.2	358
480 min Winter	11.622	0.0	204.2	478

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.663	0.663	1.4	398.1	O K
720 min Winter	9.678	0.678	1.4	407.1	O K
960 min Winter	9.698	0.698	1.4	419.0	O K
1440 min Winter	9.715	0.715	1.4	429.0	Flood Risk
2160 min Winter	9.712	0.712	1.4	427.5	Flood Risk
2880 min Winter	9.695	0.695	1.4	416.9	O K
4320 min Winter	9.649	0.649	1.4	389.3	O K
5760 min Winter	9.604	0.604	1.4	362.4	O K
7200 min Winter	9.557	0.557	1.4	334.0	O K
8640 min Winter	9.503	0.503	1.4	301.9	O K
10080 min Winter	9.448	0.448	1.4	269.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	201.3	596
720 min Winter	8.424	0.0	199.2	712
960 min Winter	6.697	0.0	196.5	944
1440 min Winter	4.839	0.0	194.9	1400
2160 min Winter	3.490	0.0	405.7	2076
2880 min Winter	2.766	0.0	392.5	2712
4320 min Winter	1.989	0.0	366.5	3416
5760 min Winter	1.573	0.0	666.7	4328
7200 min Winter	1.311	0.0	690.8	5264
8640 min Winter	1.129	0.0	708.4	6144
10080 min Winter	0.994	0.0	715.2	6952

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.531

Time (mins) From:	To:	Area (ha)
0	4	0.531

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	600.0	1.000	600.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0058-1500-1000-1500
Design Head (m)	1.000
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.5	Kick-Flo®	0.515	1.1
Flush-Flo™	0.253	1.4	Mean Flow over Head Range	-	1.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.2	0.800	1.4	2.000	2.0	4.000	2.8	7.000	3.7
0.200	1.4	1.000	1.5	2.200	2.1	4.500	3.0	7.500	3.8
0.300	1.4	1.200	1.6	2.400	2.2	5.000	3.1	8.000	3.9
0.400	1.3	1.400	1.7	2.600	2.3	5.500	3.3	8.500	4.0
0.500	1.2	1.600	1.9	3.000	2.5	6.000	3.4	9.000	4.1
0.600	1.2	1.800	2.0	3.500	2.7	6.500	3.5	9.500	4.2

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.222	0.222	1.4	133.5	O K
30 min Summer	9.291	0.291	1.4	174.7	O K
60 min Summer	9.362	0.362	1.4	217.2	O K
120 min Summer	9.432	0.432	1.4	259.4	O K
180 min Summer	9.472	0.472	1.4	283.0	O K
240 min Summer	9.497	0.497	1.4	298.5	O K
360 min Summer	9.533	0.533	1.4	319.7	O K
480 min Summer	9.557	0.557	1.4	334.0	O K
600 min Summer	9.573	0.573	1.4	344.1	O K
720 min Summer	9.586	0.586	1.4	351.3	O K
960 min Summer	9.601	0.601	1.4	360.4	O K
1440 min Summer	9.611	0.611	1.4	366.5	O K
2160 min Summer	9.602	0.602	1.4	360.9	O K
2880 min Summer	9.583	0.583	1.4	350.1	O K
4320 min Summer	9.547	0.547	1.4	328.5	O K
5760 min Summer	9.510	0.510	1.4	305.9	O K
7200 min Summer	9.471	0.471	1.4	282.6	O K
8640 min Summer	9.436	0.436	1.4	261.6	O K
10080 min Summer	9.403	0.403	1.4	242.1	O K
15 min Winter	9.249	0.249	1.4	149.6	O K
30 min Winter	9.326	0.326	1.4	195.8	O K
60 min Winter	9.406	0.406	1.4	243.6	O K
120 min Winter	9.486	0.486	1.4	291.4	O K
180 min Winter	9.531	0.531	1.4	318.4	O K
240 min Winter	9.560	0.560	1.4	336.1	O K
360 min Winter	9.600	0.600	1.4	360.2	O K
480 min Winter	9.628	0.628	1.4	376.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	103.4	19
30 min Summer	90.705	0.0	113.8	34
60 min Summer	56.713	0.0	201.4	64
120 min Summer	34.246	0.0	223.4	124
180 min Summer	25.149	0.0	224.5	184
240 min Summer	20.078	0.0	222.3	244
360 min Summer	14.585	0.0	215.7	364
480 min Summer	11.622	0.0	210.1	482
600 min Summer	9.738	0.0	205.7	602
720 min Summer	8.424	0.0	202.0	722
960 min Summer	6.697	0.0	195.9	962
1440 min Summer	4.839	0.0	186.9	1442
2160 min Summer	3.490	0.0	403.4	2160
2880 min Summer	2.766	0.0	388.8	2480
4320 min Summer	1.989	0.0	355.7	3240
5760 min Summer	1.573	0.0	583.2	4032
7200 min Summer	1.311	0.0	606.4	4760
8640 min Summer	1.129	0.0	624.7	5536
10080 min Summer	0.994	0.0	638.0	6352
15 min Winter	138.153	0.0	109.5	19
30 min Winter	90.705	0.0	115.5	34
60 min Winter	56.713	0.0	217.6	64
120 min Winter	34.246	0.0	225.3	122
180 min Winter	25.149	0.0	220.2	182
240 min Winter	20.078	0.0	215.6	240
360 min Winter	14.585	0.0	209.2	358
480 min Winter	11.622	0.0	204.9	476

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.647	0.647	1.4	388.5	O K
720 min Winter	9.662	0.662	1.4	397.2	O K
960 min Winter	9.681	0.681	1.4	408.6	O K
1440 min Winter	9.697	0.697	1.4	418.0	O K
2160 min Winter	9.693	0.693	1.4	416.0	O K
2880 min Winter	9.675	0.675	1.4	405.1	O K
4320 min Winter	9.629	0.629	1.4	377.5	O K
5760 min Winter	9.584	0.584	1.4	350.4	O K
7200 min Winter	9.535	0.535	1.4	321.3	O K
8640 min Winter	9.479	0.479	1.4	287.5	O K
10080 min Winter	9.427	0.427	1.4	256.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	201.7	596
720 min Winter	8.424	0.0	199.3	712
960 min Winter	6.697	0.0	195.8	944
1440 min Winter	4.839	0.0	192.9	1400
2160 min Winter	3.490	0.0	405.4	2076
2880 min Winter	2.766	0.0	391.8	2708
4320 min Winter	1.989	0.0	364.7	3412
5760 min Winter	1.573	0.0	652.0	4328
7200 min Winter	1.311	0.0	676.4	5264
8640 min Winter	1.129	0.0	695.7	6128
10080 min Winter	0.994	0.0	706.0	6864

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.519

Time From:	(mins) To:	Area (ha)
0	4	0.519

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	600.0	1.000	600.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0058-1500-1000-1500
Design Head (m)	1.000
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.5	Kick-Flo®	0.515	1.1
Flush-Flo™	0.253	1.4	Mean Flow over Head Range	-	1.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.2	0.800	1.4	2.000	2.0	4.000	2.8	7.000	3.7
0.200	1.4	1.000	1.5	2.200	2.1	4.500	3.0	7.500	3.8
0.300	1.4	1.200	1.6	2.400	2.2	5.000	3.1	8.000	3.9
0.400	1.3	1.400	1.7	2.600	2.3	5.500	3.3	8.500	4.0
0.500	1.2	1.600	1.9	3.000	2.5	6.000	3.4	9.000	4.1
0.600	1.2	1.800	2.0	3.500	2.7	6.500	3.5	9.500	4.2

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.274	0.274	1.1	54.9	O K
30 min Summer	9.358	0.358	1.1	71.5	O K
60 min Summer	9.442	0.442	1.1	88.4	O K
120 min Summer	9.523	0.523	1.1	104.5	O K
180 min Summer	9.563	0.563	1.1	112.7	O K
240 min Summer	9.587	0.587	1.1	117.4	O K
360 min Summer	9.614	0.614	1.1	122.8	O K
480 min Summer	9.626	0.626	1.1	125.3	O K
600 min Summer	9.630	0.630	1.1	126.1	O K
720 min Summer	9.629	0.629	1.1	125.9	O K
960 min Summer	9.618	0.618	1.1	123.6	O K
1440 min Summer	9.591	0.591	1.1	118.2	O K
2160 min Summer	9.550	0.550	1.1	110.1	O K
2880 min Summer	9.510	0.510	1.1	102.0	O K
4320 min Summer	9.424	0.424	1.1	84.8	O K
5760 min Summer	9.350	0.350	1.1	70.0	O K
7200 min Summer	9.289	0.289	1.1	57.7	O K
8640 min Summer	9.238	0.238	1.1	47.5	O K
10080 min Summer	9.197	0.197	1.1	39.4	O K
15 min Winter	9.308	0.308	1.1	61.5	O K
30 min Winter	9.402	0.402	1.1	80.3	O K
60 min Winter	9.497	0.497	1.1	99.4	O K
120 min Winter	9.588	0.588	1.1	117.6	O K
180 min Winter	9.635	0.635	1.1	127.0	O K
240 min Winter	9.663	0.663	1.1	132.6	O K
360 min Winter	9.696	0.696	1.1	139.1	O K
480 min Winter	9.713	0.713	1.1	142.5	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	53.6	19
30 min Summer	90.705	0.0	70.1	34
60 min Summer	56.713	0.0	90.5	64
120 min Summer	34.246	0.0	109.2	124
180 min Summer	25.149	0.0	120.2	182
240 min Summer	20.078	0.0	127.9	242
360 min Summer	14.585	0.0	139.0	362
480 min Summer	11.622	0.0	147.4	482
600 min Summer	9.738	0.0	153.8	600
720 min Summer	8.424	0.0	159.0	720
960 min Summer	6.697	0.0	165.7	912
1440 min Summer	4.839	0.0	164.3	1138
2160 min Summer	3.490	0.0	201.9	1532
2880 min Summer	2.766	0.0	213.2	1956
4320 min Summer	1.989	0.0	229.7	2724
5760 min Summer	1.573	0.0	243.3	3464
7200 min Summer	1.311	0.0	253.3	4184
8640 min Summer	1.129	0.0	261.5	4920
10080 min Summer	0.994	0.0	268.4	5552
15 min Winter	138.153	0.0	60.0	19
30 min Winter	90.705	0.0	77.9	33
60 min Winter	56.713	0.0	101.3	64
120 min Winter	34.246	0.0	122.2	122
180 min Winter	25.149	0.0	134.4	180
240 min Winter	20.078	0.0	142.9	238
360 min Winter	14.585	0.0	155.1	356
480 min Winter	11.622	0.0	163.8	472

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.720	0.720	1.1	144.1	Flood Risk
720 min Winter	9.722	0.722	1.1	144.4	Flood Risk
960 min Winter	9.715	0.715	1.1	142.9	Flood Risk
1440 min Winter	9.680	0.680	1.1	136.0	O K
2160 min Winter	9.629	0.629	1.1	125.8	O K
2880 min Winter	9.574	0.574	1.1	114.9	O K
4320 min Winter	9.452	0.452	1.1	90.4	O K
5760 min Winter	9.336	0.336	1.1	67.2	O K
7200 min Winter	9.248	0.248	1.1	49.6	O K
8640 min Winter	9.183	0.183	1.1	36.7	O K
10080 min Winter	9.138	0.138	1.1	27.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	169.9	584
720 min Winter	8.424	0.0	173.5	698
960 min Winter	6.697	0.0	174.0	916
1440 min Winter	4.839	0.0	167.6	1198
2160 min Winter	3.490	0.0	226.1	1640
2880 min Winter	2.766	0.0	238.7	2104
4320 min Winter	1.989	0.0	257.0	2984
5760 min Winter	1.573	0.0	272.5	3696
7200 min Winter	1.311	0.0	283.7	4400
8640 min Winter	1.129	0.0	293.0	5024
10080 min Winter	0.994	0.0	300.8	5656

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.215

Time From:	(mins) To:	Area (ha)
0	4	0.215

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	200.0	1.000	200.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1300-1000-1300
Design Head (m)	1.000
Design Flow (l/s)	1.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	53
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.3	Kick-Flo®	0.477	0.9
Flush-Flo™	0.236	1.1	Mean Flow over Head Range	-	1.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.0	0.800	1.2	2.000	1.8	4.000	2.4	7.000	3.2
0.200	1.1	1.000	1.3	2.200	1.9	4.500	2.6	7.500	3.3
0.300	1.1	1.200	1.4	2.400	1.9	5.000	2.7	8.000	3.4
0.400	1.1	1.400	1.5	2.600	2.0	5.500	2.8	8.500	3.5
0.500	1.0	1.600	1.6	3.000	2.1	6.000	2.9	9.000	3.6
0.600	1.0	1.800	1.7	3.500	2.3	6.500	3.1	9.500	3.6

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.258	0.258	1.4	51.6	O K
30 min Summer	9.336	0.336	1.4	67.2	O K
60 min Summer	9.413	0.413	1.4	82.7	O K
120 min Summer	9.486	0.486	1.4	97.1	O K
180 min Summer	9.522	0.522	1.4	104.3	O K
240 min Summer	9.542	0.542	1.4	108.3	O K
360 min Summer	9.561	0.561	1.4	112.3	O K
480 min Summer	9.568	0.568	1.4	113.6	O K
600 min Summer	9.567	0.567	1.4	113.3	O K
720 min Summer	9.560	0.560	1.4	112.1	O K
960 min Summer	9.544	0.544	1.4	108.9	O K
1440 min Summer	9.509	0.509	1.4	101.8	O K
2160 min Summer	9.455	0.455	1.4	91.0	O K
2880 min Summer	9.406	0.406	1.4	81.2	O K
4320 min Summer	9.322	0.322	1.4	64.3	O K
5760 min Summer	9.253	0.253	1.4	50.6	O K
7200 min Summer	9.201	0.201	1.4	40.1	O K
8640 min Summer	9.161	0.161	1.3	32.3	O K
10080 min Summer	9.132	0.132	1.3	26.5	O K
15 min Winter	9.289	0.289	1.4	57.9	O K
30 min Winter	9.377	0.377	1.4	75.5	O K
60 min Winter	9.465	0.465	1.4	93.0	O K
120 min Winter	9.549	0.549	1.4	109.7	O K
180 min Winter	9.590	0.590	1.4	118.0	O K
240 min Winter	9.614	0.614	1.4	122.7	O K
360 min Winter	9.638	0.638	1.4	127.7	O K
480 min Winter	9.649	0.649	1.4	129.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	50.9	19
30 min Summer	90.705	0.0	66.9	34
60 min Summer	56.713	0.0	85.5	64
120 min Summer	34.246	0.0	103.4	122
180 min Summer	25.149	0.0	113.8	182
240 min Summer	20.078	0.0	121.2	242
360 min Summer	14.585	0.0	132.0	362
480 min Summer	11.622	0.0	140.1	482
600 min Summer	9.738	0.0	146.7	600
720 min Summer	8.424	0.0	152.1	716
960 min Summer	6.697	0.0	160.9	818
1440 min Summer	4.839	0.0	173.2	1066
2160 min Summer	3.490	0.0	190.8	1432
2880 min Summer	2.766	0.0	201.5	1820
4320 min Summer	1.989	0.0	217.1	2596
5760 min Summer	1.573	0.0	229.7	3336
7200 min Summer	1.311	0.0	239.1	4032
8640 min Summer	1.129	0.0	246.9	4680
10080 min Summer	0.994	0.0	253.4	5352
15 min Winter	138.153	0.0	57.1	19
30 min Winter	90.705	0.0	74.9	33
60 min Winter	56.713	0.0	95.8	62
120 min Winter	34.246	0.0	115.8	122
180 min Winter	25.149	0.0	127.5	180
240 min Winter	20.078	0.0	135.7	238
360 min Winter	14.585	0.0	147.7	354
480 min Winter	11.622	0.0	156.8	468

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10 Aldersgate Street London EC1A 4HJ	Aberfeldy Village Block H1, H2	
Date 08/02/2022 File Block H1, H2.SRCX	Designed by LB Checked by GB	
Innovyze	Source Control 2020.1	

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.650	0.650	1.4	130.1	O K
720 min Winter	9.647	0.647	1.4	129.3	O K
960 min Winter	9.630	0.630	1.4	126.0	O K
1440 min Winter	9.588	0.588	1.4	117.5	O K
2160 min Winter	9.519	0.519	1.4	103.8	O K
2880 min Winter	9.439	0.439	1.4	87.9	O K
4320 min Winter	9.310	0.310	1.4	61.9	O K
5760 min Winter	9.214	0.214	1.4	42.8	O K
7200 min Winter	9.150	0.150	1.3	30.0	O K
8640 min Winter	9.110	0.110	1.2	22.0	O K
10080 min Winter	9.086	0.086	1.1	17.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	164.0	582
720 min Winter	8.424	0.0	170.0	692
960 min Winter	6.697	0.0	179.5	904
1440 min Winter	4.839	0.0	190.6	1126
2160 min Winter	3.490	0.0	213.7	1600
2880 min Winter	2.766	0.0	225.7	1992
4320 min Winter	1.989	0.0	243.3	2768
5760 min Winter	1.573	0.0	257.3	3464
7200 min Winter	1.311	0.0	267.9	4112
8640 min Winter	1.129	0.0	276.6	4752
10080 min Winter	0.994	0.0	284.0	5344

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.203

Time (mins) From:	To:	Area (ha)
0	4	0.203

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	200.0	1.000	200.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0058-1500-1000-1500
Design Head (m)	1.000
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	58
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.5	Kick-Flo®	0.515	1.1
Flush-Flo™	0.253	1.4	Mean Flow over Head Range	-	1.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.2	0.800	1.4	2.000	2.0	4.000	2.8	7.000	3.7
0.200	1.4	1.000	1.5	2.200	2.1	4.500	3.0	7.500	3.8
0.300	1.4	1.200	1.6	2.400	2.2	5.000	3.1	8.000	3.9
0.400	1.3	1.400	1.7	2.600	2.3	5.500	3.3	8.500	4.0
0.500	1.2	1.600	1.9	3.000	2.5	6.000	3.4	9.000	4.1
0.600	1.2	1.800	2.0	3.500	2.7	6.500	3.5	9.500	4.2

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.216	0.216	1.1	43.2	O K
30 min Summer	9.282	0.282	1.1	56.3	O K
60 min Summer	9.346	0.346	1.1	69.3	O K
120 min Summer	9.407	0.407	1.1	81.3	O K
180 min Summer	9.436	0.436	1.1	87.3	O K
240 min Summer	9.453	0.453	1.1	90.6	O K
360 min Summer	9.470	0.470	1.1	94.0	O K
480 min Summer	9.476	0.476	1.1	95.3	O K
600 min Summer	9.476	0.476	1.1	95.2	O K
720 min Summer	9.471	0.471	1.1	94.1	O K
960 min Summer	9.456	0.456	1.1	91.2	O K
1440 min Summer	9.427	0.427	1.1	85.5	O K
2160 min Summer	9.385	0.385	1.1	77.1	O K
2880 min Summer	9.346	0.346	1.1	69.2	O K
4320 min Summer	9.277	0.277	1.1	55.4	O K
5760 min Summer	9.221	0.221	1.1	44.1	O K
7200 min Summer	9.177	0.177	1.1	35.4	O K
8640 min Summer	9.144	0.144	1.1	28.8	O K
10080 min Summer	9.119	0.119	1.1	23.9	O K
15 min Winter	9.242	0.242	1.1	48.5	O K
30 min Winter	9.316	0.316	1.1	63.2	O K
60 min Winter	9.390	0.390	1.1	77.9	O K
120 min Winter	9.459	0.459	1.1	91.9	O K
180 min Winter	9.495	0.495	1.1	99.0	O K
240 min Winter	9.515	0.515	1.1	103.0	O K
360 min Winter	9.537	0.537	1.1	107.4	O K
480 min Winter	9.547	0.547	1.1	109.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	42.3	19
30 min Summer	90.705	0.0	55.7	34
60 min Summer	56.713	0.0	71.5	64
120 min Summer	34.246	0.0	86.4	122
180 min Summer	25.149	0.0	95.1	182
240 min Summer	20.078	0.0	101.3	242
360 min Summer	14.585	0.0	110.3	362
480 min Summer	11.622	0.0	117.1	482
600 min Summer	9.738	0.0	122.5	600
720 min Summer	8.424	0.0	127.1	720
960 min Summer	6.697	0.0	134.4	808
1440 min Summer	4.839	0.0	144.7	1038
2160 min Summer	3.490	0.0	159.7	1428
2880 min Summer	2.766	0.0	168.6	1820
4320 min Summer	1.989	0.0	181.7	2596
5760 min Summer	1.573	0.0	192.3	3344
7200 min Summer	1.311	0.0	200.2	4032
8640 min Summer	1.129	0.0	206.7	4752
10080 min Summer	0.994	0.0	212.1	5440
15 min Winter	138.153	0.0	47.5	19
30 min Winter	90.705	0.0	62.3	33
60 min Winter	56.713	0.0	80.1	62
120 min Winter	34.246	0.0	96.7	122
180 min Winter	25.149	0.0	106.5	180
240 min Winter	20.078	0.0	113.4	238
360 min Winter	14.585	0.0	123.4	354
480 min Winter	11.622	0.0	130.9	470

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.549	0.549	1.1	109.8	O K
720 min Winter	9.546	0.546	1.1	109.3	O K
960 min Winter	9.534	0.534	1.1	106.7	O K
1440 min Winter	9.497	0.497	1.1	99.4	O K
2160 min Winter	9.435	0.435	1.1	86.9	O K
2880 min Winter	9.373	0.373	1.1	74.7	O K
4320 min Winter	9.268	0.268	1.1	53.7	O K
5760 min Winter	9.190	0.190	1.1	37.9	O K
7200 min Winter	9.136	0.136	1.1	27.2	O K
8640 min Winter	9.101	0.101	1.0	20.3	O K
10080 min Winter	9.080	0.080	1.0	16.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	137.0	582
720 min Winter	8.424	0.0	141.9	694
960 min Winter	6.697	0.0	149.7	906
1440 min Winter	4.839	0.0	158.6	1140
2160 min Winter	3.490	0.0	178.8	1576
2880 min Winter	2.766	0.0	188.9	1988
4320 min Winter	1.989	0.0	203.6	2768
5760 min Winter	1.573	0.0	215.4	3464
7200 min Winter	1.311	0.0	224.2	4112
8640 min Winter	1.129	0.0	231.6	4760
10080 min Winter	0.994	0.0	237.7	5352

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.170

Time (mins) From:	To:	Area (ha)
0	4	0.170

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	200.0	1.000	200.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1300-1000-1300
Design Head (m)	1.000
Design Flow (l/s)	1.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	53
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.3	Kick-Flo®	0.477	0.9
Flush-Flo™	0.236	1.1	Mean Flow over Head Range	-	1.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.0	0.800	1.2	2.000	1.8	4.000	2.4	7.000	3.2
0.200	1.1	1.000	1.3	2.200	1.9	4.500	2.6	7.500	3.3
0.300	1.1	1.200	1.4	2.400	1.9	5.000	2.7	8.000	3.4
0.400	1.1	1.400	1.5	2.600	2.0	5.500	2.8	8.500	3.5
0.500	1.0	1.600	1.6	3.000	2.1	6.000	2.9	9.000	3.6
0.600	1.0	1.800	1.7	3.500	2.3	6.500	3.1	9.500	3.6

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.230	0.230	0.8	23.0	O K
30 min Summer	9.298	0.298	0.8	29.8	O K
60 min Summer	9.365	0.365	0.8	36.5	O K
120 min Summer	9.425	0.425	0.8	42.5	O K
180 min Summer	9.452	0.452	0.8	45.2	O K
240 min Summer	9.463	0.463	0.8	46.3	O K
360 min Summer	9.470	0.470	0.8	47.0	O K
480 min Summer	9.465	0.465	0.8	46.5	O K
600 min Summer	9.456	0.456	0.8	45.6	O K
720 min Summer	9.447	0.447	0.8	44.7	O K
960 min Summer	9.428	0.428	0.8	42.8	O K
1440 min Summer	9.385	0.385	0.8	38.5	O K
2160 min Summer	9.327	0.327	0.8	32.7	O K
2880 min Summer	9.277	0.277	0.8	27.7	O K
4320 min Summer	9.196	0.196	0.8	19.6	O K
5760 min Summer	9.142	0.142	0.8	14.2	O K
7200 min Summer	9.106	0.106	0.8	10.6	O K
8640 min Summer	9.084	0.084	0.7	8.4	O K
10080 min Summer	9.070	0.070	0.7	7.0	O K
15 min Winter	9.258	0.258	0.8	25.8	O K
30 min Winter	9.335	0.335	0.8	33.5	O K
60 min Winter	9.412	0.412	0.8	41.2	O K
120 min Winter	9.481	0.481	0.8	48.1	O K
180 min Winter	9.512	0.512	0.8	51.2	O K
240 min Winter	9.527	0.527	0.8	52.7	O K
360 min Winter	9.538	0.538	0.8	53.8	O K
480 min Winter	9.536	0.536	0.8	53.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	23.2	19
30 min Summer	90.705	0.0	30.5	33
60 min Summer	56.713	0.0	38.5	64
120 min Summer	34.246	0.0	46.5	122
180 min Summer	25.149	0.0	51.3	182
240 min Summer	20.078	0.0	54.6	242
360 min Summer	14.585	0.0	59.5	360
480 min Summer	11.622	0.0	63.2	478
600 min Summer	9.738	0.0	66.2	526
720 min Summer	8.424	0.0	68.7	590
960 min Summer	6.697	0.0	72.8	714
1440 min Summer	4.839	0.0	78.8	968
2160 min Summer	3.490	0.0	85.6	1360
2880 min Summer	2.766	0.0	90.5	1732
4320 min Summer	1.989	0.0	97.5	2464
5760 min Summer	1.573	0.0	103.0	3168
7200 min Summer	1.311	0.0	107.2	3824
8640 min Summer	1.129	0.0	110.8	4496
10080 min Summer	0.994	0.0	113.8	5152
15 min Winter	138.153	0.0	26.0	19
30 min Winter	90.705	0.0	34.1	33
60 min Winter	56.713	0.0	43.1	62
120 min Winter	34.246	0.0	52.1	120
180 min Winter	25.149	0.0	57.4	180
240 min Winter	20.078	0.0	61.1	236
360 min Winter	14.585	0.0	66.6	350
480 min Winter	11.622	0.0	70.8	462

Meinhardt (UK) Ltd		Page 2
10 Aldersgate Street London EC1A 4HJ	Aberfeldy Village Block I1	
Date 08/02/2022 File Block I1.SRCX	Designed by LB Checked by GB	
Innovyze	Source Control 2020.1	

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.528	0.528	0.8	52.8	O K
720 min Winter	9.516	0.516	0.8	51.6	O K
960 min Winter	9.492	0.492	0.8	49.2	O K
1440 min Winter	9.440	0.440	0.8	44.0	O K
2160 min Winter	9.348	0.348	0.8	34.8	O K
2880 min Winter	9.270	0.270	0.8	27.0	O K
4320 min Winter	9.159	0.159	0.8	15.9	O K
5760 min Winter	9.098	0.098	0.8	9.8	O K
7200 min Winter	9.070	0.070	0.7	7.0	O K
8640 min Winter	9.059	0.059	0.6	5.9	O K
10080 min Winter	9.051	0.051	0.5	5.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	74.1	568
720 min Winter	8.424	0.0	76.9	666
960 min Winter	6.697	0.0	81.5	752
1440 min Winter	4.839	0.0	88.2	1068
2160 min Winter	3.490	0.0	95.9	1472
2880 min Winter	2.766	0.0	101.3	1872
4320 min Winter	1.989	0.0	109.2	2552
5760 min Winter	1.573	0.0	115.4	3176
7200 min Winter	1.311	0.0	120.1	3752
8640 min Winter	1.129	0.0	124.1	4496
10080 min Winter	0.994	0.0	127.4	5152

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.091

Time From: (mins)	To:	Area (ha)
0	4	0.091

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	100.0	1.000	100.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0047-1000-1000-1000
Design Head (m)	1.000
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	47
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.0	Kick-Flo®	0.415	0.7
Flush-Flo™	0.205	0.8	Mean Flow over Head Range	-	0.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.8	0.800	0.9	2.000	1.4	4.000	1.9	7.000	2.4
0.200	0.8	1.000	1.0	2.200	1.4	4.500	2.0	7.500	2.5
0.300	0.8	1.200	1.1	2.400	1.5	5.000	2.1	8.000	2.6
0.400	0.7	1.400	1.2	2.600	1.5	5.500	2.2	8.500	2.7
0.500	0.7	1.600	1.2	3.000	1.6	6.000	2.3	9.000	2.7
0.600	0.8	1.800	1.3	3.500	1.8	6.500	2.3	9.500	2.8

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.246	0.246	1.1	88.5	O K
30 min Summer	9.322	0.322	1.1	115.8	O K
60 min Summer	9.399	0.399	1.1	143.7	O K
120 min Summer	9.476	0.476	1.1	171.3	O K
180 min Summer	9.518	0.518	1.1	186.4	O K
240 min Summer	9.544	0.544	1.1	196.0	O K
360 min Summer	9.579	0.579	1.1	208.5	O K
480 min Summer	9.601	0.601	1.1	216.4	O K
600 min Summer	9.615	0.615	1.1	221.4	O K
720 min Summer	9.624	0.624	1.1	224.7	O K
960 min Summer	9.633	0.633	1.1	227.8	O K
1440 min Summer	9.628	0.628	1.1	226.2	O K
2160 min Summer	9.604	0.604	1.1	217.6	O K
2880 min Summer	9.580	0.580	1.1	209.0	O K
4320 min Summer	9.534	0.534	1.1	192.2	O K
5760 min Summer	9.487	0.487	1.1	175.4	O K
7200 min Summer	9.436	0.436	1.1	157.1	O K
8640 min Summer	9.391	0.391	1.1	140.9	O K
10080 min Summer	9.351	0.351	1.1	126.5	O K
15 min Winter	9.276	0.276	1.1	99.2	O K
30 min Winter	9.361	0.361	1.1	129.8	O K
60 min Winter	9.448	0.448	1.1	161.3	O K
120 min Winter	9.535	0.535	1.1	192.5	O K
180 min Winter	9.582	0.582	1.1	209.6	O K
240 min Winter	9.613	0.613	1.1	220.6	O K
360 min Winter	9.653	0.653	1.1	235.1	O K
480 min Winter	9.679	0.679	1.1	244.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	138.153	0.0	78.8	19
30 min Summer	90.705	0.0	93.3	34
60 min Summer	56.713	0.0	141.5	64
120 min Summer	34.246	0.0	167.6	124
180 min Summer	25.149	0.0	177.6	184
240 min Summer	20.078	0.0	179.6	244
360 min Summer	14.585	0.0	178.2	362
480 min Summer	11.622	0.0	176.0	482
600 min Summer	9.738	0.0	173.7	602
720 min Summer	8.424	0.0	171.6	722
960 min Summer	6.697	0.0	167.7	962
1440 min Summer	4.839	0.0	160.9	1440
2160 min Summer	3.490	0.0	316.8	1820
2880 min Summer	2.766	0.0	324.2	2192
4320 min Summer	1.989	0.0	300.0	2984
5760 min Summer	1.573	0.0	389.6	3856
7200 min Summer	1.311	0.0	405.5	4608
8640 min Summer	1.129	0.0	418.7	5360
10080 min Summer	0.994	0.0	429.4	6056
15 min Winter	138.153	0.0	86.1	19
30 min Winter	90.705	0.0	95.3	34
60 min Winter	56.713	0.0	157.3	64
120 min Winter	34.246	0.0	179.1	122
180 min Winter	25.149	0.0	180.7	182
240 min Winter	20.078	0.0	179.7	240
360 min Winter	14.585	0.0	177.3	358
480 min Winter	11.622	0.0	175.2	476

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.696	0.696	1.1	250.7	O K
720 min Winter	9.708	0.708	1.1	255.0	Flood Risk
960 min Winter	9.721	0.721	1.1	259.6	Flood Risk
1440 min Winter	9.723	0.723	1.1	260.3	Flood Risk
2160 min Winter	9.699	0.699	1.1	251.6	O K
2880 min Winter	9.668	0.668	1.1	240.3	O K
4320 min Winter	9.607	0.607	1.1	218.7	O K
5760 min Winter	9.544	0.544	1.1	195.9	O K
7200 min Winter	9.475	0.475	1.1	171.2	O K
8640 min Winter	9.401	0.401	1.1	144.5	O K
10080 min Winter	9.340	0.340	1.1	122.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	9.738	0.0	173.5	592
720 min Winter	8.424	0.0	172.0	708
960 min Winter	6.697	0.0	169.5	936
1440 min Winter	4.839	0.0	166.4	1386
2160 min Winter	3.490	0.0	342.8	2016
2880 min Winter	2.766	0.0	335.7	2304
4320 min Winter	1.989	0.0	309.4	3240
5760 min Winter	1.573	0.0	436.3	4152
7200 min Winter	1.311	0.0	454.1	5048
8640 min Winter	1.129	0.0	469.0	5792
10080 min Winter	0.994	0.0	481.3	6464

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.345

Time From: (mins)	To:	Area (ha)
0	4	0.345

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	360.0	1.000	360.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1300-1000-1300
Design Head (m)	1.000
Design Flow (l/s)	1.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	53
Invert Level (m)	9.000
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.3	Kick-Flo®	0.477	0.9
Flush-Flo™	0.236	1.1	Mean Flow over Head Range	-	1.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.0	0.800	1.2	2.000	1.8	4.000	2.4	7.000	3.2
0.200	1.1	1.000	1.3	2.200	1.9	4.500	2.6	7.500	3.3
0.300	1.1	1.200	1.4	2.400	1.9	5.000	2.7	8.000	3.4
0.400	1.1	1.400	1.5	2.600	2.0	5.500	2.8	8.500	3.5
0.500	1.0	1.600	1.6	3.000	2.1	6.000	2.9	9.000	3.6
0.600	1.0	1.800	1.7	3.500	2.3	6.500	3.1	9.500	3.6

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 222 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	8.366	0.366	0.0	3.9	3.9	52.1	O K
30 min Summer	8.462	0.462	0.0	3.9	3.9	65.8	O K
60 min Summer	8.542	0.542	0.0	3.9	3.9	77.2	O K
120 min Summer	8.589	0.589	0.0	3.9	3.9	83.9	O K
180 min Summer	8.588	0.588	0.0	3.9	3.9	83.7	O K
240 min Summer	8.572	0.572	0.0	3.9	3.9	81.5	O K
360 min Summer	8.538	0.538	0.0	3.9	3.9	76.7	O K
480 min Summer	8.505	0.505	0.0	3.9	3.9	72.0	O K
600 min Summer	8.473	0.473	0.0	3.9	3.9	67.3	O K
720 min Summer	8.441	0.441	0.0	3.9	3.9	62.9	O K
960 min Summer	8.383	0.383	0.0	3.9	3.9	54.5	O K
1440 min Summer	8.286	0.286	0.0	3.9	3.9	40.8	O K
2160 min Summer	8.191	0.191	0.0	3.8	3.8	27.2	O K
2880 min Summer	8.137	0.137	0.0	3.5	3.5	19.6	O K
4320 min Summer	8.097	0.097	0.0	2.9	2.9	13.8	O K
5760 min Summer	8.080	0.080	0.0	2.4	2.4	11.4	O K
7200 min Summer	8.071	0.071	0.0	2.0	2.0	10.1	O K
8640 min Summer	8.064	0.064	0.0	1.7	1.7	9.1	O K
10080 min Summer	8.059	0.059	0.0	1.5	1.5	8.4	O K
15 min Winter	8.412	0.412	0.0	3.9	3.9	58.7	O K
30 min Winter	8.521	0.521	0.0	3.9	3.9	74.2	O K
60 min Winter	8.615	0.615	0.0	3.9	3.9	87.7	O K
120 min Winter	8.678	0.678	0.0	3.9	3.9	96.6	O K
180 min Winter	8.685	0.685	0.0	3.9	3.9	97.7	O K
240 min Winter	8.672	0.672	0.0	3.9	3.9	95.7	O K
360 min Winter	8.623	0.623	0.0	3.9	3.9	88.8	O K
480 min Winter	8.574	0.574	0.0	3.9	3.9	81.8	O K
600 min Winter	8.524	0.524	0.0	3.9	3.9	74.7	O K
720 min Winter	8.476	0.476	0.0	3.9	3.9	67.8	O K
960 min Winter	8.387	0.387	0.0	3.9	3.9	55.1	O K
1440 min Winter	8.249	0.249	0.0	3.9	3.9	35.4	O K
2160 min Winter	8.137	0.137	0.0	3.5	3.5	19.5	O K
2880 min Winter	8.101	0.101	0.0	3.0	3.0	14.4	O K
4320 min Winter	8.076	0.076	0.0	2.2	2.2	10.8	O K
5760 min Winter	8.065	0.065	0.0	1.7	1.7	9.2	O K
7200 min Winter	8.058	0.058	0.0	1.5	1.5	8.2	O K
8640 min Winter	8.053	0.053	0.0	1.3	1.3	7.5	O K
10080 min Winter	8.049	0.049	0.0	1.1	1.1	6.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	146.390	0.0	54.4	18
30 min Summer	94.615	0.0	70.4	33
60 min Summer	58.167	0.0	87.0	62
120 min Summer	34.550	0.0	103.4	122
180 min Summer	25.152	0.0	112.9	180
240 min Summer	19.972	0.0	119.6	202
360 min Summer	14.389	0.0	129.2	260
480 min Summer	11.404	0.0	136.6	326
600 min Summer	9.515	0.0	142.4	392
720 min Summer	8.203	0.0	147.4	458
960 min Summer	6.487	0.0	155.4	588
1440 min Summer	4.654	0.0	167.1	836
2160 min Summer	3.334	0.0	179.9	1188
2880 min Summer	2.629	0.0	189.1	1524
4320 min Summer	1.879	0.0	202.6	2208
5760 min Summer	1.480	0.0	213.0	2936
7200 min Summer	1.229	0.0	221.0	3672
8640 min Summer	1.055	0.0	227.7	4408
10080 min Summer	0.928	0.0	233.4	5136
15 min Winter	146.390	0.0	61.0	18
30 min Winter	94.615	0.0	78.9	32
60 min Winter	58.167	0.0	97.5	62
120 min Winter	34.550	0.0	115.8	118
180 min Winter	25.152	0.0	126.5	176
240 min Winter	19.972	0.0	133.9	230
360 min Winter	14.389	0.0	144.8	290
480 min Winter	11.404	0.0	153.0	360
600 min Winter	9.515	0.0	159.6	430
720 min Winter	8.203	0.0	165.1	500
960 min Winter	6.487	0.0	174.1	634
1440 min Winter	4.654	0.0	187.3	868
2160 min Winter	3.334	0.0	201.5	1192
2880 min Winter	2.629	0.0	211.8	1500
4320 min Winter	1.879	0.0	227.0	2208
5760 min Winter	1.480	0.0	238.5	2944
7200 min Winter	1.229	0.0	247.6	3672
8640 min Winter	1.055	0.0	255.1	4384
10080 min Winter	0.928	0.0	261.5	5112

Rainfall Details

Rainfall Model	FSR	Ratio R	0.437	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
Region	England and Wales	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	20.500	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.200

Time From:	(mins) To:	Area (ha)
0	4	0.200

Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 8.000 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	150.0	0.0	1.000	150.0	0.0	1.001	0.0	0.0

Hydro-Brake© Optimum Outflow Control

Unit Reference	MD-SHE-0094-3900-1000-3900	Sump Available	Yes
Design Head (m)	1.000	Diameter (mm)	94
Design Flow (l/s)	3.9	Invert Level (m)	8.000
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	3.9	Kick-Flo®	0.632	3.2
Flush-Flo™	0.297	3.9	Mean Flow over Head Range	-	3.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake© Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum© be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.0	0.600	3.4	1.600	4.8	2.600	6.1	5.000	8.3	7.500	10.0
0.200	3.8	0.800	3.5	1.800	5.1	3.000	6.5	5.500	8.7	8.000	10.4
0.300	3.9	1.000	3.9	2.000	5.4	3.500	7.0	6.000	9.0	8.500	10.7
0.400	3.8	1.200	4.2	2.200	5.6	4.000	7.4	6.500	9.4	9.000	10.9
0.500	3.7	1.400	4.6	2.400	5.9	4.500	7.9	7.000	9.7	9.500	11.2

Proposed Surface Water Discharge rates

Total Site Area = 9.1ha
Total actively drained area = 5.92 ha

Calculated Green field runoff rate = 22.4 l/s

Phase A

1. **Block F1:** Hard standing area (excluding green areas, roads): 2145m²
2. **Block H1/H2:** Hard standing area (excluding green areas, roads): 2025m²
3. **Block H3:** Hard standing area (excluding green areas, roads): 1700m²
4. **Block I1:** Hard standing area (excluding green areas, roads): 905m²
5. **Block J1:** Hard standing area (excluding green areas, roads): 2624m²

Phase B

1. **Block A1/A2:** Hard standing area (excluding green areas, roads): 3570m²
2. **Block A3:** Hard standing area (excluding green areas, roads): 1265m²
3. **Block B1/B2:** Hard standing area (excluding green areas, roads): 2225m²
4. **Block B3:** Hard standing area (excluding green areas, roads): 1525m²
5. **Block B4:** Hard standing area (excluding green areas, roads): 1255m²
6. **Block B5:** Hard standing area (excluding green areas, roads): 321m²
7. **Jolly's Green:** Hard standing area (excluding green areas, roads): 200m²

Phase C

1. **Block C1/C2/C3/C4:** Hard standing area (excluding green areas, roads): 6005m²
2. **Block C5:** Hard standing area (excluding green areas, roads): 210m²
3. **Block C6:** Hard standing area (excluding green areas, roads): 148m²
4. **Block E1/E2/E3:** Hard standing area (excluding green areas, roads): 5185m²

Phase D

1. **Block D1/D2/D3/D4:** Hard standing area (excluding green areas, roads): 5310m²

Phase	Storm Event	Proposed Surface Water Discharge Rate	Proposed connections For connection location refer to Proposed Discharge Location Section	Required Surface Water Attenuation
Phase A Block F1	1 in 100 year + 40% CC	1.25 l/s	1 connection	185m³
Phase A Block H1/H2	1 in 100 year + 40% CC	1.5 l/s	1 connection	161m³
Phase A Block H3	1 in 100 year + 40% CC	1.25 l/s	1 connection	135m³
Phase A Block I1	1 in 100 year + 40% CC	1 l/s	1 connection	69m³
Phase A Block J1	1 in 100 year + 40% CC	1 l/s	1 connection	260m³
Phase B Block A1/A2	1 in 100 year + 40% CC	1.5 l/s	1 connections	343m³
Phase B Block A3	1 in 100 year + 40% CC	1 l/s	Shared Connection with Block B1/B2/B4 (0.33')	98m³
Phase B Block B1/B2	1 in 100 year + 40% CC	1.5 l/s	Shared Connection with Block A3/B4 (0.33')	183m³

Phase B Block B3	1 in 100 year + 40% CC	1.3 l/s	Shared connection with Block B5 (0.5)	129m³
Phase B Block B4	1 in 100 year + 40% CC	1 l/s	Shared Connection with Block A3/B1/B2 (0.33')	97m³
Phase B Block B5	1 in 100 year + 40% CC	1 l/s	Shared connection with Block B3 (0.5)	13m³
Phase B **Jolly's Green**	1 in 100 year + 40% CC	3.4 l/s	1 connection	100m³
Phase C Block C1/C2/C3/C4	1 in 100 year + 40% CC	1.5 l/s	Shared Connection with Block E1/E2/E3 & C5 (0.25)	651m³
Phase C Block C5	1 in 100 year + 40% CC	0.75 l/s	Shared Connection with Block E1/E2/E3 & C1/C2/C3/C4 (0.25)	10m³
Phase C **Block C6**	1 in 100 year + 40% CC	0.25 l/s	Shared Connection with Block E1/E2/E3 & C1/C2/C3/C4 (0.25)	10m³
Phase C Block E1/E2/E3	1 in 100 year + 40% CC	1.5 l/s	Shared Connection with Block C1/C2/C3/C4 & (0.25)	562m³
Phase D Block D1/D2/D3/D4	1 in 100 year + 40% CC	1.5 l/s	1 connection	576m³
Total		22.4 l/s	13 connections	3668m³

Proposed Discharge Locations

It is proposed to discharge surface water from all blocks via gravity to the surrounding Thames Water combined water sewers, the below are the locations of proposed connections and the proposed discharge rate, please also refer to the below ground drainage masterplan drawing (2812-MHT-CV-BG-DR-100);

- One new connection to the northwest corner of the building I1 into the Thames Water combined water network in Blair Street (TWMH7303); Proposed discharge rate is 1l/s;
- One new connection to the southeast corner of the building J1 into Thames Water combined water sewer in Leven Road (TWMH3602); Proposed discharge rate is 1.25l/s;
- One new connection to the northeast of building A1/A2 into the Thames Water combined water sewer in Leven Road (TWMH3605); Proposed discharge rate 1.5l/s:
- One new connection serving blocks A3, B1/B2 and B4 located to the south of the buildings discharging into Thames Water manhole (TWMH3501A); Proposed discharge rate 3.5l/s:
- One new connection north of block B3 downstream of Thames Water combined water manhole (TWMH3516); Proposed discharge rate is 2.3l/s:
- One new connection to the Thames Water combined sewer manhole in Ettrick Street (TWMH4303); Proposed discharge rate is 4l/s.
- One new connection to the Thames Water combined sewer manhole in Ettrick Street (TWMH4302); Proposed discharge rate is 1.5l/s.
- One new connection to the southeast corner of the building F1 into the Thames Water combined water sewer in Aberfeldy Street (TWMH4312); Proposed discharge rate is 1.25l/s; and
- Two new connections for Building H1&H2 and H3 which will discharge surface water via two new separate connections into Thames Water combined sewer in Aberfeldy Street (TWMH4215). Proposed discharge rate for Building H1&H2 connection is 1.5l/s and for Building H3 is 1.25l/s.
- One New connection to TW combined sewer under Joshua Street.

The proposed new connections are subject to a CCTV survey which will survey the line, level and condition of the existing sewers. If this survey identifies any available existing connections in those locations there may be an opportunity to reuse. This will be explored during detailed design.

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by: Luke Boustead

Site name: Aberfeldy Village

Site location: Tower Hamlets

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: 51.51314° N

Longitude: 0.00532° W

Reference: 4176337745

Date: Mar 09 2022 17:48

Runoff estimation approach IH124

Site characteristics

Total site area (ha): 5.9

Methodology

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

SPR estimation method: Calculate from SOIL type

Soil characteristics	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics	Default	Edited
SAAR (mm):	580	580
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.

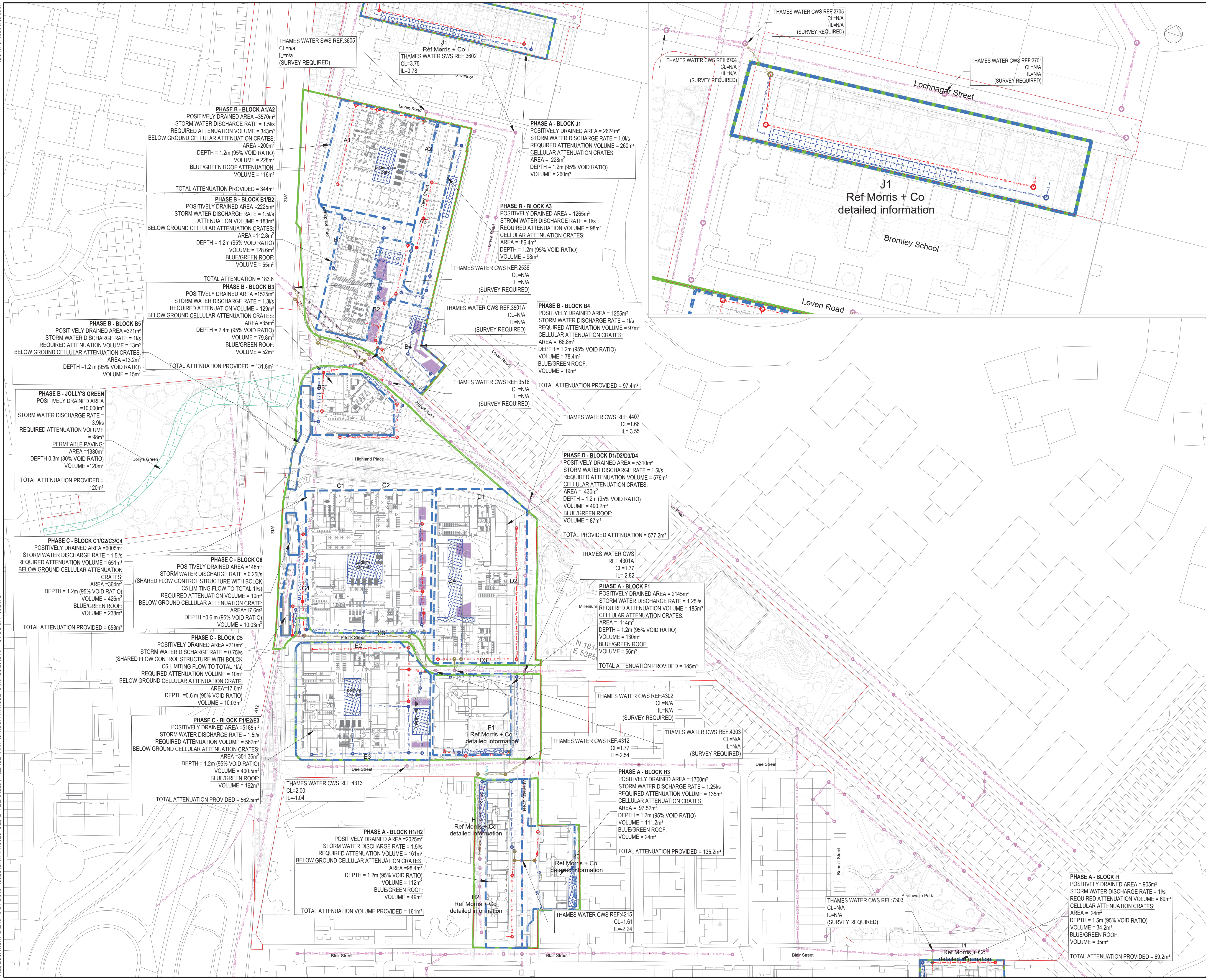
(2) Are flow rates < 5.0 l/s?

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):	22.86	22.86
1 in 1 year (l/s):	19.43	19.43
1 in 30 years (l/s):	52.58	52.58
1 in 100 year (l/s):	72.92	72.92
1 in 200 years (l/s):	85.49	85.49



ISSUED FOR INFORMATION

REV	DESCRIPTION	BY	DATE
P01	STAGE 2 ISSUE	LH	20/08/21
P02	SUSTAINABILITY PRESENTATION	LB	25/08/21
P03	DRAFT STAGE 2+ ISSUED FOR PLANNING	LH	17/09/21
P04	ISSUED FOR PLANNING	LB	14/10/21
P05	REVISED PLANNING ISSUE	LB	07/03/22

NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING IS FOR INFORMATION ONLY.
4. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.
5. PERMEABLE PAVING TO BE UTILIZED IN PRIVATELY MANAGED PUBLIC SPACE WHERE FEASIBLE.
6. THIS DRAWING IS BASED ON:
   - THAMES WATER ASSET RECORDS DATED NOVEMBER 2020
   - LEVITT BERNSTEIN ARCHITECTURAL MASTERPLAN 3663 - 100A - Proposed LGF Plan - Scenario A - P10, DATED: 10/08/21
   - TOPOGRAPHICAL & UTILITIES COMBINED SURVEY FULL SITE V2

TOTAL DISCHARGE RATE FROM SITE IS EQUAL TO THE GREENFEILD RUNOFF RATE OF 18.73 L/S.

KEY:

- ASSUMED PROPERTY BOUNDARY
- PROPOSED SURFACE WATER SEWER
- EXISTING SURFACE WATER SEWER
- PROPOSED FOUL WATER SEWER
- EXISTING COMBINED WATER SEWER
- PROPOSED COMBINED WATER SEWER
- ABANDONED SEWER
- PROPOSED SURFACE WATER MANHOLE
- EXISTING FOUL WATER MANHOLE
- PROPOSED FOUL WATER MANHOLE
- EXISTING COMBINED WATER SEWER
- PROPOSED COMBINED WATER MANHOLE
- PROPOSED BELOW GROUND SURFACE WATER ATTENUATION TANK
- SUDS PLANTER (BIO-RETENTION)
- ASSUMED POSITIVELY DRAINED BLOCK AREA
- PERMEABLE PAVING

CDM RESIDUAL CIVIL / STRUCTURAL DESIGN RISKS

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PROJECT
ABERFELDY VILLAGE MASTERPLAN

CLIENT
ECOWORLD

TITLE
BELOW GROUND DRAINAGE MASTERPLAN

DISCIPLINE			SCALE
CIVIL			1:1000
DRAWN	DESIGNED	CHECKED	APPROVED
LH	LH	LB	LB
DRAWING No			ISSUE
2812-MHT-CV-BG-DR-100			P05

ISO A1 841mm x 594mm

DATE: 07/03/2022
FILE LOCATION: \\MEINHARDT-DC1\PROJECTDATA\PROJECTS\2812 - ABERFELDY VILLAGE\1. MHT\CIVIL\DRAWINGS\2812-MHT-CV-BG-DR-100.DWG