

Surface Water Drainage Statement

16 Worthing Road, Ferring, BN16 1AZ

Client

Randall & Chisnall Construction Ltd
19 First Avenue
Worthing BN16 1AZ
Ref: 7338A

Consulting Engineers

GTA Civils & Transport Ltd
66a Church Walk
Burgess Hill
West Sussex
RH15 9AS
Tel: 01444 871444

1.0 INTRODUCTION

This statement has been prepared for Randall & Chisnall Construction Ltd in relation to a proposal at 16 Worthing Road, Ferring, BN16 1AZ.

The statement sets out a Surface Water Drainage Strategy in compliance with local and national SuDS policy in order to address Pre-commencement Condition 10 of Application Ref: EP/121/17/PL as approved by Arun District Council.

No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.

2.0 EXISTING AND PROPOSED SITES

This site is a rectangular plot of area 0.11ha situated on the south side of Worthing Road (B2140) – refer to Site Location Plan in Appendix A. The southern boundary backs on to Langmead Recreation Ground and bounding the site to the east and west are neighbouring properties of the same road.

The site contains a single detached residential dwelling with associated garage.

Topography: the site is fairly flat with boundary levels in the region of +10.00m AOD, although the front garden and driveway are set lower at minimum +9.500m AOD – refer to Topographical Survey in Appendix B.

Geology: from the Geotechnical Assessment Report No. R18-12714 by Ashdown Site Investigation, borehole logs to maximum depths of 3m recorded a geology of River Terrace Deposits over White Chalk – refer to borehole logs in Appendix C.

Existing drainage: is unknown but is assumed to discharge to the public sewer in Worthing Road, which according to Southern Water's records is a foul sewer of diameter 225mm – refer to sewer records in Appendix D. There are no surface water sewers close to the site.

Proposed site: the proposal is to construct a block of 6No flats in replacement of the existing structures – refer to Appendix E.

3.0 SURFACE WATER DRAINAGE STRATEGY

As part of the Geotechnical Assessment by Ashdown Site Investigation, falling head soakage tests were undertaken, the results of which are contained in Appendix C. The results of the infiltration tests indicate that the River Terrace Deposits and White Chalk Subgroup possess moderate infiltration characteristics. The lowest infiltration rate recorded in the River Terrace Deposits was 8.6×10^{-5} m/s, and this figure has been used to inform the drainage strategy design.

The Surface Water Drainage Strategy is contained in Appendix F and shows all surface water runoff draining to ground via a porous sub-base located under the parking area to the front of the proposed flats. The parking area itself is shown surfaced in permeable paving.

Surface water from the roofs and hardstanding areas (other than the parking) are piped into the porous sub-base via distribution blocks i.e. cellular crates, which allow drained runoff to diffuse efficiently through the sub-base medium.

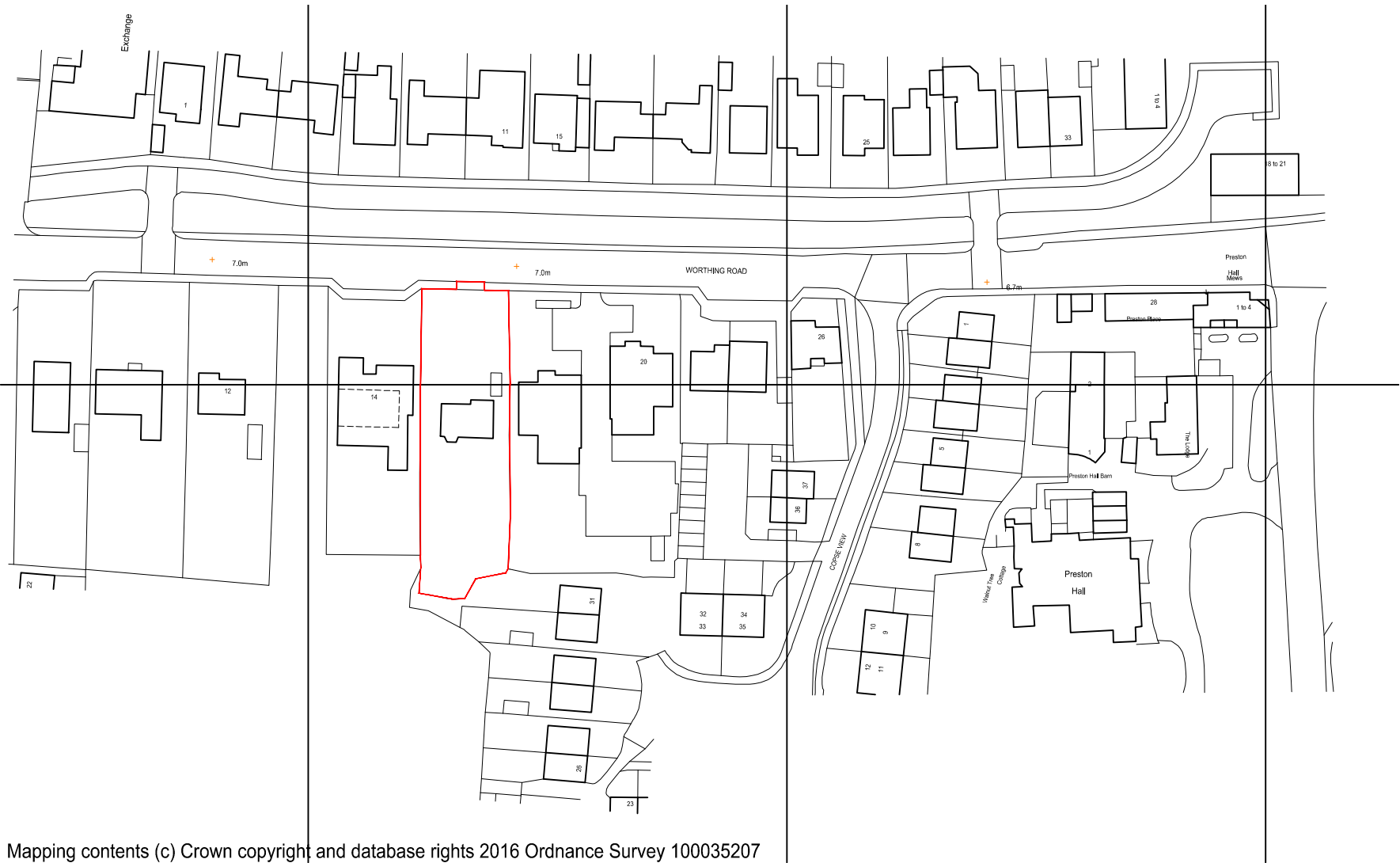
Micro Drainage results – refer to Appendix G – show that a volume of 10.9m.cu of infiltration storage is required to drain the runoff from the proposed roofs and hardstanding areas following a 1 in 100 storm with +40% climate change allowance. The Proposed Surface Water Drainage Strategy in Appendix F shows an infiltration storage volume of 14.7m.cu under the 189m.sq area of permeable paving provided by 260mm depth of 30% voids' sub-base ($189 \times 0.260 \times 0.3 = 14.7$).

Pollution control: before draining to ground, all surface water runoff will pass through and be filtered by the sub-base medium under car park, the which will comprise 10-63mm open-graded crushed rock.

Groundwater: monitoring results from November to March by Ashdown Site Investigation are contained in Appendix C. The maximum level recorded was at 1m below ground level in window sampler WS1 which is at ground level +9.63m AOD. Maximum groundwater level to AOD is therefore +8.63m. The base level of the infiltration sub-base is set at +9.63m (reference Proposed Surface Water Drainage Strategy, Appendix F), which is 1m above the highest recorded groundwater level ($9.63 - 8.63 = 1.00$).

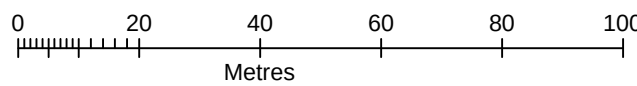
First Issue: 17 April 2020

APPENDIX A – SITE LOCATION PLAN



Mapping contents (c) Crown copyright and database rights 2016 Ordnance Survey 100035207

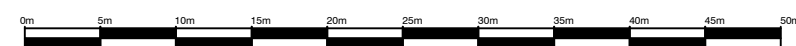
Location Plan as existing - 1:1250 @ A1



scale bar - 1:1250 @ A1

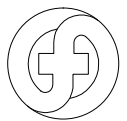


Block Plan As Proposed - 1:500 @ A1

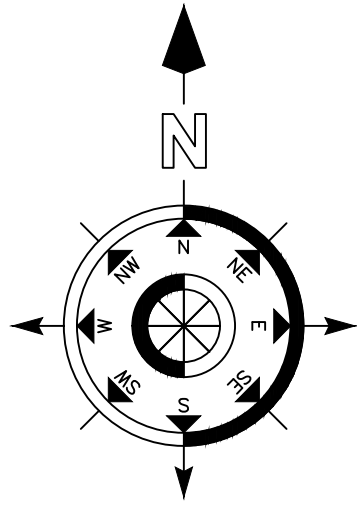


scale bar - 1:500 @ A1

- NOTES
- DO NOT SCALE OFF THIS DRAWING EXCEPT FOR PLANNING PURPOSES
 - CHECK ALL DIMENSIONS ON SITE BEFORE ANY WORK IS COMMENCED
 - ALL GOODS MATERIALS AND WORKMANSHIP MUST CONFORM WITH CURRENT BUILDING REGULATIONS, BRITISH STANDARDS AND CODES OF PRACTICE
 - COPYRIGHT OF THIS DRAWING IS RETAINED BY THE ARCHITECT AND IT MUST NOT BE REPRODUCED WITHOUT WRITTEN CONSENT

REV	DATE	BY	AMENDMENT
folkes architects 1 01903 866020 1 01903 816496 info@folkesarchitects.co.uk THE DESIGN STUDIO 94 High Street Steering West Sussex BN14 9SD			
CLIENT Randall & Chisnall Construction Ltd			
JOB TITLE Proposed Development 16 Worthing Road East Preston Littlehampton BN16 1AZ			
DRAWING TITLE Location & Block Plans PLANNING SSUE			
DATE Aug '17	SCALE as indicated	DRAWN BY ec	
		CHECKED BY mf	
JOB NO. 1681	DRAWING NO. 2.06	REVISION	

APPENDIX B – TOPOGRAPHICAL SURVEY



NOTES
DO NOT SCALE OFF THIS DRAWING
CHECK ALL DIMENSIONS ON SITE BEFORE ANY WORK IS COMMENCED
ALL GOODS MATERIALS AND WORKMANSHIP MUST CONFORM WITH CURRENT BUILDING REGULATIONS, BRITISH STANDARDS AND CODES OF PRACTICE
COPYRIGHT OF THIS DRAWING IS RETAINED BY THE ARCHITECT AND IT MUST NOT BE REPRODUCED WITHOUT WRITTEN CONSENT

LEGEND			
BANKING		SLOPING MASONRY	
BUSHES & HEDGES		FENCE	
MARSH		WALL	
TREES		BUILDING	
NOTE: SPREAD AND HEIGHTS ARE INDICATIVE ONLY		OPEN SIDED BUILDING	
GATES		GLASS ROOFED	
RETAINING WALL		CONTOURS	
		OVERHEAD WIRES	
ABBREVIATIONS (WHERE APPLICABLE)			
AIR VALVE	AV	MANHOLE	MH
BED LEVEL	BL	MARKER	MR
BELUSHI REACON	BB	NOTICE BOARD	NB
BOLLARD	B	NAME PLATE	NP
BRITISH TELECOM BOX	BTB	OVERHEAD WIRES	OW
BRICKWORK	BTWH	PARKING METER	PM
BUS STOP	BKWK	RIDGE LEVEL	RL
CABLE TV	BS	ROAD SIGN	RS
COVER LEVEL	CATV	RODDING EYE	RE
CABLE MARKER	CM	RETAINING WALL	RW
CONCRETE POST	CP	SLUICE VALVE	SV
DOWN PIPE	DP	STOP COCK	SC
DROP KERB	DK	SOFFIT LEVEL	SOF
EAVES LEVEL	EA	SPOT LEVEL	SPL
ELECTRICITY CABLE PIT	ELCP	STRUCTURAL SLAB LEVEL	SSL
ELECTRICITY CONTROL BOX	ECB	STATION	STN
EARTH ROD	EP	TREE STUMP	TS
FIRE HYDRANT	ER	TELEGRAPH POLE	TGP
FLOWER BED	FB	TELEPHONE CALL BOX	TCB
FOOTPATH	FP	TOP OF KERB	TK
FLOOR LEVEL	FL	TURNSTILE	TS
FLAG STAFF	FS	TOP OF WALL	TW
GAS VALVE	GV	TRAFFIC LIGHT	TL
GATE STOP	GS	UNABLE TO LIFT	UL
GULLY	G	UNABLE TO SURVEY	US
GULLY OUTLET	GO	UNDERGROUND	UG
INSPECTION COVER	IC	WATER LEVEL	WL
INVERT LEVEL	IL	WATER METER	WM
LAMP POST	LP	WASH OUT	WO
LETTER BOX	LB	WASTE PIPE	WP
		WATER VALVE	WV
BUILDING			
ACCESS HATCH	AH	WINDOW CILL LEVEL	WCL
ARCH HEAD HEIGHT	AHH	SKYLIGHT	WHL
ARCH SPRINGER HEIGHT	ASH	SOIL AND VENT PIPE	SWP
ARCH SPRINGER LEVEL	ASL	THRESHOLD LEVEL	THL
BEAM	BE	WASH BASIN	WB
BEAM HEIGHT	BH	WATER TANK	WT
BEAM HEAD LEVEL	BHL		
BEAM SOFFIT LEVEL	BSL	FENCES	
COLUMN	COL	BARBED WIRE FENCE	BWF
CILL TO HEAD	C-H	CORRUGATED IRON FENCE	CIF
CEILING LEVEL	CL	CLOSE BOARD FENCE	CBF
DOOR HEAD	DH	CHAIN LINK FENCE	CLF
DOOR HEAD LEVEL	DHL	CHESTNUT PALING FENCE	CPF
FIRE ALARM	FA	FENCE POST	FPO
FLOOR TO CILL	F-C	INTERWOVEN FENCE	IWF
FALSE CEILING	FC	IRON RAILING FENCE	IRF
FLOOR TO CEILING HEIGHT	FCH	LARCH LAP FENCE	LLF
FINISHED FLOOR LEVEL	FFL	MISCELLANEOUS FENCING	MLF
HOSE REEL	HR	PALISADE FENCE	PF
HOSE REEL POST AND RAIL FENCE	HRP	POST AND CHAIN FENCE	PCF
HOSE REEL POST AND RAIL FENCE	HRP	POST AND WIRE	PWF
HOSE REEL POST AND RAIL FENCE	HRP	TUBULAR STEEL RAIL	TSR
HOSE REEL POST AND RAIL FENCE	HRP	WIRE MESH FENCE	WMF

Note:
Survey is based on arbitrary height datum of +10.00 metres Stn A

REV	DATE	BY	AMENDMENT

THE DESIGN STUDIO
84 High Street
Bognor Regis
West Sussex
BN44 5RD

CLIENT
Randall & Chisnall Construction Ltd

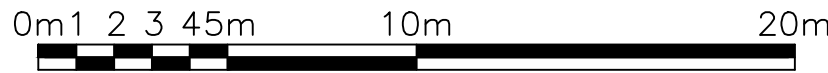
JOB TITLE
16 Worthing Road
East Preston
West Sussex
BN16 1AZ

DRAWING TITLE
Topographical Survey

DATE	SCALE	DRAWN BY
31.03.17	1:200 @ A1	DJ

JOB NO.	DRAWING NO.	CHECKED BY
1681	1.01	MF

REVISION



SCALE 1:200

TOPOGRAPHICAL SURVEY OVERLAID WITH OS MAP

APPENDIX C – EXTRACTS FROM GEOTECHINICAL ASSESSMENT REPORT

The infiltration rates derived from the tests are summarised in the following table.

Table 4. Calculated Infiltration Rates

Exploratory Hole	Test Response Zone Depth (m)		Stratum	Infiltration Rate (f) (m/sec)	Driving Head of Water (m)
	Top	Bottom			
TP01 – Test 1	0.41	0.85	River Terrace Deposits	3.4×10^{-4}	-
TP01 – Test 2	0.40	0.85	River Terrace Deposits	2.1×10^{-4}	-
TP01 – Test 3	0.40	0.85	River Terrace Deposits	8.6×10^{-5}	-
WS02 – Test 1	2.00	3.00	White Chalk Subgroup	1.1×10^{-5}	1.0
WS02 – Test 2	2.00	3.00	White Chalk Subgroup	1.1×10^{-5}	1.0

The value 'f' is equivalent to the soil infiltration coefficient 'q' quoted in the Construction Industry Research and Information Association (CIRIA) Report 156.

The results from the infiltration tests indicate that the near surface River Terrace Deposits and White Chalk Subgroup soils possess moderate infiltration characteristics. However, it is noted that chalk deposits were not encountered within the upper 3m of the majority of the site and the fine grained River Terrace Deposits may possess poorer infiltration rates due to their high fines content (clay and silt). It would therefore be prudent to undertake larger scale testing at the proposed soakaway locations in order to establish the soil infiltration rate that may be achievable at these locations. The results from the infiltration tests should be provided to engineers responsible for the design of the drainage system.

To minimise the risk of subsidence, point discharging infiltration systems (conventional ring or trench soakaways) should be constructed a minimum of 10m away from proposed or existing buildings. Where dissolution features are known to be prevalent, point discharging infiltration systems should preferably be avoided, but where this is not practical the guidance recommends that they should be sited at least 20m away from any foundations.

In the event that discharge to ground via infiltration systems is proposed, it is recommended that designers of the system provide for the prevention of pollution of groundwater. In this regard attention is drawn to guidance provided within BRE 365 and by the Environment Agency which requires a contamination risk assessment to be carried out in order to assess the potential risk to groundwater. Further works would be required in order to undertake a groundwater contamination risk assessment of the site. Appropriate consideration should also be given to whether there is a need for inclusion of interceptors and oil separators. The Local Authority and/or relevant water company should be consulted in relation to consent for discharge of water from rooftops, areas of hardstanding and roadways to drains.

**Ashdown Site Investigation Ltd.
February 2018**

ASHDOWN SITE INVESTIGATION L · I · M · I · T · E · D E-mail: contact@ashdownsi.co.uk Web: www.ashdownsi.co.uk Tel: 01273 483119		Site Name: 16 Worthing Road, East Preston, West Sussex												
		Job Number: R18-12714												
		Start Date: 24/01/2018					Borehole Number: WS03							
End Date: 24/01/2018					Sheet 1 of 1									
Samples and In Situ Testing														
Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Dynamic Probe					Legend	Depth	Stratum Description		
					Blows/100mm									
	D	0.10			0	5	10	15	20	25	30		0.00	Topsoil.
													0.30	Firm light orange brown mottled light grey and dark brown slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is subangular fine to medium ironstone. (River Terrace Deposits)
	D	0.60												
	H	0.60		40										
	H	0.90		60										
	V	1.00		80										
	H	1.20		50										
	D	1.40												
	H	1.70		25										
	V	2.00		50										
	H	2.30		40										
	D	2.60												End of borehole at 3.00m
	H	2.60		90										
	D	2.90												
	V	3.00		120										
Remarks														
Groundwater: Borehole dry on completion.												Excavation Method: WLS		
Stability: Borehole stable on completion.												Borehole Diameter: Various		
Notes: n/a												Made By: ML		

Site Name: 16 Worthing Road, East Preston, West Sussex

Job Number: R18-12714

Start Date: 24/01/2018

End Date: 24/01/2018

Borehole Number:

WS04

Sheet 1 of 1

Samples and In Situ Testing				Dynamic Probe				Legend		Depth	Stratum Description			
Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Blows/100mm									
					0	5	10	15	20	25	30			
	D	0.30										0.00	Topsoil.	
	H	0.40		<25								0.25	Soft light orange brown silty CLAY with frequent rootlets. (River Terrace Deposits - Undifferentiated)	
	H	0.70		35										
	D	0.80												
	V	1.00		90								1.00	Firm light orange brown mottled light grey slightly gravelly silty CLAY. Gravel is subangular fine ironstone. (River Terrace Deposits - Undifferentiated) becoming slightly sandy below 1.10m depth. Sand is fine.	
	H	1.30		40										
	H	1.80		40										
	V	2.00		60										
	D	2.10												
	H	2.20		60										
	H	2.70		75									becoming stiff below 2.70m depth.	
	D	2.80												
	V	3.00		80								3.00	End of borehole at 3.00m	

Remarks	
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Groundwater: Borehole dry on completion.

Stability: Borehole stable on completion.

Notes: n/a

Excavation Method: WLS

Borehole Diameter: Various

Made By: ML

ASHDOWN SITE INVESTIGATION L · I · M · I · T · E · D E-mail: contact@ashdownsi.co.uk Web: www.ashdownsi.co.uk Tel: 01273 483119		Site Name: 16 Worthing Road, East Preston, West Sussex																																																																																																																																																									
		Job Number: R18-12714																																																																																																																																																									
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Samples and In Situ Testing Dynamic Probe Blows/100mm 0 5 10 15 20 25 30 Legend Standpipe Sample/ Test Type Depth From (m) Depth To (m) Test Result Depth Stratum Description <table border="1"> <tr> <td></td> <td>D</td> <td>0.30</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.00</td> <td rowspan="10"> Topsoil over, MADE GROUND: Dark brown slightly gravelly silty clay. Gravel is subangular to subrounded fine to medium brick, concrete, chalk and flint. Soft light brown mottled light grey and dark brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine ironstone. (River Terrace Deposits - Undifferentiated) becoming stiff at 1.00m depth. becoming firm below 1.30m depth. </td> </tr> <tr> <td></td> <td>H</td> <td>0.60</td> <td></td> <td>25</td> <td></td> <td></td> <td></td> <td></td> <td>0.40</td> </tr> <tr> <td></td> <td>D</td> <td>0.70</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>V</td> <td>1.00</td> <td></td> <td>90</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>H</td> <td>1.30</td> <td></td> <td>50</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>H</td> <td>1.60</td> <td></td> <td>50</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>U</td> <td>1.80</td> <td>2.00</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>V</td> <td>2.00</td> <td></td> <td>60</td> <td></td> <td></td> <td></td> <td></td> <td>2.00</td> </tr> <tr> <td></td> <td>H</td> <td>2.30</td> <td></td> <td>40</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>D</td> <td>2.40</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>H</td> <td>2.70</td> <td></td> <td>50</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td rowspan="3"> Firm light orange brown mottled light grey silty CLAY. (River Terrace Deposits - Undifferentiated) </td> </tr> <tr> <td></td> <td>U</td> <td>2.80</td> <td>3.00</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>V</td> <td>3.00</td> <td></td> <td>60</td> <td></td> <td></td> <td></td> <td></td> <td>3.00</td> </tr> <tr> <td colspan="10"></td> <td colspan="2">End of borehole at 3.00m</td> </tr> </table>													D	0.30							0.00	Topsoil over, MADE GROUND: Dark brown slightly gravelly silty clay. Gravel is subangular to subrounded fine to medium brick, concrete, chalk and flint. Soft light brown mottled light grey and dark brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine ironstone. (River Terrace Deposits - Undifferentiated) becoming stiff at 1.00m depth. becoming firm below 1.30m depth.		H	0.60		25					0.40		D	0.70									V	1.00		90							H	1.30		50							H	1.60		50							U	1.80	2.00								V	2.00		60					2.00		H	2.30		40							D	2.40									H	2.70		50						Firm light orange brown mottled light grey silty CLAY. (River Terrace Deposits - Undifferentiated)		U	2.80	3.00								V	3.00		60					3.00											End of borehole at 3.00m	
	D	0.30							0.00	Topsoil over, MADE GROUND: Dark brown slightly gravelly silty clay. Gravel is subangular to subrounded fine to medium brick, concrete, chalk and flint. Soft light brown mottled light grey and dark brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine ironstone. (River Terrace Deposits - Undifferentiated) becoming stiff at 1.00m depth. becoming firm below 1.30m depth.																																																																																																																																																	
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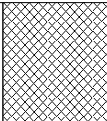
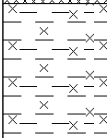
Job Number: R18-12714

Start Date: 24/01/2018

End Date: 24/01/2018

Trial Pit Number: **TP01**

Sheet 1 of 1

Samples and In Situ Testing				Stratum Description	
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Legend	Depth/ Reduced Level
D D V	0.30 0.70 0.80		120		0.00 Topsoil over, MADE GROUND: Light grey brown slightly gravelly silty clay. Gravel is subangular to subrounded fine to medium brick, concrete, flint, slag and chalk.
					0.40 Stiff light orange brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to medium flint and chalk. (River Terrace Deposits - Undifferentiated)
					0.85 End of trial pit at 0.85m

Remarks	
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Groundwater: Trial pit dry on completion.

Excavation Method: HDP

Stability: Trial pit stable on completion.

Pit Length: 0.30m

Notes: n/a

Pit Width: 0.30m

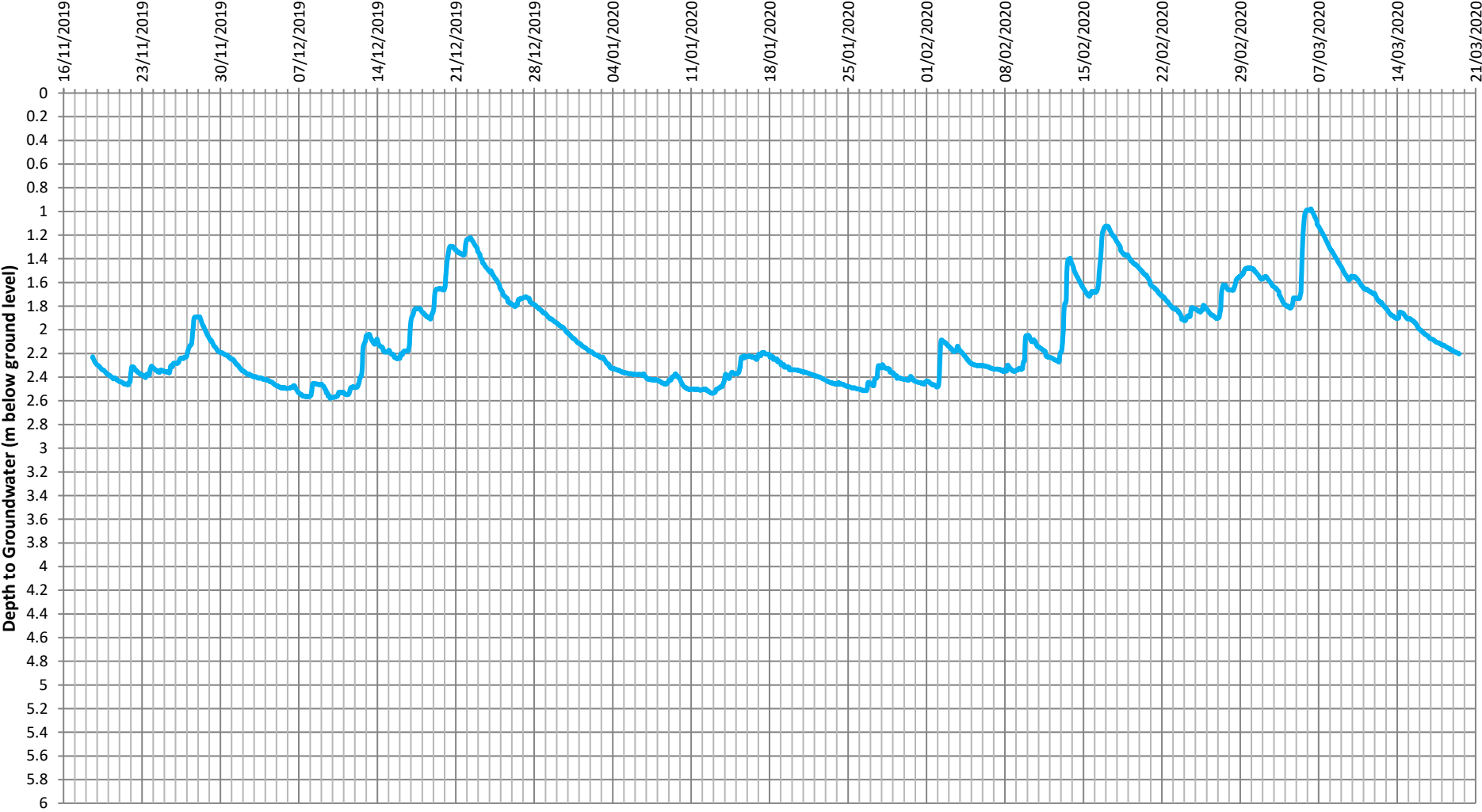
Made By: ML

Ashdown Site Investigation Limited

Site: 16 Worthing Road, East Preston, West Sussex

Report No. P14285

Groundwater Monitoring Results - WS1



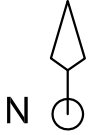
APPENDIX D – SEWER RECORDS SOUTHERN WATER

SEWER RECORDS PAGE 1 OF 2

102938



102650

506398	O.S. REF. TQ0602NE	Drawn by: ahmadr	The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. WARNING: BAC pipes are constructed of Bonded Asbestos Cement WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530.	 N 
	Title: 331309_16 Worthing Road Ferrin	Scale: 1:1250		
		Date: 14/03/2019		

506869

SEWER RECORDS PAGE 2 OF 2

Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape	Node	Cover	Invert	Size	Material	Shape
4602X	8.24	5.5	175	VC	CIRC																		
4701X	7.62	4.97	175	VC	CIRC																		
4702X	7.97	5.3	175	VC	CIRC																		
4703X	7.86	5.52	150	VC	CIRC																		
4801X	6.95	3.02	200	VC	CIRC																		
4802X	6.83	3.91	150	VC	CIRC																		
4901X	5.77	3.58	175	VC	CIRC																		
5801X	7.18	4.98	150	VC	CIRC																		
5802X	7.37	2.75	200	VC	CIRC																		
6701X	7.72	5.87	150	VC	CIRC																		
6801X	7.36	5.78	150	VC	CIRC																		
6802X	7.1	2.37	200	VC	CIRC																		
7701X	7.51	5.3	150	VC	CIRC																		
7702X	7.58	4.63	150	VC	CIRC																		
7801X	7.49	6.99	150	VC	CIRC																		
7802X	6.98	2.27	200	VC	CIRC																		
7803X	6.44	1.96	225	VC	CIRC																		
7903X	7.23	5.661	150	VC	CIRC																		
7904X	7.19	5.484	150	VC	CIRC																		
7905X	7.23	5.402	150	VC	CIRC																		
8701X	6.54	4.24	150	VC	CIRC																		
8801X	6.42	1.76	225	VC	CIRC																		
8804X	6.35	5.07	150	VC	CIRC																		
8805X	6.5		225	CP	CIRC																		
8806X	7.03		OTHER	BRC	CIRC																		
8807X	7.23	1.16	225	CP	CIRC																		
8902X	7.33	5.23	150	VC	CIRC																		
8903X	6.81	5.077	150	VC	CIRC																		

LINE STYLES / COLOURS

Brown

Red

Orange

Dark Blue

Purple

Light Blue

Yellow

Green

Foul

Foul Syphon Sewer

Foul Vacuum Main

Foul Rising Main

Combined

Combined Syphon Sewer

Combined Rising Main

Lateral Drain

Building Over Agreement Area

Treated Effluent

Sludge

Sewer Catchment

Section 104 Area

Surface Water

Surface Water Rising Main

Private

Access Shaft

Decommissioned

MATERIALS

AK

BAC

BRC

BRE

CC

CI

CO

CP

CSB

CSU

DI

GRC

GRP

MAC

MAR

PE

PF

PP

PVC

RPM

SI

ST

VC

XXX

ZZZ

Alkathene

Bonded Asbestos Cement

Black (Common)

Brick (Engineering)

Concrete Box Culvert

Cast Iron

Concrete (In-Situ)

Concrete (Pre-Cast)

Concrete Segments (bolted)

Concrete Segments (unbolted)

Ductile Iron

Glass Reinforced Concrete

Glass Reinforced Plastic

Masonry in regular Courses

Masonry in random Courses

Polyethylene

Pitch Fibre

Polypropylene

Polyvinyl Chloride

Reinforced Plastic Matrix

Spun Iron

Steel

Unfilled Clay

Other

Unknown

LEGEND - SEWERS

Manhole (SW)

Manhole (F&C)

Lamp hole (SW)

Lamp hole (F&C)

Pumping Station (SW)

Pumping Station (F&C)

Side entry manhole (SW)

Side entry Manhole (F&C)

Blind shaft (SW)

Blind shaft (F&C)

Ejector station (SW)

Ejector station (F&C)

Watertight door (SW)

Watertight door (F&C)

Flushing ch. Min-e (SW)

Flushing ch. Min-e (F&C)

Flushing ch. No-e (SW)

Flushing ch. No-e (F&C)

Demarcation Chamber

Washout (SW)

Washout (F&C)

Rodding Eye (SW)

Rodding Eye (F&C)

Gauging point (SW)

Gauging point (F&C)

Intercept chamber (SW)

Intercept chamber (F&C)

Storm Tank (SW)

Storm Tank (F&C)

Vortex chamber (SW)

Vortex chamber (F&C)

Label ellipse

Dummy/S24 manhole

Outfall

Penstock chamber

Damboards

Storm Overflow

Backdrop manhole

Other (s)

Other

Change in sewer (s)

Change in sewer

Reflex valve

Flap valve

Cascade

Anode

Valve

Closed Valve

Air Valve

Hatch box (SW)

Hatch box (F&C)

Direction arrow

Emptying valve

Catchpit

Soakaway

Inlet

Balancing Pond

Wastewater treatment works

Marine treatment works

Outfall headworks

Vent

Vent column

Tidal storage tank

Blank end

Head of Public Sewer

Micro Pumping Station

SHAPES (S)

A

B

C

E

H

Arched

Barrel

Circular

Egg

Horseshoe

R

S

T

U

X

Rectangular

Square

Trapezoidal

U Shape

Other

NODE REFERENCING SYSTEM

1st digit:

2nd digit:

3rd digit:

4th digit:

hundred metre easting identifier

hundred metre northing identifier

sewer type identifier

0-4 = Foul/Combined
5-9 = Surface Water

next sequential node

Drawn by:ahmadr

Title:331309_16 Worthing Road Ferrin

Date:14/03/2019

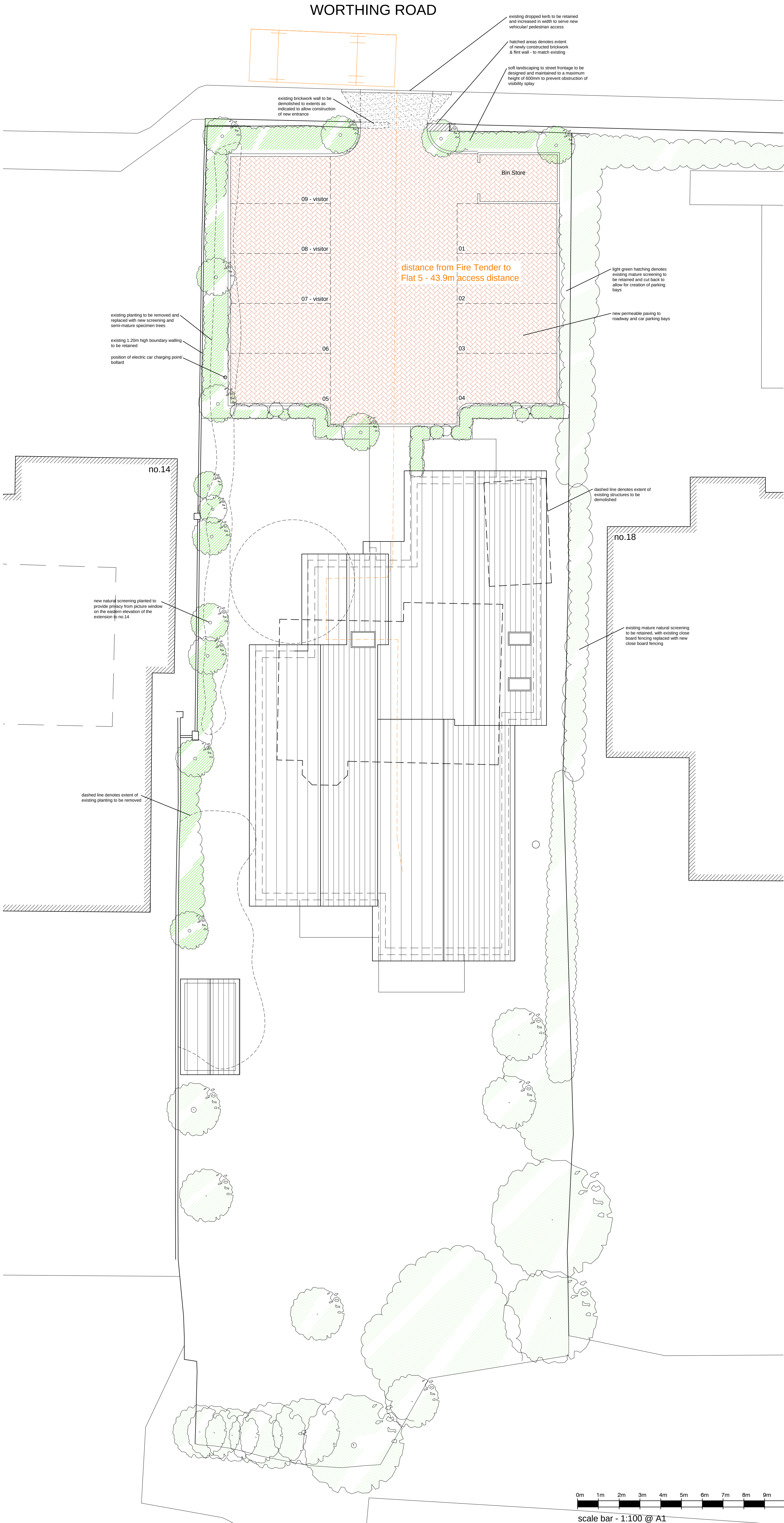


ARUN DISTRICT COUNCIL EP/48/20/DOC

APPENDIX E – PROPOSED SITE PLAN



NOTES
DO NOT SCALE OFF THIS DRAWING
CHECK ALL DIMENSIONS ON SITE BEFORE ANY WORK IS COMMENCED
ALL GOODS MATERIALS AND WORKMANSHIP MUST CONFORM WITH CURRENT BUILDING REGULATIONS, BRITISH STANDARDS AND CODES OF PRACTICE
COPYRIGHT OF THIS DRAWING IS RETAINED BY THE ARCHITECT AND IT MUST NOT BE REPRODUCED WITHOUT WRITTEN CONSENT



C	24.10.17	ec	bin store amended following planners comments.
B	27.09.17	ec	feature windows omitted and rooflights added to first floor flats
A	16.08.16	ec	PLANNING ISSUE
REV	DATE	BY	AMENDMENT

**folkes architects**

THE DESIGN STUDIO
94 High Street
Steering
West Sussex
BN44 3SD

T: 01903 868829
F: 01903 815496
info@folkesarchitects.co.uk

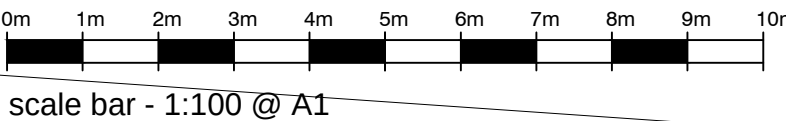
CLIENT
Randall & Chisnall Construction Ltd

JOB TITLE
**Proposed Development
16 Worthing Road
East Preston
Littlehampton
BN16 1AZ**

DRAWING TITLE
**Proposed Site Plan

PLANNING ISSUE**

DATE	SCALE	DRAWN BY	ec
Aug '17	1:100 @ A1	CHECKED BY	mf
JOB NO.	DRAWING NO.	REVISION	
1681	2.01	C	



APPENDIX F – PROPOSED SURFACE WATER DRAINAGE STRATEGY

Ex.FWS VC 200mm ϕ 99.68m 1:262



CE 10.000
 Top of stone 9.890
 Bottom of stone 9.630
 Depth of stone 260mm
 Area 189m.sq
 Volume of stone 14.74m.cu (30% voids)
 Infiltration sub-base sized for 1 in 100 year + 40% peak storm

Distribution tank 1
1416mm x 1416mm x 150mm thick
IL 9.640

Distribution tank 2
1416mm x 708mm x 150mm thick
IL 9.640

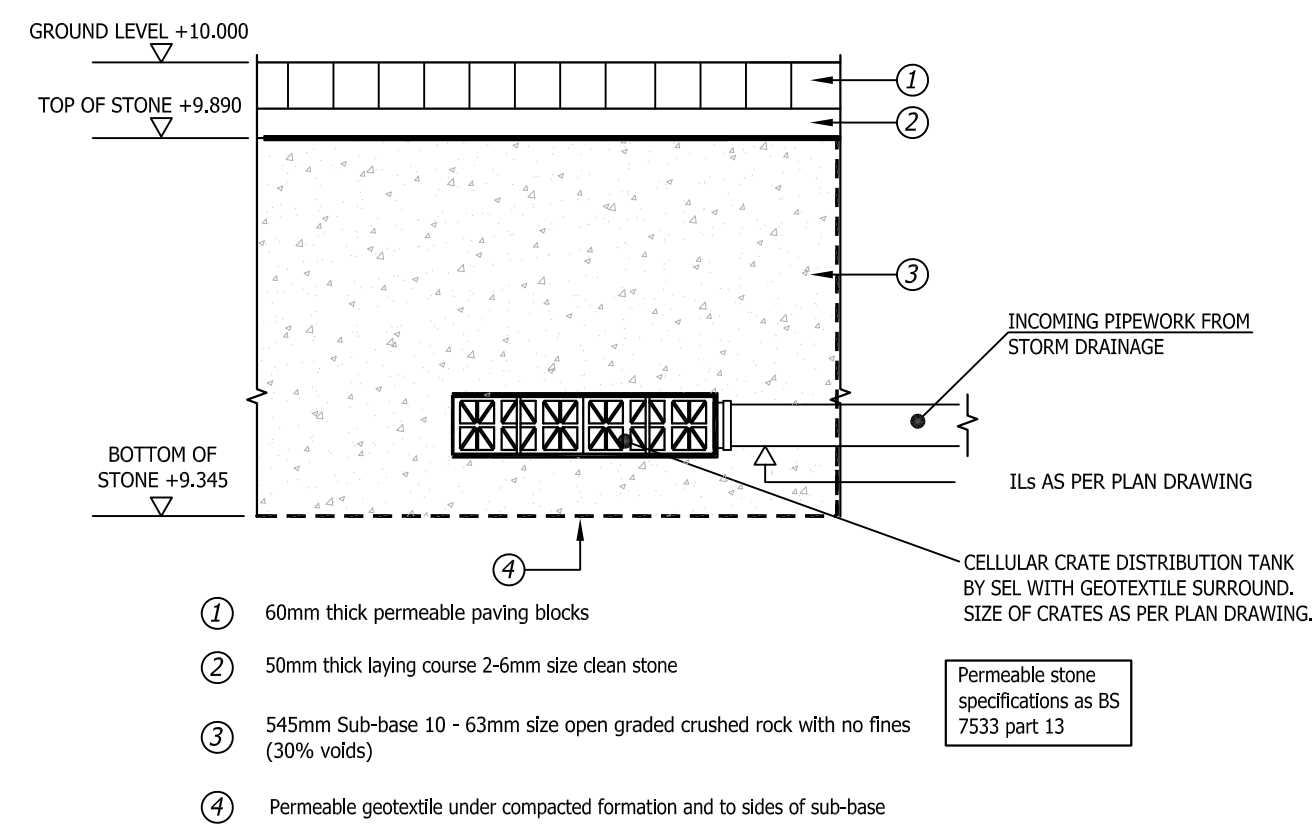
The diagram illustrates a sewerage system layout with the following components and connections:

- Surface water drain:** Represented by a blue line at the top.
- Existing foul sewer:** Represented by a yellow line below the surface water drain.
- RWP (Rainwater Pipe):** Indicated by a blue line with a blue circle and a cross symbol.
- RP (Rainwater Pipe):** Indicated by a blue line with a blue circle and a cross symbol.
- SIC (450mm Plastic Inspection chamber):** Represented by a blue circle with a cross inside.
- PPCP (600mm Plastic Inspection chamber):** Represented by a blue circle with a cross inside.
- Drainage channel:** Represented by a blue line with a cross-hatch pattern at the bottom.

The layout shows the surface water drain and existing foul sewer running horizontally. The RWP and RP are vertical lines connecting to the horizontal lines. The SIC and PPCP are circular chambers connected to the horizontal lines. The drainage channel is at the bottom, connected to the horizontal lines.

ABBREVIATIONS

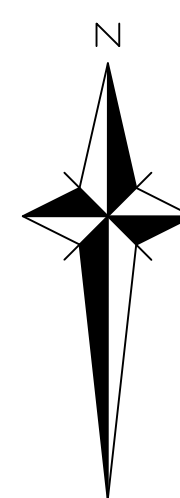
CL	COVER LEVEL
Ex.FWS	EXISTING FOUL SEWER
FFL	FINISHED FLOOR LEVEL
GL	GROUND LEVEL
IL	INVERT LEVEL
RP	RODDING POINT
RWP	RAINWATER PIPE
SIC	SURFACE WATER INSPECTION CHAMBER
SL	SUMP LEVEL
SWD	SURFACE WATER DRAIN



SECTION THROUGH PERMEABLE PAVING SYSTEM
SHOWING DISTRIBUTION BLOCK

DESIGN NOTES

1. INFILTRATION STORAGE SUB-BASE SIZED FOR THE 1 IN 100 YR STORM + 40%.
2. INFILTRATION STORAGE DESIGN BASED ON INFILTRATION RATE OF 8.6×10^{-5} m/s DERIVED FROM FALLING HEAD TESTS WITHIN RIVER TERRACE DEPOSITS REFERENCE GEOTECHNICAL ASSESSMENT REPORT No. R18-12714 BY ASHDOWN SITE INVESTIGATION LTD.
3. BRE 365 SOAKAGE TESTING AT LOCATION AND DEPTH OF PROPOSED PERMEABLE PAVING SUB-BASE SHOULD BE UNDERTAKEN PRIOR TO DETAILED DESIGN.
4. LOCATION OF RWP ON CYCLE STORE TO BE CONFIRMED BY ARCHITECT.
5. THIS DRAWING HAS BEEN PRODUCED WITHOUT INPUT FROM A PROPOSED LEVELS PLAN. ALL COVER LEVELS SHOWN ARE PRELIMINARY.



P1	INITIAL ISSUE	17.04.20	JR	MR	
Rev	Amendments	Date	Dsn	Chn	
Status PRELIMINARY					
Client RANDALL & CHISNALL CONSTRUCTION LTD					
Architect FOLKES ARCHITECTS					
Project 16 WORTHING ROAD FERRING, BN16 1AZ					
Title SURFACE WATER DRAINAGE STRATEGY					
Date APRIL 2020		Scale @ A1 1:100			
Clients Ref.		Project Ref.			
 Civils & Transport Gloucester House, 66a Church Walk, Burgess Hill, West Sussex, RH15 9AS Tel 01444 871444 Web: www.gtacivils.co.uk					
Drawing Number 27338/1101			Rev. P1		

APPENDIX G – MICRO DRAINAGE OUTPUT SHEETS

GTA Civils Ltd				Page 1																																																																																																																																																																																																																			
66a Church Walk		16 Worthing Road																																																																																																																																																																																																																					
Burgess Hill		Porous sub-base																																																																																																																																																																																																																					
West Sussex RH15 9AS		1 in 100 year+40%																																																																																																																																																																																																																					
Date 17/04/2020		Designed by JR																																																																																																																																																																																																																					
File Porous car park.srcx		Checked by																																																																																																																																																																																																																					
Micro Drainage		Source Control 2018.1																																																																																																																																																																																																																					
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 12 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>9.779</td><td>0.149</td><td>8.1</td><td>8.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>9.800</td><td>0.170</td><td>8.1</td><td>9.6</td><td>O K</td></tr><tr><td>60 min Summer</td><td>9.790</td><td>0.160</td><td>8.1</td><td>9.1</td><td>O K</td></tr><tr><td>120 min Summer</td><td>9.732</td><td>0.102</td><td>8.1</td><td>5.8</td><td>O K</td></tr><tr><td>180 min Summer</td><td>9.695</td><td>0.065</td><td>8.1</td><td>3.7</td><td>O K</td></tr><tr><td>240 min Summer</td><td>9.678</td><td>0.048</td><td>7.9</td><td>2.7</td><td>O K</td></tr><tr><td>360 min Summer</td><td>9.666</td><td>0.036</td><td>5.9</td><td>2.0</td><td>O K</td></tr><tr><td>480 min Summer</td><td>9.659</td><td>0.029</td><td>4.8</td><td>1.6</td><td>O K</td></tr><tr><td>600 min Summer</td><td>9.655</td><td>0.025</td><td>4.0</td><td>1.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>9.651</td><td>0.021</td><td>3.5</td><td>1.2</td><td>O K</td></tr><tr><td>960 min Summer</td><td>9.647</td><td>0.017</td><td>2.8</td><td>1.0</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>9.642</td><td>0.012</td><td>2.0</td><td>0.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>9.639</td><td>0.009</td><td>1.5</td><td>0.5</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>9.637</td><td>0.007</td><td>1.2</td><td>0.4</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>9.635</td><td>0.005</td><td>0.9</td><td>0.3</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>9.634</td><td>0.004</td><td>0.7</td><td>0.2</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>9.634</td><td>0.004</td><td>0.6</td><td>0.2</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>9.633</td><td>0.003</td><td>0.5</td><td>0.2</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>9.633</td><td>0.003</td><td>0.5</td><td>0.2</td><td>O K</td></tr><tr><td>15 min Winter</td><td>9.802</td><td>0.172</td><td>8.1</td><td>9.8</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>152.216</td><td>0.0</td><td>14</td></tr><tr><td>30 min Summer</td><td>101.752</td><td>0.0</td><td>23</td></tr><tr><td>60 min Summer</td><td>64.903</td><td>0.0</td><td>40</td></tr><tr><td>120 min Summer</td><td>37.581</td><td>0.0</td><td>70</td></tr><tr><td>180 min Summer</td><td>27.232</td><td>0.0</td><td>98</td></tr><tr><td>240 min Summer</td><td>21.625</td><td>0.0</td><td>126</td></tr><tr><td>360 min Summer</td><td>15.557</td><td>0.0</td><td>186</td></tr><tr><td>480 min Summer</td><td>12.291</td><td>0.0</td><td>246</td></tr><tr><td>600 min Summer</td><td>10.233</td><td>0.0</td><td>306</td></tr><tr><td>720 min Summer</td><td>8.811</td><td>0.0</td><td>368</td></tr><tr><td>960 min Summer</td><td>6.963</td><td>0.0</td><td>490</td></tr><tr><td>1440 min Summer</td><td>5.012</td><td>0.0</td><td>734</td></tr><tr><td>2160 min Summer</td><td>3.632</td><td>0.0</td><td>1080</td></tr><tr><td>2880 min Summer</td><td>2.906</td><td>0.0</td><td>1436</td></tr><tr><td>4320 min Summer</td><td>2.147</td><td>0.0</td><td>2184</td></tr><tr><td>5760 min Summer</td><td>1.749</td><td>0.0</td><td>2936</td></tr><tr><td>7200 min Summer</td><td>1.501</td><td>0.0</td><td>3576</td></tr><tr><td>8640 min Summer</td><td>1.331</td><td>0.0</td><td>4264</td></tr><tr><td>10080 min Summer</td><td>1.209</td><td>0.0</td><td>5112</td></tr><tr><td>15 min Winter</td><td>152.216</td><td>0.0</td><td>15</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	9.779	0.149	8.1	8.4	O K	30 min 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Summer	15.557	0.0	186	480 min Summer	12.291	0.0	246	600 min Summer	10.233	0.0	306	720 min Summer	8.811	0.0	368	960 min Summer	6.963	0.0	490	1440 min Summer	5.012	0.0	734	2160 min Summer	3.632	0.0	1080	2880 min Summer	2.906	0.0	1436	4320 min Summer	2.147	0.0	2184	5760 min Summer	1.749	0.0	2936	7200 min Summer	1.501	0.0	3576	8640 min Summer	1.331	0.0	4264	10080 min Summer	1.209	0.0	5112	15 min Winter	152.216	0.0	15
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1440 min Summer	5.012	0.0	734																																																																																																																																																																																																																				
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2880 min Summer	2.906	0.0	1436																																																																																																																																																																																																																				
4320 min Summer	2.147	0.0	2184																																																																																																																																																																																																																				
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8640 min Summer	1.331	0.0	4264																																																																																																																																																																																																																				
10080 min Summer	1.209	0.0	5112																																																																																																																																																																																																																				
15 min Winter	152.216	0.0	15																																																																																																																																																																																																																				
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Micro Drainage		Source Control 2018.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	9.822	0.192	8.1	10.9	O K
60 min Winter	9.800	0.170	8.1	9.6	O K
120 min Winter	9.712	0.082	8.1	4.7	O K
180 min Winter	9.676	0.046	7.5	2.6	O K
240 min Winter	9.667	0.037	6.1	2.1	O K
360 min Winter	9.657	0.027	4.4	1.5	O K
480 min Winter	9.652	0.022	3.5	1.2	O K
600 min Winter	9.648	0.018	3.0	1.0	O K
720 min Winter	9.646	0.016	2.6	0.9	O K
960 min Winter	9.642	0.012	2.0	0.7	O K
1440 min Winter	9.639	0.009	1.5	0.5	O K
2160 min Winter	9.637	0.007	1.1	0.4	O K
2880 min Winter	9.635	0.005	0.9	0.3	O K
4320 min Winter	9.634	0.004	0.7	0.2	O K
5760 min Winter	9.633	0.003	0.5	0.2	O K
7200 min Winter	9.633	0.003	0.4	0.2	O K
8640 min Winter	9.633	0.003	0.4	0.2	O K
10080 min Winter	9.632	0.002	0.4	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	101.752	0.0	24		
60 min Winter	64.903	0.0	42		
120 min Winter	37.581	0.0	74		
180 min Winter	27.232	0.0	98		
240 min Winter	21.625	0.0	128		
360 min Winter	15.557	0.0	186		
480 min Winter	12.291	0.0	246		
600 min Winter	10.233	0.0	304		
720 min Winter	8.811	0.0	368		
960 min Winter	6.963	0.0	492		
1440 min Winter	5.012	0.0	734		
2160 min Winter	3.632	0.0	1108		
2880 min Winter	2.906	0.0	1416		
4320 min Winter	2.147	0.0	2196		
5760 min Winter	1.749	0.0	2856		
7200 min Winter	1.501	0.0	3648		
8640 min Winter	1.331	0.0	4448		
10080 min Winter	1.209	0.0	5144		
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