Foul & SuDS Drainage Statement & Maintenance Plan

Land off North End Road, Yapton, West Sussex BN18 0DT

Client

Redrow Homes Ltd
Unit 1, Faraday Office Park
Basingstoke
Hampshire
RG24 8QQ
11228
Date: November 2021

Consulting Engineers

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

ARUN DISTRICT COUNCIL Y/163/21/DOC

Index

1	Introduction	2
2	Existing Site	3
3	Proposed Surface Water Drainage	4
4	Proposed Foul Water Drainage & Conclusion	6

Schedule of Appendices

A Site Location Maps and Aerial View

B Topographic Survey & Sewer Records

C Proposed Drainage Design Layout Sheets

D MicroDrainage Calculation Sheets

E Soil Soakage Test Report & Summary Sheet

Annex

Drainage Maintenance & Management Plan

Issue	Issue date	Compiled	Checked
Preliminary Issue	11 November 2021	JP	MR

ARUN DISTRICT COUNCIL Y/163/21/DOC

1 Introduction

1.1 This Statement has been prepared for Redrow Homes South East in relation to the outline consent of 45 residential dwellings at North End Road, Yapton, BN18 0DT. No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.

1.2 GTA Civils & Transport Limited was appointed by the client to provide a Foul & (SuDS) Drainage Statement.

1.3 The main objective of this Statement is to assist in the discharging of Condition 12 and 13 which are as follows:

Condition 12

No development shall take place until details of the implementation, maintenance and management of a sustainable drainage scheme have been submitted to and approved in writing by the LPA. The scheme shall be implemented and thereafter managed and maintained in accordance with the approved details. Those details shall include:

i. A timetable for the scheme's implementation; and

ii. A management and maintenance plan for the lifetime of the development which shall include the arrangement for the adoption by any public body or statutory undertake, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.

Condition 13

Construction of the development shall not commence until details of the proposed means of foul water sewerage have been submitted to and approved in writing by the LPA. No dwelling shall be occupied until works for the disposal of sewerage of sewerage have been fully implemented in accordance with the approved details.

ARUN DISTRICT COUNCIL Y/163/21/DOC

2 Existing Site

2.1 The application site comprises a vacant agricultural field accessed from North End Road. The site area is approximately 1.8ha. A site location map and aerial view are shown in Appendix A.

2.2 Hydrology: An unnamed watercourse approximately 330m north of the site. It continues to flow east to join River Arun.

2.3 Topography: The topographical survey in Appendix B shows the site to be relatively flat with a fall from north to southwest. Levels range from approximately 7.62m AOD in the north to 6.16m AOD in the south.

2.4 Public Sewers: Southern Water's sewer records show the nearest foul sewer is close to the access in North End Road (manhole ref 9901). Refer to Appendix B. The nearest surface water sewer is at the junction between North End Road and Maypole Lane, some 90m to the NE of the site access.

2.5 Geology: The BGS online map shows that the site is underlain by Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culvert Chalk Formation and Portsdown Chalk Formation. Superficial deposits description as River Terrace Deposits (undifferentiated) – sand, silt and clay.

2.6 Soakage tests undertaken in accordance with BRE365 – initially in January '20. The average rate of the 5 results is **9.58×10^{-7}m/s**. Refer to Appendix E. This is the rate used in the SuDS design. Since then, 2 further series of tests were undertaken (in October '20 and October '21). The recommended overall rate from *all the tests* in the overarching report is **1.5×10^{-6}m/s**.

2.7 Flood Risk: the proposed development lies entirely within Flood Zone 1. It is clear from flooding from reservoirs source and is therefore 'appropriate' in terms of consideration of the Sequential & Exception Tests (Table 3 of the NPPF).

ARUN DISTRICT COUNCIL Y/163/21/DOC

3 Proposed Surface Water Drainage

3.1 Full planning permission is being sought for building 45 residential dwelling houses with associated roads, garages, driveways and gardens. The proposed site layout is in Appendix C.

3.2 The NPPF states that SuDS should be utilised unless there are practical reasons for not doing so. The SuDS hierarchy has been applied, with infiltration features at top of this list. As set out in section 2.6 above, the soil soakage rate on this site is reliable for soakage.

3.3 Because of the variation in soakage rates, the *lower* rate of 9.58 x 10^{-7}m/s has been used in the drainage strategy layout. It is contended that this is a sturdier, conservative approach than relying on the higher rate, where there are pockets of lower porosity.

3.4 As infiltration is suitable, porous paving will be used in all catchments. the total area is divided into 13 catchment 'zones' plus 2 trench soakaways - which include all the contributing area in the site. MicroDrainage calculations are shown in Appendix D.

3.5 The following table summarises the area for infiltration at each catchment in the site:

Zones	**Catchments (ha)**
Zone 1	0.330
Zone 2	0.075
Zone 3	0.024
Zone 4	0.051
Zone 5	0.033
Zone 6	0.046
Zone 7	0.041
Zone 8	0.033
Zone 9	0.080
Zone 10	0.036
Zone 11	0.033
Zone 12	0.020
Zone 13	0.009
Trench 1	0.017
Trench 2	0.006

3.6 The structures will hold the volume in the critical 1 in 10 years event as well as the 100 yrs + 40% event. The calculated "half drain times" in the 1 in 10 years event are less than 24 hours and so comply with Building Regulations.

ARUN DISTRICT COUNCIL Y/163/21/DOC

3.7 Ownership and maintenance responsibilities for the proposed drainage system are set out in the Drainage Management and Maintenance Plan – refer to the Annex of this Statement.

3.8 It is contended that this development's SuDS design is compliant with the PPG/NPPF.

ARUN DISTRICT COUNCIL Y/163/21/DOC

4 Proposed Foul Water Drainage & Conclusion

4.1 The majority of development's foul network will drain by gravity - and connect to a public foul sewer in North End Road. A Pump Station is needed for the lower area to connect with the private foul network within the site. Refer to Appendix C.

4.2 An application to connect into the public sewer will be made under Section 106 of the Water Industry Act – to Southern Water, the owner of the public sewerage network.

It is contended that this proposal is fully compliant with national and local drainage policies. The items outlined in the Outline Planning decision notice have been addressed.

- End of Statement -

ARUN DISTRICT COUNCIL Y/163/21/DOC

Appendix A

Site Location Maps and Aerial View

ARUN DISTRICT COUNCIL Y/163/21/DOC

ARUN DISTRICT COUNCIL Y/163/21/DOC

Appendix B

Topographic Survey & Sewer Records

ARUN DISTRICT COUNCIL Y/163/21/DOC

KEY

TOPOGRAPHICAL KEY

SURVEY STATION 5
BANKING TOP BOTTOM
HEDGE SPREADS
WOODLAND CANOPY
ARROW ON STEPS / RAMPS INDICATES DIRECTION UPWARDS
TREES SPREAD & GIRTH SHOWN TO SCALE
GATE
KERB CHANNEL
ROAD UNKERBED

FENCE
WALL
BUILDING
OPEN SIDED BUILDING
OVERHANG / CANOPY
GLASSHOUSE
CONTOUR 25.50
SPOT LEVEL + 127.13 SONAR LEVEL 127.13
BORE HOLE BH
TRIAL HOLE TH
FOOTPATH
CHANGE IN SURFACE

GENERAL

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

APPURTENANCES

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

DEPTHS

E	ELECTRONICALLY DERIVED
Pr	PASSIVELY DERIVED
Bd	BASE DEPTH
Cd	DEPTH TO CROWN
Id	DEPTH TO INVERT
Sd	DEPTH TO SOFFIT

PIPE MATERIALS

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

FENCES

BW	BARBED WIRE FENCE
CB	CLOSED BOARDED FENCE
CL	CHAIN LINK FENCE
CI	CORRUGATED IRON FENCE
CNP	CHESTNUT PALING
CL	CHAIN LINK FENCE
IR	IRON RAILINGS
LL	LARCH LAP FENCE
P/R	POST AND RAIL FENCE
P/W	POST AND WIRE FENCE
R/M	WIRE MESH FENCE

LEVELS

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

LINESTYLE

INTERNAL METER — MT
POT ENDED SERVICE
SEWER CAPPED PLR
SURVEY ABANDONED
INTERNAL VALVE
UNKNOWN UNDERGROUND ANOMALY
UNDERGROUND CHAMBERS
POST PROCESSING AREA
ABOVE GROUND — (AG)
ASSUMED ROUTE — QB4(AR)
EMPTY DUCTS — (E)
OVERHEAD — (OH)
BACK DROP
P TRAP
UTILITY CROSSOVER
SURVEY BOUNDARY
VERBAL INFORMATION — QB4(VI)
RECORD INFORMATION — QB4(R)
REDUNDANT SERVICE
RISING MAIN
CCTV SECTION 4 AND 5 FILLTS ARE SHOWN IN RED

SERVICE TYPE

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

CAUTIONARY NOTES

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

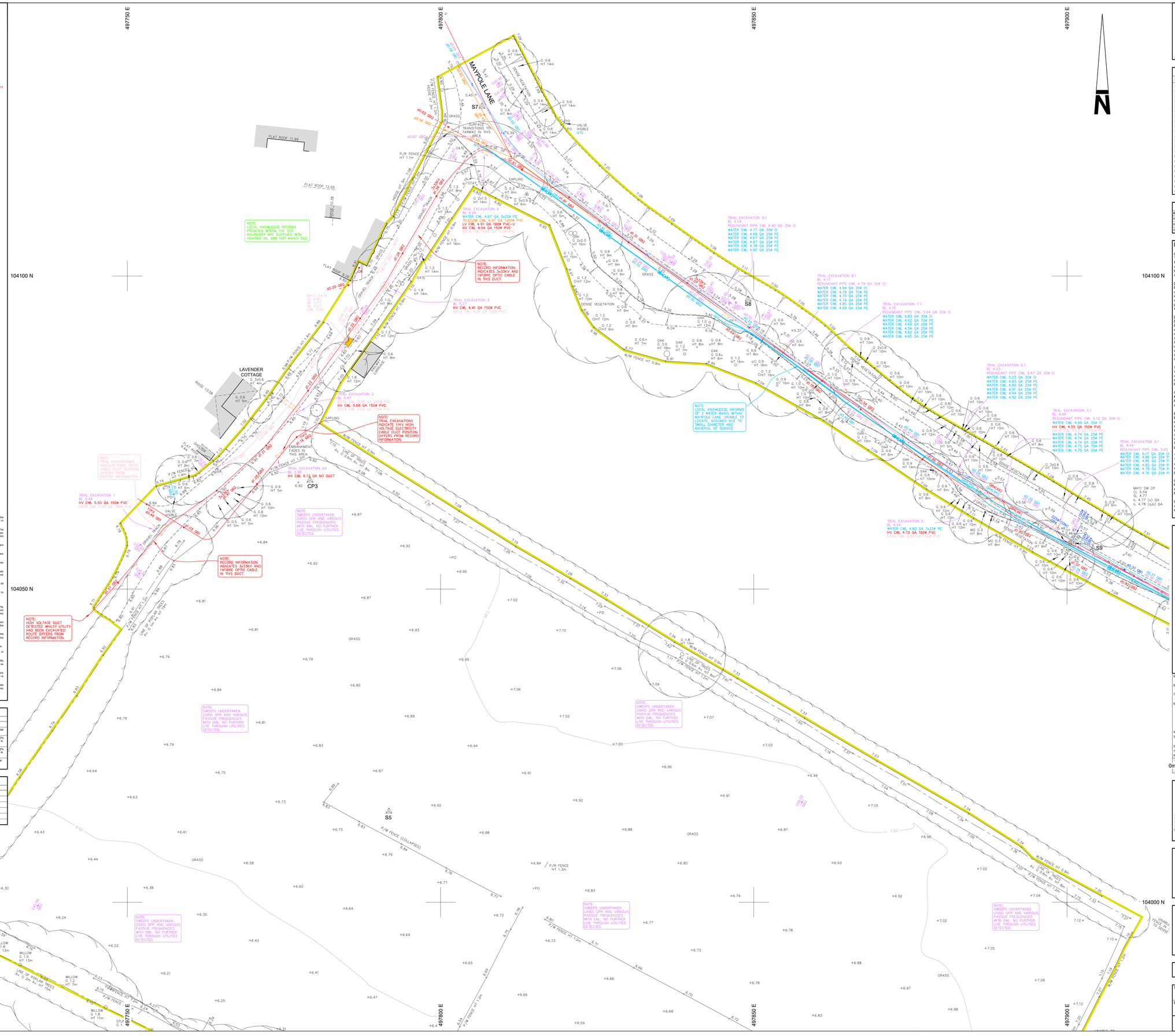
ALWAYS EXERCISE CAUTION WHEN EXCAVATING.

PAS 128:2014 Quality Level Guide

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

Desktop Utility Records

Utility Type	Provider Details	Date Acquired
Drainage	Southern Water	10/04/2019
Water	Portsmouth Water	30/04/2019
Gas	Southern Gas Networks (Scotia)	09/04/2019
Electricity	Scottish & Southern Electricity	24/04/2019
Telecom	Openreach	09/04/2019
CATV	Virgin Media	Not affected



Notes :

1. GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL GNSS NETWORK. LOCAL SCALE FACTOR OF 0.99971 APPLIED.
2. TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.
3. THIS SURVEY SHOULD ALWAYS BE READ IN CONJUNCTION WITH THE DESKTOP UTILITY REPORT, THAT WAS CARRIED OUT AS A PREREQUISITE TO THIS DETECTION SURVEY.
4. BACKGROUND DETAIL IS ORDNANCE SURVEY DIGITAL DATA.

Ordnance Survey (c) Crown Copyright 2014. All rights reserved. Licence number 100022432

Coordinate Table

Station	Description	Easting	Northing	Level
S1	ROAD NAIL	498004.654	104001.196	5.740
S2	ROAD NAIL	497977.583	103948.677	6.339
S3	ROAD NAIL	497937.946	103909.921	6.192
S4	ROAD NAIL	497880.559	103954.665	7.160
S5	PEG	497791.754	104014.490	6.932
S7	ROAD NAIL	497806.610	104127.069	5.465
S8	ROAD NAIL	497849.100	104096.262	5.292
S9	ROAD NAIL	497904.124	104056.519	5.540
S10	ROAD NAIL	497960.641	104026.537	5.754
S11	ROAD NAIL	498046.035	104043.688	6.076
S1A	PEG	498125.726	103938.123	8.084
S1B	PEG	498002.024	103860.129	7.804
S1C	PEG	498084.779	103713.606	7.599
S31	ROAD NAIL	497898.283	103853.574	6.360
CP1	PEG	497875.688	103928.846	6.963
CP2	PEG	497727.572	104003.636	6.318
CP3	PEG	497779.164	104067.355	6.830
CP4	PEG	497990.299	103897.672	7.271
CP5	PEG	498042.991	103783.755	7.937
CP6	PEG	498139.720	103643.004	7.374
CP7	PEG	498177.964	103757.318	7.246
CP8	PEG	498210.443	103923.213	7.849

Equipment Information

Equipment	Manufacturer	Model	Serial Number	MKS REF	Date of Calibration
EML Tx Transmitter	SPX Radiodetection	RD8000	10/TX-108-5221	RD10	05/03/2020
EML Rx Receiver	SPX Radiodetection	RD8000	10/RKPDLS-14596	RD10	05/03/2020
GPR	IDS Georadar	iSpera	8991A	GPR7	15/04/2019

DETECTION SURVEY REPORT

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

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

DETECTION SURVEY
DRAINAGE
Drainage was lifted with pipe sizes and invert levels recorded. Wherever possible the chamber sizes have been recorded and positioned on the drawing. All connections from gullies, external rainwater pipes and external soil stacks have been proven wherever possible into manholes and sewer runs by radio sonde location and/or GPR. Where a saddle connection is present in the position is assumed only until proven otherwise. In instances where other detection methods were unsuccessful connections between manholes have been assumed to be straight and labelled as QB4. All drainage should be cross checked in critical areas by CCTV survey or verification survey type A. To be read in conjunction with InSewer Surveys CCTV report Ref: TV200508 & TV201126. Connection between MH9 & MH9950 proven via water test.

WATER
Water mains within the survey area have been located using EML with electronically derived depths and GPR derived depths recorded to crown of pipe. Following a discussion with a local resident, 3x25ø PE water pipes have been added to the survey drawing along Maypole Lane. Recommend trial excavations to confirm depth and position in critical areas.

GAS
No evidence of gas utilities were identified during site visit. Record information confirms this. Resident with local knowledge suggests that the local area is supplied by oil. Recommend trial excavations in key areas.

ELECTRICITY
Electric cables within the survey area have been located using EML methods with electronically derived depths recorded. Unable to confirm amount of cables within ducts from surface inspection. During the excavation work, we successfully found a single 150Ø duct in the ground along Maypole Lane. Unlike the records there was no sign of another two ducts alongside this utility. It is believed that the three 33KV cables share the same duct. The route we have plotted has replaced the original record information which differ. This also applies to the 11KV to the North of the site. Recommend trial excavations to confirm depths and position in critical areas.

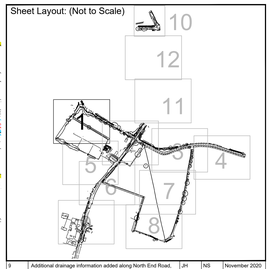
TELECOM
Telecom ducts have been traced with depths recorded. Due to laws protecting British Telecom apparatus all ducts have been located using remote detection techniques only and compared with record information. Chamber sizes have been recorded using GPR techniques wherever possible. For further information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

CATV
Fibre optic cable route matching the 3x33KV high voltage ducts has been located from the excavations. Unable to be positioned due to the lack of conductivity through the utility. Recommend trial excavations to confirm depths and position in critical areas.

UNKNOWNS
All unknown anomalies were located using EML or GPR techniques. Recommend trial excavations to confirm identity position and depths in critical areas.

SEE CAUTIONARY NOTES WITHIN THE UTILITY KEY

Sheet Layout: (Not to Scale)



Revision	Description	Surv. by	Appr. by	Date
9	Additional drainage information added along North End Road, additional survey control installed on site, CPI-CPS.	JH	NS	November 2020
8	Trial excavation information added outside sub-station along Ford Lane.	MK	NS	August 2020
7	Located rising main and CCTV investigations on highway drainage	JM	NS	June 2020
6	Utility and topographical survey extended along Church Lane, North End Road, Lake Road and Yapton Lane. Woodland canopies surveyed. Extra area surveyed behind garages of 1-4 Park Cottages. Further information added regarding the utilities along Maypole Lane following recent excavations carried out in this area.	JL/LW	NS/GL	October 2019
4	Trial excavation information added.	LW	DF	June 2019
3	Topographical & Utility survey information added south of North End Road and junction of Yapton Lane & Lake Lane	RG / KS	NS / DF	June 2019
2	Utility survey carried out within the specified site boundary.	LW	DSR	April 2019
1	Ford Lane extended to the East. Woodland canopies surveyed.	JL	AJ / NS	February 2019

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

mksurveys
Tel 01908 565561 Milton Keynes enquiries@mksurveys.co.uk
Tel 01865 594919 Oxford oxford@mksurveys.co.uk
Tel 0116 2649127 East Midlands eastmidlands@mksurveys.co.uk
Tel 01384 404203 West Midlands westmidlands@mksurveys.co.uk
Tel 01403 243182 Horsham horsham@mksurveys.co.uk
www.mksurveys.com www.surveys4bim.co.uk

REDROW HOMES

North End Road
Yapton
West Sussex

Topographical and PAS 128:2014 Utility Survey

Scale	Sheet Size:	Sheet Number:	Date:
1:200	A0	1	January 2019
Project Number: 26436	Rev: 9	Surveyed By: JL	Approved By: AJ / CP

MKS PROJECT CODE: 26436 VERSION: 9

KEY

TOPOGRAPHICAL KEY

SURVEY STATION — 5
BANKING — TOP / BOTTOM
HEDGE SPREADS
WOODLAND CANOPY
ARROW ON STEPS / RAMPS INDICATES DIRECTION UP/AWARDS
TREES — SPREAD & GIRTH SHOWN TO SCALE
GATE
KERB CHANNEL
ROAD UNKERBED

FENCE
WALL
BUILDING
OPEN SIDED BUILDING
OVERHANG / CANOPY
GLASSHOUSE
CONTOUR — 25.00
SPOT LEVEL + 127.13 — SONAR LEVEL O 127.13
BORE HOLE — BH
TRIAL HOLE — TH
FOOTPATH
CHANGE IN SURFACE

GENERAL

Av	AVERAGE
(ACP)	ASSUMED CONNECTION POINT
CW	CABLE ON WALL
CW	COMBINED WATER
DC	DOG COOLER
DK	DROP KERB
EML	ELECTROMAGNETIC LOCATOR
EOT	END OF TRACE
FD	FIBRE OPTIC
FP	FOOTPATH
FW	FOUL WATER
GP	GATE POST
GPR	GROUND PENETRATING RADAR
HB	HOLLOW BOX
HP	HIGH PRESSURE
HV	HIGH VOLTAGE
KV	KILO VOLT
IP	INTERMEDIATE PRESSURE
LP	LOW PRESSURE
LV	LOW VOLTAGE
MP	MEDIUM PRESSURE
ND	NO DEPTH INFORMATION
NFI	NO FURTHER INFORMATION
NDV	NO DUCTS VISIBLE
NPV	NO PIPES VISIBLE
OSBM	ORDNANCE SURVEY BENCHMARK
POW	PIPE ON WALL
RED	REDUCER
RED	REDUNDANT SERVICE
RW	RETAINING WALL
SB	SOFT BED
SNP	STREET NAME PLATE
SW	SURFACE WATER
TAC	TACTILE PAVING
TBM	TEMPORARY
TW	TRADE EFFLUENT WATER
UTL	UNABLE TO LOCATE
UTR	UNABLE TO RAISE
UTS	UNABLE TO SURVEY

APPARATUS

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

DEPTHS

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

PIPE MATERIALS

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

FENCES

BW	BARBED WIRE FENCE
CB	CLOSED BOARDED FENCE
CL	CHAIN LINK FENCE
CI	CORRUGATED IRON FENCE
CNP	CHESTNUT PALING
CL	CHAIN LINK FENCE
IR	IRON RAILINGS
LL	LARCH LAP FENCE
P/R	POST AND RAIL FENCE
P/W	POST AND WIRE FENCE
W/M	WIRE MESH FENCE

LEVELS

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

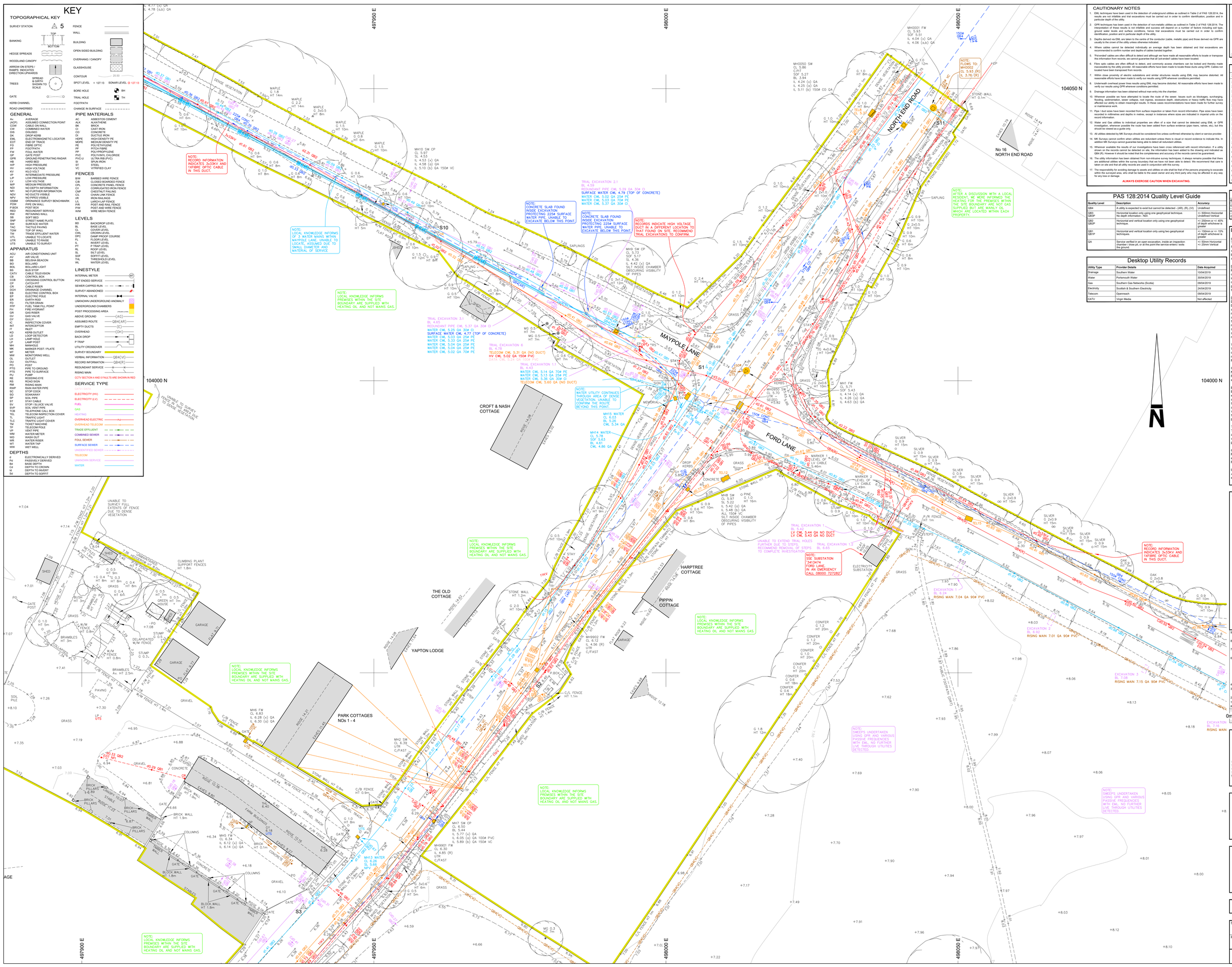
LINESTYLE

INTERNAL METER	MT
POT ENDED SERVICE	
SEWER CAPPED	
SURVEY ABANDONED	
INTERNAL VALVE	
UNKNOWN UNDERGROUND ANOMALY	
UNDERGROUND CHAMBERS	
POST PROCESSING AREA	
ABOVE GROUND	(AG)
ASSUMED ROUTE	QB4(AR)
EMPTY DUCTS	(E)
OVERHEAD	(OH)
BACK DROP	
P TRAP	
UTILITY CROSSOVER	
SURVEY BOUNDARY	
VERBAL INFORMATION	QB4(VI)
RECORD INFORMATION	QB4(R)
REDUNDANT SERVICE	
RISING MAIN	

CCTV SECTION 4 AND 5 FILLTS ARE SHOWN IN RED

SERVICE TYPE

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



CAUTIONARY NOTES

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

ALWAYS EXERCISE CAUTION WHEN EXCAVATING.

Notes :

1. GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL GNSS NETWORK. LOCAL SCALE FACTOR OF 0.99971 APPLIED.
2. TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.
3. THIS SURVEY SHOULD ALWAYS BE READ IN CONJUNCTION WITH THE DESKTOP UTILITY REPORT. THAT WAS CARRIED OUT AS A PREREQUISITE TO THIS DETECTION SURVEY.
4. BACKGROUND DETAIL IS ORDNANCE SURVEY DIGITAL DATA.

Ordnance Survey (c) Crown Copyright 2014. All rights reserved. Licence number 100022432

Coordinate Table

Station	Description	Easting	Northing	Level
S1	ROAD NAIL	498004.654	104001.196	5.740
S2	ROAD NAIL	497977.583	103946.677	6.339
S3	ROAD NAIL	497937.946	103909.921	6.192
S4	ROAD NAIL	497880.559	103954.665	7.160
S5	PEG	497791.754	104014.490	6.932
S7	ROAD NAIL	497806.610	104127.069	5.465
S8	ROAD NAIL	497849.100	104096.262	5.292
S9	ROAD NAIL	497904.124	104056.519	5.540
S10	ROAD NAIL	497960.641	104026.537	5.754
S11	ROAD NAIL	498046.035	104043.688	6.076
S1A	PEG	498125.726	103938.123	8.084
S1B	PEG	498002.024	103860.129	7.804
S1C	PEG	498084.779	103713.606	7.599
S31	ROAD NAIL	497898.283	103853.574	6.360
CP1	PEG	497875.688	103928.846	6.963
CP2	PEG	497727.572	104003.636	6.318
CP3	PEG	497779.164	104067.355	6.838
CP4	PEG	497990.299	103897.672	7.271
CP5	PEG	498042.991	103783.755	7.937
CP6	PEG	498139.720	103543.004	7.374
CP7	PEG	498177.964	103757.318	7.246
CP8	PEG	498210.443	103923.213	7.849

PAS 128:2014 Quality Level Guide

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

Desktop Utility Records

Utility Type	Provider Details	Date Acquired
Drainage	Southern Water	10/04/2019
Water	Portsmouth Water	30/04/2019
Gas	Southern Gas Networks (Scotia)	09/04/2019
Electricity	Scottish & Southern Electricity	24/04/2019
Telecom	Openreach	09/04/2019
CATV	Virgin Media	Not affected

Equipment Information

Equipment	Manufacturer	Model	Serial Number	MKS REF	Date of Calibration
EML Tx Transmitter	SPX Radiodetection	RD8000	10/TX-106-5221	RD10	05/03/2020
EML Rx Receiver	SPX Radiodetection	RD8000	10/RPDLB-14598	RD10	05/03/2020
GPR	IDS Georadar	Opera	8991A	GPR7	15/04/2019

DETECTION SURVEY REPORT

GENERAL

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

DESKTOP UTILITY REPORT

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

DETECTION SURVEY

DRAINAGE

Drainage was lifted with pipe sizes and invert levels recorded. Wherever possible the chamber sizes have been recorded and positioned on the drawing. All connections from gullies, external rainwater pipes and external soil stacks have been proven wherever possible into manholes and sewer runs by radio sonde location and/or GPR. Where a saddle connection is present the position is assumed only until proven otherwise. In instances where other detection methods were unsuccessful connections between manholes have been assumed to be straight and labelled as QB4. All drainage should be cross checked in critical areas by CCTV survey or verification survey type A. To be read in conjunction with InSewer Surveys CCTV report Ref: TV200608 & TV201126. Connection between MH9 & MH0950 proven via water test.

WATER

Water mains within the survey area have been located using EML with electronically derived depths and GPR derived depths recorded to crown of pipe. Following a discussion with a local resident, 3x250 PE water pipes have been added to the survey drawing along Maypole Lane. Recommend trial excavations to confirm depth and position in critical areas.

GAS

No evidence of gas utilities were identified during site visit. Record information confirms this. Resident with local knowledge suggests that the local area is supplied by oil. Recommend trial excavations in key areas.

ELECTRICITY

Electric cables within the survey area have been located using EML methods with electronically derived depths recorded. Unable to confirm amount of cables within ducts from surface inspection. During the excavation work, we successfully found a single 150Ø duct in the ground along Maypole Lane. Unlike the records there was no sign of another two ducts alongside this utility. It is believed that the three 33KV cables share the same duct. The route we have plotted has replaced the original record information which differ. This also applies to the 11KV to the far West of the site. Recommend trial excavations to confirm depths and position in critical areas.

TELECOM

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

CATV

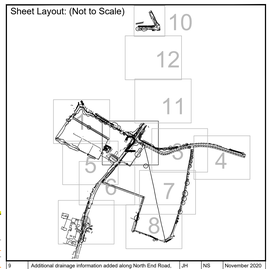
Fibre optic cable route matching the 3x33KV high voltage ducts has been located from the excavations. Unable to be positioned due to the lack of conductivity through the utility. Recommend trial excavations to confirm depths and position in critical areas.

UNKNOWNS

All unknown anomalies were located using EML or GPR techniques. Recommend trial excavations to confirm identity position and depths in critical areas.

SEE CAUTIONARY NOTES WITHIN THE UTILITY KEY

Sheet Layout: (Not to Scale)



Revision	Description	Surv. by	Appr. by	Date
9	Additional drainage information added along North End Road, additional survey control installed on site, CPI-CPR.	JH	NS	November 2020
8	Trial excavation information added outside sub-station along Ford Lane.	MK	NS	August 2020
7	Located rising main and CCTV investigations on highway drainage.	JM	NS	June 2020
6	Utility and topographical survey extended along Church Lane, North End Road, Lake Road and Yapton Lane. Woodland canopies surveyed. Extra area surveyed behind garages of 1-4 Park Cottages. Further information added regarding the utilities along Maypole Lane following recent excavations carried out in this area.	JL/LW	NS/GL	October 2019
4	Trial excavation information added.	LW	DF	June 2019
3	Topographical & Utility survey information added south of North End Road and junction of Yapton Lane & Lake Lane	RG / KS	NS / DF	June 2019
2	Utility survey carried out within the specified site boundary.	LW	DSR	April 2019
1	Ford Lane extended to the East. Woodland canopies surveyed.	JL	AJ / NS	February 2019

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

mksurveys

Tel 01908 565561
Tel 01865 594979
Tel 0116 2649127
Tel 01284 844320
Tel 01403 243162

Milton Keynes
Oxford
East Midlands
West Midlands
Horsham

enquiries@mksurveys.co.uk
oxford@mksurveys.co.uk
eastmidlands@mksurveys.co.uk
westmidlands@mksurveys.co.uk
horsham@mksurveys.co.uk

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

REDROW HOMES

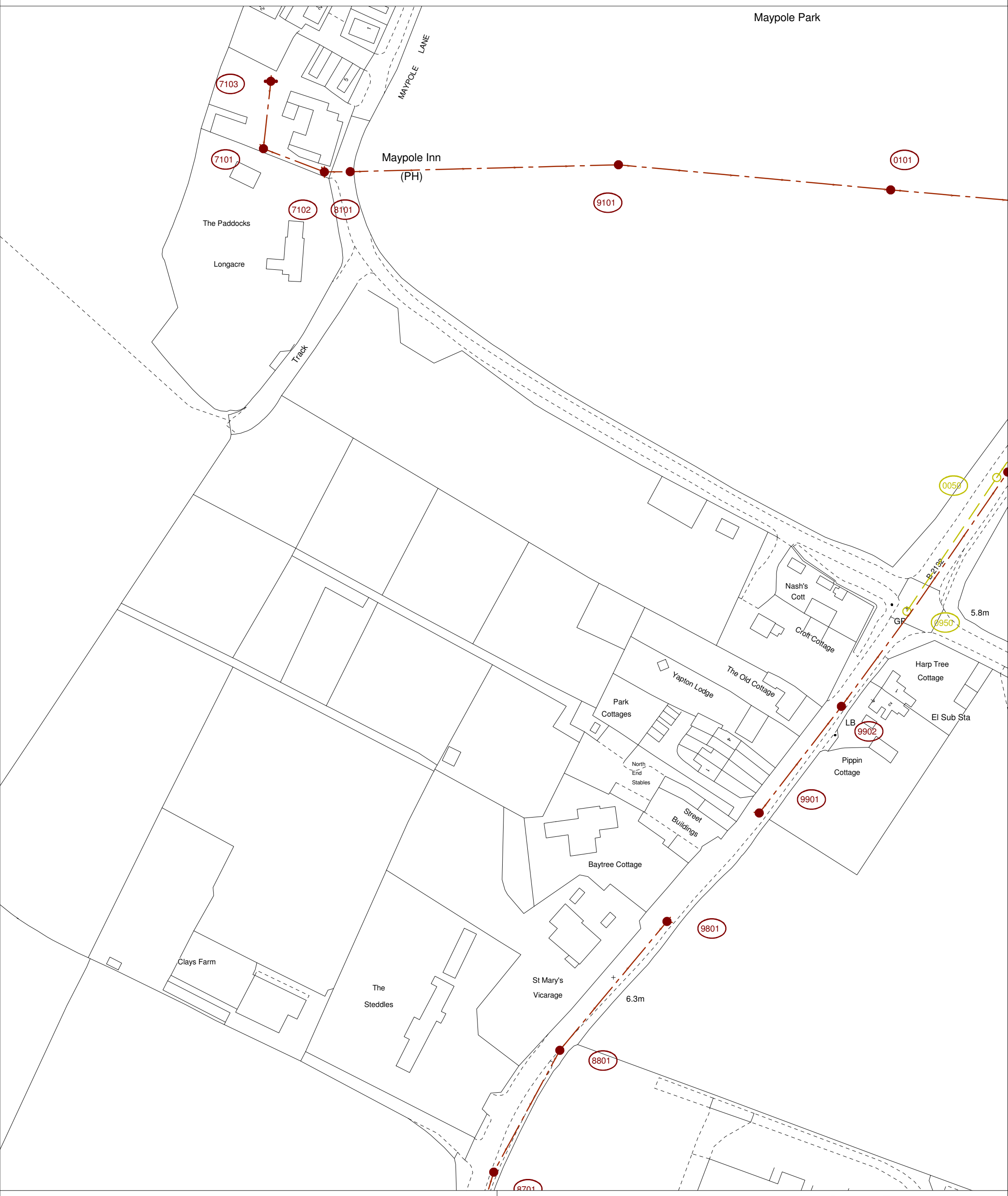
North End Road
Yapton
West Sussex

Topographical and PAS 128:2014 Utility Survey

Scale	Sheet Size:	Sheet Number:	Date:
1:200	A0	2	January 2019
Project Number:	Rev:	Surveyed By:	Approved By:
26436	9	JL	AJ / CP

© MKS SURVEYS LIMITED

SOUTHERN WATER



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

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

Southern Water

O.S. REF: SU9703NE

Scale: 1:1250

N

Printed By: Roopa

Date: 9-1-2019

Sewer Plot

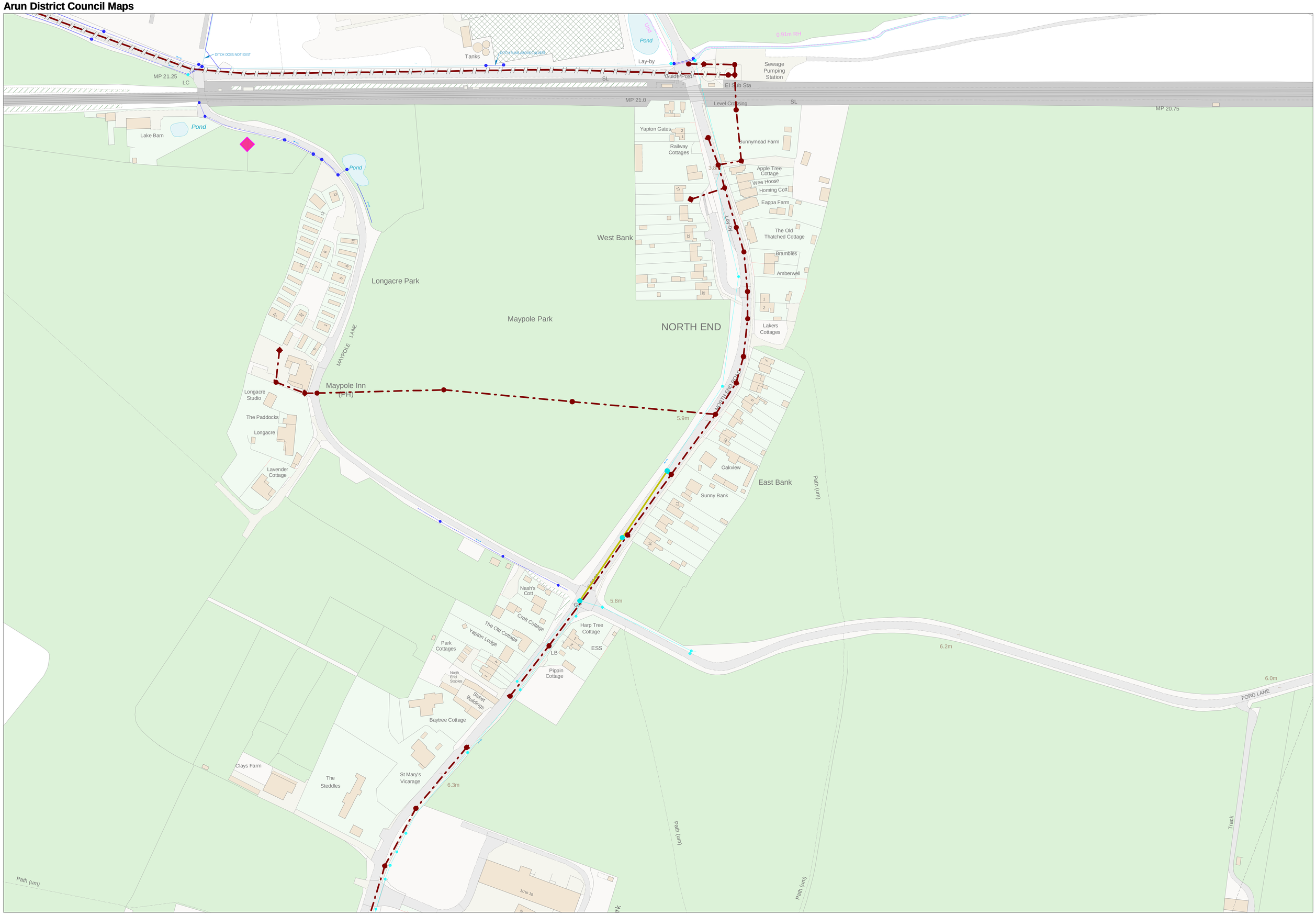
Site Plan

WARNING: BAC pipes are constructed of Bonded Asbestos Cement

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement

Requested By:

Arun District Council Maps



Mapping produced by Arun District Council

© Arun District Council and Crown Copyright. All rights reserved. Licence No: 100018487, 2020

ARUN DISTRICT COUNCIL Y:/163/21/DOC

Production Date: 25 September 2020

Scale: 1:1250@ A1

www.arun.gov.uk

ARUN DISTRICT COUNCIL

Appendix C

Proposed Drainage Design Layout Sheets

ARUN DISTRICT COUNCIL Y/163/21/DOC

GENERAL NOTES:

1. All dimensions to be checked on site. All details and dimensions relating to sub-contractors or suppliers work must be checked and agreed between the sub-contractor or supplier and the main contractor.

2. This drawing is to be read in conjunction with all relevant architects, services and engineers drawings and specifications.

3. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. Any discrepancies shall be notified to gta prior to works commencing.

4. Tender or billing drawings shall not be used for construction or the ordering of materials.

5. Do not scale. All dimensions and levels to be site confirmed.

6. Copyright : This drawing must not be copied, amended nor reproduced without the prior written agreement of gta.

KEY

- Existing surface water drain
- Existing foul water drain
- Private surface water drain
- Private foul drain
- Adoptable foul sewer
- Adoptable surface water sewer
- FIC — Foul Plastic Inspection Chamber - D202.6
- SIC — Surface Water Plastic Inspection Chamber - D202.6
- SAC — 300mm diameter Surface Water Access Chamber - D202.18
- FAC — 300mm diameter Foul Water Access Chamber - D202.18
- FWMH — Private Foul Manhole
- SWMH — Private Surface Water Manhole
- FWSMH — Adoptable Foul water Sewer Manhole
- HWMH — Adoptable Highway Manhole
- SVP — Foul drain point D307.0
- RWP — SW Drain point for RWP D203.5
- Drainage channel
- 300mm wide x 450mm deep gravel filled french drain
- Baffle in Permeable Paving
- Area of voided stone under permeable paving - refer to external works layouts for details
- DT — Distribution tank (inlet) from roof drainage in permeable paving sub-base. See detail on drg 1702
- DT — Distribution tank (Outfall) in permeable paving sub-base. See detail on drg 1702
- +9.400 — Proposed external levels

DESIGN NOTES

1. PERMEABLE PAVING DESIGN BASED ON AVERAGE INFILTRATION RATE OF 0.958 X 10-6 M/S FROM EASTWOOD & PARTNERS TEST RESULTS FOR SHALLOW TEST PITS SA1-5 DATED JANUARY 2020, EXCEPT ZONE 6 BASED ON ACTUAL NEARBY RESULT SA103 AT 6.7X10-6M/S

2. CONTRACTOR TO ESTABLISH LOCATIONS OF ALL EXISTING SERVICES PRIOR TO COMMENCING.

3. EXISTING TREES TO BE PROTECTED WHERE EXCAVATIONS RUN CLOSE.

4. SECTION 106 APPROVAL TO BE GAINED FROM SOUTHERN WATER FOR CONNECTION TO FOUL SEWER

SPECIFICATION NOTES

All drainage shall be constructed and commissioned in accordance with BS EN 295 & BS EN752, Building Regulations Doc. H and any particular requirements of the Building Control Officer.

Drainage pipelines shall be in PVC-u below ground as Marley or similar approved, or vitrified clay.
All sewer pipelines to be VC only.

This drawing shall be read in conjunction with all other relevant drainage drawings, architectural drawings and structural drawings.

For manhole details, gully details, bedding etc, refer to gta detail sheets.

All foul water drain runs shall have a fall of 1:40 or steeper, unless noted otherwise.

All cement used for concrete drainage installations shall be sulphate resistant to class 3 of BRE Digest 363. (Grade ST5)

The use of short radius or 90º bends for changes in direction is not permitted, only long or medium radius 45º bends shall be used. All junctions shall be 45º.

All drains shall have granular bed and surround as class 'S' bedding, unless noted otherwise.

All drainage works shall commence from the downstream end first unless agreed otherwise. Outfall level to be checked by contractor prior to any works commencing and any discrepancy identified to engineer prior to laying and drainage.

ABBREVIATIONS

D307.0	DETAIL NUMBER - SEE DRAINAGE DETAIL SHEET
FD	FOUL DRAIN
SWD	SURFACE WATER DRAIN
FWS	ADOPTABLE FOUL WATER SEWER
SWS	ADOPTABLE SURFACE WATER SEWER
MH	MANHOLE
IC	INSPECTION CHAMBER
SA	SOAKAWAY
FIC	450mm DIA. FOUL INSPECTION CHAMBER - D202.6
SIC	450mm DIA. SURFACE WATER INSPECTION CHAMBER - D202.6
FAC	300mm DIA. FOUL ACCESS CHAMBER - D202.18
SAC	300mm DIA. SURFACE WATER ACCESS CHAMBER - D202.18
CI	CAST IRON
VC	VITRIFIED CLAY
CONC	CONCRETE
PVC-U	POLYVINYL CHLORIDE - UNPLASTICISED
G	SMALL GULLY - D209.0
YG	YARD GULLY - D209.2
RG	ROAD GULLY - D208.1
CPG	CAR PARK GULLY - D208.2
DP	BELOW GROUND DRAIN POINT
SVP	SOIL VENT PIPE DROP
SS	STUB STACK OR DIRECT DRAIN CONNECTION
RP	EXTERNAL RODDING POINT - D213.1
DT	SURFACE WATER DISTRIBUTION TANK
FFL	FINISHED FLOOR LEVEL
SSL	STRUCTURAL SLAB LEVEL
GL	GROUND LEVEL
CL	COVER LEVEL
IL	INVERT LEVEL
SL	SUMP LEVEL
BL	BASE LEVEL
HL	HIGH LEVEL
BD	BACKDROP
CBS	CONCRETE BED & SURROUND
CLASS S	GRANULAR BED & SURROUND
CLASS B	GRANULAR BED

Rev	Amendments	Date	Drn	Chk
P1	INITIAL ISSUE	29.9.21	AE	MR

Status: PRELIMINARY

Client: REDROW HOMES

Architect:

Project: LAND OFF NORTH END ROAD YAPTON

Title: SITE DRAINAGE LAYOUT SHEET 1 OF 2

Date: SEPTEMBER 2021	Scale @ A0: 1:200
Clients Ref:	Project Ref: 11228

gta Civils & Transport
Gloucester House, 66a Church Walk.
Burgess Hill, West Sussex, RH15 9AS
Tel:01444 871444 Web: www.gtacivils.co.uk

Drawing Number: 11228/1601 Rev: P1

GENERAL NOTES:

1. All dimensions to be checked on site. All details and dimensions relating to sub-contractors or suppliers work must be checked and agreed between the sub-contractor or supplier and the main contractor.

2. This drawing is to be read in conjunction with all relevant architects, services and engineers drawings and specifications.

3. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. Any discrepancies shall be notified to gsp prior to works commencing.

4. Tender or billing drawings shall not be used for construction or the ordering of materials.

5. Do not scale. All dimensions and levels to be site confirmed.

6. Copyright : This drawing must not be copied, amended nor reproduced without the prior written agreement of gta.

SPECIFICATION NOTES

All drainage shall be constructed and commissioned in accordance with BS EN 295 & BS EN752, Building Regulations Doc. H and any particular requirements of the Building Control Officer.

Drainage pipelines shall be in PVC-u below ground as Marley or similar approved, or vitrified clay.
All sewer pipelines to be VC only.

This drawing shall be read in conjunction with all other relevant drainage drawings, architectural drawings and structural drawings.

For manhole details, gully details, bedding etc, refer to gta detail sheets.

All foul water drain runs shall have a fall of 1:40 or steeper, unless noted otherwise.

All cement used for concrete drainage installations shall be sulphate resistant to class 3 of BRE Digest 363. (Grade ST5)

The use of short radius or 90º bends for changes in direction is not permitted, only long or medium radius 45º bends shall be used. All junctions shall be 45º.

All drains shall have granular bed and surround as class `S` bedding, unless noted otherwise.

All drainage works shall commence from the downstream end first unless agreed otherwise. Outfall level to be checked by contractor prior to any works commencing and any discrepancy identified to engineer prior to laying and drainage.

ABBREVIATIONS

D307.0	DETAIL NUMBER - SEE DRAINAGE DETAIL SHEET
FD	FOUL DRAIN
SWD	SURFACE WATER DRAIN
FWS	ADOPTABLE FOUL WATER SEWER
SWS	ADOPTABLE SURFACE WATER SEWER
MH	MANHOLE
IC	INSPECTION CHAMBER
SA	SOAKAWAY
FIC	450mm DIA. FOUL INSPECTION CHAMBER - D202.6
SIC	450mm DIA. SURFACE WATER INSPECTION CHAMBER - D202.6
FAC	300mm DIA. FOUL ACCESS CHAMBER - D202.18
SAC	300mm DIA. SURFACE WATER ACCESS CHAMBER - D202.18
CI	CAST IRON
VC	VITRIFIED CLAY
CONC	CONCRETE
PVC-U	POLYVINYL CHLORIDE - UNPLASTICISED
G	SMALL GULLY - D209.0
YG	YARD GULLY - D209.2
RG	ROAD GULLY - D208.1
CPG	CAR PARK GULLY - D208.2
DP	BELOW GROUND DRAIN POINT
SVP	SOIL VENT PIPE DROP
SS	STUB STACK OR DIRECT DRAIN CONNECTION
RP	EXTERNAL RODDING POINT - D213.1
DT	SURFACE WATER DISTRIBUTION TANK
FFL	FINISHED FLOOR LEVEL
SSL	STRUCTURAL SLAB LEVEL
GL	GROUND LEVEL
CL	COVER LEVEL
IL	INVERT LEVEL
SL	SUMP LEVEL
BL	BASE LEVEL
HL	HIGH LEVEL
BD	BACKDROP
CBS	CONCRETE BED & SURROUND
CLASS S	GRANULAR BED & SURROUND
CLASS B	GRANULAR BED

KEY

- Existing surface water drain
- Existing foul water drain
- Private surface water drain
- Private foul drain
- Adoptable foul sewer
- Adoptable surface water sewer
- FIC — Foul Plastic Inspection Chamber - D202.6
- SIC — Surface Water Plastic Inspection Chamber - D202.6
- SAC — 300mm diameter Surface Water Access Chamber - D202.18
- FAC — 300mm diameter Foul Water Access Chamber - D202.18
- FWMH — Private Foul Manhole
- SWMH — Private Surface Water Manhole
- FWSMH — Adoptable Foul water Sewer Manhole
- HWMH — Adoptable Highway Manhole
- SVP — Foul drain point D307.0
- RWP — SW Drain point for RWP D203.5
- Drainage channel
- Baffle in Permeable Paving

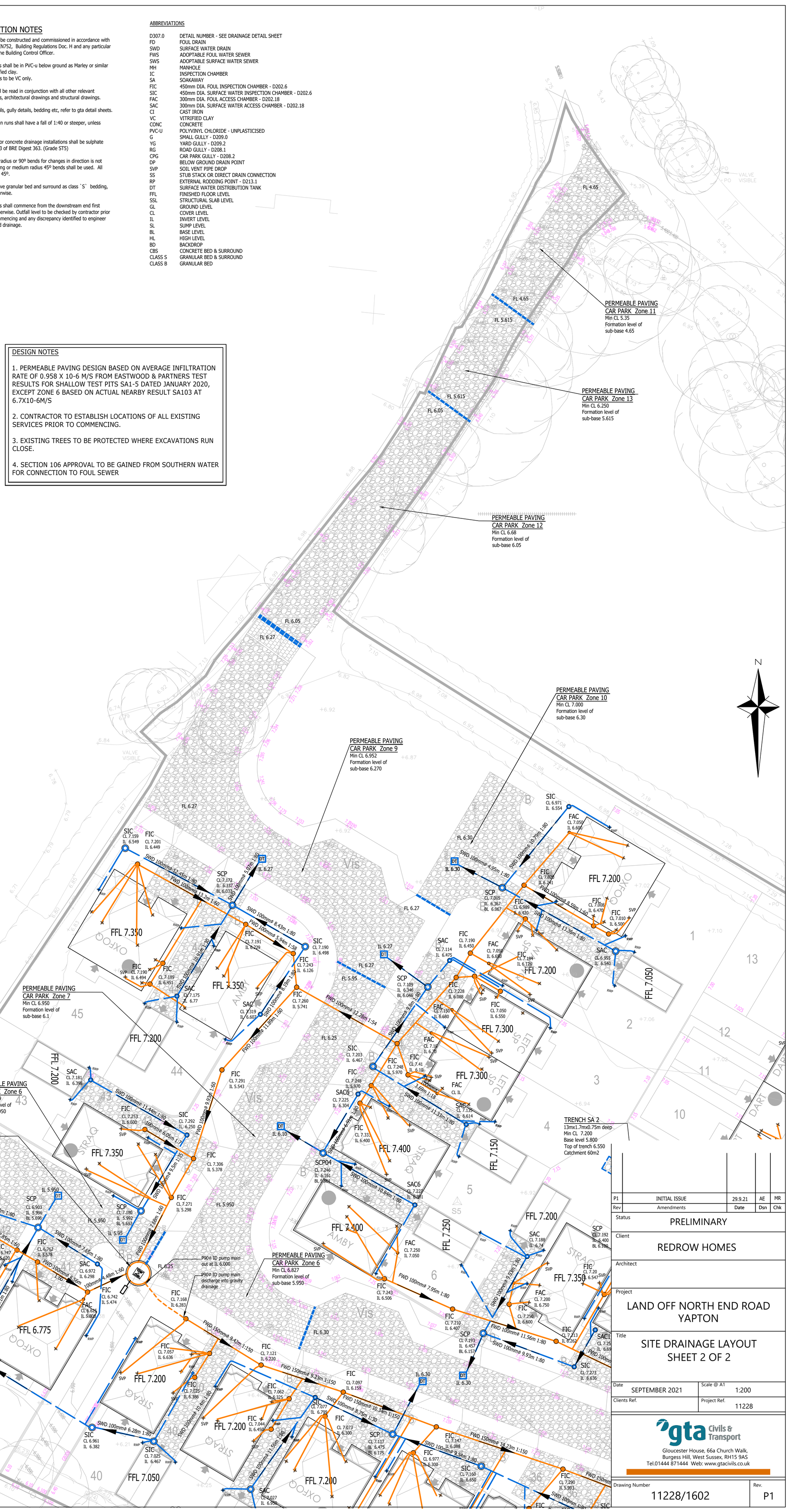
DESIGN NOTES

1. PERMEABLE PAVING DESIGN BASED ON AVERAGE INFILTRATION RATE OF 0.958 X 10-6 M/S FROM EASTWOOD & PARTNERS TEST RESULTS FOR SHALLOW TEST PITS SA1-5 DATED JANUARY 2020, EXCEPT ZONE 6 BASED ON ACTUAL NEARBY RESULT SA103 AT 6.7X10-6M/S

2. CONTRACTOR TO ESTABLISH LOCATIONS OF ALL EXISTING SERVICES PRIOR TO COMMENCING.

3. EXISTING TREES TO BE PROTECTED WHERE EXCAVATIONS RUN CLOSE.

4. SECTION 106 APPROVAL TO BE GAINED FROM SOUTHERN WATER FOR CONNECTION TO FOUL SEWER



Rev	Amendments	Date	Dsn	Chk
P1	INITIAL ISSUE	29.9.21	AE	MR

Status: PRELIMINARY

Client: REDROW HOMES

Architect:

Project: LAND OFF NORTH END ROAD YAPTON

Title: SITE DRAINAGE LAYOUT SHEET 2 OF 2

Date: SEPTEMBER 2021 | Scale @ A1: 1:200

Clients Ref. | Project Ref.: 11228

gta Civils & Transport
Gloucester House, 66a Church Walk,
Burgess Hill, West Sussex, RH15 9AS
Tel.01444 871444 Web: www.gtacivils.co.uk

Drawing Number: 11228/1602 | Rev.: P1

LEGEND

PERMEABLE PAVING

	ZONE 1	AREA = 2253m2
	ZONE 2	AREA = 1068m2
	ZONE 4	AREA = 560m2
	ZONE 5	AREA = 343m2
	ZONE 6	AREA = 589m2
	ZONE 7	AREA = 600m2
	ZONE 9	AREA = 770m2
	ZONE 10	AREA = 325m2
	ZONE 11	AREA = 94m2
	ZONE 12	AREA = 177
	ZONE 13	AREA = 101m2

TRENCH SOAKAWAYS

	ZONE 3	AREA = 63m2
	ZONE 8	AREA = 170m2

GENERAL NOTES:

1. All dimensions to be checked on site. All details and dimensions relating to sub-contractors or suppliers work must be checked and agreed between the sub-contractor or supplier and the main contractor.

2. This drawing is to be read in conjunction with all relevant architects, services and engineers drawings and specifications.

3. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. Any discrepancies shall be notified to gsp prior to works commencing.

4. Tender or billing drawings shall not be used for construction or the ordering of materials.

5. Do not scale. All dimensions and levels to be site confirmed.

6. Copyright : This drawing must not be copied, amended nor reproduced without the prior written agreement of gta.

Rev.	Amendments	Date	Dwn	Chk
P1	INITIAL ISSUE	12.11.21	AE	MR

Status: PRELIMINARY

Client: REDROW HOMES

Architect:

Project: LAND OFF NORTH END ROAD YAPTON

Title: CATCHMENT AND AND IMPLEMENTATION PLAN

Date: NOVEMBER 2021 | Scale @ A0: 1:250

Clients Ref.: | Project Ref.: 11228

gta Civils & Transport
Gloucester House, 66a Church Walk, Burgess Hill, West Sussex, RH15 9AS
Tel.01444 871444 Web: www.gtacivils.co.uk

Drawing Number: 11228/1101 | Rev.: P1

Appendix D

MicroDrainage Calculation Sheets

ARUN DISTRICT COUNCIL Y/163/21/DOC

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 2940 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.701	0.201	0.0	4.5	O K
30 min Summer	5.768	0.268	0.0	6.0	O K
60 min Summer	5.844	0.344	0.0	7.7	O K
120 min Summer	5.904	0.404	0.0	9.0	O K
180 min Summer	5.940	0.440	0.0	9.8	O K
240 min Summer	5.964	0.464	0.0	10.3	O K
360 min Summer	5.992	0.492	0.0	11.0	O K
480 min Summer	6.010	0.510	0.0	11.3	O K
600 min Summer	6.021	0.521	0.0	11.6	O K
720 min Summer	6.028	0.528	0.0	11.8	O K
960 min Summer	6.036	0.536	0.0	11.9	O K
1440 min Summer	6.038	0.538	0.0	12.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	19
30 min Summer	94.616	0.0	34
60 min Summer	60.860	0.0	64
120 min Summer	36.127	0.0	124
180 min Summer	26.472	0.0	184
240 min Summer	21.126	0.0	244
360 min Summer	15.216	0.0	364
480 min Summer	12.017	0.0	482
600 min Summer	9.993	0.0	602
720 min Summer	8.588	0.0	722
960 min Summer	6.754	0.0	962
1440 min Summer	4.821	0.0	1442

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.027	0.527	0.0	11.7	O K
2880 min Summer	6.016	0.516	0.0	11.5	O K
4320 min Summer	6.002	0.502	0.0	11.2	O K
5760 min Summer	5.994	0.494	0.0	11.0	O K
7200 min Summer	5.990	0.490	0.0	10.9	O K
8640 min Summer	5.989	0.489	0.0	10.9	O K
10080 min Summer	5.989	0.489	0.0	10.9	O K
15 min Winter	5.725	0.225	0.0	5.0	O K
30 min Winter	5.801	0.301	0.0	6.7	O K
60 min Winter	5.885	0.385	0.0	8.6	O K
120 min Winter	5.953	0.453	0.0	10.1	O K
180 min Winter	5.994	0.494	0.0	11.0	O K
240 min Winter	6.021	0.521	0.0	11.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	2140
2880 min Summer	2.752	0.0	2448
4320 min Summer	2.023	0.0	3196
5760 min Summer	1.647	0.0	4032
7200 min Summer	1.418	0.0	4832
8640 min Summer	1.263	0.0	5704
10080 min Summer	1.152	0.0	6552
15 min Winter	141.021	0.0	19
30 min Winter	94.616	0.0	34
60 min Winter	60.860	0.0	64
120 min Winter	36.127	0.0	122
180 min Winter	26.472	0.0	182
240 min Winter	21.126	0.0	240

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.055	0.555	0.0	12.4	O K
480 min Winter	6.075	0.575	0.0	12.8	O K
600 min Winter	6.089	0.589	0.0	13.1	O K
720 min Winter	6.098	0.598	0.0	13.3	O K
960 min Winter	6.109	0.609	0.0	13.6	O K
1440 min Winter	6.117	0.617	0.0	13.7	O K
2160 min Winter	6.112	0.612	0.0	13.6	O K
2880 min Winter	6.101	0.601	0.0	13.4	O K
4320 min Winter	6.081	0.581	0.0	12.9	O K
5760 min Winter	6.069	0.569	0.0	12.7	O K
7200 min Winter	6.060	0.560	0.0	12.5	O K
8640 min Winter	6.052	0.552	0.0	12.3	O K
10080 min Winter	6.047	0.547	0.0	12.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	358
480 min Winter	12.017	0.0	476
600 min Winter	9.993	0.0	596
720 min Winter	8.588	0.0	712
960 min Winter	6.754	0.0	944
1440 min Winter	4.821	0.0	1400
2160 min Winter	3.461	0.0	2076
2880 min Winter	2.752	0.0	2708
4320 min Winter	2.023	0.0	3376
5760 min Winter	1.647	0.0	4328
7200 min Winter	1.418	0.0	5264
8640 min Winter	1.263	0.0	6216
10080 min Winter	1.152	0.0	7064

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.017

Time (mins) From:	To:	Area (ha)
0	4	0.017

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 6.500

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.00300	Invert Level (m)	5.500	Cap Volume Depth (m)	0.000
Infiltration Coefficient Side (m/hr)	0.00300	Trench Width (m)	4.5	Cap Infiltration Depth (m)	0.000
Safety Factor	2.0	Trench Length (m)	16.5		
Porosity	0.30	Slope (1:X)	0.0		

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 2507 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.038	0.238	0.0	1.6	O K
30 min Summer	6.118	0.318	0.0	2.1	O K
60 min Summer	6.207	0.407	0.0	2.7	O K
120 min Summer	6.278	0.478	0.0	3.2	O K
180 min Summer	6.320	0.520	0.0	3.5	O K
240 min Summer	6.348	0.548	0.0	3.6	O K
360 min Summer	6.381	0.581	0.0	3.9	O K
480 min Summer	6.401	0.601	0.0	4.0	O K
600 min Summer	6.413	0.613	0.0	4.1	O K
720 min Summer	6.420	0.620	0.0	4.1	O K
960 min Summer	6.427	0.627	0.0	4.2	O K
1440 min Summer	6.425	0.625	0.0	4.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	19
30 min Summer	94.616	0.0	34
60 min Summer	60.860	0.0	64
120 min Summer	36.127	0.0	124
180 min Summer	26.472	0.0	184
240 min Summer	21.126	0.0	244
360 min Summer	15.216	0.0	362
480 min Summer	12.017	0.0	482
600 min Summer	9.993	0.0	602
720 min Summer	8.588	0.0	722
960 min Summer	6.754	0.0	962
1440 min Summer	4.821	0.0	1440

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.410	0.610	0.0	4.0	O K
2880 min Summer	6.398	0.598	0.0	4.0	O K
4320 min Summer	6.383	0.583	0.0	3.9	O K
5760 min Summer	6.373	0.573	0.0	3.8	O K
7200 min Summer	6.367	0.567	0.0	3.8	O K
8640 min Summer	6.364	0.564	0.0	3.7	O K
10080 min Summer	6.364	0.564	0.0	3.7	O K
15 min Winter	6.067	0.267	0.0	1.8	O K
30 min Winter	6.157	0.357	0.0	2.4	O K
60 min Winter	6.257	0.457	0.0	3.0	O K
120 min Winter	6.337	0.537	0.0	3.6	O K
180 min Winter	6.385	0.585	0.0	3.9	O K
240 min Winter	6.417	0.617	0.0	4.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	1880
2880 min Summer	2.752	0.0	2252
4320 min Summer	2.023	0.0	3028
5760 min Summer	1.647	0.0	3872
7200 min Summer	1.418	0.0	4688
8640 min Summer	1.263	0.0	5536
10080 min Summer	1.152	0.0	6360
15 min Winter	141.021	0.0	19
30 min Winter	94.616	0.0	34
60 min Winter	60.860	0.0	64
120 min Winter	36.127	0.0	122
180 min Winter	26.472	0.0	182
240 min Winter	21.126	0.0	240

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.454	0.654	0.0	4.3	O K
480 min Winter	6.477	0.677	0.0	4.5	O K
600 min Winter	6.492	0.692	0.0	4.6	O K
720 min Winter	6.502	0.702	0.0	4.7	O K
960 min Winter	6.513	0.713	0.0	4.7	O K
1440 min Winter	6.516	0.716	0.0	4.7	O K
2160 min Winter	6.504	0.704	0.0	4.7	O K
2880 min Winter	6.487	0.687	0.0	4.6	O K
4320 min Winter	6.468	0.668	0.0	4.4	O K
5760 min Winter	6.451	0.651	0.0	4.3	O K
7200 min Winter	6.438	0.638	0.0	4.2	O K
8640 min Winter	6.427	0.627	0.0	4.2	O K
10080 min Winter	6.418	0.618	0.0	4.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	358
480 min Winter	12.017	0.0	476
600 min Winter	9.993	0.0	594
720 min Winter	8.588	0.0	708
960 min Winter	6.754	0.0	942
1440 min Winter	4.821	0.0	1396
2160 min Winter	3.461	0.0	2036
2880 min Winter	2.752	0.0	2364
4320 min Winter	2.023	0.0	3244
5760 min Winter	1.647	0.0	4200
7200 min Winter	1.418	0.0	5112
8640 min Winter	1.263	0.0	5976
10080 min Winter	1.152	0.0	6864

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.006

Time (mins) From:	To:	Area (ha)
0	4	0.006

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 7.150

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.00300	Invert Level (m)	5.800	Cap Volume Depth (m)	0.000
Infiltration Coefficient Side (m/hr)	0.00300	Trench Width (m)	1.7	Cap Infiltration Depth (m)	0.000
Safety Factor	2.0	Trench Length (m)	13.0		
Porosity	0.30	Slope (1:X)	0.0		

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 3479 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.474	0.174	0.4	50.1	O K
30 min Summer	6.538	0.238	0.4	68.3	O K
60 min Summer	6.608	0.308	0.4	88.6	O K
120 min Summer	6.665	0.365	0.4	104.8	O K
180 min Summer	6.699	0.399	0.4	114.6	O K
240 min Summer	6.722	0.422	0.4	121.2	O K
360 min Summer	6.749	0.449	0.4	129.1	O K
480 min Summer	6.767	0.467	0.4	134.0	O K
600 min Summer	6.778	0.478	0.4	137.3	O K
720 min Summer	6.786	0.486	0.4	139.6	O K
960 min Summer	6.795	0.495	0.4	142.2	O K
1440 min Summer	6.800	0.500	0.4	143.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	23
30 min Summer	94.616	0.0	38
60 min Summer	60.860	0.0	68
120 min Summer	36.127	0.0	128
180 min Summer	26.472	0.0	188
240 min Summer	21.126	0.0	246
360 min Summer	15.216	0.0	366
480 min Summer	12.017	0.0	486
600 min Summer	9.993	0.0	606
720 min Summer	8.588	0.0	726
960 min Summer	6.754	0.0	964
1440 min Summer	4.821	0.0	1442

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.795	0.495	0.4	142.3	O K
2880 min Summer	6.784	0.484	0.4	139.2	O K
4320 min Summer	6.772	0.472	0.4	135.5	O K
5760 min Summer	6.764	0.464	0.4	133.4	O K
7200 min Summer	6.761	0.461	0.4	132.5	O K
8640 min Summer	6.760	0.460	0.4	132.2	O K
10080 min Summer	6.761	0.461	0.4	132.5	O K
15 min Winter	6.497	0.197	0.4	56.5	O K
30 min Winter	6.568	0.268	0.4	77.0	O K
60 min Winter	6.647	0.347	0.4	99.7	O K
120 min Winter	6.711	0.411	0.4	118.1	O K
180 min Winter	6.750	0.450	0.4	129.2	O K
240 min Winter	6.776	0.476	0.4	136.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	2160
2880 min Summer	2.752	0.0	2628
4320 min Summer	2.023	0.0	3336
5760 min Summer	1.647	0.0	4144
7200 min Summer	1.418	0.0	4968
8640 min Summer	1.263	0.0	5800
10080 min Summer	1.152	0.0	6656
15 min Winter	141.021	0.0	23
30 min Winter	94.616	0.0	37
60 min Winter	60.860	0.0	68
120 min Winter	36.127	0.0	126
180 min Winter	26.472	0.0	184
240 min Winter	21.126	0.0	244

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.808	0.508	0.4	145.9	O K
480 min Winter	6.828	0.528	0.4	151.7	O K
600 min Winter	6.842	0.542	0.4	155.7	Flood Risk
720 min Winter	6.852	0.552	0.4	158.5	Flood Risk
960 min Winter	6.864	0.564	0.4	162.0	Flood Risk
1440 min Winter	6.874	0.574	0.4	165.0	Flood Risk
2160 min Winter	6.875	0.575	0.4	165.2	Flood Risk
2880 min Winter	6.869	0.569	0.4	163.4	Flood Risk
4320 min Winter	6.850	0.550	0.4	158.1	Flood Risk
5760 min Winter	6.840	0.540	0.4	155.1	Flood Risk
7200 min Winter	6.833	0.533	0.4	153.0	O K
8640 min Winter	6.827	0.527	0.4	151.3	O K
10080 min Winter	6.823	0.523	0.4	150.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	362
480 min Winter	12.017	0.0	480
600 min Winter	9.993	0.0	598
720 min Winter	8.588	0.0	714
960 min Winter	6.754	0.0	950
1440 min Winter	4.821	0.0	1414
2160 min Winter	3.461	0.0	2096
2880 min Winter	2.752	0.0	2744
4320 min Winter	2.023	0.0	3896
5760 min Winter	1.647	0.0	4448
7200 min Winter	1.418	0.0	5400
8640 min Winter	1.263	0.0	6320
10080 min Winter	1.152	0.0	7264

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.205

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.100	4	8	0.105

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 6.936

Complex Structure

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.300	Depression Storage (mm)	5
Max Percolation (l/s)	209.3	Width (m)	4.8	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	157.0	Membrane Depth (m)	0

Infiltration Blanket

Infiltration Coefficient Base (m/hr)	0.00300	Invert Level (m)	6.300	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Diameter/Width (m)	12.0		
Porosity	0.30	Length (m)	17.0		

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 3103 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.617	0.167	0.2	28.0	O K
30 min Summer	6.673	0.223	0.2	37.5	O K
60 min Summer	6.736	0.286	0.2	48.1	O K
120 min Summer	6.786	0.336	0.2	56.5	O K
180 min Summer	6.816	0.366	0.2	61.6	O K
240 min Summer	6.836	0.386	0.2	64.9	O K
360 min Summer	6.860	0.410	0.2	69.0	O K
480 min Summer	6.874	0.424	0.2	71.4	O K
600 min Summer	6.884	0.434	0.2	73.0	O K
720 min Summer	6.890	0.440	0.2	74.1	O K
960 min Summer	6.897	0.447	0.2	75.2	O K
1440 min Summer	6.900	0.450	0.2	75.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	27
30 min Summer	94.616	0.0	42
60 min Summer	60.860	0.0	72
120 min Summer	36.127	0.0	130
180 min Summer	26.472	0.0	190
240 min Summer	21.126	0.0	250
360 min Summer	15.216	0.0	370
480 min Summer	12.017	0.0	488
600 min Summer	9.993	0.0	608
720 min Summer	8.588	0.0	728
960 min Summer	6.754	0.0	966
1440 min Summer	4.821	0.0	1444

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.891	0.441	0.2	74.3	O K
2880 min Summer	6.880	0.430	0.2	72.3	O K
4320 min Summer	6.867	0.417	0.2	70.1	O K
5760 min Summer	6.859	0.409	0.2	68.8	O K
7200 min Summer	6.855	0.405	0.2	68.1	O K
8640 min Summer	6.853	0.403	0.2	67.7	O K
10080 min Summer	6.852	0.402	0.2	67.7	O K
15 min Winter	6.637	0.187	0.2	31.4	O K
30 min Winter	6.700	0.250	0.2	42.1	O K
60 min Winter	6.771	0.321	0.2	53.9	O K
120 min Winter	6.827	0.377	0.2	63.5	O K
180 min Winter	6.862	0.412	0.2	69.2	O K
240 min Winter	6.884	0.434	0.2	73.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	2160
2880 min Summer	2.752	0.0	2516
4320 min Summer	2.023	0.0	3284
5760 min Summer	1.647	0.0	4088
7200 min Summer	1.418	0.0	4904
8640 min Summer	1.263	0.0	5792
10080 min Summer	1.152	0.0	6648
15 min Winter	141.021	0.0	27
30 min Winter	94.616	0.0	41
60 min Winter	60.860	0.0	70
120 min Winter	36.127	0.0	130
180 min Winter	26.472	0.0	188
240 min Winter	21.126	0.0	246

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.912	0.462	0.2	77.8	O K
480 min Winter	6.930	0.480	0.2	80.7	O K
600 min Winter	6.941	0.491	0.2	82.6	O K
720 min Winter	6.949	0.499	0.2	84.0	O K
960 min Winter	6.959	0.509	0.2	85.6	O K
1440 min Winter	6.966	0.516	0.2	86.8	O K
2160 min Winter	6.963	0.513	0.2	86.4	O K
2880 min Winter	6.955	0.505	0.2	84.9	O K
4320 min Winter	6.935	0.485	0.2	81.6	O K
5760 min Winter	6.924	0.474	0.2	79.7	O K
7200 min Winter	6.915	0.465	0.2	78.2	O K
8640 min Winter	6.908	0.458	0.2	77.0	O K
10080 min Winter	6.902	0.452	0.2	76.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	364
480 min Winter	12.017	0.0	482
600 min Winter	9.993	0.0	600
720 min Winter	8.588	0.0	716
960 min Winter	6.754	0.0	950
1440 min Winter	4.821	0.0	1414
2160 min Winter	3.461	0.0	2092
2880 min Winter	2.752	0.0	2744
4320 min Winter	2.023	0.0	3508
5760 min Winter	1.647	0.0	4400
7200 min Winter	1.418	0.0	5336
8640 min Winter	1.263	0.0	6312
10080 min Winter	1.152	0.0	7256

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.107

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.035	4	8	0.036	8	12	0.036

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 7.231

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.450	Depression Storage (mm)	0
Max Percolation (l/s)	155.8	Width (m)	12.6	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	44.5	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 2796 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.902	0.152	0.1	14.7	O K
30 min Summer	6.954	0.204	0.1	19.7	O K
60 min Summer	7.011	0.261	0.1	25.2	O K
120 min Summer	7.057	0.307	0.1	29.5	O K
180 min Summer	7.084	0.334	0.1	32.1	O K
240 min Summer	7.102	0.352	0.1	33.9	O K
360 min Summer	7.123	0.373	0.1	35.9	O K
480 min Summer	7.135	0.385	0.1	37.1	O K
600 min Summer	7.144	0.394	0.1	37.9	O K
720 min Summer	7.149	0.399	0.1	38.4	O K
960 min Summer	7.154	0.404	0.1	38.9	O K
1440 min Summer	7.154	0.404	0.1	38.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	23
30 min Summer	94.616	0.0	38
60 min Summer	60.860	0.0	68
120 min Summer	36.127	0.0	128
180 min Summer	26.472	0.0	186
240 min Summer	21.126	0.0	246
360 min Summer	15.216	0.0	366
480 min Summer	12.017	0.0	486
600 min Summer	9.993	0.0	606
720 min Summer	8.588	0.0	724
960 min Summer	6.754	0.0	964
1440 min Summer	4.821	0.0	1442

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	7.143	0.393	0.1	37.8	O K
2880 min Summer	7.132	0.382	0.1	36.8	O K
4320 min Summer	7.118	0.368	0.1	35.5	O K
5760 min Summer	7.110	0.360	0.1	34.7	O K
7200 min Summer	7.104	0.354	0.1	34.1	O K
8640 min Summer	7.101	0.351	0.1	33.8	O K
10080 min Summer	7.099	0.349	0.1	33.6	O K
15 min Winter	6.921	0.171	0.1	16.5	O K
30 min Winter	6.979	0.229	0.1	22.0	O K
60 min Winter	7.043	0.293	0.1	28.2	O K
120 min Winter	7.094	0.344	0.1	33.2	O K
180 min Winter	7.125	0.375	0.1	36.1	O K
240 min Winter	7.146	0.396	0.1	38.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	2104
2880 min Summer	2.752	0.0	2420
4320 min Summer	2.023	0.0	3160
5760 min Summer	1.647	0.0	3976
7200 min Summer	1.418	0.0	4832
8640 min Summer	1.263	0.0	5696
10080 min Summer	1.152	0.0	6464
15 min Winter	141.021	0.0	23
30 min Winter	94.616	0.0	37
60 min Winter	60.860	0.0	68
120 min Winter	36.127	0.0	126
180 min Winter	26.472	0.0	184
240 min Winter	21.126	0.0	244

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	7.170	0.420	0.1	40.5	O K
480 min Winter	7.186	0.436	0.1	42.0	O K
600 min Winter	7.196	0.446	0.1	43.0	O K
720 min Winter	7.203	0.453	0.1	43.6	O K
960 min Winter	7.210	0.460	0.1	44.3	O K
1440 min Winter	7.214	0.464	0.1	44.7	O K
2160 min Winter	7.208	0.458	0.1	44.2	O K
2880 min Winter	7.197	0.447	0.1	43.1	O K
4320 min Winter	7.178	0.428	0.1	41.2	O K
5760 min Winter	7.164	0.414	0.1	39.9	O K
7200 min Winter	7.153	0.403	0.1	38.9	O K
8640 min Winter	7.144	0.394	0.1	38.0	O K
10080 min Winter	7.136	0.386	0.1	37.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	362
480 min Winter	12.017	0.0	478
600 min Winter	9.993	0.0	596
720 min Winter	8.588	0.0	714
960 min Winter	6.754	0.0	946
1440 min Winter	4.821	0.0	1404
2160 min Winter	3.461	0.0	2076
2880 min Winter	2.752	0.0	2712
4320 min Winter	2.023	0.0	3412
5760 min Winter	1.647	0.0	4328
7200 min Winter	1.418	0.0	5264
8640 min Winter	1.263	0.0	6216
10080 min Winter	1.152	0.0	7064

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.056

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.028	4	8	0.028

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 7.384

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.750	Depression Storage (mm)	0
Max Percolation (l/s)	89.2	Width (m)	14.6	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	22.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 3282 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.774	0.174	0.1	8.7	O K
30 min Summer	6.833	0.233	0.1	11.6	O K
60 min Summer	6.899	0.299	0.1	14.9	O K
120 min Summer	6.951	0.351	0.1	17.5	O K
180 min Summer	6.983	0.383	0.1	19.0	O K
240 min Summer	7.004	0.404	0.1	20.1	O K
360 min Summer	7.029	0.429	0.1	21.3	O K
480 min Summer	7.045	0.445	0.1	22.1	O K
600 min Summer	7.055	0.455	0.1	22.6	O K
720 min Summer	7.062	0.462	0.1	22.9	O K
960 min Summer	7.070	0.470	0.1	23.3	O K
1440 min Summer	7.073	0.473	0.1	23.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	23
30 min Summer	94.616	0.0	38
60 min Summer	60.860	0.0	68
120 min Summer	36.127	0.0	128
180 min Summer	26.472	0.0	188
240 min Summer	21.126	0.0	248
360 min Summer	15.216	0.0	366
480 min Summer	12.017	0.0	486
600 min Summer	9.993	0.0	606
720 min Summer	8.588	0.0	726
960 min Summer	6.754	0.0	966
1440 min Summer	4.821	0.0	1444

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	7.067	0.467	0.1	23.2	O K
2880 min Summer	7.055	0.455	0.1	22.6	O K
4320 min Summer	7.042	0.442	0.1	22.0	O K
5760 min Summer	7.034	0.434	0.1	21.6	O K
7200 min Summer	7.031	0.431	0.1	21.4	O K
8640 min Summer	7.030	0.430	0.1	21.4	O K
10080 min Summer	7.030	0.430	0.1	21.4	O K
15 min Winter	6.795	0.195	0.1	9.7	O K
30 min Winter	6.862	0.262	0.1	13.0	O K
60 min Winter	6.935	0.335	0.1	16.7	O K
120 min Winter	6.995	0.395	0.1	19.6	O K
180 min Winter	7.030	0.430	0.1	21.4	O K
240 min Winter	7.054	0.454	0.1	22.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	2160
2880 min Summer	2.752	0.0	2624
4320 min Summer	2.023	0.0	3332
5760 min Summer	1.647	0.0	4144
7200 min Summer	1.418	0.0	4968
8640 min Summer	1.263	0.0	5800
10080 min Summer	1.152	0.0	6656
15 min Winter	141.021	0.0	23
30 min Winter	94.616	0.0	38
60 min Winter	60.860	0.0	68
120 min Winter	36.127	0.0	126
180 min Winter	26.472	0.0	186
240 min Winter	21.126	0.0	244

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	7.084	0.484	0.1	24.0	O K
480 min Winter	7.102	0.502	0.1	24.9	O K
600 min Winter	7.115	0.515	0.1	25.6	O K
720 min Winter	7.124	0.524	0.1	26.0	Flood Risk
960 min Winter	7.134	0.534	0.1	26.5	Flood Risk
1440 min Winter	7.143	0.543	0.1	27.0	Flood Risk
2160 min Winter	7.142	0.542	0.1	26.9	Flood Risk
2880 min Winter	7.134	0.534	0.1	26.6	Flood Risk
4320 min Winter	7.115	0.515	0.1	25.6	O K
5760 min Winter	7.105	0.505	0.1	25.1	O K
7200 min Winter	7.097	0.497	0.1	24.7	O K
8640 min Winter	7.091	0.491	0.1	24.4	O K
10080 min Winter	7.087	0.487	0.1	24.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	362
480 min Winter	12.017	0.0	480
600 min Winter	9.993	0.0	598
720 min Winter	8.588	0.0	716
960 min Winter	6.754	0.0	950
1440 min Winter	4.821	0.0	1414
2160 min Winter	3.461	0.0	2096
2880 min Winter	2.752	0.0	2744
4320 min Winter	2.023	0.0	3892
5760 min Winter	1.647	0.0	4440
7200 min Winter	1.418	0.0	5400
8640 min Winter	1.263	0.0	6312
10080 min Winter	1.152	0.0	7264

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.033

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.009	4	8	0.024

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 7.216

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.600	Depression Storage (mm)	0
Max Percolation (l/s)	46.0	Width (m)	7.2	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	23.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 1901 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.210	0.260	0.2	15.4	O K
30 min Summer	6.298	0.348	0.2	20.6	O K
60 min Summer	6.394	0.444	0.2	26.3	O K
120 min Summer	6.469	0.519	0.2	30.7	O K
180 min Summer	6.512	0.562	0.2	33.3	O K
240 min Summer	6.539	0.589	0.2	34.9	O K
360 min Summer	6.569	0.619	0.2	36.7	O K
480 min Summer	6.584	0.634	0.2	37.6	O K
600 min Summer	6.592	0.642	0.2	38.0	O K
720 min Summer	6.595	0.645	0.2	38.2	O K
960 min Summer	6.591	0.641	0.2	38.0	O K
1440 min Summer	6.567	0.617	0.2	36.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	23
30 min Summer	94.616	0.0	38
60 min Summer	60.860	0.0	68
120 min Summer	36.127	0.0	126
180 min Summer	26.472	0.0	186
240 min Summer	21.126	0.0	246
360 min Summer	15.216	0.0	366
480 min Summer	12.017	0.0	484
600 min Summer	9.993	0.0	604
720 min Summer	8.588	0.0	724
960 min Summer	6.754	0.0	962
1440 min Summer	4.821	0.0	1430

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.530	0.580	0.2	34.4	O K
2880 min Summer	6.504	0.554	0.2	32.8	O K
4320 min Summer	6.467	0.517	0.2	30.6	O K
5760 min Summer	6.440	0.490	0.2	29.0	O K
7200 min Summer	6.419	0.469	0.2	27.8	O K
8640 min Summer	6.402	0.452	0.2	26.8	O K
10080 min Summer	6.387	0.437	0.2	25.9	O K
15 min Winter	6.242	0.292	0.2	17.3	O K
30 min Winter	6.340	0.390	0.2	23.1	O K
60 min Winter	6.448	0.498	0.2	29.5	O K
120 min Winter	6.533	0.583	0.2	34.6	O K
180 min Winter	6.583	0.633	0.2	37.5	O K
240 min Winter	6.615	0.665	0.2	39.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	1736
2880 min Summer	2.752	0.0	2108
4320 min Summer	2.023	0.0	2936
5760 min Summer	1.647	0.0	3752
7200 min Summer	1.418	0.0	4544
8640 min Summer	1.263	0.0	5368
10080 min Summer	1.152	0.0	6248
15 min Winter	141.021	0.0	23
30 min Winter	94.616	0.0	37
60 min Winter	60.860	0.0	66
120 min Winter	36.127	0.0	126
180 min Winter	26.472	0.0	184
240 min Winter	21.126	0.0	242

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.652	0.702	0.2	41.6	O K
480 min Winter	6.671	0.721	0.2	42.7	O K
600 min Winter	6.683	0.733	0.2	43.4	O K
720 min Winter	6.688	0.738	0.2	43.7	O K
960 min Winter	6.689	0.739	0.2	43.8	O K
1440 min Winter	6.673	0.723	0.2	42.9	O K
2160 min Winter	6.633	0.683	0.2	40.5	O K
2880 min Winter	6.597	0.647	0.2	38.3	O K
4320 min Winter	6.544	0.594	0.2	35.2	O K
5760 min Winter	6.498	0.548	0.2	32.5	O K
7200 min Winter	6.460	0.510	0.2	30.2	O K
8640 min Winter	6.425	0.475	0.2	28.2	O K
10080 min Winter	6.395	0.445	0.2	26.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	360
480 min Winter	12.017	0.0	478
600 min Winter	9.993	0.0	594
720 min Winter	8.588	0.0	710
960 min Winter	6.754	0.0	940
1440 min Winter	4.821	0.0	1388
2160 min Winter	3.461	0.0	2012
2880 min Winter	2.752	0.0	2276
4320 min Winter	2.023	0.0	3196
5760 min Winter	1.647	0.0	4096
7200 min Winter	1.418	0.0	4976
8640 min Winter	1.263	0.0	5872
10080 min Winter	1.152	0.0	6664

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.059

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.029	4	8	0.030

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 6.827

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00700	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	5.950	Depression Storage (mm)	0
Max Percolation (l/s)	54.9	Width (m)	7.9	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	25.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 3401 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.280	0.180	0.1	15.5	O K
30 min Summer	6.341	0.241	0.1	20.7	O K
60 min Summer	6.409	0.309	0.1	26.6	O K
120 min Summer	6.463	0.363	0.1	31.2	O K
180 min Summer	6.496	0.396	0.1	34.0	O K
240 min Summer	6.518	0.418	0.1	35.9	O K
360 min Summer	6.544	0.444	0.1	38.2	O K
480 min Summer	6.560	0.460	0.1	39.6	O K
600 min Summer	6.571	0.471	0.1	40.5	O K
720 min Summer	6.578	0.478	0.1	41.1	O K
960 min Summer	6.587	0.487	0.1	41.9	O K
1440 min Summer	6.592	0.492	0.1	42.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	23
30 min Summer	94.616	0.0	38
60 min Summer	60.860	0.0	68
120 min Summer	36.127	0.0	128
180 min Summer	26.472	0.0	188
240 min Summer	21.126	0.0	246
360 min Summer	15.216	0.0	366
480 min Summer	12.017	0.0	486
600 min Summer	9.993	0.0	606
720 min Summer	8.588	0.0	726
960 min Summer	6.754	0.0	964
1440 min Summer	4.821	0.0	1444

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.586	0.486	0.1	41.8	O K
2880 min Summer	6.575	0.475	0.1	40.9	O K
4320 min Summer	6.562	0.462	0.1	39.7	O K
5760 min Summer	6.554	0.454	0.1	39.1	O K
7200 min Summer	6.552	0.452	0.1	38.8	O K
8640 min Summer	6.551	0.451	0.1	38.8	O K
10080 min Summer	6.552	0.452	0.1	38.9	O K
15 min Winter	6.302	0.202	0.1	17.4	O K
30 min Winter	6.370	0.270	0.1	23.2	O K
60 min Winter	6.446	0.346	0.1	29.8	O K
120 min Winter	6.508	0.408	0.1	35.1	O K
180 min Winter	6.545	0.445	0.1	38.3	O K
240 min Winter	6.570	0.470	0.1	40.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	2160
2880 min Summer	2.752	0.0	2684
4320 min Summer	2.023	0.0	3380
5760 min Summer	1.647	0.0	4152
7200 min Summer	1.418	0.0	4976
8640 min Summer	1.263	0.0	5872
10080 min Summer	1.152	0.0	6664
15 min Winter	141.021	0.0	23
30 min Winter	94.616	0.0	37
60 min Winter	60.860	0.0	68
120 min Winter	36.127	0.0	126
180 min Winter	26.472	0.0	184
240 min Winter	21.126	0.0	244

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.600	0.500	0.1	43.0	O K
480 min Winter	6.620	0.520	0.1	44.7	O K
600 min Winter	6.633	0.533	0.1	45.8	O K
720 min Winter	6.642	0.542	0.1	46.6	O K
960 min Winter	6.654	0.554	0.1	47.6	O K
1440 min Winter	6.664	0.564	0.1	48.5	O K
2160 min Winter	6.664	0.564	0.1	48.5	O K
2880 min Winter	6.657	0.557	0.1	47.9	O K
4320 min Winter	6.640	0.540	0.1	46.4	O K
5760 min Winter	6.629	0.529	0.1	45.5	O K
7200 min Winter	6.622	0.522	0.1	44.9	O K
8640 min Winter	6.617	0.517	0.1	44.5	O K
10080 min Winter	6.614	0.514	0.1	44.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	362
480 min Winter	12.017	0.0	480
600 min Winter	9.993	0.0	598
720 min Winter	8.588	0.0	716
960 min Winter	6.754	0.0	950
1440 min Winter	4.821	0.0	1414
2160 min Winter	3.461	0.0	2096
2880 min Winter	2.752	0.0	2764
4320 min Winter	2.023	0.0	3972
5760 min Winter	1.647	0.0	4496
7200 min Winter	1.418	0.0	5408
8640 min Winter	1.263	0.0	6392
10080 min Winter	1.152	0.0	7272

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.059

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.029	4	8	0.030

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 6.950

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.100	Depression Storage (mm)	0
Max Percolation (l/s)	79.6	Width (m)	6.1	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	47.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 3407 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.580	0.180	0.1	11.0	O K
30 min Summer	6.641	0.241	0.1	14.8	O K
60 min Summer	6.709	0.309	0.1	18.9	O K
120 min Summer	6.763	0.363	0.1	22.2	O K
180 min Summer	6.796	0.396	0.1	24.2	O K
240 min Summer	6.818	0.418	0.1	25.6	O K
360 min Summer	6.844	0.444	0.1	27.2	O K
480 min Summer	6.860	0.460	0.1	28.2	O K
600 min Summer	6.871	0.471	0.1	28.8	O K
720 min Summer	6.879	0.479	0.1	29.3	O K
960 min Summer	6.887	0.487	0.1	29.8	O K
1440 min Summer	6.892	0.492	0.1	30.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	23
30 min Summer	94.616	0.0	38
60 min Summer	60.860	0.0	68
120 min Summer	36.127	0.0	128
180 min Summer	26.472	0.0	188
240 min Summer	21.126	0.0	246
360 min Summer	15.216	0.0	366
480 min Summer	12.017	0.0	486
600 min Summer	9.993	0.0	606
720 min Summer	8.588	0.0	726
960 min Summer	6.754	0.0	964
1440 min Summer	4.821	0.0	1442

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.886	0.486	0.1	29.8	O K
2880 min Summer	6.875	0.475	0.1	29.1	O K
4320 min Summer	6.862	0.462	0.1	28.3	O K
5760 min Summer	6.855	0.455	0.1	27.8	O K
7200 min Summer	6.852	0.452	0.1	27.6	O K
8640 min Summer	6.851	0.451	0.1	27.6	O K
10080 min Summer	6.852	0.452	0.1	27.7	O K
15 min Winter	6.602	0.202	0.1	12.4	O K
30 min Winter	6.670	0.270	0.1	16.5	O K
60 min Winter	6.746	0.346	0.1	21.2	O K
120 min Winter	6.808	0.408	0.1	25.0	O K
180 min Winter	6.845	0.445	0.1	27.2	O K
240 min Winter	6.870	0.470	0.1	28.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	2160
2880 min Summer	2.752	0.0	2684
4320 min Summer	2.023	0.0	3380
5760 min Summer	1.647	0.0	4152
7200 min Summer	1.418	0.0	4976
8640 min Summer	1.263	0.0	5872
10080 min Summer	1.152	0.0	6664
15 min Winter	141.021	0.0	23
30 min Winter	94.616	0.0	37
60 min Winter	60.860	0.0	68
120 min Winter	36.127	0.0	126
180 min Winter	26.472	0.0	184
240 min Winter	21.126	0.0	244

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.901	0.501	0.1	30.6	O K
480 min Winter	6.920	0.520	0.1	31.8	O K
600 min Winter	6.933	0.533	0.1	32.6	O K
720 min Winter	6.942	0.542	0.1	33.2	O K
960 min Winter	6.954	0.554	0.1	33.9	O K
1440 min Winter	6.964	0.564	0.1	34.5	O K
2160 min Winter	6.964	0.564	0.1	34.5	O K
2880 min Winter	6.958	0.558	0.1	34.1	O K
4320 min Winter	6.940	0.540	0.1	33.1	O K
5760 min Winter	6.929	0.529	0.1	32.4	O K
7200 min Winter	6.922	0.522	0.1	32.0	O K
8640 min Winter	6.918	0.518	0.1	31.7	O K
10080 min Winter	6.914	0.514	0.1	31.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	362
480 min Winter	12.017	0.0	480
600 min Winter	9.993	0.0	598
720 min Winter	8.588	0.0	716
960 min Winter	6.754	0.0	950
1440 min Winter	4.821	0.0	1414
2160 min Winter	3.461	0.0	2096
2880 min Winter	2.752	0.0	2764
4320 min Winter	2.023	0.0	3972
5760 min Winter	1.647	0.0	4496
7200 min Winter	1.418	0.0	5408
8640 min Winter	1.263	0.0	6392
10080 min Winter	1.152	0.0	7352

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.042

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.021	4	8	0.021

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 7.139

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.400	Depression Storage (mm)	0
Max Percolation (l/s)	56.7	Width (m)	20.0	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	10.2	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 3476 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.373	0.173	0.1	18.0	O K
30 min Summer	6.437	0.237	0.1	24.7	O K
60 min Summer	6.508	0.308	0.1	32.1	O K
120 min Summer	6.565	0.365	0.1	38.1	O K
180 min Summer	6.599	0.399	0.1	41.7	O K
240 min Summer	6.622	0.422	0.1	44.1	O K
360 min Summer	6.650	0.450	0.1	47.0	O K
480 min Summer	6.667	0.467	0.1	48.8	O K
600 min Summer	6.679	0.479	0.1	50.0	O K
720 min Summer	6.687	0.487	0.1	50.8	O K
960 min Summer	6.696	0.496	0.1	51.8	O K
1440 min Summer	6.701	0.501	0.1	52.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	27
30 min Summer	94.616	0.0	42
60 min Summer	60.860	0.0	72
120 min Summer	36.127	0.0	132
180 min Summer	26.472	0.0	190
240 min Summer	21.126	0.0	250
360 min Summer	15.216	0.0	370
480 min Summer	12.017	0.0	488
600 min Summer	9.993	0.0	608
720 min Summer	8.588	0.0	728
960 min Summer	6.754	0.0	966
1440 min Summer	4.821	0.0	1444

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.696	0.496	0.1	51.8	O K
2880 min Summer	6.686	0.486	0.1	50.7	O K
4320 min Summer	6.673	0.473	0.1	49.4	O K
5760 min Summer	6.666	0.466	0.1	48.6	O K
7200 min Summer	6.662	0.462	0.1	48.3	O K
8640 min Summer	6.661	0.461	0.1	48.2	O K
10080 min Summer	6.662	0.462	0.1	48.3	O K
15 min Winter	6.396	0.196	0.1	20.4	O K
30 min Winter	6.467	0.267	0.1	27.9	O K
60 min Winter	6.547	0.347	0.1	36.2	O K
120 min Winter	6.611	0.411	0.1	43.0	O K
180 min Winter	6.650	0.450	0.1	47.0	O K
240 min Winter	6.676	0.476	0.1	49.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	2160
2880 min Summer	2.752	0.0	2628
4320 min Summer	2.023	0.0	3336
5760 min Summer	1.647	0.0	4144
7200 min Summer	1.418	0.0	4976
8640 min Summer	1.263	0.0	5800
10080 min Summer	1.152	0.0	6664
15 min Winter	141.021	0.0	27
30 min Winter	94.616	0.0	41
60 min Winter	60.860	0.0	70
120 min Winter	36.127	0.0	130
180 min Winter	26.472	0.0	188
240 min Winter	21.126	0.0	246

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.709	0.509	0.1	53.1	O K
480 min Winter	6.729	0.529	0.1	55.3	O K
600 min Winter	6.743	0.543	0.1	56.7	O K
720 min Winter	6.753	0.553	0.1	57.8	O K
960 min Winter	6.765	0.565	0.1	59.0	O K
1440 min Winter	6.776	0.576	0.1	60.1	O K
2160 min Winter	6.776	0.576	0.1	60.2	O K
2880 min Winter	6.770	0.570	0.1	59.5	O K
4320 min Winter	6.752	0.552	0.1	57.6	O K
5760 min Winter	6.741	0.541	0.1	56.5	O K
7200 min Winter	6.734	0.534	0.1	55.8	O K
8640 min Winter	6.728	0.528	0.1	55.1	O K
10080 min Winter	6.724	0.524	0.1	54.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	364
480 min Winter	12.017	0.0	482
600 min Winter	9.993	0.0	600
720 min Winter	8.588	0.0	716
960 min Winter	6.754	0.0	952
1440 min Winter	4.821	0.0	1414
2160 min Winter	3.461	0.0	2096
2880 min Winter	2.752	0.0	2748
4320 min Winter	2.023	0.0	3892
5760 min Winter	1.647	0.0	4448
7200 min Winter	1.418	0.0	5408
8640 min Winter	1.263	0.0	6320
10080 min Winter	1.152	0.0	7264

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.075

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.025	4	8	0.025	8	12	0.025

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 6.952

Complex Structure

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.200	Depression Storage (mm)	5
Max Percolation (l/s)	89.8	Width (m)	6.3	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	51.3	Membrane Depth (m)	0

Infiltration Blanket

Infiltration Coefficient Base (m/hr)	0.00300	Invert Level (m)	6.200	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Diameter/Width (m)	5.0		
Porosity	0.30	Length (m)	5.0		

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 3287 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.475	0.175	0.1	8.4	O K
30 min Summer	6.534	0.234	0.1	11.2	O K
60 min Summer	6.600	0.300	0.1	14.4	O K
120 min Summer	6.653	0.353	0.1	16.9	O K
180 min Summer	6.684	0.384	0.1	18.4	O K
240 min Summer	6.705	0.405	0.1	19.5	O K
360 min Summer	6.731	0.431	0.1	20.7	O K
480 min Summer	6.746	0.446	0.1	21.4	O K
600 min Summer	6.757	0.457	0.1	21.9	O K
720 min Summer	6.764	0.464	0.1	22.3	O K
960 min Summer	6.771	0.471	0.1	22.6	O K
1440 min Summer	6.775	0.475	0.1	22.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	23
30 min Summer	94.616	0.0	38
60 min Summer	60.860	0.0	68
120 min Summer	36.127	0.0	128
180 min Summer	26.472	0.0	188
240 min Summer	21.126	0.0	246
360 min Summer	15.216	0.0	366
480 min Summer	12.017	0.0	486
600 min Summer	9.993	0.0	606
720 min Summer	8.588	0.0	726
960 min Summer	6.754	0.0	964
1440 min Summer	4.821	0.0	1444

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.769	0.469	0.1	22.5	O K
2880 min Summer	6.758	0.458	0.1	22.0	O K
4320 min Summer	6.744	0.444	0.1	21.3	O K
5760 min Summer	6.737	0.437	0.1	21.0	O K
7200 min Summer	6.733	0.433	0.1	20.8	O K
8640 min Summer	6.732	0.432	0.1	20.7	O K
10080 min Summer	6.733	0.433	0.1	20.8	O K
15 min Winter	6.496	0.196	0.1	9.4	O K
30 min Winter	6.563	0.263	0.1	12.6	O K
60 min Winter	6.636	0.336	0.1	16.1	O K
120 min Winter	6.696	0.396	0.1	19.0	O K
180 min Winter	6.732	0.432	0.1	20.7	O K
240 min Winter	6.756	0.456	0.1	21.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	2160
2880 min Summer	2.752	0.0	2628
4320 min Summer	2.023	0.0	3332
5760 min Summer	1.647	0.0	4144
7200 min Summer	1.418	0.0	4968
8640 min Summer	1.263	0.0	5800
10080 min Summer	1.152	0.0	6656
15 min Winter	141.021	0.0	23
30 min Winter	94.616	0.0	37
60 min Winter	60.860	0.0	68
120 min Winter	36.127	0.0	126
180 min Winter	26.472	0.0	184
240 min Winter	21.126	0.0	244

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.786	0.486	0.1	23.3	O K
480 min Winter	6.804	0.504	0.1	24.2	O K
600 min Winter	6.817	0.517	0.1	24.8	O K
720 min Winter	6.826	0.526	0.1	25.2	O K
960 min Winter	6.836	0.536	0.1	25.8	O K
1440 min Winter	6.845	0.545	0.1	26.2	O K
2160 min Winter	6.844	0.544	0.1	26.1	O K
2880 min Winter	6.837	0.537	0.1	25.8	O K
4320 min Winter	6.818	0.518	0.1	24.9	O K
5760 min Winter	6.807	0.507	0.1	24.4	O K
7200 min Winter	6.800	0.500	0.1	24.0	O K
8640 min Winter	6.794	0.494	0.1	23.7	O K
10080 min Winter	6.790	0.490	0.1	23.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	362
480 min Winter	12.017	0.0	480
600 min Winter	9.993	0.0	598
720 min Winter	8.588	0.0	714
960 min Winter	6.754	0.0	950
1440 min Winter	4.821	0.0	1414
2160 min Winter	3.461	0.0	2096
2880 min Winter	2.752	0.0	2744
4320 min Winter	2.023	0.0	3892
5760 min Winter	1.647	0.0	4440
7200 min Winter	1.418	0.0	5400
8640 min Winter	1.263	0.0	6320
10080 min Winter	1.152	0.0	7264

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.032

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.015	4	8	0.017

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 7.050

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.300	Depression Storage (mm)	0
Max Percolation (l/s)	44.4	Width (m)	10.0	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	16.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Half Drain Time : 1582 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	4.744	0.094	0.0	2.6	O K
30 min Summer	4.775	0.125	0.0	3.5	O K
60 min Summer	4.810	0.160	0.0	4.5	O K
120 min Summer	4.837	0.187	0.0	5.2	O K
180 min Summer	4.852	0.202	0.0	5.6	O K
240 min Summer	4.862	0.212	0.0	5.9	O K
360 min Summer	4.873	0.223	0.0	6.2	O K
480 min Summer	4.878	0.228	0.0	6.4	O K
600 min Summer	4.880	0.230	0.0	6.4	O K
720 min Summer	4.881	0.231	0.0	6.4	O K
960 min Summer	4.879	0.229	0.0	6.4	O K
1440 min Summer	4.871	0.221	0.0	6.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	19
30 min Summer	94.616	0.0	34
60 min Summer	60.860	0.0	64
120 min Summer	36.127	0.0	124
180 min Summer	26.472	0.0	184
240 min Summer	21.126	0.0	242
360 min Summer	15.216	0.0	362
480 min Summer	12.017	0.0	482
600 min Summer	9.993	0.0	602
720 min Summer	8.588	0.0	722
960 min Summer	6.754	0.0	960
1440 min Summer	4.821	0.0	1254

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	4.860	0.210	0.0	5.9	O K
2880 min Summer	4.851	0.201	0.0	5.6	O K
4320 min Summer	4.837	0.187	0.0	5.2	O K
5760 min Summer	4.826	0.176	0.0	4.9	O K
7200 min Summer	4.816	0.166	0.0	4.6	O K
8640 min Summer	4.809	0.159	0.0	4.4	O K
10080 min Summer	4.802	0.152	0.0	4.2	O K
15 min Winter	4.755	0.105	0.0	2.9	O K
30 min Winter	4.791	0.141	0.0	3.9	O K
60 min Winter	4.829	0.179	0.0	5.0	O K
120 min Winter	4.860	0.210	0.0	5.9	O K
180 min Winter	4.878	0.228	0.0	6.4	O K
240 min Winter	4.889	0.239	0.0	6.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	1620
2880 min Summer	2.752	0.0	2016
4320 min Summer	2.023	0.0	2812
5760 min Summer	1.647	0.0	3640
7200 min Summer	1.418	0.0	4464
8640 min Summer	1.263	0.0	5272
10080 min Summer	1.152	0.0	6048
15 min Winter	141.021	0.0	19
30 min Winter	94.616	0.0	33
60 min Winter	60.860	0.0	64
120 min Winter	36.127	0.0	122
180 min Winter	26.472	0.0	180
240 min Winter	21.126	0.0	240

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	4.902	0.252	0.0	7.0	O K
480 min Winter	4.908	0.258	0.0	7.2	O K
600 min Winter	4.912	0.262	0.0	7.3	O K
720 min Winter	4.914	0.264	0.0	7.4	O K
960 min Winter	4.913	0.263	0.0	7.3	O K
1440 min Winter	4.906	0.256	0.0	7.2	O K
2160 min Winter	4.891	0.241	0.0	6.7	O K
2880 min Winter	4.880	0.230	0.0	6.4	O K
4320 min Winter	4.858	0.208	0.0	5.8	O K
5760 min Winter	4.839	0.189	0.0	5.3	O K
7200 min Winter	4.822	0.172	0.0	4.8	O K
8640 min Winter	4.808	0.158	0.0	4.4	O K
10080 min Winter	4.795	0.145	0.0	4.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	358
480 min Winter	12.017	0.0	474
600 min Winter	9.993	0.0	590
720 min Winter	8.588	0.0	706
960 min Winter	6.754	0.0	932
1440 min Winter	4.821	0.0	1370
2160 min Winter	3.461	0.0	1732
2880 min Winter	2.752	0.0	2188
4320 min Winter	2.023	0.0	3072
5760 min Winter	1.647	0.0	3976
7200 min Winter	1.418	0.0	4824
8640 min Winter	1.263	0.0	5624
10080 min Winter	1.152	0.0	6456

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.010

Time (mins) From:	To:	Area (ha)
0	4	0.010

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 5.350

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	4.650	Depression Storage (mm)	0
Max Percolation (l/s)	25.8	Width (m)	6.0	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	15.5	Membrane Depth (m)	0

©1982-2020 Innovyze

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

Half Drain Time : 1695 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.199	0.099	0.1	5.2	O K
30 min Summer	6.233	0.133	0.1	7.0	O K
60 min Summer	6.269	0.169	0.1	8.9	O K
120 min Summer	6.298	0.198	0.1	10.4	O K
180 min Summer	6.314	0.214	0.1	11.3	O K
240 min Summer	6.325	0.225	0.1	11.9	O K
360 min Summer	6.336	0.236	0.1	12.5	O K
480 min Summer	6.342	0.242	0.1	12.8	O K
600 min Summer	6.345	0.245	0.1	12.9	O K
720 min Summer	6.346	0.246	0.1	13.0	O K
960 min Summer	6.345	0.245	0.1	12.9	O K
1440 min Summer	6.337	0.237	0.1	12.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	19
30 min Summer	94.616	0.0	34
60 min Summer	60.860	0.0	64
120 min Summer	36.127	0.0	124
180 min Summer	26.472	0.0	184
240 min Summer	21.126	0.0	242
360 min Summer	15.216	0.0	362
480 min Summer	12.017	0.0	482
600 min Summer	9.993	0.0	602
720 min Summer	8.588	0.0	722
960 min Summer	6.754	0.0	960
1440 min Summer	4.821	0.0	1312

©1982-2020 Innovyze

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.326	0.226	0.1	11.9	O K
2880 min Summer	6.317	0.217	0.1	11.5	O K
4320 min Summer	6.303	0.203	0.1	10.7	O K
5760 min Summer	6.291	0.191	0.1	10.1	O K
7200 min Summer	6.282	0.182	0.1	9.6	O K
8640 min Summer	6.275	0.175	0.1	9.2	O K
10080 min Summer	6.268	0.168	0.1	8.9	O K
15 min Winter	6.211	0.111	0.1	5.9	O K
30 min Winter	6.249	0.149	0.1	7.8	O K
60 min Winter	6.290	0.190	0.1	10.0	O K
120 min Winter	6.322	0.222	0.1	11.7	O K
180 min Winter	6.341	0.241	0.1	12.7	O K
240 min Winter	6.353	0.253	0.1	13.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	1660
2880 min Summer	2.752	0.0	2044
4320 min Summer	2.023	0.0	2852
5760 min Summer	1.647	0.0	3688
7200 min Summer	1.418	0.0	4472
8640 min Summer	1.263	0.0	5280
10080 min Summer	1.152	0.0	6056
15 min Winter	141.021	0.0	19
30 min Winter	94.616	0.0	34
60 min Winter	60.860	0.0	64
120 min Winter	36.127	0.0	122
180 min Winter	26.472	0.0	180
240 min Winter	21.126	0.0	240

©1982-2020 Innovyze

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.367	0.267	0.1	14.1	O K
480 min Winter	6.375	0.275	0.1	14.5	O K
600 min Winter	6.379	0.279	0.1	14.7	O K
720 min Winter	6.381	0.281	0.1	14.8	O K
960 min Winter	6.381	0.281	0.1	14.8	O K
1440 min Winter	6.375	0.275	0.1	14.5	O K
2160 min Winter	6.360	0.260	0.1	13.7	O K
2880 min Winter	6.348	0.248	0.1	13.1	O K
4320 min Winter	6.327	0.227	0.1	12.0	O K
5760 min Winter	6.308	0.208	0.1	11.0	O K
7200 min Winter	6.292	0.192	0.1	10.1	O K
8640 min Winter	6.277	0.177	0.1	9.4	O K
10080 min Winter	6.264	0.164	0.1	8.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	358
480 min Winter	12.017	0.0	474
600 min Winter	9.993	0.0	590
720 min Winter	8.588	0.0	706
960 min Winter	6.754	0.0	934
1440 min Winter	4.821	0.0	1372
2160 min Winter	3.461	0.0	1776
2880 min Winter	2.752	0.0	2196
4320 min Winter	2.023	0.0	3112
5760 min Winter	1.647	0.0	3984
7200 min Winter	1.418	0.0	4896
8640 min Winter	1.263	0.0	5704
10080 min Winter	1.152	0.0	6552

©1982-2020 Innovyze

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.020

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

©1982-2020 Innovyze

Model Details

Storage is Online Cover Level (m) 6.683

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.100	Depression Storage (mm)	0
Max Percolation (l/s)	48.9	Width (m)	5.5	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	32.0	Membrane Depth (m)	0

©1982-2020 Innovyze

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

Half Drain Time : 1469 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.701	0.087	0.0	2.4	O K
30 min Summer	5.730	0.116	0.0	3.1	O K
60 min Summer	5.763	0.149	0.0	4.0	O K
120 min Summer	5.787	0.173	0.0	4.7	O K
180 min Summer	5.801	0.187	0.0	5.1	O K
240 min Summer	5.810	0.196	0.0	5.3	O K
360 min Summer	5.820	0.206	0.0	5.6	O K
480 min Summer	5.824	0.210	0.0	5.7	O K
600 min Summer	5.826	0.212	0.0	5.7	O K
720 min Summer	5.826	0.212	0.0	5.7	O K
960 min Summer	5.824	0.210	0.0	5.7	O K
1440 min Summer	5.815	0.201	0.0	5.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	141.021	0.0	19
30 min Summer	94.616	0.0	34
60 min Summer	60.860	0.0	64
120 min Summer	36.127	0.0	124
180 min Summer	26.472	0.0	184
240 min Summer	21.126	0.0	242
360 min Summer	15.216	0.0	362
480 min Summer	12.017	0.0	482
600 min Summer	9.993	0.0	602
720 min Summer	8.588	0.0	722
960 min Summer	6.754	0.0	960
1440 min Summer	4.821	0.0	1212

©1982-2020 Innovyze

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	5.805	0.191	0.0	5.2	O K
2880 min Summer	5.797	0.183	0.0	4.9	O K
4320 min Summer	5.783	0.169	0.0	4.6	O K
5760 min Summer	5.771	0.157	0.0	4.2	O K
7200 min Summer	5.762	0.148	0.0	4.0	O K
8640 min Summer	5.754	0.140	0.0	3.8	O K
10080 min Summer	5.747	0.133	0.0	3.6	O K
15 min Winter	5.712	0.098	0.0	2.6	O K
30 min Winter	5.745	0.131	0.0	3.5	O K
60 min Winter	5.781	0.167	0.0	4.5	O K
120 min Winter	5.809	0.195	0.0	5.3	O K
180 min Winter	5.825	0.211	0.0	5.7	O K
240 min Winter	5.835	0.221	0.0	6.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	3.461	0.0	1576
2880 min Summer	2.752	0.0	1964
4320 min Summer	2.023	0.0	2808
5760 min Summer	1.647	0.0	3624
7200 min Summer	1.418	0.0	4400
8640 min Summer	1.263	0.0	5192
10080 min Summer	1.152	0.0	5960
15 min Winter	141.021	0.0	19
30 min Winter	94.616	0.0	33
60 min Winter	60.860	0.0	64
120 min Winter	36.127	0.0	122
180 min Winter	26.472	0.0	180
240 min Winter	21.126	0.0	240

©1982-2020 Innovyze

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

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	5.847	0.233	0.0	6.3	O K
480 min Winter	5.853	0.239	0.0	6.4	O K
600 min Winter	5.855	0.241	0.0	6.5	O K
720 min Winter	5.857	0.243	0.0	6.5	O K
960 min Winter	5.855	0.241	0.0	6.5	O K
1440 min Winter	5.847	0.233	0.0	6.3	O K
2160 min Winter	5.833	0.219	0.0	5.9	O K
2880 min Winter	5.821	0.207	0.0	5.6	O K
4320 min Winter	5.799	0.185	0.0	5.0	O K
5760 min Winter	5.780	0.166	0.0	4.5	O K
7200 min Winter	5.763	0.149	0.0	4.0	O K
8640 min Winter	5.749	0.135	0.0	3.6	O K
10080 min Winter	5.736	0.122	0.0	3.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	15.216	0.0	356
480 min Winter	12.017	0.0	474
600 min Winter	9.993	0.0	590
720 min Winter	8.588	0.0	704
960 min Winter	6.754	0.0	932
1440 min Winter	4.821	0.0	1356
2160 min Winter	3.461	0.0	1688
2880 min Winter	2.752	0.0	2136
4320 min Winter	2.023	0.0	3028
5760 min Winter	1.647	0.0	3920
7200 min Winter	1.418	0.0	4752
8640 min Winter	1.263	0.0	5536
10080 min Winter	1.152	0.0	6352

©1982-2020 Innovyze

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	100	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.009

Time (mins) From:	To:	Area (ha)
0	4	0.009

©1982-2020 Innovyze

Model Details

Storage is Online Cover Level (m) 6.314

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	5.614	Depression Storage (mm)	0
Max Percolation (l/s)	25.0	Width (m)	6.0	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	15.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Half Drain Time : 1440 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.589	0.089	0.0	2.0	O K
30 min Summer	5.616	0.116	0.0	2.6	O K
60 min Summer	5.645	0.145	0.0	3.2	O K
120 min Summer	5.677	0.177	0.0	3.9	O K
180 min Summer	5.696	0.196	0.0	4.4	O K
240 min Summer	5.707	0.207	0.0	4.6	O K
360 min Summer	5.721	0.221	0.0	4.9	O K
480 min Summer	5.727	0.227	0.0	5.1	O K
600 min Summer	5.730	0.230	0.0	5.1	O K
720 min Summer	5.731	0.231	0.0	5.1	O K
960 min Summer	5.730	0.230	0.0	5.1	O K
1440 min Summer	5.723	0.223	0.0	5.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	19
30 min Summer	41.172	0.0	34
60 min Summer	26.015	0.0	64
120 min Summer	16.169	0.0	124
180 min Summer	12.093	0.0	184
240 min Summer	9.770	0.0	242
360 min Summer	7.145	0.0	362
480 min Summer	5.684	0.0	482
600 min Summer	4.750	0.0	602
720 min Summer	4.097	0.0	720
960 min Summer	3.241	0.0	960
1440 min Summer	2.334	0.0	1198

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	5.716	0.216	0.0	4.8	O K
2880 min Summer	5.709	0.209	0.0	4.7	O K
4320 min Summer	5.700	0.200	0.0	4.5	O K
5760 min Summer	5.693	0.193	0.0	4.3	O K
7200 min Summer	5.687	0.187	0.0	4.2	O K
8640 min Summer	5.683	0.183	0.0	4.1	O K
10080 min Summer	5.680	0.180	0.0	4.0	O K
15 min Winter	5.599	0.099	0.0	2.2	O K
30 min Winter	5.630	0.130	0.0	2.9	O K
60 min Winter	5.663	0.163	0.0	3.6	O K
120 min Winter	5.699	0.199	0.0	4.4	O K
180 min Winter	5.720	0.220	0.0	4.9	O K
240 min Winter	5.734	0.234	0.0	5.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1576
2880 min Summer	1.362	0.0	1984
4320 min Summer	1.021	0.0	2808
5760 min Summer	0.845	0.0	3632
7200 min Summer	0.738	0.0	4464
8640 min Summer	0.666	0.0	5272
10080 min Summer	0.615	0.0	6056
15 min Winter	62.552	0.0	19
30 min Winter	41.172	0.0	33
60 min Winter	26.015	0.0	64
120 min Winter	16.169	0.0	122
180 min Winter	12.093	0.0	180
240 min Winter	9.770	0.0	240

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	5.749	0.249	0.0	5.6	O K
480 min Winter	5.758	0.258	0.0	5.7	O K
600 min Winter	5.762	0.262	0.0	5.8	O K
720 min Winter	5.764	0.264	0.0	5.9	O K
960 min Winter	5.764	0.264	0.0	5.9	O K
1440 min Winter	5.758	0.258	0.0	5.7	O K
2160 min Winter	5.747	0.247	0.0	5.5	O K
2880 min Winter	5.738	0.238	0.0	5.3	O K
4320 min Winter	5.721	0.221	0.0	4.9	O K
5760 min Winter	5.707	0.207	0.0	4.6	O K
7200 min Winter	5.695	0.195	0.0	4.4	O K
8640 min Winter	5.685	0.185	0.0	4.1	O K
10080 min Winter	5.677	0.177	0.0	3.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	356
480 min Winter	5.684	0.0	472
600 min Winter	4.750	0.0	588
720 min Winter	4.097	0.0	702
960 min Winter	3.241	0.0	926
1440 min Winter	2.334	0.0	1354
2160 min Winter	1.694	0.0	1688
2880 min Winter	1.362	0.0	2136
4320 min Winter	1.021	0.0	3068
5760 min Winter	0.845	0.0	3928
7200 min Winter	0.738	0.0	4824
8640 min Winter	0.666	0.0	5624
10080 min Winter	0.615	0.0	6464

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	10	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.017

Time (mins) From:	To:	Area (ha)
0	4	0.017

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 6.500

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.00300	Invert Level (m)	5.500	Cap Volume Depth (m)	0.000
Infiltration Coefficient Side (m/hr)	0.00300	Trench Width (m)	4.5	Cap Infiltration Depth (m)	0.000
Safety Factor	2.0	Trench Length (m)	16.5		
Porosity	0.30	Slope (1:X)	0.0		

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Half Drain Time : 1437 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.905	0.105	0.0	0.7	O K
30 min Summer	5.938	0.138	0.0	0.9	O K
60 min Summer	5.972	0.172	0.0	1.1	O K
120 min Summer	6.010	0.210	0.0	1.4	O K
180 min Summer	6.032	0.232	0.0	1.5	O K
240 min Summer	6.046	0.246	0.0	1.6	O K
360 min Summer	6.062	0.262	0.0	1.7	O K
480 min Summer	6.070	0.270	0.0	1.8	O K
600 min Summer	6.073	0.273	0.0	1.8	O K
720 min Summer	6.075	0.275	0.0	1.8	O K
960 min Summer	6.073	0.273	0.0	1.8	O K
1440 min Summer	6.066	0.266	0.0	1.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	19
30 min Summer	41.172	0.0	34
60 min Summer	26.015	0.0	64
120 min Summer	16.169	0.0	124
180 min Summer	12.093	0.0	184
240 min Summer	9.770	0.0	242
360 min Summer	7.145	0.0	362
480 min Summer	5.684	0.0	482
600 min Summer	4.750	0.0	602
720 min Summer	4.097	0.0	720
960 min Summer	3.241	0.0	960
1440 min Summer	2.334	0.0	1196

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.058	0.258	0.0	1.7	O K
2880 min Summer	6.051	0.251	0.0	1.7	O K
4320 min Summer	6.041	0.241	0.0	1.6	O K
5760 min Summer	6.034	0.234	0.0	1.5	O K
7200 min Summer	6.028	0.228	0.0	1.5	O K
8640 min Summer	6.025	0.225	0.0	1.5	O K
10080 min Summer	6.022	0.222	0.0	1.5	O K
15 min Winter	5.918	0.118	0.0	0.8	O K
30 min Winter	5.954	0.154	0.0	1.0	O K
60 min Winter	5.993	0.193	0.0	1.3	O K
120 min Winter	6.036	0.236	0.0	1.6	O K
180 min Winter	6.061	0.261	0.0	1.7	O K
240 min Winter	6.078	0.278	0.0	1.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1560
2880 min Summer	1.362	0.0	1964
4320 min Summer	1.021	0.0	2808
5760 min Summer	0.845	0.0	3632
7200 min Summer	0.738	0.0	4464
8640 min Summer	0.666	0.0	5272
10080 min Summer	0.615	0.0	6056
15 min Winter	62.552	0.0	19
30 min Winter	41.172	0.0	33
60 min Winter	26.015	0.0	64
120 min Winter	16.169	0.0	122
180 min Winter	12.093	0.0	180
240 min Winter	9.770	0.0	240

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.096	0.296	0.0	2.0	O K
480 min Winter	6.106	0.306	0.0	2.0	O K
600 min Winter	6.111	0.311	0.0	2.1	O K
720 min Winter	6.113	0.313	0.0	2.1	O K
960 min Winter	6.114	0.314	0.0	2.1	O K
1440 min Winter	6.106	0.306	0.0	2.0	O K
2160 min Winter	6.095	0.295	0.0	2.0	O K
2880 min Winter	6.085	0.285	0.0	1.9	O K
4320 min Winter	6.067	0.267	0.0	1.8	O K
5760 min Winter	6.053	0.253	0.0	1.7	O K
7200 min Winter	6.041	0.241	0.0	1.6	O K
8640 min Winter	6.031	0.231	0.0	1.5	O K
10080 min Winter	6.022	0.222	0.0	1.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	356
480 min Winter	5.684	0.0	472
600 min Winter	4.750	0.0	588
720 min Winter	4.097	0.0	702
960 min Winter	3.241	0.0	924
1440 min Winter	2.334	0.0	1342
2160 min Winter	1.694	0.0	1668
2880 min Winter	1.362	0.0	2136
4320 min Winter	1.021	0.0	3068
5760 min Winter	0.845	0.0	3928
7200 min Winter	0.738	0.0	4824
8640 min Winter	0.666	0.0	5696
10080 min Winter	0.615	0.0	6464

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	10	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.006

Time (mins) From:	To:	Area (ha)
0	4	0.006

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 7.150

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.00300	Invert Level (m)	5.800	Cap Volume Depth (m)	0.000
Infiltration Coefficient Side (m/hr)	0.00300	Trench Width (m)	1.7	Cap Infiltration Depth (m)	0.000
Safety Factor	2.0	Trench Length (m)	13.0		
Porosity	0.30	Slope (1:X)	0.0		

©1982-2020 Innovyze

Summary of Results for 10 year Return Period

Half Drain Time : 1215 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.328	0.068	0.1	2.8	O K
30 min Summer	6.350	0.090	0.1	3.6	O K
60 min Summer	6.372	0.112	0.1	4.5	O K
120 min Summer	6.397	0.137	0.1	5.5	O K
180 min Summer	6.411	0.151	0.1	6.1	O K
240 min Summer	6.419	0.159	0.1	6.5	O K
360 min Summer	6.429	0.169	0.1	6.8	O K
480 min Summer	6.433	0.173	0.1	7.0	O K
600 min Summer	6.435	0.175	0.1	7.1	O K
720 min Summer	6.435	0.175	0.1	7.1	O K
960 min Summer	6.432	0.172	0.1	7.0	O K
1440 min Summer	6.427	0.167	0.1	6.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	23
30 min Summer	41.172	0.0	37
60 min Summer	26.015	0.0	68
120 min Summer	16.169	0.0	126
180 min Summer	12.093	0.0	186
240 min Summer	9.770	0.0	246
360 min Summer	7.145	0.0	364
480 min Summer	5.684	0.0	484
600 min Summer	4.750	0.0	602
720 min Summer	4.097	0.0	722
960 min Summer	3.241	0.0	914
1440 min Summer	2.334	0.0	1130

©1982-2020 Innovyze

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.420	0.160	0.1	6.5	O K
2880 min Summer	6.414	0.154	0.1	6.2	O K
4320 min Summer	6.404	0.144	0.1	5.8	O K
5760 min Summer	6.396	0.136	0.1	5.5	O K
7200 min Summer	6.389	0.129	0.1	5.2	O K
8640 min Summer	6.384	0.124	0.1	5.0	O K
10080 min Summer	6.380	0.120	0.1	4.9	O K
15 min Winter	6.337	0.077	0.1	3.1	O K
30 min Winter	6.361	0.101	0.1	4.1	O K
60 min Winter	6.386	0.126	0.1	5.1	O K
120 min Winter	6.414	0.154	0.1	6.2	O K
180 min Winter	6.430	0.170	0.1	6.9	O K
240 min Winter	6.440	0.180	0.1	7.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1516
2880 min Summer	1.362	0.0	1932
4320 min Summer	1.021	0.0	2732
5760 min Summer	0.845	0.0	3568
7200 min Summer	0.738	0.0	4328
8640 min Summer	0.666	0.0	5184
10080 min Summer	0.615	0.0	5944
15 min Winter	62.552	0.0	23
30 min Winter	41.172	0.0	37
60 min Winter	26.015	0.0	66
120 min Winter	16.169	0.0	124
180 min Winter	12.093	0.0	184
240 min Winter	9.770	0.0	242

©1982-2020 Innovyze

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.451	0.191	0.1	7.7	O K
480 min Winter	6.457	0.197	0.1	8.0	O K
600 min Winter	6.459	0.199	0.1	8.1	O K
720 min Winter	6.460	0.200	0.1	8.1	O K
960 min Winter	6.459	0.199	0.1	8.1	O K
1440 min Winter	6.451	0.191	0.1	7.7	O K
2160 min Winter	6.442	0.182	0.1	7.4	O K
2880 min Winter	6.432	0.172	0.1	7.0	O K
4320 min Winter	6.415	0.155	0.1	6.3	O K
5760 min Winter	6.400	0.140	0.1	5.7	O K
7200 min Winter	6.388	0.128	0.1	5.2	O K
8640 min Winter	6.377	0.117	0.1	4.7	O K
10080 min Winter	6.368	0.108	0.1	4.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	358
480 min Winter	5.684	0.0	474
600 min Winter	4.750	0.0	588
720 min Winter	4.097	0.0	702
960 min Winter	3.241	0.0	924
1440 min Winter	2.334	0.0	1318
2160 min Winter	1.694	0.0	1644
2880 min Winter	1.362	0.0	2104
4320 min Winter	1.021	0.0	2984
5760 min Winter	0.845	0.0	3856
7200 min Winter	0.738	0.0	4680
8640 min Winter	0.666	0.0	5448
10080 min Winter	0.615	0.0	6256

©1982-2020 Innovyze

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	10	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.024

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.010	4	8	0.014

©1982-2020 Innovyze

Model Details

Storage is Online Cover Level (m) 6.931

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.260	Depression Storage (mm)	0
Max Percolation (l/s)	37.5	Width (m)	7.5	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	18.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Half Drain Time : 1181 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.817	0.067	0.1	6.5	O K
30 min Summer	6.838	0.088	0.1	8.5	O K
60 min Summer	6.860	0.110	0.1	10.6	O K
120 min Summer	6.884	0.134	0.1	12.9	O K
180 min Summer	6.897	0.147	0.1	14.2	O K
240 min Summer	6.906	0.156	0.1	15.0	O K
360 min Summer	6.915	0.165	0.1	15.9	O K
480 min Summer	6.919	0.169	0.1	16.3	O K
600 min Summer	6.921	0.171	0.1	16.5	O K
720 min Summer	6.921	0.171	0.1	16.4	O K
960 min Summer	6.918	0.168	0.1	16.2	O K
1440 min Summer	6.913	0.163	0.1	15.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	23
30 min Summer	41.172	0.0	37
60 min Summer	26.015	0.0	66
120 min Summer	16.169	0.0	126
180 min Summer	12.093	0.0	186
240 min Summer	9.770	0.0	246
360 min Summer	7.145	0.0	364
480 min Summer	5.684	0.0	482
600 min Summer	4.750	0.0	602
720 min Summer	4.097	0.0	722
960 min Summer	3.241	0.0	898
1440 min Summer	2.334	0.0	1116

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.906	0.156	0.1	15.0	O K
2880 min Summer	6.900	0.150	0.1	14.4	O K
4320 min Summer	6.890	0.140	0.1	13.4	O K
5760 min Summer	6.882	0.132	0.1	12.7	O K
7200 min Summer	6.875	0.125	0.1	12.1	O K
8640 min Summer	6.870	0.120	0.1	11.6	O K
10080 min Summer	6.866	0.116	0.1	11.1	O K
15 min Winter	6.825	0.075	0.1	7.2	O K
30 min Winter	6.849	0.099	0.1	9.5	O K
60 min Winter	6.873	0.123	0.1	11.9	O K
120 min Winter	6.901	0.151	0.1	14.5	O K
180 min Winter	6.916	0.166	0.1	16.0	O K
240 min Winter	6.926	0.176	0.1	17.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1512
2880 min Summer	1.362	0.0	1912
4320 min Summer	1.021	0.0	2728
5760 min Summer	0.845	0.0	3568
7200 min Summer	0.738	0.0	4328
8640 min Summer	0.666	0.0	5104
10080 min Summer	0.615	0.0	5944
15 min Winter	62.552	0.0	22
30 min Winter	41.172	0.0	37
60 min Winter	26.015	0.0	66
120 min Winter	16.169	0.0	124
180 min Winter	12.093	0.0	182
240 min Winter	9.770	0.0	242

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.937	0.187	0.1	18.0	O K
480 min Winter	6.942	0.192	0.1	18.5	O K
600 min Winter	6.945	0.195	0.1	18.8	O K
720 min Winter	6.946	0.196	0.1	18.9	O K
960 min Winter	6.944	0.194	0.1	18.7	O K
1440 min Winter	6.936	0.186	0.1	18.0	O K
2160 min Winter	6.927	0.177	0.1	17.0	O K
2880 min Winter	6.917	0.167	0.1	16.1	O K
4320 min Winter	6.900	0.150	0.1	14.5	O K
5760 min Winter	6.885	0.135	0.1	13.0	O K
7200 min Winter	6.873	0.123	0.1	11.8	O K
8640 min Winter	6.862	0.112	0.1	10.8	O K
10080 min Winter	6.853	0.103	0.1	9.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	358
480 min Winter	5.684	0.0	474
600 min Winter	4.750	0.0	588
720 min Winter	4.097	0.0	702
960 min Winter	3.241	0.0	922
1440 min Winter	2.334	0.0	1304
2160 min Winter	1.694	0.0	1640
2880 min Winter	1.362	0.0	2100
4320 min Winter	1.021	0.0	2984
5760 min Winter	0.845	0.0	3808
7200 min Winter	0.738	0.0	4616
8640 min Winter	0.666	0.0	5448
10080 min Winter	0.615	0.0	6248

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	10	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.056

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.028	4	8	0.028

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 7.384

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.750	Depression Storage (mm)	0
Max Percolation (l/s)	89.2	Width (m)	14.6	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	22.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Half Drain Time : 1389 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.677	0.077	0.1	3.8	O K
30 min Summer	6.701	0.101	0.1	5.0	O K
60 min Summer	6.726	0.126	0.1	6.3	O K
120 min Summer	6.754	0.154	0.1	7.6	O K
180 min Summer	6.770	0.170	0.1	8.4	O K
240 min Summer	6.780	0.180	0.1	8.9	O K
360 min Summer	6.791	0.191	0.1	9.5	O K
480 min Summer	6.797	0.197	0.1	9.8	O K
600 min Summer	6.799	0.199	0.1	9.9	O K
720 min Summer	6.800	0.200	0.1	9.9	O K
960 min Summer	6.798	0.198	0.1	9.9	O K
1440 min Summer	6.793	0.193	0.1	9.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	23
30 min Summer	41.172	0.0	38
60 min Summer	26.015	0.0	68
120 min Summer	16.169	0.0	126
180 min Summer	12.093	0.0	186
240 min Summer	9.770	0.0	246
360 min Summer	7.145	0.0	366
480 min Summer	5.684	0.0	484
600 min Summer	4.750	0.0	604
720 min Summer	4.097	0.0	724
960 min Summer	3.241	0.0	960
1440 min Summer	2.334	0.0	1190

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.785	0.185	0.1	9.2	O K
2880 min Summer	6.779	0.179	0.1	8.9	O K
4320 min Summer	6.770	0.170	0.1	8.4	O K
5760 min Summer	6.763	0.163	0.1	8.1	O K
7200 min Summer	6.757	0.157	0.1	7.8	O K
8640 min Summer	6.752	0.152	0.1	7.6	O K
10080 min Summer	6.749	0.149	0.1	7.4	O K
15 min Winter	6.686	0.086	0.1	4.3	O K
30 min Winter	6.713	0.113	0.1	5.6	O K
60 min Winter	6.741	0.141	0.1	7.0	O K
120 min Winter	6.773	0.173	0.1	8.6	O K
180 min Winter	6.791	0.191	0.1	9.5	O K
240 min Winter	6.803	0.203	0.1	10.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1560
2880 min Summer	1.362	0.0	1964
4320 min Summer	1.021	0.0	2808
5760 min Summer	0.845	0.0	3632
7200 min Summer	0.738	0.0	4464
8640 min Summer	0.666	0.0	5264
10080 min Summer	0.615	0.0	6048
15 min Winter	62.552	0.0	23
30 min Winter	41.172	0.0	37
60 min Winter	26.015	0.0	66
120 min Winter	16.169	0.0	126
180 min Winter	12.093	0.0	184
240 min Winter	9.770	0.0	242

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.817	0.217	0.1	10.8	O K
480 min Winter	6.823	0.223	0.1	11.1	O K
600 min Winter	6.827	0.227	0.1	11.3	O K
720 min Winter	6.829	0.229	0.1	11.4	O K
960 min Winter	6.829	0.229	0.1	11.4	O K
1440 min Winter	6.823	0.223	0.1	11.1	O K
2160 min Winter	6.812	0.212	0.1	10.5	O K
2880 min Winter	6.803	0.203	0.1	10.1	O K
4320 min Winter	6.787	0.187	0.1	9.3	O K
5760 min Winter	6.773	0.173	0.1	8.6	O K
7200 min Winter	6.761	0.161	0.1	8.0	O K
8640 min Winter	6.750	0.150	0.1	7.5	O K
10080 min Winter	6.741	0.141	0.1	7.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	360
480 min Winter	5.684	0.0	476
600 min Winter	4.750	0.0	592
720 min Winter	4.097	0.0	706
960 min Winter	3.241	0.0	930
1440 min Winter	2.334	0.0	1358
2160 min Winter	1.694	0.0	1688
2880 min Winter	1.362	0.0	2140
4320 min Winter	1.021	0.0	3068
5760 min Winter	0.845	0.0	3920
7200 min Winter	0.738	0.0	4760
8640 min Winter	0.666	0.0	5616
10080 min Winter	0.615	0.0	6448

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	10	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.033

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.009	4	8	0.024

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 7.216

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.600	Depression Storage (mm)	0
Max Percolation (l/s)	46.0	Width (m)	7.2	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	23.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Half Drain Time : 801 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.064	0.114	0.2	6.8	O K
30 min Summer	6.099	0.149	0.2	8.8	O K
60 min Summer	6.135	0.185	0.2	11.0	O K
120 min Summer	6.173	0.223	0.2	13.2	O K
180 min Summer	6.193	0.243	0.2	14.4	O K
240 min Summer	6.205	0.255	0.2	15.1	O K
360 min Summer	6.215	0.265	0.2	15.7	O K
480 min Summer	6.216	0.266	0.2	15.8	O K
600 min Summer	6.213	0.263	0.2	15.6	O K
720 min Summer	6.209	0.259	0.2	15.3	O K
960 min Summer	6.200	0.250	0.2	14.8	O K
1440 min Summer	6.184	0.234	0.2	13.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	22
30 min Summer	41.172	0.0	37
60 min Summer	26.015	0.0	66
120 min Summer	16.169	0.0	126
180 min Summer	12.093	0.0	184
240 min Summer	9.770	0.0	244
360 min Summer	7.145	0.0	362
480 min Summer	5.684	0.0	482
600 min Summer	4.750	0.0	594
720 min Summer	4.097	0.0	634
960 min Summer	3.241	0.0	756
1440 min Summer	2.334	0.0	1010

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.163	0.213	0.2	12.6	O K
2880 min Summer	6.145	0.195	0.2	11.6	O K
4320 min Summer	6.117	0.167	0.2	9.9	O K
5760 min Summer	6.096	0.146	0.2	8.6	O K
7200 min Summer	6.079	0.129	0.2	7.6	O K
8640 min Summer	6.065	0.115	0.2	6.8	O K
10080 min Summer	6.054	0.104	0.2	6.1	O K
15 min Winter	6.078	0.128	0.2	7.6	O K
30 min Winter	6.117	0.167	0.2	9.9	O K
60 min Winter	6.158	0.208	0.2	12.3	O K
120 min Winter	6.202	0.252	0.2	14.9	O K
180 min Winter	6.226	0.276	0.2	16.3	O K
240 min Winter	6.240	0.290	0.2	17.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1412
2880 min Summer	1.362	0.0	1820
4320 min Summer	1.021	0.0	2600
5760 min Summer	0.845	0.0	3400
7200 min Summer	0.738	0.0	4112
8640 min Summer	0.666	0.0	4848
10080 min Summer	0.615	0.0	5552
15 min Winter	62.552	0.0	22
30 min Winter	41.172	0.0	37
60 min Winter	26.015	0.0	66
120 min Winter	16.169	0.0	124
180 min Winter	12.093	0.0	182
240 min Winter	9.770	0.0	240

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.253	0.303	0.2	18.0	O K
480 min Winter	6.256	0.306	0.2	18.2	O K
600 min Winter	6.255	0.305	0.2	18.1	O K
720 min Winter	6.251	0.301	0.2	17.8	O K
960 min Winter	6.239	0.289	0.2	17.1	O K
1440 min Winter	6.218	0.268	0.2	15.9	O K
2160 min Winter	6.187	0.237	0.2	14.1	O K
2880 min Winter	6.159	0.209	0.2	12.4	O K
4320 min Winter	6.114	0.164	0.2	9.7	O K
5760 min Winter	6.077	0.127	0.2	7.5	O K
7200 min Winter	6.049	0.099	0.2	5.9	O K
8640 min Winter	6.027	0.077	0.2	4.6	O K
10080 min Winter	6.012	0.062	0.2	3.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	356
480 min Winter	5.684	0.0	470
600 min Winter	4.750	0.0	580
720 min Winter	4.097	0.0	688
960 min Winter	3.241	0.0	880
1440 min Winter	2.334	0.0	1096
2160 min Winter	1.694	0.0	1540
2880 min Winter	1.362	0.0	1988
4320 min Winter	1.021	0.0	2808
5760 min Winter	0.845	0.0	3568
7200 min Winter	0.738	0.0	4256
8640 min Winter	0.666	0.0	4936
10080 min Winter	0.615	0.0	5552

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	10	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.059

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.029	4	8	0.030

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 6.827

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00700	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	5.950	Depression Storage (mm)	0
Max Percolation (l/s)	54.9	Width (m)	7.9	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	25.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Half Drain Time : 1430 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.179	0.079	0.1	6.8	O K
30 min Summer	6.204	0.104	0.1	8.9	O K
60 min Summer	6.230	0.130	0.1	11.2	O K
120 min Summer	6.259	0.159	0.1	13.7	O K
180 min Summer	6.276	0.176	0.1	15.1	O K
240 min Summer	6.286	0.186	0.1	16.0	O K
360 min Summer	6.298	0.198	0.1	17.0	O K
480 min Summer	6.304	0.204	0.1	17.5	O K
600 min Summer	6.307	0.207	0.1	17.8	O K
720 min Summer	6.308	0.208	0.1	17.9	O K
960 min Summer	6.307	0.207	0.1	17.8	O K
1440 min Summer	6.300	0.200	0.1	17.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	23
30 min Summer	41.172	0.0	37
60 min Summer	26.015	0.0	68
120 min Summer	16.169	0.0	126
180 min Summer	12.093	0.0	186
240 min Summer	9.770	0.0	246
360 min Summer	7.145	0.0	364
480 min Summer	5.684	0.0	484
600 min Summer	4.750	0.0	602
720 min Summer	4.097	0.0	722
960 min Summer	3.241	0.0	960
1440 min Summer	2.334	0.0	1212

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.293	0.193	0.1	16.6	O K
2880 min Summer	6.287	0.187	0.1	16.1	O K
4320 min Summer	6.278	0.178	0.1	15.3	O K
5760 min Summer	6.271	0.171	0.1	14.7	O K
7200 min Summer	6.265	0.165	0.1	14.2	O K
8640 min Summer	6.261	0.161	0.1	13.9	O K
10080 min Summer	6.258	0.158	0.1	13.6	O K
15 min Winter	6.189	0.089	0.1	7.6	O K
30 min Winter	6.217	0.117	0.1	10.0	O K
60 min Winter	6.246	0.146	0.1	12.6	O K
120 min Winter	6.279	0.179	0.1	15.4	O K
180 min Winter	6.298	0.198	0.1	17.0	O K
240 min Winter	6.310	0.210	0.1	18.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1580
2880 min Summer	1.362	0.0	1988
4320 min Summer	1.021	0.0	2812
5760 min Summer	0.845	0.0	3632
7200 min Summer	0.738	0.0	4464
8640 min Summer	0.666	0.0	5272
10080 min Summer	0.615	0.0	6056
15 min Winter	62.552	0.0	23
30 min Winter	41.172	0.0	37
60 min Winter	26.015	0.0	66
120 min Winter	16.169	0.0	124
180 min Winter	12.093	0.0	184
240 min Winter	9.770	0.0	242

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.324	0.224	0.1	19.3	O K
480 min Winter	6.332	0.232	0.1	19.9	O K
600 min Winter	6.335	0.235	0.1	20.3	O K
720 min Winter	6.337	0.237	0.1	20.4	O K
960 min Winter	6.338	0.238	0.1	20.5	O K
1440 min Winter	6.332	0.232	0.1	20.0	O K
2160 min Winter	6.321	0.221	0.1	19.0	O K
2880 min Winter	6.313	0.213	0.1	18.3	O K
4320 min Winter	6.297	0.197	0.1	16.9	O K
5760 min Winter	6.283	0.183	0.1	15.7	O K
7200 min Winter	6.271	0.171	0.1	14.7	O K
8640 min Winter	6.261	0.161	0.1	13.8	O K
10080 min Winter	6.252	0.152	0.1	13.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	358
480 min Winter	5.684	0.0	476
600 min Winter	4.750	0.0	590
720 min Winter	4.097	0.0	706
960 min Winter	3.241	0.0	932
1440 min Winter	2.334	0.0	1360
2160 min Winter	1.694	0.0	1692
2880 min Winter	1.362	0.0	2164
4320 min Winter	1.021	0.0	3072
5760 min Winter	0.845	0.0	3968
7200 min Winter	0.738	0.0	4824
8640 min Winter	0.666	0.0	5624
10080 min Winter	0.615	0.0	6456

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	10	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.059

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.029	4	8	0.030

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 6.950

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.100	Depression Storage (mm)	0
Max Percolation (l/s)	79.6	Width (m)	6.1	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	47.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Half Drain Time : 1437 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.479	0.079	0.1	4.9	O K
30 min Summer	6.504	0.104	0.1	6.4	O K
60 min Summer	6.530	0.130	0.1	8.0	O K
120 min Summer	6.559	0.159	0.1	9.7	O K
180 min Summer	6.576	0.176	0.1	10.7	O K
240 min Summer	6.586	0.186	0.1	11.4	O K
360 min Summer	6.598	0.198	0.1	12.1	O K
480 min Summer	6.604	0.204	0.1	12.5	O K
600 min Summer	6.607	0.207	0.1	12.7	O K
720 min Summer	6.608	0.208	0.1	12.7	O K
960 min Summer	6.607	0.207	0.1	12.6	O K
1440 min Summer	6.601	0.201	0.1	12.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	23
30 min Summer	41.172	0.0	37
60 min Summer	26.015	0.0	68
120 min Summer	16.169	0.0	126
180 min Summer	12.093	0.0	186
240 min Summer	9.770	0.0	246
360 min Summer	7.145	0.0	364
480 min Summer	5.684	0.0	484
600 min Summer	4.750	0.0	602
720 min Summer	4.097	0.0	722
960 min Summer	3.241	0.0	960
1440 min Summer	2.334	0.0	1212

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.593	0.193	0.1	11.8	O K
2880 min Summer	6.587	0.187	0.1	11.5	O K
4320 min Summer	6.578	0.178	0.1	10.9	O K
5760 min Summer	6.571	0.171	0.1	10.5	O K
7200 min Summer	6.566	0.166	0.1	10.1	O K
8640 min Summer	6.561	0.161	0.1	9.9	O K
10080 min Summer	6.558	0.158	0.1	9.7	O K
15 min Winter	6.489	0.089	0.1	5.4	O K
30 min Winter	6.517	0.117	0.1	7.1	O K
60 min Winter	6.546	0.146	0.1	8.9	O K
120 min Winter	6.579	0.179	0.1	10.9	O K
180 min Winter	6.598	0.198	0.1	12.1	O K
240 min Winter	6.610	0.210	0.1	12.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1580
2880 min Summer	1.362	0.0	1988
4320 min Summer	1.021	0.0	2812
5760 min Summer	0.845	0.0	3632
7200 min Summer	0.738	0.0	4464
8640 min Summer	0.666	0.0	5272
10080 min Summer	0.615	0.0	6056
15 min Winter	62.552	0.0	23
30 min Winter	41.172	0.0	37
60 min Winter	26.015	0.0	66
120 min Winter	16.169	0.0	124
180 min Winter	12.093	0.0	184
240 min Winter	9.770	0.0	242

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.624	0.224	0.1	13.7	O K
480 min Winter	6.632	0.232	0.1	14.2	O K
600 min Winter	6.636	0.236	0.1	14.4	O K
720 min Winter	6.638	0.238	0.1	14.5	O K
960 min Winter	6.638	0.238	0.1	14.6	O K
1440 min Winter	6.632	0.232	0.1	14.2	O K
2160 min Winter	6.622	0.222	0.1	13.6	O K
2880 min Winter	6.613	0.213	0.1	13.0	O K
4320 min Winter	6.597	0.197	0.1	12.1	O K
5760 min Winter	6.583	0.183	0.1	11.2	O K
7200 min Winter	6.571	0.171	0.1	10.5	O K
8640 min Winter	6.561	0.161	0.1	9.9	O K
10080 min Winter	6.552	0.152	0.1	9.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	358
480 min Winter	5.684	0.0	476
600 min Winter	4.750	0.0	590
720 min Winter	4.097	0.0	706
960 min Winter	3.241	0.0	932
1440 min Winter	2.334	0.0	1360
2160 min Winter	1.694	0.0	1692
2880 min Winter	1.362	0.0	2164
4320 min Winter	1.021	0.0	3072
5760 min Winter	0.845	0.0	3968
7200 min Winter	0.738	0.0	4824
8640 min Winter	0.666	0.0	5624
10080 min Winter	0.615	0.0	6456

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	10	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.042

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.021	4	8	0.021

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 7.139

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.400	Depression Storage (mm)	0
Max Percolation (l/s)	56.7	Width (m)	20.0	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	10.2	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Half Drain Time : 1429 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.267	0.067	0.1	7.0	O K
30 min Summer	6.293	0.093	0.1	9.7	O K
60 min Summer	6.321	0.121	0.1	12.6	O K
120 min Summer	6.351	0.151	0.1	15.8	O K
180 min Summer	6.369	0.169	0.1	17.6	O K
240 min Summer	6.380	0.180	0.1	18.8	O K
360 min Summer	6.393	0.193	0.1	20.2	O K
480 min Summer	6.400	0.200	0.1	20.9	O K
600 min Summer	6.403	0.203	0.1	21.2	O K
720 min Summer	6.404	0.204	0.1	21.3	O K
960 min Summer	6.404	0.204	0.1	21.3	O K
1440 min Summer	6.399	0.199	0.1	20.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	26
30 min Summer	41.172	0.0	41
60 min Summer	26.015	0.0	70
120 min Summer	16.169	0.0	130
180 min Summer	12.093	0.0	188
240 min Summer	9.770	0.0	248
360 min Summer	7.145	0.0	366
480 min Summer	5.684	0.0	486
600 min Summer	4.750	0.0	604
720 min Summer	4.097	0.0	722
960 min Summer	3.241	0.0	960
1440 min Summer	2.334	0.0	1196

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.393	0.193	0.1	20.2	O K
2880 min Summer	6.388	0.188	0.1	19.6	O K
4320 min Summer	6.379	0.179	0.1	18.7	O K
5760 min Summer	6.372	0.172	0.1	17.9	O K
7200 min Summer	6.366	0.166	0.1	17.3	O K
8640 min Summer	6.361	0.161	0.1	16.8	O K
10080 min Summer	6.357	0.157	0.1	16.4	O K
15 min Winter	6.278	0.078	0.1	8.1	O K
30 min Winter	6.306	0.106	0.1	11.1	O K
60 min Winter	6.337	0.137	0.1	14.4	O K
120 min Winter	6.372	0.172	0.1	18.0	O K
180 min Winter	6.392	0.192	0.1	20.1	O K
240 min Winter	6.405	0.205	0.1	21.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1564
2880 min Summer	1.362	0.0	1968
4320 min Summer	1.021	0.0	2808
5760 min Summer	0.845	0.0	3632
7200 min Summer	0.738	0.0	4464
8640 min Summer	0.666	0.0	5272
10080 min Summer	0.615	0.0	6056
15 min Winter	62.552	0.0	26
30 min Winter	41.172	0.0	41
60 min Winter	26.015	0.0	70
120 min Winter	16.169	0.0	128
180 min Winter	12.093	0.0	186
240 min Winter	9.770	0.0	244

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.420	0.220	0.1	23.0	O K
480 min Winter	6.428	0.228	0.1	23.8	O K
600 min Winter	6.433	0.233	0.1	24.3	O K
720 min Winter	6.435	0.235	0.1	24.5	O K
960 min Winter	6.436	0.236	0.1	24.6	O K
1440 min Winter	6.431	0.231	0.1	24.1	O K
2160 min Winter	6.421	0.221	0.1	23.1	O K
2880 min Winter	6.413	0.213	0.1	22.2	O K
4320 min Winter	6.397	0.197	0.1	20.6	O K
5760 min Winter	6.383	0.183	0.1	19.1	O K
7200 min Winter	6.370	0.170	0.1	17.8	O K
8640 min Winter	6.359	0.159	0.1	16.6	O K
10080 min Winter	6.349	0.149	0.1	15.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	360
480 min Winter	5.684	0.0	476
600 min Winter	4.750	0.0	592
720 min Winter	4.097	0.0	706
960 min Winter	3.241	0.0	932
1440 min Winter	2.334	0.0	1358
2160 min Winter	1.694	0.0	1688
2880 min Winter	1.362	0.0	2140
4320 min Winter	1.021	0.0	3068
5760 min Winter	0.845	0.0	3928
7200 min Winter	0.738	0.0	4768
8640 min Winter	0.666	0.0	5624
10080 min Winter	0.615	0.0	6456

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	10	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.075

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.025	4	8	0.025	8	12	0.025

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 6.952

Complex Structure

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.200	Depression Storage (mm)	5
Max Percolation (l/s)	89.8	Width (m)	6.3	Evaporation (mm/day)	3
Safety Factor	2.0	Length (m)	51.3	Membrane Depth (m)	0

Infiltration Blanket

Infiltration Coefficient Base (m/hr)	0.00300	Invert Level (m)	6.200	Cap Volume Depth (m)	0.000
Safety Factor	2.0	Diameter/Width (m)	5.0		
Porosity	0.30	Length (m)	5.0		

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Half Drain Time : 1387 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.377	0.077	0.1	3.7	O K
30 min Summer	6.401	0.101	0.1	4.8	O K
60 min Summer	6.426	0.126	0.1	6.1	O K
120 min Summer	6.454	0.154	0.1	7.4	O K
180 min Summer	6.470	0.170	0.1	8.2	O K
240 min Summer	6.481	0.181	0.1	8.7	O K
360 min Summer	6.492	0.192	0.1	9.2	O K
480 min Summer	6.498	0.198	0.1	9.5	O K
600 min Summer	6.500	0.200	0.1	9.6	O K
720 min Summer	6.501	0.201	0.1	9.6	O K
960 min Summer	6.499	0.199	0.1	9.6	O K
1440 min Summer	6.493	0.193	0.1	9.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	23
30 min Summer	41.172	0.0	37
60 min Summer	26.015	0.0	68
120 min Summer	16.169	0.0	126
180 min Summer	12.093	0.0	186
240 min Summer	9.770	0.0	246
360 min Summer	7.145	0.0	364
480 min Summer	5.684	0.0	484
600 min Summer	4.750	0.0	602
720 min Summer	4.097	0.0	722
960 min Summer	3.241	0.0	960
1440 min Summer	2.334	0.0	1196

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.486	0.186	0.1	8.9	O K
2880 min Summer	6.480	0.180	0.1	8.6	O K
4320 min Summer	6.471	0.171	0.1	8.2	O K
5760 min Summer	6.463	0.163	0.1	7.8	O K
7200 min Summer	6.458	0.158	0.1	7.6	O K
8640 min Summer	6.453	0.153	0.1	7.4	O K
10080 min Summer	6.450	0.150	0.1	7.2	O K
15 min Winter	6.386	0.086	0.1	4.1	O K
30 min Winter	6.413	0.113	0.1	5.4	O K
60 min Winter	6.442	0.142	0.1	6.8	O K
120 min Winter	6.474	0.174	0.1	8.3	O K
180 min Winter	6.492	0.192	0.1	9.2	O K
240 min Winter	6.504	0.204	0.1	9.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1560
2880 min Summer	1.362	0.0	1964
4320 min Summer	1.021	0.0	2808
5760 min Summer	0.845	0.0	3632
7200 min Summer	0.738	0.0	4464
8640 min Summer	0.666	0.0	5272
10080 min Summer	0.615	0.0	6048
15 min Winter	62.552	0.0	23
30 min Winter	41.172	0.0	37
60 min Winter	26.015	0.0	66
120 min Winter	16.169	0.0	124
180 min Winter	12.093	0.0	184
240 min Winter	9.770	0.0	242

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.517	0.217	0.1	10.4	O K
480 min Winter	6.524	0.224	0.1	10.8	O K
600 min Winter	6.528	0.228	0.1	10.9	O K
720 min Winter	6.530	0.230	0.1	11.0	O K
960 min Winter	6.530	0.230	0.1	11.0	O K
1440 min Winter	6.524	0.224	0.1	10.7	O K
2160 min Winter	6.513	0.213	0.1	10.2	O K
2880 min Winter	6.504	0.204	0.1	9.8	O K
4320 min Winter	6.488	0.188	0.1	9.0	O K
5760 min Winter	6.474	0.174	0.1	8.3	O K
7200 min Winter	6.462	0.162	0.1	7.8	O K
8640 min Winter	6.451	0.151	0.1	7.3	O K
10080 min Winter	6.442	0.142	0.1	6.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	358
480 min Winter	5.684	0.0	476
600 min Winter	4.750	0.0	590
720 min Winter	4.097	0.0	704
960 min Winter	3.241	0.0	930
1440 min Winter	2.334	0.0	1356
2160 min Winter	1.694	0.0	1688
2880 min Winter	1.362	0.0	2140
4320 min Winter	1.021	0.0	3068
5760 min Winter	0.845	0.0	3920
7200 min Winter	0.738	0.0	4760
8640 min Winter	0.666	0.0	5616
10080 min Winter	0.615	0.0	6456

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	10	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.032

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.015	4	8	0.017

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 7.050

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.300	Depression Storage (mm)	0
Max Percolation (l/s)	44.4	Width (m)	10.0	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	16.0	Membrane Depth (m)	0

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Half Drain Time : 666 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	4.691	0.041	0.0	1.2	O K
30 min Summer	4.704	0.054	0.0	1.5	O K
60 min Summer	4.717	0.067	0.0	1.9	O K
120 min Summer	4.731	0.081	0.0	2.3	O K
180 min Summer	4.738	0.088	0.0	2.5	O K
240 min Summer	4.742	0.092	0.0	2.6	O K
360 min Summer	4.746	0.096	0.0	2.7	O K
480 min Summer	4.746	0.096	0.0	2.7	O K
600 min Summer	4.746	0.096	0.0	2.7	O K
720 min Summer	4.745	0.095	0.0	2.6	O K
960 min Summer	4.743	0.093	0.0	2.6	O K
1440 min Summer	4.739	0.089	0.0	2.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	19
30 min Summer	41.172	0.0	33
60 min Summer	26.015	0.0	64
120 min Summer	16.169	0.0	122
180 min Summer	12.093	0.0	182
240 min Summer	9.770	0.0	242
360 min Summer	7.145	0.0	360
480 min Summer	5.684	0.0	476
600 min Summer	4.750	0.0	520
720 min Summer	4.097	0.0	578
960 min Summer	3.241	0.0	702
1440 min Summer	2.334	0.0	968

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	4.732	0.082	0.0	2.3	O K
2880 min Summer	4.727	0.077	0.0	2.1	O K
4320 min Summer	4.718	0.068	0.0	1.9	O K
5760 min Summer	4.711	0.061	0.0	1.7	O K
7200 min Summer	4.706	0.056	0.0	1.6	O K
8640 min Summer	4.702	0.052	0.0	1.5	O K
10080 min Summer	4.700	0.050	0.0	1.4	O K
15 min Winter	4.696	0.046	0.0	1.3	O K
30 min Winter	4.710	0.060	0.0	1.7	O K
60 min Winter	4.725	0.075	0.0	2.1	O K
120 min Winter	4.741	0.091	0.0	2.5	O K
180 min Winter	4.749	0.099	0.0	2.8	O K
240 min Winter	4.755	0.105	0.0	2.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1380
2880 min Summer	1.362	0.0	1764
4320 min Summer	1.021	0.0	2548
5760 min Summer	0.845	0.0	3288
7200 min Summer	0.738	0.0	3968
8640 min Summer	0.666	0.0	4672
10080 min Summer	0.615	0.0	5352
15 min Winter	62.552	0.0	19
30 min Winter	41.172	0.0	33
60 min Winter	26.015	0.0	62
120 min Winter	16.169	0.0	120
180 min Winter	12.093	0.0	180
240 min Winter	9.770	0.0	238

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	4.759	0.109	0.0	3.0	O K
480 min Winter	4.760	0.110	0.0	3.1	O K
600 min Winter	4.760	0.110	0.0	3.1	O K
720 min Winter	4.758	0.108	0.0	3.0	O K
960 min Winter	4.755	0.105	0.0	2.9	O K
1440 min Winter	4.749	0.099	0.0	2.8	O K
2160 min Winter	4.739	0.089	0.0	2.5	O K
2880 min Winter	4.730	0.080	0.0	2.2	O K
4320 min Winter	4.715	0.065	0.0	1.8	O K
5760 min Winter	4.704	0.054	0.0	1.5	O K
7200 min Winter	4.699	0.049	0.0	1.4	O K
8640 min Winter	4.695	0.045	0.0	1.3	O K
10080 min Winter	4.693	0.043	0.0	1.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	352
480 min Winter	5.684	0.0	464
600 min Winter	4.750	0.0	572
720 min Winter	4.097	0.0	672
960 min Winter	3.241	0.0	752
1440 min Winter	2.334	0.0	1054
2160 min Winter	1.694	0.0	1492
2880 min Winter	1.362	0.0	1904
4320 min Winter	1.021	0.0	2680
5760 min Winter	0.845	0.0	3392
7200 min Winter	0.738	0.0	4040
8640 min Winter	0.666	0.0	4760
10080 min Winter	0.615	0.0	5544

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	10	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.010

Time (mins) From:	To:	Area (ha)
0	4	0.010

©1982-2020 Innovyze

ARUN DISTRICT COUNCIL Y/163/21/DOC

Model Details

Storage is Online Cover Level (m) 5.350

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	4.650	Depression Storage (mm)	0
Max Percolation (l/s)	25.8	Width (m)	6.0	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	15.5	Membrane Depth (m)	0

©1982-2020 Innovyze

Summary of Results for 10 year Return Period

Half Drain Time : 717 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.144	0.044	0.1	2.3	O K
30 min Summer	6.157	0.057	0.1	3.0	O K
60 min Summer	6.171	0.071	0.1	3.7	O K
120 min Summer	6.186	0.086	0.1	4.5	O K
180 min Summer	6.193	0.093	0.1	4.9	O K
240 min Summer	6.198	0.098	0.1	5.2	O K
360 min Summer	6.202	0.102	0.1	5.4	O K
480 min Summer	6.203	0.103	0.1	5.4	O K
600 min Summer	6.202	0.102	0.1	5.4	O K
720 min Summer	6.201	0.101	0.1	5.4	O K
960 min Summer	6.199	0.099	0.1	5.3	O K
1440 min Summer	6.195	0.095	0.1	5.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	19
30 min Summer	41.172	0.0	33
60 min Summer	26.015	0.0	64
120 min Summer	16.169	0.0	122
180 min Summer	12.093	0.0	182
240 min Summer	9.770	0.0	242
360 min Summer	7.145	0.0	360
480 min Summer	5.684	0.0	480
600 min Summer	4.750	0.0	538
720 min Summer	4.097	0.0	596
960 min Summer	3.241	0.0	714
1440 min Summer	2.334	0.0	980

©1982-2020 Innovyze

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	6.189	0.089	0.1	4.7	O K
2880 min Summer	6.183	0.083	0.1	4.4	O K
4320 min Summer	6.173	0.073	0.1	3.9	O K
5760 min Summer	6.166	0.066	0.1	3.5	O K
7200 min Summer	6.161	0.061	0.1	3.2	O K
8640 min Summer	6.157	0.057	0.1	3.0	O K
10080 min Summer	6.153	0.053	0.1	2.8	O K
15 min Winter	6.149	0.049	0.1	2.6	O K
30 min Winter	6.164	0.064	0.1	3.4	O K
60 min Winter	6.180	0.080	0.1	4.2	O K
120 min Winter	6.196	0.096	0.1	5.1	O K
180 min Winter	6.206	0.106	0.1	5.6	O K
240 min Winter	6.211	0.111	0.1	5.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1384
2880 min Summer	1.362	0.0	1788
4320 min Summer	1.021	0.0	2552
5760 min Summer	0.845	0.0	3296
7200 min Summer	0.738	0.0	4040
8640 min Summer	0.666	0.0	4752
10080 min Summer	0.615	0.0	5448
15 min Winter	62.552	0.0	19
30 min Winter	41.172	0.0	33
60 min Winter	26.015	0.0	62
120 min Winter	16.169	0.0	120
180 min Winter	12.093	0.0	180
240 min Winter	9.770	0.0	238

©1982-2020 Innovyze

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	6.216	0.116	0.1	6.1	O K
480 min Winter	6.218	0.118	0.1	6.2	O K
600 min Winter	6.218	0.118	0.1	6.2	O K
720 min Winter	6.216	0.116	0.1	6.1	O K
960 min Winter	6.213	0.113	0.1	6.0	O K
1440 min Winter	6.207	0.107	0.1	5.6	O K
2160 min Winter	6.196	0.096	0.1	5.1	O K
2880 min Winter	6.187	0.087	0.1	4.6	O K
4320 min Winter	6.171	0.071	0.1	3.8	O K
5760 min Winter	6.160	0.060	0.1	3.1	O K
7200 min Winter	6.152	0.052	0.1	2.7	O K
8640 min Winter	6.148	0.048	0.1	2.5	O K
10080 min Winter	6.145	0.045	0.1	2.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	352
480 min Winter	5.684	0.0	464
600 min Winter	4.750	0.0	574
720 min Winter	4.097	0.0	678
960 min Winter	3.241	0.0	768
1440 min Winter	2.334	0.0	1068
2160 min Winter	1.694	0.0	1512
2880 min Winter	1.362	0.0	1932
4320 min Winter	1.021	0.0	2724
5760 min Winter	0.845	0.0	3456
7200 min Winter	0.738	0.0	4104
8640 min Winter	0.666	0.0	4760
10080 min Winter	0.615	0.0	5544

©1982-2020 Innovyze

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	10	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 497736 103464 SU 97736 03464	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.020

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

©1982-2020 Innovyze

Model Details

Storage is Online Cover Level (m) 6.683

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	6.100	Depression Storage (mm)	0
Max Percolation (l/s)	48.9	Width (m)	5.5	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	32.0	Membrane Depth (m)	0

©1982-2020 Innovyze

Summary of Results for 10 year Return Period

Half Drain Time : 618 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	5.652	0.038	0.0	1.0	O K
30 min Summer	5.664	0.050	0.0	1.4	O K
60 min Summer	5.676	0.062	0.0	1.7	O K
120 min Summer	5.689	0.075	0.0	2.0	O K
180 min Summer	5.695	0.081	0.0	2.2	O K
240 min Summer	5.699	0.085	0.0	2.3	O K
360 min Summer	5.702	0.088	0.0	2.4	O K
480 min Summer	5.702	0.088	0.0	2.4	O K
600 min Summer	5.702	0.088	0.0	2.4	O K
720 min Summer	5.701	0.087	0.0	2.3	O K
960 min Summer	5.699	0.085	0.0	2.3	O K
1440 min Summer	5.695	0.081	0.0	2.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	62.552	0.0	19
30 min Summer	41.172	0.0	33
60 min Summer	26.015	0.0	64
120 min Summer	16.169	0.0	122
180 min Summer	12.093	0.0	182
240 min Summer	9.770	0.0	242
360 min Summer	7.145	0.0	360
480 min Summer	5.684	0.0	450
600 min Summer	4.750	0.0	502
720 min Summer	4.097	0.0	562
960 min Summer	3.241	0.0	684
1440 min Summer	2.334	0.0	954

©1982-2020 Innovyze

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
2160 min Summer	5.689	0.075	0.0	2.0	O K
2880 min Summer	5.683	0.069	0.0	1.9	O K
4320 min Summer	5.675	0.061	0.0	1.6	O K
5760 min Summer	5.669	0.055	0.0	1.5	O K
7200 min Summer	5.665	0.051	0.0	1.4	O K
8640 min Summer	5.662	0.048	0.0	1.3	O K
10080 min Summer	5.660	0.046	0.0	1.2	O K
15 min Winter	5.657	0.043	0.0	1.2	O K
30 min Winter	5.670	0.056	0.0	1.5	O K
60 min Winter	5.684	0.070	0.0	1.9	O K
120 min Winter	5.698	0.084	0.0	2.3	O K
180 min Winter	5.706	0.092	0.0	2.5	O K
240 min Winter	5.711	0.097	0.0	2.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
2160 min Summer	1.694	0.0	1360
2880 min Summer	1.362	0.0	1756
4320 min Summer	1.021	0.0	2508
5760 min Summer	0.845	0.0	3232
7200 min Summer	0.738	0.0	3960
8640 min Summer	0.666	0.0	4664
10080 min Summer	0.615	0.0	5352
15 min Winter	62.552	0.0	19
30 min Winter	41.172	0.0	33
60 min Winter	26.015	0.0	62
120 min Winter	16.169	0.0	120
180 min Winter	12.093	0.0	178
240 min Winter	9.770	0.0	236

©1982-2020 Innovyze

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
360 min Winter	5.714	0.100	0.0	2.7	O K
480 min Winter	5.715	0.101	0.0	2.7	O K
600 min Winter	5.715	0.101	0.0	2.7	O K
720 min Winter	5.713	0.099	0.0	2.7	O K
960 min Winter	5.710	0.096	0.0	2.6	O K
1440 min Winter	5.704	0.090	0.0	2.4	O K
2160 min Winter	5.694	0.080	0.0	2.2	O K
2880 min Winter	5.685	0.071	0.0	1.9	O K
4320 min Winter	5.672	0.058	0.0	1.6	O K
5760 min Winter	5.663	0.049	0.0	1.3	O K
7200 min Winter	5.659	0.045	0.0	1.2	O K
8640 min Winter	5.656	0.042	0.0	1.1	O K
10080 min Winter	5.654	0.040	0.0	1.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
360 min Winter	7.145	0.0	350
480 min Winter	5.684	0.0	462
600 min Winter	4.750	0.0	566
720 min Winter	4.097	0.0	656
960 min Winter	3.241	0.0	742
1440 min Winter	2.334	0.0	1040
2160 min Winter	1.694	0.0	1472
2880 min Winter	1.362	0.0	1876
4320 min Winter	1.021	0.0	2636
5760 min Winter	0.845	0.0	3296
7200 min Winter	0.738	0.0	4040
8640 min Winter	0.666	0.0	4760
10080 min Winter	0.615	0.0	5544

©1982-2020 Innovyze

Rainfall Details

Rainfall Model	FEH	Data Type	Point	Cv (Winter)	0.840
Return Period (years)	10	Summer Storms	Yes	Shortest Storm (mins)	15
FEH Rainfall Version	2013	Winter Storms	Yes	Longest Storm (mins)	10080
Site Location	GB 497736 103464 SU 97736 03464	Cv (Summer)	0.750	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.009

Time (mins) From:	To:	Area (ha)
0	4	0.009

©1982-2020 Innovyze

Model Details

Storage is Online Cover Level (m) 6.314

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00300	Porosity	0.30	Slope (1:X)	0.0
Membrane Percolation (mm/hr)	1000	Invert Level (m)	5.614	Depression Storage (mm)	0
Max Percolation (l/s)	25.0	Width (m)	6.0	Evaporation (mm/day)	0
Safety Factor	2.0	Length (m)	15.0	Membrane Depth (m)	0

©1982-2020 Innovyze

Appendix E

Soil Soakage Test Report & Summary Sheet

Date	Location	Test number	Infiltration rate ($x10^{-6}$ m/sec)	
			Average	BRE 365
January 2020	SA1A	1	0.86	~
	SA2A	1	1.7	~
	SA3A	1	0.92	~
	SA4A	1	0.55	~
	SA5A	1	0.76	~
October 2020	SA102	1	1.6	~
		2	1.6	1.4
		3	3.8	~
	SA103	1	2.0	1.7
		2	2.0	4.0
		3	7.1	6.7
	SA105	1	0.7	~
		2	0.52	~
		3	0.29	~
	SA106	1	1.2	~
		2	1.0	~
		3	0.98	~
October 2021	SA201	1	3.4	2.4
		2	1.0	~
		3	1.2	1.2
	SA202	1	19	16
		2	6.4	5.5
		3	4.9	3.9
	SA203	1	12	10
		2	5.5	3.6
		3	4.8	4.0
	SA204	1	11	8.8
		2	6.9	6.2
		3	6.2	5.6

ARUN DISTRICT COUNCIL Y/163/21/DOC

Eastwood&Partners
CONSULTING ENGINEERS

Eastwood & Partners, St Andrew's House, 23 Kingfield Road, Sheffield, S11 9AS
Tel: 0114 255 4554 **mail@eastwoodandpartners.com** **www.eastwoodandpartners.com**

Mike Dodds
Redrow Homes Ltd
Unit 1, Faraday Office Park
Basingstoke
Hampshire
RG24 8QQ

CAT/RAN/44005-008

Issue 2

4 November 2021

Dear Mike,

North End Road, Yapton – Report on Infiltration Testing and Groundwater Monitoring

Site Description

The site is located on the north west side of North End Road in Yapton, around 6 km to the north east of Bognor Regis in West Sussex. It has an area of around 1.8 hectares and is approximately rectangular. Stables are currently located in the eastern section of the site, whilst the remainder comprises a horse paddock. The site is relatively level, although the eastern section, occupied by the stables, slopes gently down towards the south east.

Previous Investigations

A '*Phase I Desk Study, Site Reconnaissance & Phase II Site Investigation Report'* ref LP1841, dated 6 February 2019, has previously been completed for the site by Leap Environmental Ltd. A summary of relevant information from this report is provided below.

Ground Conditions

The surface covering typically comprises topsoil, around 0.2 to 0.3 m thick. Granular made ground was locally encountered at the surface in the area of the stables to a depth of around 0.4 m. Superficial River Terrace Deposits, generally comprising firm to stiff silty sandy clay, were encountered below the surface covering to depths of between 1 and 3 m, occasionally transitioning to clayey sand with increased depth. Weathered chalk was encountered from around 2.25 m below ground level (bgl).

Groundwater was not encountered during excavation of any of the trial pits.

Infiltration Testing

Infiltration tests were carried out in two of the trial pits with one test being completed at each location. The water was left to drain for between 3.5 and 5 hours. Infiltration rates of between

Directors: **P Richardson** BSc CEng MICE FIStructE **S R Ellis** BEng CEng MIStructE MICE **C A Topliss** BSc CEnv CSci CGeol SiLC MICE FGS
S J English BEng CEng MIStructE **A R Priest** BEng **A G Marshall** BEng CEng MIStructE
Technical Directors: **A Allison** BEng **M P Chappell** BEng IEng AMIStructE **K Edwards** MSci CGeol FGS
P A Harrison BEng CEng MIStructE **C Hodge** EngTech MICE **A J Kerslake** BEng FGS
Senior Associates: **C A Wood** BSc, CEng, MIStructE, MICE **M Dyson** BSc CEng MIStructE
Associates: **A M Cross** MEng CEng MICE **A Lavelle** MEng CEng MICE **S R Jackson** MEng CEng MIStructE **R A Noble** BSc FGS
Consultants: **S D Preston** BEng CEng FICE FIStructE **K R Pursall** BEng CEng MIStructE **S J Mitchell** BSc MSc CEng MEI MCIBSE MASHRAE

Eastwood & Partners (Consulting Engineers) Limited Registered No 1835021

ARUN DISTRICT COUNCIL Y/163/21/DOC

0.2 and 1.6 x 10^{-6} m/s were recorded. None of the tests drained past 75% effective depth; it was therefore not possible to calculate a BRE365 infiltration rate for any of the tests.

It was concluded that conventional soakaways would not be appropriate for the site, but deepened soakaways constructed in the structured chalk may be suitable.

E&P Site Works

Eastwood & Partners have undertaken the following works at the site:

- Three window sample holes were undertaken in November 2019 to depths of 5 m and each was installed with a groundwater monitoring well. Nine rounds of groundwater monitoring were subsequently carried out between November 2019 and March 2020.
- Shallow infiltration tests (1.0 m to 1.1 m bgl) were completed at five locations (SA1A to SA5A) between 27 and 29 January 2020. One test was completed at each location.
- Further shallow infiltration testing (0.9 m to 1.0 m bgl) was undertaken at four locations (SA102, SA103, SA105 and SA106) in October 2020. Three tests were completed at each location.
- Additional shallow infiltration testing (0.6 m bgl) was undertaken in four locations (SA201 to SA204) in October 2021. Three tests were completed at each location.

Ground Conditions

Between 0.05 and 0.3 m of topsoil was encountered at the surface, underlain by firm to stiff silty clay or clayey silt to depths of between 2.6 and 2.4 m. Silty sand was encountered at two locations in the south east of the site from around 2.5 m bgl to depths of 3.3 and 4 m. Structureless chalk, generally composed of gravelly sandy silty clay, was encountered below the site from around 2.9 to 4 m bgl. Groundwater was not encountered during the progression of exploratory holes.

Infiltration Testing

The material at the base of the soakaway pits typically comprised clayey silt or silty clay. The pits were filled with around 500 mm of water and left to drain for at least 3 hours. A number of pits suffered from minor side collapses due to heavy rainfall which occurred during the test, causing the depth of the water in the pit to rise. This has been accounted for during the calculation of the infiltration rates. The results and calculations are appended to this report, and are summarised in the table overleaf.

ARUN DISTRICT COUNCIL Y/163/21/DOC

Date	Location	Test number	Infiltration rate ($x10^{-6}$ m/sec)	
			Average	BRE 365
January 2020	SA1A	1	0.86	~
	SA2A	1	1.7	~
	SA3A	1	0.92	~
	SA4A	1	0.55	~
	SA5A	1	0.76	~
October 2020	SA102	1	1.6	~
		2	1.6	1.4
		3	3.8	~
	SA103	1	2.0	1.7
		2	2.0	4.0
		3	7.1	6.7
	SA105	1	0.7	~
		2	0.52	~
		3	0.29	~
	SA106	1	1.2	~
		2	1.0	~
		3	0.98	~
October 2021	SA201	1	3.4	2.4
		2	1.0	~
		3	1.2	1.2
	SA202	1	19	16
		2	6.4	5.5
		3	4.9	3.9
	SA203	1	12	10
		2	5.5	3.6
		3	4.8	4.0
	SA204	1	11	8.8
		2	6.9	6.2
		3	6.2	5.6

Based on the results recorded above it is considered that it would be reasonable to adopt an infiltration rate of around $1.5x10^{-6}$ m/sec for the design of shallow infiltration features such as permeable paving. Features such as these are spread over wide areas and therefore the slight variations in the infiltration rates recorded will be diffused.

Groundwater Monitoring

Nine rounds of groundwater monitoring have been completed at the site. The results are appended, and are summarised in the table below.

Location	Range of Groundwater Depths (m) (No. of Rounds)
BH101	3.6 to 5.0 (8)
BH102	4.6 to 4.97 (3)
BH103	3.38 to 4.82 (9)

Over the monitoring period the groundwater depth varied between 3.38 and 5 m bgl. The groundwater was recorded to be at its shallowest during round 9 in BH103 in the west of the site. The groundwater in this well was consistently around 0.2 m higher compared to BH101 in the centre of the site, and around 0.5 to 1 m higher compared to BH102 in the east.

BH102 was only monitored on three occasions as the well could not be located during any visit after 17 January 2020. This is thought to be a result of heavy plant movement in the period following the 17 January obscuring/burying the well.

We trust that this meets with your approval, however if you have any comments or queries regarding the above, please do not hesitate to contact us.

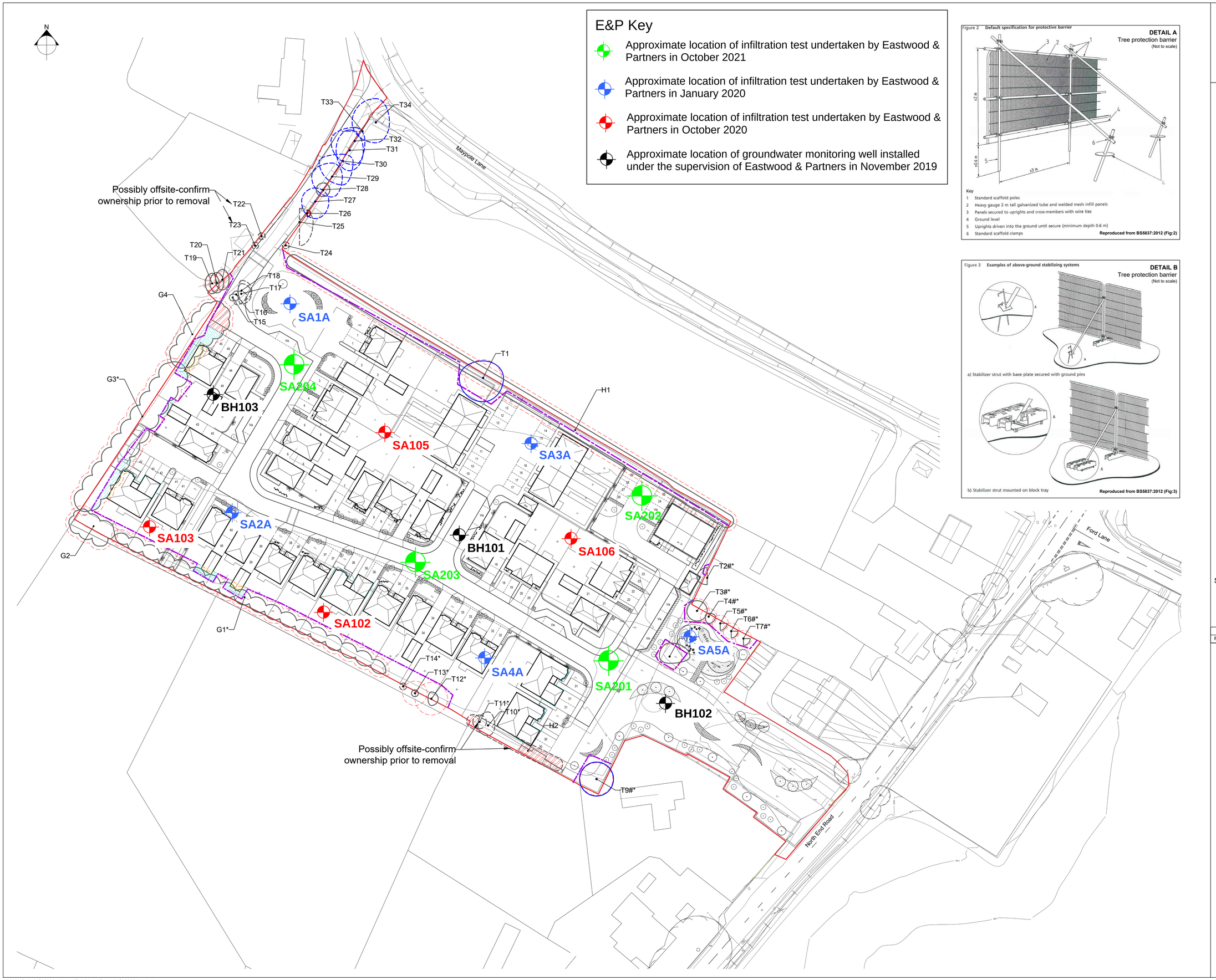
Yours sincerely

CATopliss

Catherine Topliss

Enc. Sketch plan showing GWM well and SA locations
Calculation of Infiltration Rates
Groundwater Monitoring Results
WS logs

ARUN DISTRICT COUNCIL Y/163/21/DOC



E&P Key

- Approximate location of infiltration test undertaken by Eastwood & Partners in October 2021
- Approximate location of infiltration test undertaken by Eastwood & Partners in January 2020
- Approximate location of infiltration test undertaken by Eastwood & Partners in October 2020
- Approximate location of groundwater monitoring well installed under the supervision of Eastwood & Partners in November 2019

Figure 2 Default specification for protective barrier

DETAIL A
Tree protection barrier
(Not to scale)

Key
1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Reproduced from BS5837:2012 (Fig:2)

Figure 3 Examples of above-ground stabilizing systems

DETAIL B
Tree protection barrier
(Not to scale)

a) Stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray

Reproduced from BS5837:2012 (Fig:3)

© 2019 RPS Group

Notes

1. This drawing has been prepared in accordance with the scope of RPS's appointment with its client and is subject to the terms and conditions of that appointment. RPS accepts no liability for any use of this document other than by its client and only for the purposes for which it was prepared and provided.
2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.
3. Where applicable Ordnance Survey (c) Crown Copyright 2019
   All rights reserved. Licence number 0100031673

Key

- Survey boundary.
- T1 — Tree with numbered reference. Canopy spread and BS5837:2012 tree quality category as shown below.
- T1* — Tree (location estimated) with numbered reference. Canopy spread and BS5837:2012 tree quality category.
- T1# — Tree off-site with numbered reference. Canopy spread and BS5837:2012 tree quality category.
- G1 — Vegetation group with numbered reference. Canopy extents and BS5837:2012 tree quality category as shown below.
- H1 — Hedge with numbered reference. Width and BS5837:2012 tree quality category as shown below.

BS 5837:2012 Tree Quality Categories - Table 1

- Category A - High quality
- Category B - Moderate quality
- Category C - Low quality
- Category U - Unsuitable for retention

- Tree outside of survey area (Shown for context only)
- Root protection area (RPA) Calculated in accordance with Section 4.6 - BS5837:2012
- Temporary protective fencing in accordance with Section 6.2 - BS5837:2012. See inset details for example barriers OR tree protection barrier provided by site hoarding fence
- Surface area to be protected in accordance with Section 6.2.3 BS - 5837:2012 for pedestrian movements.
- Excavation to be completed by hand, any required root pruning to be in accordance with BS 3998. Pruning of roots over 25mmØ to be monitored by arboriculturalist, with ongoing monitoring of trees condition by an arboriculturalist being recommended.
- G1 — Vegetation group with numbered reference to be removed or partially removed to facilitate the development.
- Tree to be removed with numbered reference. Canopy spread and BS5837:2012 tree quality category.

NOTES:

- Refer to RPS Tree Survey Report & Schedule for further details.
- Survey based on a visual inspection from the ground and is not intended as a full arboricultural inspection.
- Plan produced in accordance with recommendations set out in BS 5837:2012 - 'Trees in Relation to design, demolition and construction'.
- Due to the legal protection afforded to breeding birds vegetation removal should not take place during the bird nesting period; generally, although not restricted to, March - August inclusive.
- Survey based upon topographic survey produced by MK Surveys in Horsham, January 2019.

Scale Bar
0m 25m 50m

Rev	Description	By	CB	Date
A	Updated to new layout	JMB	DC	07/ 20

MAKING COMPLEX EASY

Lakesbury House, Hiltingbury Road, Chandlers Ford, Hampshire SO53 5SS

T: 02380 810 440 **E:** rpsso@rpsgroup.com

Client: Redrow Homes Limited

Project: Maypole Lane
Yapton, Bognor Regis

Title: Tree Protection and Removal Plan

Status	Drawn By	PM/Checked by
For Planning	AB	DC

Job Ref	Scale @ A1	Date Created
JSL3292	1:500	02/2020

RPS Drawing / Figure Number	Rev
711	A

rpsgroup.com

EASTWOOD & PARTNERS
(Consulting Engineers) Ltd

PROJECT:	**North End Road, Yapton**	**Job No. 44005**	**Date 27/01/2020**
SUBJECT:	**Infiltration Test Results and Calculation of Infiltration Rates**	**Prepared DN**	**Checked RAN**

Test No. **SA1A - Test 1**

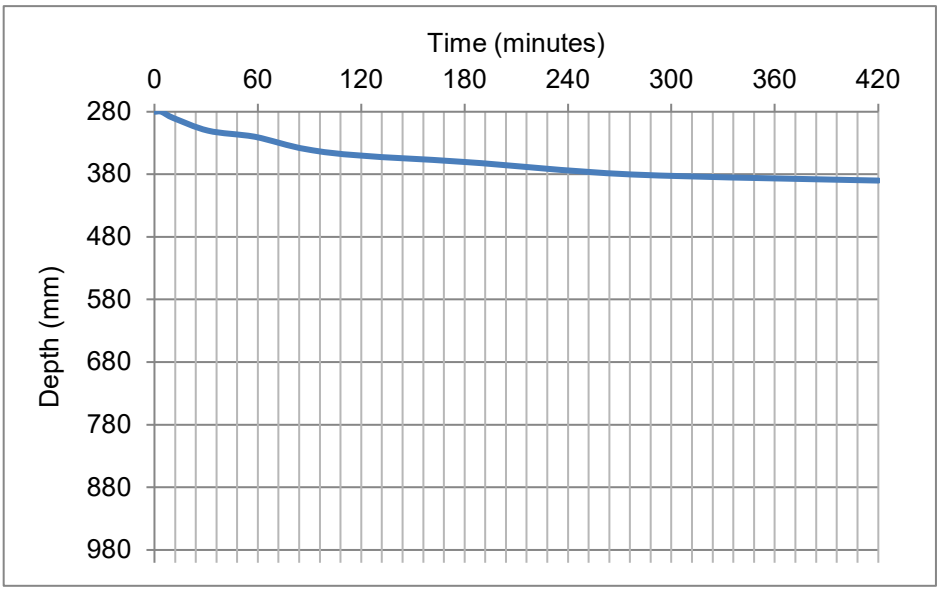
Test Pit Dimensions

Length = **1200** mm
Width = **450** mm
Depth = **1000** mm (Total depth)

Plan area = **0.54** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **280** mm

Time (min)	**Depth (mm)**
0	**280**
4	**280**
11	**290**
31	**310**
58	**320**
88	**340**
120	**350**
180	**360**
277	**380**
420	**390**



Water level at 470 mm when checked in the morning the next day.

Depth (m)	**Description**
0.0 - 0.15	TOPSOIL: Dark brown slightly silty sandy CLAY with rootlets.
0.15 - 0.7	Firm brown slightly gravelly silty CLAY.
0.7 - 1.0	Stiff brown silty CLAY.

PROJECT:	North End Road, Yapton	Job No. 44005	Date 27/01/2020
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared DN	Checked RAN

Test No. SA1A - Test 1

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} x t_{p75-25}}$$

Where:

V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water =	**280**	mm	Average water depth:	**665**	mm
Start time =	**0**	min			
			Change in water depth:	**110**	mm

Final parameters

Depth to water =	**390**	mm	Time interval:	**420**	min
End time =	**420**	min			

Effective Storage Volume of Water in the Trial Pit	=	**0.3888**	m³
75% Effective Depth	=	**460**	mm from ground level
25% Effective Depth	=	**820**	mm from ground level
Time at 75% Effective Depth	=	**N/A**	minutes
Time at 25% Effective Depth	=	**N/A**	minutes

V_{p75-25}	=	**0.19**	m³
a_{p50}	=	**1.73**	m²
t_{p75-25}	=		sec
f	=		**m/sec**

Average Soakaway Rate	=	**2.4E-06**	m³/sec
Average soakaway area	=	**2.73**	m² (sides + base)

BR365 Soil Infiltration Rate =	**N/A**	**m/sec**
Average Infiltration Rate =	**8.6E-07**	**m/sec**

EASTWOOD & PARTNERS
(Consulting Engineers) Ltd

PROJECT:	**North End Road, Yapton**	**Job No. 44005**	**Date 27/01/2020**
SUBJECT:	**Infiltration Test Results and Calculation of Infiltration Rates**	**Prepared DN**	**Checked RAN**

Test No. **SA2A - Test 1**

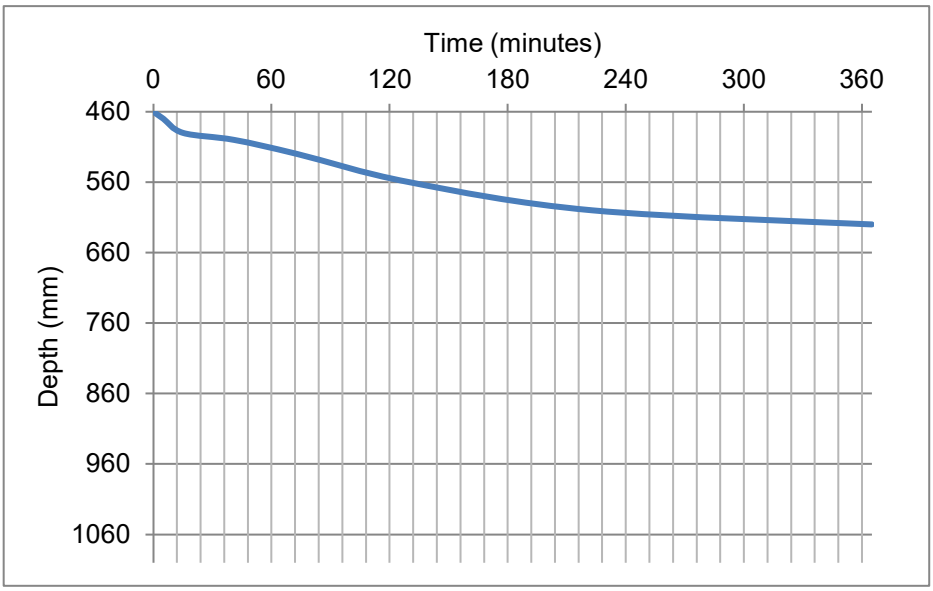
Test Pit Dimensions

Length = **1500** mm
Width = **450** mm
Depth = **1100** mm (Total depth)

Plan area = **0.675** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **460** mm

Time (min)	**Depth (mm)**
0	**460**
5	**470**
15	**490**
41	**500**
73	**520**
130	**560**
223	**600**
365	**620**



Water level at 920 mm when checked in the morning the next day.

Depth (m)	**Description**
0.0 - 0.05	TOPSOIL: Greyish brown silty sandy CLAY with rootlets.
0.05 - 0.25	Stiff brown slightly sandy silty CLAY.
0.25 - 1.1	Stiff orangish brown slightly sandy slightly gravelly silty CLAY

PROJECT:	North End Road, Yapton	Job No. 44005	Date 27/01/2020
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared DN	Checked RAN

Test No. SA2A - Test 1

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} x t_{p75-25}}$$

Where:

V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water =	**460**	mm	Average water depth:	**560**	mm
Start time =	**0**	min			
			Change in water depth:	**160**	mm

Final parameters

Depth to water =	**620**	mm	Time interval:	**365**	min
End time =	**365**	min			

Effective Storage Volume of Water in the Trial Pit	=	**0.432**	m³
75% Effective Depth	=	**620**	mm from ground level
25% Effective Depth	=	**940**	mm from ground level
Time at 75% Effective Depth	=	**365**	minutes
Time at 25% Effective Depth	=	**N/A**	minutes

V_{p75-25}	=	**0.22**	m³
a_{p50}	=	**1.92**	m²
t_{p75-25}	=		sec
f	=		**m/sec**

Average Soakaway Rate	=	**4.9E-06**	m³/sec
Average soakaway area	=	**2.86**	m² (sides + base)

BR365 Soil Infiltration Rate =	**N/A**	**m/sec**
Average Infiltration Rate =	**1.7E-06**	**m/sec**

EASTWOOD & PARTNERS
(Consulting Engineers) Ltd

PROJECT:	**North End Road, Yapton**	**Job No. 44005**	**Date 27/01/2020**
SUBJECT:	**Infiltration Test Results and Calculation of Infiltration Rates**	**Prepared DN**	**Checked RAN**

Test No. **SA3A - Test 1**

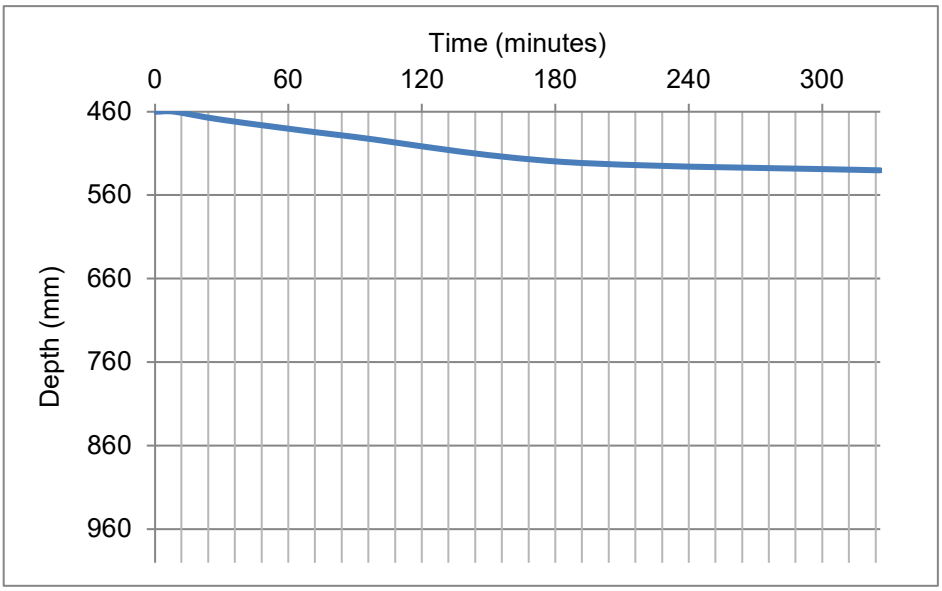
Test Pit Dimensions

Length = **1600** mm
Width = **450** mm
Depth = **1000** mm (Total depth)

Plan area = **0.72** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **460** mm

Time (min)	Depth (mm)
0	**460**
9	**460**
31	**470**
89	**490**
184	**520**
326	**530**



Water level at 600 mm when checked in the morning the next day.

Depth (m)	Description
0.0 - 0.25	TOPSOIL: Dark brown silty CLAY.
0.25 - 1.0	Firm brown clayey SILT.

PROJECT:	North End Road, Yapton	Job No. 44005	Date 27/01/2020
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared DN	Checked RAN

Test No. SA3A - Test 1

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} x t_{p75-25}}$$

Where:

V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water =	**460**	mm	Average water depth:	**505**	mm
Start time =	**0**	min			
			Change in water depth:	**70**	mm

Final parameters

Depth to water =	**530**	mm	Time interval:	**326**	min
End time =	**326**	min			

Effective Storage Volume of Water in the Trial Pit	=	**0.3888**	m³
75% Effective Depth	=	**595**	mm from ground level
25% Effective Depth	=	**865**	mm from ground level
Time at 75% Effective Depth	=	**N/A**	minutes
Time at 25% Effective Depth	=	**N/A**	minutes

V_{p75-25}	=	**0.19**	m³
a_{p50}	=	**1.83**	m²
t_{p75-25}	=		sec
f	=		**m/sec**

Average Soakaway Rate	=	**2.6E-06**	m³/sec
Average soakaway area	=	**2.79**	m² (sides + base)

BR365 Soil Infiltration Rate =	**N/A**	**m/sec**
Average Infiltration Rate =	**9.2E-07**	**m/sec**

EASTWOOD & PARTNERS
(Consulting Engineers) Ltd

PROJECT:	**North End Road, Yapton**	**Job No. 44005**	**Date 27/01/2020**
SUBJECT:	**Infiltration Test Results and Calculation of Infiltration Rates**	**Prepared DN**	**Checked RAN**

Test No. **SA4A - Test 1**

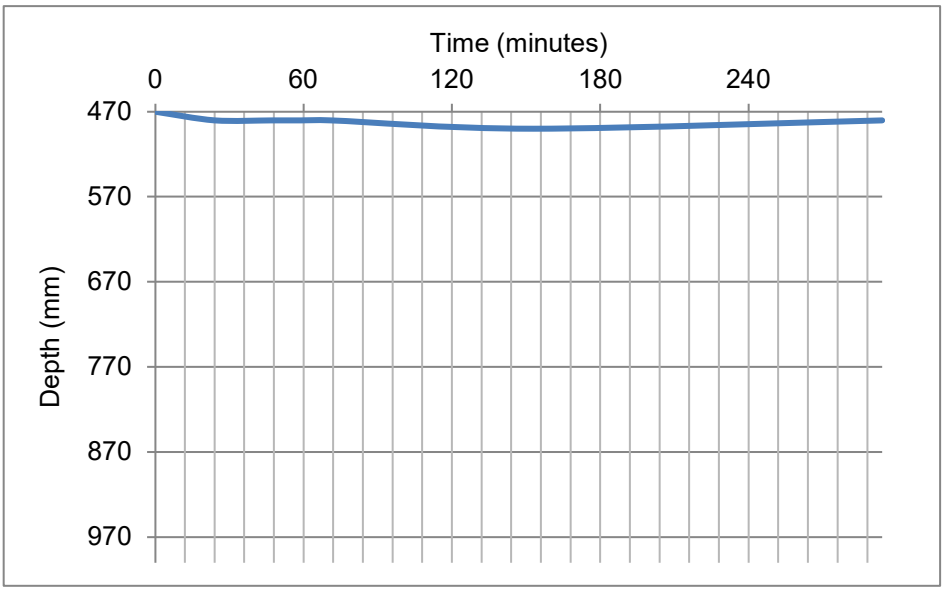
Test Pit Dimensions

Length = **1600** mm
Width = **450** mm
Depth = **1000** mm (Total depth)

Plan area = **0.72** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **460** mm

Time (min)	**Depth (mm)**
0	**470**
24	**480**
47	**480**
59	**480**
71	**480**
153	**490**
294	**480**



Water level at 500 mm when checked in the morning the next day.

Depth (m)	**Description**
0.0 - 0.1	TOPSOIL: Dark brown silty CLAY.
0.1 - 1.0	Firm brown clayey SILT.

PROJECT:	North End Road, Yapton	Job No. 44005	Date 27/01/2020
SUBJECT:	Infiltration Test Results and Calculation of Infiltration Rates	Prepared DN	Checked RAN

Test No. SA4A - Test 1

Soil Infiltration Rate in Accordance with BR365

$$f = \frac{V_{p75-25}}{a_{p50} x t_{p75-25}}$$

Where:

V_{p75-25} is the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} is the internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} is the time for the water level to fall from 75% to 25% effective depth

Initial parameters

Depth to water =	**470**	mm	Average water depth:	**520**	mm
Start time =	**0**	min			
			Change in water depth:	**20**	mm

Final parameters

Depth to water =	**490**	mm	Time interval:	**153**	min
End time =	**153**	min			

Effective Storage Volume of Water in the Trial Pit	=	**0.3816**	m³
75% Effective Depth	=	**603**	mm from ground level
25% Effective Depth	=	**868**	mm from ground level
Time at 75% Effective Depth	=	**N/A**	minutes
Time at 25% Effective Depth	=	**N/A**	minutes

V_{p75-25}	=	**0.19**	m³
a_{p50}	=	**1.81**	m²
t_{p75-25}	=		sec
f	=		**m/sec**

Average Soakaway Rate	=	**1.6E-06**	m³/sec
Average soakaway area	=	**2.85**	m² (sides + base)

BR365 Soil Infiltration Rate =	**N/A**	**m/sec**
Average Infiltration Rate =	**5.5E-07**	**m/sec**

EASTWOOD & PARTNERS
(Consulting Engineers) Ltd

PROJECT:	**North End Road, Yapton**	**Job No. 44005**	**Date 27/01/2020**
SUBJECT:	**Infiltration Test Results and Calculation of Infiltration Rates**	**Prepared DN**	**Checked RAN**

Test No. **SA5A - Test 1**

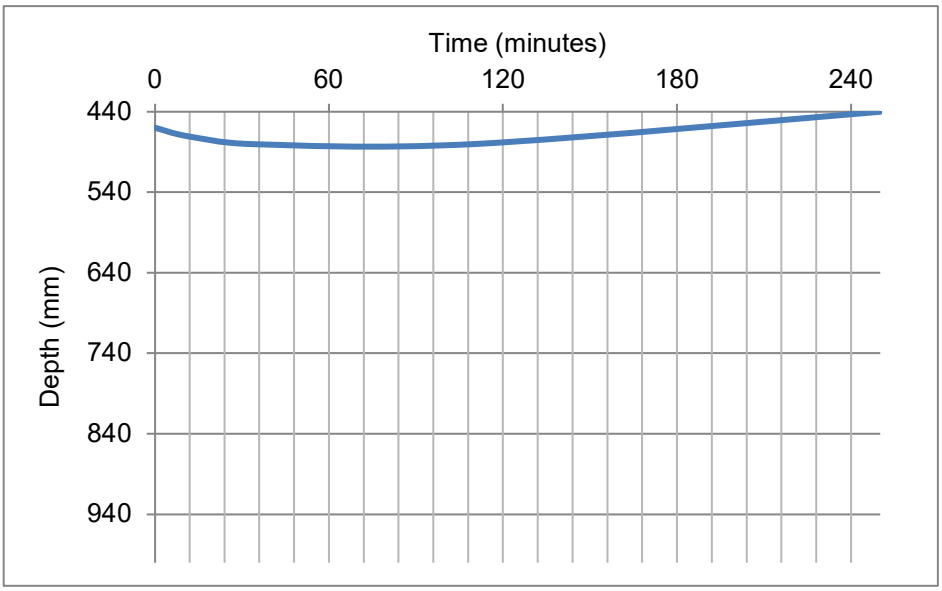
Test Pit Dimensions

Length = **1700** mm
Width = **450** mm
Depth = **1000** mm (Total depth)

Plan area = **0.765** m²

Approximate time to discharge water into the hole: **30** Seconds
Depth to water after completion of pumping: **460** mm

Time (min)	**Depth (mm)**
0	**460**
11	**470**
33	**480**
110	**480**
250	**440**



Water level at 480 mm when checked in the morning the next day.
Water level rise thought to be a result of heavy rain during the test.

Depth (m)	**Description**
0.0 - 0.2	TOPSOIL: Dark brown silty CLAY.
0.2 - 1.0	Firm brown clayey SILT.

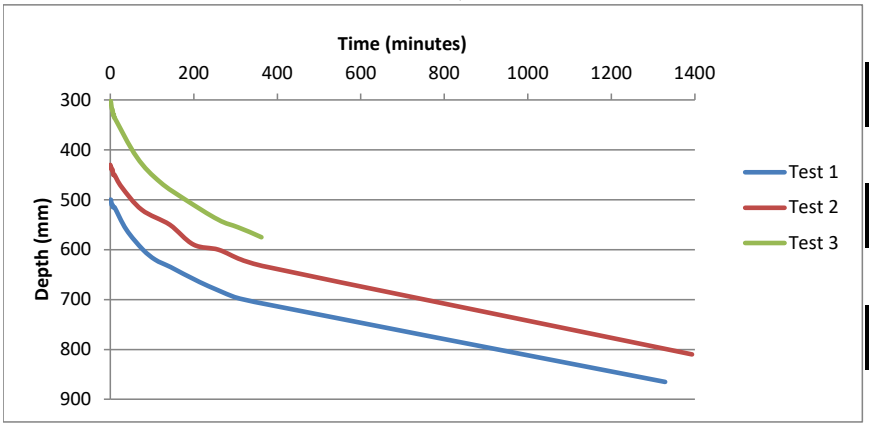
EASTWOOD PARTNERS
(Consulting Engineers) Ltd

Infiltration Test Results and Calculation of Infiltration Rates

Site: North End Road, Yapton
Client: Redrow Homes
Test Reference: SA102

Test 1				Test 2				Test 3			
Pit Dimensions				**Pit Dimensions**				**Pit Dimensions**			
Trial pit length (mm)			1700	Trial pit length (mm)			1700	Trial pit length (mm)			1700
Trial pit width (mm)			450	Trial pit width (mm)			450	Trial pit width (mm)			450
Trial pit depth (mm)			1000	Trial pit depth (mm)			940	Trial pit depth (mm)			850
Plan area (m^2)			0.765	Plan area (m^2)			0.765	Plan area (m^2)			0.765
Time to discharge water (s)			60	Time to discharge water (s)			60	Time to discharge water (s)			60
Depth to water at start of test (mm)			500	Depth to water at start of test (mm)			430	Depth to water at start of test (mm)			300
Time to soakaway				**Time to soakaway**				**Time to soakaway**			
Time		Depth to Water	Duration	Time		Depth to Water	Duration	Time		Depth to Water	Duration
Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes
1	10:17	500	0	2	09:08	430	0	3	08:33	300	0
1	10:18	500	1	2	09:09	435	1	3	08:34	305	1
1	10:19	505	2	2	09:10	435	2	3	08:35	310	2
1	10:20	510	3	2	09:11	440	3	3	08:36	315	3
1	10:21	510	4	2	09:12	440	4	3	08:37	320	4
1	10:22	510	5	2	09:13	440	5	3	08:38	320	5
1	10:23	515	6	2	09:14	445	6	3	08:39	325	6
1	10:24	515	7	2	09:15	450	7	3	08:40	330	7
1	10:25	515	8	2	09:16	450	8	3	08:41	330	8
1	10:26	515	9	2	09:17	450	9	3	08:42	335	9
1	10:27	515	10	2	09:18	450	10	3	08:43	335	10
1	10:55	560	38	2	09:35	475	27	3	09:36	415	63
1	11:35	600	78	2	10:23	520	75	3	10:32	465	119
1	12:04	620	107	2	11:30	550	142	3	11:33	500	180
1	12:41	635	144	2	12:27	590	199	3	12:51	540	258
1	13:51	665	214	2	13:27	600	259	3	13:39	555	306
1	15:14	695	297	2	14:21	620	313	3	14:35	575	362
1	16:02	705	345	2	15:24	635	376				
2	08:26	865	1329	3	08:21	810	1393				
Final depth		865		Final depth		810		Final depth		575	
75% Effective depth (mm)			625	75% Effective depth (mm)			557.5	75% Effective depth (mm)			437.5
25% Effective depth (mm)			875	25% Effective depth (mm)			812.5	25% Effective depth (mm)			712.5
Time at 75% effective depth - t_{p75} (min)			119	Time at 75% effective depth - t_{p75} (min)			153	Time at 75% effective depth - t_{p75} (min)			83
Time at 25 % effective depth - t_{p25} (min)			N/A	Time at 25 % effective depth - t_{p25} (min)			1408	Time at 25 % effective depth - t_{p25} (min)			N/A
Effective Storage volume of water (m^3)			0.3825	Effective Storage volume of water (m^3)			0.39015	Effective Storage volume of water (m^3)			0.42075
V_{p75-25} (m^3)			0.19125	V_{p75-25} (m^3)			0.195075	V_{p75-25} (m^3)			0.210375
Internal surface area - a_{p50} (m^2)			1.84	Internal surface area - a_{p50} (m^2)			1.8615	Internal surface area - a_{p50} (m^2)			1.9475
t_{p75-25} (sec)			N/A	t_{p75-25} (sec)			75300	t_{p75-25} (sec)			N/A
BR365 Soil Infiltration Rate			**N/A**	**BR365 Soil Infiltration Rate***			**1.4E-06**	**BR365 Soil Infiltration Rate**			**N/A**
Average Soil Infiltration Rate			**1.6E-06**	**Average Soil Infiltration Rate**			**1.6E-06**	**Average Soil Infiltration Rate**			**3.8E-06**

*t_{p75} value extrapolated based on rate recorded between 376 and 1393 min



Testing completed by	RAN
Date	21-23/10/2020

Calculation completed by	RAN
Date	26/10/2020

Calculation checked by	GC
Date	26/10/2020

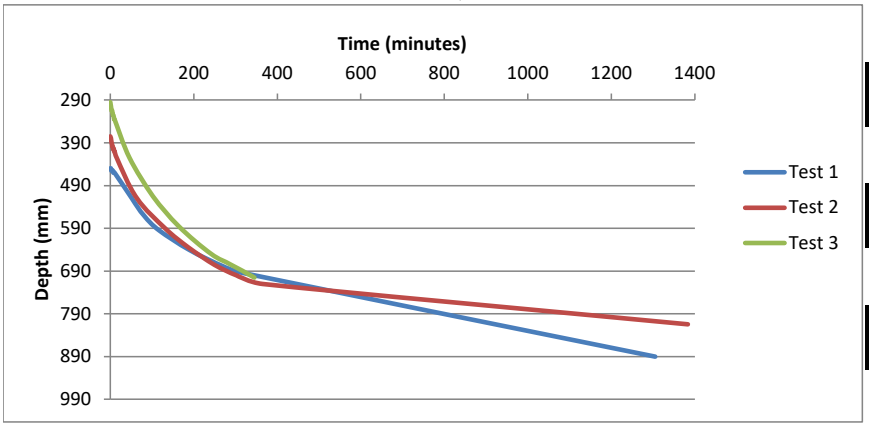
EASTWOOD PARTNERS
(Consulting Engineers) Ltd

Infiltration Test Results and Calculation of Infiltration Rates

Site: North End Road, Yapton
Client: Redrow Homes
Test Reference: SA103

Test 1				Test 2				Test 3			
Pit Dimensions				**Pit Dimensions**				**Pit Dimensions**			
Trial pit length (mm)			1600	Trial pit length (mm)			1600	Trial pit length (mm)			1600
Trial pit width (mm)			450	Trial pit width (mm)			450	Trial pit width (mm)			450
Trial pit depth (mm)			1000	Trial pit depth (mm)			890	Trial pit depth (mm)			815
Plan area (m^2)			0.72	Plan area (m^2)			0.72	Plan area (m^2)			0.72
Time to discharge water (s)			60	Time to discharge water (s)			60	Time to discharge water (s)			60
Depth to water at start of test (mm)			450	Depth to water at start of test (mm)			375	Depth to water at start of test (mm)			295
Time to soakaway				**Time to soakaway**				**Time to soakaway**			
Time		Depth to Water	Duration	Time		Depth to Water	Duration	Time		Depth to Water	Duration
Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes
1	10:45	450	0	2	09:21	375	0	3	08:51	295	0
1	10:46	450	1	2	09:22	380	1	3	08:52	305	1
1	10:47	455	2	2	09:23	385	2	3	08:53	310	2
1	10:48	455	3	2	09:24	390	3	3	08:54	315	3
1	10:49	455	4	2	09:25	395	4	3	08:55	315	4
1	10:50	455	5	2	09:26	400	5	3	08:56	320	5
1	10:51	455	6	2	09:27	400	6	3	08:57	325	6
1	10:52	460	7	2	09:28	405	7	3	08:58	325	7
1	10:53	460	8	2	09:29	405	8	3	08:59	330	8
1	10:54	460	9	2	09:30	410	9	3	09:00	335	9
1	10:55	460	10	2	09:31	410	10	3	09:01	335	10
1	11:36	520	51	2	09:36	425	15	3	09:37	425	46
1	12:05	560	80	2	10:24	520	63	3	10:33	515	102
1	12:42	595	117	2	11:32	590	131	3	11:34	585	163
1	13:53	640	188	2	12:28	635	187	3	12:52	650	241
1	15:17	680	272	2	13:30	675	249	3	13:40	675	289
1	16:04	695	319	2	14:23	700	302	3	14:36	705	345
2	08:30	890	1305	2	15:26	720	365				
		Dry		3	08:24	815	1383				
						Dry					
Final depth		890		Final depth		815		Final depth		705	
75% Effective depth (mm)			587.5	75% Effective depth (mm)			503.75	75% Effective depth (mm)			425
25% Effective depth (mm)			862.5	25% Effective depth (mm)			761.25	25% Effective depth (mm)			685
Time at 75% effective depth - t_{p75} (min)			109	Time at 75% effective depth - t_{p75} (min)			55	Time at 75% effective depth - t_{p75} (min)			46
Time at 25 % effective depth - t_{p25} (min)			1166	Time at 25 % effective depth - t_{p25} (min)			495	Time at 25 % effective depth - t_{p25} (min)			308
Effective Storage volume of water (m^3)			0.396	Effective Storage volume of water (m^3)			0.3708	Effective Storage volume of water (m^3)			0.3744
V_{p75-25} (m^3)			0.198	V_{p75-25} (m^3)			0.1854	V_{p75-25} (m^3)			0.1872
Internal surface area - a_{p50} (m^2)			1.8475	Internal surface area - a_{p50} (m^2)			1.77575	Internal surface area - a_{p50} (m^2)			1.786
t_{p75-25} (sec)			63420	t_{p75-25} (sec)			26400	t_{p75-25} (sec)			15720
BR365 Soil Infiltration Rate			**1.7E-06**	**BR365 Soil Infiltration Rate***			**4.0E-06**	**BR365 Soil Infiltration Rate**			**6.7E-06**
Average Soil Infiltration Rate			**2.0E-06**	**Average Soil Infiltration Rate**			**2.0E-06**	**Average Soil Infiltration Rate**			**7.1E-06**

*t_{p25} value extrapolated based on rate recorded between 302 and 365 min



Testing completed by	RAN
Date	21-23/10/20

Calculation completed by	RAN
Date	26/10/2020

Calculation checked by	GC
Date	26/10/2020

EASTWOOD PARTNERS
(Consulting Engineers) Ltd

Infiltration Test Results and Calculation of Infiltration Rates

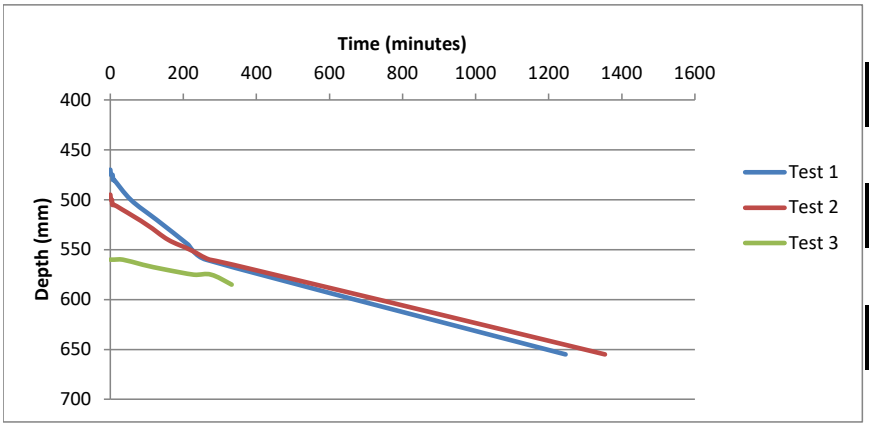
Site: North End Road, Yapton
Client: Redrow Homes
Test Reference: SA105

Test 1		Test 2		Test 3	
Pit Dimensions		**Pit Dimensions**		**Pit Dimensions**	
Trial pit length (mm)	1500	Trial pit length (mm)	1500	Trial pit length (mm)	1500
Trial pit width (mm)	450	Trial pit width (mm)	450	Trial pit width (mm)	450
Trial pit depth (mm)	1000	Trial pit depth (mm)	1055	Trial pit depth (mm)	1145
Plan area (m^2)	0.675	Plan area (m^2)	0.675	Plan area (m^2)	0.675
Time to discharge water (s)	60	Time to discharge water (s)	60	Time to discharge water (s)	60
Depth to water at start of test (mm)	470	Depth to water at start of test (mm)	495	Depth to water at start of test (mm)	560

Time to soakaway

Time		Depth to Water	Duration	Time		Depth to Water	Duration	Time		Depth to Water	Duration
Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes
1	11:49	470	0	2	09:55	495	0	3	09:07	560	0
1	11:50	475	1	2	09:56	500	1	3	09:08	560	1
1	11:51	475	2	2	09:57	500	2	3	09:09	560	2
1	11:52	475	3	2	09:58	500	3	3	09:10	560	3
1	11:53	475	4	2	09:59	500	4	3	09:11	560	4
1	11:54	475	5	2	10:00	505	5	3	09:12	560	5
1	11:55	475	6	2	10:01	505	6	3	09:13	560	6
1	11:56	480	7	2	10:02	505	7	3	09:14	560	7
1	11:57	480	8	2	10:03	505	8	3	09:15	560	8
1	11:58	480	9	2	10:04	505	9	3	09:16	560	9
1	11:59	480	10	2	10:05	505	10	3	09:17	560	10
1	12:45	500	56	2	10:28	510	33	3	09:41	560	34
1	13:55	520	126	2	11:35	525	100	3	10:36	565	89
1	15:22	545	213	2	12:33	540	158	3	11:37	570	150
1	16:11	560	262	2	13:33	550	218	3	12:55	575	228
2	08:35	655	1246	2	14:26	560	271	3	13:43	575	276
				2	15:31	565	336	3	14:39	585	332
				3	08:29	655	1354				

Final depth	655	Final depth	655	Final depth	585
75% Effective depth (mm)	602.5	75% Effective depth (mm)	635	75% Effective depth (mm)	706.25
25% Effective depth (mm)	867.5	25% Effective depth (mm)	915	25% Effective depth (mm)	998.75
Time at 75% effective depth - t_{p75} (min)	702	Time at 75% effective depth - t_{p75} (min)	1128	Time at 75% effective depth - t_{p75} (min)	N/A
Time at 25 % effective depth - t_{p25} (min)	N/A	Time at 25 % effective depth - t_{p25} (min)	N/A	Time at 25 % effective depth - t_{p25} (min)	N/A
Effective Storage volume of water (m^3)	0.35775	Effective Storage volume of water (m^3)	0.378	Effective Storage volume of water (m^3)	0.394875
V_{p75-25} (m^3)	0.178875	V_{p75-25} (m^3)	0.189	V_{p75-25} (m^3)	0.1974375
Internal surface area - a_{p50} (m^2)	1.7085	Internal surface area - a_{p50} (m^2)	1.767	Internal surface area - a_{p50} (m^2)	1.81575
t_{p75-25} (sec)	N/A	t_{p75-25} (sec)	N/A	t_{p75-25} (sec)	N/A
BR365 Soil Infiltration Rate	**N/A**	**BR365 Soil Infiltration Rate (f)**	**N/A**	**BR365 Soil Infiltration Rate (f)**	**N/A**
Average Soil Infiltration Rate	**7.0E-07**	**Average Soil Infiltration Rate**	**5.2E-07**	**Average Soil Infiltration Rate**	**2.9E-07**



Testing completed by	RAN
Date	21-23/10/20

Calculation completed by	RAN
Date	26/10/2020

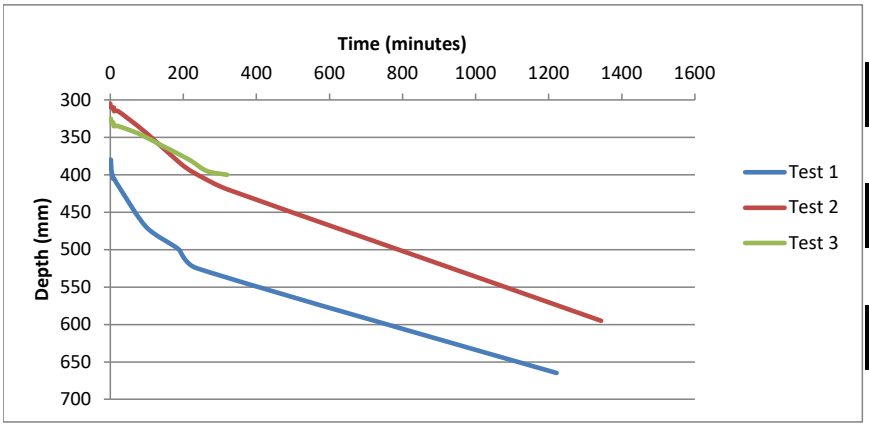
Calculation checked by	GC
Date	26/10/2020

EASTWOOD PARTNERS
(Consulting Engineers) Ltd

Infiltration Test Results and Calculation of Infiltration Rates

Site: North End Road, Yapton
Client: Redrow Homes
Test Reference: SA106

Test 1				Test 2				Test 3			
Pit Dimensions				**Pit Dimensions**				**Pit Dimensions**			
Trial pit length (mm)			1600	Trial pit length (mm)			1600	Trial pit length (mm)			1600
Trial pit width (mm)			450	Trial pit width (mm)			450	Trial pit width (mm)			450
Trial pit depth (mm)			900	Trial pit depth (mm)			880	Trial pit depth (mm)			890
Plan area (m^2)			0.72	Plan area (m^2)			0.72	Plan area (m^2)			0.72
Time to discharge water (s)			60	Time to discharge water (s)			60	Time to discharge water (s)			60
Depth to water at start of test (mm)			380	Depth to water at start of test (mm)			305	Depth to water at start of test (mm)			325
Time to soakaway				**Time to soakaway**				**Time to soakaway**			
Time		Depth to Water	Duration	Time		Depth to Water	Duration	Time		Depth to Water	Duration
Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes
1	12:17	380	0	2	10:09	305	0	3	09:21	325	0
1	12:18	380	1	2	10:10	310	1	3	09:22	325	1
1	12:19	390	2	2	10:11	310	2	3	09:23	330	2
1	12:20	395	3	2	10:12	310	3	3	09:24	330	3
1	12:21	400	4	2	10:13	310	4	3	09:25	330	4
1	12:22	400	5	2	10:14	310	5	3	09:26	330	5
1	12:23	400	6	2	10:15	310	6	3	09:27	330	6
1	12:24	405	7	2	10:16	310	7	3	09:28	330	7
1	12:25	405	8	2	10:17	310	8	3	09:29	330	8
1	12:26	405	9	2	10:18	310	9	3	09:30	335	9
1	12:27	405	10	2	10:19	315	10	3	09:31	335	10
1	12:46	420	29	2	10:30	315	21	3	09:43	335	22
1	13:56	470	99	2	11:37	340	88	3	10:38	345	77
1	15:25	500	188	2	12:35	365	146	3	11:39	360	138
1	16:14	525	237	2	13:35	390	206	3	12:57	380	216
2	08:38	665	1221	2	14:27	405	258	3	13:45	395	264
				2	15:33	420	324	3	14:41	400	320
				3	08:32	595	1343				
Final depth		665		Final depth		595		Final depth		400	
75% Effective depth (mm)			510	75% Effective depth (mm)			448.75	75% Effective depth (mm)			466.25
25% Effective depth (mm)			770	25% Effective depth (mm)			736.25	25% Effective depth (mm)			748.75
Time at 75% effective depth - t_{p75} (min)			208	Time at 75% effective depth - t_{p75} (min)			491	Time at 75% effective depth - t_{p75} (min)			N/A
Time at 25 % effective depth - t_{p25} (min)			N/A	Time at 25 % effective depth - t_{p25} (min)			N/A	Time at 25 % effective depth - t_{p25} (min)			N/A
Effective Storage volume of water (m^3)			0.3744	Effective Storage volume of water (m^3)			0.414	Effective Storage volume of water (m^3)			0.4068
V_{p75-25} (m^3)			0.1872	V_{p75-25} (m^3)			0.207	V_{p75-25} (m^3)			0.2034
Internal surface area - a_{p50} (m^2)			1.786	Internal surface area - a_{p50} (m^2)			1.89875	Internal surface area - a_{p50} (m^2)			1.87825
t_{p75-25} (sec)			N/A	t_{p75-25} (sec)			N/A	t_{p75-25} (sec)			N/A
BR365 Soil Infiltration Rate			**N/A**	**BR365 Soil Infiltration Rate (f)**			**N/A**	**BR365 Soil Infiltration Rate (f)**			**N/A**
Average Soil Infiltration Rate			**1.2E-06**	**Average Soil Infiltration Rate**			**1.0E-06**	**Average Soil Infiltration Rate**			**9.8E-07**



Testing completed by	RAN
Date	21-23/10/20

Calculation completed by	RAN
Date	26/10/2020

Calculation checked by	GC
Date	26/10/2020

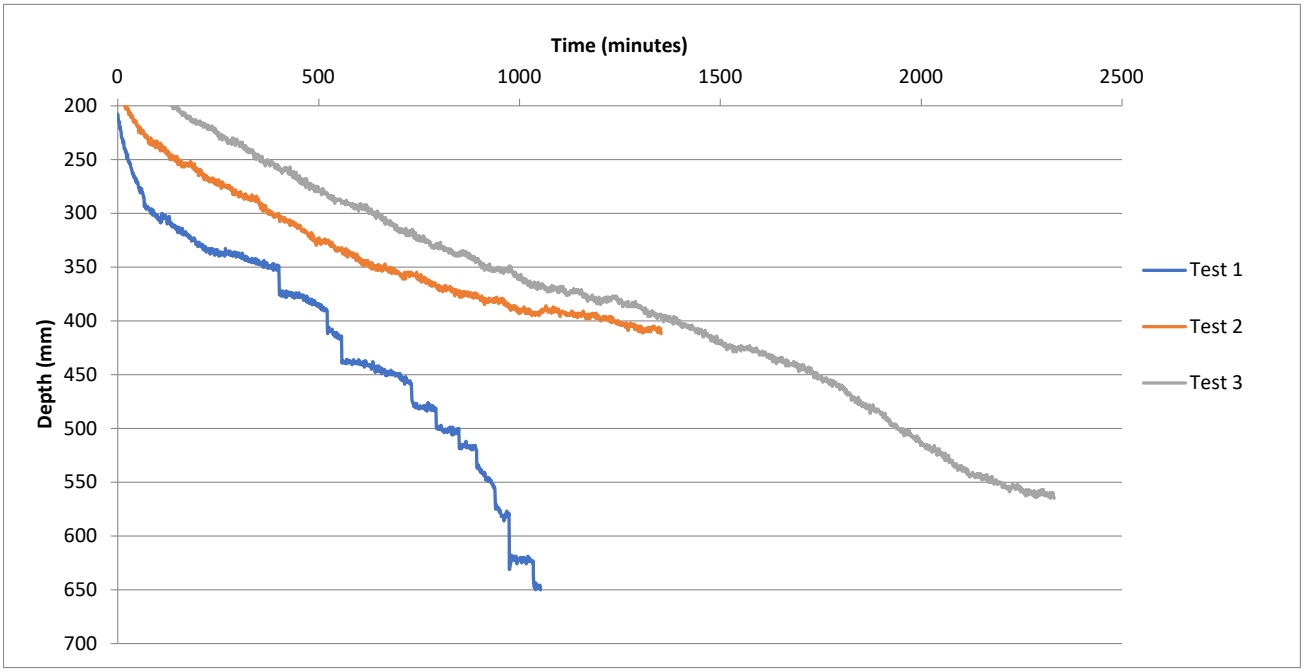
Infiltration Test Results and Calculation of Infiltration Rates

Site: North End Road, Yapton

Client: Redrow Homes

Test Reference: SA201

Test 1		Test 2		Test 3	
Pit Dimensions		**Pit Dimensions**		**Pit Dimensions**	
Trial pit length (mm)	1200	Trial pit length (mm)	1200	Trial pit length (mm)	1200
Trial pit width (mm)	650	Trial pit width (mm)	650	Trial pit width (mm)	650
Trial pit depth (mm)	650	Trial pit depth (mm)	650	Trial pit depth (mm)	635
Plan area (m^2)	0.78	Plan area (m^2)	0.78	Plan area (m^2)	0.78
Depth to water at start of test (mm)	208	Depth to water at start of test (mm)	193	Depth to water at start of test (mm)	173
End time (sec)	63180	End time (sec)	81120	End time (sec)	139860
Final depth	650	Final depth	412	Final depth	565
75% Effective depth (mm)	319	75% Effective depth (mm)	307	75% Effective depth (mm)	289
25% Effective depth (mm)	540	25% Effective depth (mm)	536	25% Effective depth (mm)	520
Time at 75% effective depth - t_{p75} (sec)	9960	Time at 75% effective depth - t_{p75} (sec)	24840	Time at 75% effective depth - t_{p75} (sec)	32400
Time at 25% effective depth - t_{p25} (sec)	54180	Time at 25% effective depth - t_{p25} (sec)	N/A	Time at 25% effective depth - t_{p25} (sec)	121080
Effective Storage volume of water (m^3)	0.34476	Effective Storage volume of water (m^3)	0.35646	Effective Storage volume of water (m^3)	0.36036
V_{p75-25} (m^3)	0.17238	V_{p75-25} (m^3)	0.17823	V_{p75-25} (m^3)	0.18018
Internal surface area - a_{p50} (m^2)	1.5977	Internal surface area - a_{p50} (m^2)	1.62545	Internal surface area - a_{p50} (m^2)	1.6347
t_{p75-25} (sec)	44220	t_{p75-25} (sec)		t_{p75-25} (sec)	88680
BR365 Soil Infiltration Rate	**2.4E-06**	**BR365 Soil Infiltration Rate**	**N/A**	**BR365 Soil Infiltration Rate**	**1.2E-06**
Average Soil Infiltration Rate	**3.4E-06**	**Average Soil Infiltration Rate**	**1.0E-06**	**Average Soil Infiltration Rate**	**1.2E-06**
Testing completed by	EJD	Calculation completed by	EJD	Calculation checked by	RAN
Date	27-29/10/21	Date	03/11/2021	Date	03/11/2021



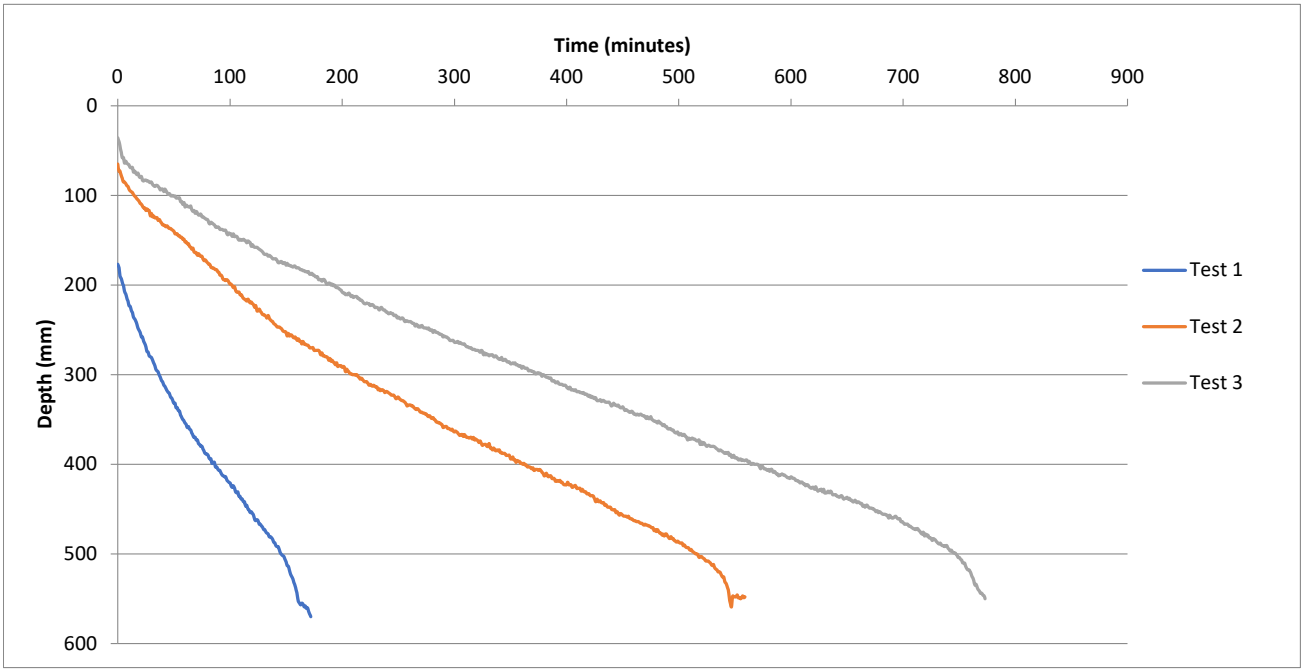
Infiltration Test Results and Calculation of Infiltration Rates

Site: North End Road, Yapton

Client: Redrow Homes

Test Reference: SA202

Test 1		Test 2		Test 3	
Pit Dimensions		**Pit Dimensions**		**Pit Dimensions**	
Trial pit length (mm)	1200	Trial pit length (mm)	1200	Trial pit length (mm)	1200
Trial pit width (mm)	600	Trial pit width (mm)	600	Trial pit width (mm)	600
Trial pit depth (mm)	570	Trial pit depth (mm)	560	Trial pit depth (mm)	548
Plan area (m^2)	0.72	Plan area (m^2)	0.72	Plan area (m^2)	0.72
Depth to water at start of test (mm)	177	Depth to water at start of test (mm)	65	Depth to water at start of test (mm)	36
End time (sec)	10320	End time (sec)	33540	End time (sec)	46380
Final depth	570	Final depth	548	Final depth	550
75% Effective depth (mm)	275	75% Effective depth (mm)	189	75% Effective depth (mm)	164
25% Effective depth (mm)	472	25% Effective depth (mm)	436	25% Effective depth (mm)	420
Time at 75% effective depth - t_{p75} (sec)	1620	Time at 75% effective depth - t_{p75} (sec)	5460	Time at 75% effective depth - t_{p75} (sec)	7800
Time at 25% effective depth - t_{p25} (sec)	7800	Time at 25% effective depth - t_{p25} (sec)	25440	Time at 25% effective depth - t_{p25} (sec)	36480
Effective Storage volume of water (m^3)	0.28296	Effective Storage volume of water (m^3)	0.3564	Effective Storage volume of water (m^3)	0.36864
V_{p75-25} (m^3)	0.14148	V_{p75-25} (m^3)	0.1782	V_{p75-25} (m^3)	0.18432
Internal surface area - a_{p50} (m^2)	1.4274	Internal surface area - a_{p50} (m^2)	1.611	Internal surface area - a_{p50} (m^2)	1.6416
t_{p75-25} (sec)	6180	t_{p75-25} (sec)	19980	t_{p75-25} (sec)	28680
BR365 Soil Infiltration Rate	**1.6E-05**	**BR365 Soil Infiltration Rate**	**5.5E-06**	**BR365 Soil Infiltration Rate**	**3.9E-06**
Average Soil Infiltration Rate	**1.9E-05**	**Average Soil Infiltration Rate**	**6.4E-06**	**Average Soil Infiltration Rate**	**4.9E-06**
Testing completed by	EJD	Calculation completed by	EJD	Calculation checked by	RAN
Date	27-29/10/21	Date	03/11/2021	Date	04/11/2021



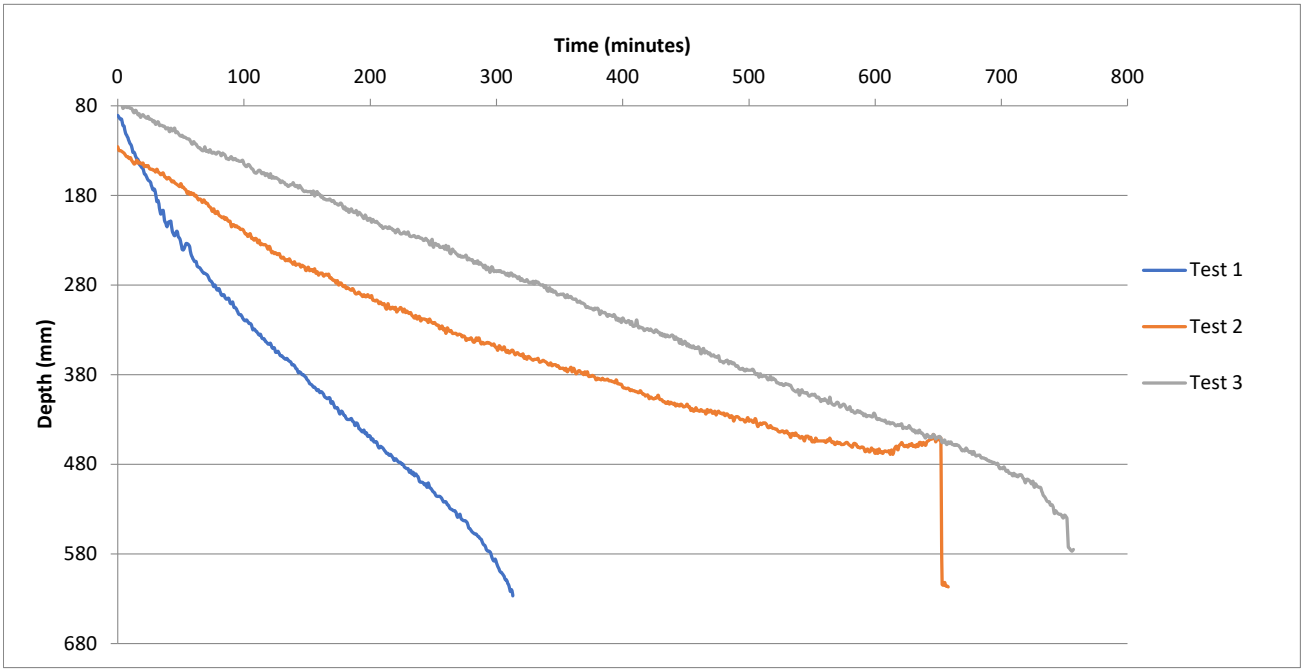
Infiltration Test Results and Calculation of Infiltration Rates

Site: North End Road, Yapton

Client: Redrow Homes

Test Reference: SA203

Test 1		Test 2		Test 3	
Pit Dimensions		**Pit Dimensions**		**Pit Dimensions**	
Trial pit length (mm)	1300	Trial pit length (mm)	1300	Trial pit length (mm)	1300
Trial pit width (mm)	600	Trial pit width (mm)	600	Trial pit width (mm)	600
Trial pit depth (mm)	630	Trial pit depth (mm)	627	Trial pit depth (mm)	590
Plan area (m^2)	0.78	Plan area (m^2)	0.78	Plan area (m^2)	0.78
Depth to water at start of test (mm)	91	Depth to water at start of test (mm)	126	Depth to water at start of test (mm)	75
End time (sec)	18780	End time (sec)	39480	End time (sec)	45420
Final depth	627	Final depth	617	Final depth	575
75% Effective depth (mm)	226	75% Effective depth (mm)	251	75% Effective depth (mm)	204
25% Effective depth (mm)	495	25% Effective depth (mm)	502	25% Effective depth (mm)	461
Time at 75% effective depth - t_{p75} (sec)	2880	Time at 75% effective depth - t_{p75} (sec)	7920	Time at 75% effective depth - t_{p75} (sec)	11640
Time at 25% effective depth - t_{p25} (sec)	14280	Time at 25% effective depth - t_{p25} (sec)	39140	Time at 25% effective depth - t_{p25} (sec)	40020
Effective Storage volume of water (m^3)	0.42042	Effective Storage volume of water (m^3)	0.39078	Effective Storage volume of water (m^3)	0.4017
V_{p75-25} (m^3)	0.21021	V_{p75-25} (m^3)	0.19539	V_{p75-25} (m^3)	0.20085
Internal surface area - a_{p50} (m^2)	1.8041	Internal surface area - a_{p50} (m^2)	1.7319	Internal surface area - a_{p50} (m^2)	1.7585
t_{p75-25} (sec)	11400	t_{p75-25} (sec)	31220	t_{p75-25} (sec)	28380
BR365 Soil Infiltration Rate	**1.0E-05**	**BR365 Soil Infiltration Rate**	**3.6E-06**	**BR365 Soil Infiltration Rate**	**4.0E-06**
Average Soil Infiltration Rate	**1.2E-05**	**Average Soil Infiltration Rate**	**5.5E-06**	**Average Soil Infiltration Rate**	**4.8E-06**
Testing completed by	EJD	Calculation completed by	EJD	Calculation checked by	RAN
Date	27-29/10/21	Date	03/11/2021	Date	04/11/2021



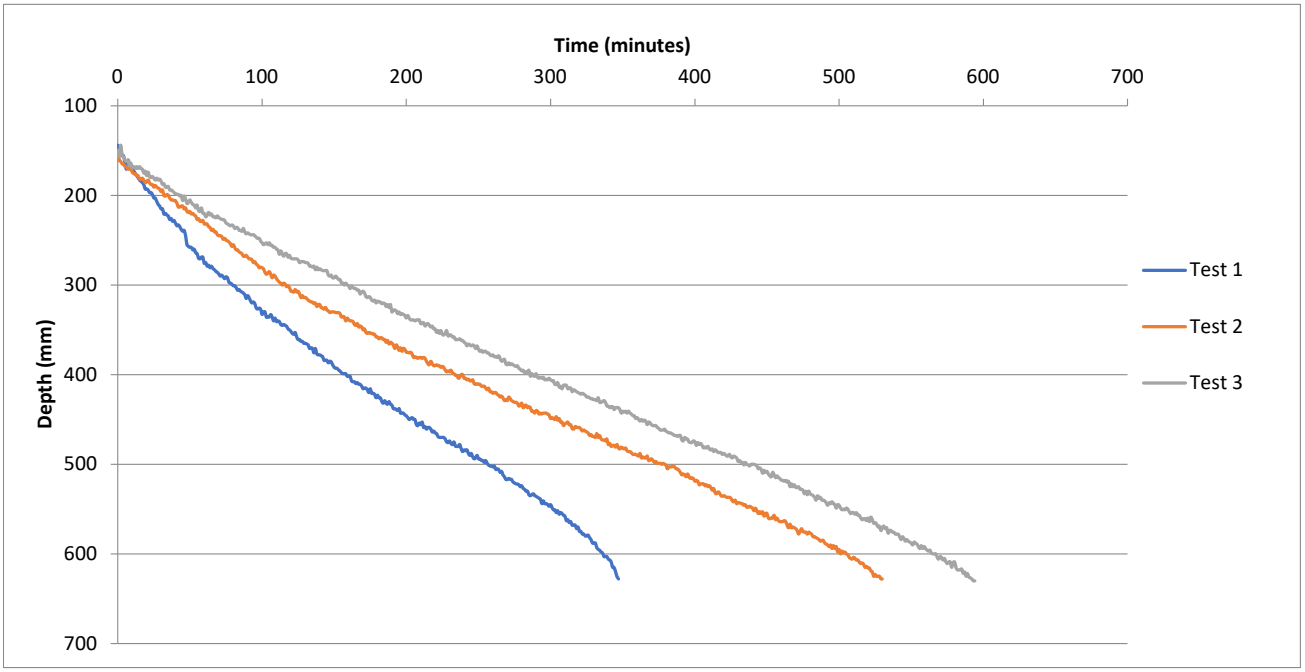
Infiltration Test Results and Calculation of Infiltration Rates

Site: North End Road, Yapton

Client: Redrow Homes

Test Reference: SA204

Test 1		Test 2		Test 3	
Pit Dimensions		**Pit Dimensions**		**Pit Dimensions**	
Trial pit length (mm)	1300	Trial pit length (mm)	1300	Trial pit length (mm)	1300
Trial pit width (mm)	600	Trial pit width (mm)	600	Trial pit width (mm)	600
Trial pit depth (mm)	630	Trial pit depth (mm)	628	Trial pit depth (mm)	630
Plan area (m^2)	0.78	Plan area (m^2)	0.78	Plan area (m^2)	0.78
Depth to water at start of test (mm)	144	Depth to water at start of test (mm)	150	Depth to water at start of test (mm)	150
End time (sec)	20820	End time (sec)	31800	End time (sec)	35640
Final depth	628	Final depth	628	Final depth	630
75% Effective depth (mm)	266	75% Effective depth (mm)	270	75% Effective depth (mm)	270
25% Effective depth (mm)	509	25% Effective depth (mm)	509	25% Effective depth (mm)	510
Time at 75% effective depth - t_{p75} (sec)	3300	Time at 75% effective depth - t_{p75} (sec)	5460	Time at 75% effective depth - t_{p75} (sec)	7200
Time at 25% effective depth - t_{p25} (sec)	15900	Time at 25% effective depth - t_{p25} (sec)	23400	Time at 25% effective depth - t_{p25} (sec)	27000
Effective Storage volume of water (m^3)	0.37908	Effective Storage volume of water (m^3)	0.37284	Effective Storage volume of water (m^3)	0.3744
V_{p75-25} (m^3)	0.18954	V_{p75-25} (m^3)	0.18642	V_{p75-25} (m^3)	0.1872
Internal surface area - a_{p50} (m^2)	1.7034	Internal surface area - a_{p50} (m^2)	1.6882	Internal surface area - a_{p50} (m^2)	1.692
t_{p75-25} (sec)	12600	t_{p75-25} (sec)	17940	t_{p75-25} (sec)	19800
BR365 Soil Infiltration Rate	**8.8E-06**	**BR365 Soil Infiltration Rate**	**6.2E-06**	**BR365 Soil Infiltration Rate**	**5.6E-06**
Average Soil Infiltration Rate	**1.1E-05**	**Average Soil Infiltration Rate**	**6.9E-06**	**Average Soil Infiltration Rate**	**6.2E-06**
Testing completed by	EJD	Calculation completed by	EJD	Calculation checked by	RAN
Date	27-29/10/21	Date	03/11/2021	Date	04/11/2021



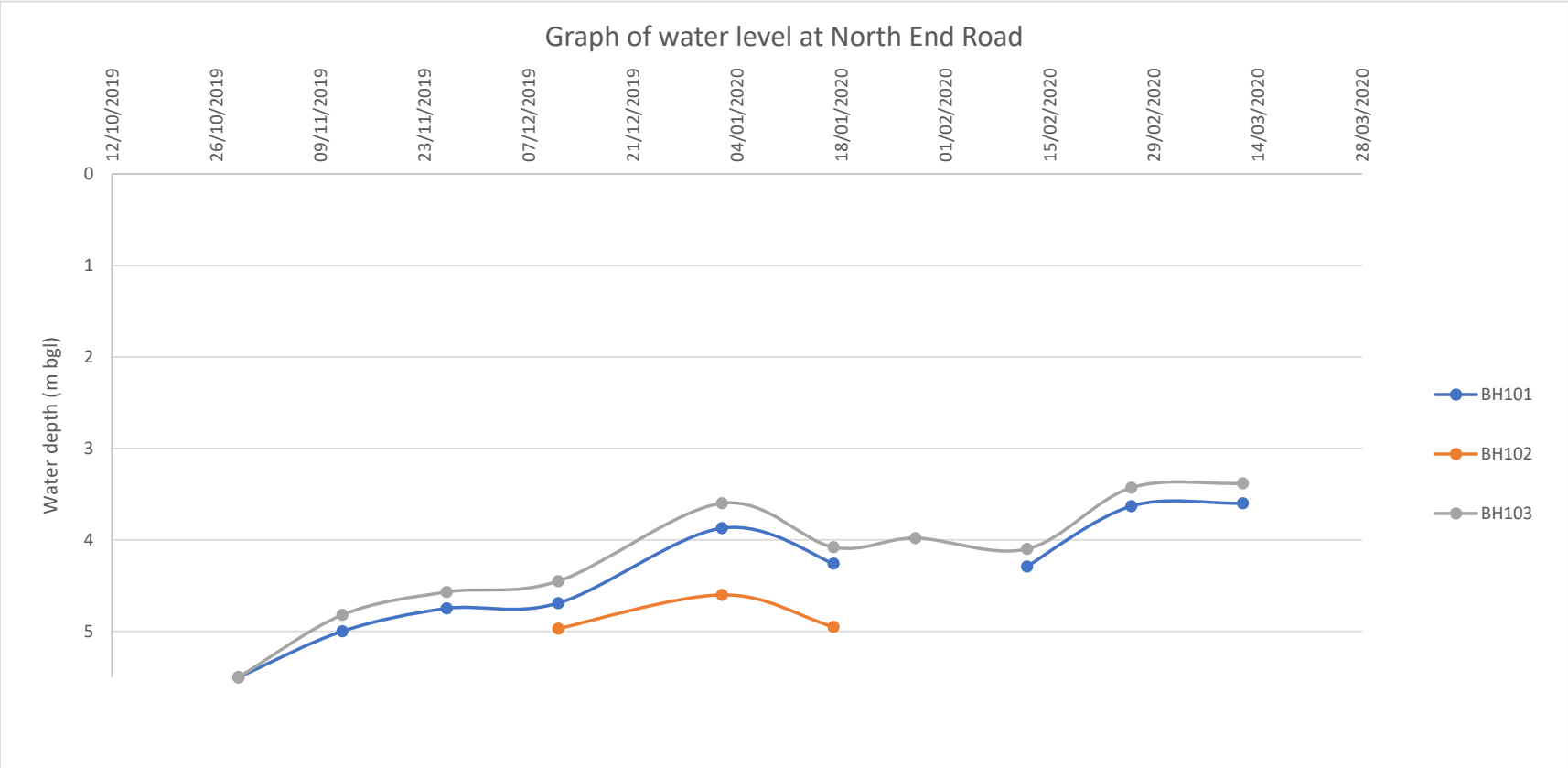
ARUN DISTRICT COUNCIL Y/163/21/DOC

Winter Groundwater Monitoring Results

North End Road

	Monitoring Date											BH Depth
BH	29/10/2019	12/11/2019	26/11/2019	11/12/2019	02/01/2020	17/01/2020	28/01/2020	12/02/2020	26/02/2020	12/03/2020	22/10/2020	
BH101		5	4.75	4.69	3.87	4.26		4.29	3.63	3.6	CNF	5.04
BH102				4.97	4.6	4.95	CNF	CNF	CNF	CNF	CNF	5.07
BH103		4.82	4.57	4.45	3.6	4.08	3.98	4.1	3.43	3.38	CNF	5.05

CNF - Could not find - wells appear to have been buried or destroyed by plant movement/archaeological works.
NOTE: Where cells are blank, well was found to be dry.



Eastwood&Partners
CONSULTING ENGINEERS

Borehole No.
BH101
Sheet 1 of 1

Project Name North End Road	Project No. 44005A	Co-ords:	Hole Type WS
Location: Yapton		Level:	Scale 1:50
Client: Redrow Homes		Dates: 28/10/2019	Logged By RAN

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.20			TOPSOIL: Dark brown slightly sandy, silty CLAY.
					0.40			Firm brown silty CLAY.
					1.20			Very stiff brown desiccated silty CLAY.
					2.10			Stiff brown/orange silty sandy CLAY.
					2.60			Firm brown/orange silty very sandy CLAY.
					3.30			Brown/orange very silty slightly gravelly SAND. Gravel is fine to coarse, angular flint.
					5.00			Structureless CHALK composed of cream/pale yellow firm very gravelly silty CLAY. Gravel is weak, low and medium density cream/white and angular to sub-angular. (Grade Dm)
								End of Borehole at 5.000m
			Type	Results				

Remarks
No groundwater encountered.

Eastwood&Partners
CONSULTING ENGINEERS

Borehole No.
BH102
Sheet 1 of 1

Project Name North End Road	Project No. 44005A	Co-ords:	Hole Type WS
Location: Yapton		Level:	Scale 1:50
Client: Redrow Homes		Dates: 28/10/2019	Logged By RAN

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
								TOPSOIL: Dark brown slightly sandy, silty CLAY.
					0.30			Firm to stiff brown silty CLAY.
					1.90			Stiff brown sandy silty CLAY with occasional fine to coarse angular and sub-angular flint gravel.
					2.40			Brown/orange silty SAND.
					2.90			Brown/orange very silty SAND/very sandy SILT with occasional fine to coarse, angular and sub-angular flint gravel.
					4.00			Structureless CHALK composed of slightly clayey sandy angular and sub-angular GRAVEL. Clasts are weak, medium density cream/white. Matrix is cream. Frequent rinded flint nodules. (Grade Dc)
					5.00			End of Borehole at 5.000m
			Type	Results				

Remarks
No groundwater encountered.

Eastwood&Partners
CONSULTING ENGINEERS

Borehole No.
BH103
Sheet 1 of 1

Project Name North End Road	Project No. 44005A	Co-ords:	Hole Type WS
Location: Yapton		Level:	Scale 1:50
Client: Redrow Homes		Dates: 28/10/2019	Logged By RAN

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.05			TOPSOIL: Dark brown slightly sandy, silty CLAY. Firm brown silty CLAY. *Stiff below 0.6 m.*
					1.10			Stiff brown/orange silty sandy CLAY.
					1.60			Firm to stiff brown/grey silty CLAY.
					2.60			Brown and white silty gravelly CLAY. Gravel is fine to coarse, angular and sub-angular chalk.
					3.20			Structureless CHALK composed of cream/pale yellow firm very gravelly silty CLAY. Gravel is weak, low and medium density cream/white and angular to sub-angular. (Grade Dm)
					5.00			End of Borehole at 5.000m
			Type	Results				

Remarks
No groundwater encountered.

Annex

SuDS Management & Maintenance Plan

ARUN DISTRICT COUNCIL Y/163/21/DOC

1. Ownership & Maintenance Responsibilities

Responsibility for the maintenance of the drainage system will be apportioned as follows:

The drainage features will be cared for by the Estate Management Company which will be set up by the developer to administer the site-wide infrastructure. This includes:

- porous paving.
- control manholes / flow restrictors
- the associated manholes and piped systems.

The following sections set out schedules detailing the maintenance requirements for each of the main drainage items used within the scheme. The Estate Management Company will undertake the inspections and maintenance activities in accordance with these schedules.

Additional reference should be made to currently established best practice and guidance documents such as The SuDS Manual (CIRIA C753, 2015) and other resources available at the susdrain website (www.susdrain.org).

This SuDS Management and Maintenance Plan (SMMP) should be considered a live document. The frequency of maintenance intervals may need to be increased or decreased based on the observed performance of the drainage systems over time. Changes should be agreed with the drainage authority and recorded and dated in the SMMP.

Important safety information is set out in the next section.

ARUN DISTRICT COUNCIL Y/163/21/DOC

2. Health and Safety

All those responsible for and involved in the maintenance of the site drainage systems should be safety-conscious and comply with the relevant health and safety legislation. This includes:

- The Health and Safety at Work etc Act 1974
- The Management of Health and Safety at Work Regulations 1999
- The Workplace (Health, Safety and Welfare) Regulations 1992

The Estate Management Company is responsible for suitable risk assessment and management to ensure safe working conditions and practices. Measures to protect potential visitors also need to be considered.

Specialist contractors used should work to industry guidelines and be able to demonstrate safe working practices.

Employers have a duty to employees to inform them about the risks of their work environment and to decrease the risk as far as reasonably practicable. Appropriate personal protective equipment (PPE) should be provided and policies implemented based on risk assessment.

Operatives should be trained for working near water. Risks of contaminated water should be considered. Checking for open cuts and using nitrile gloves, waterproof plasters etc is advised.

Entry of pipes, chambers, tanks and culverts should be avoided wherever possible. Work should be carried out from the surface using appropriate equipment. In the event that entry cannot be avoided to perform a critical task, the required safety training, protection measures and precautions must be implemented prior to entry. Lone working should never be attempted.

For further information refer to Section 36 of The SuDS Manual (CIRIA C753).

ARUN DISTRICT COUNCIL Y/163/21/DOC

3. Schedule A – Sewers, Manholes, Gullies, Channel Drains

Regular inspection and maintenance are required to ensure the effective long-term operation of private drains, manholes, gullies & channel drains.

Post Completion: a CCTV survey to be carried out on all new and retained existing drainage systems and any downstream receiving systems, prior to connection with adopted sewers.

The report will be used to prove the integrity of the as-built drainage system prior to issue of practical completion certificate and will be handed over to the Client & Management Company for future reference.

Ongoing maintenance responsibility for all sewers is by Southern Water. All other gullies and drainage are privately owned and to be maintained by the Estate Management Company in shared areas and each homeowner within conveyed land. Operation and maintenance requirements for **all** (foul and storm) sewers, drains, manholes, gullies and channel drains are described in the following table:

Schedule	Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	6 Monthly intervals.
	Common yard & car park & other hard standing areas to be swept clear of debris, to prevent possibility of blockages to the receiving drainage systems.	Monthly.
	Lift and inspect receiving manholes to check for any blockages.	Monthly.
	Debris removal from gullies & channel drains (where may cause risks to performance).	6 monthly, after autumn leaf fall, or as required based on observations.
Remedial Actions	Repair any damaged gully or channel drain gratings.	As required.

ARUN DISTRICT COUNCIL Y/163/21/DOC

	Replace / fix any loose channel drain covers.	As required.
Monitoring	Carry out full CCTV survey to confirm ongoing integrity of all drains. Inspect all gullies and silt pits & drainage channels during the survey.	10-yearly intervals.

Where appropriate refer also to specialist drainage manufacturer's information and maintenance requirements.

In all instances, inspection and cleaning should be carried out only by a specialist contractor and in accordance with the guidelines given in `Safe Working in Sewers and at Sewage Works' published by National Joint Health and Safety Committee for the Water Services. Further information on safety is set out in Section 2.

ARUN DISTRICT COUNCIL Y/163/21/DOC

5 Schedule B – Permeable Pavements

5.1 Inspection Frequency and Maintenance Requirements: as per table below.

Schedule	Action	Frequency
Regular Maintenance	Standard road sweeper	Annually after autumn leaf fall
Occasional Maintenance	Weed removal Stabilise and mow contributing and adjacent areas	Annually As required
Remedial Actions	Remediate adjacent landscaping to original levels Paving repairs including replenishment of lost jointing material Rehabilitation of surface and upper substructure by remedial sweeping	As required As required Every 10 to 15 years or as required if infiltration is reduced by clogging
Monitoring	Initial inspection Inspection for evidence of poor operation and/or weed growth Inspection for silt accumulation to establish sweeping frequencies Monitor inspection chambers	Monthly for first three months Quarterly, 48 hrs after large storms in first six months Annually Annually

5.2 Safety information is set out in Section 4.

ARUN DISTRICT COUNCIL Y/163/21/DOC

6 Foul Drainage

Inspection frequency: annually.

Maintenance Requirements: Visual inspection of chambers & manholes is to be completed on a 5-yearly basis and any signs of blockage / waste build up should be jet washed or removed by a Licensed Effluent Disposal Contractor.

A CCTV Drainage Survey should be completed every 10 Years and any of blockage/waste build up should be jet washed or removed by a Licensed Effluent Disposal Contractor.

7 Contamination, Oil Spillages or Dilution of Spillage

In the event of a spillage, it is the responsibility of the landowner to clear up any spillage before it enters the drainage system. The primary method of dealing with any spillage of hydrocarbons should be using sand to soak up the leak and prevent any hydrocarbons entering the drainage system. Once sand has been contaminated it should not be washed into the drainage system but disposed of by a Licensed Contractor.

Environment Agency – Emergency Contact Number

In the event of a spillage the Environment Agency should be contacted to notify the event and seek advice. The Environment Agency Incident Hotline is **0800 80 70 60** (Freephone 24hrs).

ARUN DISTRICT COUNCIL Y/163/21/DOC

Civil Engineering - Transport Planning - Flood Risk

GTA Civils & Transport, Gloucester House, 66a Church Walk, Burgess Hill, West Sussex, RH15 9AS
T: 01444 871444 E: enquiries@gtacivils.co.uk www: gtacivils.co.uk

GTA Civils & Transport Limited, Registered in England No. 11917461. VAT Registration No. 319 2609 02