

Technical Note - Discharge of Surface Water Management Planning Conditions



The Civil Engineering Practice
11 Tungsten Building
George Street
Fishergate
Sussex
BN41 1RA



Project	The Laurels, Dappers Lane, Angmering
Project Number	23260

By Martin Kempshall C E ng MIC E

Date 24 J une 2020

1 Introduction

- 1.1 This Technical Note has been produced in support of the Reserved Matters / Discharge of Condition Application for discharging of Conditions 14, 15, 16 and 18 of Outline Planning Permission A/74/18/OUT comprising 9 two-storey dwellings at The Laurels, Dappers Lane, Angmering, BN16 4EN.
- 1.2 This Technical Note is to be read in conjunction with all planning, architectural and other reports that accompany the Planning Application for the proposed development.
- 1.3 The proposed development will incorporate a sustainable drainage system which will discharge all surface water via infiltration to ground using permeable paving with subbase attenuation.

2 Condition 14

- 2.1 Condition 14 of Outline Planning Application A/74/18/OUT states:

Development shall not commence, other than works of site survey and investigation, until full details of the proposed surface water drainage scheme have been submitted to and approved in writing by the Local Planning Authority. The design should follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations, and the recommendations of the SuDs Manual produced by CIRIA. Winter groundwater monitoring to establish highest annual ground water levels and Percolation testing to BRE 365, or similar approved, will be required to support the design of any Infiltration drainage. No building shall be occupied until the complete surface water drainage system serving the property has been implemented in accordance with the agreed details and the details so agreed shall be adhered to and maintained in good working order in perpetuity.



Reason: To ensure that the proposed development is satisfactory drained in accordance with policies WSP1, WDM1, WDM2 and WDM3 of the Arun Local Plan. It is considered necessary for this to be a pre-commencement condition to ensure that the surface water disposal scheme is agreed before construction commences.

3 Summary of Surface Water Management and Design for Discharge of Condition 14

- 3.1 The design is in compliance with the principles of the design and will be based upon Arun District Council Supplementary Requirements for Surface Water Drainage Proposals and West Sussex County Council LLFA Policy for the Management of Surface Water and recognised best practice.
- 3.2 Infiltration to ground is proposed in accordance with the Drainage Hierarchy preference and CIRIA SuDS C753.
- 3.3 The system is designed to attenuate all storm water events up to and including the critical 1 in 100 year storm with a 40% allowance for climate change. The design-for exceedance events has been accommodated within the attenuation system to ensure that all surface water is retained on site.
- 3.4 Requirements of Table 26.2 of CIRIA SuDS Manual have been achieved to ensure water quality requirements are met across the site.
- 3.5 The design has been based upon tested infiltration rates completed by Tweedie Evans Consulting. Infiltration rates have been used based on the lowest recorded rates or on specific location of the test results.

4 Site Investigation

4.1 General Site Ground Conditions

- 4.1.1 The Tweedie Evans Consulting Geotechnical Assessment identifies made ground generally comprising gravelly clay, which was encountered at depths between 0.2m and 0.8 below ground level.
- 4.1.2 The gravel fraction of the made ground comprised variable quantities of flint, brick, concrete, plastic and asphalt.
- 4.1.3 Beneath the made ground, the investigation encountered predominantly gravelly silty clay underlain by clayey sandy gravels.
- 4.1.4 Ground conditions have been demonstrated within the Tweedie Evans Consulting Geotechnical Assessment to be consistent across the site.

4.2 Winter Groundwater Monitoring

- 4.2.1 Groundwater monitoring was undertaken throughout the Winter of 2018/2019 and identified a maximum groundwater level of approximately 2 metres below existing ground levels.
- 4.2.2 Groundwater levels were also recorded during the winter infiltration testing in January 2020 and were identified as being 3.9mbgl.
- 4.2.3 A full copy of the winter groundwater monitoring data is located at the rear of this Technical Note.

4.3 Soakage Testing

- 4.3.1 Winter infiltration testing was completed on 24 January 2020 demonstrating infiltration rates of between 6.4×10^{-3} m/s in the clayey sandy gravels and 1.5×10^{-5} m/s in the gravelly silty clays beneath the made ground.

Table 5.2: Soakage Test Results		
Soakage Test Location	Infiltration Rate (m/s)	Comments
TP01/SA01	2.6×10^{-5}	Single fill achieved (access restrictions following the first filling)
TP02/SA02	2.7×10^{-5} to 3.6×10^{-5}	Two fillings achieved within available time (access restrictions following the second filling)
TP03/SA03	1.5×10^{-5}	Infiltration rate based on first filling only. Drop in water level during second filling: ~14cm in 53min
TP04/SA04	6.4×10^{-3}	Single fill achieved due to fast drainage.
TP05/SA05	2.5×10^{-3}	Single fill achieved due to fast drainage.

Table 1 Summary of Infiltration Test Results

- 4.3.2 A copy of Drawing 101 showing the proposed drainage layout is located at the rear of this Technical Note.
- 4.3.3 Extracts from the Tweedie Evans Consulting Geotechnical Assessment are located at the rear of this Technical Note.

5 Detailed Surface Water Drainage Design

- 5.1 All surface water is to be collected and discharged via an infiltration blanket beneath a permeable paved surface.
- 5.2 Groundwater was recorded at its highest level during the Winter of 2018/2019 at 2mbgl.
- 5.3 All surface water is to be discharged by infiltration to ground via voided subbase attenuation beneath permeable paving situated in the highway and driveways.
- 5.4 Water from impermeable areas will discharge to the voided subbase via rainwater diffuser units. All rainwater diffuser units will have upstream catchment pits to reduce the potential for siltation of the units.
- 5.5 The minimum voided subbase thickness of 450mm will be provided in all areas based on assumed CBR values of 2%-5%.
- 5.6 The drainage has been separated into six catchments. The infiltration rates used in the design are based on the nearest infiltration test from the soakage testing with the lowest test rates from each location used, which are as follows:

Catchment	Test Location Used	Design Infiltration Rate
A	TP03	1.5×10^{-5} m/s
B	TP03	1.5×10^{-5} m/s
C	TP03	1.5×10^{-5} m/s
D	TP02	2.7×10^{-5} m/s
E	TP01	2.6×10^{-5} m/s
F	TP01	2.6×10^{-5} m/s

Table 2 Design Infiltration rates

- 5.7 Surface water storage requirements for each catchment is as follows:
- ¿ Catchment A (No Dig Construction area) is limited to 100mm of voided subbase, 93mm of voided subbase is required meet the necessary surface water attenuation requirements for this area.
 - ¿ Catchment B comprises 289m² of impermeable area discharging to 159m² of voided subbase. A minimum subbase thickness of 200mm is required equating to 9.4m³ of storage, a minimum 21.5m³ is to be provided.
 - ¿ Catchment C (Highway and adjacent footway only) requires 130mm of voided subbase to achieve the necessary surface water attenuation requirements for this area.

- ¿ Catchment D comprises 512m² of impermeable area discharging to 171m³ of voided subbase. A minimum subbase thickness of 310mm is required equating to 15.4m³ of storage, a minimum 23.2m³ is to be provided.
- ¿ Catchment E comprises 821m² of impermeable area discharging to 360m³ of voided subbase. A minimum subbase thickness of 210mm is required equating to 22.5m³ of storage, a minimum 48.6m³ is to be provided.
- ¿ Catchment F comprises 450m² of impermeable area discharging to 229m³ of voided subbase. A minimum subbase thickness of 170mm is required equating to 11.7m³ of storage, a minimum 30.9m³ is to be provided.

5.8 A copy of Drawing 103 showing the impermeable areas and drainage catchments for the site are located at the rear of this report.

5.9 A copy of Drawing 201 showing the proposed drainage layout is located at the rear of this Technical Note.

5.10 A copy of the microdrainage calculations for each of the surface water catchments is located at the rear of this Technical Note.

6 Surface Water Quality and Treatment

6.1.1 In accordance with CIRIA SuDS Manual 2015 (Report C753) the pollution hazard level for the proposed residential development is very low to low.

6.1.2 The surface water scheme will include mitigation to ensure that surface water is suitably treated, and any pollution risk adequately managed prior to discharge.

6.1.3 Table 26.2 in Chapter 26 of CIRIA report C753 The SuDS Manual provides Pollution Hazard Indices for varying land types and those determined as most relevant to the development proposals are as follows:

Land Use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very Low	0.2	0.2	0.05
Commercial / Industrial roofs	Low	0.3	0.2	0.05
Individual property driveways, residential car park, low-traffic roads	Low	0.5	0.4	0.4

Table 3: Pollution Hazard Indices

6.1.4 Where multiple drainage components are used in series the individual mitigation index of secondary and tertiary components is lowered by 50% due to reduced performance associated with primary treatment.

SuDS Type	Total suspended solids (TSS)	Metals	Hydro-carbons
Permeable pavement	0.7	0.6	0.7

Table 4: Pollution Mitigation Indices

6.1.5 The proposed use of permeable paving will meet the target treatment level required for runoff with very low to low risk of pollution hazard thus demonstrating that the surface water drainage system for the site can be designed to adequately mitigate against the risk of pollution.

7 Condition 15

7.1 Condition 15 of Outline Planning Application A/74/18/OUT states:

The development shall not proceed until formal consent has been approved in writing from the Lead Local Flood Authority (WSCC) or its agent (ADC) for the discharge of any flows to watercourses, or the culverting, diversion, infilling or obstruction of any watercourse on the site. Any discharge to a watercourse must be at a rate no greater than the predevelopment run off values.

Reason: To ensure that the proposed development is satisfactorily drained in accordance with policies WSP1, WDM1, WDM2 and WDM3 of the Arun Local Plan. This is required to be a pre-commencement condition because it is necessary to implement the surface water drainage system prior to commencing any building works.

8 Statement on Ordinary Watercourse / Culvert

- 8.1 All surface water is to be discharged to ground in accordance with the Drainage Hierarchy. The watercourse will not be culverted, diverted, infilled or obstructed in any way as a result of the development.
- 8.2 The CCTV survey identified the culvert as being 450mm in diameter with the depth to the top of the pipe being 1.6m below ground level. The CCTV survey information is located at the rear of this Technical Note.
- 8.3 The highway access is proposed in the same location as the existing highway access to the site which currently crosses the culvert.
- 8.4 The culvert is located within the boundary of the public highway with the entrance of the site subject to a Minor Works S278. The details of any protection that is required for the culvert will be agreed with West Sussex County Council Highways as part of the S278 works for the site entrance.
- 8.5 A copy of the highway boundary plan is located at the rear of this Technical Note.

9 Condition 16

9.1 Condition 16 of Outline Planning Application A/74/18/OUT states:

Development shall not commence until full details of the maintenance and management of the SuDS system is set out in a site-specific maintenance manual and submitted to, and approved in writing, by the Local Planning Authority. The manual is to include (a) details of financial management of the site including arrangements made in the event that the management company (or any subsequent management company) is no longer able to fulfil its duties; and (b) arrangements for the replacement of major components at the end of the manufacturers recommended design life.

Reason: To ensure the efficient maintenance and on-going operation of the SuDS system and to ensure the best practice in line with guidance set out in 'The SuDS Manual' CIRIA publication ref: C753 Chapter 32. This is required to be a pre-commencement condition because it is necessary to implement the surface water drainage system prior to commencing any building works in accordance with policies WSP1, WDM1, WDM2 and WDM3 of Arun Local Plan.

10 Management and Maintenance of Proposed SuDS Drainage System

10.1 Upon completion, management of the shared drainage facilities will be passed on to a private Estates Management Company appointed by the Developer on behalf of the new Residents.

10.2 The regular and corrective maintenance of all shared elements of the drainage system beneath the road, including all parts of the infiltration blanket will be managed and funded through the Management Company on behalf of the Residents.

10.3 In the event that the Estates Management Company becomes unable to discharge its duties within 2 years of first appointment the developer will endeavour to appoint an alternative on behalf of the Residents.

10.4 The proposed permeable paving system with subbase attenuation is low maintenance and does not contain any control devices requiring replacement.

10.5 The design life of permeable paving is approximately 25 years with adequate maintenance as outlined within the Drainage Maintenance Manual. The system will be fully serviced after 25 years as set out in the Drainage Maintenance Manual.

10.6 Upon completion of the development specific details of the elements of the drainage system shall be provided to the Local Planning Authority and provided as part of Condition 17 of the approved Outline Planning Permission.

10.7 A copy of Drawing 102 showing the proposed drainage maintenance requirements and ownership responsibilities is located at the rear of this Technical Note.

11 Maintenance during construction

- 11.1 Once appointed the Contractor will prepare a site specific method statement for the control of silt and other pollutants during construction. CIRIA Report C532 :Control of Water Pollution from Construction Sites~provides further guidance on this.
- 11.2 During the construction phase, should hardstanding areas be constructed prior to the completion of the proposed surface water scheme surface, water flow will be temporarily channelled into localised soakaways wherever viable. Appropriate water quality mitigation in accordance with CIRIA Report C532 will be provided. This approach allows for surface water to be attenuated and sediments captured during the construction phase.
- 11.3 During the construction phase, the permeable subbase layer will be constructed and then covered with a sacrificial layer of geotextile overlaid by 100mm thick compacted voided stone or similarly approved hardcore for use as a temporary road surface. The sacrificial layer will be removed at the end of the main construction period with the laying course and paver surface laid with the sacrificial stone and geotextile discarded.
- 11.4 The Contractor will maintain the proposed drainage system during construction and until the site is handed over to the private Management Company.

12 Condition 18

12.1 Condition 18 of Outline Planning Application A/74/18/OUT states:

The development layout shall not be agreed until such time that arrangements for the future access and maintenance of any watercourse or culvert (piped watercourse) crossing or abutting the site has been submitted and approved in writing by the Local Planning Authority. The details thereby agreed shall be adhered to at all times thereafter.

No construction is permitted, which will restrict current and future landowners from undertaking their riparian maintenance responsibilities of any watercourse on or adjacent to the site.

Reason: To ensure that the duties and responsibilities, as required under the Land Drainage Act 1991, and amended by the Flood and Water Management Act 2010, can be fulfilled without additional impediment following the development completion and in accordance with policy WDM1 of the Arun Local Plan.

13 Statement on Ordinary Watercourse / Culvert

- 13.1 The culvert will not be impeded or modified as part of the works. The CCTV survey identified the culvert as being 450mm in diameter with the depth to the top of the pipe being 1.6m below ground level at the upstream manhole 35m north of the proposed site entrance.

- 13.2 The depth of the culvert indicates that no additional works will be required to protect the culvert at the site entrance, which is currently used as the existing access for the site. Should any further works be required to provide a betterment to the current site entrance then these will be agreed under the Minor Works S278.
- 13.3 The CCTV survey for the length of culvert adjacent to the site demonstrates that there are no defects in this section of the culvert. Minor defects were identified on the culvert downstream of the site on land not under the ownership of the applicant.
- 13.4 Riparian Ownership responsibilities will be maintained with the Landowner continuing to fulfil these duties as Riparian Owner under the Land Drainage Act. The responsibility for maintaining the section of culvert located beneath the entrance to the site will be undertaken by the site's private Estates Management Company.

14 Documents appended

Drawing 01 - Site Location Plan

Drawing 102 - Proposed Maintenance Plan

Drawing 103 - Proposed Impermeable Areas Plan

Drawing 105 - Culvert location and West County Council Highway Boundaries Plan

Drawing 106 - Existing Site Layout Plan

Drawing 201 - Proposed Drainage Layout and Levels Plan

Drawing 401 - Proposed Levels Plan

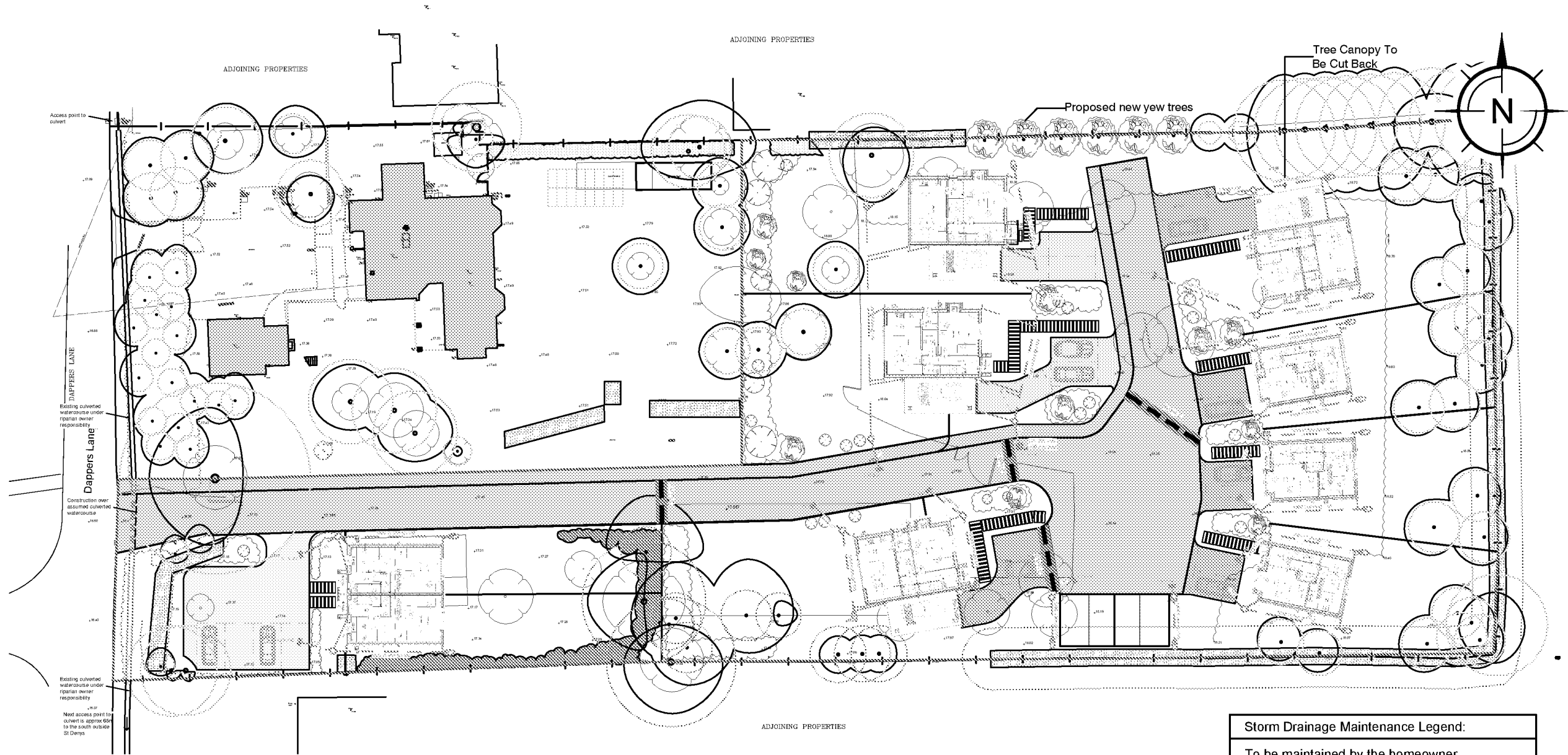
Drawing 501 - Construction Details

Microdrainage Calculations for Climate Change adjusted 1 in 100 year event

Extracts from Tweedie Evans Consulting Geotechnical Assessment dated March 2020

Ashdown Site Investigation Groundwater Monitoring Results 2018-2019

Drain Boss CCTV Survey of Culvert



Storm Drainage Maintenance Legend:

To be maintained by the homeowner

- Type 4 Private Type 4 Storm Water Inspection Chamber
- Private Storm Water Catchpit
- Private Storm Water Rodding Eye
- Fin Drain Fin Drain to Subbase
- Permeable Drives under private ownership. Subject to legal covenant
- Impermeable Drives under private ownership

To be maintained by Management Company

- Property boundary
- Distribution Tanks to Subbase
- Baffle to subbase
- Permeable Drive under management company ownership
- Other hard paved areas including no-dig area at site boundary
- Culverted watercourse within the red line boundary

- GENERAL NOTES:**
- All dimensions to be checked on site. All details and dimensions relating to sub-Contractors work must be checked and agreed between the sub-Contractor or supplier and the general Contractor.
 - This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and specification.
 - The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.
 - Any information given regarding existing underground services is given in good faith after consultation with the relevant authority. No liability is accepted by the Consultant and the main Contractor is responsible for obtaining and checking all information and taking due care and attention whilst undertaking the works.

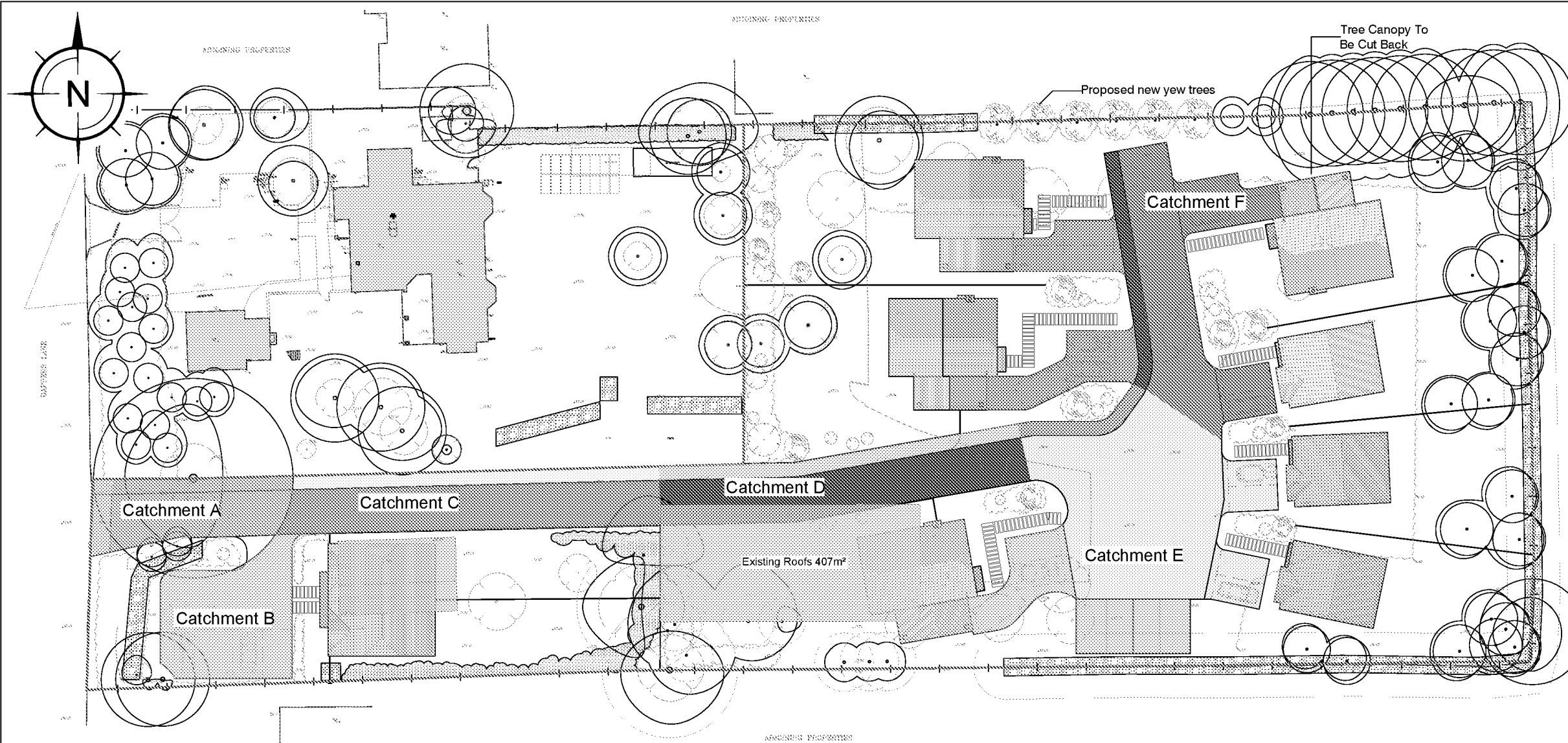
01.06.2020	MJP	Invert levels to diffuser tanks	MK	
22.05.2020	MJP	Drainage Layout updated	MK	
26.03.2020	MJP	Diffuser tanks to subbase	MK	
REV	DATE	INT	DESCRIPTION	CHK

Issue Status **FOR PLANNING**

 **The Civil Engineering Practice**
11 Tungsten Building
George Street
Fishergate
Sussex
BN41 1RA
01273 424424
rev@civil.co.uk
www.civil.co.uk

CLIENT Oceanview Developments
PROJECT The Laurels
Dappers Lane
Angmering
TITLE Proposed Ownership Plan

DRAWN M Pacifico	DATE Oct 2019	PROJECT NO. 23260
ENGINEER M Kempshall	CHECKED SFM	REV
SCALE 1:500 @ A3	102	C



Catchment A			Catchment D		
	Area of No-Dig Construction	86m ²		Area of Voided Subbase	171m ²
	Roof	0m ²		Roof	228m ²
	Hardpaved	86m ²		Hardpaved	284m ²
Formation varies - 190mm constant depth			Formation Level 16.99		
Catchment B			Catchment E		
	Area of Voided Subbase	159m ²		Area of Voided Subbase	360m ²
	Roof	130m ²		Roof	325m ²
	Hardpaved	159m ²		Hardpaved	496m ²
Formation Level 16.54			Formation Level 17.45		
Catchment C			Catchment F		
	Area of Voided Subbase	175m ²		Area of Voided Subbase	229m ²
	Roof	0m ²		Roof	187m ²
	Hardpaved	227m ²		Hardpaved	263m ²
Formation Level 16.85			Formation Level 17.77		

- GENERAL NOTES:
1. All dimensions to be checked on site. All details and dimensions relating to sub-Contractors work must be checked and agreed between the sub-Contractor or supplier and the general Contractor.
 2. This drawing is to be read in conjunction with all relevant Architects and Engineer's drawings and specification.
 3. The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.
 4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority. No liability is accepted by the Consultant and the main Contractor is responsible for obtaining and checking all information and taking due care and attention whilst undertaking the works.

D 24.06.2020 PJR:	Formation levels added to key	MK		
C 22.05.2020 MJF:	Areas updated	MK		
B 16.05.2020 MJF:	No-dig and Section 278 highway areas added	MK		
A 24.03.2020 MJF:	Areas updated	MK		
REV	DATE	INT	DESCRIPTION	CHK

Issue Status **FOR PLANNING**

The Civil Engineering Practice
11 Tunstall Building
George Street
Fishergate
Sussex
BN41 1RA

01273 424824
civildesign@cepr.co.uk
www.cepr.co.uk

CLIENT		Oceanview Developments	
PROJECT		The Laurels Dappers Lane Angmering	
TITLE		Proposed Impermeable Areas Plan	
DRAWN	DATE	PROJECT NO.	2326
M Pacifico	Nov 2019		
ENGINEER	CHECKED	DWG. NO.	
M Kempshall	SRM	103	
SCALE		1:500 @ A3	

ARUN DISTRICT COUNCIL A7920DOC



- GENERAL NOTES:
- 1. All dimensions to be checked on site. All details and dimensions relating to sub-Contractors work must be checked and agreed between the sub-Contractor or supplier and the general Contractor.
 - 2. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and specification.
 - 3. The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.
 - 4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority. No liability is accepted by the Consultant and the main Contractor is responsible for obtaining and checking all information and taking due care and attention whilst undertaking the works.

REV	DATE	BY	DESCRIPTION	CHK

Issue Status

INFORMATION

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishergate
Sussex
BN41 1RA
01273 424456
renovation@civil.co.uk
www.civil.co.uk

CLIENT

Oceanview Developments

PROJECT

The Laurels
Dappers Lane, Angmering

TITLE

Culvert and Highway Overlay

DRAWN

M Pacifico

DATE

Jan 2020

PROJECT NO.

23260

DRAWN BY

M Kempshall

CHECKED

SFM

DWG NO.

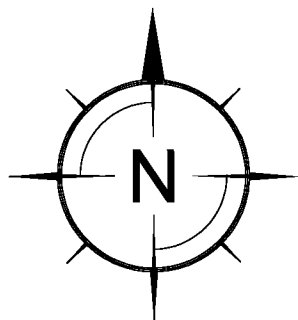
105

REV

-

SCALE

1:250 @ A3



- NOTES:
1. All dimensions to be checked on site. All details and dimensions relating to sub-Contractors work must be checked and agreed between the sub-Contractor or supplier and the general Contractor.
 2. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and specification.
 3. The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.
 4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority. No liability is accepted by the Consultant and the main Contractor is responsible for obtaining and checking all information and taking due care and attention whilst undertaking the works.

REV	DATE	INT	DESCRIPTION	CHK
-----	------	-----	-------------	-----

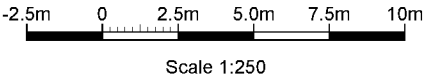
Issue Status **FOR CONSTRUCTION**

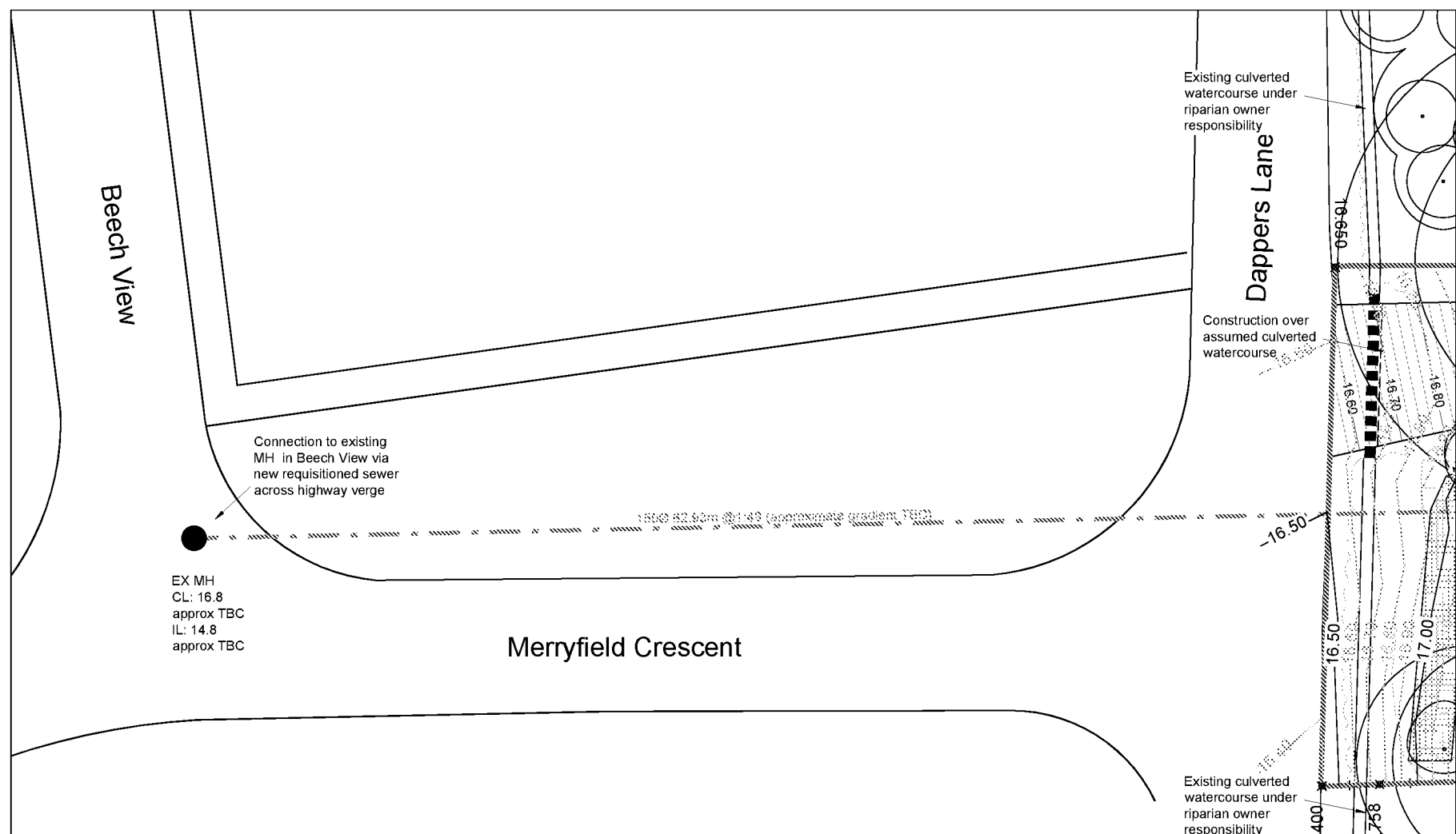
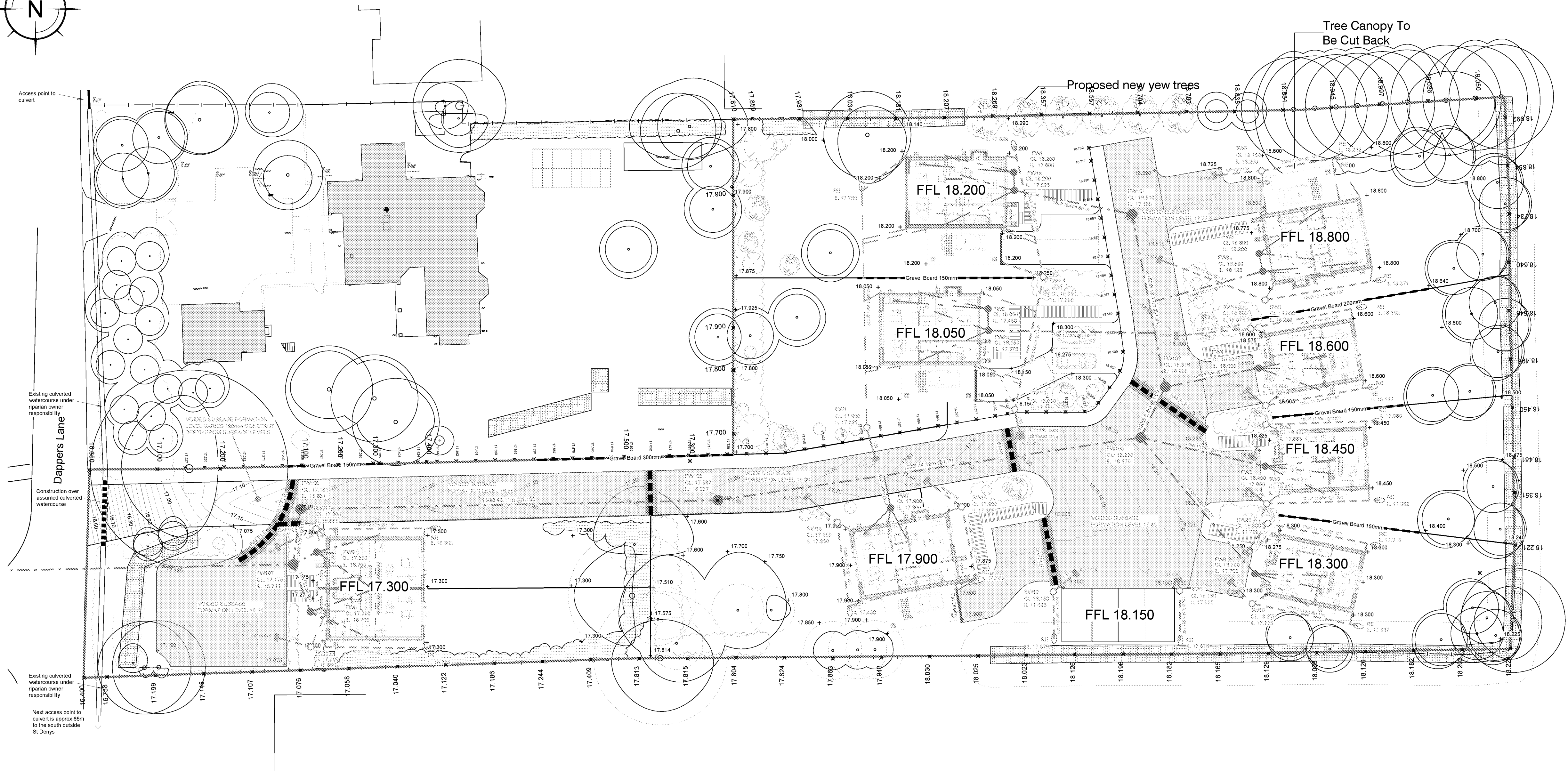
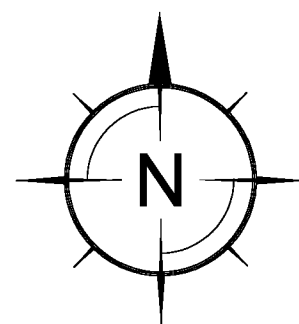


The Civil Engineering Practice
11 Tungsten Building
George Street
Fishergate
Sussex
BN41 1RA
01273 424424
reception@civil.co.uk
www.civil.co.uk

CLIENT Oceanview Developments Ltd
PROJECT The Laurals
Dappers Lane
Angmering
TITLE Existing Site Layout Plan

DRAWN M Pacifico	DATE May 2020	PROJECT NO. 23260
ENGINEER M Kemshall	CHECKED	DWG. No. REV.
SCALE 1:250 @ A1, 1:500 @ A3		106

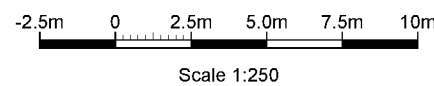




Drainage Legend:	
	Voids subbase for storm water storage and attenuation
	Type 4 Private Type 4 Storm Water Inspection Chamber
	Private Storm Water Catchpit
	Private Storm Water Rodding Eye
	Property boundary
	Distribution Tanks to Subbase
	Fin Drain
	Fin Drain to Subbase
	Baffle to subbase
	Private Foul Water Sewer Type 2 Manhole
	Private Foul Water Sewer Type 4 Inspection Chamber

FOUL WATER MANHOLE SCHEDULE						
MANHOLE REFERENCE	COVER LEVEL	INVERT LEVEL	DEPTH TO INVERT	DIAMETER / SIZE	COVER TYPE	MANHOLE TYPE
FW101	18.510	17.160	1.350	1200mmØ	D400	Type 2
FW102	18.316	16.960	1.356	1200mmØ	D400	Type 2
FW103	18.200	16.870	1.330	1200mmØ	D400	Type 2
FW104	Not Used					
FW105	17.587	16.237	1.350	1200mmØ	D400	Type 2
FW106	17.181	15.831	1.350	1200mmØ	D400	Type 2
FW107	17.175	15.793	1.382	1200mmØ	D400	Type 2
FW1	18.200	17.600	0.600	450mmØ	A15	Type 4
FW1a	18.200	17.525	0.675	450mmØ	A15	Type 4
FW2	18.050	17.450	0.600	450mmØ	A15	Type 4
FW2a	18.050	17.375	0.675	450mmØ	A15	Type 4
FW3	18.800	18.200	0.600	450mmØ	A15	Type 4
FW3a	18.800	18.125	0.675	450mmØ	A15	Type 4
FW4	18.600	18.000	0.600	450mmØ	A15	Type 4
FW5	18.450	17.850	0.600	450mmØ	A15	Type 4
FW6	18.300	17.700	0.600	450mmØ	A15	Type 4
FW7	17.900	17.300	0.600	450mmØ	A15	Type 4
FW8	17.300	16.700	0.600	450mmØ	A15	Type 4
FW9	17.300	16.700	0.600	450mmØ	A15	Type 4

STORM WATER MANHOLE SCHEDULE						
MANHOLE REFERENCE	COVER LEVEL	INVERT LEVEL	DEPTH TO INVERT	DIAMETER / SIZE	COVER TYPE	MANHOLE TYPE
SW1	18.350	17.690	0.660	450mmØ	A15	Type 4
SW2	Not Used					
SW3	Not Used					
SW4	17.900	17.325	0.575	450mmØ	A15	Catchpit
SW5	18.750	18.200	0.550	450mmØ	A15	Catchpit
SW6	18.800	18.250	0.550	450mmØ	A15	Catchpit
SW7	18.600	18.025	0.575	450mmØ	A15	Catchpit
SW8	18.450	17.865	0.585	450mmØ	A15	Catchpit
SW9	18.450	17.850	0.600	450mmØ	A15	Catchpit
SW10	18.275	17.725	0.550	450mmØ	A15	Catchpit
SW11	18.150	17.625	0.525	450mmØ	A15	Catchpit
SW12	18.150	17.625	0.525	450mmØ	A15	Catchpit
SW13	18.050	17.550	0.500	450mmØ	A15	Catchpit
SW14	Not Used					
SW15	17.900	17.306	0.594	450mmØ	A15	Catchpit
SW16	17.900	17.350	0.550	450mmØ	A15	Catchpit
SW17	17.300	16.685	0.615	450mmØ	A15	Catchpit
SW18	17.300	16.660	0.640	450mmØ	A15	Catchpit
SW19	18.600	18.075	0.525	450mmØ	A15	Catchpit
SW20	18.300	17.900	0.400	450mmØ	A15	Catchpit



- NOTES:
1. All dimensions to be checked on site. All details and dimensions relating to sub-Contractors work must be checked and agreed between the sub-Contractor or supplier and the general Contractor.
 2. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and specification.
 3. The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.
 4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority. No liability is accepted by the Consultant and the main Contractor is responsible for obtaining and checking all information and taking due care and attention whilst undertaking the works.
 5. All pipes, bends and junctions shall be verified clay to BS EN 295-1, with flexible joints and kitemark certified. Alternatively all pipes and fittings can be UPVC conforming to BS EN 1401-1 and shall be laid in accordance with the manufacturers specification. If UPVC pipes are to be used then the manufacturer shall be approved by the Engineer prior to construction.
 6. All Adoptable sewers shall be in strict accordance with the current edition of Sewers For Adoption. Unless otherwise stated adoptable sewers shall be 150mm diameter and shall be laid in a class S bedding. Where the depth to soffit is less than 1.2m under a public highway or 0.9m elsewhere the pipe shall be laid with a class Z bedding.
 7. All private building drainage shall be constructed in strict accordance with BS EN 752:1996. Unless otherwise specified building drainage shall be 100mm diameter and shall be laid at a minimum gradient of 1 in 40 for foul drains and 1 in 80 for surface water drains. All building drains shall be laid in class B bedding unless otherwise specified.
 8. Where the service trench is near to the foundation of any building, refer to the guidance in Approved Document H, Building Regulations Part H1.
 9. Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN 3 concrete encasement (150mm thick). In all other cases the pipes shall be bedded and surrounded with 100mm thick granular material.
 10. In any circumstances where pipes are bedded and surrounded in concrete flexible joints should be provided. Compressible boards (fibroboard or polystyrene) shall be provided at a maximum of 8m centres (coinciding with pipe joints). The boards shall be pre-cut to pipe diameter and to a height and width equal to the concrete cross section. A board thickness of 18mm for pipes up to 450mm nominal diameter and 36mm for pipes over 450mm nominal diameter.
 11. All syps shall have rodding access plates fitted at their bases (ground floor level).
 12. Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.

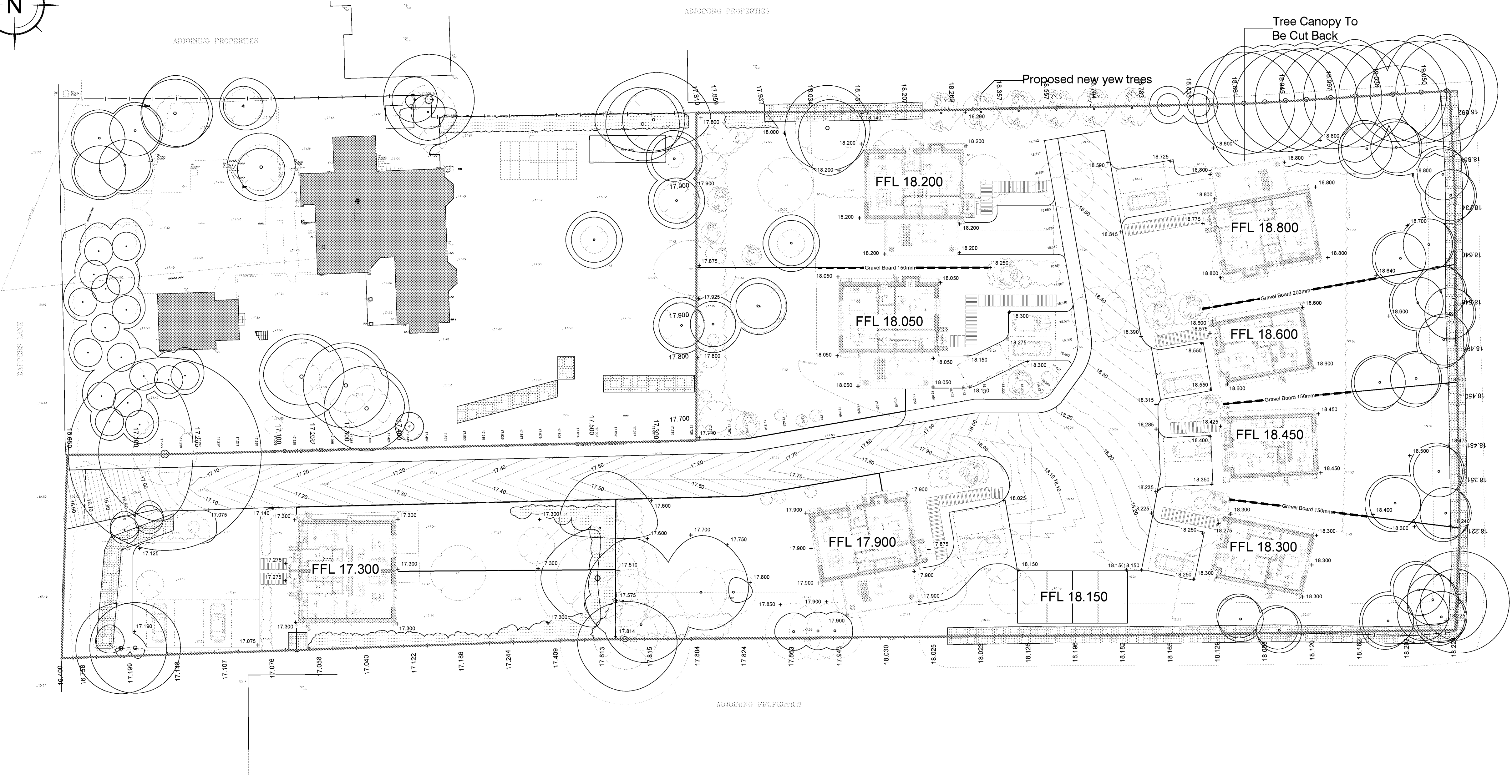
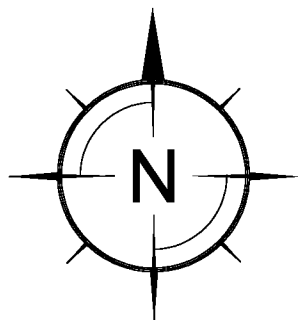
B 24.06.2020 PJR: Baffles added close to site entrance. Voids subbase formation levels added. MK
A 01.06.2020 MJP: Invert levels and gradients to diffuser tanks. MK
REV DATE INT DESCRIPTION CHK

Issue Status FOR CONSTRUCTION

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishergate
Sussex
BN41 1RA
01273 424424
reception@civil.co.uk
www.civil.co.uk

CLIENT Oceanview Developments Ltd
PROJECT The Laurels
Dappers Lane
Angmering
TITLE Proposed Drainage Layout and Levels Plan

DRAWN M Pacifico DATE May 2020 PROJECT NO. 23260
ENGINEER M Kemshall CHECKED DRG. NO. REV.
SCALE 1:250 @ A1, 1:500 @ A3 201 B



- NOTES:
1. All dimensions to be checked on site. All details and dimensions relating to sub-Contractors work must be checked and agreed between the sub-Contractor or supplier and the general Contractor.
 2. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and specification.
 3. The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.
 4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority. No liability is accepted by the Consultant and the main Contractor is responsible for obtaining and checking all information and taking due care and attention whilst undertaking the works.

A	01.06.20	MJP	Road contours and footway levels added	MK
REV	DATE	INT	DESCRIPTION	CHK

Issue Status **FOR CONSTRUCTION**

c
e
p

The Civil Engineering Practice
11 Tungsten Building
George Street
Fishergate
Sussex
BN41 1RA
01273 424424
reception@civil.co.uk
www.civil.co.uk

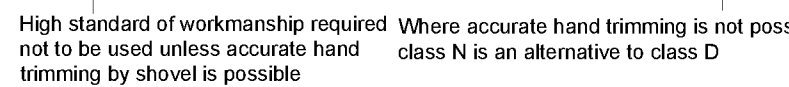
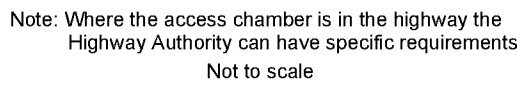
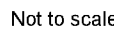
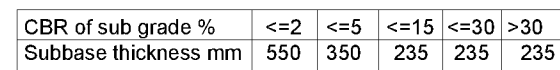
CLIENT
Oceanview Developments Ltd

PROJECT
The Laurals
Dappers Lane
Angmering

TITLE
Proposed Levels Plan

DRAWN M Pacifico	DATE May 2020	PROJECT NO. 23260
ENGINEER M Kemshall	CHECKED	REV.
SCALE 1:250 @ A1, 1:500 @ A3	401	A

Scale 1:250



PIPE BORE	BEDDING CLASS	Fields and gardens		Light traffic roads		Heavy traffic roads	
		MIN	MAX	MIN	MAX	MIN	MAX
100mm	D or N F B	0.4	4.2	0.7	4.1	0.7	3.7
		0.3	5.8	0.5	5.8	0.5	5.5
		0.3	7.4	0.4	7.4	0.4	7.2
150mm	D or N F B	0.8	2.7	1.1	2.5	--	--
		0.6	3.9	0.7	3.8	0.7	3.3
		0.6	5.0	0.6	5.0	0.6	4.6
225mm	D or N F B	--	--	--	--	--	--
		0.6	2.5	1.2	2.1	--	--
		0.6	3.3	0.8	3.2	0.9	2.4

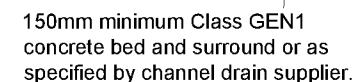
LEGEND:

	Selected fill: free from stones larger than 40mm, lumps of clay over 100mm, timber frozen material and vegetable matter
	Granular material: should conform to BS 882:1983 table 4 or BS8301:1985 Appendix D. Compaction fraction > 0.3 for class N > 0.2 for class F and B.
	Selected fill or granular fill free from stones larger than 40mm

'x' - Denotes external pipe diameter.



PIPE BEDDING DETAILS
(ADOPTABLE DRAINS)
(Not To Scale)



ACO CHANNEL
DRAIN DETAIL
(Scale 1:20)



Issue Status	FOR PLANNING
--------------	--------------

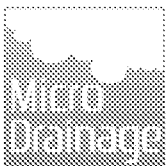
c
e
p

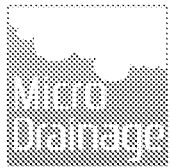
The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA

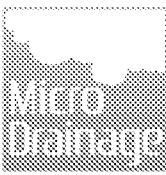
01273 424424
reception@civil.co.uk
www.civil.co.uk

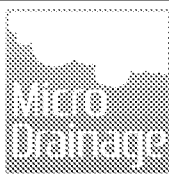
DRAWN		DATE		PROJECT NO.	
M Pacifico		Nov 2019		23260	
ENGINEER		CHECKED		DWG. No.	
M Kempshall		SRM		REV.	
SCALE				501 B	
As Shown @ A1					

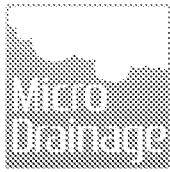
The Civil Engineering Practice					Page 1
11 Tungsten Building George Street Fishersgate BN41 1RA		The Laurels Dappers Lane, Angmering Catchment A			
Date 22/05/2020 File CATCHMENT A.SRCX		Designed by SRD Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Half Drain Time : 29 minutes.					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	16.714	0.064	0.9	1.7	Flood Risk
30 min Summer	16.727	0.077	0.9	2.0	Flood Risk
60 min Summer	16.733	0.083	0.9	2.2	Flood Risk
120 min Summer	16.728	0.078	0.9	2.0	Flood Risk
180 min Summer	16.718	0.068	0.9	1.8	Flood Risk
240 min Summer	16.709	0.059	0.9	1.5	Flood Risk
360 min Summer	16.697	0.047	0.8	1.2	Flood Risk
480 min Summer	16.691	0.041	0.7	1.1	Flood Risk
600 min Summer	16.686	0.036	0.6	0.9	Flood Risk
720 min Summer	16.683	0.033	0.6	0.8	Flood Risk
960 min Summer	16.677	0.027	0.5	0.7	Flood Risk
1440 min Summer	16.671	0.021	0.4	0.5	Flood Risk
2160 min Summer	16.666	0.016	0.3	0.4	Flood Risk
2880 min Summer	16.663	0.013	0.2	0.3	Flood Risk
4320 min Summer	16.659	0.009	0.2	0.2	Flood Risk
5760 min Summer	16.658	0.008	0.1	0.2	Flood Risk
7200 min Summer	16.656	0.006	0.1	0.2	Flood Risk
8640 min Summer	16.656	0.006	0.1	0.1	Flood Risk
10080 min Summer	16.655	0.005	0.1	0.1	Flood Risk
15 min Winter	16.723	0.073	0.9	1.9	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
15 min Summer	129.682	0.0	18		
30 min Summer	87.133	0.0	28		
60 min Summer	55.837	0.0	46		
120 min Summer	34.509	0.0	78		
180 min Summer	25.637	0.0	110		
240 min Summer	20.604	0.0	140		
360 min Summer	15.169	0.0	198		
480 min Summer	12.185	0.0	260		
600 min Summer	10.272	0.0	320		
720 min Summer	8.930	0.0	380		
960 min Summer	7.152	0.0	502		
1440 min Summer	5.221	0.0	740		
2160 min Summer	3.803	0.0	1104		
2880 min Summer	3.033	0.0	1468		
4320 min Summer	2.201	0.0	2204		
5760 min Summer	1.751	0.0	2896		
7200 min Summer	1.466	0.0	3560		
8640 min Summer	1.270	0.0	4360		
10080 min Summer	1.124	0.0	5136		
15 min Winter	129.682	0.0	18		
©1982-2020 Innovyze					

The Civil Engineering Practice				Page 2	
11 Tungsten Building George Street Fishersgate BN41 1RA		The Laurels Dappers Lane, Angmering Catchment A			
Date 22/05/2020 File CATCHMENT A.SRCX		Designed by SRD Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	16.738	0.088	0.9	2.3	Flood Risk
60 min Winter	16.743	0.093	0.9	2.4	Flood Risk
120 min Winter	16.732	0.082	0.9	2.1	Flood Risk
180 min Winter	16.716	0.066	0.9	1.7	Flood Risk
240 min Winter	16.703	0.053	0.9	1.4	Flood Risk
360 min Winter	16.692	0.042	0.7	1.1	Flood Risk
480 min Winter	16.685	0.035	0.6	0.9	Flood Risk
600 min Winter	16.680	0.030	0.5	0.8	Flood Risk
720 min Winter	16.676	0.026	0.5	0.7	Flood Risk
960 min Winter	16.671	0.021	0.4	0.6	Flood Risk
1440 min Winter	16.666	0.016	0.3	0.4	Flood Risk
2160 min Winter	16.662	0.012	0.2	0.3	Flood Risk
2880 min Winter	16.659	0.009	0.2	0.2	Flood Risk
4320 min Winter	16.657	0.007	0.1	0.2	Flood Risk
5760 min Winter	16.656	0.006	0.1	0.1	Flood Risk
7200 min Winter	16.655	0.005	0.1	0.1	Flood Risk
8640 min Winter	16.654	0.004	0.1	0.1	Flood Risk
10080 min Winter	16.654	0.004	0.1	0.1	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	87.133	0.0	30		
60 min Winter	55.837	0.0	48		
120 min Winter	34.509	0.0	84		
180 min Winter	25.637	0.0	116		
240 min Winter	20.604	0.0	144		
360 min Winter	15.169	0.0	204		
480 min Winter	12.185	0.0	264		
600 min Winter	10.272	0.0	326		
720 min Winter	8.930	0.0	386		
960 min Winter	7.152	0.0	508		
1440 min Winter	5.221	0.0	750		
2160 min Winter	3.803	0.0	1104		
2880 min Winter	3.033	0.0	1472		
4320 min Winter	2.201	0.0	2204		
5760 min Winter	1.751	0.0	2904		
7200 min Winter	1.466	0.0	3760		
8640 min Winter	1.270	0.0	4504		
10080 min Winter	1.124	0.0	5120		
©1982-2020 Innovyze					

The Civil Engineering Practice		Page 4																
11 Tungsten Building George Street Fishersgate BN41 1RA	The Laurels Dappers Lane, Angmering Catchment A																	
Date 22/05/2020 File CATCHMENT A.SRCX	Designed by SRD Checked by																	
Innovyze Source Control 2020.1																		
<u>Model Details</u> Storage is Online Cover Level (m) 16.900 <u>Infiltration Blanket Structure</u> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.05400</td> <td>Diameter/Width (m)</td> <td>9.3</td> </tr> <tr> <td>Safety Factor</td> <td>1.5</td> <td>Length (m)</td> <td>9.3</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>0.150</td> </tr> <tr> <td>Invert Level (m)</td> <td>16.650</td> <td></td> <td></td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.05400	Diameter/Width (m)	9.3	Safety Factor	1.5	Length (m)	9.3	Porosity	0.30	Cap Volume Depth (m)	0.150	Invert Level (m)	16.650		
Infiltration Coefficient Base (m/hr)	0.05400	Diameter/Width (m)	9.3															
Safety Factor	1.5	Length (m)	9.3															
Porosity	0.30	Cap Volume Depth (m)	0.150															
Invert Level (m)	16.650																	
©1982-2020 Innovyze																		

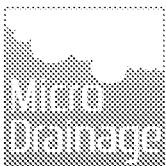
The Civil Engineering Practice				Page 1																																																																																																																																																																																																																			
11 Tungsten Building George Street Fishersgate BN41 1RA		The Laurels Dappers Lane, Angmering Catchment B																																																																																																																																																																																																																					
Date 22/05/2020 File Catchment B.SRCX		Designed by SRD Checked by																																																																																																																																																																																																																					
Innovyze		Source Control 2020.1																																																																																																																																																																																																																					
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 52 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>16.662</td><td>0.122</td><td>1.6</td><td>5.8</td><td>O K</td></tr><tr><td>30 min Summer</td><td>16.693</td><td>0.153</td><td>1.6</td><td>7.3</td><td>O K</td></tr><tr><td>60 min Summer</td><td>16.711</td><td>0.171</td><td>1.6</td><td>8.1</td><td>O K</td></tr><tr><td>120 min Summer</td><td>16.711</td><td>0.171</td><td>1.6</td><td>8.1</td><td>O K</td></tr><tr><td>180 min Summer</td><td>16.699</td><td>0.159</td><td>1.6</td><td>7.6</td><td>O K</td></tr><tr><td>240 min Summer</td><td>16.685</td><td>0.145</td><td>1.6</td><td>6.9</td><td>O K</td></tr><tr><td>360 min Summer</td><td>16.658</td><td>0.118</td><td>1.6</td><td>5.6</td><td>O K</td></tr><tr><td>480 min Summer</td><td>16.635</td><td>0.095</td><td>1.6</td><td>4.5</td><td>O K</td></tr><tr><td>600 min Summer</td><td>16.617</td><td>0.077</td><td>1.6</td><td>3.7</td><td>O K</td></tr><tr><td>720 min Summer</td><td>16.603</td><td>0.063</td><td>1.6</td><td>3.0</td><td>O K</td></tr><tr><td>960 min Summer</td><td>16.588</td><td>0.048</td><td>1.5</td><td>2.3</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>16.577</td><td>0.037</td><td>1.2</td><td>1.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>16.568</td><td>0.028</td><td>0.9</td><td>1.3</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>16.562</td><td>0.022</td><td>0.7</td><td>1.1</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>16.556</td><td>0.016</td><td>0.5</td><td>0.8</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>16.553</td><td>0.013</td><td>0.4</td><td>0.6</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>16.551</td><td>0.011</td><td>0.4</td><td>0.5</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>16.550</td><td>0.010</td><td>0.3</td><td>0.5</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>16.549</td><td>0.009</td><td>0.3</td><td>0.4</td><td>O K</td></tr><tr><td>15 min Winter</td><td>16.679</td><td>0.139</td><td>1.6</td><td>6.6</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>129.682</td><td>0.0</td><td>19</td></tr><tr><td>30 min Summer</td><td>87.133</td><td>0.0</td><td>32</td></tr><tr><td>60 min Summer</td><td>55.837</td><td>0.0</td><td>52</td></tr><tr><td>120 min Summer</td><td>34.509</td><td>0.0</td><td>86</td></tr><tr><td>180 min Summer</td><td>25.637</td><td>0.0</td><td>120</td></tr><tr><td>240 min Summer</td><td>20.604</td><td>0.0</td><td>154</td></tr><tr><td>360 min Summer</td><td>15.169</td><td>0.0</td><td>218</td></tr><tr><td>480 min Summer</td><td>12.185</td><td>0.0</td><td>278</td></tr><tr><td>600 min Summer</td><td>10.272</td><td>0.0</td><td>336</td></tr><tr><td>720 min Summer</td><td>8.930</td><td>0.0</td><td>390</td></tr><tr><td>960 min Summer</td><td>7.152</td><td>0.0</td><td>502</td></tr><tr><td>1440 min Summer</td><td>5.221</td><td>0.0</td><td>740</td></tr><tr><td>2160 min Summer</td><td>3.803</td><td>0.0</td><td>1104</td></tr><tr><td>2880 min Summer</td><td>3.033</td><td>0.0</td><td>1468</td></tr><tr><td>4320 min Summer</td><td>2.201</td><td>0.0</td><td>2204</td></tr><tr><td>5760 min Summer</td><td>1.751</td><td>0.0</td><td>2928</td></tr><tr><td>7200 min Summer</td><td>1.466</td><td>0.0</td><td>3640</td></tr><tr><td>8640 min Summer</td><td>1.270</td><td>0.0</td><td>4352</td></tr><tr><td>10080 min Summer</td><td>1.124</td><td>0.0</td><td>5096</td></tr><tr><td>15 min Winter</td><td>129.682</td><td>0.0</td><td>20</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	16.662	0.122	1.6	5.8	O K	30 min Summer	16.693	0.153	1.6	7.3	O K	60 min Summer	16.711	0.171	1.6	8.1	O K	120 min Summer	16.711	0.171	1.6	8.1	O K	180 min Summer	16.699	0.159	1.6	7.6	O K	240 min Summer	16.685	0.145	1.6	6.9	O K	360 min Summer	16.658	0.118	1.6	5.6	O K	480 min Summer	16.635	0.095	1.6	4.5	O K	600 min Summer	16.617	0.077	1.6	3.7	O K	720 min Summer	16.603	0.063	1.6	3.0	O K	960 min Summer	16.588	0.048	1.5	2.3	O K	1440 min Summer	16.577	0.037	1.2	1.7	O K	2160 min Summer	16.568	0.028	0.9	1.3	O K	2880 min Summer	16.562	0.022	0.7	1.1	O K	4320 min Summer	16.556	0.016	0.5	0.8	O K	5760 min Summer	16.553	0.013	0.4	0.6	O K	7200 min Summer	16.551	0.011	0.4	0.5	O K	8640 min Summer	16.550	0.010	0.3	0.5	O K	10080 min Summer	16.549	0.009	0.3	0.4	O K	15 min Winter	16.679	0.139	1.6	6.6	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	129.682	0.0	19	30 min Summer	87.133	0.0	32	60 min Summer	55.837	0.0	52	120 min Summer	34.509	0.0	86	180 min Summer	25.637	0.0	120	240 min Summer	20.604	0.0	154	360 min Summer	15.169	0.0	218	480 min Summer	12.185	0.0	278	600 min Summer	10.272	0.0	336	720 min Summer	8.930	0.0	390	960 min Summer	7.152	0.0	502	1440 min Summer	5.221	0.0	740	2160 min Summer	3.803	0.0	1104	2880 min Summer	3.033	0.0	1468	4320 min Summer	2.201	0.0	2204	5760 min Summer	1.751	0.0	2928	7200 min Summer	1.466	0.0	3640	8640 min Summer	1.270	0.0	4352	10080 min Summer	1.124	0.0	5096	15 min Winter	129.682	0.0	20
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status																																																																																																																																																																																																																		
15 min Summer	16.662	0.122	1.6	5.8	O K																																																																																																																																																																																																																		
30 min Summer	16.693	0.153	1.6	7.3	O K																																																																																																																																																																																																																		
60 min Summer	16.711	0.171	1.6	8.1	O K																																																																																																																																																																																																																		
120 min Summer	16.711	0.171	1.6	8.1	O K																																																																																																																																																																																																																		
180 min Summer	16.699	0.159	1.6	7.6	O K																																																																																																																																																																																																																		
240 min Summer	16.685	0.145	1.6	6.9	O K																																																																																																																																																																																																																		
360 min Summer	16.658	0.118	1.6	5.6	O K																																																																																																																																																																																																																		
480 min Summer	16.635	0.095	1.6	4.5	O K																																																																																																																																																																																																																		
600 min Summer	16.617	0.077	1.6	3.7	O K																																																																																																																																																																																																																		
720 min Summer	16.603	0.063	1.6	3.0	O K																																																																																																																																																																																																																		
960 min Summer	16.588	0.048	1.5	2.3	O K																																																																																																																																																																																																																		
1440 min Summer	16.577	0.037	1.2	1.7	O K																																																																																																																																																																																																																		
2160 min Summer	16.568	0.028	0.9	1.3	O K																																																																																																																																																																																																																		
2880 min Summer	16.562	0.022	0.7	1.1	O K																																																																																																																																																																																																																		
4320 min Summer	16.556	0.016	0.5	0.8	O K																																																																																																																																																																																																																		
5760 min Summer	16.553	0.013	0.4	0.6	O K																																																																																																																																																																																																																		
7200 min Summer	16.551	0.011	0.4	0.5	O K																																																																																																																																																																																																																		
8640 min Summer	16.550	0.010	0.3	0.5	O K																																																																																																																																																																																																																		
10080 min Summer	16.549	0.009	0.3	0.4	O K																																																																																																																																																																																																																		
15 min Winter	16.679	0.139	1.6	6.6	O K																																																																																																																																																																																																																		
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																				
15 min Summer	129.682	0.0	19																																																																																																																																																																																																																				
30 min Summer	87.133	0.0	32																																																																																																																																																																																																																				
60 min Summer	55.837	0.0	52																																																																																																																																																																																																																				
120 min Summer	34.509	0.0	86																																																																																																																																																																																																																				
180 min Summer	25.637	0.0	120																																																																																																																																																																																																																				
240 min Summer	20.604	0.0	154																																																																																																																																																																																																																				
360 min Summer	15.169	0.0	218																																																																																																																																																																																																																				
480 min Summer	12.185	0.0	278																																																																																																																																																																																																																				
600 min Summer	10.272	0.0	336																																																																																																																																																																																																																				
720 min Summer	8.930	0.0	390																																																																																																																																																																																																																				
960 min Summer	7.152	0.0	502																																																																																																																																																																																																																				
1440 min Summer	5.221	0.0	740																																																																																																																																																																																																																				
2160 min Summer	3.803	0.0	1104																																																																																																																																																																																																																				
2880 min Summer	3.033	0.0	1468																																																																																																																																																																																																																				
4320 min Summer	2.201	0.0	2204																																																																																																																																																																																																																				
5760 min Summer	1.751	0.0	2928																																																																																																																																																																																																																				
7200 min Summer	1.466	0.0	3640																																																																																																																																																																																																																				
8640 min Summer	1.270	0.0	4352																																																																																																																																																																																																																				
10080 min Summer	1.124	0.0	5096																																																																																																																																																																																																																				
15 min Winter	129.682	0.0	20																																																																																																																																																																																																																				
©1982-2020 Innovyze																																																																																																																																																																																																																							

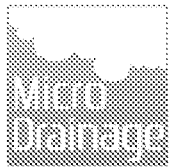
The Civil Engineering Practice					Page 2	
11 Tungsten Building George Street Fishersgate BN41 1RA		The Laurels Dappers Lane, Angmering Catchment B				
Date 22/05/2020 File Catchment B.SRCX		Designed by SRD Checked by				
Innovyze		Source Control 2020.1				
<u>Summary of Results for 100 year Return Period (+40%)</u>						
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	
30 min Winter	16.716	0.176	1.6	8.4	O K	
60 min Winter	16.737	0.197	1.6	9.4	O K	
120 min Winter	16.733	0.193	1.6	9.2	O K	
180 min Winter	16.714	0.174	1.6	8.3	O K	
240 min Winter	16.692	0.152	1.6	7.2	O K	
360 min Winter	16.650	0.110	1.6	5.2	O K	
480 min Winter	16.617	0.077	1.6	3.6	O K	
600 min Winter	16.594	0.054	1.6	2.6	O K	
720 min Winter	16.586	0.046	1.5	2.2	O K	
960 min Winter	16.578	0.038	1.2	1.8	O K	
1440 min Winter	16.568	0.028	0.9	1.3	O K	
2160 min Winter	16.560	0.020	0.6	1.0	O K	
2880 min Winter	16.556	0.016	0.5	0.8	O K	
4320 min Winter	16.552	0.012	0.4	0.6	O K	
5760 min Winter	16.550	0.010	0.3	0.5	O K	
7200 min Winter	16.548	0.008	0.3	0.4	O K	
8640 min Winter	16.547	0.007	0.2	0.3	O K	
10080 min Winter	16.546	0.006	0.2	0.3	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)			
30 min Winter	87.133	0.0	32			
60 min Winter	55.837	0.0	58			
120 min Winter	34.509	0.0	92			
180 min Winter	25.637	0.0	130			
240 min Winter	20.604	0.0	166			
360 min Winter	15.169	0.0	230			
480 min Winter	12.185	0.0	288			
600 min Winter	10.272	0.0	334			
720 min Winter	8.930	0.0	384			
960 min Winter	7.152	0.0	502			
1440 min Winter	5.221	0.0	748			
2160 min Winter	3.803	0.0	1108			
2880 min Winter	3.033	0.0	1472			
4320 min Winter	2.201	0.0	2208			
5760 min Winter	1.751	0.0	2976			
7200 min Winter	1.466	0.0	3656			
8640 min Winter	1.270	0.0	4384			
10080 min Winter	1.124	0.0	5136			
©1982-2020 Innovyze						

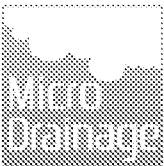
The Civil Engineering Practice		Page 3																																				
11 Tungsten Building George Street Fishersgate BN41 1RA	The Laurels Dappers Lane, Angmering Catchment B																																					
Date 22/05/2020	Designed by SRD																																					
File Catchment B.SRCX	Checked by																																					
Innovyze		Source Control 2020.1																																				
<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>19.700</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.350</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.029 <table> <thead> <tr> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To: (ha)</th> <th>From:</th> <th>To: (ha)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>4 0.014</td> <td>4</td> <td>8 0.015</td> </tr> </tbody> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	100	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	19.700	Shortest Storm (mins)	15	Ratio R	0.350	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)	Area	Time (mins)	Area	From:	To: (ha)	From:	To: (ha)	0	4 0.014	4	8 0.015
Rainfall Model	FSR	Winter Storms	Yes																																			
Return Period (years)	100	Cv (Summer)	0.750																																			
Region	England and Wales	Cv (Winter)	0.840																																			
M5-60 (mm)	19.700	Shortest Storm (mins)	15																																			
Ratio R	0.350	Longest Storm (mins)	10080																																			
Summer Storms	Yes	Climate Change %	+40																																			
Time (mins)	Area	Time (mins)	Area																																			
From:	To: (ha)	From:	To: (ha)																																			
0	4 0.014	4	8 0.015																																			
©1982-2020 Innovyze																																						

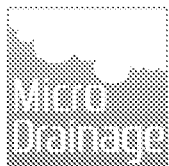
The Civil Engineering Practice		Page 4																
11 Tungsten Building George Street Fishersgate BN41 1RA	The Laurels Dappers Lane, Angmering Catchment B																	
Date 22/05/2020	Designed by SRD																	
File Catchment B.SRCX	Checked by																	
Innovyze	Source Control 2020.1																	
<u>Model Details</u> Storage is Online Cover Level (m) 17.150 <u>Infiltration Blanket Structure</u> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.05400</td> <td>Diameter/Width (m)</td> <td>12.6</td> </tr> <tr> <td>Safety Factor</td> <td>1.5</td> <td>Length (m)</td> <td>12.6</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>0.200</td> </tr> <tr> <td>Invert Level (m)</td> <td>16.540</td> <td></td> <td></td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.05400	Diameter/Width (m)	12.6	Safety Factor	1.5	Length (m)	12.6	Porosity	0.30	Cap Volume Depth (m)	0.200	Invert Level (m)	16.540		
Infiltration Coefficient Base (m/hr)	0.05400	Diameter/Width (m)	12.6															
Safety Factor	1.5	Length (m)	12.6															
Porosity	0.30	Cap Volume Depth (m)	0.200															
Invert Level (m)	16.540																	
©1982-2020 Innovyze																		

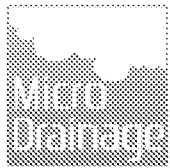
The Civil Engineering Practice					Page 1
11 Tungsten Building George Street Fishersgate BN41 1RA			The Laurels Dappers Lane, Angmering Catchment C		
Date 22/05/2020 File CATCHMENT C.SRCX			Designed by SRD Checked by		
Innovyze			Source Control 2020.1		
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Half Drain Time : 32 minutes.					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	16.934	0.084		1.7	4.4 Flood Risk
30 min Summer	16.953	0.103		1.7	5.4 Flood Risk
60 min Summer	16.963	0.113		1.7	5.9 Flood Risk
120 min Summer	16.959	0.109		1.7	5.7 Flood Risk
180 min Summer	16.948	0.098		1.7	5.1 Flood Risk
240 min Summer	16.936	0.086		1.7	4.5 Flood Risk
360 min Summer	16.916	0.066		1.7	3.4 Flood Risk
480 min Summer	16.903	0.053		1.7	2.7 Flood Risk
600 min Summer	16.896	0.046		1.6	2.4 Flood Risk
720 min Summer	16.891	0.041		1.4	2.2 Flood Risk
960 min Summer	16.885	0.035		1.2	1.8 Flood Risk
1440 min Summer	16.876	0.026		0.9	1.4 Flood Risk
2160 min Summer	16.870	0.020		0.7	1.0 Flood Risk
2880 min Summer	16.866	0.016		0.6	0.8 Flood Risk
4320 min Summer	16.862	0.012		0.4	0.6 Flood Risk
5760 min Summer	16.860	0.010		0.3	0.5 Flood Risk
7200 min Summer	16.858	0.008		0.3	0.4 Flood Risk
8640 min Summer	16.857	0.007		0.3	0.4 Flood Risk
10080 min Summer	16.856	0.006		0.2	0.3 Flood Risk
15 min Winter	16.945	0.095		1.7	5.0 Flood Risk
Storm Event		Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	
15 min Summer		129.682	0.0	18	
30 min Summer		87.133	0.0	30	
60 min Summer		55.837	0.0	48	
120 min Summer		34.509	0.0	82	
180 min Summer		25.637	0.0	114	
240 min Summer		20.604	0.0	146	
360 min Summer		15.169	0.0	206	
480 min Summer		12.185	0.0	262	
600 min Summer		10.272	0.0	320	
720 min Summer		8.930	0.0	380	
960 min Summer		7.152	0.0	500	
1440 min Summer		5.221	0.0	740	
2160 min Summer		3.803	0.0	1104	
2880 min Summer		3.033	0.0	1468	
4320 min Summer		2.201	0.0	2204	
5760 min Summer		1.751	0.0	2928	
7200 min Summer		1.466	0.0	3640	
8640 min Summer		1.270	0.0	4392	
10080 min Summer		1.124	0.0	5136	
15 min Winter		129.682	0.0	19	
©1982-2020 Innovyze					

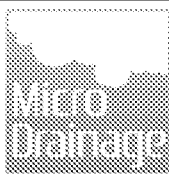
The Civil Engineering Practice				Page 2	
11 Tungsten Building George Street Fishersgate BN41 1RA		The Laurels Dappers Lane, Angmering Catchment C			
Date 22/05/2020 File CATCHMENT C.SRCX		Designed by SRD Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	16.969	0.119	1.7	6.2	Flood Risk
60 min Winter	16.978	0.128	1.7	6.7	Flood Risk
120 min Winter	16.969	0.119	1.7	6.2	Flood Risk
180 min Winter	16.950	0.100	1.7	5.2	Flood Risk
240 min Winter	16.931	0.081	1.7	4.2	Flood Risk
360 min Winter	16.904	0.054	1.7	2.8	Flood Risk
480 min Winter	16.894	0.044	1.5	2.3	Flood Risk
600 min Winter	16.888	0.038	1.3	2.0	Flood Risk
720 min Winter	16.883	0.033	1.2	1.7	Flood Risk
960 min Winter	16.877	0.027	0.9	1.4	Flood Risk
1440 min Winter	16.870	0.020	0.7	1.0	Flood Risk
2160 min Winter	16.865	0.015	0.5	0.8	Flood Risk
2880 min Winter	16.862	0.012	0.4	0.6	Flood Risk
4320 min Winter	16.859	0.009	0.3	0.4	Flood Risk
5760 min Winter	16.857	0.007	0.2	0.4	Flood Risk
7200 min Winter	16.856	0.006	0.2	0.3	Flood Risk
8640 min Winter	16.855	0.005	0.2	0.3	Flood Risk
10080 min Winter	16.855	0.005	0.2	0.2	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	87.133	0.0	31		
60 min Winter	55.837	0.0	50		
120 min Winter	34.509	0.0	88		
180 min Winter	25.637	0.0	122		
240 min Winter	20.604	0.0	154		
360 min Winter	15.169	0.0	208		
480 min Winter	12.185	0.0	264		
600 min Winter	10.272	0.0	326		
720 min Winter	8.930	0.0	386		
960 min Winter	7.152	0.0	502		
1440 min Winter	5.221	0.0	744		
2160 min Winter	3.803	0.0	1104		
2880 min Winter	3.033	0.0	1472		
4320 min Winter	2.201	0.0	2164		
5760 min Winter	1.751	0.0	2944		
7200 min Winter	1.466	0.0	3672		
8640 min Winter	1.270	0.0	4280		
10080 min Winter	1.124	0.0	5248		
©1982-2020 Innovyze					

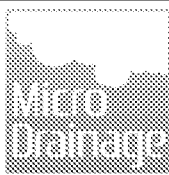
The Civil Engineering Practice		Page 4																
11 Tungsten Building George Street Fishersgate BN41 1RA	The Laurels Dappers Lane, Angmering Catchment C																	
Date 22/05/2020 File CATCHMENT C.SRCX	Designed by SRD Checked by																	
Innovyze Source Control 2020.1																		
<u>Model Details</u> Storage is Online Cover Level (m) 17.100 <u>Infiltration Blanket Structure</u> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.05400</td> <td>Diameter/Width (m)</td> <td>13.2</td> </tr> <tr> <td>Safety Factor</td> <td>1.5</td> <td>Length (m)</td> <td>13.2</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>0.150</td> </tr> <tr> <td>Invert Level (m)</td> <td>16.850</td> <td></td> <td></td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.05400	Diameter/Width (m)	13.2	Safety Factor	1.5	Length (m)	13.2	Porosity	0.30	Cap Volume Depth (m)	0.150	Invert Level (m)	16.850		
Infiltration Coefficient Base (m/hr)	0.05400	Diameter/Width (m)	13.2															
Safety Factor	1.5	Length (m)	13.2															
Porosity	0.30	Cap Volume Depth (m)	0.150															
Invert Level (m)	16.850																	
©1982-2020 Innovyze																		

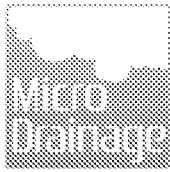
The Civil Engineering Practice					Page 1	
11 Tungsten Building George Street Fishersgate BN41 1RA			The Laurels Dappers Lane, Angmering Catchment D			
Date 22/05/2020 File CATCHMENT D.SRCX			Designed by SRD Checked by			
Innovyze			Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>						
Half Drain Time : 46 minutes.						
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	
15 min Summer	17.184	0.194		3.0	9.8	Flood Risk
30 min Summer	17.231	0.241		3.0	12.2	Flood Risk
60 min Summer	17.252	0.262		3.0	13.3	Flood Risk
120 min Summer	17.243	0.253		3.0	12.8	Flood Risk
180 min Summer	17.220	0.230		3.0	11.7	Flood Risk
240 min Summer	17.193	0.203		3.0	10.3	Flood Risk
360 min Summer	17.145	0.155		3.0	7.9	Flood Risk
480 min Summer	17.106	0.116		3.0	5.9	Flood Risk
600 min Summer	17.076	0.086		3.0	4.3	O K
720 min Summer	17.054	0.064		3.0	3.3	O K
960 min Summer	17.037	0.047		2.8	2.4	O K
1440 min Summer	17.025	0.035		2.1	1.8	O K
2160 min Summer	17.016	0.026		1.6	1.3	O K
2880 min Summer	17.011	0.021		1.3	1.0	O K
4320 min Summer	17.005	0.015		0.9	0.8	O K
5760 min Summer	17.002	0.012		0.7	0.6	O K
7200 min Summer	17.000	0.010		0.6	0.5	O K
8640 min Summer	16.999	0.009		0.5	0.4	O K
10080 min Summer	16.998	0.008		0.5	0.4	O K
15 min Winter	17.212	0.222		3.0	11.2	Flood Risk
Storm Event		Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
15 min Summer		129.682	0.0	19		
30 min Summer		87.133	0.0	31		
60 min Summer		55.837	0.0	50		
120 min Summer		34.509	0.0	84		
180 min Summer		25.637	0.0	118		
240 min Summer		20.604	0.0	152		
360 min Summer		15.169	0.0	214		
480 min Summer		12.185	0.0	274		
600 min Summer		10.272	0.0	330		
720 min Summer		8.930	0.0	384		
960 min Summer		7.152	0.0	494		
1440 min Summer		5.221	0.0	736		
2160 min Summer		3.803	0.0	1100		
2880 min Summer		3.033	0.0	1468		
4320 min Summer		2.201	0.0	2176		
5760 min Summer		1.751	0.0	2872		
7200 min Summer		1.466	0.0	3600		
8640 min Summer		1.270	0.0	4352		
10080 min Summer		1.124	0.0	5008		
15 min Winter		129.682	0.0	19		
©1982-2020 Innovyze						

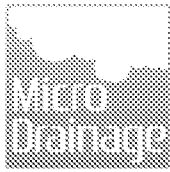
The Civil Engineering Practice				Page 2	
11 Tungsten Building George Street Fishersgate BN41 1RA		The Laurels Dappers Lane, Angmering Catchment D			
Date 22/05/2020 File CATCHMENT D.SRCX		Designed by SRD Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	17.268	0.278		3.0 14.1	Flood Risk
60 min Winter	17.293	0.303		3.0 15.4	Flood Risk
120 min Winter	17.277	0.287		3.0 14.5	Flood Risk
180 min Winter	17.238	0.248		3.0 12.6	Flood Risk
240 min Winter	17.196	0.206		3.0 10.5	Flood Risk
360 min Winter	17.123	0.133		3.0 6.7	Flood Risk
480 min Winter	17.068	0.078		3.0 3.9	O K
600 min Winter	17.040	0.050		3.0 2.5	O K
720 min Winter	17.033	0.043		2.6 2.2	O K
960 min Winter	17.025	0.035		2.1 1.8	O K
1440 min Winter	17.016	0.026		1.6 1.3	O K
2160 min Winter	17.009	0.019		1.1 0.9	O K
2880 min Winter	17.005	0.015		0.9 0.8	O K
4320 min Winter	17.001	0.011		0.7 0.6	O K
5760 min Winter	16.999	0.009		0.5 0.4	O K
7200 min Winter	16.997	0.007		0.4 0.4	O K
8640 min Winter	16.996	0.006		0.4 0.3	O K
10080 min Winter	16.996	0.006		0.3 0.3	O K
Storm Event		Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	
30 min Winter		87.133	0.0	32	
60 min Winter		55.837	0.0	54	
120 min Winter		34.509	0.0	92	
180 min Winter		25.637	0.0	128	
240 min Winter		20.604	0.0	162	
360 min Winter		15.169	0.0	226	
480 min Winter		12.185	0.0	278	
600 min Winter		10.272	0.0	316	
720 min Winter		8.930	0.0	378	
960 min Winter		7.152	0.0	492	
1440 min Winter		5.221	0.0	736	
2160 min Winter		3.803	0.0	1104	
2880 min Winter		3.033	0.0	1500	
4320 min Winter		2.201	0.0	2176	
5760 min Winter		1.751	0.0	2912	
7200 min Winter		1.466	0.0	3736	
8640 min Winter		1.270	0.0	4408	
10080 min Winter		1.124	0.0	5064	
©1982-2020 Innovyze					

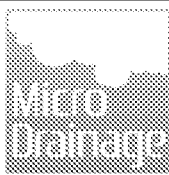
The Civil Engineering Practice		Page 4																
11 Tungsten Building George Street Fishersgate BN41 1RA	The Laurels Dappers Lane, Angmering Catchment D																	
Date 22/05/2020 File CATCHMENT D.SRCX	Designed by SRD Checked by																	
Innovyze Source Control 2020.1																		
<u>Model Details</u> Storage is Online Cover Level (m) 17.400 <u>Infiltration Blanket Structure</u> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.09720</td> <td>Diameter/Width (m)</td> <td>13.0</td> </tr> <tr> <td>Safety Factor</td> <td>1.5</td> <td>Length (m)</td> <td>13.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>0.310</td> </tr> <tr> <td>Invert Level (m)</td> <td>16.990</td> <td></td> <td></td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.09720	Diameter/Width (m)	13.0	Safety Factor	1.5	Length (m)	13.0	Porosity	0.30	Cap Volume Depth (m)	0.310	Invert Level (m)	16.990		
Infiltration Coefficient Base (m/hr)	0.09720	Diameter/Width (m)	13.0															
Safety Factor	1.5	Length (m)	13.0															
Porosity	0.30	Cap Volume Depth (m)	0.310															
Invert Level (m)	16.990																	
©1982-2020 Innovyze																		

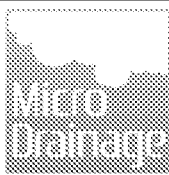
The Civil Engineering Practice				Page 1																																																																																																																																																																																																																			
11 Tungsten Building George Street Fishersgate BN41 1RA		The Laurels Dappers Lane, Angmering Catchment E																																																																																																																																																																																																																					
Date 22/05/2020 File Catchment E.SRCX		Designed by SRD Checked by																																																																																																																																																																																																																					
Innovyze		Source Control 2020.1																																																																																																																																																																																																																					
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 31 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>17.589</td><td>0.139</td><td>6.3</td><td>15.1</td><td>O K</td></tr><tr><td>30 min Summer</td><td>17.621</td><td>0.171</td><td>6.3</td><td>18.5</td><td>O K</td></tr><tr><td>60 min Summer</td><td>17.632</td><td>0.182</td><td>6.3</td><td>19.7</td><td>O K</td></tr><tr><td>120 min Summer</td><td>17.620</td><td>0.170</td><td>6.3</td><td>18.4</td><td>O K</td></tr><tr><td>180 min Summer</td><td>17.598</td><td>0.148</td><td>6.3</td><td>16.0</td><td>O K</td></tr><tr><td>240 min Summer</td><td>17.575</td><td>0.125</td><td>6.3</td><td>13.5</td><td>O K</td></tr><tr><td>360 min Summer</td><td>17.538</td><td>0.088</td><td>6.3</td><td>9.6</td><td>O K</td></tr><tr><td>480 min Summer</td><td>17.513</td><td>0.063</td><td>6.3</td><td>6.9</td><td>O K</td></tr><tr><td>600 min Summer</td><td>17.500</td><td>0.050</td><td>6.2</td><td>5.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>17.494</td><td>0.044</td><td>5.5</td><td>4.8</td><td>O K</td></tr><tr><td>960 min Summer</td><td>17.486</td><td>0.036</td><td>4.5</td><td>3.9</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>17.477</td><td>0.027</td><td>3.4</td><td>3.0</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>17.470</td><td>0.020</td><td>2.5</td><td>2.2</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>17.466</td><td>0.016</td><td>2.0</td><td>1.7</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>17.462</td><td>0.012</td><td>1.5</td><td>1.3</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>17.460</td><td>0.010</td><td>1.2</td><td>1.0</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>17.458</td><td>0.008</td><td>1.0</td><td>0.9</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>17.457</td><td>0.007</td><td>0.9</td><td>0.8</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>17.456</td><td>0.006</td><td>0.8</td><td>0.7</td><td>O K</td></tr><tr><td>15 min Winter</td><td>17.610</td><td>0.160</td><td>6.3</td><td>17.3</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>129.682</td><td>0.0</td><td>18</td></tr><tr><td>30 min Summer</td><td>87.133</td><td>0.0</td><td>30</td></tr><tr><td>60 min Summer</td><td>55.837</td><td>0.0</td><td>46</td></tr><tr><td>120 min Summer</td><td>34.509</td><td>0.0</td><td>82</td></tr><tr><td>180 min Summer</td><td>25.637</td><td>0.0</td><td>114</td></tr><tr><td>240 min Summer</td><td>20.604</td><td>0.0</td><td>146</td></tr><tr><td>360 min Summer</td><td>15.169</td><td>0.0</td><td>206</td></tr><tr><td>480 min Summer</td><td>12.185</td><td>0.0</td><td>260</td></tr><tr><td>600 min Summer</td><td>10.272</td><td>0.0</td><td>314</td></tr><tr><td>720 min Summer</td><td>8.930</td><td>0.0</td><td>374</td></tr><tr><td>960 min Summer</td><td>7.152</td><td>0.0</td><td>494</td></tr><tr><td>1440 min Summer</td><td>5.221</td><td>0.0</td><td>736</td></tr><tr><td>2160 min Summer</td><td>3.803</td><td>0.0</td><td>1100</td></tr><tr><td>2880 min Summer</td><td>3.033</td><td>0.0</td><td>1444</td></tr><tr><td>4320 min Summer</td><td>2.201</td><td>0.0</td><td>2200</td></tr><tr><td>5760 min Summer</td><td>1.751</td><td>0.0</td><td>2904</td></tr><tr><td>7200 min Summer</td><td>1.466</td><td>0.0</td><td>3624</td></tr><tr><td>8640 min Summer</td><td>1.270</td><td>0.0</td><td>4392</td></tr><tr><td>10080 min Summer</td><td>1.124</td><td>0.0</td><td>5048</td></tr><tr><td>15 min Winter</td><td>129.682</td><td>0.0</td><td>19</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	17.589	0.139	6.3	15.1	O K	30 min Summer	17.621	0.171	6.3	18.5	O K	60 min Summer	17.632	0.182	6.3	19.7	O K	120 min Summer	17.620	0.170	6.3	18.4	O K	180 min Summer	17.598	0.148	6.3	16.0	O K	240 min Summer	17.575	0.125	6.3	13.5	O K	360 min Summer	17.538	0.088	6.3	9.6	O K	480 min Summer	17.513	0.063	6.3	6.9	O K	600 min Summer	17.500	0.050	6.2	5.4	O K	720 min Summer	17.494	0.044	5.5	4.8	O K	960 min Summer	17.486	0.036	4.5	3.9	O K	1440 min Summer	17.477	0.027	3.4	3.0	O K	2160 min Summer	17.470	0.020	2.5	2.2	O K	2880 min Summer	17.466	0.016	2.0	1.7	O K	4320 min Summer	17.462	0.012	1.5	1.3	O K	5760 min Summer	17.460	0.010	1.2	1.0	O K	7200 min Summer	17.458	0.008	1.0	0.9	O K	8640 min Summer	17.457	0.007	0.9	0.8	O K	10080 min Summer	17.456	0.006	0.8	0.7	O K	15 min Winter	17.610	0.160	6.3	17.3	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	129.682	0.0	18	30 min Summer	87.133	0.0	30	60 min Summer	55.837	0.0	46	120 min Summer	34.509	0.0	82	180 min Summer	25.637	0.0	114	240 min Summer	20.604	0.0	146	360 min Summer	15.169	0.0	206	480 min Summer	12.185	0.0	260	600 min Summer	10.272	0.0	314	720 min Summer	8.930	0.0	374	960 min Summer	7.152	0.0	494	1440 min Summer	5.221	0.0	736	2160 min Summer	3.803	0.0	1100	2880 min Summer	3.033	0.0	1444	4320 min Summer	2.201	0.0	2200	5760 min Summer	1.751	0.0	2904	7200 min Summer	1.466	0.0	3624	8640 min Summer	1.270	0.0	4392	10080 min Summer	1.124	0.0	5048	15 min Winter	129.682	0.0	19
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status																																																																																																																																																																																																																		
15 min Summer	17.589	0.139	6.3	15.1	O K																																																																																																																																																																																																																		
30 min Summer	17.621	0.171	6.3	18.5	O K																																																																																																																																																																																																																		
60 min Summer	17.632	0.182	6.3	19.7	O K																																																																																																																																																																																																																		
120 min Summer	17.620	0.170	6.3	18.4	O K																																																																																																																																																																																																																		
180 min Summer	17.598	0.148	6.3	16.0	O K																																																																																																																																																																																																																		
240 min Summer	17.575	0.125	6.3	13.5	O K																																																																																																																																																																																																																		
360 min Summer	17.538	0.088	6.3	9.6	O K																																																																																																																																																																																																																		
480 min Summer	17.513	0.063	6.3	6.9	O K																																																																																																																																																																																																																		
600 min Summer	17.500	0.050	6.2	5.4	O K																																																																																																																																																																																																																		
720 min Summer	17.494	0.044	5.5	4.8	O K																																																																																																																																																																																																																		
960 min Summer	17.486	0.036	4.5	3.9	O K																																																																																																																																																																																																																		
1440 min Summer	17.477	0.027	3.4	3.0	O K																																																																																																																																																																																																																		
2160 min Summer	17.470	0.020	2.5	2.2	O K																																																																																																																																																																																																																		
2880 min Summer	17.466	0.016	2.0	1.7	O K																																																																																																																																																																																																																		
4320 min Summer	17.462	0.012	1.5	1.3	O K																																																																																																																																																																																																																		
5760 min Summer	17.460	0.010	1.2	1.0	O K																																																																																																																																																																																																																		
7200 min Summer	17.458	0.008	1.0	0.9	O K																																																																																																																																																																																																																		
8640 min Summer	17.457	0.007	0.9	0.8	O K																																																																																																																																																																																																																		
10080 min Summer	17.456	0.006	0.8	0.7	O K																																																																																																																																																																																																																		
15 min Winter	17.610	0.160	6.3	17.3	O K																																																																																																																																																																																																																		
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																				
15 min Summer	129.682	0.0	18																																																																																																																																																																																																																				
30 min Summer	87.133	0.0	30																																																																																																																																																																																																																				
60 min Summer	55.837	0.0	46																																																																																																																																																																																																																				
120 min Summer	34.509	0.0	82																																																																																																																																																																																																																				
180 min Summer	25.637	0.0	114																																																																																																																																																																																																																				
240 min Summer	20.604	0.0	146																																																																																																																																																																																																																				
360 min Summer	15.169	0.0	206																																																																																																																																																																																																																				
480 min Summer	12.185	0.0	260																																																																																																																																																																																																																				
600 min Summer	10.272	0.0	314																																																																																																																																																																																																																				
720 min Summer	8.930	0.0	374																																																																																																																																																																																																																				
960 min Summer	7.152	0.0	494																																																																																																																																																																																																																				
1440 min Summer	5.221	0.0	736																																																																																																																																																																																																																				
2160 min Summer	3.803	0.0	1100																																																																																																																																																																																																																				
2880 min Summer	3.033	0.0	1444																																																																																																																																																																																																																				
4320 min Summer	2.201	0.0	2200																																																																																																																																																																																																																				
5760 min Summer	1.751	0.0	2904																																																																																																																																																																																																																				
7200 min Summer	1.466	0.0	3624																																																																																																																																																																																																																				
8640 min Summer	1.270	0.0	4392																																																																																																																																																																																																																				
10080 min Summer	1.124	0.0	5048																																																																																																																																																																																																																				
15 min Winter	129.682	0.0	19																																																																																																																																																																																																																				
©1982-2020 Innovyze																																																																																																																																																																																																																							

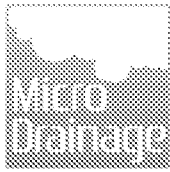
The Civil Engineering Practice				Page 2	
11 Tungsten Building George Street Fishersgate BN41 1RA		The Laurels Dappers Lane, Angmering Catchment E			
Date 22/05/2020 File Catchment E.SRCX		Designed by SRD Checked by			
Innovyze		Source Control 2020.1			
Summary of Results for 100 year Return Period (+40%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	17.647	0.197	6.3	21.3	O K
60 min Winter	17.658	0.208	6.3	22.5	O K
120 min Winter	17.635	0.185	6.3	20.1	O K
180 min Winter	17.599	0.149	6.3	16.2	O K
240 min Winter	17.564	0.114	6.3	12.4	O K
360 min Winter	17.513	0.063	6.3	6.8	O K
480 min Winter	17.496	0.046	5.7	4.9	O K
600 min Winter	17.489	0.039	4.8	4.2	O K
720 min Winter	17.484	0.034	4.3	3.7	O K
960 min Winter	17.477	0.027	3.4	3.0	O K
1440 min Winter	17.470	0.020	2.5	2.2	O K
2160 min Winter	17.465	0.015	1.8	1.6	O K
2880 min Winter	17.462	0.012	1.5	1.3	O K
4320 min Winter	17.459	0.009	1.1	0.9	O K
5760 min Winter	17.457	0.007	0.8	0.7	O K
7200 min Winter	17.456	0.006	0.7	0.6	O K
8640 min Winter	17.455	0.005	0.7	0.5	O K
10080 min Winter	17.455	0.005	0.6	0.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	87.133	0.0	31		
60 min Winter	55.837	0.0	59		
120 min Winter	34.509	0.0	88		
180 min Winter	25.637	0.0	122		
240 min Winter	20.604	0.0	154		
360 min Winter	15.169	0.0	208		
480 min Winter	12.185	0.0	256		
600 min Winter	10.272	0.0	316		
720 min Winter	8.930	0.0	376		
960 min Winter	7.152	0.0	500		
1440 min Winter	5.221	0.0	738		
2160 min Winter	3.803	0.0	1096		
2880 min Winter	3.033	0.0	1420		
4320 min Winter	2.201	0.0	2220		
5760 min Winter	1.751	0.0	2992		
7200 min Winter	1.466	0.0	3632		
8640 min Winter	1.270	0.0	4432		
10080 min Winter	1.124	0.0	5032		
©1982-2020 Innovyze					

The Civil Engineering Practice		Page 3																																				
11 Tungsten Building George Street Fishersgate BN41 1RA	The Laurels Dappers Lane, Angmering Catchment E																																					
Date 22/05/2020	Designed by SRD																																					
File Catchment E.SRCX	Checked by																																					
Innovyze		Source Control 2020.1																																				
<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>19.700</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.350</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.082 <table> <thead> <tr> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To: (ha)</th> <th>From:</th> <th>To: (ha)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>4 0.041</td> <td>4</td> <td>8 0.041</td> </tr> </tbody> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	100	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	19.700	Shortest Storm (mins)	15	Ratio R	0.350	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)	Area	Time (mins)	Area	From:	To: (ha)	From:	To: (ha)	0	4 0.041	4	8 0.041
Rainfall Model	FSR	Winter Storms	Yes																																			
Return Period (years)	100	Cv (Summer)	0.750																																			
Region	England and Wales	Cv (Winter)	0.840																																			
M5-60 (mm)	19.700	Shortest Storm (mins)	15																																			
Ratio R	0.350	Longest Storm (mins)	10080																																			
Summer Storms	Yes	Climate Change %	+40																																			
Time (mins)	Area	Time (mins)	Area																																			
From:	To: (ha)	From:	To: (ha)																																			
0	4 0.041	4	8 0.041																																			
©1982-2020 Innovyze																																						

The Civil Engineering Practice		Page 4																
11 Tungsten Building George Street Fishersgate BN41 1RA	The Laurels Dappers Lane, Angmering Catchment E																	
Date 22/05/2020	Designed by SRD																	
File Catchment E.SRCX	Checked by																	
Innovyze	Source Control 2020.1																	
<u>Model Details</u> Storage is Online Cover Level (m) 18.100 <u>Infiltration Blanket Structure</u> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.09360</td> <td>Diameter/Width (m)</td> <td>19.0</td> </tr> <tr> <td>Safety Factor</td> <td>1.5</td> <td>Length (m)</td> <td>19.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>0.220</td> </tr> <tr> <td>Invert Level (m)</td> <td>17.450</td> <td></td> <td></td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.09360	Diameter/Width (m)	19.0	Safety Factor	1.5	Length (m)	19.0	Porosity	0.30	Cap Volume Depth (m)	0.220	Invert Level (m)	17.450		
Infiltration Coefficient Base (m/hr)	0.09360	Diameter/Width (m)	19.0															
Safety Factor	1.5	Length (m)	19.0															
Porosity	0.30	Cap Volume Depth (m)	0.220															
Invert Level (m)	17.450																	
©1982-2020 Innovyze																		

The Civil Engineering Practice				Page 1																																																																																																																																																																																																																			
11 Tungsten Building George Street Fishersgate BN41 1RA		The Laurels Dappers Lane, Angmering Catchment F																																																																																																																																																																																																																					
Date 22/05/2020 File Catchment F.SRCX		Designed by SRD Checked by																																																																																																																																																																																																																					
Innovyze		Source Control 2020.1																																																																																																																																																																																																																					
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 25 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>17.888</td><td>0.118</td><td>4.0</td><td>8.0</td><td>○ K</td></tr><tr><td>30 min Summer</td><td>17.912</td><td>0.142</td><td>4.0</td><td>9.7</td><td>○ K</td></tr><tr><td>60 min Summer</td><td>17.921</td><td>0.151</td><td>4.0</td><td>10.3</td><td>○ K</td></tr><tr><td>120 min Summer</td><td>17.907</td><td>0.137</td><td>4.0</td><td>9.4</td><td>○ K</td></tr><tr><td>180 min Summer</td><td>17.886</td><td>0.116</td><td>4.0</td><td>7.9</td><td>○ K</td></tr><tr><td>240 min Summer</td><td>17.866</td><td>0.096</td><td>4.0</td><td>6.5</td><td>○ K</td></tr><tr><td>360 min Summer</td><td>17.836</td><td>0.066</td><td>4.0</td><td>4.5</td><td>○ K</td></tr><tr><td>480 min Summer</td><td>17.820</td><td>0.050</td><td>3.9</td><td>3.4</td><td>○ K</td></tr><tr><td>600 min Summer</td><td>17.813</td><td>0.043</td><td>3.4</td><td>3.0</td><td>○ K</td></tr><tr><td>720 min Summer</td><td>17.808</td><td>0.038</td><td>3.0</td><td>2.6</td><td>○ K</td></tr><tr><td>960 min Summer</td><td>17.802</td><td>0.032</td><td>2.5</td><td>2.2</td><td>○ K</td></tr><tr><td>1440 min Summer</td><td>17.794</td><td>0.024</td><td>1.9</td><td>1.6</td><td>○ K</td></tr><tr><td>2160 min Summer</td><td>17.788</td><td>0.018</td><td>1.4</td><td>1.2</td><td>○ K</td></tr><tr><td>2880 min Summer</td><td>17.784</td><td>0.014</td><td>1.1</td><td>1.0</td><td>○ K</td></tr><tr><td>4320 min Summer</td><td>17.780</td><td>0.010</td><td>0.8</td><td>0.7</td><td>○ K</td></tr><tr><td>5760 min Summer</td><td>17.778</td><td>0.008</td><td>0.7</td><td>0.6</td><td>○ K</td></tr><tr><td>7200 min Summer</td><td>17.777</td><td>0.007</td><td>0.5</td><td>0.5</td><td>○ K</td></tr><tr><td>8640 min Summer</td><td>17.776</td><td>0.006</td><td>0.5</td><td>0.4</td><td>○ K</td></tr><tr><td>10080 min Summer</td><td>17.775</td><td>0.005</td><td>0.4</td><td>0.4</td><td>○ K</td></tr><tr><td>15 min Winter</td><td>17.904</td><td>0.134</td><td>4.0</td><td>9.2</td><td>○ K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>129.682</td><td>0.0</td><td>18</td></tr><tr><td>30 min Summer</td><td>87.133</td><td>0.0</td><td>28</td></tr><tr><td>60 min Summer</td><td>55.837</td><td>0.0</td><td>46</td></tr><tr><td>120 min Summer</td><td>34.509</td><td>0.0</td><td>80</td></tr><tr><td>180 min Summer</td><td>25.637</td><td>0.0</td><td>112</td></tr><tr><td>240 min Summer</td><td>20.604</td><td>0.0</td><td>142</td></tr><tr><td>360 min Summer</td><td>15.169</td><td>0.0</td><td>200</td></tr><tr><td>480 min Summer</td><td>12.185</td><td>0.0</td><td>254</td></tr><tr><td>600 min Summer</td><td>10.272</td><td>0.0</td><td>314</td></tr><tr><td>720 min Summer</td><td>8.930</td><td>0.0</td><td>374</td></tr><tr><td>960 min Summer</td><td>7.152</td><td>0.0</td><td>494</td></tr><tr><td>1440 min Summer</td><td>5.221</td><td>0.0</td><td>736</td></tr><tr><td>2160 min Summer</td><td>3.803</td><td>0.0</td><td>1100</td></tr><tr><td>2880 min Summer</td><td>3.033</td><td>0.0</td><td>1460</td></tr><tr><td>4320 min Summer</td><td>2.201</td><td>0.0</td><td>2160</td></tr><tr><td>5760 min Summer</td><td>1.751</td><td>0.0</td><td>2880</td></tr><tr><td>7200 min Summer</td><td>1.466</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.270</td><td>0.0</td><td>4288</td></tr><tr><td>10080 min Summer</td><td>1.124</td><td>0.0</td><td>5032</td></tr><tr><td>15 min Winter</td><td>129.682</td><td>0.0</td><td>18</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	17.888	0.118	4.0	8.0	○ K	30 min Summer	17.912	0.142	4.0	9.7	○ K	60 min Summer	17.921	0.151	4.0	10.3	○ K	120 min Summer	17.907	0.137	4.0	9.4	○ K	180 min Summer	17.886	0.116	4.0	7.9	○ K	240 min Summer	17.866	0.096	4.0	6.5	○ K	360 min Summer	17.836	0.066	4.0	4.5	○ K	480 min Summer	17.820	0.050	3.9	3.4	○ K	600 min Summer	17.813	0.043	3.4	3.0	○ K	720 min Summer	17.808	0.038	3.0	2.6	○ K	960 min Summer	17.802	0.032	2.5	2.2	○ K	1440 min Summer	17.794	0.024	1.9	1.6	○ K	2160 min Summer	17.788	0.018	1.4	1.2	○ K	2880 min Summer	17.784	0.014	1.1	1.0	○ K	4320 min Summer	17.780	0.010	0.8	0.7	○ K	5760 min Summer	17.778	0.008	0.7	0.6	○ K	7200 min Summer	17.777	0.007	0.5	0.5	○ K	8640 min Summer	17.776	0.006	0.5	0.4	○ K	10080 min Summer	17.775	0.005	0.4	0.4	○ K	15 min Winter	17.904	0.134	4.0	9.2	○ K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	129.682	0.0	18	30 min Summer	87.133	0.0	28	60 min Summer	55.837	0.0	46	120 min Summer	34.509	0.0	80	180 min Summer	25.637	0.0	112	240 min Summer	20.604	0.0	142	360 min Summer	15.169	0.0	200	480 min Summer	12.185	0.0	254	600 min Summer	10.272	0.0	314	720 min Summer	8.930	0.0	374	960 min Summer	7.152	0.0	494	1440 min Summer	5.221	0.0	736	2160 min Summer	3.803	0.0	1100	2880 min Summer	3.033	0.0	1460	4320 min Summer	2.201	0.0	2160	5760 min Summer	1.751	0.0	2880	7200 min Summer	1.466	0.0	3672	8640 min Summer	1.270	0.0	4288	10080 min Summer	1.124	0.0	5032	15 min Winter	129.682	0.0	18
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status																																																																																																																																																																																																																		
15 min Summer	17.888	0.118	4.0	8.0	○ K																																																																																																																																																																																																																		
30 min Summer	17.912	0.142	4.0	9.7	○ K																																																																																																																																																																																																																		
60 min Summer	17.921	0.151	4.0	10.3	○ K																																																																																																																																																																																																																		
120 min Summer	17.907	0.137	4.0	9.4	○ K																																																																																																																																																																																																																		
180 min Summer	17.886	0.116	4.0	7.9	○ K																																																																																																																																																																																																																		
240 min Summer	17.866	0.096	4.0	6.5	○ K																																																																																																																																																																																																																		
360 min Summer	17.836	0.066	4.0	4.5	○ K																																																																																																																																																																																																																		
480 min Summer	17.820	0.050	3.9	3.4	○ K																																																																																																																																																																																																																		
600 min Summer	17.813	0.043	3.4	3.0	○ K																																																																																																																																																																																																																		
720 min Summer	17.808	0.038	3.0	2.6	○ K																																																																																																																																																																																																																		
960 min Summer	17.802	0.032	2.5	2.2	○ K																																																																																																																																																																																																																		
1440 min Summer	17.794	0.024	1.9	1.6	○ K																																																																																																																																																																																																																		
2160 min Summer	17.788	0.018	1.4	1.2	○ K																																																																																																																																																																																																																		
2880 min Summer	17.784	0.014	1.1	1.0	○ K																																																																																																																																																																																																																		
4320 min Summer	17.780	0.010	0.8	0.7	○ K																																																																																																																																																																																																																		
5760 min Summer	17.778	0.008	0.7	0.6	○ K																																																																																																																																																																																																																		
7200 min Summer	17.777	0.007	0.5	0.5	○ K																																																																																																																																																																																																																		
8640 min Summer	17.776	0.006	0.5	0.4	○ K																																																																																																																																																																																																																		
10080 min Summer	17.775	0.005	0.4	0.4	○ K																																																																																																																																																																																																																		
15 min Winter	17.904	0.134	4.0	9.2	○ K																																																																																																																																																																																																																		
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																				
15 min Summer	129.682	0.0	18																																																																																																																																																																																																																				
30 min Summer	87.133	0.0	28																																																																																																																																																																																																																				
60 min Summer	55.837	0.0	46																																																																																																																																																																																																																				
120 min Summer	34.509	0.0	80																																																																																																																																																																																																																				
180 min Summer	25.637	0.0	112																																																																																																																																																																																																																				
240 min Summer	20.604	0.0	142																																																																																																																																																																																																																				
360 min Summer	15.169	0.0	200																																																																																																																																																																																																																				
480 min Summer	12.185	0.0	254																																																																																																																																																																																																																				
600 min Summer	10.272	0.0	314																																																																																																																																																																																																																				
720 min Summer	8.930	0.0	374																																																																																																																																																																																																																				
960 min Summer	7.152	0.0	494																																																																																																																																																																																																																				
1440 min Summer	5.221	0.0	736																																																																																																																																																																																																																				
2160 min Summer	3.803	0.0	1100																																																																																																																																																																																																																				
2880 min Summer	3.033	0.0	1460																																																																																																																																																																																																																				
4320 min Summer	2.201	0.0	2160																																																																																																																																																																																																																				
5760 min Summer	1.751	0.0	2880																																																																																																																																																																																																																				
7200 min Summer	1.466	0.0	3672																																																																																																																																																																																																																				
8640 min Summer	1.270	0.0	4288																																																																																																																																																																																																																				
10080 min Summer	1.124	0.0	5032																																																																																																																																																																																																																				
15 min Winter	129.682	0.0	18																																																																																																																																																																																																																				
©1982-2020 Innovyze																																																																																																																																																																																																																							

The Civil Engineering Practice					Page 2	
11 Tungsten Building George Street Fishersgate BN41 1RA		The Laurels Dappers Lane, Angmering Catchment F				
Date 22/05/2020 File Catchment F.SRCX		Designed by SRD Checked by				
Innovyze		Source Control 2020.1				
<u>Summary of Results for 100 year Return Period (+40%)</u>						
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	
30 min Winter	17.934	0.164	4.0	11.2	O K	
60 min Winter	17.940	0.170	4.0	11.7	O K	
120 min Winter	17.915	0.145	4.0	9.9	O K	
180 min Winter	17.881	0.111	4.0	7.6	O K	
240 min Winter	17.851	0.081	4.0	5.5	O K	
360 min Winter	17.818	0.048	3.8	3.3	O K	
480 min Winter	17.810	0.040	3.1	2.7	O K	
600 min Winter	17.804	0.034	2.7	2.3	O K	
720 min Winter	17.800	0.030	2.4	2.0	O K	
960 min Winter	17.794	0.024	1.9	1.6	O K	
1440 min Winter	17.788	0.018	1.4	1.2	O K	
2160 min Winter	17.783	0.013	1.0	0.9	O K	
2880 min Winter	17.780	0.010	0.8	0.7	O K	
4320 min Winter	17.778	0.008	0.6	0.5	O K	
5760 min Winter	17.776	0.006	0.5	0.4	O K	
7200 min Winter	17.775	0.005	0.4	0.3	O K	
8640 min Winter	17.774	0.004	0.3	0.3	O K	
10080 min Winter	17.774	0.004	0.3	0.3	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)			
30 min Winter	87.133	0.0	30			
60 min Winter	55.837	0.0	50			
120 min Winter	34.509	0.0	86			
180 min Winter	25.637	0.0	118			
240 min Winter	20.604	0.0	148			
360 min Winter	15.169	0.0	196			
480 min Winter	12.185	0.0	256			
600 min Winter	10.272	0.0	316			
720 min Winter	8.930	0.0	376			
960 min Winter	7.152	0.0	496			
1440 min Winter	5.221	0.0	736			
2160 min Winter	3.803	0.0	1100			
2880 min Winter	3.033	0.0	1456			
4320 min Winter	2.201	0.0	2236			
5760 min Winter	1.751	0.0	2848			
7200 min Winter	1.466	0.0	3576			
8640 min Winter	1.270	0.0	4408			
10080 min Winter	1.124	0.0	5144			
©1982-2020 Innovyze						

The Civil Engineering Practice		Page 3
11 Tungsten Building George Street Fishersgate BN41 1RA	The Laurels Dappers Lane, Angmering Catchment F	
Date 22/05/2020	Designed by SRD	
File Catchment F.SRCX	Checked by	
Innovyze		Source Control 2020.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.700	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.045

Time (mins)	Area	Time (mins)	Area
From:	To: (ha)	From:	To: (ha)
0	4 0.022	4	8 0.023

©1982-2020 Innovyze

The Civil Engineering Practice		Page 4																
11 Tungsten Building George Street Fishersgate BN41 1RA	The Laurels Dappers Lane, Angmering Catchment F																	
Date 22/05/2020	Designed by SRD																	
File Catchment F.SRCX	Checked by																	
Innovyze	Source Control 2020.1																	
<u>Model Details</u> Storage is Online Cover Level (m) 18.300 <u>Infiltration Blanket Structure</u> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.09360</td> <td>Diameter/Width (m)</td> <td>15.1</td> </tr> <tr> <td>Safety Factor</td> <td>1.5</td> <td>Length (m)</td> <td>15.1</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume Depth (m)</td> <td>0.180</td> </tr> <tr> <td>Invert Level (m)</td> <td>17.770</td> <td></td> <td></td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.09360	Diameter/Width (m)	15.1	Safety Factor	1.5	Length (m)	15.1	Porosity	0.30	Cap Volume Depth (m)	0.180	Invert Level (m)	17.770		
Infiltration Coefficient Base (m/hr)	0.09360	Diameter/Width (m)	15.1															
Safety Factor	1.5	Length (m)	15.1															
Porosity	0.30	Cap Volume Depth (m)	0.180															
Invert Level (m)	17.770																	
©1982-2020 Innovyze																		

Table 4.1: Generalised Ground Profile

Depth (mbgl)	Encountered Material
0.0 – 0.2 / >0.8	Made Ground: Black clayey gravelly sand / brown and dark brown clayey slightly gravelly to gravelly sand with low to medium cobble content / dark brown slightly sandy slightly gravelly clayey silt (eastern site area). Dark brown slightly clayey sandy gravelly cobbles and boulders (TP02) and black clayey gravelly sand over brown sandy gravel and cobble (TP04). The gravel, cobble and boulder comprised brick, concrete, flint, chalk tarmac. Locally rare tile, plastic, wood, clay pipe, metal, textile and black carbonaceous fragments.
0.0 – 0.15/0.2	Topsoil (WS01, TP03 and TP05): Black slightly sandy silty clay with many roots.
0.2 / 0.8 – >3.0 / 4.2 (0.15/0.7 – >0.65/1.2)	Superficial Head Deposits: Firm medium strength (however locally soft to firm low to medium strength) brown slightly gravelly to gravelly slightly sandy silty clay.
(0.7/1.2 – >3.0/4.2)	Medium dense to dense brown slightly clayey to clayey sandy gravel of flint.
3.2/4.2 – >5.0	London Clay Formation: Firm to stiff medium to high strength brown, becoming grey with depth, slightly silty clay

4.3 Groundwater and Perched Water

- 4.3.1 Groundwater entries were recorded at WS05 at 2.95mbgl and WS01 at approximately 4.0mbgl, rising to 3.1mbgl upon completion.

5.7 Drainage

C/k/BA/n. The soakage tests were undertaken in general accordance with the methodology outlined in KMD Manual across the site with testing undertaken in both the cohesive and granular sewerage deposits.

C/k/BA/q. The results are presented in Table 5.2 and summarised below in separate sections.

Table 5.2: Soakage Test Results

Soakage Test Location	Infiltration Rate (m/s)	Comments
Station 10+00	0.000 L/m ² /s	min - test achieved access restrictions
Station 10+20	0.000 L/m ² /s to 0.000 L/m ² /s	min - test achieved within a 10 minute time access restrictions
Station 10+40	0.000 L/m ² /s	infiltration rate based on test results
Station 10+60	0.000 L/m ² /s	min - test achieved due to test drainage
Station 10+80	0.000 L/m ² /s	min - test achieved due to test drainage

C/k/BA/c. Based on the test data and infiltration rates of 0.000 L/m²/s and 0.000 L/m²/s there recorded within the sewerage deposits at the test locations. It is noted that only a single test was completed within the more cohesive sewerage deposits at Station 10+00 and the results are due to the access restrictions. It is also noted that insufficient time was available to complete a second test at Station 10+20. There was no drop in water level was recorded after 10 minutes to the recorded 0.000 L/m²/s.

C/k/BA/d. A single test was completed within the granular sewerage deposits at Station 10+40 and Station 10+60 due to the test infiltration of water. At these test locations water was added to the elevations of 0.000 m and 0.000 m. It is noted that the water level did not rise to the level of 0.000 m. Based on these test locations and infiltration rates in excess of 0.000 L/m²/s and 0.000 L/m²/s there recorded.

C/k/BA/e. Where the test results are based on the testing undertaken to monitor the sewerage deposits particularly the more granular road materials encountered at the site are considered likely to provide a suitable drainage medium. It is recommended that a drainage engineer be consulted to determine whether suitable and sufficient attenuation can be provided within the proposed scheme such that a sustainable drainage system can be confirmed to be suitable.

C/k/BA/f. The requirements of the Environment Agency need to be incorporated into any design which drains into an adjacent watercourse.

C/k/BA/g. It should be noted that the minimum distance of 0.6m from infiltration drainage to any building or structure is recommended in the KMD Manual of good practice. It is noted that infiltration systems should normally be installed at least 0.6m from the nearest building foundation or structure. It is noted that the minimum distance of 0.6m from the building foundation to the infiltration system is recommended in the KMD Manual. It is noted that the minimum distance of 0.6m from the building foundation to the infiltration system is recommended in the KMD Manual.

5.7 Drainage

C/k/BA/n. The soakage tests were undertaken in general accordance with the methodology outlined in KMD Manual across the site with testing undertaken in both the cohesive and granular sewerage deposits.

C/k/BA/q. The results are presented in Table 5.2 in Appendix and summarised below in table 5.2.

Table 5.2: Soakage Test Results

Soakage Test Location	Infiltration Rate (m/s)	Comments
Station 10+00	0.0001 m/s	min - 10 min achieved access restrictions
Station 10+20	0.0001 m/s to 0.0002 m/s	10 min achieved within a 10 min time access restrictions
Station 10+40	0.0001 m/s	infiltration rate based on 10 min - 10 min
Station 10+60	0.0001 m/s	min - 10 min achieved due to 10 min drainage
Station 10+80	0.0001 m/s	min - 10 min achieved due to 10 min drainage

C/k/BA/c. Based on the test data infiltration rates of 0.0001 m/s and 0.0002 m/s were recorded within the sewerage deposits at the test locations. It is noted that only a single test was completed within the more cohesive sewerage deposits at Station 10+00 and 10+20 due to the access restrictions. It is also noted that insufficient time was available to complete a second test at Station 10+40. There was no drop in water level was recorded after 10 minutes to the recorded 0.0001 m/s.

C/k/BA/d. A single test was completed within the granular sewerage deposits at Station 10+60 and Station 10+80 due to the 10 min infiltration rate. At these test locations water was added to the elevations of 0.0001 m/s and 0.0002 m/s periods. It is noted that the water level did not rise significantly. Based on these test locations infiltration rates in excess of 0.0001 m/s and 0.0002 m/s were recorded.

C/k/BA/e. Where possible based on the testing undertaken to monitor the sewerage deposits particularly the more granular road materials encountered at the site are considered likely to provide a suitable drainage medium. It is recommended that a drainage engineer be consulted to determine whether suitable and sufficient attenuation can be provided within the proposed scheme such that a sustainable drainage system can be confirmed to be suitable.

C/k/BA/f. The requirements of the Environment Agency need to be incorporated into any design which drains into an adjacent watercourse.

C/k/BA/g. It should be noted that the 10 min soakage test and the 10 min infiltration drainage Manual of good practice states that infiltration systems should normally be installed at least 10 m from the nearest foundation or building. The 10 min soakage test and the 10 min infiltration drainage Manual also refers to the 10 min soakage test and the 10 min infiltration drainage Manual. It indicates a minimum distance of 10 m from foundations.

6.3 Ground Engineering

Preliminary Foundation Recommendations

It is considered that conventional foundations may settle under the proposed residential properties within the competent medium dense to dense urban deposits encountered from depths of about 1.5m to 2.5m and below.

The more cohesive shallow head deposits have been recorded to be non-whole soils where there is a minimum foundation depth of 0.5m. To this recommended foundation the use of a 1:1.5 slope is advised.

An allowable bearing resistance of 100 kPa is considered appropriate. Then within the medium dense to dense urban materials, it is shown that to ensure foundations are formed within similar materials to minimise the potential differential settlement.

Given that the natural shear failure deposits encountered there recorded to be non-whole plasticity the provision of voids below the road and against the side of foundations is not considered to be required.

Ground Floor pile

Given the recorded depth of made road on site, it is recommended that a 1:1.5 slope be required within the design.

Where made road is less than 100mm deep and foundations are less than 100mm deep, a road bearing is utilised in accordance with the recommendations.

Integrations

Integration of the materials immediately beneath the site should be achieved in a conventional integration.

Based on site observations, significant deterioration is likely to be required during integration and formation.

Drainage

Permeability rates of 1.5 x 10⁻⁶ m/s and 1.5 x 10⁻⁶ m/s were recorded within the shear failure deposits with higher infiltration rates in the order of 1.5 x 10⁻⁶ m/s and in the order of 1.5 x 10⁻⁶ m/s and the near shear failure more cohesive shear failure deposits.

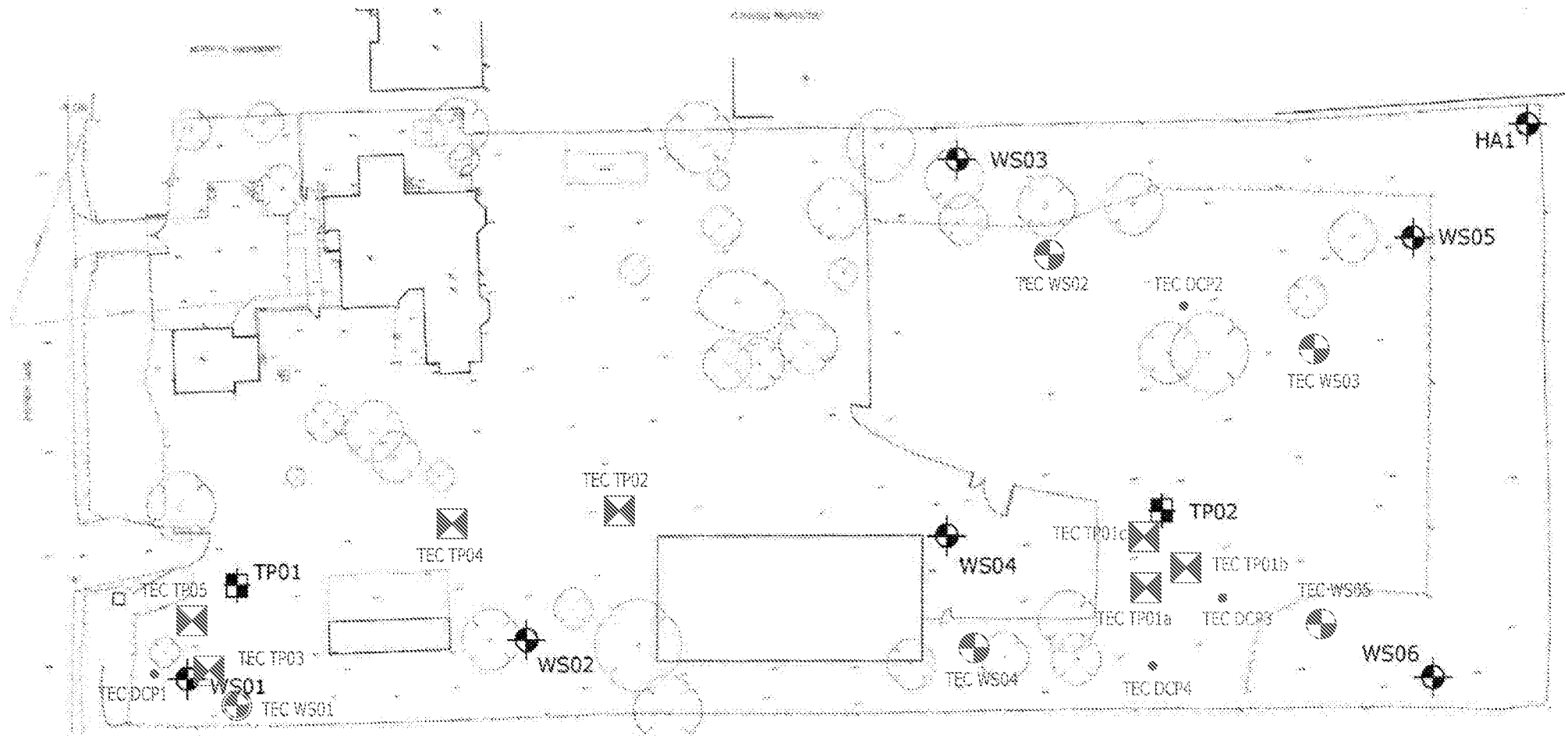
It is also noted that the recorded infiltration rates of 1.5 x 10⁻⁶ m/s and 1.5 x 10⁻⁶ m/s.

Where based on the test undertaken to determine the shear failure deposits, particularly the more urban road materials encountered at the site are considered likely to provide a suitable drainage medium. Therefore it is recommended that a drainage engineer be consulted to determine whether suitable and sufficient attention can be provided within the proposed scheme such that a sustainable drainage system can be confirmed to be achieved.

It should be noted that the proposed infiltration drainage Manual of good practice states that infiltration systems should normally be at least 1m from the nearest foundation or below ground level.

	As per the Manual, the reference to the minimum distance from foundations indicates a minimum distance of 1m from foundations.
CoO&D	In addition to the requirements of the Environment Agency and the local authority, the design should need to be incorporated into an design which drains into an adjacent.
	<u>Element Design</u>
CoO&D	Based on the data obtained from the site, a 1:100 year return period is recommended for the design. The road formation is to be within natural ground deposits.
CoO&D	Notwithstanding this, there is a significant made ground is encountered primarily in the eastern site area greater than 1:100 year return period. To be recommended for the design. The road formation is to be within potential made ground deposits of the inherent area of this material.
CoO&D	It should be noted that all road formations should be controlled and so should be removed and replaced with selected material and there should be a minimum of 1:100 year return period to the penetration of the post should be removed.
	<u>Protection of concrete</u>
CoO&D	The results of the water solution and the test carried out on the natural ground materials indicate that the materials encountered on site generally fall within the 1:100 year return period.

TEC



TEC Trial Pit:



Previous ASI Exploratory Hole Location:



TEC Exploratory Hole Location:



Previous ASI Trial Pit Location:



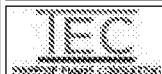
TEC Exploratory Hole with Installation Location:



TEC DCP-TRL Test Location:



Extract of Ashdown Site Investigation Ltd
drawing ref: Figure 2, R18-13291 dated: Nov 2018



Tweedle Evans Consulting
The Old Chapel
35a Southover
Wells, Somerset
BA5 1UH

Tel: 01749 677760
Fax: 01749 679345
Email: info@tecon.co.uk
www.tecon.co.uk

Site Name:

Dappers Lane, Angmering

Drawing Name:

Exploratory Hole Location Plan

Client Name:

Oceanview Developments Ltd

Project No:

1912010.001

Figure No:

3

Date:

March 2020

Scale:

NTS



Borehole No.

Sheet 1 of 1

Hole Type
WS

Scale
1:33

Logged By

Remarks
Hand dug to 1.2mbgl. Standing water at 3.1mbgl upon completion. Borehole collapsed to 4.06mbgl prior to installation. Terminated at depth.



				Borehole Log				Borehole No. WS02	
Project Name: Dappers Lane, Angmering				Project No. 1912010.001		Co-ords: -		Sheet 1 of 1	
Location: Angmering				Level: mbgl		Hole Type WS		Scale 1:33	
Client: Oceanview Developments Ltd				Dates: 24/01/2020 - 24/01/2020		Logged By			

Well	Water Strikes	Samples and In Situ Testing				Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results	Information					
									MADE GROUND - Dark brown slightly sandy slightly gravelly clayey silt. Fragments of flint, chalk and plastic.	
		0.70	GT			0.50			Firm slightly sandy gravelly silty CLAY. Gravel of sub-rounded to angular flint.	
		1.00 1.00	GT	N=36 (12 for 0mm/36 for 0mm)		1.00			Dense brown slightly clayey sandy GRAVEL of rounded to angular flint.	1
		2.00		N=32 (12 for 0mm/32 for 0mm)					...Becoming clayey sandy gravel at 1.9mbgl.	2
		3.00		N=27 (9 for 0mm/27 for 0mm)		3.20			Stiff high strength brown slightly silty CLAY.	3
		4.00		N=18 (5 for 0mm/18 for 0mm)					...Becoming grey at 4.5mbgl.	4
		5.00		N=16 (4 for 0mm/16 for 0mm)		5.00			HSV - 87.5, 100, 87.5 kPa	5
									End of borehole at 5.0 m	6

Remarks No groundwater encountered. Terminated at depth.	
--	---

				Borehole Log				Borehole No. WS03	
Project Name: Dappers Lane, Angmering				Project No. 1912010.001		Co-ords: -		Sheet 1 of 1	
Location: Angmering				Level: mbgl		Hole Type WS		Scale 1:33	
Client: Oceanview Developments Ltd				Dates: 24/01/2020 - 24/01/2020		Logged By			

Well	Water Strikes	Samples and In Situ Testing				Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results	Information					
		1.00	GT	N=42 (9 for 0mm/42 for 0mm)		0.40		MADE GROUND - Dark brown slightly sandy slightly gravelly clayey silt. Fragments of flint, chalk and plastic.	1	
		1.00				0.70		Firm slightly sandy gravelly silty CLAY. Gravel of sub-angular to sub-rounded flint.		
							Dense brown clayey sandy GRAVEL of sub-angular to angular flint.			
		2.00		N=40 (15 for 0mm/40 for 0mm)				...Recoverd as slightly clayey 1.3-2.0mbgl.	2	
		3.00		N=17 (11 for 0mm/17 for 0mm)					3	
						3.20		Stiff brown slightly gravelly slightly sandy silty CLAY.		
						3.40		End of borehole at 3.0 m	4	
									5	
									6	

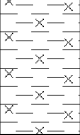
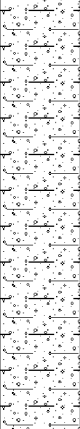
Remarks No groundwater encountered. Terminated at depth.	
--	---

				Borehole Log				Borehole No. WS04	
Project Name: Dappers Lane, Angmering				Project No. 1912010.001		Co-ords: -		Sheet 1 of 1	
Location: Angmering				Level: mbgl		Hole Type WS		Scale 1:33	
Client: Oceanview Developments Ltd				Dates: 24/01/2020 - 24/01/2020		Logged By			

Well	Water Strikes	Samples and In Situ Testing				Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results	Information					
									MADE GROUND - Dark brown clayey sandy silt. Many wood fragments and rare flint gravel.	
		0.40							Firm medium strength slightly gravelly slightly sandy silty CLAY. Gravel of flint.	
		0.80	GT						HSV - 55, 45, 55 kPa	
		1.00		N=39 (9 for 0mm/39 for 0mm)		1.00			Medium dense to dense brown clayey sandy GRAVEL of rounded to angular flint. ...slightly clayey between 1.2-2.1mbgl.	1
		2.00		N=38 (10 for 0mm/38 for 0mm)						2
		3.00		N=24 (8 for 0mm/24 for 0mm)						3
		4.00		N=28 (9 for 0mm/28 for 0mm)		4.20			Water entry at approx. 4.1mbgl. Firm to stiff medium strength brown slightly silty CLAY. HSV - 80, 70, 80 kPa	4
		5.00		N=13 (4 for 0mm/13 for 0mm)		5.00			End of borehole at 5.0 m	5
										6

Remarks Standing water at 3.7mbgl upon completion. Terminated at depth.	
---	---

				Borehole Log				Borehole No. WS05	
Project Name: Dappers Lane, Angmering				Project No. 1912010.001		Co-ords: -		Sheet 1 of 1	
Location: Angmering				Level: mbgl		Scale 1:33		Hole Type WS	
Client: Oceanview Developments Ltd				Dates: 24/01/2020 - 24/01/2020		Logged By			

Well	Water Strikes	Samples and In Situ Testing				Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results	Information					
		0.20							TOPSOIL - Black slightly sandy silty CLAY with many roots.	
									Soft to firm low to medium strength brown slightly silty CLAY.	
		0.70	GT							
		1.00		N=60 (19 for 0mm/60 for 0mm)					Medium dense to dense brown clayey sandy GRAVEL of rounded to angular flint. ...Recovered as slightly clayey 1.1-1.5mbgl.	1
		2.00		N=30 (11 for 0mm/30 for 0mm)						2
		3.00		N=21 (8 for 0mm/21 for 0mm)					Water entry at 2.95mbgl. End of borehole at 3.0 m	3
										4
										5
										6

Remarks Wet at base. Terminated at depth.		
---	--	---

 Trial Pit Log					Trialpit No TP01a	
					Sheet 1 of 1	
Project Name: Dappers Lane, Angmering			Project No. 1912010.001		Co-ords: - Level: mbgl	
Location: Angmering			Dimensions: Inclination: ° Orientation: ° Depth: 0.8m		Date 24/01/2020	
Client: Oceanview Developments Ltd					Scale 1:25 Logged ML	

Water Strike	Samples and In Situ Testing				Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results	Information				
					0.20		MADE GROUND - Black clayey gravelly sand. Gravel of brick, flint and chalk. Many roots noted.	1 2 3 4 5
					0.80		MADE GROUND - Brown cobbly locally clayey sand. Gravel and cobble of brick, flint and chalk. Rare metal fragments noted.	
End of pit at 0.8 m								

Remarks:	Terminated due to presence of made ground at 0.8mbgl (TEC instructed to undertake soakage testing at 0.6mbgl).	
Stability:	Good	



Trialpit No
TP01b

Project Name: Dappers Lane, Angmering

Co-ords: -
Level: mbgl

Date
24/01/2020

Dimensions:	
Inclination: °	

0.50m

Scale
1:25

Orientation: °
Depth: 0.8m

Logged
ML

1

2 -

3 -

4 -

5 -

Terminated due to presence of made ground at 0.8mbgl (TEC instructed to undertake soakage testing at 0.6mbgl).



 TRIALPIT ENGINEERING CONSULTANTS					Trial Pit Log					Trialpit No TP01c Sheet 1 of 1	
Project Name: Dappers Lane, Angmering					Project No. 1912010.001		Co-ords: - Level: mbgl			Date 24/01/2020	
Location: Angmering					Dimensions: Inclination: ° Orientation: ° Depth: 1.2m			0.50m 1.55m		Scale 1:25	
Client: Oceanview Developments Ltd										Logged ML	

Water Strike	Samples and In Situ Testing				Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results	Information						
					0.20		 MADE GROUND - Dark brown clayey slightly gravelly sand. Gravel of brick and flint. Locally black organic fragments.	1		
					0.80		 MADE GROUND - Dark brown locally light brown clayey gravelly sand with low cobble content. Gravel and cobble of brick, flint and tile. Rare plastic fragments and many roots noted.			
					1.20		 (Medium dense) brown clayey slightly sandy GRAVEL of sub-angular to angular flint.			
								End of pit at 1.2 m		
										2
										3
										4
										5

Remarks:	Densities based on visual observations only. Terminated to allow for soakage testing to be undertaken.	
Stability:	Good	





Trialpit No
TP02

Project Name: Dappers Lane, Angmering

Co-ords: -
Level: mbgl

Date
24/01/2020

Dimensions:	1.40m
Inclination: °	E

Scale
1:25

Orientation: °
Depth: 0.9m

Logged
ML

22 -

23 -

24 -

25 -





Trialpit No
TP03

Project Name: Dappers Lane, Angmering

Project No.
1912010.001

Co-ords: -
Level: mbgl

Date
24/01/2020

Location: Angmering

Dimensions:	1.10m
Inclination: °	0.50m
Orientation: °	
Depth: 0.7m	

Scale
1:25

Logged
ML

Client: Oceanview Developments Ltd

1

2 -

3 -

4 -

5 -

Remarks:	Terminated to allow for soakage testing to be undertaken.
----------	---

Stability: Good

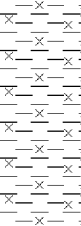


 TRIAL PIT LOGS CONSULTANTS					Trial Pit Log					Trialpit No TP04 Sheet 1 of 1	
Project Name: Dappers Lane, Angmering					Project No. 1912010.001		Co-ords: - Level: mbgl			Date 24/01/2020	
Location: Angmering					Dimensions: Inclination: ° Orientation: ° Depth: 1.2m			0.50m 1.30m		Scale 1:25	
Client: Oceanview Developments Ltd										Logged ML	

Water Strike	Samples and In Situ Testing				Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results	Information					
					0.20			MADE GROUND - Black clayey gravelly sand. Gravel of brick, flint and chalk. Many roots noted.	1
					0.60			MADE GROUND - Brown sandy gravel and cobble of flint, brick, tarmac and tile. Rare concrete boulders noted.	
					0.80			Firm brown slightly sandy gravelly CLAY. Gravel of flint.	
					1.20			(Medium dense) brown slightly clayey sandy GRAVEL of sub-angular to angular flint.	
							----- End of pit at 1.2 m -----		2
									3
									4
									5

Remarks:	Densities based on visual observations only. Terminated to allow for soakage testing to be undertaken.	
Stability:	Good	

 Trial Pit Log					Trialpit No TP05 Sheet 1 of 1		
Project Name: Dappers Lane, Angmering			Project No. 1912010.001		Co-ords: - Level: mbgl		Date 24/01/2020
Location: Angmering			Client: Oceanview Developments Ltd		Dimensions: Inclination: ° Orientation: ° Depth: 1.3m		Scale 1:25
							Logged ML

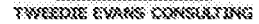
Water Strike	Samples and In Situ Testing				Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results	Information					
					0.20		 TOPSOIL - Black slightly sandy silty CLAY with many roots.	1	
					1.00	 Soft to firm brown slightly gravelly slightly sandy silty CLAY. Rare roots noted. Gravel of sub-angular to angular flint.			
					1.32	 (Medium dense) brown slightly clayey sandy GRAVEL of sub-angular to angular flint.			
							End of pit at 1.3 m		2
									3
									4
									5

Remarks:	Densities based on visual observations only. Terminated to allow for soakage testing to be undertaken.	
Stability:	Good	

BRE Digest 365 (2016) Soakaway Design



BRE Digest 365 (2016) Soakaway Design



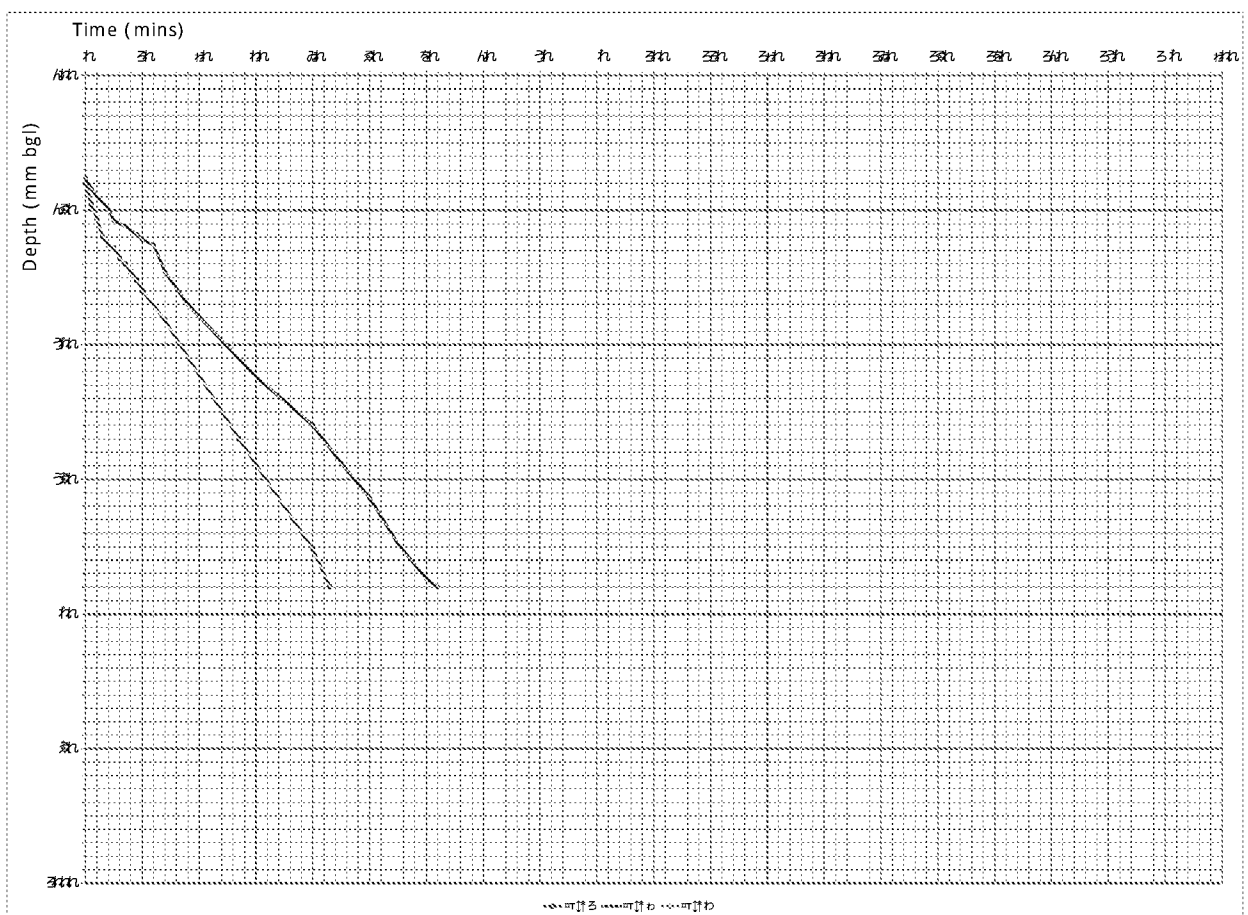
Operator:	ME
Test Date:	24th January 2020

Test 3

[illegible]

Pit reference	Fig. 2.5.402
---------------	--------------

50% effective depth (mm bgl)	840	839
75% effective depth (mm bgl)	890	890



BRE Digest 365 (2016) Soakaway Design



BRE Digest 365 (2016) Soakaway Design



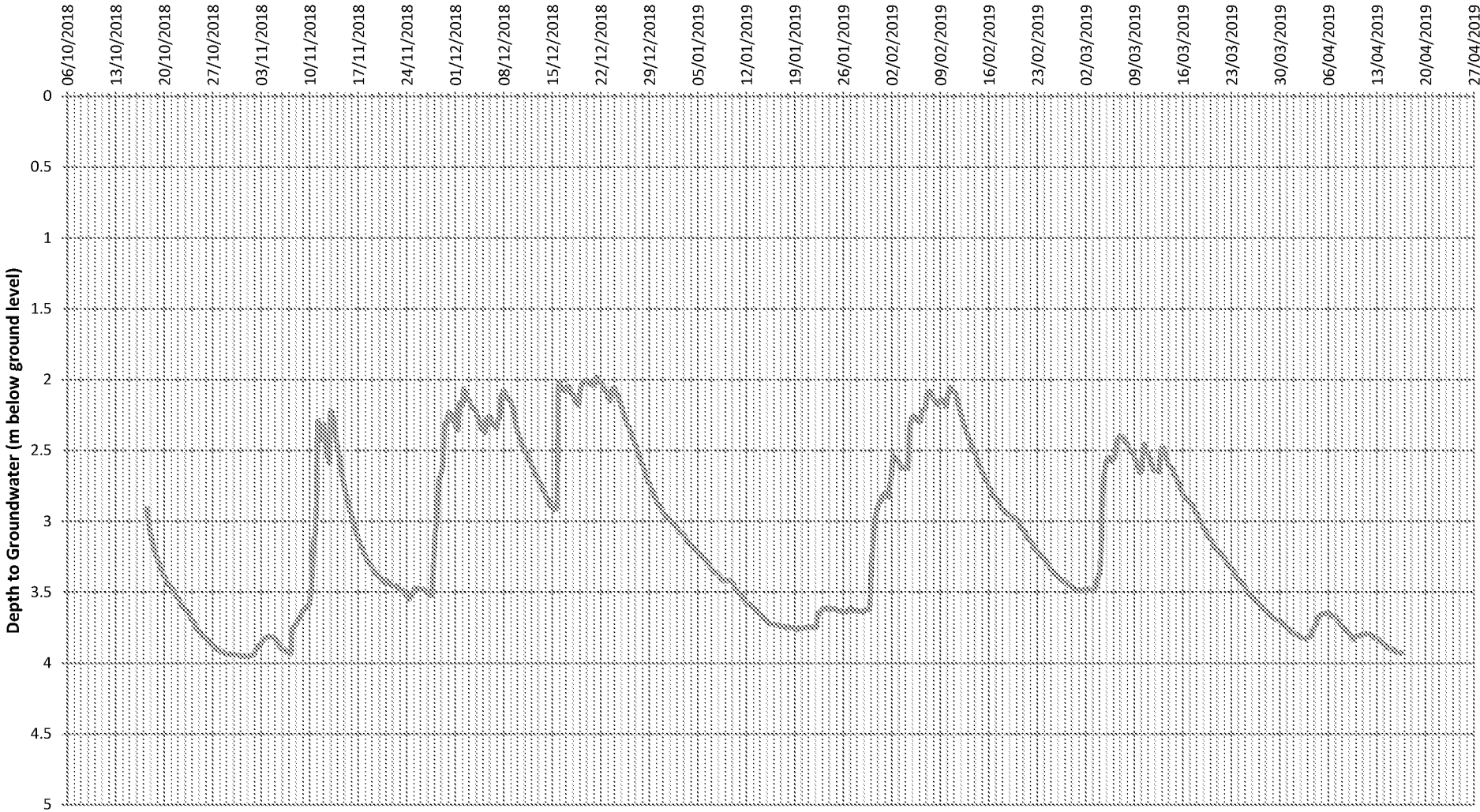
BRE Digest 365 (2016) Soakaway Design

Ashdown Site Investigation Limited

Site: The Laurels, Dappers Lane, Angmering, West Sussex

Report No. R18-13291

Groundwater Monitoring Results - WS04



Drainage Report



Prepared For
Sam Wiggins
Old Milton Road
New Milton
Hampshire
BH25 6EB

Site
The Laurels, Dappers Lane
Angmering
West Sussex
BN16 4EN



PLUMBING & DRAINAGE

Fixed Fee - No Call Out Charge

DRAIN BOSS
Chris Powell



Total Defects for Project

Total DRB Grades for Project

0

0

6

0

0

0

1

0

The Laurels - CCTV Survey Report : 10/03/20

Name : DRAIN BOSS
 Contact : Gordon Brown
 Location : Ley Spring
 Town : Bolney Road, Ansty
 Region : West Sussex
 Postcode : RH17 5AW
 Email : [REDACTED]
 Contact Number : [REDACTED]
 Surveyor : Chris Powell
 Valid Certification No : 0352478

Client Information

Name : Sam Wiggins
 Contact : Oceanview Developments
 Location : Old Milton Road
 Town : New Milton
 Region : Hampshire
 Postcode : BH25 6EB
 Tel : [REDACTED]
 Mobile : [REDACTED]
 Email : [REDACTED]
 Fax : [REDACTED]

Site Information

Name :
 Contact : Sam Wiggins
 Location : The Laurels, Dappers Lane
 Town : Angmering
 Region : West Sussex
 Postcode : BN16 4EN
 Tel :
 Mobile :
 Email :
 Fax :

Total Defects for Project

0

0

6

0

0

Total DRB Grades for Project

0

1

0

Report interpretation.

Overview:

Each section of the drainage system is allocated a score indicating areas that require attention. These areas are detailed in the Overview section on the following page and also at the bottom right of the first few pages. We use colour coding as an indicator of severity. Additional information concerning rehabilitation options/recommendations is included in the Overview page, which can also be used as an, "at a glance" indication of system condition. More in depth information for each section, including images can be found later in the report. Grade indicators are as follows:

Grade A: Drain is serviceable no recommendations required

Grade B: There is an issue that might require remedial works

Grade C: There is a defect that requires remedial works, the drain is not serviceable.

Observations:

Each section of drainage reported on (manhole to manhole for example), contains detailed information about that drain and any observations made concerning condition are detailed below the header section. The observations are colour coded and given a severity score, with more significant defects being given a higher score, using a scale from 1 to 5 as detailed below:

Severity 1 to 2: These defects may require remedial monitoring

Severity 3: These defects probably require some form of remedial works

Severity 4 to 5: Defects that will require remedial repair or replacement

General:

The information provided is relevant at the time of survey. The coding system in this report is based on the Manual of Sewer Condition Classification, 5th edition (M5CC5) domestic codes (BS EN 13508-1:2003). This is the official standard for the water industry.

The severity system is based on significant experience in general practice and the 1 -5 grades represent the severity of individual defects: 5 representing a more serious defect.

Please feel free to contact us for further explanation or pricing for remedial works required.

Total Defects for Project

Total DRB Grades for Project



Overview

Section: 1 From: CP1 To: CP2	Grade B	DRB Grade:  Pipe Size: 450 Material: Concrete Use: Combined
---	---------	---

Total Defects for Project



Total DRB Grades for Project



Site: The Laurels, Dappers Lane, Angmering

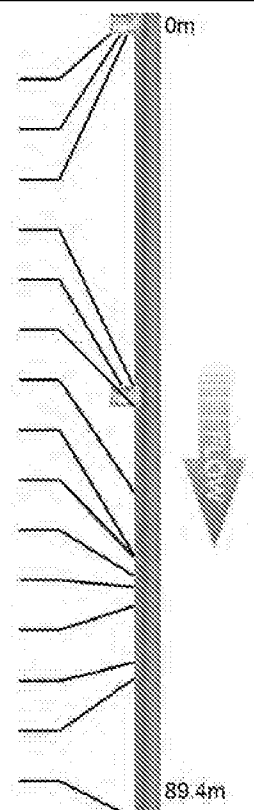
Section 1

Client:	Location (Street Name):	City/Town/Village	Cust Job Ref.	Surveyors Name:	Date:
Sam Wiggins	The Laurels, Dappers Lane	Angmering		Chris Powell	10/03/2020

Start Node Ref:	CP1	Finish Node Ref:	CP2	Direction:	D	Height/Dia:	450
Start Node Depth:	0.00	Finish Node Depth:	0.00	Use:	C	Shape:	C
Start Node Coordinate:		Finish Node Coordinate:		Material:	CO	Cleaned	N

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	Remarks
A				D	N	89.4	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole		0_0		
00.00m	WL	Water level 0%			0:00:00	
00.80m	CN	Connection other than junction 03 : 150mm		0_2	0:00:23	
41.60m	WL	Water level 15%		0_3	0:04:26	
43.70m	CN	Connection other than junction 01 : 150mm		0_4	0:04:37	
43.70m	REM	General remark		0_5	0:05:25	
53.20m	REM	General remark		0_6	0:06:20	
60.20m	R	Roots		0_7	0:06:54	
60.40m	R	Roots		0_8	0:07:31	
62.50m	R	Roots		0_9	0:07:37	
63.70m	R	Roots		0_10	0:07:46	
65.80m	R	Roots		0_11	0:07:59	
72.10m	WL	Water level 20%		0_12	0:08:28	
73.80m	R	Roots		0_13	0:08:39	
89.40m	CPF	Finish node type, catch pit		0_99		



Invert level of catch pit is 1.6m to crown of pipe. The pipe is then 450mm deep.

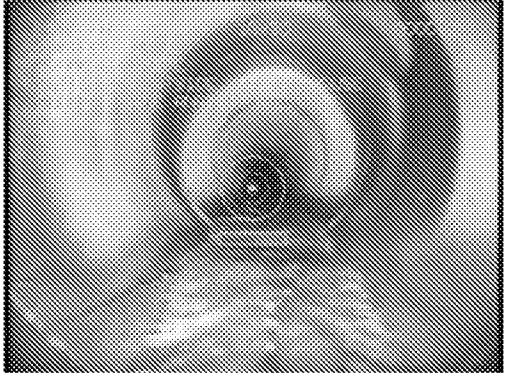
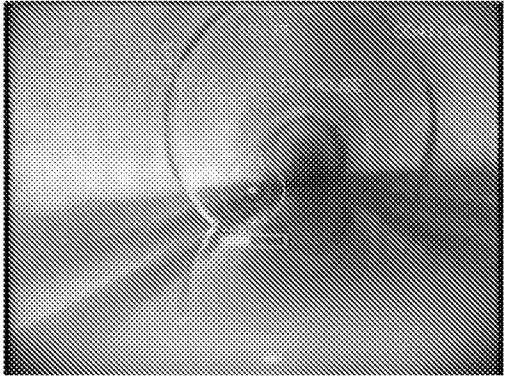
Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 1

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole CP1	Image Provided - Ref: 0_0 
00.00m	0:00:00	WL	Water level: 0% Height/Diameter	
00.80m	0:00:23	CN	Connection other than junction at 03 o'clock: 150mm x 450mm Diameter	Image Provided - Ref: 0_2 
41.60m	0:04:26	WL	Water level: 15% Height/Diameter	Image Provided - Ref: 0_3 

Total Defects for section

DRB Grade for Section

0

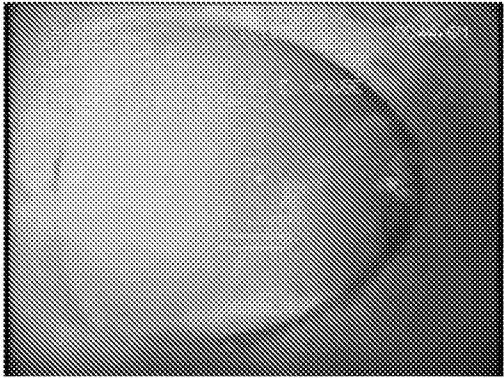
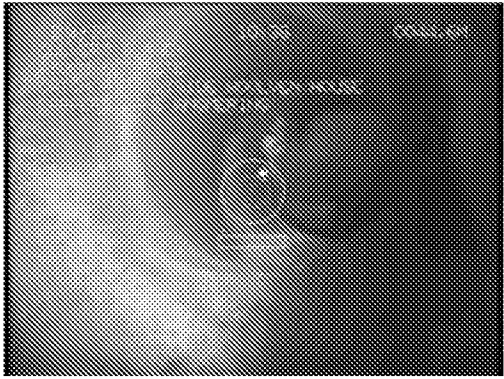
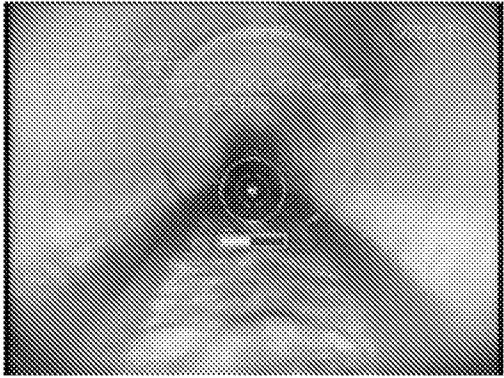
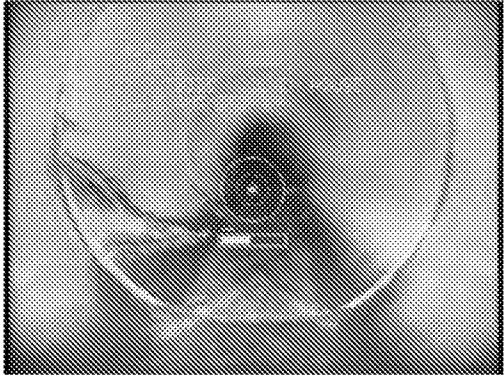
0

6

0

0

B

Pos	Video Ref	Code	Description	Image
43.70m	0:04:37	CN	Connection other than junction at 01 o'clock: 150mm x 450mm Diameter connection from swg outside the laurels	Image Provided - Ref: 0_4 
43.70m	0:05:25	REM	General remark connecting pipework from swg outside the laurels is displaced	Image Provided - Ref: 0_5 
53.20m	0:06:20	REM	General remark Past boundary line of the laurels	Image Provided - Ref: 0_6 
60.20m	0:06:54	R	Roots - Severity 3	Image Provided - Ref: 0_7 

Total Defects for section

DRB Grade for Section

0

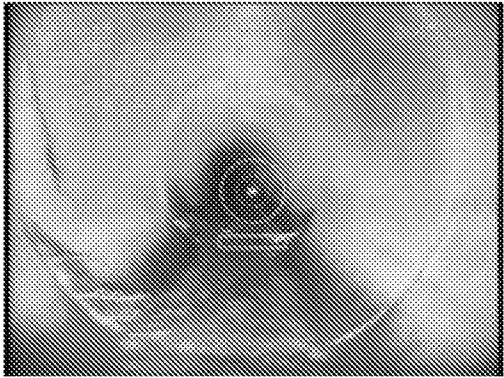
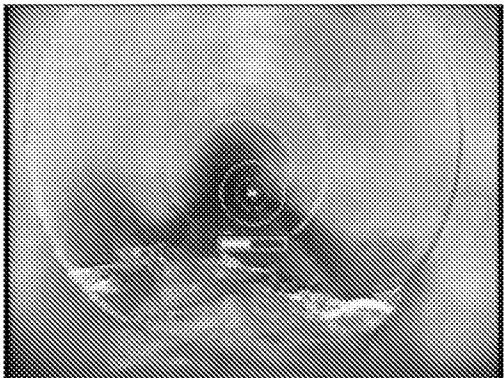
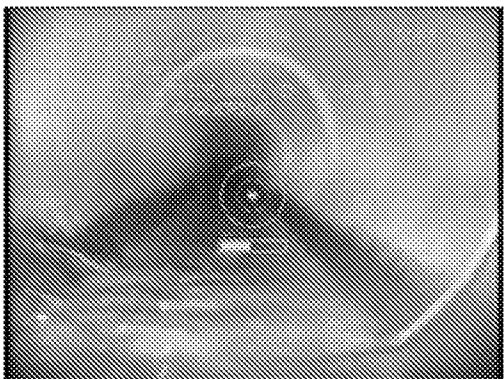
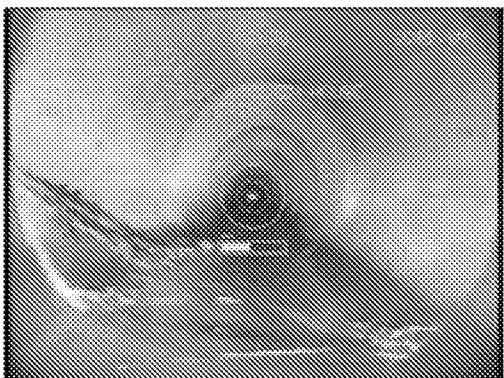
0

6

0

0

B

Pos	Video Ref	Code	Description	Image
60.40m	0:07:31	R	Roots - Severity 3	Image Provided - Ref: 0_8 
62.50m	0:07:37	R	Roots - Severity 3	Image Provided - Ref: 0_9 
63.70m	0:07:46	R	Roots - Severity 3	Image Provided - Ref: 0_10 
65.80m	0:07:59	R	Roots - Severity 3	Image Provided - Ref: 0_11 

Total Defects for section

DRB Grade for Section

0

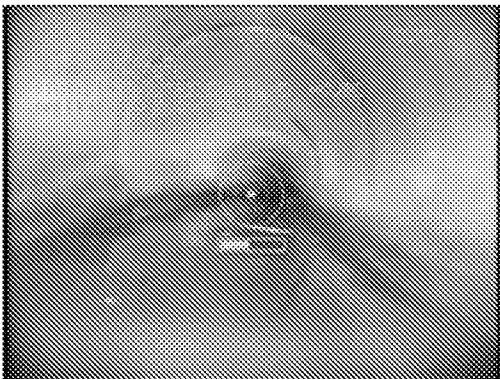
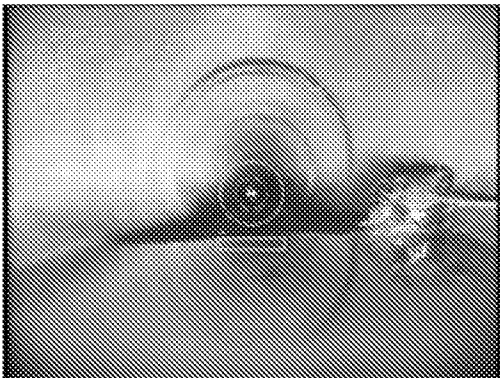
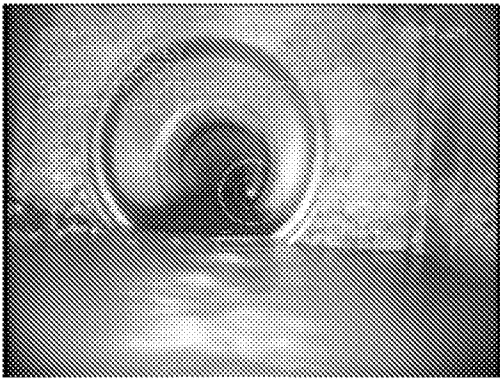
0

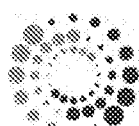
6

0

0

B

Pos	Video Ref	Code	Description	Image
72.10m	0:08:28	WL	Water level: 20% Height/Diameter	Image Provided - Ref: 0_12 
73.80m	0:08:39	R	Roots - Severity 3	Image Provided - Ref: 0_13 
89.40m		CPF	Finish node type, catch pit CP2	Image Provided - Ref: 0_9999 


VIEWLINE

CCTV Survey Reporting Software

ARUN DISTRICT COUNCIL A/79/20/DOC

www.viewline.tv