



**Oldlands Farm,
Steyning Road,
Bognor Regis,
West Sussex**

**Access Road Drainage &
SuDS Strategy**

for

Hanbury Properties Limited

August 2014

Hydrock Ref: R/14443/008



DOCUMENT CONTROL SHEET

Issued by: Hydrock Consultants Limited
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WA15 9NE



Client: Hanbury Properties Limited

Project: Oldlands Farm, Bognor Regis, West Sussex

Title: Access Road Drainage Strategy

Status: Final

Date: 17th September 2014

Document Production Record

Issue Number:	2	Name	Signature
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Document Revision Record

Issue number	Date	Revision Details	Issued to
1	13/08/14	Final	Quod
2	17/09/14	Final	Quod

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Introduction

This report accompanies the submitted drainage drawing (Hydrock ref. C14443-302) relating to the access road as approved under hybrid application BE/61/13, dated 19 March 2014. The drawing and supporting commentary below have been prepared on behalf of Hanbury Properties Limited to discharge conditions 3 and 6 of the hybrid permission. The details relate specifically to the 'full' element of the application which in the case of surface water drainage is the access road required to serve the uses permitted under the 'outline' element of the scheme.

Conditions 3 and 6 of BE/61/13 are set out below for the avoidance of doubt.

Condition 3

“Development shall not commence 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, 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”.

Condition 6

“No development shall take place until a surface water drainage scheme for the site, based on sustainable drainage principles and an assessment of the hydrological and hydrogeological context of the development, has been submitted to and approved in writing by the Local Planning Authority. The drainage strategy should:

Demonstrate the surface water run-off generated up to and including the 1 in 100 yr plus 30% for climate change critical storm will not exceed the run-off from the undeveloped site following the corresponding rainfall event (as stated within the approved FRA ref: 13/0404/4692)

Consider pollution prevention measures.

The scheme shall subsequently be implemented in accordance with the approved details before the development is completed”



Drainage & SuDS Strategy

The surface water drainage strategy for the proposed Access Road at Oldlands Farm is to restrict the peak surface water discharge to a maximum rate of greenfield runoff of 5.0l/s, as agreed with the Environment Agency. The surface water drainage network has been designed to mimic the existing catchment and contours, with the run-off being taken north towards the open ditch that splits Oldlands Farm and runs in an easterly direction where it is then culverted for a short section under the railway line before ultimately discharging to the Lidsey Rife approximately 300m to the east.

Prevention and Source Control methods as the first stage of the SuDS management train process of controlling the runoff have been considered. However, due to the scheme being a new heavy duty highway, permeable surfacing is not possible. Furthermore the Hydrock site investigation (R/14459/003) has been reviewed for the whole Oldlands Farm scheme with the outcome being that due to the cohesive ground and high water table, infiltration options would not be feasible. The soakaway tests in line with BRE 365 guidance and taken from the investigation can be found in Appendix B.

Due to the lack of available land for a pond based device, and in light of the finding discussed, the most viable SuDS solution is for the inclusion of oversized pipes beneath the highway to collect the surface water runoff from the gullies and act as the online attenuation. A hydrobrake flow restricting device is installed within SWMH 5 with an allowable discharge rate of 5.0l/s.

Refer to Proposed Access Road drainage layout within Appendix A for further details.

Pollution Prevention Measures

Pollution control devices to serve the highway drainage will encompass trapped gullies and a sump constructed within the hydrobrake manhole SWMH 5. These are standard devices for highways that will hold pollutants and avoid them directly entering the nearby watercourse. Due to the low risk of pollution, petrol separators have not been included. This is standard for this type of scheme.



APPENDIX A – HYDROCK DRAWINGS

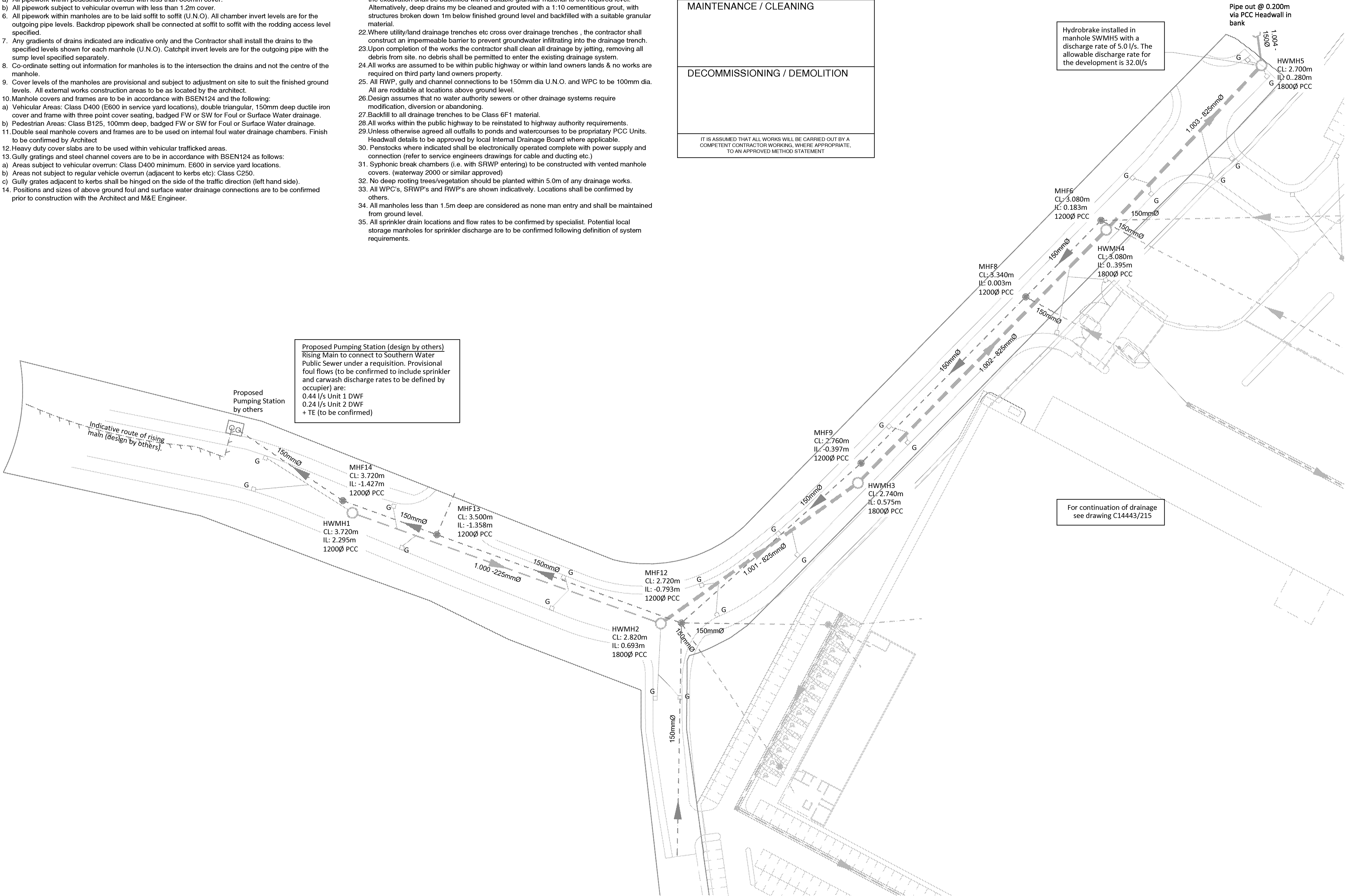
CONTENTS	
Identifier	Name
Hydrock	Drawing No. C14443/502

Notes:

- This drawing is to be read in conjunction with all relevant drawings, specifications and documentation.
- The position, size and levels of all drains are to be confirmed on site prior to the commencement of the works and any discrepancies reported immediately to the Engineer.
- Do not scale from this drawing, work to dimensions or co-ordinates provided. All levels are in metres and all dimensions are in millimetres, unless otherwise noted.
- The contractor shall allow for the protection, temporary and permanent support and diversion works as necessary, to all existing services to the satisfaction of the public utilities.
- The contractor shall allow for dealing with surface water run-off into excavations and from groundwater by means of sumps, pumping and de-watering as appropriate, in order to keep the excavation as reasonably dry as possible during the construction of the works.
- All private drainage within the site is to comply with the requirements of BSEN752 and Building Regulations Part H.
- Concrete protection to pipework is to be provided as follows:
 - All pipework within pedestrian/soft areas with less than 600mm cover.
 - All pipework subject to vehicular overrun with less than 1.2m cover.
- All pipework within manholes are to be laid soffit to soffit (U.N.O.). All chamber invert levels are for the outgoing pipe levels. Backdrop pipework shall be connected at soffit to soffit with the rodding access level specified.
- Any gradients of drains indicated are indicative only and the Contractor shall install the drains to the specified levels shown for each manhole (U.N.O.). Catchpit invert levels are for the outgoing pipe with the sump level specified separately.
- Co-ordinate setting out information for manholes is to the intersection the drains and not the centre of the manhole.
- Cover levels of the manholes are provisional and subject to adjustment on site to suit the finished ground levels. All external works construction areas to be as located by the architect.
- Manhole covers and frames are to be in accordance with BSEN124 and the following:
 - Vehicular Areas: Class D400 (E600 in service yard locations), double triangular, 150mm deep ductile iron cover and frame with three point cover seating, badged FW or SW for Foul or Surface Water drainage.
 - Pedestrian Areas: Class B125, 100mm deep, badged FW or SW for Foul or Surface Water drainage.
- Double seal manhole covers and frames are to be used on internal foul water drainage chambers. Finish to be confirmed by Architect.
- Heavy duty cover slabs are to be used within vehicular trafficked areas.
- Gully gratings and steel channel covers are to be in accordance with BSEN124 as follows:
 - Areas subject to vehicular overrun: Class D400 minimum. E600 in service yard locations.
 - Areas not subject to regular vehicle overrun (adjacent to kerbs etc): Class C250.
 - Gully gratings adjacent to kerbs shall be hinged on the side of the traffic direction (left hand side).
- Positions and sizes of above ground foul and surface water drainage connections are to be confirmed prior to construction with the Architect and M&E Engineer.

- Drainage channels are to be ACO Qmax, ACO Multidrain as specified or similar approved. Type and size of channel is to be approved by the Engineer in writing prior to ordering.
- All brickwork in connection with drainage is to be solid Class B Engineering Brick to BS3921.
- All precast concrete pipes, chamber products and road gullies shall be to BS5911 and be Kitemarked.
- Design chemical class for all insitu and precast concrete products shall be as stated in geotechnical report.
- All separators shall be in accordance with the Environment Agency document PPG3.
- All below ground plastic/grp tanks shall be installed in accordance with the manufacturers instructions. They shall be provided with sufficient concrete surround to counter floatation and shall have a wall thickness adequate to resist the highest ground water level which could be encountered at their location.
- All existing drainage/structures to be abandoned shall be broken out and removed from site, the excavation shall be backfilled with a suitable granular material to the required level. Alternatively, deep drains may be cleaned and grouted with a 1:10 cementitious grout, with structures broken down 1m below finished ground level and backfilled with a suitable granular material.
- Where utility/land drainage trenches etc cross over drainage trenches, the contractor shall construct an impermeable barrier to prevent groundwater infiltrating into the drainage trench.
- Upon completion of the works the contractor shall clean all drainage by jetting, removing all debris from site, no debris shall be permitted to enter the existing drainage system.
- All works are assumed to be within public highway or within land owners lands & no works are required on third party land owners property.
- All RWP, gully and channel connections to be 150mm dia U.N.O. and WPC to be 100mm dia. All are roddable at locations above ground level.
- Design assumes that no water authority sewers or other drainage systems require modification, diversion or abandoning.
- Backfill to all drainage trenches to be Class 6F1 material.
- All works within the public highway to be reinstated to highway authority requirements.
- Unless otherwise agreed all outfalls to ponds and watercourses to be proprietary PCC Units. Headwall details to be approved by local Internal Drainage Board where applicable.
- Penstocks where indicated shall be electronically operated complete with power supply and connection (refer to service engineers drawings for cable and ducting etc.)
- Syphonic break chambers (i.e. with SRWP entering) to be constructed with vented manhole covers. (waterway 2000 or similar approved)
- No deep rooting trees/vegetation should be planted within 5.0m of any drainage works.
- All WPC's, SRWP's and RWP's are shown indicatively. Locations shall be confirmed by others.
- All manholes less than 1.5m deep are considered as none man entry and shall be maintained from ground level.
- All sprinkler drain locations and flow rates to be confirmed by specialist. Potential local storage manholes for sprinkler discharge are to be confirmed following definition of system requirements.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING
CONSTRUCTION
MAINTENANCE / CLEANING
DECOMMISSIONING / DEMOLITION
IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT

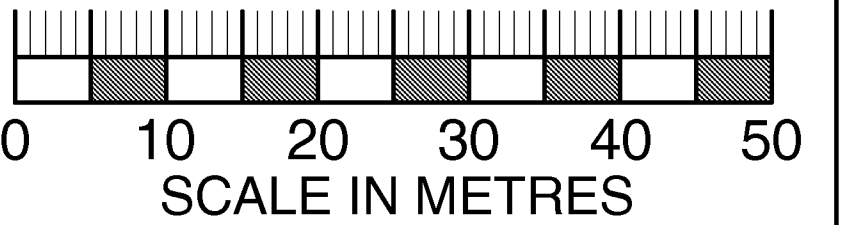


Notes:

- All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
- This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

KEY:

- Proposed syphonic pipe (designed by specialist)
- Proposed SW Drainage
- Proposed Highway Drainage
- Proposed channel Drain
- Proposed Foul Drainage
- Site Boundary
- Proprietary sumped catchpit



T1	12.09.14	INITIAL ISSUE		MH	ME
Rev	Date	Description	By	Ckd	
Architect					
MICHAEL SPARKS ASSOCIATES					
Hydrock Consultants Ltd 10 Blandford Square 100 Victoria Road Bognor Regis, Sussex BN25 1JF Tel: 01323 811111 Fax: 01323 811112 www.hydrock.com					
Client					
BERICOTE					
Project Title					
OLDLANDS FARM, BOGNOR REGIS					
Drawing Title					
PROPOSED ACCESS ROAD DRAINAGE LAYOUT					
Drawing Status					
TENDER					
Hydrock Job No					
C14443					
Drawn	Checked	Amended At	Date	Issue Date	
MOH	ME	As Shown	19.08.14	12.09.14	
Drawing Number				Revision	
502				T1	



APPENDIX B – SOAKAWAY TESTS

CONTENTS	
Identifier	Name
Hydrock	Soakaway Location Plan and Test Results (from main SI)



- Notes:
1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
 2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.



- TP TRIAL PIT
- TP TRIAL PIT SOAKAWAY
- BH BOREHOLE
- CPT STATIC CONE PENETRATION TEST
- MH MONITORING WELL
- EXTENT OF RAISED MARINE DEPOSITS
- BACKFILLED FORMER PONDS
- PROPOSED BUILDINGS
- EXISTING GAS MAIN
- LOCATION OF WELL

Rev	Date	Description	By	Ckd
Architect				
Client				
Project Title				
OLDLANDS FARM BOGNOR REGIS				
Drawing Title				
Site Zonation Plan				
Drawing Status				
INFORMATION				
Hydrock Job No				
C/14459				
Drawn	Checked	Scale @ A1	Date	Issue Date
AB	CV	1:1500	23/05/14	23/05/14
Drawing Number				Revisions
14459/D006				-

BRE BR365 - Trial Pit Soakaway Data Sheet

Site: C14459- Oldlands Farm

Client: Bericote

Test Location	TP40	Date of start of testing	04/06/2014	Date at end of testing	04/06/2014
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[illegible]

Note: Groundwater table taken as base of pit for infiltration rate calculation.

BRE BR365 - Trial Pit Soakaway Data Sheet

Site: C14459- Oldlands Farm

Client: Bericote

Test Location

TP34

Date of start of testing

04/06/2014

Date at end of testing

04/06/2014

[illegible]

Note: Groundwater table taken as base of pit for infiltration rate calculation.

BRE BR365 - Trial Pit Soakaway Data Sheet

Site: C14459- Oldlands Farm

Client: Bericote

Test Location

TP26A

Date of start of testing

04/06/2014

Date at end of testing

04/06/2014

[illegible]

Note: Groundwater table taken as base of pit for infiltration rate calculation.

BRE BR365 - Trial Pit Soakaway Data Sheet

Site: C14459- Oldlands Farm

Client: Bericote

Test Location

TP15

Date of start of testing

04/06/2014

Date at end of testing

04/06/2014

[illegible]

Note: Groundwater table taken as base of pit for infiltration rate calculation.

BRE BR365 - Trial Pit Soakaway Data Sheet

Site: C14459- Oldlands Farm

Client: Bericote

Test Location	TP17	Date of start of testing	04/06/2014	Date at end of testing	04/06/2014
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[illegible]

Note: Groundwater table taken as base of pit for infiltration rate calculation.



APPENDIX C – HYDROCK HYDRAULIC CALCULATIONS

CONTENTS	
Identifier	Name
Hydrock	Micro Drainage Calculations

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Date Sept 2014 File Access Road Model ...	Designed by PG Checked by	
Micro Drainage	Network 2013.1.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	Add Flow / Climate Change (%)	0
M5-60 (mm)	19.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.350	Maximum Backdrop Height (m)	3.000
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.175	4-8	0.337	8-12	0.008

Total Area Contributing (ha) = 0.520

Total Pipe Volume (m³) = 114.763

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	82.000	0.410	200.0	0.130	4.00	0.0	0.600	o	225
1.001	60.000	0.120	500.0	0.195	0.00	0.0	0.600	o	325
1.002	89.000	0.178	500.0	0.130	0.00	0.0	0.600	o	325
1.003	58.000	0.116	500.0	0.065	0.00	0.0	0.600	o	325
1.004	12.000	0.080	150.0	0.000	0.00	0.0	0.600	o	300

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.48	3.295	0.130	0.0	0.0	0.0	0.32	36.6	17.6
1.001	50.00	6.24	0.693	0.325	0.0	0.0	0.0	1.32	706.1	44.0
1.002	50.00	7.36	0.573	0.455	0.0	0.0	0.0	1.32	706.1	61.6
1.003	50.00	8.10	0.395	0.520	0.0	0.0	0.0	1.32	706.1	70.4
1.004	49.81	8.25	0.279	0.520	0.0	0.0	0.0	1.28	90.6	70.4

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	1	3.720	2.295	1.200	Open Manhole	1200
1.001	o	825	2	3.890	0.693	1.362	Open Manhole	1800
1.002	o	825	3	2.740	0.573	1.342	Open Manhole	1800
1.003	o	825	4	3.080	0.395	1.860	Open Manhole	1800
1.004	o	300	5	2.700	0.279	2.121	Open Manhole	1800

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	82.000	200.0	2	3.890	1.885	0.770	Open Manhole	1800
1.001	60.000	500.0	3	2.740	0.573	1.342	Open Manhole	1800
1.002	89.000	500.0	4	3.080	0.395	1.860	Open Manhole	1800
1.003	58.000	500.0	5	2.700	0.279	1.596	Open Manhole	1800
1.004	12.000	150.0		2.400	0.199	1.901	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.004		2.400	0.199	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.348		

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<u>Online Controls for Storm</u>		
<u>Hydro-Brake® Manhole: 5, DS/PN: 1.004, Volume (m³): 36.2</u>		
Design Head (m) 2.000 Hydro-Brake® Type Md4 Invert Level (m) 0.279 Design Flow (l/s) 5.3 Diameter (mm) 69		
Depth (m)	Flow (l/s)	Depth (m) Flow (l/s) Depth (m) Flow (l/s) Depth (m) Flow (l/s) Depth (m) Flow (l/s)
0.100	2.0	1.200 4.1 3.000 6.4 7.000 9.8
0.200	2.2	1.400 4.4 3.500 6.9 7.500 10.2
0.300	2.1	1.600 4.7 4.000 7.4 8.000 10.5
0.400	2.4	1.800 5.0 4.500 7.9 8.500 10.8
0.500	2.6	2.000 5.2 5.000 8.3 9.000 11.1
0.600	2.9	2.200 5.5 5.500 8.7 9.500 11.4
0.800	3.3	2.400 5.7 6.000 9.1
1.000	3.7	2.600 6.0 6.500 9.5
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 1 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.350
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status ON
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 20

PN	Storm	Return Period	Climate Change	First X Surchage	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	1	0%	30/15 Summer				
1.001	240 Winter	1	0%	30/120 Winter				
1.002	240 Winter	1	0%	30/120 Summer	100/60 Winter			18
1.003	240 Winter	1	0%	30/60 Winter				
1.004	240 Winter	1	0%	1/15 Summer	100/30 Winter			21

PN	US/MH Name	Water		Flooded		Pipe		Status
		Level (m)	Surch'd Depth (m)	Volume (m³)	Flow / Cap. (l/s)	O'flow (l/s)	Flow (l/s)	
1.000	1	2.407	-0.113	0.000	0.49	0.0	17.5	OK
1.001	2	0.878	-0.640	0.000	0.02	0.0	9.2	OK
1.002	3	0.878	-0.520	0.000	0.02	0.0	10.9	OK
1.003	4	0.877	-0.343	0.000	0.01	0.0	6.8	OK
1.004	5	0.877	0.298	0.000	0.04	0.0	2.9	SURCHARGED

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 1 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.350
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status ON
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 20

PN	Storm	Return Period	Climate Change	First X Surge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	30	0%	30/15 Summer				
1.001	360 Winter	30	0%	30/120 Winter				
1.002	360 Winter	30	0%	30/120 Summer	100/60 Winter			18
1.003	360 Winter	30	0%	30/60 Winter				
1.004	360 Winter	30	0%	1/15 Summer	100/30 Winter			21

PN	US/MH Name	Water		Flooded		Pipe		Status
		Level (m)	Surch'd Depth (m)	Volume (m³)	Flow / Cap. (l/s)	O'flow (l/s)	Flow (l/s)	
1.000	1	2.641	0.121	0.000	1.14	0.0	40.5	SURCHARGED
1.001	2	2.607	1.089	0.000	0.02	0.0	14.9	FLOOD RISK
1.002	3	2.607	1.209	0.000	0.02	0.0	14.2	FLOOD RISK
1.003	4	2.608	1.388	0.000	0.01	0.0	8.4	SURCHARGED
1.004	5	2.607	2.028	0.000	0.08	0.0	5.7	FLOOD RISK

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 1 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.350
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 19.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status ON
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 20

PN	Storm	Return Period	Climate Change	First X Surchage	First Y Flood	First Z Overflow Act.	O/F	Lvl Exc.
1.000	15 Winter	100	+20%	30/15 Summer				
1.001	360 Winter	100	+20%	30/120 Winter				
1.002	360 Winter	100	+20%	30/120 Summer	100/60 Winter			18
1.003	360 Winter	100	+20%	30/60 Winter				
1.004	360 Winter	100	+20%	1/15 Summer	100/30 Winter			21

PN	US/MH Name	Water		Flooded		Pipe		Status
		Level (m)	Surch'd Depth (m)	Volume (m³)	Flow / Cap. (l/s)	O'flow (l/s)	Flow (l/s)	
1.000	1	3.240	0.720	0.000	1.65	0.0	58.9	SURCHARGED
1.001	2	2.770	1.252	0.000	0.04	0.0	23.0	FLOOD RISK
1.002	3	2.770	1.372	30.228	0.05	0.0	32.0	FLOOD
1.003	4	2.771	1.551	0.000	0.06	0.0	36.4	SURCHARGED
1.004	5	2.771	2.192	70.539	0.08	0.0	5.7	FLOOD

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