

NYMNP
21/12/2022

NOTES

1. Driveway and car park surfacing design and construction to Engineer's Specification (by others).
2. All dimensions are in millimetres unless otherwise stated.
3. Pre-cast concrete products shall comply with the relevant provisions of BS 5911 and be 'Kite Marked'.
4. Manhole covers and frames, grids and frames shall comply with the relevant provisions of BS EN 124. D400 class manhole cover to be used within trafficked areas. A15 class manhole cover to be used in untrafficked areas.
5. Do not scale from this drawing. If in doubt ask.

Discharge rate of 5l/s from site into culverted watercourse estimated.
Occupier should undertake inspection of control manhole SW9 on a 2 monthly basis and clean when necessary.

KEY:

- Roofed & Paved Areas
Total impermeable roofed and paved area of 2060m²
- Roofed areas to sealed downpipes
- Primary Surface Water drainage system draining to attenuation structures
- Existing culverted watercourse
- Primary Foul Water drainage system draining to public sewer
- SW PPIC Manhole 600mm dia
- SW PPIC Manhole 600mm dia with 300mm deep sump
- SW Control Manhole 1200mm dia with 300mm deep sump and 5l/s hydrobrake
- FW PPIC Manhole 600mm dia
- Attenuation Tank 27.5m² by 0.4m deep to provide storage upto 100yr+CC40% storm
- ACCO Drainage Channel

REV	DESCRIPTION	DATE
0	For Approval	18/12/22

EWE Associates Ltd
EWE Associates Limited
7 Waveney Close
Burton Upon Stather
Scunthorpe
DN15 9DT
Tel: 07875 972270

Email : lea.favill@eweassociates.com

PROJECT Proposed Residential Development Low Farm Sneaton near Whitby

CLIENT Bell Snoxell Ltd

DRAWING TITLE Drainage Layout

SCALE 1:200 **DATE** 18/12/22

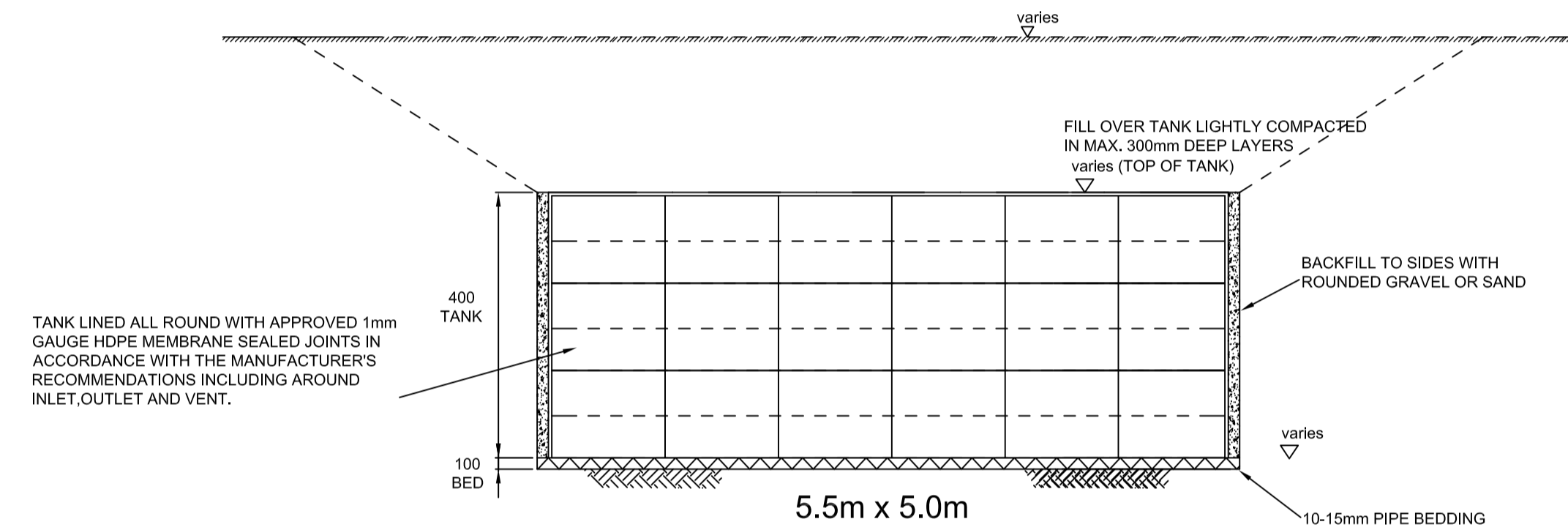
DRAWN BY LJF **CHECKED BY** JF **REVISION** 0

DRAWING No EWE/2969/01

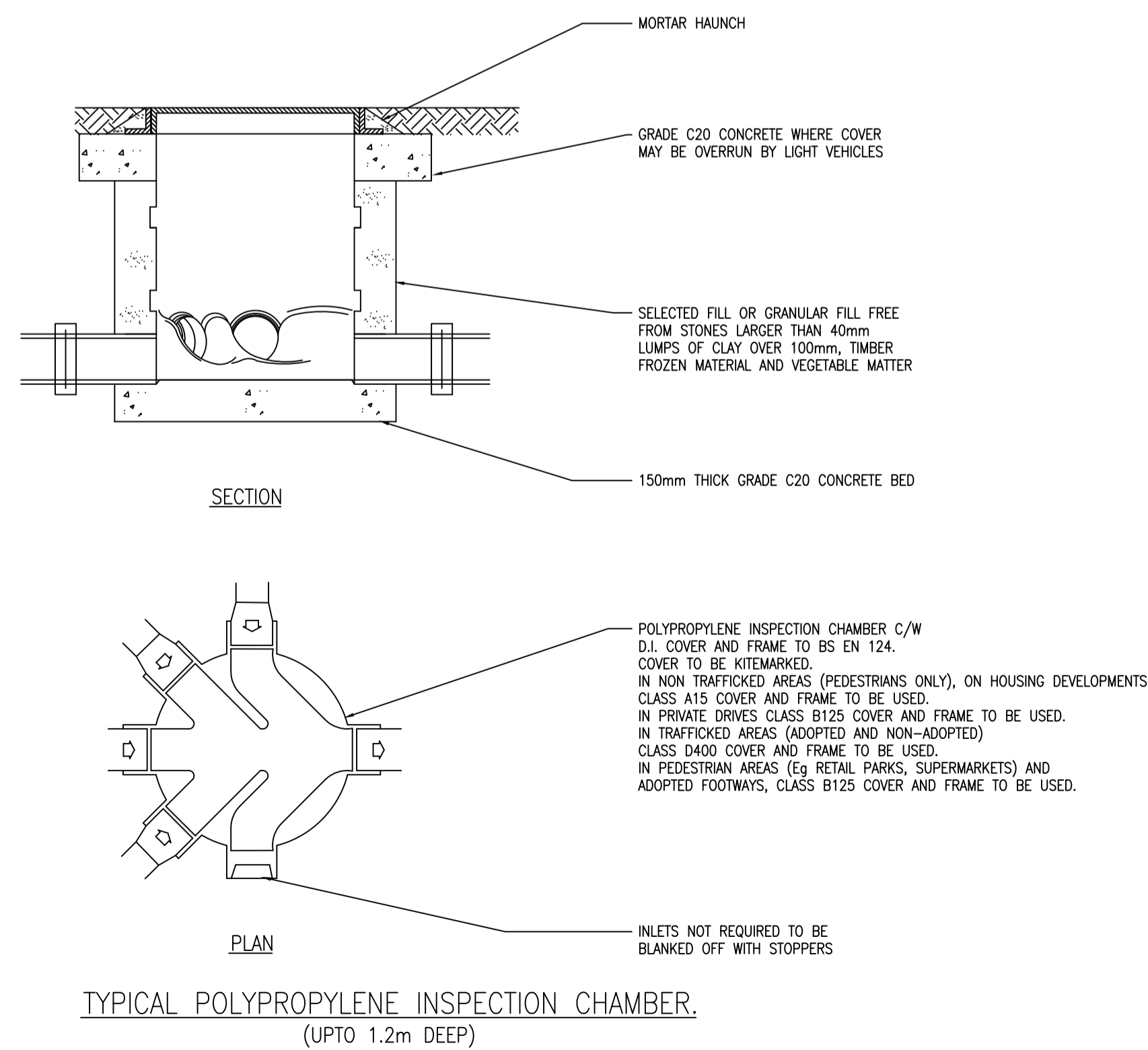
PLANNING CONDITION DISCHARGE DRAWING ONLY

FOUL WATER MANHOLE SCHEDULE											
MANHOLE REF:	PIPE OUTLET SIZE mm	PIPE MATERIAL	COVER LEVEL	INVERT LEVEL	DEPTH m	DEPTH to soffit	CHAMBER TYPE	CHAMBER SIZE mm	COVER TYPE	COVER SIZE mm	COMMENTS
SW1	300	Twinwall	5.700	3.920	1.780	1.480	PPIC	600	D400	600	Limited access
SW2	300	Twinwall	5.400	3.870	1.530	1.230	PPIC	600	D400	600	Limited access
SW3	300	Twinwall	5.300	3.830	1.470	1.170	PPIC	600	D400	600	Limited access
SW4	300	Twinwall	5.300	3.790	1.510	1.210	PPIC	600	D400	600	Limited access
SW5	300	Twinwall	5.000	3.770	1.230	0.930	PPIC	600	D400	600	
SW6	300	Twinwall	5.200	3.720	1.480	1.180	PPIC	600	D400	600	
SW7	300	Twinwall	5.000	3.690	1.310	1.010	PPIC	600	D400	600	
SW8	300	Twinwall	5.000	3.620	1.380	1.080	PPIC	600	D400	600	
SW9	150	Polysewer	5.000	3.600	1.400	1.250	CONC	1200	D400	600	5l/s hydrobrake

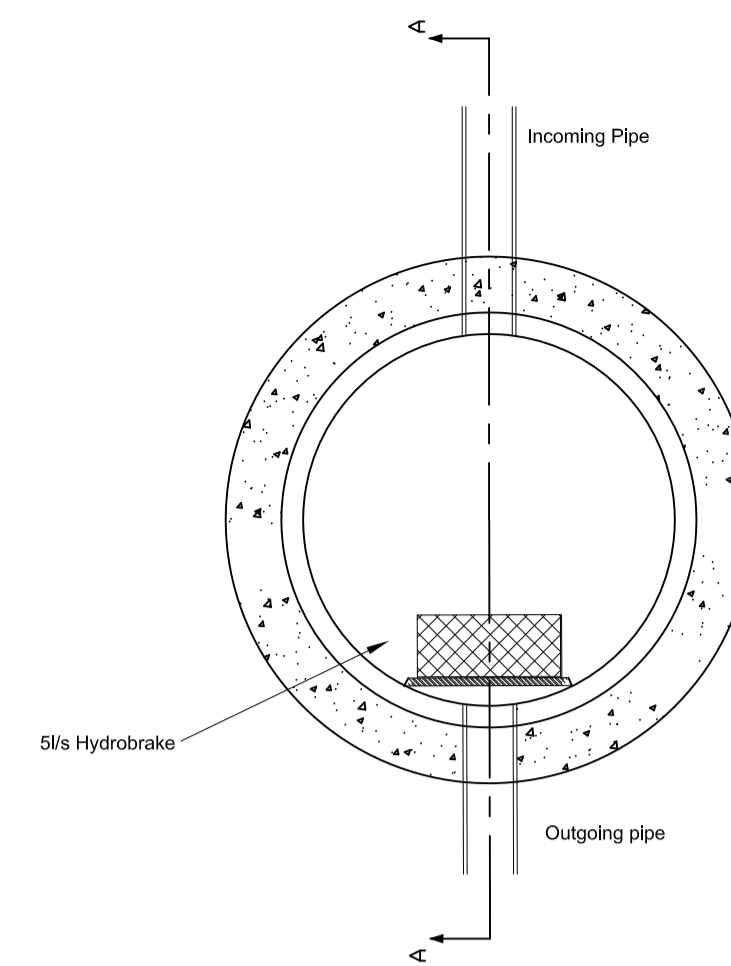
FOUL WATER MANHOLE SCHEDULE											
MANHOLE REF:	PIPE OUTLET SIZE mm	PIPE MATERIAL	COVER LEVEL	INVERT LEVEL	DEPTH m	DEPTH to soffit	CHAMBER TYPE	CHAMBER SIZE mm	COVER TYPE	COVER SIZE mm	COMMENTS
FW1	150	Polysewer	5.400	4.020	1.380	1.230	PPIC	600	D400	600	Limited access
FW2	150	Polysewer	5.250	3.770	1.480	1.330	PPIC	600	D400	600	Limited access
FW3	150	Polysewer	4.800	3.570	1.230	1.080	PPIC	600	D400	600	Limited access
FW4	150	Polysewer	4.700	3.025	1.450	1.300	PPIC	600	D400	600	Limited access
FW5	150	Polysewer	4.200	3.000	1.200	1.050	PPIC	600	D400	600	



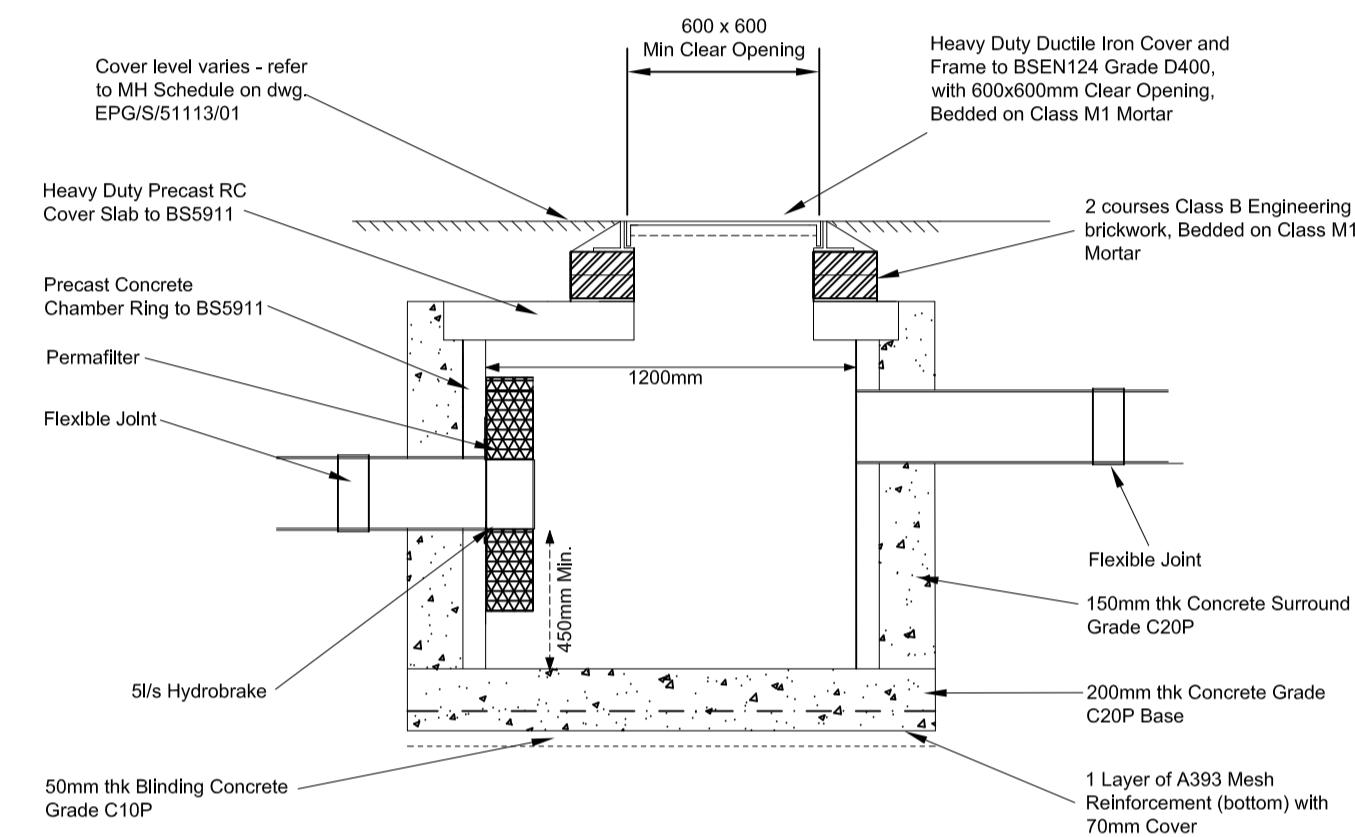
CRATE TANK - CROSS-SECTION (1:50)



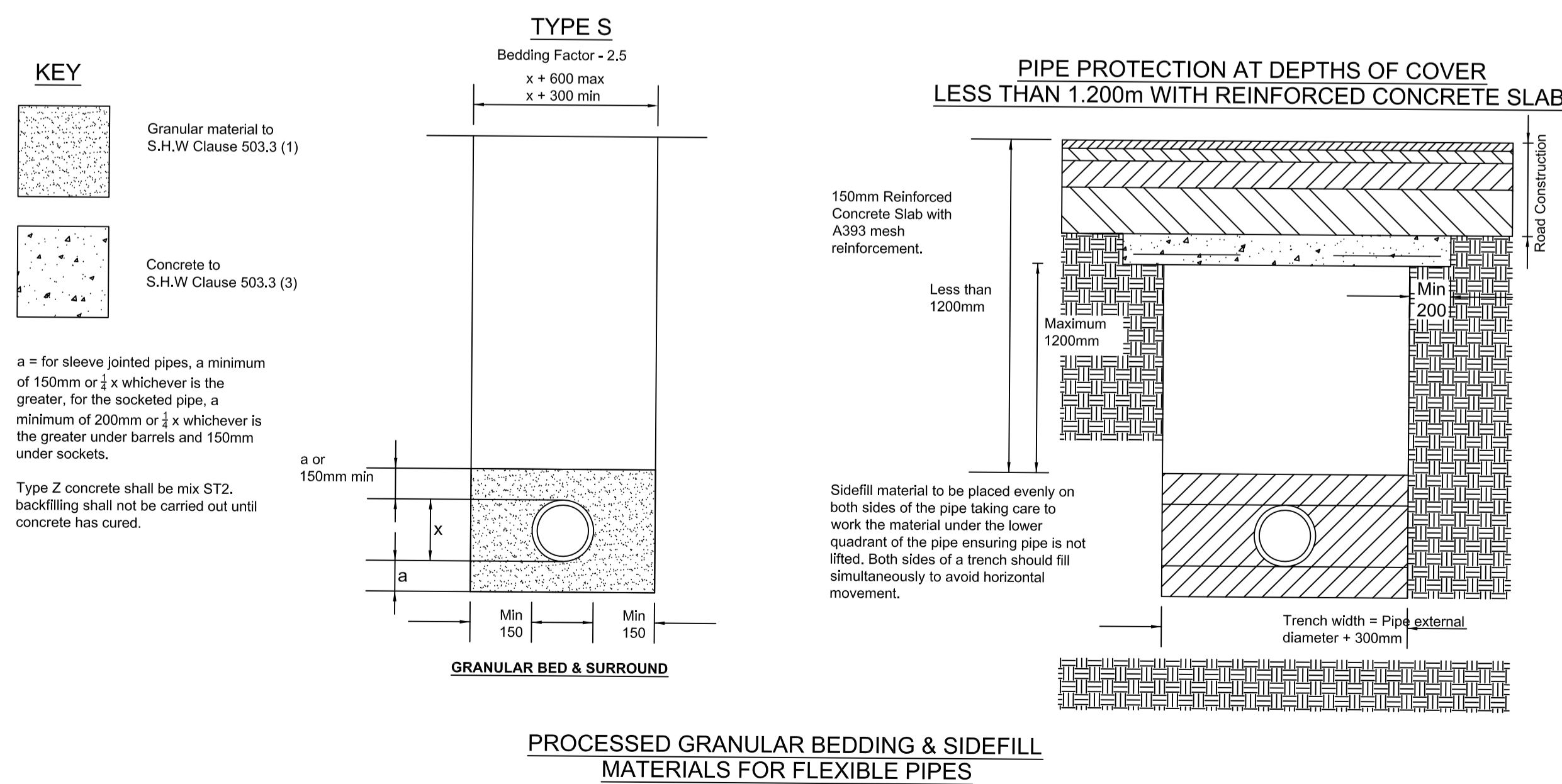
TYPICAL POLYPROPYLENE INSPECTION CHAMBER. (UPTO 1.2m DEEP)



TYPICAL 1200mm FLOW CONTROL CATCHPIT MANHOLE



TYPICAL 1200mm FLOW CONTROL CATCHPIT MANHOLE (SW9) SECTION A-A SCALE 1:25



NYMNPA
21/12/2022

REV	DESCRIPTION	DATE
0	For Approval	18/12/22

EWE Associates Ltd
EWE Associates Limited
7 Waveney Close
Burton Upon Stather
Scunthorpe
DN15 9DT
Tel: 07875 972270

Email: lea.favill@eweassociates.com

PROJECT
Proposed Residential Development Low Farm Sneaton near Whitby

CLIENT
Bell Snoxell Ltd

DRAWING TITLE
Drainage Details

SCALE
1:200


DATE
18/12/22

DRAWN BY
LJF

CHECKED BY
JF

REVISION
0

DRAWING No
EWE/2969/02

EWE Associates Ltd		Page 1
Windy Ridge Barn Thealby Lane Winterton DN15 9TG		
Date 16/12/2022 17:03 File 100yr+CC40%Winter...	Designed By Lea Checked By	
Micro Drainage		Network W.12.4

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
1.000	12.500	0.050	250.0	0.061	5.00	0.600	o	300
1.001	10.000	0.040	250.0	0.000	0.00	0.600	o	300
1.002	10.000	0.040	250.0	0.036	0.00	0.600	o	300
1.003	5.000	0.020	250.0	0.000	0.00	0.600	o	300
1.004	12.500	0.050	250.0	0.037	0.00	0.600	o	300
1.005	7.500	0.030	250.0	0.000	0.00	0.600	o	300
1.006	17.500	0.070	250.0	0.072	0.00	0.600	o	300
1.007	2.000	0.020	100.0	0.000	0.00	0.600	o	300
1.008	12.000	0.100	120.0	0.000	0.00	0.600	o	150

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
1.000	1	5.700	3.920	1.480	5.400	3.870	1.230		600
1.001	2	5.400	3.870	1.230	5.300	3.830	1.170		600
1.002	3	5.300	3.830	1.170	5.300	3.790	1.210		600
1.003	4	5.300	3.790	1.210	5.000	3.770	0.930		600
1.004	5	5.000	3.770	0.930	5.200	3.720	1.180		600
1.005	6	5.200	3.720	1.180	5.000	3.690	1.010		600
1.006	7	5.000	3.690	1.010	5.000	3.620	1.080		600
1.007	8	5.000	3.620	1.080	5.000	3.600	1.100		600
1.008	9	5.000	3.600	1.250	3.900	3.500	0.250	Hydro-Brake®	1200

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)
1.008		3.900	3.500	3.500	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	40.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Run Time (mins)	600
Hot Start Level (mm)	0	Output Interval (mins)	5
Manhole Headloss Coeff (Global)	0.500		
Number of Input Hydrographs	0	Number of Storage Structures	8
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model FEH

Windy Ridge Barn
Thealby Lane
Winterton DN15 9TG



Date 16/12/2022 17:03
File 100yr+CC40%Winter...

Designed By Lea
Checked By

Micro Drainage

Network W.12.4

Synthetic Rainfall Details

Return Period (years)	100
Site Location	489950 508100 NZ 89950 08100
C (1km)	-0.022
D1 (1km)	0.373
D2 (1km)	0.367
D3 (1km)	0.269
E (1km)	0.286
F (1km)	2.363
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	300

Windy Ridge Barn
Thealby Lane
Winterton DN15 9TG



Date 16/12/2022 17:03
File 100yr+CC40%Winter...

Designed By Lea
Checked By

Micro Drainage

Network W.12.4

Online Controls for Storm

Hydro-Brake® Manhole: 9, DS/PN: 1.008, Volume (m³): 1.7

Design Head (m) 1.300 Hydro-Brake® Type Md4 Invert Level (m) 3.600
Design Flow (l/s) 5.0 Diameter (mm) 76

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.3	1.200	4.9	3.000	7.8	7.000	11.9
0.200	3.0	1.400	5.3	3.500	8.4	7.500	12.3
0.300	2.6	1.600	5.7	4.000	9.0	8.000	12.7
0.400	2.9	1.800	6.0	4.500	9.5	8.500	13.1
0.500	3.2	2.000	6.4	5.000	10.1	9.000	13.5
0.600	3.5	2.200	6.7	5.500	10.6	9.500	13.9
0.800	4.0	2.400	7.0	6.000	11.0		
1.000	4.5	2.600	7.3	6.500	11.5		

Windy Ridge Barn
Thealby Lane
Winterton DN15 9TG



Date 16/12/2022 17:03
File 100yr+CC40%Winter...

Designed By Lea
Checked By

Micro Drainage

Network W.12.4

Storage Structures for Storm

Tank or Pond Manhole: 1, DS/PN: 1.000

Invert Level (m) 3.920

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	27.5	1.400	0.0	2.800	0.0	4.200	0.0
0.200	27.5	1.600	0.0	3.000	0.0	4.400	0.0
0.400	27.5	1.800	0.0	3.200	0.0	4.600	0.0
0.600	0.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	0.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	0.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Tank or Pond Manhole: 2, DS/PN: 1.001

Invert Level (m) 3.870

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	27.5	1.400	0.0	2.800	0.0	4.200	0.0
0.200	27.5	1.600	0.0	3.000	0.0	4.400	0.0
0.400	27.5	1.800	0.0	3.200	0.0	4.600	0.0
0.600	0.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	0.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	0.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Tank or Pond Manhole: 3, DS/PN: 1.002

Invert Level (m) 3.830

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	27.5	1.400	0.0	2.800	0.0	4.200	0.0
0.200	27.5	1.600	0.0	3.000	0.0	4.400	0.0
0.400	27.5	1.800	0.0	3.200	0.0	4.600	0.0
0.600	0.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	0.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	0.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Tank or Pond Manhole: 4, DS/PN: 1.003

Invert Level (m) 3.790

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	27.5	0.200	27.5	0.400	27.5	0.600	0.0

Windy Ridge Barn
Thealby Lane
Winterton DN15 9TG



Date 16/12/2022 17:03
File 100yr+CC40%Winter...

Designed By Lea
Checked By

Micro Drainage

Network W.12.4

Tank or Pond Manhole: 4, DS/PN: 1.003

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.800	0.0	2.000	0.0	3.200	0.0	4.400	0.0
1.000	0.0	2.200	0.0	3.400	0.0	4.600	0.0
1.200	0.0	2.400	0.0	3.600	0.0	4.800	0.0
1.400	0.0	2.600	0.0	3.800	0.0	5.000	0.0
1.600	0.0	2.800	0.0	4.000	0.0		
1.800	0.0	3.000	0.0	4.200	0.0		

Tank or Pond Manhole: 5, DS/PN: 1.004

Invert Level (m) 3.770

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	27.5	1.400	0.0	2.800	0.0	4.200	0.0
0.200	27.5	1.600	0.0	3.000	0.0	4.400	0.0
0.400	27.5	1.800	0.0	3.200	0.0	4.600	0.0
0.600	0.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	0.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	0.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Tank or Pond Manhole: 6, DS/PN: 1.005

Invert Level (m) 3.720

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	27.5	1.400	0.0	2.800	0.0	4.200	0.0
0.200	27.5	1.600	0.0	3.000	0.0	4.400	0.0
0.400	27.5	1.800	0.0	3.200	0.0	4.600	0.0
0.600	0.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	0.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	0.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Tank or Pond Manhole: 7, DS/PN: 1.006

Invert Level (m) 3.690

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	27.5	1.400	0.0	2.800	0.0	4.200	0.0
0.200	27.5	1.600	0.0	3.000	0.0	4.400	0.0
0.400	27.5	1.800	0.0	3.200	0.0	4.600	0.0
0.600	0.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	0.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	0.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Windy Ridge Barn
Thealby Lane
Winterton DN15 9TG



Date 16/12/2022 17:03
File 100yr+CC40%Winter...

Designed By Lea
Checked By

Micro Drainage

Network W.12.4

Tank or Pond Manhole: 8, DS/PN: 1.007

Invert Level (m) 3.620

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	27.5	1.400	0.0	2.800	0.0	4.200	0.0
0.200	27.5	1.600	0.0	3.000	0.0	4.400	0.0
0.400	27.5	1.800	0.0	3.200	0.0	4.600	0.0
0.600	0.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	0.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	0.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Windy Ridge Barn
Thealby Lane
Winterton DN15 9TG



Date 16/12/2022 17:03
File 100yr+CC40%Winter...

Designed By Lea
Checked By

Micro Drainage

Network W.12.4

Summary of Results for 300 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 450.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status OFF
 Inertia Status OFF

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1	4.233	0.013	0.000	0.09	0.0	5.1	SURCHARGED
1.001	2	4.232	0.062	0.000	0.07	0.0	4.0	SURCHARGED
1.002	3	4.232	0.102	0.000	0.10	0.0	5.5	SURCHARGED
1.003	4	4.232	0.142	0.000	0.09	0.0	4.1	SURCHARGED
1.004	5	4.233	0.163	0.000	0.09	0.0	5.1	SURCHARGED
1.005	6	4.239	0.219	0.000	0.10	0.0	5.2	SURCHARGED
1.006	7	4.249	0.259	0.000	0.09	0.0	5.5	SURCHARGED
1.007	8	4.266	0.346	0.000	0.09	0.0	4.8	SURCHARGED
1.008	9	4.270	0.520	0.000	0.24	0.0	3.6	SURCHARGED

Calculated by:

Site name:

Site location:

Site Details

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method: SPR estimation method: Soil characteristics SOIL type: HOST class: SPR/SPRHOST: Hydrological characteristics SAAR (mm): Hydrological region: Growth curve factor 1 year: Growth curve factor 30 years: Growth curve factor 100 years: Growth curve factor 200 years:

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

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

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

Q_{BAR} (l/s):

1 in 1 year (l/s):

1 in 30 years (l/s):

1 in 100 year (l/s):

1 in 200 years (l/s):

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Modified Rational Method

Length (m)	55	m
Area (ha)	0.032	Ha
Max Height	7.4	mAOD
Min Height	3.8	mAOD
DeltaH	3.5	
Slope (%)	6.42	
Te (mins)	7.62	mins
ARF	0.999	
SAAR	718.000	mm
UCWI	95	mm
PIMP	100.0	%
SOIL	0.43	
Percentage Runoff PR	80.36	
DEEPSTOR	0.29	

Cv	0.8036
Cr	1.3
allowable outflow	
1 year	3.72 l/s

Post Development	Return Period		flood		1		2	
	Rainfall Duration (hours)	Rainfall Duration (days)	Rainfall Depth (mm)	Effective Depth (mm)	Rainfall Intensity (mm/hr)	FLOW (l/s)	FLOW (l/s/ha)	
	0.13	0.005	5.2	6.0	40.0	3.7	116.2	
	0.25	0.010	8.21	8.6	32.8	3.1	95.4	
	0.5	0.021	10.31	10.8	20.6	1.9	59.9	
	0.75	0.031	11.75	12.3	15.7	1.5	45.5	
	1	0.042	12.9	13.5	12.9	1.2	37.5	
	1.25	0.052	13.86	14.5	11.1	1.0	32.2	
	1.5	0.063	14.69	15.3	9.8	0.9	28.4	
	1.75	0.073	15.43	16.1	8.8	0.8	25.6	
	2	0.083	16.1	16.8	8.1	0.7	23.4	
	2.25	0.094	16.72	17.5	7.4	0.7	21.6	
	2.5	0.104	17.29	18.1	6.9	0.6	20.1	
	2.75	0.115	17.82	18.6	6.5	0.6	18.8	
	3	0.125	18.32	19.1	6.1	0.6	17.7	
	3.25	0.135	18.8	19.6	5.8	0.5	16.8	
	3.5	0.146	19.24	20.1	5.5	0.5	16.0	
	3.75	0.156	19.67	20.5	5.2	0.5	15.2	
	4	0.167	20.08	21.0	5.0	0.5	14.6	
	4.25	0.177	20.47	21.4	4.8	0.4	14.0	

Modified Rational Method

Length (m)	55	m
Area (ha)	0.032	Ha
Max Height	7.4	mAOD
Min Height	3.8	mAOD
DeltaH	3.5	
Slope (%)	6.42	
Te (mins)	7.62	mins
ARF	0.999	
SAAR	718.000	mm
UCWI	95	mm
PIMP	100.0	%
SOIL	0.43	
Percentage Runoff PR	80.36	
DEEPSTOR	0.29	

Cv	0.8036
Cr	1.3
allowable outflow	
30 year	12.08 l/s

Post Development	Return Period		flood		30		50	
	Rainfall Duration (hours)	Rainfall Duration (days)	Rainfall Depth (mm)	Effective Depth (mm)	Rainfall Intensity (mm/hr)	FLOW (l/s)	FLOW (l/s/ha)	
	0.13	0.005	16.9	21.0	130.0	12.1	377.5	
	0.25	0.010	25.76	26.9	103.0	9.6	299.2	
	0.5	0.021	30.47	31.8	60.9	5.7	177.0	
	0.75	0.031	33.58	35.1	44.8	4.2	130.0	
	1	0.042	35.95	37.6	36.0	3.3	104.4	
	1.25	0.052	37.9	39.6	30.3	2.8	88.1	
	1.5	0.063	39.57	41.3	26.4	2.5	76.6	
	1.75	0.073	41.03	42.9	23.4	2.2	68.1	
	2	0.083	42.33	44.2	21.2	2.0	61.5	
	2.25	0.094	43.52	45.5	19.3	1.8	56.2	
	2.5	0.104	44.6	46.6	17.8	1.7	51.8	
	2.75	0.115	45.6	47.6	16.6	1.5	48.2	
	3	0.125	46.54	48.6	15.5	1.4	45.1	
	3.25	0.135	47.41	49.5	14.6	1.4	42.4	
	3.5	0.146	48.24	50.4	13.8	1.3	40.0	
	3.75	0.156	49.02	51.2	13.1	1.2	38.0	
	4	0.167	49.76	52.0	12.4	1.2	36.1	
	4.25	0.177	50.47	52.7	11.9	1.1	34.5	

Modified Rational Method

Length (m)	55	m
Area (ha)	0.032	Ha
Max Height	7.4	mAOD
Min Height	3.8	mAOD
DeltaH	3.5	
Slope (%)	6.42	
Te (mins)	7.62	mins
ARF	0.999	
SAAR	718.000	mm
UCWI	95	mm
PIMP	100.0	%
SOIL	0.43	
Percentage Runoff PR	80.36	
DEEPSTOR	0.29	

Cv	0.8036
Cr	1.3
allowable outflow	
100 year	17.01 l/s

Post Development	Return Period		flood		100		140	
	Rainfall Duration (hours)	Rainfall Duration (days)	Rainfall Depth (mm)	Effective Depth (mm)	Rainfall Intensity (mm/hr)	FLOW (l/s)	FLOW (l/s/ha)	
	0.13	0.005	23.8	29.3	183.1	17.0	531.7	
	0.25	0.010	36	37.6	144.0	13.4	418.2	
	0.5	0.021	41.87	43.7	83.7	7.8	243.2	
	0.75	0.031	45.67	47.7	60.9	5.7	176.8	
	1	0.042	48.56	50.7	48.6	4.5	141.0	
	1.25	0.052	50.9	53.2	40.7	3.8	118.3	
	1.5	0.063	52.9	55.3	35.3	3.3	102.4	
	1.75	0.073	54.64	57.1	31.2	2.9	90.7	
	2	0.083	56.19	58.7	28.1	2.6	81.6	
	2.25	0.094	57.59	60.2	25.6	2.4	74.3	
	2.5	0.104	58.88	61.5	23.6	2.2	68.4	
	2.75	0.115	60.06	62.7	21.8	2.0	63.4	
	3	0.125	61.16	63.9	20.4	1.9	59.2	
	3.25	0.135	62.18	65.0	19.1	1.8	55.6	
	3.5	0.146	63.15	66.0	18.0	1.7	52.4	
	3.75	0.156	64.06	66.9	17.1	1.6	49.6	
	4	0.167	64.92	67.8	16.2	1.5	47.1	
	4.25	0.177	65.75	68.7	15.5	1.4	44.9	