

Surface Water Drainage Strategy StatementProject Title: **Spectra**Project No: **25185**

By	Date	Sheet	Client	File	Rev
FDH	May 2026	1	Kevin Sheppard	☐	A

This technical note should be read in conjunction with GAP drainage strategy layout drawing 25185-GAP-XX-XX-DR-C-9000, GAP drainage construction details drawing 25185-GAP-XX-XX-DR-C-9300 and supporting design calculations 25185-GAP-XX-XX-CA-C-9000.

SuDS Hierarchy

For sustainable best practice the aim should be to discharge surface water runoff as high up the following hierarchy of drainage options as reasonably practicable:

1. collected for non-potable use – as the site is an existing industrial unit and yard with limited landscaping and proposals includes an extension only with no additional welfare facilities it is considered unsuitable to collect water for re-use.
2. infiltrated to ground – infiltration testing was undertaken and found solid clay ground conditions with no water loss in the trial pit over a 4-hour period, therefore concluded infiltration is not viable for the site.
3. discharged to an above ground surface water body – there are no surface water bodies in close proximity to the site and connection is considered unsuitable.
4. discharged to a surface water sewer, or another piped surface water drainage system – Wessex Water asset records show a private surface water sewer in Quartermaster Road and the CCTV survey suggests the existing surface water network utilises this connection and is considered suitable.
5. discharged to a combined sewer – Wessex Water asset records show no combined sewers in close proximity to the site and connection is considered unsuitable.

A 'SuDS Approach' has been adopted when preparing this strategy, using the highest viable priority level options to discharge surface water runoff. The drainage strategy proposes a connection to the existing on-site private surface water sewer which discharges to the private network in Quartermaster Road. This proposal maintains the existing surface water drainage outfall and there is no change to the existing drainage approach.

Greenfield Runoff Rate

The pre-development site has an existing surface water discharge location which is to be retained with no change. The extension and associated yard area will be served via a new surface water drainage network upstream of the existing discharge location; therefore, a catchment-based approach has been utilised to ensure the discharge rate for the individual catchment (circa 900m²) of the extension and associated yard is not assessed based on the whole site area and discharge rate exceeded.

The greenfield runoff rate has been calculated using the individual catchment area and parameters shown in Figure 1.

Pre-development discharge

Site Makeup	Greenfield	OK
Greenfield Method	IH124	Cancel
Positively Drained Area (ha)	0.090	
SAAR (mm)	746	Load
Soil Index	4	
SPR	0.47	
Region	8	
Betterment (%)	0	
	Calc	
QBar (l/s)	0.5	

Return Period (years)	Growth Factor	Q (l/s)
1	0.78	0.4
30	1.98	0.9
100	2.42	1.1

Note: FEH point descriptors can be downloaded from fehweb.ceh.ac.uk

Only XML file format can be used

FEH-22 is the current FEH data and this should be used for new development

ReFH2 legacy – Doesn't contain the new BFIHOST19 descriptor
 ReFH2 – Contains the new BFIHOST19 descriptor

Figure 1: Greenfield Runoff Rate

To achieve the greenfield runoff rates for all storm events this resulted in a 24mm orifice, which is considered very small and manufacturers typically recommend 50mm orifices due to risks of blockage and on-going maintenance and performance. A minimum orifice of 50mm resulted in discharge rate of 3.3l/s for the 1 in 100-year +45%CC, therefore a flow control device has been introduced to give a maximum post-development discharge rate of 1l/s for all storm events which provides a betterment on the greenfield 1 in 100-year rate.

Table 1: Summary of Post-Development Discharge Rates

Rainfall Event	Post-Development Discharge Rate (l/s)
1 in 1-year	0.8
1 in 30-year +40%CC	0.8
1 in 100-year +45%CC	1.0

Surface Water Drainage Strategy

Surface water runoff from the roof for the new extension (circa 345m²) will be captured via rainwater downpipes and conveyed via a below ground pipe network and manholes to the existing on-site private surface water manhole outfall.

The yard area adjacent the extension was previously served by an existing drainage channel which is now redundant due to the extension location. Surface water runoff from the yard (circa 555m²) will be captured via a new drainage channel along the front of the extension and conveyed via a below ground pipe network and manholes to the existing on-site private surface water manhole outfall.

The off-site discharge rate will be restricted to 1l/s through the use of a hyrdobrake flow control device. Surface water storage is provided through the use of an attenuation tank which has been sized to achieve the maximum discharge rate of 1l/s and mitigate flooding up to the 1 in 100-year rainfall event with uplift for climate change. In accordance with National Standards for Sustainable Drainage Table S3.1, a factor of safety has been applied to this figure; the selected factor for this design is 3, representing inconvenience for a drained area of between 100m² and 1000m².

Drainage design software 'Flow', by Causeway Ltd., has been used to prepare the drainage strategy layout using the following criteria:

Rainfall Methodology	FEH-22
Return Period (pipe design)	100% AEP
Return Period (system design)	100% AEP, 3.3% AEP and 1% AEP
Climate Change	40% for 3.3% AEP, 45% for 1% AEP
Storm Durations	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1,440, 2,160 & 2,880 minutes
Cv	1.00

The drainage strategy has been designed to accommodate 1% AEP event with uplift for climate change, below ground. The calculations demonstrate there is no flooding for all rainfall events up to the 1% AEP +45% climate change. The maximum water level within the drainage network is 51.336 which is below the existing FFL of 51.42. The existing ground levels are being maintained, and they are above the 1% AEP +45% climate change maximum flood level, therefore, site is concluded to not be at risk of flooding.

Exceedance Routes

The proposals include no change to existing ground levels; therefore, the pre- and post-development exceedance routes are maintained and there is no increase of change in flood risk on or off-site.

Moreover, the introduction of attenuation and a flow control device restricting the off-site discharge rate for the extension and associated yard to a maximum discharge rate of 1l/s provides a betterment on the current unrestricted discharge and improves the risk of flooding off-site

In the event of rainfall exceeding 1% AEP +45% climate change, surface water would break out from the lowest point in the network, which is the existing surface water manhole, reference EX SWMH6. From here the excess surface water runoff would follow the existing ground levels and overland flow route towards the northwest of the site where surface water runoff will be intercepted by the existing drainage channel. Surface water will either be discharged directly into the existing surface water drainage network or pond temporarily on hard surfacing areas until the rainfall event subsides and the network has capacity.

Water Quality

Table 4.3 of CIRIA C753 defines the minimum water quality management for discharges to receiving surface waters. For this site, this will be the existing private surface water sewer. Referring to table 4.3 from CIRIA C753, the land use is classified as 'commercial yard'. On this basis, a simple index approach can be adopted.

TABLE 4.3 Minimum water quality management requirements for discharges to receiving surface waters and groundwater			
Land use	Pollution hazard level	Requirements for discharge to surface waters, including coasts and estuaries ²	Requirements for discharge to groundwater
Residential roofs	Very low	Removal of gross solids and sediments only	
Individual property driveways, roofs (excluding residential), residential car parks, low traffic roads (eg cul de sacs, home zones, general access roads), non-residential car parking with infrequent change (eg schools, offices)	Low	Simple index approach ³ <i>Note: extra measures may be required for discharges to protected resources¹</i>	
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	Simple index approach ³ <i>Note: extra measures may be required for discharges to protected resources¹</i>	Simple index approach ³ <i>Note: extra measures may be required for discharges to protected resources¹</i> In England and Wales, Risk Screening ⁴ must be undertaken first to determine whether consultation with the environmental regulator is required. In Northern Ireland, the need for risk screening should be agreed with the environmental regulator.

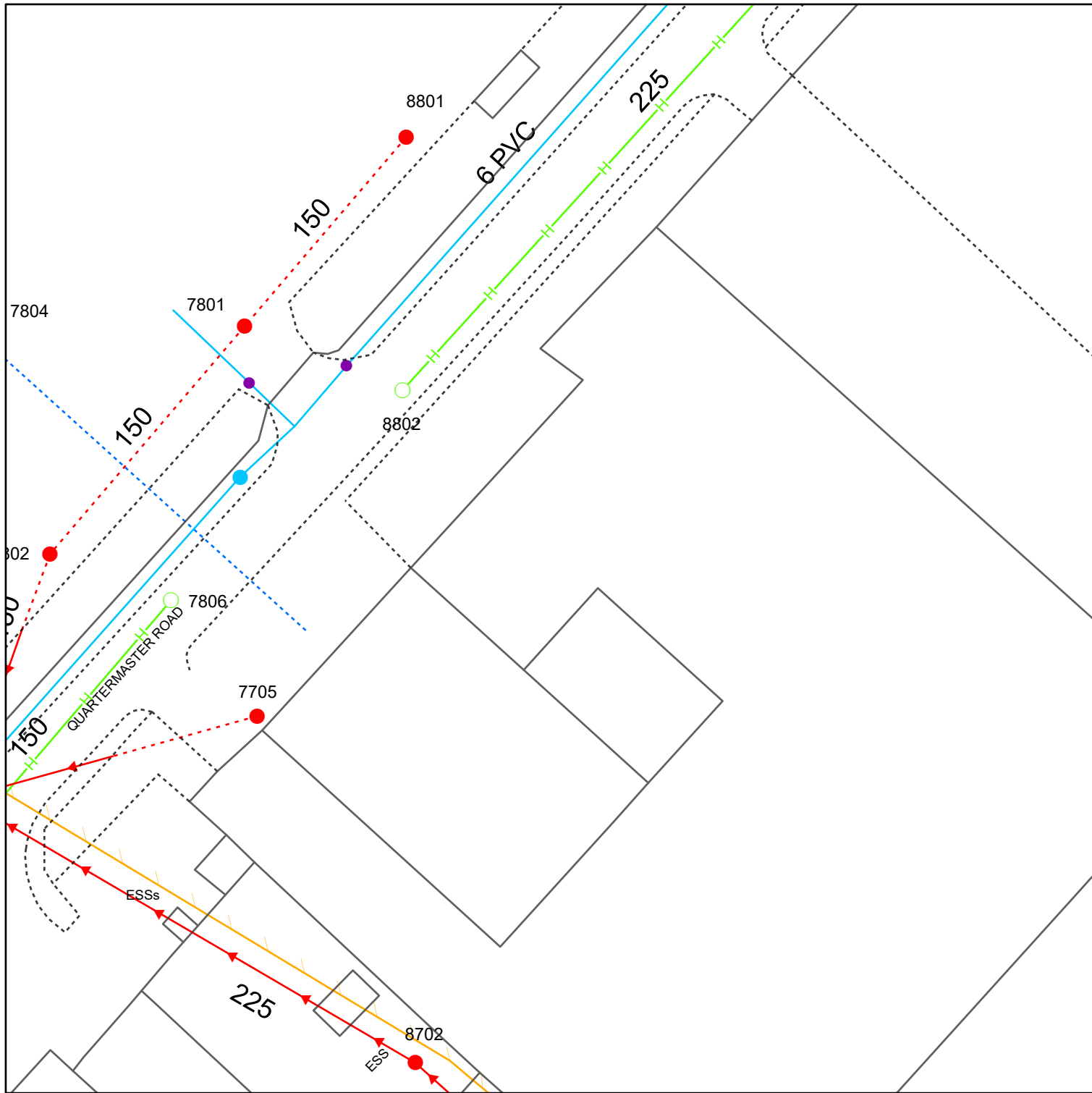
Table 26.2 of CIRIA C753 defines the pollution hazard indices for the proposed land use for total suspended solids (TSS), metals and hydrocarbons.

TABLE 26.2 Pollution hazard indices for different land use classifications				
Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7

For this development leaf guards on rainwater downpipes, silt traps and sump units on drainage channels with maintenance access and catchpit manholes with maintenance access for attenuation will be used to remove any gross solids and sediments before surface water from the roof and yard is discharged into the existing private surface water sewer, which satisfies the requirements in Table 4.3 from CIRIA C753.

Appendix A – Wessex Water Asset Map

Wessex Water Network Map



Reproduced from the Ordnance Survey map with the permission of the Controller of His Majesty's Stationery Office. © Crown copyright and database rights (2025) OS AC0000848304

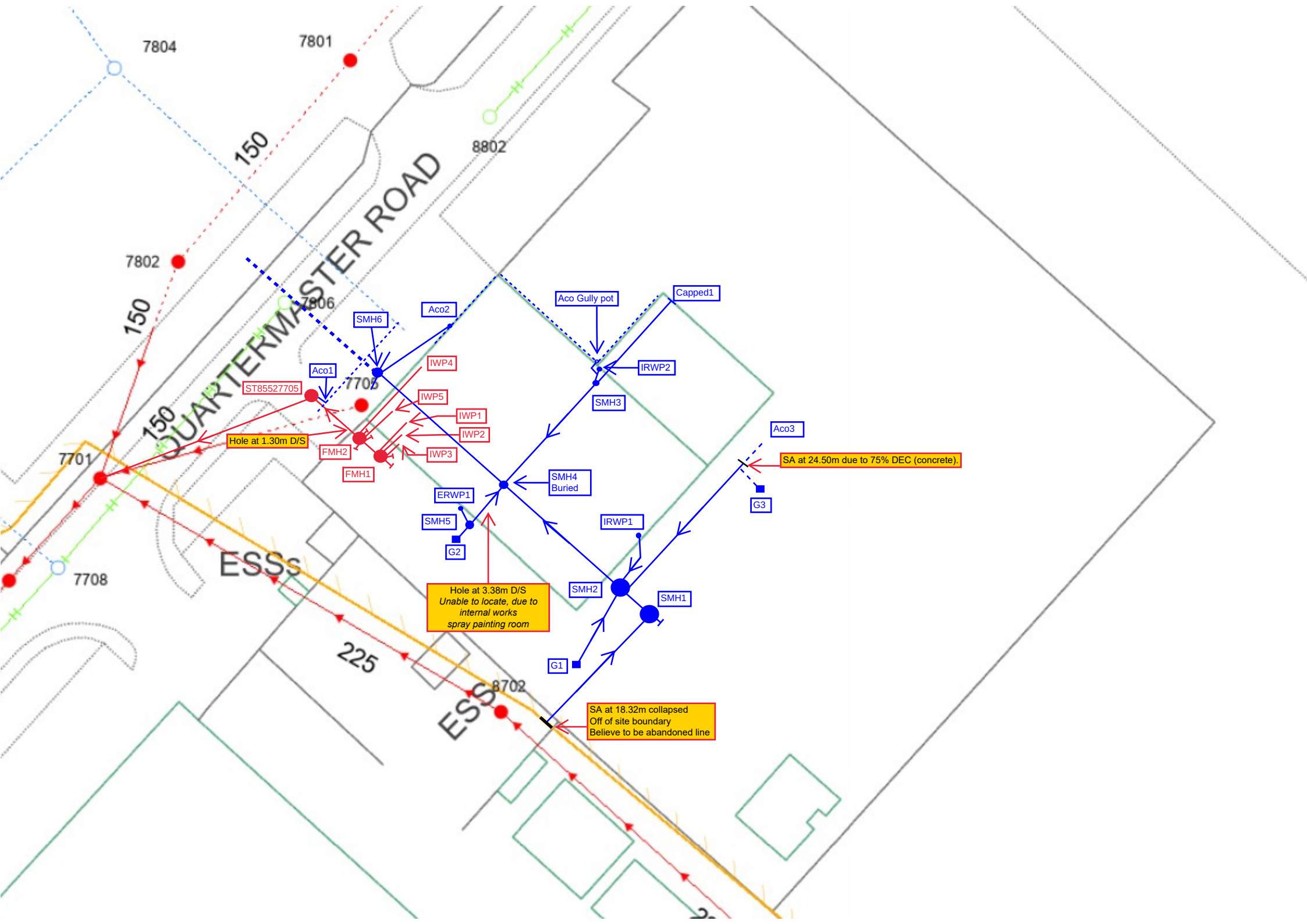
WATER MAINS		SEWERS		STRATEGIC		PUBLIC		PRIVATE		SECTION 104		OTHER WESSEX PIPES		NON-WESSEX / UNKNOWN	
	Distribution		Foul		Surface								Rising Mains		Private Rising Mains
	Washout		Combined										Standby Rising Mains		Culverted Watercourse
	Raw Water		Abandoned										EDM		Highway Drain
	Abandoned												Overflow		Use Unknown
	Private												Syphon		Status Unknown
Colours generally indicate the use of the sewer/drain (i.e Red - Foul, Dark Blue - Surface, Magenta - Combined/Dual Use, Light Green - Highway Drain, Mid Green - Overflow). Some styles of line and symbol are shown on the key in sample/typical colours.															
FITTINGS		STRUCTURES													
	Hydrant		Manhole - Foul		Pumping Station - Surface										
	Other		Manhole - Surface		Pumping Stn - Foul/Combined										
			Manhole - Combined		Gully										
			Inlet		Vent Column										
			Outfall		Rodding Eye										
			Lamphole		Catchpit										
			Bifurcation - Foul		Flushing Chamber										
			Bifurcation - Surface		Soakaway										
			Bifurcation - Combined		Non Return Valve										
			Combined Sewage Overflow		Air Valve										
					Hatch Box										
					Washout										
OTHER STRUCTURES Attenuation Tank Chamber Storage Tank Interceptor															
Wessex Water YTL GROUP															

Information in this map is provided for identification purposes only. No warranty as to accuracy is given or implied. The precise route of pipe work may not exactly match that shown. Wessex Water does not accept liability for inaccuracies. Sewers and lateral drains adopted by Wessex Water under the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011 are to be plotted over time and may not yet be shown. In carrying out any works, you accept liability for the cost of any repairs to Wessex Water apparatus damaged as a result of your works. You are advised to commence excavations using hand tools only. Mechanical digging equipment should not be used until pipe work has been precisely located. If you are considering any form of building works and pipe work is shown within the boundary of your property or a property to be purchased (or very close by) a surveyor should plot its exact position prior to commencing works or purchase. If you are proposing to build over or near Wessex Water's apparatus you should contact the Developer Services Team, tel: 01225 526633 or e-mail: developer.enquiries@wessexwater.co.uk to discuss your proposals. Details of assets within Wessex Water's land ownership are unavailable through this service.

Date: 21/03/2025
Centre: 385827E, 152817N
Scale: 1:625
(when printed at A4 size)



Appendix B – CCTV Survey



Appendix C – Greenfield Runoff Rate

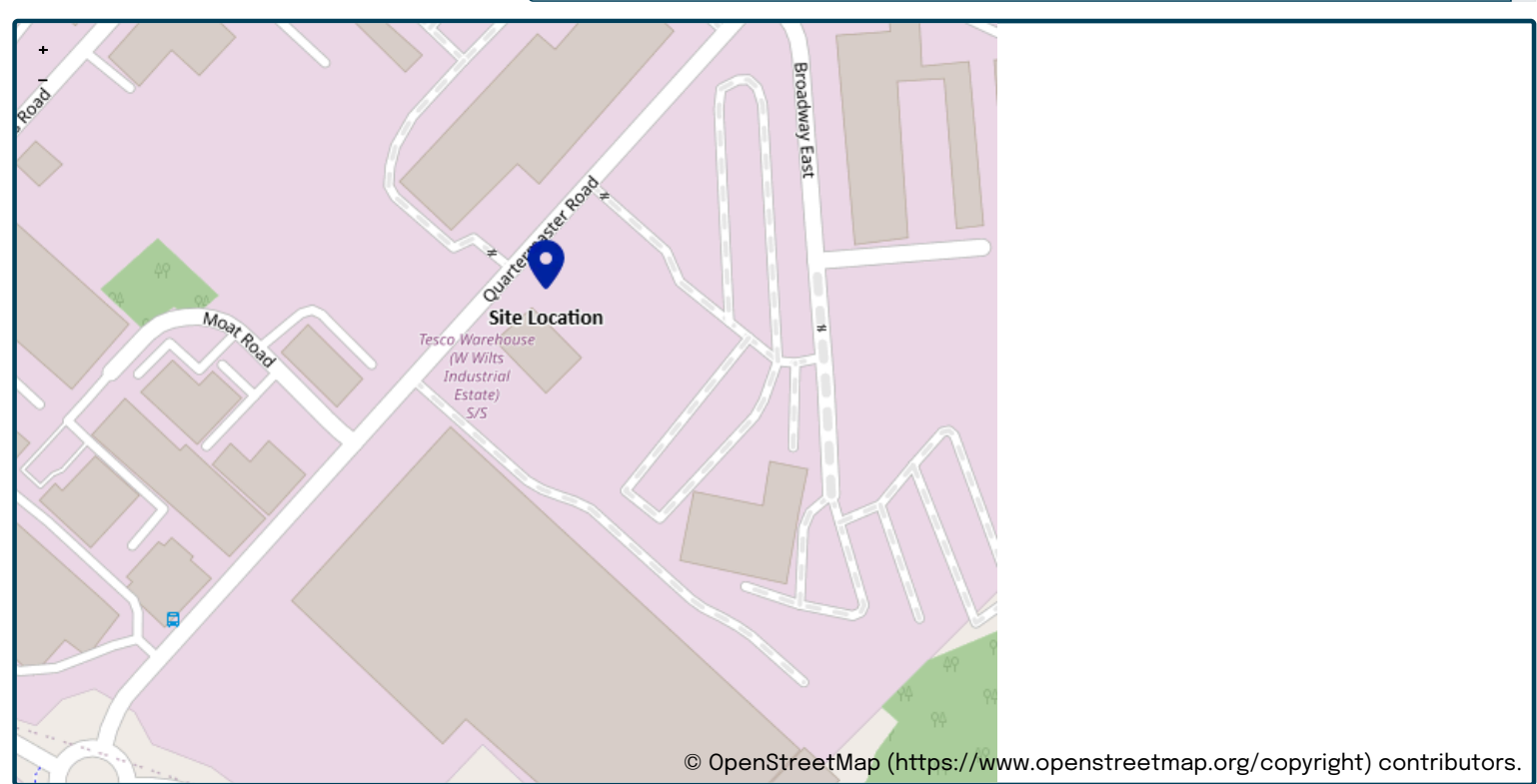
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	06/05/2026
Calculated by	FDH
Reference	25185 - Spectra
Model version	2.2.3

Location

Site name	Spectra
Site location	9 Quartermaster Road



Site easting (British National Grid)	385823
Site northing (British National Grid)	152811

Site details

Total site area (ha)	0.09	ha
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Greenfield runoff

Method

Method	IH124
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IH124

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	746	mm	746
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	0.5	l/s	

Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	8		8
1 year growth factor	0.78		
2 year growth factor	0.93		
10 year growth factor	1.49		
30 year growth factor	1.95		
100 year growth factor	2.43		
200 year growth factor	2.78		

Results

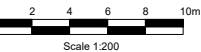
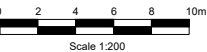
Method	IH124	
Flow rate 1 year (l/s)	0.4	l/s
Flow rate 2 year (l/s)	0.4	l/s
Flow rate 10 years (l/s)	0.7	l/s
Flow rate 30 years (l/s)	0.9	l/s
Flow rate 100 years (l/s)	1.1	l/s
Flow rate 200 years (l/s)	1.3	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com) (<https://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 [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate 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, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Appendix D – Surface Water Drainage Strategy Layout



Refer to Architects / M&E Drawings for exact positions of internal connections & RWP's
Unless specified otherwise, all Inspection chambers and catchpits are to be 450Ø.
Unless otherwise noted all drainage to be 100Ø.

- Cover levels have been based on existing ground levels taken from the topographical survey, proposed levels to be confirmed by the architect.
- RWP exact locations to be confirmed by the architect.
- Existing hard standing area served by the existing rain water drainage channel has been estimated based on layouts, exact areas to be confirmed.
- The CCTV survey didn't identify invert levels. It is recommended invert levels are determined to allow invert level connection feasibility.

NOT FOR CONSTRUCTION

Drawing Status: **S4 - Suitable for Approval**

Project-Originator-Zone-Level-Type-Role	Drawing No.:	Revision:
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 **Tree Roots** - No arboricultural information has been made available, therefore there is the possibility that root protection areas will impose restrictions on drainage locations.

REFERENCE	DETAILS
	Existing Services - Services to be located prior to construction and care taken during works to prevent damage to existing services. Existing drainage to be diverted where required and recommended remedial works undertaken to ensure correct functioning and maintenance of drainage systems.
	Ground Conditions & Temporary Works - In the absence of a Site Investigation Report for trenching it is assumed ground conditions in this area are suitable without requiring temporary support during construction. Ground conditions to be confirmed prior to construction.
	Tree Roots - No arboricultural information has been made available, therefore there is the possibility that root protection areas will impose restrictions on drainage locations.

Appendix E – Drainage Construction Details

General Notes

- These drawings are to be read in conjunction with all relevant Architect's and Engineer's drawings and specifications.
- Except where specific dimensions are shown on these drawings, all setting out shall be in accordance with the architects drawings and specifications. Any discrepancy between these drawings and the architects drawings or the actual site dimensions should be referred to the engineer immediately and confirmed in writing. The contractor is responsible for the accuracy of all dimensions and the setting out.
- Do not scale from these drawings. If in doubt, ask.
- All dimensions are in millimeters unless noted otherwise.
- All proprietary materials to be in accordance with manufacturers specifications and to Engineer's approval.
- All proprietary CDP elements shown on the drawings should be treated as indicative and are subject to detailed design by specialist manufacturer/supplier. The contractor should make suitable allowance for third party design/detailing and potential impact on the permanent work design.

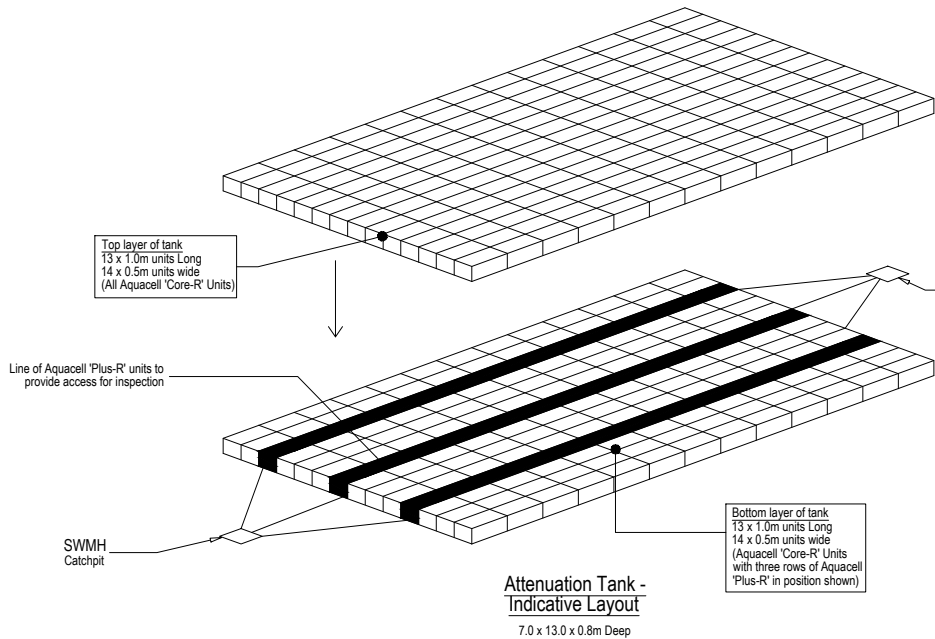
THIS DRAWING IS FOR
PLANNING PURPOSES ONLY

This drawing has been prepared for submission to fulfil planning permission requirements and is not to be used for construction in anyway. Some elements may still be subject to amendment during scheme development, post planning approval.

Godsell Arnold Partnership Ltd accept no liabilities if works are constructed based on this drawing.

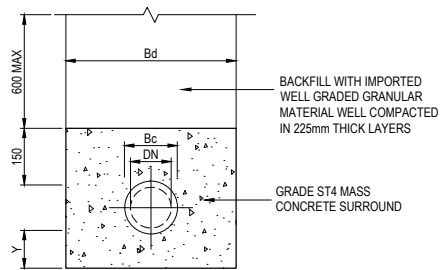
Godsell Arnold Partnership Ltd.will not be able to assist in any technical questions arising if any construction proceeds based on this planning drawing.

NOT FOR CONSTRUCTION

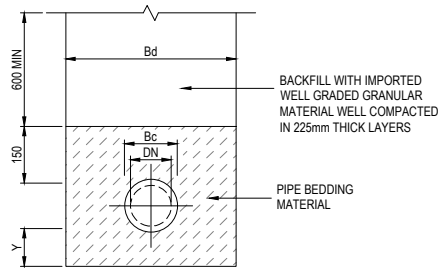


Attenuation Tank -
Indicative Layout

7.0 x 13.0 x 0.8m Deep



CLASS 'Z' BEDDING DETAIL
(CONCRETE BED & SURROUND)

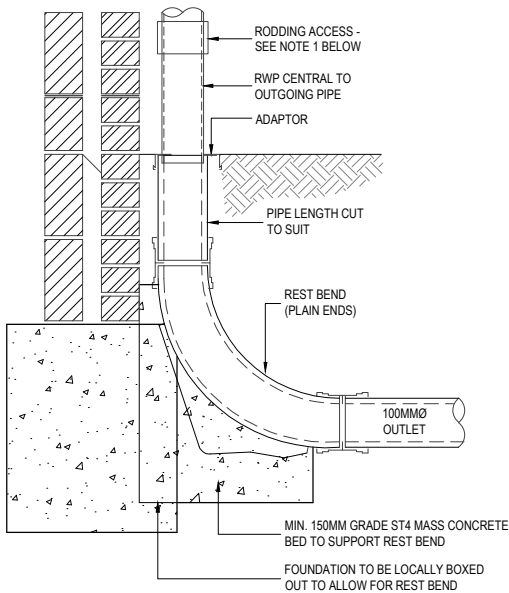


CLASS 'S' BEDDING DETAIL
(GRANULAR BED & SURROUND)

NOMINAL MAXIMUM AGGREGATE SIZE (mm) B.S. 882 GRADING		
PIPE BORE (mm)	AGGREGATE	S BEDDING CLASS B
100	Single size graded	10
150	Single size graded	10 or 14 14 to 5
225	Single size graded	10, 14 or 20 14 to 5 or 20 to 5
300	Single size graded	10, 14 or 20 14 to 5 or 20 to 5

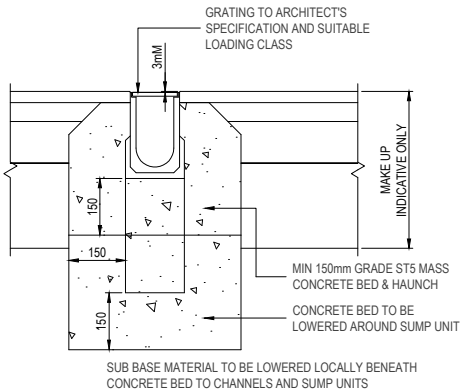
NOMINAL INTERNAL Ø DN (mm)	ASSUMED EXTERNAL Ø Bc (mm)	ASSUMED MAX. PERMISSIBLE TRENCH WIDTH Bd (mm)	Y (mm)
100	130	550	100
150	190	600	100
225	280	700	100
300	388	750	125

PIPE BEDDING TABLES



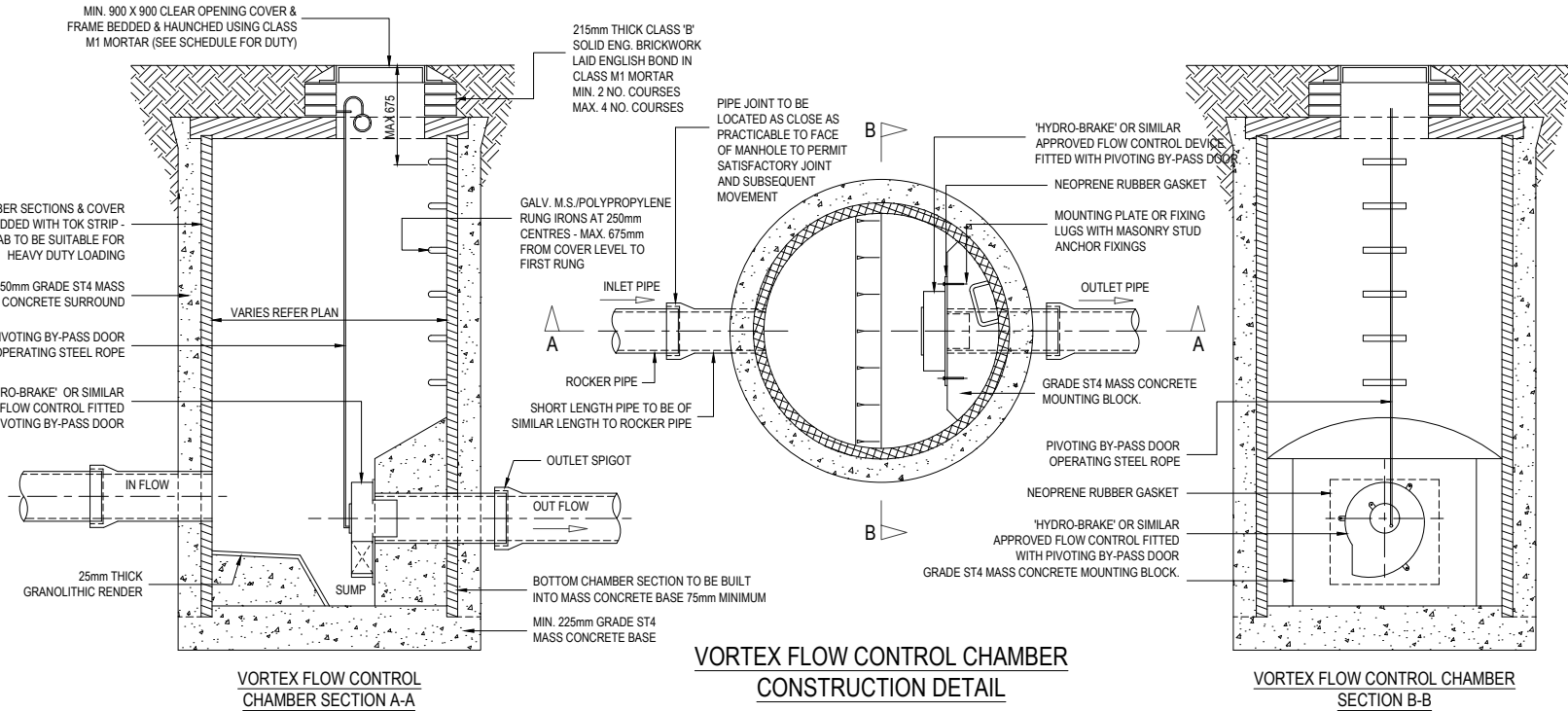
RWP WITH 100Ø OUTLET
CONNECTION DETAIL

NOTE:
1. WHERE THE RWP CONNECTS TO THE SW NETWORK VIA A JUNCTION, RODDING ACCESS MUST BE PROVIDED.

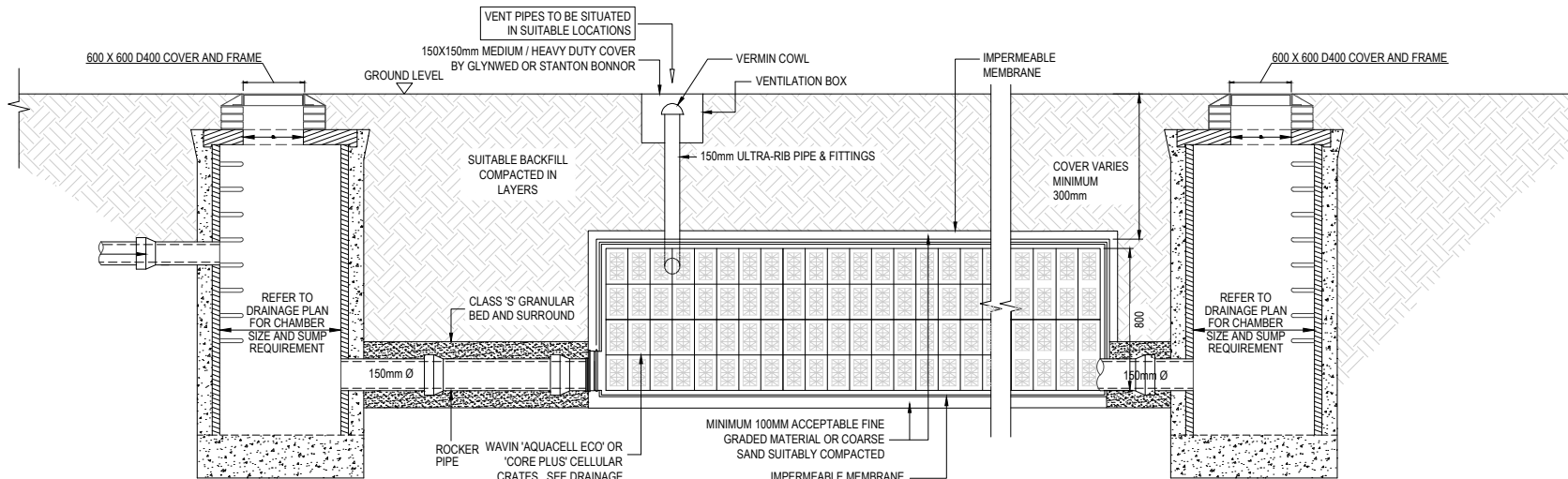


DRAINAGE CHANNEL
CONSTRUCTION DETAIL

NOTES:
1. SUMP UNIT TO BE PROVIDED AT DISCHARGE POINT WITH A 100mm OUTLET.
2. EXPANSION JOINT TO BE PROVIDED @ 5m C/C'S ALONG LENGTH OF CHANNEL ACROSS WHOLE WIDTH OF CONCRETE AS PER MANUFACTURER'S RECOMMENDATIONS.
3. THE CHANNEL MUST NOT BE TRAFFICKED UNTIL AFTER THE WEARING COURSE HAS BEEN LAID AND COMPACTED.

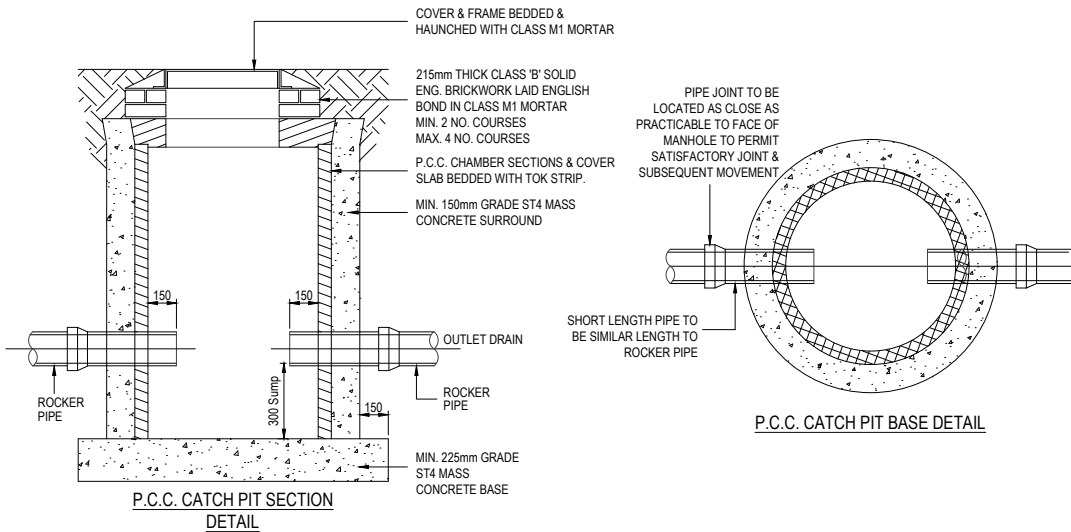


VORTEX FLOW CONTROL CHAMBER
CONSTRUCTION DETAIL

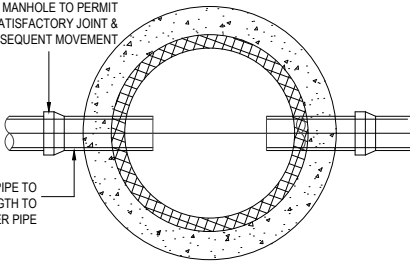


WAVIN AQUACELL ATTENUATION TANK

NOTE:
1. THIS DETAIL IS FOR FOR ARRANGEMENT USE ONLY AND DOES NOT REFLECT THE ACTUAL ON SITE LEVELS.
2. REFER TO DRAINAGE PLANS FOR PIPE ARRANGEMENTS, TANK SIZES AND LEVELS.



PCC CATCH PIT
CONSTRUCTION DETAIL



P.C.C. CATCH PIT BASE DETAIL

PS1	28.05.28	Preliminary issue.	FDH	LJW	FDH
Rev	Date	Revision Description	Drawn	Chkd	Issued

Drawing Status:

S4 - Suitable for Approval

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Client: KEVIN SHEPPARD

Project: SPECTRA

Drawing Title: DRAINAGE CONSTRUCTION DETAILS

Scale: N.T.S. Drawn: FDH Checked: LJW

Project-Originator-Zone-Level-Type-Role Drawing No: Revision:

25185-GAP-XX-XX-DR-C

9300

P01

Appendix F – Surface Water Drainage Calculations

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	0.600
Return Period (years)	1	Maximum Rainfall (mm/hr)	999.9	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	✓
CV	1.000	Connection Type	Level Soffits		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	1.200		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Sump (m)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
✓ 1	0.072	5.00	51.430	Manhole	Adoptable	1200	0.300	104.388	-712.554	1.450	49.980
✓ 2	0.018	5.00	51.360	Manhole	Adoptable	1200	0.300	92.927	-725.069	1.420	49.940
✓ EX6			51.280	Manhole	Adoptable	1200	0.000	79.100	-740.167	1.243	50.037

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)	Rain (mm/hr)
? 1.000	1	2	16.970	0.600	Colebrook-White	50.280	50.240	0.040	424.2	150	Circular	5.59	27.3
✓ 1.001	2	EX6	20.473	0.600	Colebrook-White	50.240	50.037	0.203	100.9	150	Circular	5.93	26.4

Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Minimum Depth (m)	Maximum Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
? 1.000	1	2	0.482	8.5	7.1	1.000	0.970	0.970	1.000	0.072	0.0	105	0.538
✓ 1.001	2	EX6	1.000	17.7	8.6	0.970	1.093	0.970	1.093	0.090	0.0	74	0.992

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	16.970	424.2	150	Circular	51.430	50.280	1.000	51.360	50.240	0.970
1.001	20.473	100.9	150	Circular	51.360	50.240	0.970	51.280	50.037	1.093

Link	US Node	Dia (mm)	Sump (m)	Node Type	MH Type	DS Node	Dia (mm)	Sump (m)	Node Type	MH Type
1.000	1	1200	0.300	Manhole	Adoptable	2	1200	0.300	Manhole	Adoptable
1.001	2	1200	0.300	Manhole	Adoptable	EX6	1200	0.000	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Sump (m)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
1	104.388	-712.554	51.430	1.450	1200	0.300	Manhole	Adoptable	 0	1.000	50.280	150	Circular
2	92.927	-725.069	51.360	1.420	1200	0.300	Manhole	Adoptable	 1	1.000	50.240	150	Circular
									 0	1.001	50.240	150	Circular
EX6	79.100	-740.167	51.280	1.243	1200	0.000	Manhole	Adoptable	 1	1.001	50.037	150	Circular

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Rate(s)	x
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0	Check Discharge Volume	x
Summer CV	1.000	Skip Steady State	x	Starting Level (m)			

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440	2160	2880
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	45	0	0
30	40	0	0				

Node 2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	50.240	Product Number	CTL-SHE-0047-1000-1000-1000
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	3.0	Invert Level (m)	50.260
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	91.0	91.0	0.800	91.0	118.1	0.801	0.0	118.1

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	1	240	50.372	0.092	2.4	7.9955	0.0000	OK
360 minute summer	2	240	50.371	0.131	0.8	0.1487	0.0000	OK
360 minute summer	EX6	240	50.058	0.021	0.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	1	1.000	2	0.7	0.107	0.083	0.2347	
360 minute summer	2	1.001	EX6	0.8	0.502	0.044	0.0316	16.0

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	1	352	50.852	0.572	6.7	50.0502	0.0000	SURCHARGED
360 minute winter	2	352	50.852	0.612	1.5	0.6919	0.0000	SURCHARGED
15 minute summer	EX6	121	50.059	0.022	0.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	1	1.000	2	0.8	0.051	0.091	0.2988	
360 minute winter	2	1.001	EX6	0.8	0.511	0.047	0.0330	25.3

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	1	464	51.336	1.056	7.2	68.6254	0.0000	FLOOD RISK
480 minute winter	2	464	51.335	1.095	1.6	1.2386	0.0000	FLOOD RISK
480 minute winter	EX6	464	50.062	0.025	1.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	1	1.000	2	0.9	0.054	0.110	0.2988	
480 minute winter	2	1.001	EX6	1.0	0.546	0.058	0.0387	33.9