2595-PHG-XX-XX-RP-C-0003

Residential Development at

TRASTON ROAD, NEWPORT

Bron Afon / Wellspring

Drainage Strategy

3rd Issue

June 2026

107 Cowbridge Road East

CARDIFF, CF11 9AG

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DOCUMENT CONTROL

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Client	Bron Afon / Wellspring
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Prepared by	Checked by	Approved by
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Issue History

Issue	Issue date	Details	Authorized by	Position
1st	22/10/2025	First Issue	Tony Owens-Redwood	Civil Engineer
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1. Introduction

PHG Consulting have been commissioned to produce a drainage strategy in support of a planning application for a residential development off Traston Road, Newport.

The drainage strategy will comply with local and national standards and be updated through the design process to achieve full SAB approval.

Planning History

As stated, the development site currently has planning approval, application 05/0287 was granted with conditions in August 2012, with conditions 3 and 16 relating to surface water drainage and flood risk. These are replicated below, with the full approval notice included as Appendix A.

(3) No development shall commence until full details of the surface water drainage system has been submitted to and approved in writing by the Local Planning Authority. The details shall be implemented fully in accordance with the approved scheme prior to the first occupation of any dwelling.

Reason: To ensure adequate drainage is provided.

(16) The Finished Floor Levels at ground floor level of the dwellings hereby approved shall be constructed in accordance with the levels shown on the plan labeled (sic) (Figure 4), contained within the correspondence dated 24th October 2011.

Reason: To reduce the risk of flooding.

Subsequent Condition Discharge applications were submitted for various conditions on the site, including Condition 3. Planning application 17/0382 was granted partial discharge of the surface water related condition, with planning application 17/0639 gaining approval for the surface water condition. The decision notices for these two applications are included at Appendix A.

The approval of planning application 17/0639 satisfies Condition 3.

Condition 16 requires the FFLs of the site to be constructed in line with the levels stipulated in the approved FCA (dated July 2009) and referred to in the Note to Applicant (Note 1) of the 05/0287 approval.

Existing Site

The existing site is brownfield and covers an area of 0.77 ha. The site is located just off Traston Lane, Newport, Wales, at the National Grid reference ST337863. The site location is presented in Figure 1 below.

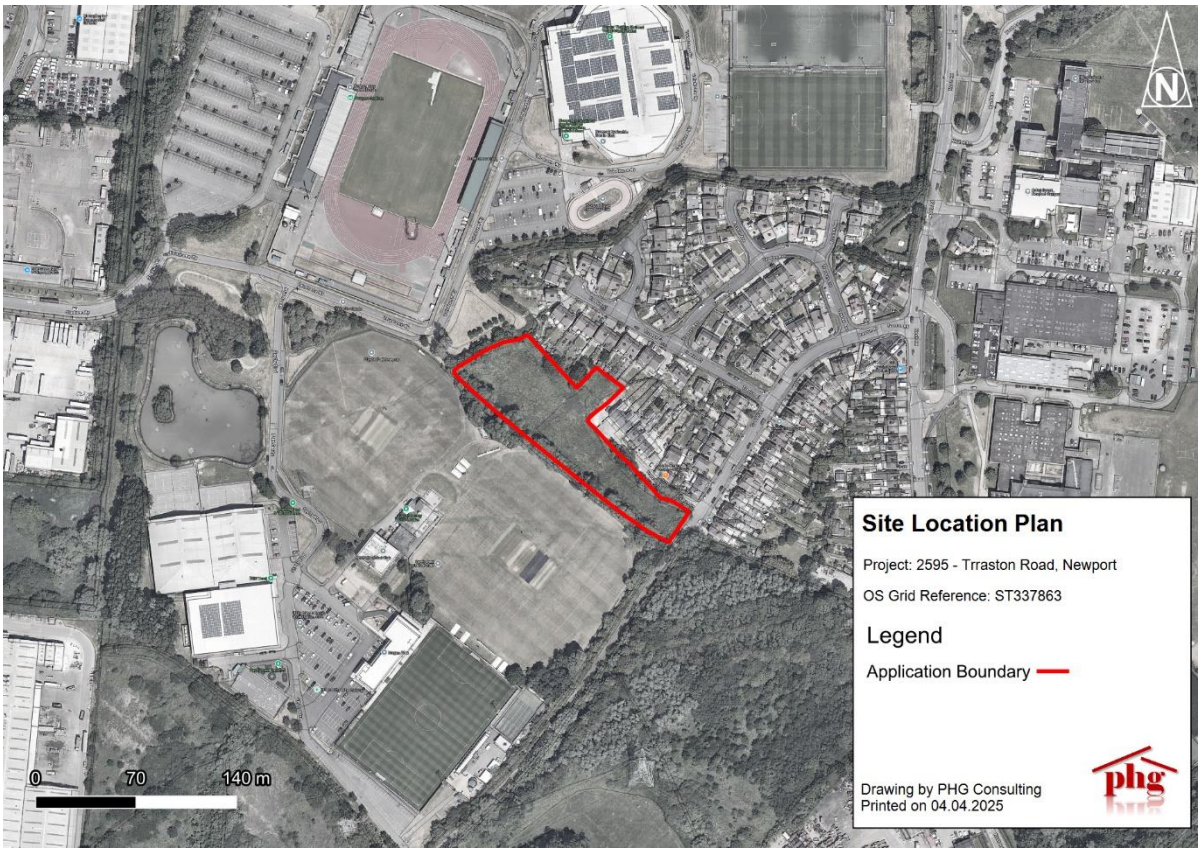

Figure 1. Site Location Plan. OS Grid Reference ST337863

Development Proposal

The development site has previously received planning approval, under the application ref. 05/0287. It was granted with conditions in August 2012, with conditions 3 and 16 relating to surface water drainage and flood risk.

The proposed development will involve construction of 26 residential units along with associated infrastructure, including sustainable drainage. The latest architect plan is shown in Figure 2 below.

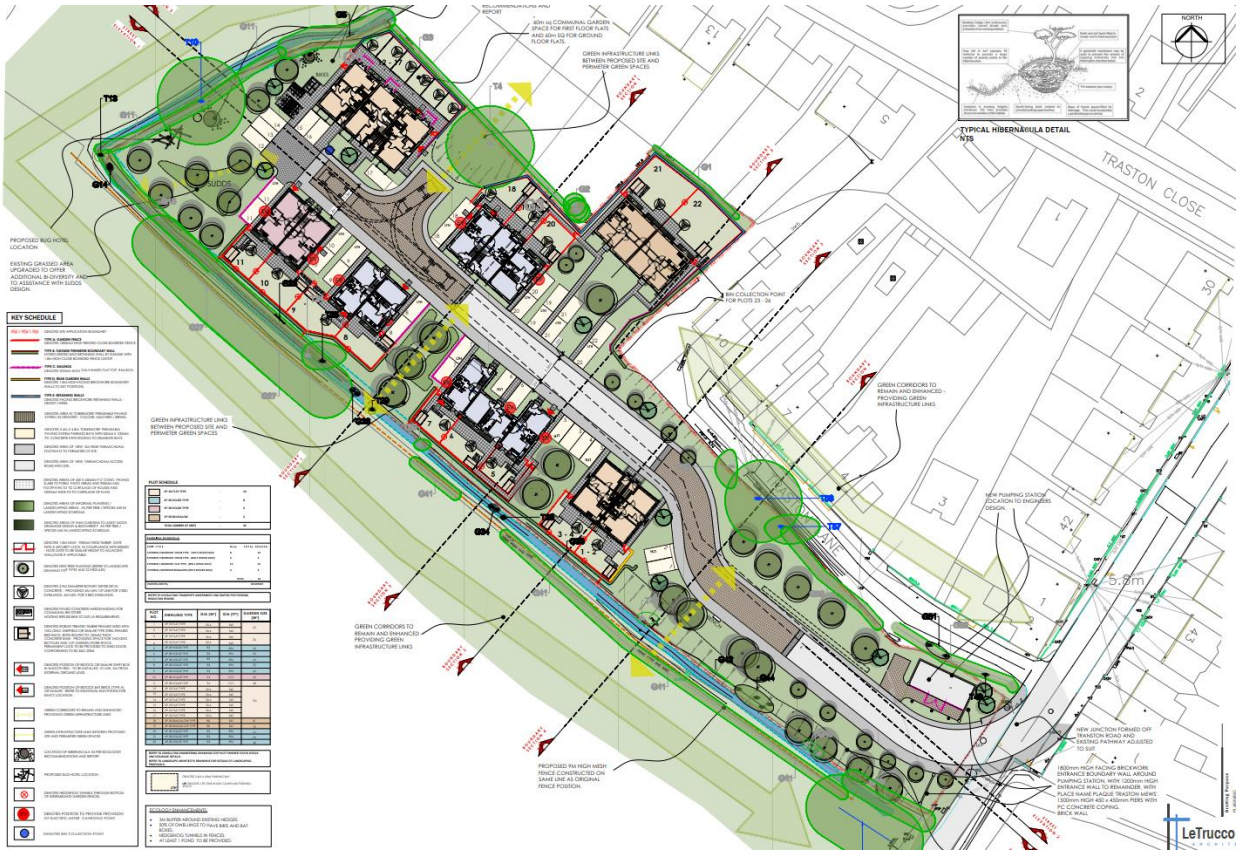

Figure 2. Proposed Architect Plan

2. Drainage Strategy

Existing Drainage Features

The site is bordered by an existing rhyne system along its western and northern boundaries. Surface water runoff from the greenfield site currently drains overland into these surrounding rhynes.

Foul Drainage

A drainage survey of the surrounding area has been completed. Due to the site's levels and the elevation of the existing drainage network, it is not possible to make a gravity connection to the public sewer.

As a result, the proposed design includes an adoptable foul water pumping station, designed in accordance with Sewers for Adoption and the relevant Dŵr Cymru Welsh Water (DCWW) addendum. The foul drainage system serving the development will be offered to DCWW for adoption under a Section 104 Agreement.

Surface Water Drainage

The site lies within an area where Newport City Council acts as the Lead Local Flood Authority (LLFA). Dŵr Cymru Welsh Water (DCWW) is the statutory water and sewerage undertaker.

The original planning permission for the site was granted prior to January 2019 and therefore did not require SAB approval. However, this revised application must comply with Schedule 3 of the Flood and Water Management Act and the National Standards for Sustainable Drainage (SuDS). A Pre-SAB and Full-SAB application will be submitted to Newport City Council for review and approval.

Key Components of the Drainage Strategy

Surface Water Runoff Destination (Standard S1)

Discharge Hierarchy: Surface water runoff will be managed following the SuDS hierarchy, prioritising infiltration where feasible before discharging to surface water bodies or existing drainage systems.

Rainwater Reuse: Site-wide rainwater harvesting is not considered practical given the site's size and location. However, each plot will include a water butt for limited rainwater reuse.

Infiltration: The underlying clay soils have insufficient permeability to manage surface water infiltration effectively.

Discharge Location: Surface water runoff will therefore be discharged to the existing watercourse located at the site boundary.

Hydraulic Control (Standard S2)

Discharge Rate: The previously approved planning permission established a maximum discharge rate of 3.4 L/s, agreed with the LLFA.

Volume Control: Measures will be implemented to manage runoff volume through infiltration (where possible) and evapotranspiration.

Interception Storage: The system will capture as much as possible of the first 5 mm of rainfall.

Attenuation: Attenuation will be provided through a combination of cellular storage, bioretention systems, a basin, and oversized pipes distributed across the site.

Hydraulic Modelling: Site-specific calculations will be based on FEH rainfall data.

Runoff Coefficient: A runoff coefficient of 1.0 has been applied for hydraulic design.

Urban Creep: A 10% allowance has been applied to residential roof areas to account for future urban creep.

Climate Change: Rainfall intensities have been increased by 40% to accommodate projected climate change impacts.

Water Quality (Standard S3)

Pollution Prevention: The SuDS network will include multiple treatment stages to remove contaminants and suspended solids before discharge, ensuring no adverse impact on the receiving watercourse.

Water Quality Management: Runoff will be treated within the development boundary to protect downstream water quality.

Amenity (Standard S4) and Biodiversity (Standard S5)

Amenity Enhancement: SuDS features will be designed as multi-functional spaces that enhance the public realm and provide aesthetic and recreational benefits.

Biodiversity Gain: Native planting and habitat creation will be integrated into the SuDS design to promote local biodiversity and ecological connectivity.

Design for Maintenance and Structural Integrity (Standard S6)

Accessibility: All SuDS features will be designed to ensure safe access for routine inspection and maintenance.

Durability: Materials and structures will be selected for long-term resilience and ease of maintenance.

Site-Specific Considerations

Topography and Permeability: The site must be raised to remain flood-free. Due to the clay-rich subsoils, infiltration potential is limited, and surface discharge is therefore the preferred drainage solution.

Approval Process

A Pre-SAB application will be submitted to Newport City Council, with feedback incorporated into the detailed design. Prior to construction, a Full-SAB application will be submitted to the Sustainable Drainage Approval Body (SAB) for final review and approval. This process ensures full compliance with the national SuDS standards and supports the long-term adoption and maintenance of the drainage infrastructure.

A copy of the Preliminary Engineering Layout Drawing and supporting hydraulic calculations is included in Appendix A.

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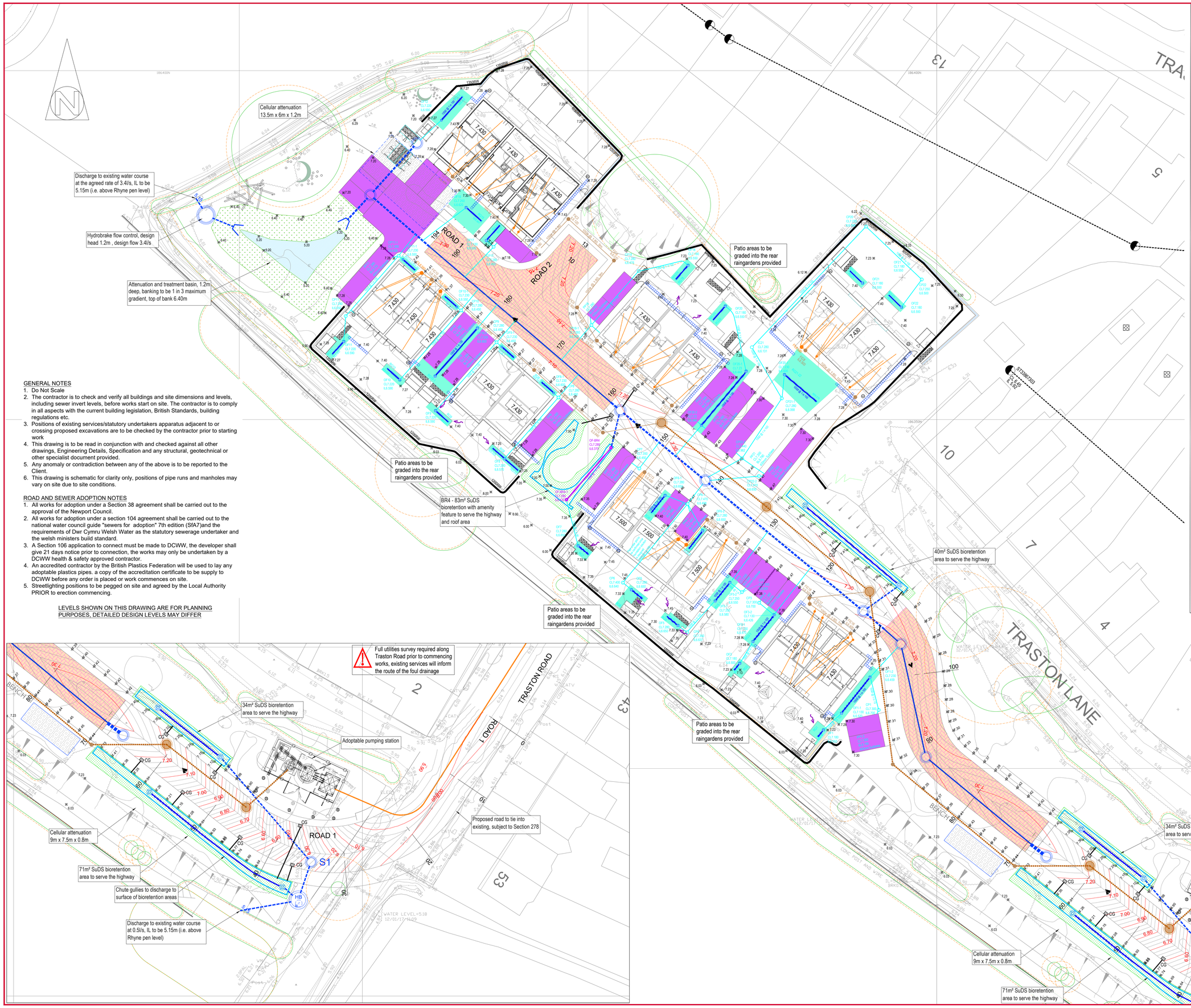
Appendix A Engineering Layout and Calculations



GENERAL NOTES

1. Do Not Scale
2. The contractor is to check and verify all buildings and site dimensions and levels, including sewer invert levels, before works start on site. The contractor is to comply in all aspects with the current building legislation, British Standards, building regulations etc.
3. Positions of existing services/statutory undertakers apparatus adjacent to or crossing proposed excavations are to be checked by the contractor prior to starting work
4. This drawing is to be read in conjunction with and checked against all other drawings, Engineering Details, Specification and any structural, geotechnical or other specialist document provided.
5. Any anomaly or contradiction between any of the above is to be reported to the Client.
6. This drawing is schematic for clarity only, positions of pipe runs and manholes may vary on site due to site conditions.

ROAD AND SEWER ADOPTION NOTES

1. All works for adoption under a Section 38 agreement shall be carried out to the approval of the Newport Council.
2. All works for adoption under a section 104 agreement shall be carried out to the national water council guide "sewers for adoption" 7th edition (SfA7)and the requirements of Dwr Cymru Welsh Water as the statutory sewerage undertaker and the welsh ministers build standard.
3. A Section 106 application to connect must be made to DCWW, the developer shall give 21 days notice prior to connection, the works may only be undertaken by a DCWW health & safety approved contractor.
4. An accredited contractor by the British Plastics Federation will be used to lay any adoptable plastics pipes. a copy of the accreditation certificate to be supply to DCWW before any order is placed or work commences on site.
5. Streetlighting positions to be pegged on site and agreed by the Local Authority PRIOR to erection commencing.

LEVELS SHOWN ON THIS DRAWING ARE FOR PLANNING PURPOSES, DETAILED DESIGN LEVELS MAY DIFFER

Legend

- Proposed Rising Main
- Proposed Hydrobrake flow control (SAB)
- Proposed Surface Water Sewer (SAB)
- Proposed Welsh Water Foul Sewer (Section 104)
- FWS 150Ø — Existing Welsh Water Combined Sewer
- Adoptable foul lateral drain (100Ø unless shown otherwise) (SFA7th)
- FIC2-1 IL112.00 — Adoptable foul inspection chamber <3.0m deep with restricted access depths over 1.2m (Refer to lateral schedule - SFA7th).
- Private foul drain (100Ø unless shown otherwise)
- IL112.00 — Private foul inspection chamber <3.0m deep with restricted access depths over 1.2m (700mm deep unless noted)
- Raingarden overflow
- SuDS Bioretention (serves highway and is adoptable by the SAB)
- SuDS Attenuation Basin
- Proposed SAB Perforated Pipe (SAB).
- Proposed SAB Raingarden underdrain (SAB).
- SuDS Permeable Paving (private only serving a single plot)
- SuDS Permeable Paving separating membrane
- Section 38 Permeable Paving (Adoptable by NCC) 80mm block, 50mm grit, subbase as noted
- SuDS Private Raingarden (private only serving a single plot)
- Precast headwall
- Proposed Cellular Attenuation
- 7.430 — Finished Floor Level (FFL) minimum 7.430m
- 1200RW — Retaining Wall
- SuDS planter
- CG — Chute gully & connection (Adoptable under Section 38)
- Raingarden underdrain 100Ø laid at 1 in 100
- G — Road gully & connection (Adoptable under Section 38)
- SuDS swale inlet
- WB — Rainwater Butt (with overflow)
- SIL175.60 — Private surface water inspection chamber <3.0m deep with restricted access depths over 1.2m.
- Catchpit
- Channel / Aco drain or similar approved (150mm wide at garage threshold)
- Permeable paving under drain
- Routing of surface water
- RE175.60 — Rodding eye (450mm deep unless noted otherwise)
- Banking (maximum 1:2)

Rev.	Date.	Details.	By.	Chk.
P08	24.06.26	Site layout amended	TOR	SJD
P07	26.04.26	Site layout amended	TOR	SJD
P06	14.01.26	Site layout amended	TOR	SJD
P05	22.10.25	Site layout amended	TOR	SJD
P04	18.06.25	External spot levels added.	SJD	TOR
P03	08.04.25	Road levels amended	TOR	SJD
P02	07.04.25	FFLs raised above the 1 in 200 yr + CC flood event	TOR	SJD
/	05.12.24	First Issue	TOR	SJD

Amendments

Client:

Bron Afon

WELLSPRING

phg

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Project:

Traston Road, Newport

Drawing title:

Engineering Layout

Drg No:	Project	Origin	Volume	Level	Type	Role	Number
2595-PHG-XX-XX-DR-C-0001							

Drawn:	Chk:	PHG Job No.	Scale(s) at A1:
TOR	SJD	2595	1:200

Date:	Suitability:	Rev:	Status:
05.12.24	Planning	P08	S1

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	1999
Site Location	GB 333706 186335 ST 33706 86335
C (1km)	0.000
D1 (1km)	0.000
D2 (1km)	0.000
D3 (1km)	0.000
E (1km)	0.000
F (1km)	0.000
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.222	4-8	0.204	8-12	0.001

Total Area Contributing (ha) = 0.427

Total Pipe Volume (m³) = 28.645

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)	Section Type	Auto Design

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)

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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)	Section Type	Auto Design
1.000	18.259	0.040	462.1	0.032	5.00	0.0	0.600	o	450	Pipe/Conduit	
1.001	25.799	0.067	386.0	0.109	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.002	16.874	0.067	252.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.003	54.783	0.083	660.0	0.117	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.004	25.430	0.057	450.0	0.095	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.005	13.187	0.029	450.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.006	18.804	0.043	437.3	0.073	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.007	6.975	0.023	303.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	

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	11.30	5.31	5.559	0.032	0.0	0.0	0.0	0.95	151.4	1.0
1.001	10.69	5.61	5.519	0.142	0.0	0.0	0.0	1.15	182.7	4.1
1.002	10.29	5.83	5.452	0.142	0.0	0.0	0.0	1.27	202.8	4.1
1.003	8.57	7.00	5.385	0.259	0.0	0.0	0.0	0.78	124.7	6.0
1.004	8.06	7.44	5.302	0.354	0.0	0.0	0.0	0.95	151.4	7.7
1.005	7.82	7.67	5.245	0.354	0.0	0.0	0.0	0.95	151.4	7.7
1.006	7.50	8.00	5.216	0.427	0.0	0.0	0.0	0.97	153.6	8.7
1.007	7.41	8.10	5.173	0.427	0.0	0.0	0.0	1.16	184.8	8.7

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	6.375	0.816	Open Manhole	1350	1.000	5.559	450				
2	6.650	1.131	Open Manhole	1350	1.001	5.519	450	1.000	5.519	450	
3	6.665	1.213	Open Manhole	1350	1.002	5.452	450	1.001	5.452	450	
4	6.680	1.295	Open Manhole	1350	1.003	5.385	450	1.002	5.385	450	
5	6.600	1.298	Open Manhole	1350	1.004	5.302	450	1.003	5.302	450	
6	6.850	1.605	Open Manhole	1350	1.005	5.245	450	1.004	5.245	450	
7	6.700	1.484	Open Manhole	1350	1.006	5.216	450	1.005	5.216	450	
8	6.300	1.127	Open Manhole	1350	1.007	5.173	450	1.006	5.173	450	
	6.100	0.950	Open Manhole	0		OUTFALL		1.007	5.150	450	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	333780.903	186276.598	333780.903	186276.598	Required	
2	333767.768	186289.280	333767.768	186289.280	Required	
3	333747.568	186305.329	333747.568	186305.329	Required	
4	333740.958	186320.855	333740.958	186320.855	Required	
5	333698.928	186355.992	333698.928	186355.992	Required	
6	333679.916	186372.880	333679.916	186372.880	Required	
7	333668.973	186380.239	333668.973	186380.239	Required	
8	333650.328	186377.799	333650.328	186377.799	Required	
	333647.476	186384.164			No Entry	

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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	450	1	6.375	5.559	0.366	Open Manhole	1350
1.001	o	450	2	6.650	5.519	0.681	Open Manhole	1350
1.002	o	450	3	6.665	5.452	0.763	Open Manhole	1350
1.003	o	450	4	6.680	5.385	0.845	Open Manhole	1350
1.004	o	450	5	6.600	5.302	0.848	Open Manhole	1350
1.005	o	450	6	6.850	5.245	1.155	Open Manhole	1350
1.006	o	450	7	6.700	5.216	1.034	Open Manhole	1350
1.007	o	450	8	6.300	5.173	0.677	Open Manhole	1350

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	18.259	462.1	2	6.650	5.519	0.681	Open Manhole	1350
1.001	25.799	386.0	3	6.665	5.452	0.763	Open Manhole	1350
1.002	16.874	252.5	4	6.680	5.385	0.845	Open Manhole	1350
1.003	54.783	660.0	5	6.600	5.302	0.848	Open Manhole	1350
1.004	25.430	450.0	6	6.850	5.245	1.155	Open Manhole	1350
1.005	13.187	450.0	7	6.700	5.216	1.034	Open Manhole	1350
1.006	18.804	437.3	8	6.300	5.173	0.677	Open Manhole	1350
1.007	6.975	303.3		6.100	5.150	0.500	Open Manhole	0

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.032	0.032	0.032
1.001	User	-	100	0.109	0.109	0.109
1.002	-	-	100	0.000	0.000	0.000
1.003	User	-	100	0.117	0.117	0.117
1.004	User	-	100	0.095	0.095	0.095
1.005	-	-	100	0.000	0.000	0.000
1.006	User	-	100	0.073	0.073	0.073
1.007	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.427	0.427	0.427

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)
1.007		6.100	5.150	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 Coeffiecient	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	5
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	FEH
Return Period (years)	2
FEH Rainfall Version	1999
Site Location	GB 333706 186335 ST 33706 86335
C (1km)	0.000
D1 (1km)	0.000
D2 (1km)	0.000
D3 (1km)	0.000
E (1km)	0.000
F (1km)	0.000
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840

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Synthetic Rainfall Details

Storm Duration (mins) 30

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: 8, DS/PN: 1.007, Volume (m³): 4.4

Unit Reference	MD-SHE-0085-3400-1200-3400
Design Head (m)	1.200
Design Flow (l/s)	3.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	85
Invert Level (m)	5.173
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	3.4
Flush-Flo™	0.363	3.4
Kick-Flo®	0.743	2.7
Mean Flow over Head Range	-	3.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.5	1.200	3.4	3.000	5.2	7.000	7.7
0.200	3.2	1.400	3.6	3.500	5.6	7.500	8.0
0.300	3.4	1.600	3.9	4.000	5.9	8.000	8.3
0.400	3.4	1.800	4.1	4.500	6.3	8.500	8.5
0.500	3.3	2.000	4.3	5.000	6.6	9.000	8.7
0.600	3.2	2.200	4.5	5.500	6.9	9.500	9.0
0.800	2.8	2.400	4.7	6.000	7.2		
1.000	3.1	2.600	4.9	6.500	7.5		

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Storage Structures for Storm

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

Invert Level (m) 6.175

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	61.0	0.200	111.7

Cellular Storage Manhole: 2, DS/PN: 1.001

Invert Level (m) 5.519 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	67.5	67.5	0.801	0.0	93.9
0.800	67.5	93.9			

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

Invert Level (m) 6.450

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	44.0	0.150	101.4

Cellular Storage Manhole: 7, DS/PN: 1.006

Invert Level (m) 5.218 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	81.0	81.0	1.300	0.0	127.8
1.200	81.0	127.8			

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

Invert Level (m) 5.173

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	81.0	1.127	251.0

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2 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 Coeffiecient 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 5
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 FEH
FEH Rainfall Version 2013
Site Location GB 333706 186335 ST 33706 86335
Data Type Point
Cv (Summer) 1.000
Cv (Winter) 1.000

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	30 Summer	2	+0%	100/120 Summer				5.640
1.001	2	30 Summer	2	+0%	100/30 Summer				5.623
1.002	3	480 Summer	2	+0%	100/30 Summer				5.577
1.003	4	480 Summer	2	+0%	100/15 Summer				5.576
1.004	5	480 Summer	2	+0%	30/240 Summer				5.575
1.005	6	480 Summer	2	+0%	30/120 Summer				5.574
1.006	7	480 Summer	2	+0%	30/120 Summer				5.573
1.007	8	480 Summer	2	+0%	30/60 Summer				5.572

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.369	0.000	0.05			5.4	OK	
1.001	2	-0.346	0.000	0.10		16	13.5	OK	

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.002	3	-0.326	0.000	0.04			6.0	OK	
1.003	4	-0.259	0.000	0.10			11.0	OK	
1.004	5	-0.177	0.000	0.11			14.1	OK	
1.005	6	-0.121	0.000	0.15			13.5	OK	
1.006	7	-0.093	0.000	0.10		341	11.2	OK	
1.007	8	-0.051	0.000	0.03			3.4	OK	

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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 Coeffiecient	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	5
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	FEH
FEH Rainfall Version	2013
Site Location	GB 333706 186335 ST 33706 86335
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	480 Winter	30	+0%	100/120 Summer				5.820
1.001	2	480 Winter	30	+0%	100/30 Summer				5.820
1.002	3	480 Winter	30	+0%	100/30 Summer				5.820
1.003	4	480 Winter	30	+0%	100/15 Summer				5.820
1.004	5	480 Winter	30	+0%	30/240 Summer				5.816
1.005	6	480 Winter	30	+0%	30/120 Summer				5.815
1.006	7	480 Winter	30	+0%	30/120 Summer				5.814
1.007	8	480 Winter	30	+0%	30/60 Summer				5.813

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.189	0.000	0.01			1.6	OK	
1.001	2	-0.149	0.000	0.04		275	5.7	OK	

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.002	3	-0.082	0.000	0.03			5.5	OK	
1.003	4	-0.015	0.000	0.09			10.5	OK	
1.004	5	0.064	0.000	0.10			13.3	SURCHARGED	
1.005	6	0.120	0.000	0.14			12.5	SURCHARGED	
1.006	7	0.148	0.000	0.12		540	13.3	SURCHARGED	
1.007	8	0.190	0.000	0.03			3.4	SURCHARGED	

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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 Coeffiecient 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 5
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 FEH
FEH Rainfall Version 2013
Site Location GB 333706 186335 ST 33706 86335
Data Type Point
Cv (Summer) 1.000
Cv (Winter) 1.000

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	480 Winter	100	+40%	100/120 Summer				6.300
1.001	2	480 Winter	100	+40%	100/30 Summer				6.300
1.002	3	480 Winter	100	+40%	100/30 Summer				6.300
1.003	4	480 Winter	100	+40%	100/15 Summer				6.300
1.004	5	480 Winter	100	+40%	30/240 Summer				6.299
1.005	6	480 Winter	100	+40%	30/120 Summer				6.297
1.006	7	480 Winter	100	+40%	30/120 Summer				6.296
1.007	8	480 Winter	100	+40%	30/60 Summer				6.295

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.291	0.000	0.03			2.8	FLOOD RISK	
1.001	2	0.331	0.000	0.07		852	9.7	SURCHARGED	

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.002	3	0.398	0.000	0.06			9.3	SURCHARGED	
1.003	4	0.465	0.000	0.17			19.0	SURCHARGED	
1.004	5	0.547	0.000	0.21			27.1	SURCHARGED	
1.005	6	0.602	0.000	0.29			26.8	SURCHARGED	
1.006	7	0.630	0.000	0.21		1122	23.7	SURCHARGED	
1.007	8	0.672	0.000	0.03			3.4	FLOOD RISK	

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