



MELKSHAM ROAD, HOLT

DRAINAGE STATEMENT

BELLWAY HOMES

10 JUNE 2026





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Date:	10 June 2026
Document Reference:	HD089-R005 B

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1.0 Introduction

- 1.1. Abley Letchford has produced this Drainage Statement with regards to Bellway Homes interests in respect of the development at Melksham Road, Holt.
- 1.2. The development proposals, promoted by Bellway Homes for this Reserved Matters (RM) submission, are for up to 90 dwellings with associated infrastructure, open space and vehicular and pedestrian access.
- 1.3. The proposed development is located to the south of Melksham Road and is approximately 3.70ha. The nearest postcode is BA14 6QP.
- 1.4. The site is currently open fields and is used as an equestrian centre.
- 1.5. This statement provides written evidence to support the RM submission and should be read in conjunction with drawings associated with those packages.
- 1.6. Outline planning permission for the Melksham Road, Holt development has gained outline planning (application ref: PL/2022/03315) at appeal on the 21st July 2023 (Decision Ref: Ref: APP/Y3940/W/23/3315432).
- 1.7. The surface and foul water drainage proposal sections have been prepared pursuant to Condition 5 of the appeal decision (Decision Ref: Ref: APP/Y3940/W/23/3315432), copied below for reference.
- 1.8. *Condition 5: Details of the surface water drainage scheme, (including sustainable drainage details), the foul water drainage scheme and timetables for their implementation shall be submitted to the local planning authority for approval with or before the submission of reserved matters. No development shall commence until those schemes have been approved in writing by the local planning authority, and the surface water drainage scheme and the foul water drainage scheme shall then be implemented in accordance with the approved schemes and timetables, and thereafter retained.*



2.0 Drainage Strategy

- 2.1. The Flood Risk Assessment Report prepared by Enzygo was approved at Outline Stage (Ref: SHF.1132.265.HY.R.001.A). The approved surface water drainage strategy included in the Enzygo report proposes restricting the surface water discharge rate to QBbar (5.9 l/s) with additional flows attenuated on-site.
- 2.2. In accordance with the approved outline strategy, the proposal for the surface water drainage is to attenuate surface run-off on-site before discharging at the Qbar rate of 5.9 l/s to the existing land drain located along the southern boundary.
- 2.3. The SuDS Manual (CIRIA C753) states that *“where controlling runoff to greenfield volumes is considered unachievable, then the runoff volume should be reduced as much as possible, and any additional volume should be attenuated and discharged at a controlled rate. This can be achieved using one the following methods:*
1. Approach 1: long-term storage where additional runoff volume is discharged from the site at a rate of 2 l/s/ha or less, while still allowing greenfield runoff peak flow rates to be applied for the greenfield runoff volume.
 2. Approach 2: All the runoff from the site for the 1:100 year event should be discharged at either 2l/s/ha or QBAR, whichever is greater.
- 2.4. Approach 2 is used for the proposed site, where the discharge rate has been restricted to QBAR (5.9l/s) during all rainfall events (including the 1:100 year or 1% Annual Exceedance Probability (AEP) event). This rate equates to 1.6l/s/ha, which is a betterment on the 2l/s/ha rate.
- 2.5. The discharge rate for each rainfall event is summarised below and confirms that the proposed discharge rates provide more than 20% betterment compared with the pre-development greenfield rate.

Table 1: Proposed Discharge Rates

Rainfall Event	Modelled Discharge Rates (l/s)	Maximum Discharge Rate (l/s)	Existing Greenfield Rates (l/s)	Betterment (%)
100% AEP	2.50	5.9	4.60	54%
3.33% AEP	4.97		11.40	43.6%
1% AEP	5.64		14.20	39.7%



- 2.6. The drainage strategy has been developed to ensure SuDS elements are incorporated into the development's landscape layout to guarantee a sufficient surface water management train, in line with Wiltshire County Council's Core Policy 67, section 6.181.
- 2.7. Runoff from the roads and hardstanding areas will be collected by gullies and will drain into the main network and discharge into the detention basin.
- 2.8. Runoff from the site will drain into a 2.5m deep detention basin located in the south eastern corner of the site. The basin has been designed to store up to 2414m³ of surface water runoff. A freeboard allowance of 218mm is provided during the 1%AEP event.
- 2.9. A vortex separator, such as an Aqua swirl (or similar approved), shall be installed downstream of the hydro-brake. This will provide the final stage of water treatment, prior to discharging into the watercourse. Vortex separators remove pollutants such as fine particles, floating debris, hydrocarbons and heavy metals.

Drainage design parameters

- 2.10. The following drainage parameters have been utilised in the design:
 - 2.10.1. Site discharge restricted to greenfield runoff rates for all storms up to the 1%AEP plus 45% climate change.
 - 2.10.2. FEH data used.
 - 2.10.3. CV set to 1.00.
 - 2.10.4. Urban Creep provided for all dwellings in accordance with current legislation.

SuDS Features

- 2.11. The surface water strategy proposes utilising Sustainable Drainage System techniques (SuDS) to attenuate surface water runoff. The selection of the most appropriate SuDS needs to consider existing constraints, ownership and maintenance issues. To that end, the most suitable SuDS features that are incorporated into this site are:
 - 2.11.1. Detention basins.
- 2.12. The banks of the SuDS features are designed with a gradient of 1 in 2.5 and an appropriate freeboard above the maximum water level. This allows landscaping of both wetland and wildflower mixes to provide an appropriate landscape context in the vicinity of the features. This provides aesthetic interest to the features as well as assisting in maintenance.
- 2.13. Open SuDS features are designed so as not to compromise the safety of residents, visitors and their property. Generally open boundaries are provided, and perimeter planting could be utilised to define the extents of the features.



- 2.14. The basin is designed with forebays, to provide a sedimentation bay and permanent treatment areas.
- 2.15. The drainage basin are sized to accommodate all storms up to the 1%AEP plus 45% climate change with an appropriate freeboard.
- 2.16. The proposals draw reference to the DEFRA document "Sustainable Drainage Systems, Non-statutory Technical Standards for Sustainable Drainage Systems" March 2015, as well as CIRIA C753 "The SuDS Manual". In addition, all designs would be in accordance with best practice as stipulated in EA report SC030219 "Rainfall Runoff Management for Developments".
- 2.17. The utilisation of SuDS provides not only the benefit of controlling waters at source and online treatment of collected waters but also allows enhanced aesthetics and biodiversity.

Surface Water Treatment Improvements

- 2.18. Notwithstanding the requirement to provide improvements in water quality due to proposed development, the location of the site in respect to potential sensitive receptors requires consideration.
- 2.19. CIRIA report C753 The SuDS Manual outlines the methodology for assessing water quality risks associated with new development. This is a simple index approach which provides a high-level scoping analysis of the land usage and gives guidelines for appropriate treatment stages.
- 2.20. This process identifies features necessary to provide adequate substance removal in line with Environment Agency requirements. This is a three-step process of Allocation, Mitigation and Review.
- 2.21. Surfaces generating runoff are 'graded' on their potential to contribute to various harmful pollutants and gives each surface a risk of pollution from each element.
- 2.22. Historically, PPG3 documentation would recommend that pollutants were removed utilising oil separators, but since its superseding, more recent guidance has shifted to the use of SuDS features to remove pollutants; thereby providing significant improvements in treatment. The use of non-mechanical features also decreases the requirements for maintenance and increase natural biodiversity.
- 2.23. Without adequate treatment, the pollutants could cause damage if they were to enter the watercourse or water table in large volumes. The use of SuDS features slows down and degrades these pollutants.
- 2.24. The SuDS scheme provided gives a redundancy to the system, allowing there to be a comprehensive treatment train under all events, thus providing a realistic strategy which mimics the cleansing effectiveness as the concentration of a pollutant decreases along the SuDS train.



Adoption and Ownership

2.25. The drainage system is designed to the appropriate standards including Sewers for Adoption, the Building Regulations and the requirement of the National Planning Policy Framework

2.26. The intention of adoption and ownership of drainage and SuDS is as follows:

- Surface water sewers within development parcels to be offered for adoption to Wessex Water, or a NAV, under the Section 104 process of the Water Industry Act.
- Surface water highway drains, gullies and leads within adopted roads to be maintained by the Highway Authority or by a private maintenance company.
- Foul sewers within development parcels to be offered for adoption to Wessex Water under the Section 104 process of the Water Industry Act.
- Above ground attenuation within development parcels (i.e. basins) to be maintained by a private maintenance company funded by residential properties or offered for adoption to Wessex Water, or a NAV.

SuDS Maintenance Strategy

2.27. For the water treatment effects of SuDS features to remain effective, a comprehensive maintenance strategy will be implemented.

2.28. During construction, maintenance of SuDS features will be undertaken by the Contractor. Upon completion, the assets will be passed over to the Management Company or adopting authority to maintain the features in perpetuity.

2.29. A regular maintenance regime will be created, which consists of several primary measures required to ensure the longevity of the system.

2.30. A SuDS Management and Maintenance Strategy has been provided to inform the inclusion of SuDS maintenance regimes. These should be undertaken on a regular basis to ensure consistent performance. Typical maintenance activities consist of:

- Inspecting and reporting; relatively regular review of the condition identifying issues and providing resolutions. Periodic review from the maintenance contractor;
- Litter and debris removal;
- Grass trimming, overall cutting and localised strimming preventing blockages;
- Weed and evasive plant control;
- Shrub management;
- Aquatic and shoreline vegetation management;
- Sweeping pervious surfaces; and



- Oil removal from proprietary systems.
- 2.31. A remedial maintenance schedule will be recommended as part of the handover of the SuDS features. Remedial maintenance is required to provide repairs to the system and monitor long term damage ensuring the system remains consistently productive. The schedule would consist of;
- Structure rehabilitation and repair;
 - Infiltration surface rehabilitation;
 - Scarifying to remove "Thatch";
 - Spiking or Tining the soil;
 - Air pressure treatment.
- 2.32. The maintenance schedule contents and timing will depend upon multiple factors including usage, contents of water utilising the system, location and biology. To this end, it is suggested that the schedule be finalised as part of detailed design; ensuring the most comprehensive maintenance schedule is incorporated for the design in hand.
- 2.33. Community outreach can be undertaken as part of the development, which will raise awareness on the importance of SuDS to both flood risk and water quality in the local area. Imparting the new residents with knowledge on the risks associated with pollution to the surface water drainage system is key, as is the direct effect their actions may have on water quality and biodiversity in the area.

Foul Water Drainage Strategy

- 2.34. Foul water is proposed to drain through a traditional gravity network to a pumping station located in the south of the site. The proposed pumping station will pump the foul effluent through a rising main in a north westerly direction towards Melksham Road. The rising main shall terminate at a break chamber near the north western site boundary. This will subsequently connect into the existing Wessex Water foul manhole 7401 through a proposed gravity run. The foul network within the site shall be adopted by a NAV company and the gravity run downstream of the break chamber shall undergo a S104 agreement to be adopted.
- 2.35. Approval will be gained with Wessex Water to this connection and appropriate mitigation as detailed above, with Wessex Water updating any sewer impacts to finalise the POC.

Site Drainage Summary

- 2.36. It has been demonstrated that surface water from the site can be managed such that flood risk to and from the site following development is not increased.
- 2.37. It has been demonstrated that foul water from the site can be managed such that it does not have a detrimental effect to the foul sewer network.



- 2.38. The RM drainage design does not alter or amend the overall site drainage strategy and SuDS agreed during the approved outline planning application and adheres to the approved FRA and reports.



Appendices



Appendix 1 – Calculations

Drainage Simulation Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	9.999
CV	1.000	Preferred Cover Depth (m)	1.250
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	550.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
31	0.098	5.00	50.814	1350	386996.388	162383.955	1.700
49	0.164	5.00	50.573	1350	386956.692	162347.176	1.636
5	0.091	5.00	52.416	1350	386924.011	162398.081	1.797
18	0.228	5.00	53.016	1200	387030.116	162464.736	2.038
57	0.085	5.00	50.069	1500	387015.016	162364.769	2.387
54			49.694	1500	386991.854	162333.627	1.934
42	0.035	5.00	49.839	1350	386968.484	162311.210	1.700
39	0.092	5.00	50.463	1350	386905.736	162311.687	1.550
38			50.563	1350	386899.943	162318.967	1.475
36	0.099	5.00	50.696	1350	386900.186	162326.829	1.475
32			50.330	1350	387006.363	162370.557	1.700
28	0.254	5.00	52.240	1350	386968.715	162421.124	2.003
14			52.169	1350	386963.484	162418.074	1.762
27	0.035	5.00	52.347	1350	386981.177	162430.402	1.789
24	0.033	5.00	52.542	1350	386997.063	162441.196	1.805
22			53.364	1350	386978.150	162466.074	1.576
20	0.112	5.00	53.699	1350	386972.292	162473.805	1.287
HW3			47.262		387027.972	162339.503	0.582
63			48.300	1350	387028.456	162343.653	1.475
62			49.600	1350	387037.351	162362.675	2.514
HW2		5.00	49.600		387039.574	162367.641	2.500
HW1			49.600		387045.147	162384.457	2.438
61	0.067	5.00	50.345	1800	387034.264	162391.873	2.731
2	0.091	5.00	52.718	1350	386885.015	162389.172	1.475
13			52.494	1200	386953.698	162429.736	1.625
10	0.166	5.00	53.420	1350	386937.640	162451.129	1.680
53			49.693	1500	386978.208	162321.906	1.897
41			49.948	1350	386956.547	162306.679	1.625
44	0.146	5.00	51.390	1350	386939.156	162370.451	1.277
17		5.00	52.744	1350	387033.479	162460.015	1.656

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	2	5	40.001	0.600	51.243	50.769	0.474	84.4	225	5.47	47.4
1.001	5	14	44.247	0.600	50.619	50.482	0.137	323.0	375	6.20	44.6
2.000	10	13	26.749	0.600	51.740	50.944	0.796	33.6	225	5.20	48.4
2.001	13	14	15.224	0.600	50.869	50.557	0.313	48.7	300	5.31	48.0
1.002	14	28	6.055	0.600	50.407	50.237	0.170	35.7	450	6.23	44.5
3.000	17	18	5.796	0.600	51.088	51.053	0.035	165.6	225	5.10	48.8
3.001	18	24	40.579	0.600	50.978	50.812	0.166	244.5	300	5.77	46.2
4.000	20	22	9.700	0.600	52.412	51.788	0.624	15.5	225	5.05	49.0
4.001	22	24	31.251	0.600	51.788	50.887	0.901	34.7	225	5.28	48.1
3.002	24	27	19.206	0.600	50.737	50.558	0.179	107.3	375	5.95	45.5
3.003	27	28	15.536	0.600	50.558	50.312	0.246	63.2	375	6.07	45.1
1.003	28	31	46.339	0.600	50.237	49.114	1.123	41.3	450	6.48	43.8
1.004	31	32	16.704	0.600	49.114	48.630	0.484	34.5	450	6.56	43.5
1.005	32	57	10.410	0.600	48.630	47.832	0.798	13.0	450	6.59	43.4
5.000	36	38	7.866	0.600	49.221	49.088	0.133	59.1	225	5.08	48.9
5.001	38	39	9.304	0.600	49.088	48.988	0.100	93.0	225	5.19	48.5
5.002	39	41	51.057	0.600	48.913	48.398	0.515	99.1	300	5.73	46.4
5.003	41	42	12.768	0.600	48.323	48.214	0.109	117.1	375	5.86	45.9
5.004	42	53	14.455	0.600	48.139	47.946	0.193	74.9	450	5.96	45.5
6.000	44	49	29.142	0.600	50.113	49.012	1.101	26.5	225	5.19	48.5
6.001	49	53	33.189	0.600	48.937	48.096	0.841	39.5	300	5.41	47.6
5.005	53	54	17.989	0.600	47.796	47.760	0.036	500.0	600	6.24	44.5
5.006	54	57	38.811	0.600	47.760	47.682	0.078	500.0	600	6.83	42.6
1.006	57	61	33.243	0.600	47.682	47.614	0.068	488.9	600	7.34	41.1

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.424	56.6	15.6	1.250	1.422	0.091	0.0	80	1.220
1.001	1.002	110.7	29.4	1.422	1.312	0.182	0.0	131	0.852
2.000	2.264	90.0	29.1	1.455	1.325	0.166	0.0	87	2.021
2.001	2.258	159.6	28.8	1.325	1.312	0.166	0.0	86	1.726
1.002	3.413	542.8	56.1	1.312	1.553	0.348	0.0	96	2.231
3.000	1.013	40.3	0.0	1.431	1.738	0.000	0.0	0	0.000
3.001	1.001	70.8	38.1	1.738	1.430	0.228	0.0	157	1.019
4.000	3.335	132.6	19.9	1.062	1.351	0.112	0.0	58	2.413
4.001	2.228	88.6	19.5	1.351	1.430	0.112	0.0	72	1.799
3.002	1.748	193.1	61.5	1.430	1.414	0.374	0.0	145	1.558
3.003	2.283	252.1	66.6	1.414	1.553	0.409	0.0	131	1.936
1.003	3.172	504.4	159.8	1.553	1.250	1.011	0.0	174	2.829
1.004	3.469	551.8	174.3	1.250	1.250	1.109	0.0	173	3.087
1.005	5.651	898.8	173.9	1.250	1.787	1.109	0.0	133	4.414
5.000	1.704	67.7	17.5	1.250	1.250	0.099	0.0	78	1.435
5.001	1.356	53.9	17.4	1.250	1.250	0.099	0.0	87	1.210
5.002	1.579	111.6	32.1	1.250	1.250	0.192	0.0	110	1.370
5.003	1.673	184.8	31.8	1.250	1.250	0.192	0.0	104	1.261
5.004	2.351	373.9	37.3	1.250	1.297	0.227	0.0	95	1.527
6.000	2.553	101.5	25.6	1.052	1.336	0.146	0.0	77	2.138
6.001	2.510	177.4	53.3	1.336	1.297	0.310	0.0	112	2.202
5.005	1.082	305.9	86.4	1.297	1.334	0.537	0.0	217	0.936
5.006	1.082	305.9	82.6	1.334	1.787	0.537	0.0	212	0.924
1.006	1.094	309.4	257.0	1.787	2.131	1.730	0.0	420	1.217

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.007	61	HW1	13.170	0.600	47.614	47.584	0.030	439.0	600	7.53	40.6
30.000	HW2	62	5.441	0.600	47.100	47.086	0.014	388.6	450	5.09	48.9
30.001	62	63	20.999	0.600	47.086	46.825	0.261	80.5	225	5.33	47.9
7.002	63	HW3	4.178	0.600	46.825	46.680	0.145	28.8	225	5.36	47.8

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.007	1.156	326.7	263.6	2.131	1.416	1.797	0.0	410	1.279
30.000	1.025	163.0	0.0	2.050	2.064	0.000	0.0	0	0.000
30.001	1.459	58.0	0.0	2.289	1.250	0.000	0.0	0	0.000
7.002	2.446	97.3	0.0	1.250	0.357	0.000	0.0	0	0.000

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	40.001	84.4	225	PH1	52.718	51.243	1.250	52.416	50.769	1.422
1.001	44.247	323.0	375	PH1	52.416	50.619	1.422	52.169	50.482	1.312
2.000	26.749	33.6	225	PH1	53.420	51.740	1.455	52.494	50.944	1.325
2.001	15.224	48.7	300	PH1	52.494	50.869	1.325	52.169	50.557	1.312
1.002	6.055	35.7	450	PH1	52.169	50.407	1.312	52.240	50.237	1.553
3.000	5.796	165.6	225	PH1	52.744	51.088	1.431	53.016	51.053	1.738
3.001	40.579	244.5	300	PH1	53.016	50.978	1.738	52.542	50.812	1.430
4.000	9.700	15.5	225	PH1	53.699	52.412	1.062	53.364	51.788	1.351
4.001	31.251	34.7	225	PH1	53.364	51.788	1.351	52.542	50.887	1.430
3.002	19.206	107.3	375	PH1	52.542	50.737	1.430	52.347	50.558	1.414
3.003	15.536	63.2	375	PH1	52.347	50.558	1.414	52.240	50.312	1.553
1.003	46.339	41.3	450	PH1	52.240	50.237	1.553	50.814	49.114	1.250
1.004	16.704	34.5	450	PH1	50.814	49.114	1.250	50.330	48.630	1.250
1.005	10.410	13.0	450	PH1	50.330	48.630	1.250	50.069	47.832	1.787
5.000	7.866	59.1	225	PH1	50.696	49.221	1.250	50.563	49.088	1.250
5.001	9.304	93.0	225	PH1	50.563	49.088	1.250	50.463	48.988	1.250

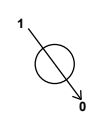
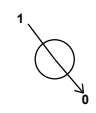
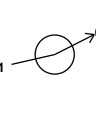
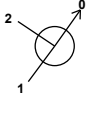
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	2	1350	Manhole	Adoptable	5	1350	Manhole	Adoptable
1.001	5	1350	Manhole	Adoptable	14	1350	Manhole	Adoptable
2.000	10	1350	Manhole	Adoptable	13	1200	Manhole	Adoptable
2.001	13	1200	Manhole	Adoptable	14	1350	Manhole	Adoptable
1.002	14	1350	Manhole	Adoptable	28	1350	Manhole	Adoptable
3.000	17	1350	Manhole	Adoptable	18	1200	Manhole	Adoptable
3.001	18	1200	Manhole	Adoptable	24	1350	Manhole	Adoptable
4.000	20	1350	Manhole	Adoptable	22	1350	Manhole	Adoptable
4.001	22	1350	Manhole	Adoptable	24	1350	Manhole	Adoptable
3.002	24	1350	Manhole	Adoptable	27	1350	Manhole	Adoptable
3.003	27	1350	Manhole	Adoptable	28	1350	Manhole	Adoptable
1.003	28	1350	Manhole	Adoptable	31	1350	Manhole	Adoptable
1.004	31	1350	Manhole	Adoptable	32	1350	Manhole	Adoptable
1.005	32	1350	Manhole	Adoptable	57	1500	Manhole	Adoptable
5.000	36	1350	Manhole	Adoptable	38	1350	Manhole	Adoptable
5.001	38	1350	Manhole	Adoptable	39	1350	Manhole	Adoptable

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)
5.002	51.057	99.1	300	PH1	50.463	48.913	1.250	49.948	48.398	1.250
5.003	12.768	117.1	375	PH1	49.948	48.323	1.250	49.839	48.214	1.250
5.004	14.455	74.9	450	PH1	49.839	48.139	1.250	49.693	47.946	1.297
6.000	29.142	26.5	225	PH1	51.390	50.113	1.052	50.573	49.012	1.336
6.001	33.189	39.5	300	PH1	50.573	48.937	1.336	49.693	48.096	1.297
5.005	17.989	500.0	600	PH1	49.693	47.796	1.297	49.694	47.760	1.334
5.006	38.811	500.0	600	PH1	49.694	47.760	1.334	50.069	47.682	1.787
1.006	33.243	488.9	600	PH1	50.069	47.682	1.787	50.345	47.614	2.131
1.007	13.170	439.0	600	PH1	50.345	47.614	2.131	49.600	47.584	1.416
30.000	5.441	388.6	450	PH1	49.600	47.100	2.050	49.600	47.086	2.064
30.001	20.999	80.5	225	PH1	49.600	47.086	2.289	48.300	46.825	1.250
7.002	4.178	28.8	225	PH1	48.300	46.825	1.250	47.262	46.680	0.357

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
5.002	39	1350	Manhole	Adoptable	41	1350	Manhole	Adoptable
5.003	41	1350	Manhole	Adoptable	42	1350	Manhole	Adoptable
5.004	42	1350	Manhole	Adoptable	53	1500	Manhole	Adoptable
6.000	44	1350	Manhole	Adoptable	49	1350	Manhole	Adoptable
6.001	49	1350	Manhole	Adoptable	53	1500	Manhole	Adoptable
5.005	53	1500	Manhole	Adoptable	54	1500	Manhole	Adoptable
5.006	54	1500	Manhole	Adoptable	57	1500	Manhole	Adoptable
1.006	57	1500	Manhole	Adoptable	61	1800	Manhole	Adoptable
1.007	61	1800	Manhole	Adoptable	HW1		Junction	
30.000	HW2		Junction		62	1350	Manhole	Adoptable
30.001	62	1350	Manhole	Adoptable	63	1350	Manhole	Adoptable
7.002	63	1350	Manhole	Adoptable	HW3		Junction	

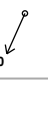
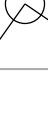
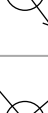
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
31	386996.388	162383.955	50.814	1.700	1350		1.003	49.114	450
49	386956.692	162347.176	50.573	1.636	1350		6.000	49.012	225
5	386924.011	162398.081	52.416	1.797	1350		1.000	50.769	225
18	387030.116	162464.736	53.016	2.038	1200		3.000	51.053	225
57	387015.016	162364.769	50.069	2.387	1500		5.006	47.682	600
							1.005	47.832	450
							1.006	47.682	600

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
54	386991.854	162333.627	49.694	1.934	1500	 1	5.005	47.760	600
						0	5.006	47.760	600
42	386968.484	162311.210	49.839	1.700	1350	 1	5.003	48.214	375
						0	5.004	48.139	450
39	386905.736	162311.687	50.463	1.550	1350	 1	5.001	48.988	225
						0	5.002	48.913	300
38	386899.943	162318.967	50.563	1.475	1350	 1	5.000	49.088	225
						0	5.001	49.088	225
36	386900.186	162326.829	50.696	1.475	1350	 1	5.000	49.221	225
						0	5.000	49.221	225
32	387006.363	162370.557	50.330	1.700	1350	 1	1.004	48.630	450
						0	1.005	48.630	450
28	386968.715	162421.124	52.240	2.003	1350	 1	3.003	50.312	375
						2	1.002	50.237	450
						0	1.003	50.237	450
14	386963.484	162418.074	52.169	1.762	1350	 1	2.001	50.557	300
						2	1.001	50.482	375
						0	1.002	50.407	450
27	386981.177	162430.402	52.347	1.789	1350	 1	3.002	50.558	375
						0	3.003	50.558	375
24	386997.063	162441.196	52.542	1.805	1350	 1	4.001	50.887	225
						2	3.001	50.812	300
						0	3.002	50.737	375
22	386978.150	162466.074	53.364	1.576	1350	 1	4.000	51.788	225
						0	4.001	51.788	225
20	386972.292	162473.805	53.699	1.287	1350	 1	4.000	52.412	225
						0	4.000	52.412	225
HW3	387027.972	162339.503	47.262	0.582		 1	7.002	46.680	225
						0			

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
63	387028.456	162343.653	48.300	1.475	1350		1 0	30.001 7.002	46.825 46.825	225 225
62	387037.351	162362.675	49.600	2.514	1350		1 0	30.000 30.001	47.086 47.086	450 225
HW2	387039.574	162367.641	49.600	2.500			0 1	30.000 1.007	47.100 47.584	450 600
HW1	387045.147	162384.457	49.600	2.438			1 0	1.006 1.007	47.614 47.614	600 600
61	387034.264	162391.873	50.345	2.731	1800		1 0	1.006 1.007	47.614 47.614	600 600
2	386885.015	162389.172	52.718	1.475	1350		0 1	1.000 2.000	51.243 50.944	225 225
13	386953.698	162429.736	52.494	1.625	1200		1 0	2.000 2.001	50.944 50.869	225 300
10	386937.640	162451.129	53.420	1.680	1350		0 1	2.000 6.001	51.740 48.096	225 300
53	386978.208	162321.906	49.693	1.897	1500		1 2 0	6.001 5.004 5.005	48.096 47.946 47.796	300 450 600
41	386956.547	162306.679	49.948	1.625	1350		1 0	5.002 5.003	48.398 48.323	300 375
44	386939.156	162370.451	51.390	1.277	1350		0 1	6.000 3.000	50.113 51.088	225 225
17	387033.479	162460.015	52.744	1.656	1350		0 0	3.000 3.000	51.088 51.088	225 225

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	2 year (l/s)	3.3
Rainfall Events	Singular	Drain Down Time (mins)	240	30 year (l/s)	7.5
Summer CV	1.000	Additional Storage (m³/ha)	0.0	100 year (l/s)	9.1
Winter CV	1.000	Starting Level (m)		Check Discharge Volume	✓
Analysis Speed	Normal	Check Discharge Rate(s)	✓	100 year 360 minute (m³)	

Storm Durations

60	180	360	600	960	2160	4320	7200	10080
120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.98
Greenfield Method	FEH	Growth Factor 100 year	2.42
Positively Drained Area (ha)	1.896	Betterment (%)	20
SAAR (mm)	732	QMed	4.4
Host	1	QBar	4.7
BFIHost	0.605	Q 2 year (l/s)	3.3
Region	8	Q 30 year (l/s)	7.5
QBar/QMed conversion factor	1.075	Q 100 year (l/s)	9.1
Growth Factor 2 year	0.88		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	1.896	Storm Duration (mins)	360
Soil Index	1	Betterment (%)	20
SPR	0.10	PR	
CWI		Runoff Volume (m³)	

Node 62 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	47.086	Product Number	CTL-SHE-0097-5900-2214-5900
Design Depth (m)	2.214	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.9	Min Node Diameter (mm)	1200

Node HW2 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	15.500
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	47.100	Main Channel Slope (1:X)	250.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	0.035

Inlets

HW1

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	560.7	0.0	2.500	1434.7	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	31	33	49.234	0.120	71.6	0.1724	0.0000	OK
60 minute summer	49	33	49.007	0.070	20.2	0.0996	0.0000	OK
60 minute summer	5	33	50.702	0.083	11.9	0.1191	0.0000	OK
60 minute summer	18	33	51.073	0.095	14.9	0.1071	0.0000	OK
60 minute summer	57	34	47.939	0.257	110.0	0.4549	0.0000	OK
60 minute summer	54	34	47.948	0.188	34.0	0.3318	0.0000	OK
60 minute summer	42	34	48.202	0.063	14.6	0.0899	0.0000	OK
60 minute summer	39	33	48.981	0.068	12.5	0.0973	0.0000	OK
60 minute summer	38	33	49.143	0.055	6.5	0.0793	0.0000	OK
60 minute summer	36	33	49.270	0.049	6.5	0.0700	0.0000	OK
60 minute summer	32	33	48.721	0.091	71.2	0.1297	0.0000	OK
60 minute summer	28	33	50.346	0.109	65.4	0.1563	0.0000	OK
60 minute summer	14	33	50.473	0.067	22.4	0.0953	0.0000	OK
60 minute summer	27	33	50.644	0.086	26.6	0.1236	0.0000	OK
60 minute summer	24	33	50.831	0.094	24.3	0.1342	0.0000	OK
60 minute summer	22	33	51.832	0.044	7.3	0.0632	0.0000	OK
60 minute summer	20	33	52.448	0.036	7.3	0.0512	0.0000	OK
360 minute summer	HW3	264	46.714	0.034	4.8	0.0000	0.0000	OK
480 minute summer	63	520	46.860	0.035	4.8	0.0504	0.0000	OK
960 minute summer	62	705	47.556	0.470	4.8	0.6719	0.0000	SURCHARGED
960 minute summer	HW2	705	47.556	0.456	17.8	0.0000	0.0000	SURCHARGED
960 minute summer	HW1	705	47.556	0.394	30.5	0.0000	0.0000	OK
60 minute summer	61	35	47.850	0.236	113.2	0.6015	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)
60 minute summer	31	1.004	32	71.2	2.537	0.129	0.4743	
60 minute summer	49	6.001	53	20.2	1.663	0.114	0.4030	
60 minute summer	5	1.001	14	11.6	0.683	0.105	0.7545	
60 minute summer	18	3.001	24	14.8	0.793	0.209	0.7579	
60 minute summer	57	1.006	61	109.0	1.000	0.352	3.6270	
60 minute summer	54	5.006	57	33.9	0.371	0.111	3.7021	
60 minute summer	42	5.004	53	14.6	1.129	0.039	0.1871	
60 minute summer	39	5.002	41	12.3	1.047	0.111	0.6028	
60 minute summer	38	5.001	39	6.5	0.891	0.121	0.0679	
60 minute summer	36	5.000	38	6.5	0.935	0.096	0.0548	
60 minute summer	32	1.005	57	71.4	3.057	0.079	0.2674	
60 minute summer	28	1.003	31	65.2	2.049	0.129	1.4760	
60 minute summer	14	1.002	28	22.4	1.034	0.041	0.1339	
60 minute summer	27	3.003	28	26.4	1.447	0.105	0.2842	
60 minute summer	24	3.002	27	24.3	1.195	0.126	0.3901	
60 minute summer	22	4.001	24	7.3	1.344	0.082	0.1695	
60 minute summer	20	4.000	22	7.3	1.545	0.055	0.0462	
480 minute summer	63	7.002	HW3	4.8	1.247	0.049	0.0161	171.8
960 minute summer	62	Hydro-Brake®	63	4.8				
960 minute summer	HW2	30.000	62	4.8	0.154	0.030	0.8621	
960 minute summer	HW1	Flow through Pond	HW2	17.8	0.013	0.000	269.9593	
60 minute summer	61	1.007	HW1	113.3	1.169	0.347	1.2766	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	2	33	51.292	0.049	5.9	0.0706	0.0000	OK
60 minute summer	13	33	50.924	0.055	10.9	0.0620	0.0000	OK
60 minute summer	10	33	51.794	0.054	10.9	0.0771	0.0000	OK
60 minute summer	53	34	47.960	0.164	34.6	0.2903	0.0000	OK
60 minute summer	41	34	48.391	0.068	12.3	0.0979	0.0000	OK
60 minute summer	44	33	50.160	0.047	9.5	0.0675	0.0000	OK
60 minute summer	17	1	51.088	0.000	0.0	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)
60 minute summer	2	1.000	5	5.9	0.922	0.104	0.2544	
60 minute summer	13	2.001	14	10.9	1.273	0.068	0.1303	
60 minute summer	10	2.000	13	10.9	1.521	0.121	0.1917	
60 minute summer	53	5.005	54	34.0	0.574	0.111	1.2395	
60 minute summer	41	5.003	42	12.4	0.936	0.067	0.1687	
60 minute summer	44	6.000	49	9.5	1.596	0.094	0.1735	
60 minute summer	17	3.000	18	0.0	0.000	0.000	0.0049	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	31	33	49.411	0.297	323.3	0.4245	0.0000	OK
60 minute summer	49	33	49.088	0.150	90.7	0.2153	0.0000	OK
60 minute summer	5	33	50.807	0.189	53.4	0.2698	0.0000	OK
60 minute summer	18	33	51.220	0.242	66.9	0.2735	0.0000	OK
60 minute summer	57	34	48.440	0.758	500.0	1.3387	0.0000	SURCHARGED
60 minute summer	54	34	48.468	0.708	155.4	1.2509	0.0000	SURCHARGED
60 minute summer	42	34	48.492	0.353	65.4	0.5053	0.0000	OK
60 minute summer	39	33	49.068	0.155	56.1	0.2217	0.0000	OK
60 minute summer	38	33	49.219	0.131	29.0	0.1870	0.0000	OK
60 minute summer	36	33	49.339	0.118	29.0	0.1693	0.0000	OK
60 minute summer	32	34	48.876	0.246	322.8	0.3524	0.0000	OK
60 minute summer	28	33	50.494	0.257	295.0	0.3682	0.0000	OK
60 minute summer	14	33	50.590	0.183	101.7	0.2620	0.0000	OK
60 minute summer	27	33	50.763	0.205	119.2	0.2935	0.0000	OK
60 minute summer	24	33	50.960	0.223	109.1	0.3195	0.0000	OK
60 minute summer	22	33	51.886	0.098	32.9	0.1405	0.0000	OK
60 minute summer	20	32	52.492	0.080	32.9	0.1140	0.0000	OK
180 minute summer	HW3	88	46.714	0.034	4.8	0.0000	0.0000	OK
180 minute winter	63	84	46.860	0.035	4.8	0.0504	0.0000	OK
960 minute winter	62	945	48.365	1.279	5.3	1.8306	0.0000	SURCHARGED
960 minute winter	HW2	945	48.365	1.265	28.6	0.0000	0.0000	SURCHARGED
960 minute winter	HW1	945	48.365	1.203	52.3	0.0000	0.0000	OK
960 minute winter	61	945	48.365	0.751	53.1	1.9123	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	31	1.004	32	322.8	3.323	0.585	1.6663	
60 minute summer	49	6.001	53	90.7	2.329	0.511	1.7552	
60 minute summer	5	1.001	14	53.0	1.034	0.479	2.2749	
60 minute summer	18	3.001	24	66.4	1.192	0.938	2.2526	
60 minute summer	57	1.006	61	500.6	1.777	1.618	9.3042	
60 minute summer	54	5.006	57	156.1	0.554	0.510	10.9322	
60 minute summer	42	5.004	53	69.0	1.242	0.185	2.1096	
60 minute summer	39	5.002	41	56.0	1.567	0.502	1.8245	
60 minute summer	38	5.001	39	29.0	1.299	0.538	0.2077	
60 minute summer	36	5.000	38	29.0	1.289	0.428	0.1771	
60 minute summer	32	1.005	57	321.2	3.025	0.357	1.2867	
60 minute summer	28	1.003	31	294.6	2.879	0.584	4.7384	
60 minute summer	14	1.002	28	101.7	1.325	0.187	0.4669	
60 minute summer	27	3.003	28	119.0	2.091	0.472	0.8916	
60 minute summer	24	3.002	27	109.0	1.676	0.564	1.2488	
60 minute summer	22	4.001	24	32.9	2.030	0.371	0.5065	
60 minute summer	20	4.000	22	32.9	2.263	0.248	0.1416	
180 minute winter	63	7.002	HW3	4.8	1.247	0.049	0.0161	97.3
960 minute winter	62	Hydro-Brake®	63	4.8				
960 minute winter	HW2	30.000	62	5.3	0.167	0.033	0.8621	
960 minute winter	HW1	Flow through Pond	HW2	28.6	0.018	0.000	959.3687	
960 minute winter	61	1.007	HW1	52.3	0.927	0.160	3.7097	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	2	33	51.355	0.112	26.7	0.1598	0.0000	OK
60 minute summer	13	33	50.993	0.124	48.7	0.1397	0.0000	OK
60 minute summer	10	33	51.864	0.124	48.7	0.1779	0.0000	OK
60 minute summer	53	34	48.485	0.689	154.0	1.2176	0.0000	SURCHARGED
60 minute summer	41	34	48.504	0.181	56.0	0.2586	0.0000	OK
60 minute summer	44	33	50.219	0.106	42.8	0.1520	0.0000	OK
60 minute summer	17	33	51.220	0.132	0.7	0.1887	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)
60 minute summer	2	1.000	5	26.7	1.389	0.471	0.7687	
60 minute summer	13	2.001	14	48.7	1.892	0.305	0.3921	
60 minute summer	10	2.000	13	48.7	2.246	0.541	0.5800	
60 minute summer	53	5.005	54	155.3	0.616	0.508	5.0671	
60 minute summer	41	5.003	42	55.6	1.337	0.301	0.8947	
60 minute summer	44	6.000	49	42.8	2.394	0.422	0.5212	
60 minute summer	17	3.000	18	0.7	-0.134	0.019	0.1615	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	31	35	50.560	1.446	532.4	2.0696	0.0000	FLOOD RISK
60 minute summer	49	34	50.258	1.321	166.8	1.8900	0.0000	SURCHARGED
60 minute summer	5	35	52.019	1.400	93.5	2.0032	0.0000	SURCHARGED
60 minute summer	18	34	52.750	1.772	126.4	2.0047	0.0000	FLOOD RISK
2160 minute winter	57	2100	49.353	1.671	57.6	2.9521	0.0000	SURCHARGED
2160 minute winter	54	2100	49.353	1.593	15.4	2.8143	0.0000	SURCHARGED
60 minute summer	42	34	49.408	1.269	114.9	1.8159	0.0000	SURCHARGED
60 minute summer	39	34	49.916	1.003	98.3	1.4360	0.0000	SURCHARGED
60 minute summer	38	34	50.046	0.958	50.9	1.3712	0.0000	SURCHARGED
60 minute summer	36	34	50.167	0.946	54.9	1.3536	0.0000	SURCHARGED
60 minute summer	32	35	49.808	1.178	533.6	1.6860	0.0000	SURCHARGED
60 minute summer	28	35	51.865	1.628	484.8	2.3299	0.0000	SURCHARGED
60 minute summer	14	35	51.912	1.506	175.3	2.1545	0.0000	FLOOD RISK
60 minute summer	27	35	52.090	1.532	193.1	2.1918	0.0000	FLOOD RISK
60 minute summer	24	35	52.305	1.568	182.5	2.2435	0.0000	FLOOD RISK
60 minute summer	22	35	52.694	0.906	62.2	1.2960	0.0000	SURCHARGED
60 minute summer	20	35	52.844	0.432	62.2	0.6178	0.0000	SURCHARGED
2160 minute winter	HW3	2100	46.718	0.038	6.0	0.0000	0.0000	OK
2160 minute winter	63	2100	46.864	0.039	6.0	0.0564	0.0000	OK
2160 minute winter	62	2100	49.353	2.267	6.0	3.2435	0.0000	FLOOD RISK
2160 minute winter	HW2	2100	49.353	2.253	33.8	0.0000	0.0000	FLOOD RISK
2160 minute winter	HW1	2100	49.353	2.191	62.4	0.0000	0.0000	OK
2160 minute winter	61	2100	49.353	1.739	62.5	4.4249	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	31	1.004	32	533.6	3.368	0.967	2.6466	
60 minute summer	49	6.001	53	163.4	2.321	0.921	2.3371	
60 minute summer	5	1.001	14	89.1	1.127	0.805	4.8803	
60 minute summer	18	3.001	24	111.8	1.587	1.580	2.8575	
2160 minute winter	57	1.006	61	60.6	0.680	0.196	9.3638	
2160 minute winter	54	5.006	57	15.4	0.302	0.050	10.9322	
60 minute summer	42	5.004	53	115.8	1.238	0.310	2.2903	
60 minute summer	39	5.002	41	97.2	1.575	0.871	3.5954	
60 minute summer	38	5.001	39	50.9	1.410	0.944	0.3700	
60 minute summer	36	5.000	38	50.9	1.390	0.752	0.3128	
60 minute summer	32	1.005	57	534.7	3.375	0.595	1.6494	
60 minute summer	28	1.003	31	486.2	3.069	0.964	7.3421	
60 minute summer	14	1.002	28	173.5	1.370	0.320	0.9594	
60 minute summer	27	3.003	28	198.9	2.051	0.789	1.7136	
60 minute summer	24	3.002	27	179.0	1.751	0.927	2.1184	
60 minute summer	22	4.001	24	57.8	2.145	0.653	1.2429	
60 minute summer	20	4.000	22	62.2	2.634	0.469	0.3858	
2160 minute winter	63	7.002	HW3	6.0	1.325	0.061	0.0188	700.9
2160 minute winter	62	Hydro-Brake®	63	6.0				
2160 minute winter	HW2	30.000	62	6.0	0.156	0.037	0.8621	
2160 minute winter	HW1	Flow through Pond	HW2	33.8	0.008	0.000	2109.8425	
2160 minute winter	61	1.007	HW1	62.4	0.785	0.191	3.7097	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	2	35	52.360	1.117	50.4	1.5980	0.0000	SURCHARGED
60 minute summer	13	35	52.037	1.167	84.7	1.3203	0.0000	SURCHARGED
60 minute summer	10	34	52.830	1.090	92.0	1.5598	0.0000	SURCHARGED
60 minute summer	53	34	49.376	1.580	277.3	2.7917	0.0000	SURCHARGED
60 minute summer	41	34	49.458	1.135	97.2	1.6245	0.0000	SURCHARGED
60 minute summer	44	34	51.026	0.913	80.8	1.3071	0.0000	SURCHARGED
60 minute summer	17	34	52.744	1.656	10.4	2.3697	0.5240	FLOOD

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	2	1.000	5	45.6	1.548	0.805	1.5909	
60 minute summer	13	2.001	14	86.7	2.075	0.543	1.0721	
60 minute summer	10	2.000	13	84.7	2.443	0.941	1.0638	
60 minute summer	53	5.005	54	276.3	0.981	0.903	5.0671	
60 minute summer	41	5.003	42	97.6	1.337	0.528	1.4083	
60 minute summer	44	6.000	49	77.2	2.459	0.761	1.1590	
60 minute summer	17	3.000	18	11.9	0.298	0.295	0.2305	



Appendix 2 – Drainage Strategy

DRAINAGE NOTES:

1. Do not scale.
2. 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.
3. Site layout shown for context only, refer to other project drawings for details.
4. All adoptable drainage works to be constructed as detailed in design and construction guidance or as stipulated in the water authorities addendum.
5. All public sewers are to be the subject of a section 104 agreement of the water industry act 1991.
6. Invert levels of existing manholes and sewers are to be checked on site before construction commences and results reported to engineers.
7. The contractor is responsible for maintaining continuity of flow for all existing sewers within the site boundary and limit of works for the duration of the project.
8. All drainage ironworks to comply with bs en124, and be stamped with bs1 kitemark. covers to suit loading as below:
 - carriageways and roads - c400
 - driveways and verges - c250
 - footways and pedestrian areas - b125
 - gardens/landscaping - a15
9. All sewer pipes, up to, and including 225mm are to be vitrified clay to BS EN295. All sewer pipes 300mm diameter and above to be concrete pipes to BS EN1916. Where agreed with adopting authority pipes up to and including 600mm diameter can be PVC-U to BS EN1401-1.
10. All drainage shall be installed and tested strictly in accordance with the manufacturers' printed instructions, bs en 752, bs en 1610, local water authority requirements and the building regulations.
11. All bedding shall be class s unless noted otherwise.
12. All trenches under existing and proposed public highways are to be backfilled with thoroughly compacted type 1 granular sub-base material.
13. Drainage laid beneath roads and areas of vehicular access (car parking etc) with less than 1200mm of cover shall be encased in concrete bed and surround with associated movement joints. drainage laid beneath paths, footways and pedestrian areas with less than 900mm of cover shall be similarly treated.
14. Chambers with outgoing pipes greater than 600mm diameter shall be fitted with guard bars, safety chains or other approved safety devices.
15. The use of precast concrete products made with sulphate resisting cement is mandatory, unless a laboratory report proves such precautions are not necessary.
16. All sewers to be abandoned must be surveyed to identify any lateral connections that are still live with any found to be reported to the engineer.
17. All foul and storm water drains which are not to be adopted as public sewers shall be in accordance with document h of the building regulations, together with nhbc standards chapter 5.3 and b8301.
18. Where pipes pass through footings, retaining or screen walls, lintels to be provided over drains.
19. Where inverts are less than 0.6m deep inspection chambers (min dia. 190mm) or access fittings (225 x 100mm) to be used, elsewhere proprietary plastic, brick or pcc is to be used and sized in accordance with table 11 of document h of the building regulations (<0.6m to invert min dn300, >0.6m to invert min dn475).
20. Where required 1m deep root barrier of an approved type to be installed vertically along the back edging kerb of all areas of footway/ demarcation to protect from both proposed and future plantation.
21. Construction details subject to refinement through detailed design/technical approval process.

KEY

- FOUL STORM
- Proposed adoptable sewer & MH
 - Highway gully and 150mmØ connection
 - Proposed control manhole
 - Proposed catchpit manhole
 - Proposed Aqua Swirl manhole
 - Foul water rising main
 - Headwall
 - Proposed road contours (major at 200mm intervals, minor at 50mm intervals)
 - Extent of ditch clearance works
 - Existing water main and easement
- Scale 1:500

Rev	Date	Description	Drawn	Checked
C	06.26	Updated to suit latest Bellway comments	LC	SM
B	06.26	Updated with new site layout	RP	SM
A	05.26	First Issue	DZ	SM

PRODUCT NUMBER:
CTL-SHE-0100-5900-2011-5900

DESIGN HEAD:
2.011 m

DESIGN FLOW:
5.9 l/s

www.ableletchford.co.uk

Client
**BELLWAY HOMES LIMITED
(SOUTH WEST)**

Project
MELKSHAM ROAD, HOLT

Title
**RESERVED MATTERS
DRAINAGE LAYOUT**

Status

Scale
1:500 @ A1

Date
MAY 2026

Drawn
DZ

Checked
SM

Drawing No
HD089-RMB-50

Revision
C

DRAINAGE NOTES:

1. Do not scale.
2. 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.
3. Site layout shown for context only, refer to other project drawings for details.
4. All adoptable drainage works to be constructed as detailed in design and construction guidance or as stipulated in the water authorities addendum.
5. All public sewers are to be the subject of a section 104 agreement of the water industry act 1991.
6. Invert levels of existing manholes and sewers are to be checked on site before construction commences and results reported to engineers.
7. The contractor is responsible for maintaining continuity of flow for all existing sewers within the site boundary and limit of works for the duration of the project.
8. All drainage ironworks to comply with bs en124, and be stamped with bs1 kitemark. covers to suit loading as below:
 - carriageways and roads - c400
 - driveways and verges - c250
 - footways and pedestrian areas - b125
 - gardens/landscaping - a15
9. All sewer pipes, up to, and including 225mm are to be vitrified clay to BS EN295. All sewer pipes 300mm diameter and above to be concrete pipes to BS EN1916. Where agreed with adopting authority pipes up to and including 600mm diameter can be PVC-U to BS EN1401-1.
10. All drainage shall be installed and tested strictly in accordance with the manufacturers' printed instructions, bs en 752, bs en 1610, local water authority requirements and the building regulations.
11. All bedding shall be class s unless noted otherwise.
12. All trenches under existing and proposed public highways are to be backfilled with thoroughly compacted type 1 granular sub-base material.
13. Drainage laid beneath roads and areas of vehicular access (car parking etc) with less than 1200mm of cover shall be encased in concrete bed and surround with associated movement joints. drainage laid beneath paths, footways and pedestrian areas with less than 900mm of cover shall be similarly treated.
14. Chambers with outgoing pipes greater than 600mm diameter shall be fitted with guard bars, safety chains or other approved safety devices.
15. The use of precast concrete products made with sulphate resisting cement is mandatory, unless a laboratory report proves such precautions are not necessary.
16. All sewers to be abandoned must be surveyed to identify any lateral connections that are still live with any found to be reported to the engineer.
17. All foul and storm water drains which are not to be adopted as public sewers shall be in accordance with document h of the building regulations, together with nhbc standards chapter 5.3 and bs8301.
18. Where pipes pass through footings, retaining or screen walls, Intels to be provided over drains.
19. Where inverts are less than 0.6m deep inspection chambers (min dia. 190mm) or access fittings (225 x 100mm) to be used, elsewhere proprietary plastic, brick or pcc is to be used and sized in accordance with table 11 of document h of the building regulations <0.6m to invert min dn300, >0.6m to invert min dn475).
20. Where required 1m deep root barrier of an approved type to be installed vertically along the back edging kerb of all areas of footway/ demarcation to protect from both proposed and future plantation.
21. Construction details subject to refinement through detailed design/technical approval process.

KEY

- Proposed drain & MH
- Highway gully and 150mmØ connection
- Drainage Catchment Area at 65% impermeable

Scale 1:500

C	06.26	Updated to suit latest Bellway comments	LC	SM
B	06.26	Updated to new site layout and drainage adjustments	RP	SM
A	05.26	First Issue	DZ	SM
Rev	Date	Description	Drawn	Checked



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Client
BELLWAY HOMES LIMITED (SOUTH WEST)

Project
MELKSHAM ROAD, HOLT

Title
RESERVED MATTERS SW CATCHMENT AREAS PLAN

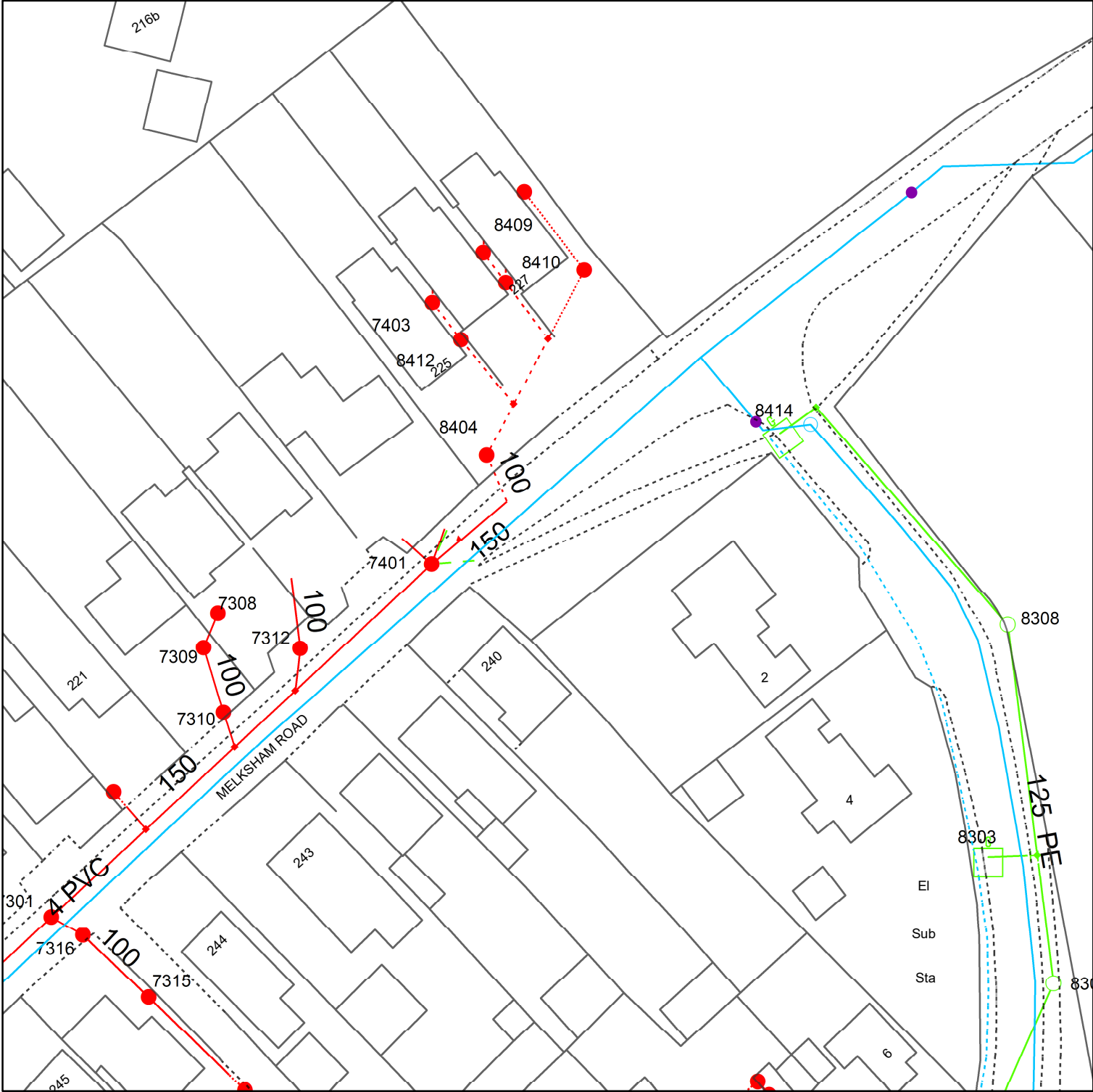
Status

Scale	Date	Drawn	Checked
1:500 @ A1	MAY 2026	DZ	SM
Drawing No	Revision		
HD089-RMB-55	C		



Appendix 3 – Wessex Water Asset Plans

Wessex Water Network Map



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WATER MAINS	SEWERS	STRATEGIC PUBLIC	PRIVATE	SECTION 104	OTHER WESSEX PIPES	NON-WESSEX / UNKNOWN
Distribution	Foul	Surface	Surface	Gully	Rising Mains	Private Rising Mains
Washout	Combined	Surface	Surface	Vent Column	Standby Rising Mains	Culverted Watercourse
Raw Water	Abandoned	Combined	Combined	Rodding Eye	EDM	Highway Drain
Abandoned	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).	Overflow	Overflow	Catchpit	Overflow	Use Unknown
Private	Some styles of line and symbol are shown on the key in sample/typical colours.	Syphon	Syphon	Flushing Chamber	Syphon	Status Unknown
FITTINGS	STRUCTURES	Pumping Station - Surface	Pumping Stn - Foul/Combined	Gully	Chamber	Tunnel
Hydrant	Manhole - Foul	Manhole - Surface	Manhole - Surface	Vent Column	Attenuation Tank	Interceptor
Other	Manhole - Combined	Inlet	Outfall	Rodding Eye	Storage Tank	
	Lamphole	Bifurcation - Foul	Bifurcation - Surface	Catchpit		
	Bifurcation - Combined	Bifurcation - Surface	Bifurcation - Combined	Flushing Chamber		
	Combined Sewage Overflow	Non Return Valve	Air Valve	Hatch Box		
		Washout				

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 526333 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.

Wessex Water
YTL GROUP

Date: 29/04/2024
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