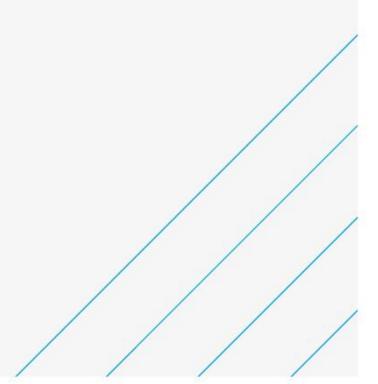




Fassaroe Phase 1 Planning Application

Stormwater Impact Assessment Report Cosgrave Property Group

April 2022





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Document history

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1. Introduction

The purpose of this Stormwater Impact Assessment report is to provide details of the Storm Water elements associated with the proposed Phase 1 of the Fassaroe Development and allowance for future phases. The proposed storm drainage network has been sized to allow for the future phases of the Fassaroe masterplan area within the control of Cosgrave Property Group.

The proposed Phase 1 planning application comprises of the construction of 650 no. residential units comprising a mix of apartments and houses along with a neighbourhood centre, a crèche, a district park, local parks, the diversion and rerouting of ESB electricity lines, a distributor road connecting to Ballyman Road, a new pedestrian / cycle route across the N11 connecting to Dargle Road, historic landfill remediation works, landscaping works, parking facilities, ancillary services and facilities and associated site development works.

The various elements of the application then include:

- Road link (2.4km) connecting N11 to Ballyman Road (with westerly connection to Ballyman Road already in place).
- Pedestrian / cycle route including bridge across the N11 to Dargle Road Upper.
- 15.3ha of District Park / Active Open Space.
- 650 no. residential units comprising 241 no. houses and 409 no. apartments.
- 3 No. pocket park areas comprising a total of 0.43ha.
- 733sq.m approx. crèche with capacity for approx. 138 no. childcare spaces
- Retail unit / kiosk (108sq.m.) in district park.
- Neighbourhood Centre Phase 1 comprising:
 - o 1,035sq.m. retail
 - o 360sq.m. café,
 - 480sq.m community concierge (serving entire Fassaroe community)
 - 414sq.m. residential ancillary uses for residents of the neighbourhood centre apartments (residents lounge 256sq.m., residents gym 90sq.m., and residents concierge 68sq.m.)
- Demolition of an existing dwelling at Berryfield Lane.
- Rerouting and undergrounding of overhead ESB lines (110kV and 38kV lines) across site and into existing ESB Substation.
- Site development / ground works on future development areas to ensure sustainable cut and fill balances across the lands
- Water supply, foul and surface water drainage proposals.
- Provisions for public bus services in line with demand towards Bray (DART and Bray bus interchange) and towards the Luas at Cherrywood / Brides Glen.
- Remediation of 5 no. historic landfill sites in line with Certificates of Authorisation issued to Wicklow County Council by the EPA in 2019.

A detailed description of the development is included in Chapter 2 of the Environmental Impact Assessment Report (EIAR) included with this planning application.



This report deals with the following aspects associated with this development:

- Existing Site
- Site Infiltration Testing
- Soil Type Classification
- Storm Water Drainage Design
- Sustainable Urban Drainage Systems (SuDS)
- Flood Risk Assessment
- SuDS Maintenance

1.1. Site Location

The proposed application site forms part of a larger designated new development area under the Bray Municipal District Local Area Plan 2018 -2024 (LAP). These wider development lands are identified as an 'Action Area' in the LAP. The lands lie on the western side of Bray. The location of the site is shown below on **Figure 1-1 – Site Location**.

The site location is indicated on Atkins drawing 5186693_HTR_01_DR_0001.



Figure 1-1 – Site Location



1.2. Existing Site Description

The existing site is predominantly existing green field land with a number of private single dwellings. A large recycling centre is located to the East of the proposed site

The majority of the proposed phase 1 development is predominantly a steep sloping site, the highest point located to the west of the site area of circa 103mOD and falling to the East / North East direction to a lowest level of circa 23mOD adjacent to the existing bridge at the N11.

The majority of the site discharges into the County Brook (EPA code 10C02) to the north. An existing public storm drain is located to the East at the lower end of the site. The existing storm drainage network travels under the M11 prior to discharge into the Dargle River.

1.3. Principle Design Considerations

During the design of the storm water drainage for the proposed site, including SuDS, the following key documents / standards were taken into consideration;

- Bray Municipal District Local Area Plan 2018 2024
- CIRIA report C753 The SuDS Manual-v6
- Greater Dublin Strategic Drainage Study (GDSDS)
- Wicklow County Development Plan, 2016 2022

The proposed stormwater drainage has been developed in consultation with the relevant authorities including the Bray District Engineer and Wicklow County Council (WCC) at preplanning stages.



2. Surface Water Design

The storm drainage system has been designed for the proposed phase 1 Development and including allowance made for future phases in accordance with the key documents and standards listed in Section 1.3 above.

Surface water generated from the proposed residential development area will be conveyed through a proposed surface water network including SuDS and attenuated / managed within areas of the site prior to final discharge at agreed Qbar greenfield run-off rates.

The proposed phase 1 development overall site area will have 4No. stormwater discharge locations;

- 1. County Brook (EPA code 10C06) located to the North of the site.
- 2. Existing 750mm dia Storm Water Network located to the East of the site.
- 3. Existing 300mm dia Storm Water Network located to the West of the site granted under WCC planning Ref; 1715
- 4. Proposed Soakaway located to the west of the central area of the site.

The proposed storm drainage network for the development is as indicated on the planning drawings 5186693_HTR_01_DR_0501-0515.

The proposed measures included within the design are as follows:

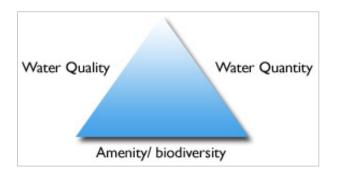
- Swales within Open Space / Park areas adjacent to roads / car parks
- Permeable paving in light traffic areas (parking bays)
- Extensive Green roofs (sedum) to suitable apartment blocks / Commercial Retail Buildings
- Intensive Green courtyards to suitable apartment blocks
- Underground modular system within green corridors / park areas
- Forebays prior to Attenuation ponds
- Storm Water Attenuation ponds in coordination with the landscape design
- Soakaway
- Filter drains in rear gardens
- Tree pits
- Vortex flow control devices



2.1. Proposed Sustainable Urban Drainage (SuDS) Strategy

For the proposed development a "SuDS triangle" was utilised to ensure all three functions are provided for within the SuDS strategy.

Figure 2-1 - SuDS Triangle



By considering the three functions of the triangle, the proposed SuDS system will allow for water quality treatment through natural processes by;

- Encouraging infiltration (where appropriate) and attenuating peak flows.
- Improving water quality by providing treatment to storm water throughout the proposed development and prior to discharge.
- Providing habitat and function where possible for those using the area (including wildlife)

The principles of a SuDS treatment train were used during the design of the surface water drainage system. The treatment train as illustrated in the image below provides an understanding of prevention and source control to reduced water run-off from a site and improve water quality.

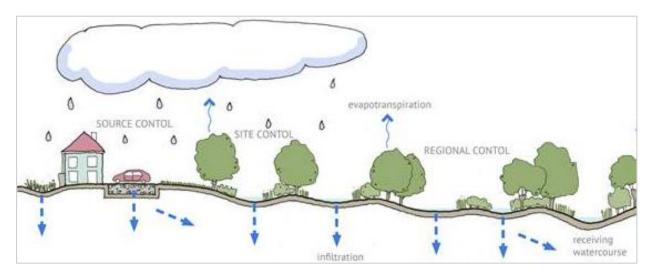


Figure 2-2 - SuDS Treatment Train

The treatment train principles include;

- Prevention of surface water run-off from the proposed site by use of filter drains, swales, permeable paving, tree pits, extensive green roofs, intensive green courtyards and modular attenuation systems, forebays and attenuation ponds.
- Minimising impermeable paved areas using permeable paving, extensive green roofs and intensive green courtyards.
- Infiltration by use of filter drains, swales, permeable paving, tree pits, soakaways and pond forebays.

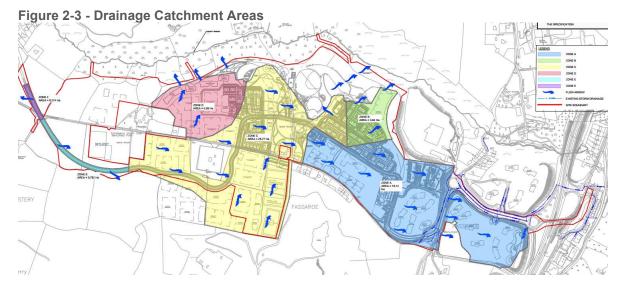


• Site control using underground modular attenuation storage, attenuation ponds and vortex flow control devices to manage flows and agreed final Qbar runoff rate.

Each of the items outlined above will help to improve water quality, reduce storm water runoff quantity from the proposed site and ensure that there is no increased risk to downstream flooding.

Drawings 5186693_HTR_01_DR_0501-0515 & 5186693_HTR_01_DR_0520-0523 inclusive outline the proposed details of the storm-water network and longitudinal sections for the proposed development.

For the purposes of designing the storm water network for the entire development and including associated Qbar calculations a total overall catchment area has been calculated as indicated below in Figure 2-3. 5186693_HTR_01_DR_0530. Refer to Appendix A - Site Characterisation Report for initial catchments area and discharge rates discussed and agreed with Bray Town Council / Wicklow County Council at pre planning stage.



There are No. proposed drainage sub-catchment areas within the proposed phase 1 development for the purpose of site control. The outfall from each catchment is segregated by the use of a vortex control device to limit / manage discharge from each catchment. Section 7 of this report provides further details on catchment areas. It noted that for the purpose of discharge rates, the large open space (public park) has been removed for consistency of overall discharge rates.

The SuDS techniques proposed within the development are as outlined below:

- Landscape ponds with permanent water located within the proposed class 1 open space (public park) and to the east of the site adjacent to the N11 will be used to as storm water attenuation. It is noted that the storm water attenuation volume required is separate to permanent water level within the ponds as details by the landscape architect design.
- Swales are to be used within the site as conveyance systems for surface water runoff. Discharge into the swale will be via drop kerbs / side inlet gully's or over edge flows.
- Permeable paving will be used in light traffic areas to the front of residential units and parking areas. The permeable paving will allow for attenuation, infiltration to ground, reduction of peak flow rates and improved water quality. Roof run-off from the front roof area of residential housing units will also discharge directly into the subbase below each permeable paving area allowing for reduced runoff from these roof areas.
- Extensive green roof and intensive green courtyards will be provided on suitable buildings as indicated on drawing 5186693_HTR_01_DR_0540 in accordance with sustainable drainage best practice. The green roofs / courtyards will provide reduced peak flow rates, attenuation, evaporation, improved water quality and enhance biodiversity.
- Underground modular attenuation systems will be used to manage surface water runoff. The modular system will allow for storm water attenuation underground for storm events up to 1 in



100-year events and including for climate change. The modular systems will also allow for infiltration to ground to reduce surface water discharge quantity.

- Filter drains within rear gardens of the housing units will allow for infiltration to ground, reduced peak flow rates and improved water quality. Only roof run-off from the rear roof of the residential unit will discharge into the filter drain. The filter drain will allow for infiltration to ground to reduce surface water discharge quantity.
- Vortex flow control devices will be used throughout the site to allow for storm water control and reduce peak runoff.

The storm water drainage network will be assessed for compliance with the key design parameters as set out in Table 2-1 below.

Parameter	Value/Requirement
Minimum depth	1.2m cover under highways
	0.9m elsewhere*
Maximum depth	5.0m
Minimum sewer size for main drainage	225mm
Co-efficient runoff factors for pipe sizing and storage requirements as set out in the CIRIA report C753 The SuDS Manual-v6. (It is noted that similar values have been used with similar scaled developments within WCC and adjacent Local authorities).	 100% - Roads / Cycle tracks / Footpaths / Roofs (when discharging directly to storm drainage network) 75% - Roads / Cycle tracks / Footpaths / Roofs when discharging directly swales, tree pits and filter drains 60% - Roads / Cycle tracks / Footpaths / Roofs when discharging directly to permeable paving 85% - Extensive Green Roof (> 150mm thk.) 70% - Intensive Green Courtyard (landscape courtyard areas with soil > 500mm thk.) 65% - Areas outside of the Phase 1 application to allow for sufficient pipe sizing and attenuation for future phases that will drain into the Phase 1 storm drainage network.
Max. velocity at pipe full	3.0 m/s
Min. velocity in	0.75 m/s (1.0 m/s used where achievable)
Roughness	0.6mm
Agreed maximum discharge rate	Qbar 3.5l/s/ha
Level of Service Critical Storm 1 in 2 yr return period	No surcharge within the pipe network, no flooding
Level of Service Critical Storm 1 in 30 yr return period	Surcharge allowed, no flooding
Level of Service	No flooding unless planned and contained on site.

Table 2-1 – Key Design Parameters

Critical Storm 1 in 100 yr return period

*Without recourse to concrete. Absolute minimum cover in roads is 0.9m. Pipes with cover between 0.9m and 1.2m shall be bedded and surrounded in concrete, 150mm thick, Class E, in accordance with Clause 1502 of the Specification for Roadworks.

"Micro Drainage", which is an industry standard software for the design and assessment of gravity sewer drainage networks, has been used to simulate the proposed storm drainage network including flow controls and attenuation requirements. Outputs from the model for the proposed storm network are contained in Appendix H of this report.



It is noted that the proposed storm drainage network has been sized to allow for the future phases of the Fassaroe masterplan area within the control of Cosgrave Property Group.



Figure 2-4 – Fassaroe Masterplan area within the control of Cosgrave Property Group

District Park and sports facilities Total of 18.4 hectares including active and passive open space.

3. Site Investigations

Site Investigations were carried out by LOH Consulting in August 2016, refer to Appendix B of this report for further details.

The purpose of the site investigation was to determine the subsurface Soil Infiltration rates, the report also provides information on ground water levels, depth to bedrock and soil types. 9No. trial holes were excavated on the site and a soakaway tests were carried out as outlined in BRE Digest 365 Soak Away Design.

The findings of the report note that the main geological feature of this area is the presence of Ordovician Metasediments (OM); Soil Classification (BminSW); Tills derived chiefly from Limestone sands and gravels; Carboniferous. Bedrock mainly Deep Marine Slate, Schist and Minor Greywacke. From this information we can conclude that the main constituent of the subsoil is a Limestone sand & gravel till. The Aquifer in this area is classified as Locally important (Lg & Ll), bedrock which is moderately productive. The Vulnerability Rating is High for wastewater treatment systems; there is a low risk of contamination of the ground water from discharge from a Surface Water Soakaway. It is noted that no wastewater (foul) treatment systems are proposed within the development. The proposed foul water network will discharge into the existing Irish Water Network East of the N11 with falls by Gravity to the Bray Pumping Station.

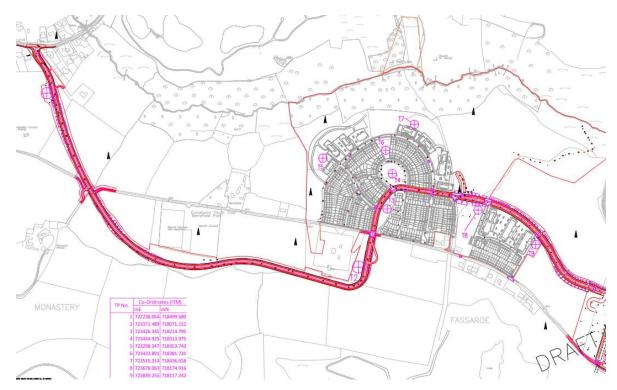


Figure 3-1 - SI Testing Locations

*Note that layout indicated was a draft layout at time of site investigations being carried out. Locations of the site investigations including overall depths and existing ground water levels are indicated on Atkins Storm drainage drawings 5186693_HTR_01_DR_0501-0515.

A review of the 9No. trial holes have indicated that no bedrock or groundwater was encountered to a depth of 2.4m. The location of trial pits, ground levels and ground water levels are indicated on the storm water layout drawings 5186693_HTR_01_DR_0501-0515.

Based on the information contained within the LOH report, there will be no perceptible impacts from existing groundwater levels on the proposed SuDS throughout the site.



The results of T1, T5, T6, T7 & T8 show that the soil will allow some level of infiltration due to the presence of the GRAVEL layer. The results of T2, T3, T4 & T9 show poor infiltration rates, GRAVEL was not encountered in these trial holes.



4. Existing Site Hydrology

There are several key hydrological features within the vicinity of the proposed development, refer to Figure 4-1 below. The Hydrological features include;

- The Dargle River (east of the N11) which flows in an easterly direction prior to discharging to the Dargle Estuary in Bray, which leads to the Irish Sea
- The County Brook which flows in a steeply sided valley along the northern boundary of the proposed development and discharges into the Dargle River
- The Glencullen River located to the south of the development and flows in an easterly direction also discharging into the Dargle River

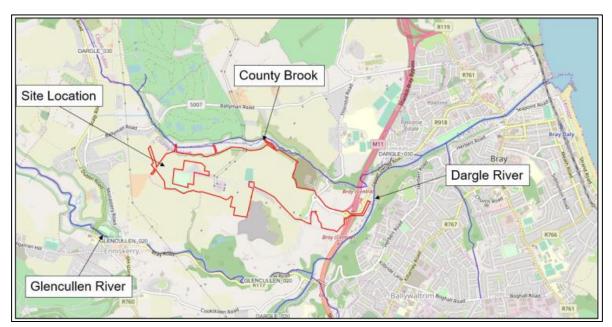


Figure 4-1 - Site Hydrology Overview



5. Soil Type Classification

To determine the allowable Qbar discharge rate from the proposed development site and following a review of the site investigations as outlined in section 3 Site Investigations of this report, a SOIL type value of 3 has been determined.



6. Surface Water Storage Requirements

The www.uksuds.com surface water storage volume estimation tool was used to determine the maximum Qbar discharge rate from the site for a 1 in 100-year storm event. Site specific data was confirmed using Met Eireann rainfall data as indicated below;

Figure 6-1 – Met Eireann Rainfall Data

Met Eireann Return Period Rainfall Depths for sliding Durations Irish Grid: Easting: 326619, Northing: 219487, Interval 4, 5.9, 8.2, 9.6, 12.3, 15.8, 20.3, 23.4, 20, 9.3, 30, 10.4, 14.4, DURATION 6months, 1year, 3, 5.3, 7.4, 8.7, 11.2, 14.4, 18.5, 21.5, 23.9, 27.7, 100, 150, 500, 50, 11.8, 16.5, 19.4, 24.1, 30.0, 13.1, 18.3, 15.6, 21.8, 25.6, 31.5, 38.8, N/A , N/A , N/A , N/A , N/A , 4.4, 6.2, 7.3, 9.5, 12.3, 15.9, 18.5, 20.6, 24.0, 28.0, 6.3, 7.7, 10.8, 12.7, 16.0, 20.3, 25.8, 29.6, 32.7, 37.5, 43.1, 47.6, 54.7, 60.3, 72.0, 81.4, 89.6, 103.9, 116.4, 127.8, 14.1, 19.6, 17.8, 24.8, 5 mins 10 mins 2.8, 3.9, 5.4, 16.8, 23.4, 6.3, 8.8, 10.3, 13.2, 16.9, 21.6, 13.0, 15.3, 19.2, 24.2, 3.9. 5.4, 6.4, 8.3, 10.8, 14.1, 16.5, 18.4, 21.5, 25.1, 29.0 27.5, 33.8, 41.5, 50.9, 57.4, 15 mins 30 mins 1 hours 4.6, 6.1, 8.0, 17.0, 21.3, 26.6, 21.5, 26.6, 33.0, 23.1, 28.6, 35.3, 43.7, 29.1, 35.7, 43.7, 9.5, 11.2, 12.3, 12.4, 15.3, 16.9, 19.2, 21.3, 24.1, 26.1, 26.0, 26.0, 31.5, 33.8, 41.5, 43.7, 15.9, 18.5, 20.3, 21.6, 25.8, 30.4, 33.3, 37.4, 41.0, 43.7, 47.8, 50.9, 53.5, 18.5, 21.5, 23.4, 24.9, 29.6, 34.7, 38.0, 42.5, 46.5, 49.4, 53.9, 57.4, 60.2, 20.6, 23.9, 26.0, 27.6, 32.7, 38.2, 41.7, 46.6, 50.8, 54.0, 58.6, 62.5, 65.5, 24.0, 27.7, 30.0, 31.8, 37.5, 43.7, 47.6, 53.0, 57.6, 61.1, 66.4, 70.4, 73.7, 28.0, 32.1, 34.7, 36.8, 43.1, 50.0, 54.3, 60.2, 65.3, 69.2, 75.0, 79.4, 83.0, 31.1, 35.6, 38.5, 40.7, 47.6, 55.0, 59.6, 66.0, 71.4, 75.6, 81.8, 86.4, 90.3, 36.3, 41.3, 44.5, 47.0, 54.7, 62.8, 68.0, 75.0, 81.0, 85.5, 92.3, 97.5, 101.6, 40.4, 45.8, 49.4, 52.0, 60.3, 69.1, 74.7, 82.2, 88.6, 93.4, 100.7, 106.1, 10.5, 49.7, 55.9, 59.8, 662.8, 102.1, 101.5, 127.6, 133.7, 138.5, 134.9, 17.9, 92.2, 106.8, 114.1, 119.5, 127.6, 133.7, 138.5, 53.8, 71.0, 75.6, 79.1, 89.6, 100.6, 107.3, 116.4, 124.0, 129.7, 138.2, 144.5, 149.6, 75.4, 83.4, 88.5, 92.3, 103.9, 115.9, 123.3, 133.1, 141.3, 147.5, 156.6, 163.3, 168.8, 85.5, 94.3, 99.8, 103.9, 116.4, 129.3, 137.2, 147.6, 156.4, 162.9, 172.6, 179.7, 138.5, 144.5, 149.6, 155.4, 162.9, 172.6, 113.7, 138.5, 133.5, 133.1, 141.3, 147.5, 156.6, 163.3, 168.8, 85.5, 94.3, 109.2, 113.4, 119.7, 124.3, 138.4, 152.7, 161.5, 170.1, 176.9, 187.0, 194.5, 200.5, 103.5, 113.4, 119.7, 124.3, 138.4, 152.7, 161.5, 173.0, 182.7, 189.9, 200.4, 208.2, 214.5, 103.5, 113.4, 119.7, 124.3, 138.4, 152.7, 161.5, 173.0, 182.7, 189.9, 200.4, 208.2, 214.5, 134.4, 146.2, 153.6, 159.1, 175.6, 192.3, 202.4, 215.8, 226.9, 235.1, 247.0, 255.9, 263.0, 151.7, 164.6, 172.6, 178.5, 196.3, 214.2, 225.1, 239.3, 251.2, 259.9, 272.6, 282.0, 289.5, 151.7, 164.6, 172.6, 178.5, 196.3, 214.2, 225.1, 239.3, 251.2, 259.9, 272.6, 282.0, 289.5, 151.7, 164.6, 172.6, 178.5, 196.3, 214.2, 225.1, 239.3, 251.2, 259.9, 272.6, 282.0, 289.5, 151.7, 164.6, 172.6, 178.5, 196.3, 214.2, 225.1, 239.3, 251.2, 259.9, 272.6, 282.0, 289.5, 151.7, 164.6, 172.6, 178.5, 196.3, 214.2, 225.1, 239.3, 251.2, 259.9, 272.6, 282.0, 289.5, 151.7, 164.6, 172.6, 10.6, 12.5, 14.1, 16.5, 19.5, 2 hours N/A 3 hours N/A hours N/A N/A 9 hours N/A 19.5, 21.9, 25.8, 28.9, 36.5, 42.7, 48.1, 57.7, 66.1, 74.0, 28.0, 32.8, 36.6, 45.4, 12 hours N/A N/A 12 hours 18 hours 24 hours 2 days 3 days 4 days 6 days 8 days 10 days 125.5, 141.5, 52.5, 58.7, 69.6, 79.2, 154.9, 166.5 186.8, 204.4, 220.4, 88.1, 12 days 16 days 20 days 25 days 81.3, 96.3, 94.9, 111.6, 107.5, 125.8, 122.4, 142.3, 200.4, 208.2, 214.5, 235.1, 261.9 286.2, 314.1, NOTES :

NA Data not available These values are derived from a Depth Duration Frequency (DDF) Model For details refer to: 'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',

Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

A SAAR Value of 829mm was utilised to calculate the green field runoff rate as confirmed by WCC, see Figure 6-2 below.



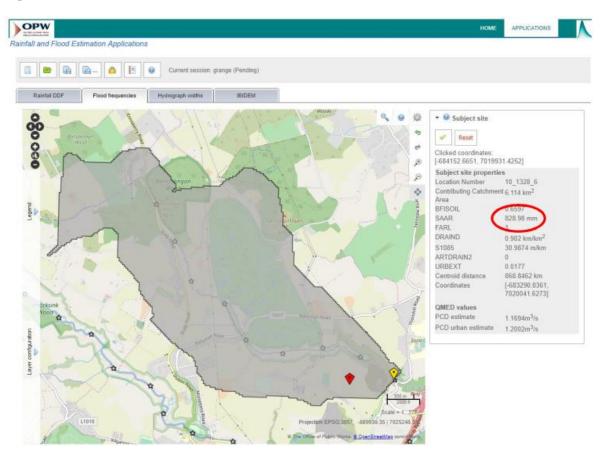


Figure 6-2 – Extract from OPW Rainfall and Flood Estimation Tool

Refer to for the output from the <u>www.uksuds.com</u> surface water storage volume estimation tool and maximum Qbar discharge rate.

A summary of the calculations is outlined in Table 6-1 below.

As indicated above in Figure 2-3 - Drainage Catchment Areas, the overall drainage catchment areas have been divided into 6 catchments for phase 1 and future phases that drain into phase 1 network.

Total drained area is based on the Area size with large open spaces removed including rear gardens.

Catchment Area	Soil Type	Area Size (ha)	Total Drained Area (ha)	Resulting Qbar (I/s)
А	3	18.14	13.38	63.5
В	3	3.84	1.453	13.45
С	3	27.62	13.50	96.67
D	Future Phase (does not drain into current Phase 1 Network)			
Е	3	0.782	0.782	Outfall to Soakaway
F	3	0.274	0.274	Outfall to existing pipe and flow control granted under planning WCC planning ref; 1715

Table 6-1 - Qbar Calculation Summary



7. Proposed Site Characteristics

The total Site Impermeable Areas and reduced Impermeable Areas based on coefficient runoff factors are indicated below in **Table 7-1**.

Table 7-1 – Site Impermeable Areas

	Total Impermeable Area	Impermeable Area based on co-efficient runoff factors (Table 2-1)
Roads / Cycle tracks / Footpaths / Roofs (when discharging directly to storm drainage network)	8.63 ha	8.63 ha
Roads / Cycle tracks / Footpaths / Roofs when discharging directly swales, tree pits and filter drains	2.24 ha	1.68 ha
Roads / Cycle tracks / Footpaths / Roofs when discharging directly to permeable paving	4.88 ha	2.93 ha
Extensive Green Roof (> 150mm thk.)	0.99 ha	0.84 ha
Intensive Green Courtyard (landscape courtyard areas with soil > 500mm thk.)	0.49 ha	0.34 ha
Phase 1 Total	17.23 ha	14.42 ha
Allowance made for future phases that will drain into the Phase 1 storm drainage network.	13.36 ha	8.68 ha
Gross Total	30.59 ha	23.10 ha

A controlled discharge will be via a vortex flow control device downstream of the attenuation systems. Each flow control device has been designed based on the maximum head of water within the attenuation system. The design head has been calculated for each catchment to ensure the flows rates indicated in Table 6-1 are not exceeded for the 1 in 100-year 6-hour storm event. It is noted that penstock will be installed within the hydro break chambers to allow maintenance when required.

Additional attenuation systems within the catchment areas have been included within the design to allow for management of surface water runoff at source, these additional tanks are indicated on the planning drawings 5186693_HTR_01_DR_0501-0515. The flow control downstream of these attenuation system allow for surface water runoff to be management locally within an area available and no impact on the overall final discharge rate from the site.

A catch pit manhole will be provided at all inlets to the attenuation systems to reduce the levels of silts entering the system. Forebays have also been provided prior to permanent ponds to provide additional treatment of surface water.

Where swales are provided, they are used for the conveyance of surface water runoff from the adjoining hard standing areas. Discharge into the swale will be via drop kerbs / side inlet gullies. Discharge from the swales to the storm water network will be via a perforated manhole cover. The manhole cover has been designed to be 50mm above the base on the swale to provide for interception volumes as indicated in Table 7-2



Porous paving provided will cater for runoff from the porous paving surface, adjacent roads / footpaths and roof runoff from the front of suitable residential units. The subbase below the porous paving will allow for infiltration, reduced peak flows and will have a minimum of 30% void ratio within the subbase. An orifice plate will be provided were suitable at the outfall chamber from each porous paving area to reduce the flow and increase the overall storage capacity of the subbase.

Filter Drains with a perforated pipe will be provided in private rear gardens to drain storm water from roof runoff from the rear of the proposed associated dwellings.

Tree pits will be used at locations as indicated. Runoff from adjacent roads / footpaths and excess runoff from adjoining impermeable surface will discharge into the pit via a dropped kerb. The tree pit will allow for interception and percolation to ground. An overflow pipe with a raised level of 50mm above the finished surface level will allow for overflow into the storm drainage network during high intensity rainfall events.

Extensive green roofs and Intensive green courtyards will be provided to suitable apartment blocks and retail units. A run-off factor of 85% for extensive and 70% for intensive has been used within the calculations.

It is noted that given the extents of SuDS provided within the proposed site as outlined above, sufficient treatment will be provided to prevent any impact on water quality of the receiving waters from the proposed development, petrol interceptor is not deemed necessary.



7.1. Compliance with GDSDS Design Criteria

Outfall Section 6.3.4 of the GDSDS Volume 2 New Development sets out four design criterion which are required to be met by the proposed drainage system. Compliance with these criteria are outlined below:

7.1.1. Interception Volume – Criterion 1.1

Interception storage volume is based on 80% runoff from paved areas and 0% runoff from pervious surfaces for the first 5mm of rainfall.

As set out in Table 24.6 - Interception Mechanisms of the CIRIA report C753 The SuDS Manual-v6, hard standing areas discharging into SuDS area deemed to be compliant for interception. As a result, the impermeable areas draining to these SuDS features can be subtracted from the total hardstanding area when calculating the interception volume requirement. The new hardstanding areas requiring interception storage for all phase 1 catchments is as described in Table 7-2 below.

7.1.1.1. Phase 1 Catchments

Table 7-2 – Total Hardstanding Area Requiring Interception Storage (Phase 1 only)

		Total Paved Site
Total Hardstanding Area		16.83 ha
Impermeable Areas deemed to be compliant as per Table 24.6 of the SuDS Manual	Extensive Green Roof (> 150mm thk.)	0.99ha
	Intensive Green Courtyard (landscape courtyard areas with soil > 500mm thk.)	0.49ha
	Total Hard standing area discharging to SuDS (tree pits, permeable paving, filter drains, tree pits)	6.72ha
Total Area deemed to be compliant		8.20ha
Total Remaining Hardstanding Area requiring interception storage		16.83 – 8.20 = 8.63ha

Table 7-3 – Interception Storage Volume Requirement

	Total
Total Hardstanding Area Not Discharging to SuDS Features	8.63ha
Volume of Interception Required	86300m ² x 0.005m x 0.8 = 346m ³



Table 7-4 – Interception Volume Provided

SuDS	Volume
Underground modular attenuation system	Total Area of Tanks A, B, C = 1575m ²
	0.25m (Depth of stone base) x $1575m^2$ = $394m^3$
	394 x 30% Voids = 118m ³
Swales	340m (l) x 1m (w) x 0.05 (d) = 17 m ³
Filter drains (rear gardens)	1357m (l) x 0.5m (w) x 0.05 (d) = 34 m ³
	34 x 30% Voids = 10.2 m ³
Forebay prior to Ponds 1, 2, and 3	Total Area = 1415 m ²
	1415 x 0.15 (d) = 212m ³
Road Soakaway	75 (L) x 20 (w) x 1 (d) = 1500m ³
	1500 x 30% Voids = 450 m ³
Total	807.2m ³ provided > 346m ³ required (OK)

Interception Volume for Phase 1 has been provided using a series of SuDS. The overall volume being provide is 807.2m³ which exceeds the minimum required interception volume of 346m³. Interception volume has been provided on the proposed site using the SuDS features noted below.

- Stone Based within the underground modular attenuation systems
- Conveyance Swales with raised outfall levels
- Filter Drains in rear gardens with outfall pipe higher than the base of the filter drain
- Forebay prior to Ponds 1, 2, and 3
- Road Soakaway

It is noted that additional Interception volume is also provided within the following SuDS features;

- Permeable pavement to parking bays
- Tree pits

7.1.2. Treatment Volume – Criterion 1.2

Treatment volume is based on 80% runoff from paved areas and 0% runoff from pervious surfaces for the first 15mm of rainfall.

Table 7-5 – Treatment Volume

	Total Paved Site
Paved surfaces (roads, footpaths, permeable paving & roof areas)	8.63ha
Volume of Treatment Storage Required	86300m2 x 0.015 x 0.8 = 1036m ³



Due to site constraints including demand for public open space requirements including play areas, playing pitches etc and planning density requirements there is insufficient area on site to provide the Treatment Volume (retention pond / wetland has not been provided). While it is noted that some treatment volume will be provided within the proposed Forebays prior to Ponds 1, 2, and 3 and also within the ponds were permanent water level is lower than the outfall pipe during certain times of the year. It is considered that the total volume of 1036m³ could not be accommodated and therefore Criterion 1.2 cannot be successfully met for this site.

In accordance with Table 6.3 of the Regional Drainage Policies – Volume 2 New Development, as Criterion 1.1 is being <u>fully</u> achieved, Criterion 1.2 is therefore <u>not</u> required.

7.1.3. River Regime Protection – Criterion 2

River Regime Protection by limiting discharge to receiving waters

An allowable outflow rate for Qbar of 3.5I/s/ha has been calculated for the site and agreed at preplanning stage with WCC / Bray Town Council.

The overall Phase 1 site attenuation volume is > 6233 m^3 as outlined in the table below. The attenuation volumes provided also allow for part of the future phases that will discharge into the phase 1 storm drainage network and therefore the total attenuation volume available will not be used until future phases are constructed under a separate planning application. As the attenuation volume will not be used and design head within the flow control devices will not be reached, the allowable maximum discharge will remain lower than the allowable rate until future phases are constructed.

Attenuation System	Volume Available
Pond 1	1875m ³
Pond 2	673m ³
Pond 3	726m ³
Pond 4	2445m ³
Tank A	620m ³
Tank B	100m ³
Tank C	400m ³
Total	6,839m ³

Table 7-6 – Phase 1 Attenuation Tanks / Ponds

It is noted that additional Attenuation storage volume is also provided within the SuDS features throughout the site. These additional volumes are not indicated in the table above.

7.1.4. Levels of Service – Criterion 3

The four criteria for levels of service are as follows:

- Criterion 3.1: No external flooding (30 year high intensity rainfall event)
- Criterion 3.2: No internal flooding (100 year high intensity rainfall event)
- Criterion 3.3: No internal flooding (100 year river event and critical duration for site storage)
- Criterion 3.4: No flood routing off site except where specifically planned (100 year high intensity rainfall event)

Criteria 3.1, 3.2, 3.3 & 3.4: All potential flooding has been reviewed and modelled using micro drainage for up to the required 1 in 100 year storm event including 20% for climate change. Outputs from the model for the proposed storm network are contained in Appendix H of this report.



7.1.5. River Flood Protection – Criterion 4

Of the three methods referred to in the GDSDS for establishing River Flood Protection, by comparison of the pre and post development runoff volumes, (Criteria 4.1, 4.2 and 4.3 respectively), Criteria 4.3 has been selected most suitable for use on this proposed site. An extract from the GDSDS for Criterion 4 is indicated in Figure 7-1 below.

Figure 7-1 - GDSDS River Flood Protection

Criterion 4 River flood protection (Criterion 4.1, or 4.2 or 4.3 to be applied)	4.1	100	"Long-term" floodwater accommodated on site for development runoff volume which is in excess of the greenfield runoff volume. Temporary flood storage drained by infiltration on a designated flooding area brought into operation by extreme events only. 100 year, 6 hour duration storm to be used for assessment of the additional volume of runoff. Infiltration storage provided equal in volume to "long term" storage. Usually designed to operate for all events. 100year, 6-hour duration storm to be used for assessment of the
	4.3	100	Maximum discharge rate of QBAR or 2 <i>l/s/ha</i> , whichever is the greater, for all attenuation storage
			greater, for all attenuation storage where separate "long term" storage cannot be provided.

Criterion 4.3 has been satisfied for the proposed site by providing an agreed Maximum discharge rate of Qbar (3.5l/s/ha) and on-site attenuation for up to the 1 in 100 year 6 hour storm event including 20% for climate change.

8. Flooding

8.1. Flood Risk Assessment

A Flood Risk Assessment (FRA) Atkins Document No. 51866993DG0062 has been undertaken for the site to satisfy the requirements of the Planning System and Flood Risk Management Guidelines. The report aimed at scoping sources of flooding, assessing whether any significant flood risk issues exist and proposing appropriate flood risk management measures as required.

The Stage 1 Flood Risk has concluded the following;

- There is no historic risk of flooding within the development site.
- The OPW CFRAM flood extent maps studies have not been carried out in the area of the site and therefore do not show any flood risk at the site.
- The NIFM illustrates that fluvial flooding for the 1 in 100 year event from the County Brook is contained within the steep valley of the watercourse beyond the northern boundary of the site.
- On the basis of the NIFM and the topographical surveys undertaken, the site is considered to be located within Zone C, low probability of flooding.
- Given that the proposed development site is located in Zone C, low probability of flooding, is thus appropriate from a flood risk perspective subject to the completion of this FRA which considers other sources of flood hazard than river flooding and subject to it meeting the normal range of proper planning and sustainable development requirements.
- Given that the proposed development is located in Zone C and is appropriate development, consideration of the Justification Test is not required.
- The proposed development is not at risk of flooding from the 1% AEP event.

9. SuDS Maintenance

Regular checks and maintenance of the SuDS systems is required and have been considered as part of the overall drainage design for the proposed development. This will ensure both the design life of the SuDS systems, ongoing improved water quality, reduced water runoff and reduce the risk of onsite flooding.

9.1. Permeable Paving

Paving should be inspected regularly, preferable during and after heavy rainfall to ensure effective operation.

Vacuum brushing or jetting of the permeable paving should be carried out once a year. Cleaning is generally carried out after Autumn leaf fall to remove silts and sediments.

9.2. Green Roofs / Green Courtyards

All components (soil substrate, vegetation, drains, membranes and rood structure) should be inspected annually and after severe storms.

Underside of roof should also be inspected annually and after severe storms for evidence of leakage.

Debris, fallen leaves and litter should be regularly removed to prevent clogging of inlet drains.

9.3. Underground modular attenuation system / Soakaway

Inspection of the system should be carried out monthly for the first 3 months and then annually to ensure the system is working correctly.

Debris should be removed monthly from the catchment surface where is may cause risk to the performance of the underground attenuation system

As required sediment from pre-treatment (catch pit) manholes prior to the attenuation system should be removed to ensure on going performance of the system.

The inside of the tank should be surveyed every 5 years or as required if performance is reduced. Sediment build up removed if necessary.

9.4. Tree Pits

Maintenance of trees will be greatest in the first few years, which will include regular inspection of tree condition including inlets and outlets, removal of invasive vegetation and possibly irrigation during long dry periods.

9.5. Swales

Mowing in the first year is critical to eliminate competition from weeds. Lawn-mowing to an ideal height of 100mm should be maintained as grasses tend to flatten down when water is flowing over them, reducing sedimentation. Maintenance of the swale should include:

- Periodic litter removal with the swale and self-clearing inlet grid.
- Occasional stabilisation of eroded side slopes and base.
- Check and Removal of Sediment build up.
- Ongoing maintenance should form part of the site landscaping proposals.



9.6. Filter Drains

Inspection of the system should be carried out monthly on the inlet / outlet pipework and any control systems for blockages.

Inspection of pre-treatment systems including should be carried out every 6 months for catch pits manholes prior to the filter drain with removal of silt or other build-ups. Removal of silt build-up may be required more frequent.

Annual cleaning of roof runoff gutters etc should be part of the generally maintenance of the drainage system to ensure debris is removed prior to entering the network.

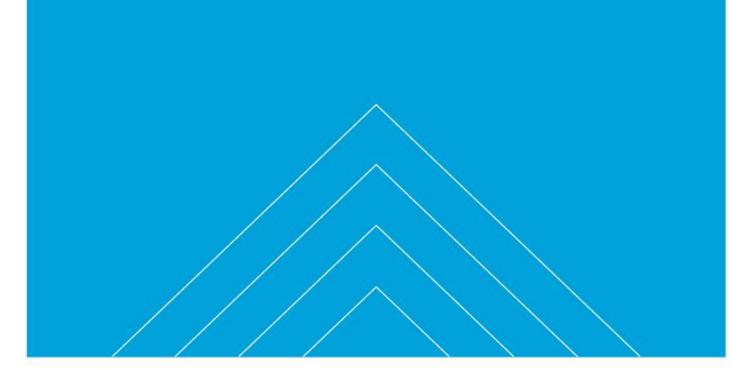
Perforated pipework should be cleared of blockage if required.

9.7. Ponds

Maintenance of the proposed Ponds and attenuation volumes within the public area should be carried out in accordance with the landscape maintenance plan and include;

- Periodic litter removal with the swale and self-clearing inlet grid.
- Occasional review and stabilisation of eroded side slopes and base.
- Check and Removal of Sediment build up.
- Ongoing maintenance should form part of the site landscaping proposals.

Appendices





Appendix A. Site Characterisation Report



Project:	Fassaroe Development	То:	Wicklow County Council
Subject:	SuDS Site Characterisation	From:	Garry Hanratty
Date:	1 Aug 2019	CC:	Ailis Corrigan

The following table below outlines the Site Characteristics as set out in the CIRIA report C753 'The SuDS Manual V6 part C relating to the surface water management plans (SWMP).

Site topography	The site area is predominantly a steep sloping site, falling from a high point in
	Drainage Zone C in a north easterly direction to the south west.
Existing flow routes and discharge points	The existing flow routes for the site are predominantly in a north easterly direction with a small portion draining to the south west. The majority of the site discharges into the County Brook (EPA code 10C06) to the north with proposed drainage Zone F discharging to the Dargle Rvier (EPA code 10D01) to theSouth.
	An existing public storm drain is located to the East lower end of the site. The existing storm drain goes under the M11 prior to discharge into the Dargle River.
Existing Soils and Potential for Infiltration	A review of the SI information for the site indicates that the ground is predominantly sandy gravelly CLAY. Based on these findings CIRIA report C753 indicates a moderate runoff potential (soil type 3). Therefore, the soil type has is a poor infiltration media. The design of infiltration systems on this site is not recommended. Greenfield runoff rates are too be agreed with Wicklow County Council as outlined further in this report.
Potential for surface water discharge	It is assumed that the proposed surface water will discharge into the existing local water courses to mimic where possible to current surface water flow as is best practice. Surface water flow from the lower eastern end of the site will discharge into the existing public storm drain.
Site Flood Risks	An initial review of the OPW <u>www.floodinfo.ie</u> does not indicate existing flooding within the vicinity of the proposed site. A review of the existing CFRAM maps indicate that the project does not extend as far as the proposed site.
	The Wicklow SFRA – County Development Plan 2016 – 2022 indicates flooding to the North and South of the proposed site (not within the site extents) within both the Glencullen and Dargle river.
	A Flood Risk Assessment (FRA) is to be carried in accordance with the Flood risk assessment will encompass all Stages of assessment, from 1 to 3, as set out in the OPW "The Planning system and Flood risk management - Guidelines for Planning Authorities" November 2009.
Existing site land use	The site is predominantly existing green field land with a number of private single dwellings. A large recycling centre is located to the East of the proposed site.
Existing site infrastructure	A full review of existing site infrastructure will be carried out during the project. This will include all services and utilities A number of ESB HV overhead line are located within the site. Irish Water (IW) potable water supply infrastructure is also located within the site and require further consideration and discussions with IW Further consideration to all existing infrastructure will be taken into account during the planning design



The site drainage will be designed in compliance with GDSDS Design Criteria and SuDS design criteria in accordance with CIRIA report C753

Interception Volume – Criterion 1.1

Interception storage volume is based on 80% runoff from paved areas and 0% runoff from pervious surfaces for the first 5mm of rainfall.

Treatment Volume - Criterion 1.2

Interception storage volume is based on 80% runoff from paved areas and 0% runoff from pervious surfaces for the first 15mm of rainfall.

River Regime Protection – Criterion 2

Allowable outflow rate for Qbar to be agreed with DLRCC drainage department.

Levels of Service - Criterion 3

There are four criteria for levels of service. These are:

Criterion 3.1: No external flooding (30-year high intensity rainfall event)

Criterion 3.2: No internal flooding. (100-year high intensity rainfall event).

Criterion 3.3: No internal flooding. (100-year river event and critical duration for site storage)

Criterion 3.4: No flood routing off site except where specifically planned. (100-year high intensity rainfall event)

River Flood Protection – Criterion 4

Of the three methods referred to in the GDSDS for establishing River Flood Protection, by comparison of the pre and post development runoff volumes, (Criteria 4.1, 4.2 and 4.3 respectively), Criteria 4.3 has been selected most suitable for use on this proposed site. An extract from the GDSDS, section E2.4 details the long-term formula for which Qbar Rural is applicable:

$$\begin{split} & \operatorname{Vol}_{xs} = \operatorname{RD.A.10} \Bigg[\frac{\operatorname{PIMP}}{100} (\alpha 0.8) + \Bigg(1 - \frac{\operatorname{PIMP}}{100} \Bigr) (\beta \operatorname{SOIL}) - \operatorname{SOIL} \Bigg] \\ & \text{where:} \\ & \operatorname{Vol}_{xs} & \text{is the extra runoff volume } (m^3) \text{ of development runoff over Greenfield runoff} \\ & \operatorname{RD} & \text{is the rainfall depth for the 100 year, 6-hour event } (mm) \\ & \operatorname{PIMP} & \text{is the impermeable area as a percentage of the total area (values from 0 to100)} \\ & \text{A} & \text{is the area of the site (ha)} \\ & \operatorname{SOIL} & \text{is the "SPR" index from FSR} \end{split}$$

 $\alpha 0.8$ is the proportion of paved area draining to the network or directly to the river (values from 0 to1) with 80 percent runoff

 $[\]beta$ is the proportion of pervious area draining to the network or directly to the river (values from 0 to 1)



Water quantity	1. Use Tree pits where suitable
	2. Lateral inflows from roads and parking areas to drain to swales.
	3. Use of perforated pipe under light vehicle parking areas to encourage infiltration.
	 Control Peak runoff rates from the site for the critical 1 in 100-year storm events including 10% for climate change in accordance with the GDSDS by using sub-catchments.
	 Control runoff volumes from the site for an appropriate 1 in 100-year events using long-term storage where suitable.
	 Control peak run off rates from the site for the critical 1 in 1 year by use of infiltration, dry detention basins and ponds prior to discharge to local water course.
Water quality	 Use of perforated pipe under light vehicle parking areas to encourage infiltration.
	2. Catch pits to be provided prior to discharge into attenuation systems.
	3. Provide treatment of surface water runoff using swales and bio- retention areas where suitable
Amenity	 Water features such as swales and detention basins to be kept shallow to allow for ease of maintenance.
	2. Keep water at surface level where practical.
	3. Water features to be within public open spaces where practical.

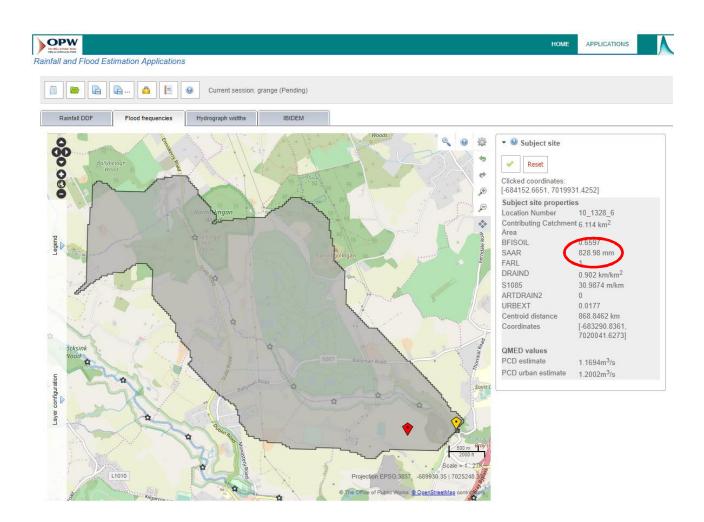
Site SuDS design (sample to be confirmed at project stage)



Qbar discharge rates calculations

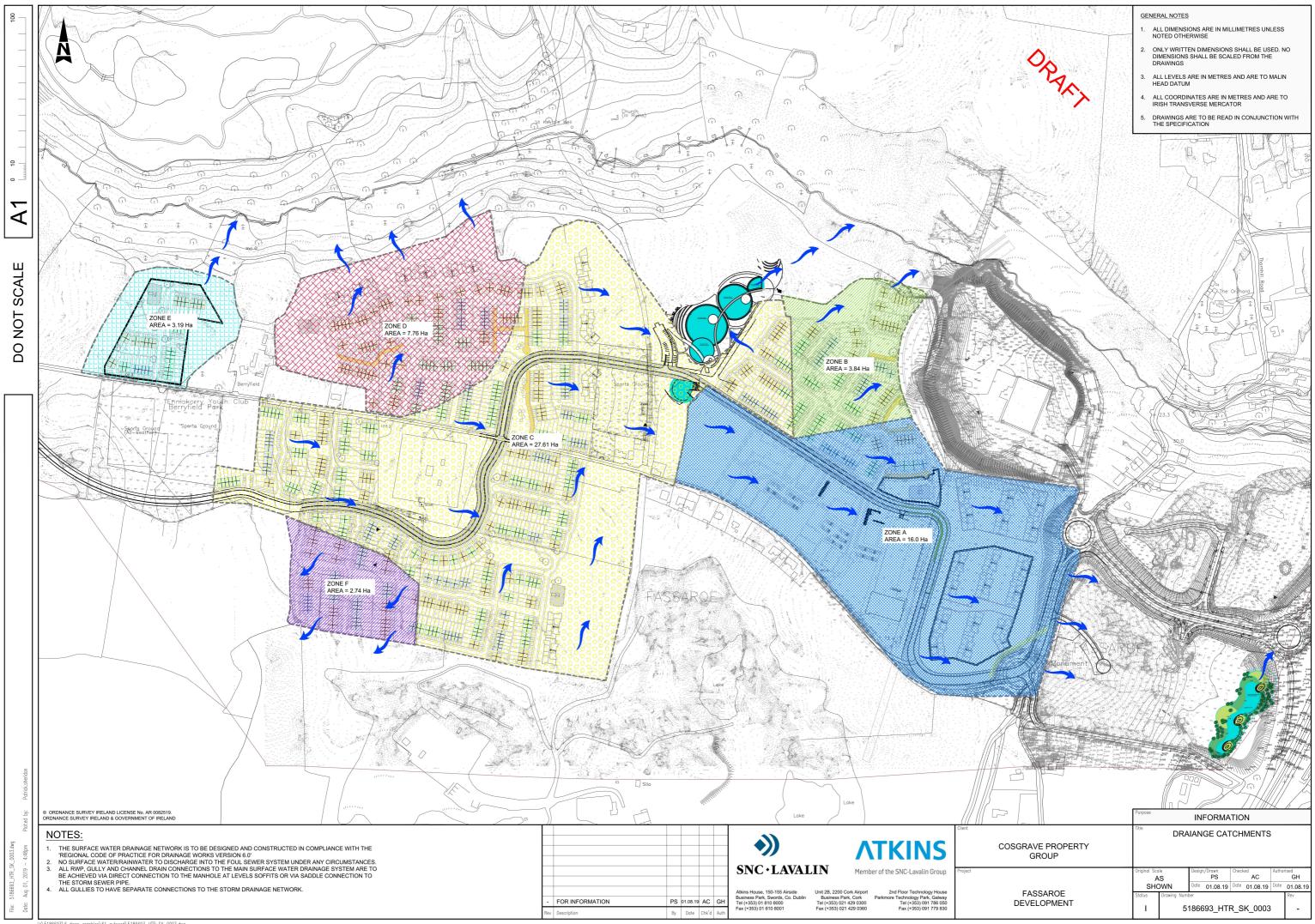
The following calculations for Qbar greenfield runoff have been carried out using <u>www.uksuds.com</u>. A number of edits have been carried out based on the Site Characterisation table including;

- Soil Type changed to Type 3 from the default Type 2 based on SI findings
- Hydrological characteristics SAAR values have been changed to 829mm from the default of 1041mm. SAAR values are based on OPW data as indicated below



Drainage Zone – Maximum Greenfield runoff rates (Qbar)

Drainage Zone	Area (ha)	Qbar Discharge rate (l/s)
A	16.0	56.02
В	3.84	13.45
С	27.61	96.67
D	7.76	27.17
E	3.19	11.17
F	2.74	8.65





Calculated by:	Garry Hanratty
Site name:	Fassaroe Development
Site location:	Zone A

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Greenfield runoff estimation for sites

www.uksuds.com | Greenfield runoff tool

Site coordinates

Latitude:	53.19692° N
Longitude:	6.14207° W
Reference:	
Date:	2019-08-01 15:41

Methodology	IH12	4		
Site characteristics				
Total site area (ha)			16	
Methodology				
Qbar estimation method Calculate fro		om SPR a	and SAAR	
SPR estimation method Calculate fr		om SOIL	type	
		Default	Edited	
SOIL type			2	3
HOST class				
SPR/SPRHOST		0.3	0.37	
Hydrological characteristics Default Edited				
SAAR (mm)			1041	829
Hydrological region			12	12
Growth curve factor: 1 year		0.85	0.85	
Growth curve factor: 30 year		2.13	2.13	
Growth curve factor: 100 year		2.61	2.61	

Notes:

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

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

(3) Is SPR/SPRHOST ≤ 0.3 ?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite may be a requirement for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Qbar (l/s)	46.39	56.02
1 in 1 year (l/s)	39.43	47.62
1 in 30 years (l/s)	98.81	119.33
1 in 100 years (l/s)	121.08	146.22

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



Calculated by:	Garry Hanratty
Site name:	Fassaroe Development
Site location:	Zone B

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Greenfield runoff estimation for sites

www.uksuds.com | Greenfield runoff tool

Site coordinates

Latitude:	53.19692° N
Longitude:	6.14207° W
Reference:	
Date:	2019-08-01 15:42

Methodology	IH124				
Site characteristics					
Total site area (ha)		3.84			
Vethodology					
Qbar estimation method		Calculate from SPR and SAAR			
SPR estimation method Calc		Calculate fr	alculate from SOIL type		
			Default	Edited	
SOIL type		2	3		
HOST class					
SPR/SPRHOST		0.3	0.37		
lydrological charac	teristic	s	Default	Edited	
SAAR (mm)			1041	829	
Hydrological region			12	12	
Growth curve factor: 1 year			0.85	0.85	
Growth curve factor: 30 year			2.13	2.13	
Growth curve factor: 100 year			2.61	2.61	

Notes:

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

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

(3) Is SPR/SPRHOST ≤ 0.3 ?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite may be a requirement for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited
Qbar (l/s)	11.13	13.45
1 in 1 year (l/s)	9.46	11.43
1 in 30 years (l/s)	23.71	28.64
1 in 100 years (l/s)	29.06	35.09

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



Methodology

Calculated by:	Garry Hanratty
Site name:	Fassaroe Development
Site location:	Zone C

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

IH124

Greenfield runoff estimation for sites

www.uksuds.com | Greenfield runoff tool

Site coordinates

Latitude:	53.19692° N
Longitude:	6.14207° W
Reference:	
Date:	2019-08-01 15:44

Site characteristics				Notes:
Total site area (ha)		27.61		(1) Is Q _{BAR} < 2.0 l/s/ha?
Methodology				
Qbar estimation method	Calculate fr	om SPR	and SAAR	
SPR estimation method	Calculate fr	om SOIL	type	
		Default	Edited	(2) Are flow rates < 5.0 l/s?
SOIL type		2	3	
HOST class				
SPR/SPRHOST		0.3	0.37	
Hydrological characterist	ics	Default	Edited	
SAAR (mm)		1041	829	(3) Is SPR/SPRHOST ≤ 0.3?
Hydrological region		12	12	Where groundwater levels are low enough the use of
Growth curve factor: 1 year	ſ	0.85	0.85	soakaways to avoid discharge offsite may be a requirement
Growth curve factor: 30 year	ar	2.13	2.13	for disposal of surface water runoff.
Growth curve factor: 100 ye	ear	2.61	2.61	

Greenfield runoff rates	Default	Edited
Qbar (l/s)	80.05	96.67
1 in 1 year (l/s)	68.04	82.17
1 in 30 years (l/s)	170.51	205.92
1 in 100 years (l/s)	208.94	252.32



Calculated by:	Garry Hanratty
Site name:	Fassaroe Development
Site location:	Zone D

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Greenfield runoff estimation for sites

www.uksuds.com | Greenfield runoff tool

Site coordinates

Latitude:	53.19692° N
Longitude:	6.14207° W
Reference:	
Date:	2019-08-01 15:45

Methodology	IH12	4			
Site characteristics					Notes:
Total site area (ha)			7.76		(1) Is Q _{BAR} < 2
Methodology					
Qbar estimation meth	nod	Calculate f	rom SPR	and SAAR	
SPR estimation meth	od	Calculate f	rom SOIL	type	
			Default	Edited	(2) Are flow ra
SOIL type			2	3	
HOST class					
SPR/SPRHOST			0.3	0.37	
Hydrological charac	teristic	cs	Default	Edited	
SAAR (mm)			1041	829	(3) Is SPR/SP
Hydrological region			12	12	Where groundw
Growth curve factor: 1 year			0.85	0.85	soakaways to a
Growth curve factor: 30 year			2.13	2.13	for disposal of s
Growth curve factor:	100 ye	ar	2.61	2.61	

.0 l/s/ha?

ates < 5.0 l/s?

PRHOST ≤ 0.3 ?

water levels are low enough the use of woid discharge offsite may be a requirement surface water runoff.

Greenfield runoff rates	Default	Edited
Qbar (I/s)	22.5	27.17
1 in 1 year (l/s)	19.12	23.1
1 in 30 years (l/s)	47.92	57.87
1 in 100 years (l/s)	58.72	70.92

I L



Calculated by:	Garry Hanratty
Site name:	Fassaroe Development
Site location:	Zone E

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Greenfield runoff estimation for sites

www.uksuds.com | Greenfield runoff tool

Site coordinates

Latitude:	53.19692° N
Longitude:	6.14207° W
Reference:	
Date:	2019-08-01 15:51

Methodology	IH12	4			
Site characteristics	;				Notes:
Total site area (ha)			3.19		(1) Is Q
Methodology					
Qbar estimation met	hod	Calculate fi	rom SPR	and SAAR	
SPR estimation met	hod	Calculate fi	rom SOIL	type	
			Default	Edited	(2) Are
SOIL type			2	3	
HOST class					
SPR/SPRHOST			0.3	0.37	
Hydrological chara	cteristic	s	Default	Edited	
SAAR (mm)			1041	829	(3) Is S
Hydrological region			12	12	Where g
Growth curve factor: 1 year			0.85	0.85	soakawa
Growth curve factor: 30 year			2.13	2.13	for dispo
Growth curve factor:	100 ye	ar	2.61	2.61	

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

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

(3) Is SPR/SPRHOST ≤ 0.3 ?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite may be a requirement for disposal of surface water runoff.

I	Greenfield runoff rates	Default	Edited
	Qbar (I/s)	9.25	11.17
ï	1 in 1 year (l/s)	7.86	9.49
I	1 in 30 years (l/s)	19.7	23.79
L	1 in 100 years (l/s)	24.14	29.15



Calculated by:	Garry Hanratty
Site name:	Fassaroe Development
Site location:	Zone F

This is an estimation of the greenfield runoff rate limits that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Greenfield runoff estimation for sites

www.uksuds.com | Greenfield runoff tool

Site coordinates

Latitude:	53.19692° N
Longitude:	6.14207° W
Reference:	
Date:	2019-08-01 15:52

Methodology	IH12	4			
Site characteristics					Notes:
Total site area (ha)			2.47		(1) Is Q _{BAR} < 2.0 l/s/ha?
Methodology					
Qbar estimation metho	bc	Calculate f	rom SPR a	and SAAR	
SPR estimation metho	bd	Calculate f	rom SOIL	type	
			Default	Edited	(2) Are flow rates < 5.0 l/s?
SOIL type			2	3	
HOST class					
SPR/SPRHOST			0.3	0.37	
Hydrological charact	eristio	s	Default	Edited	
SAAR (mm)			1041	829	(3) Is SPR/SPRHOST ≤ 0.3 ?
Hydrological region			12	12	Where groundwater levels are lo
Growth curve factor: 1	vear		0.85	0.85	soakaways to avoid discharge of
Growth curve factor: 3	,	r	2.13	2.13	for disposal of surface water run
Growth curve factor: 1			2.61	2.61	

w enough the use of site may be a requirement ff.

İ	Greenfield runoff rates	Default	Edited
	Qbar (l/s)	7.16	8.65
i	1 in 1 year (l/s)	6.09	7.35
I	1 in 30 years (l/s)	15.25	18.42
1	1 in 100 years (l/s)	18.69	22.57

I L



Appendix B. Site Infiltration Report

Soil Infiltration Report

Client:

Cosgrave Property Group

Site Address:

Fassaroe, Bray Co. Wicklow.

Date of Report:

28th August 2016

Report produced by:

L O H Consulting Ltd Ballinderrin, Enfield, Co. Meath.

Phone : 046 9549728 Mobile : (087) 6342494 E-mail : <u>larryholton1@eircom.net</u>

Introduction:

This report was commissioned to determine the Soil Infiltration rate for trial holes for Fassaroe Phase 1 Development.

9 trial holes were excavated on the site and a soak away tests was carried out as outlined in BRE Digest 365 Soak Away Design. The soil infiltration rate was determined by the method outlined in this document.

The main geological feature of this area is the presence of Ordovician Metasediments (OM); Soil Classification (BminSW) Tills derived chiefly from Limestone sands and gravels; Carboniferous. Bedrock mainly Deep Marine Slate, Schist and Minor Greywacke. From this information we can conclude that the main constituent of the subsoil is a Limestone sand & gravel till.

The Aquifer in this area is classified as Locally important (Lg & Ll), bedrock which is moderately productive. The Vulnerability Rating is High for wastewater treatment systems; there is a low risk of contamination of the ground water from discharge from a Surface Water Soak Away.

This report will present the results of the site soak away tests and provide the Soil Infiltration rate for the soil, and confirm if the storm water generated from the proposed development can be discharged to ground water through the proposed Soak Aways without causing ponding of the site.

Scope of Report:

The findings of this report are the result of a desk study and geological field interpretation. Interpretations and conclusions included in this report are based on knowledge of the ground conditions following limited investigation of the site, as well as the regional soils, subsoil and bedrock geology, and the experience of the author. Mr. Larry Holton has prepared this report in line with current best practice and with all reasonable skill, care and diligence in consideration of the limits imposed by the survey techniques used and the resources devoted to it by agreement with the client. The interpretative basis of the conclusions contained in this report should be taken into account in any future use of this report.



<u>Trial Hole 1 Log</u> (ITM Co-ordinates mE 722470.338, mN 718539.890)

Depth of trial hole (m):	2.4 Meters	Date and time of excavatio	n:	27 th Au		exam	and time of ination:		^h Aug '16 40pm								
Depth from gro (if present):	ound surface to bedr	ock (m)	2	> 2.4m	n (Not En	counter	red)										
<u> </u>	ound surface to wate	r table (m)	:	> 2.4m	n (Not En	counter	red)										
(if present):																	
	Soil/Subsoil Texture & Classification**										Soil Structure		Density/ Compactnes				Preferential flow paths
0.1 m	Topsoil		Crum	b	Loo	se	Brown	1	Abundant root								
0.2 m																	
0.3 m									. <u></u>								
0.4 m																	
0.5 m																	
0.6 m	Sandy Gravely SILT		Massiv	ve	Fir	m	Light Bro	own	None Observed								
0.7 m																	
0.8 m 0.9 m									·								
1.0 m	p of Test Water 900mm	<u></u>															
1.1 m																	
1.2 m																	
1.3 m	Sandy Gravely SILT	Ν	Aassive	e	Uncon	npact	Grey Brow	wn	None Observe								
1.4 m																	
1.5 m																	
1.6 m																	
<mark>1.7 m</mark>																	
<mark>1.8 m</mark>																	
1.9 m																	
2.0 m																	
2.1 m																	
2.2 m																	
2.3 m —	Sandy GRAVEL		Granul		Loo		Grey		Between grain								
2.4 m	ND of Trial Hole @ 2.4		Granul	iai		50	Giey		Detween grain								
2.5 m — <u>E</u>	nd of that hole @ 2.4	<u> </u>															

Test Hole dimensions:

Overall Depth 2.4m

Plan dimensions 2m X 1m at an IL of 0.9m below Ground Level.

1.5m X 2mX 1m, size of soak away tests hole



Trial Hole 2

Trial Hole 2 Log

Depth of tr hole (m):	tin exca		e and ne of vation:	27 th Au	ıg '16		and time of ination:		27 th Aug '16 11:16am	
		und surface to bedr	ock (m))	> 2.4n	n (Not En	ed)			
	n gro	und surface to wate	r table	(m)	> 2.4n	n (Not En	counter	ed)		
(if present)	:									
	Soil/Subsoil Texture & Classification**		&	So Struc		Dens Compa		Colou ***	r	Preferential flow paths
0.1 m 0.2 m		Topsoil		Cru	mb	Loc	ose	Brown	1	Abundant roots
0.3 m										
0.4 m 0.5 m 0.6 m 0.7 m		Sandy Gravely SILT		Mas	sive	Fir	m	Light Bro	own	None Observed
0.7 m 0.8 m 0.9 m 1.0 m 1.1 m	_ <u>Top</u>	of Test Water_900mm								
1.2 m 1.3 m 1.4 m 1.5 m 1.6 m 1.7 m		Sandy Gravely SILT		Massi	ve	Uncon	npact	Grey Brov	vn	None Observed
1.8 m 1.9 m 2.0 m 2.1 m										
2.2 m 2.3 m 2.4 m 2.5 m	EN	ND of Trial Hole @ 2.4	<u>n</u>							

Test Hole dimensions:

Overall Depth 2.4m

Plan dimensions 1.8m X 1.250m at an IL of 0.9m below Ground Level.

1.5m X 1.8mX 1.250m, size of soak away tests hole



Trial Hole 3 Log

Classification**StructureCompactness***flow path0.1 m 0.2 m 0.3 mTopsoilCrumbLooseBrownAbundant in one in the interval of the i	Depth of trial hole (m):	2.4 Meters	Date time excava	e of	27 th Au	ıg '16		and time of ination:		Aug '16 37am
Depth from ground surface to water table (m) (if present): > 2.4m (Not Encountered) Soil/Subsoil Texture & Classification** Soil Density/ Compactness Colour *** Preferen flow pat 0.1 m Topsoil Crumb Loose Brown Abundant to 0.2 m 0.3 m 0.4 m 0.4 m 0.5 m 0.6 m 0.6 m		ound surface to bedr	ock (m)		> 2.4m (Not Encountered)					
Soil/Subsoil Texture & Classification**Soil StructureDensity/ CompactnessColour ***Preferent flow path0.1 mTopsoilCrumbLooseBrownAbundant in output0.2 m0.3 m0.3 m0.4 m0.5 m0.6 m0.7 m0.8 m0.7 m0.8 m0.7 m0.8 m0.7 m0.8 m1.0 m1.1 m1.2 m1.4 m1.5 m1.6 m1.7 m2.0 m2.1 m2.3 m2.4 m <th>Depth from gr</th> <th>ound surface to wate</th> <th>r table (</th> <th>m)</th> <th>> 2.4n</th> <th>n (Not En</th> <th>counter</th> <th>ed)</th> <th></th> <th></th>	Depth from gr	ound surface to wate	r table (m)	> 2.4n	n (Not En	counter	ed)		
Classification**Structure Compactness***flow path0.1 m 0.2 mTopsoilCrumbLooseBrownAbundant in0.3 m 0.3 m0.4 m 0.5 m 0.6 m0.6 m 0.5 m0.6 m 0.5 m0.7 m 0.8 m 0.8 m 0.9 mTop of Test Water 900mm1.0 m 1.1 m 1.2 m 1.3 mSandy Gravely SILTMassiveUncompactGrey BrownNone Obset1.4 m 1.5 m 1.6 m1.7 m 	(if present):									
0.2 m							•		ır	Preferential flow paths
0.3 m		Topsoil		Cru	mb	Loo	se	Brown	1	Abundant root
0.4 m 0.5 m 0.6 m 0.7 m 0.8 m 0.9 m 1.0 m 1.1 m 1.2 m 1.3 m 1.3 m 1.4 m 1.5 m 1.6 m 1.7 m 1.8 m 1.9 m 2.0 m 2.1 m 2.2 m 2.3 m 2.4 m										
0.5 m 0.6 m 0.7 m 0.8 m 0.9 m 0.9 m 1.0 m 1.1 m 1.2 m 1.3 m Sandy Gravely SILT Massive Uncompact Grey Brown None Obse 1.4 m 1.5 m 1.6 m 1.7 m 1.8 m 1.9 m 2.0 m 2.1 m 2.2 m 2.3 m 2.4 m										
0.7 m0.8 m0.9 m1.0 m1.1 m1.2 m1.3 m1.3 m1.4 m1.5 m1.6 m1.7 m1.8 m1.9 m2.0 m2.1 m2.2 m2.3 m2.4 mFUD of Trick Urber @ 2.4 m										
0.8 m 0.9 m0.9 m1.0 m1.1 m1.1 m1.2 m1.3 m1.3 m1.4 m1.5 m1.6 m1.7 m1.8 m1.9 m2.1 m2.1 m2.1 m2.1 m2.1 m2.1 m2.1 m2.1 m2.1 m1.1 m <trt< td=""><td></td><td></td><th></th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></trt<>										
0.9 m 1.0 mTop of Test Water 900mmI 										
I.0 mTop of Test Water 900mm1.1 m1.1 m1.2 mSandy Gravely SILTMassiveUncompactGrey BrownNone Obset1.4 m1.5 m1.5 m1.6 m1.7 m1.8 m1.9 m1.9 m1.9 m2.0 m2.0 m1.1 m1.1 m1.1 m1.1 m2.1 m2.2 m1.1 m1.1 m1.1 m1.1 m2.3 m2.3 m1.1 m1.1 m1.1 m1.1 m	0.9 m									
1.2 m 1.3 mSandy Gravely SILTMassiveUncompactGrey BrownNone Observation1.4 m 1.5 m 1.6 m1.5 m 1.6 m1.6 m 1.7 m1.8 m 1.9 m1.9 m 1.9 m 1.9 m1.9 m 1.9 m 1.9 m1.9 m 1.9 m 1.9 m1.9 m 1.9 m 1.9 m 1.9 m1.9 m 1.9 m 1.9 m1.9 m 1.9 m 1.9 m1.9 m 1.9 m 1.9 m1.9 m 1.9 m 1.9 m 1.9 m1.9 m 1.9	— Te	op of Test Water 900mm	<u> </u>							
1.3 mSandy Gravely SILTMassiveUncompactGrey BrownNone Obset1.4 m1.5 m1.5 m1.6 m1.6 m1.7 m1.8 m1.9 m2.0 m2.1 m2.1 m2.3 m2.3 m2.4 m										
1.4 m 1.5 m 1.6 m 1.6 m 1.7 m 1.8 m 1.9 m 2.0 m 2.1 m 2.2 m 2.3 m 2.4 m		Sandy Gravely SILT		Massi	ve	Uncon	npact	Grey Brow	wn	None Observe
1.5 m 1.6 m 1.7 m 1.8 m 1.9 m 2.0 m 2.1 m 2.2 m 2.3 m 2.4 m										
1.7 m 1.8 m 1.9 m 2.0 m 2.1 m 2.2 m 2.3 m 2.4 m										
1.8 m 1.9 m 2.0 m 2.1 m 2.2 m 2.3 m 2.4 m										
1.9 m 2.0 m 2.1 m 2.2 m 2.3 m 2.4 m										
2.0 m 2.1 m 2.2 m 2.3 m 2.4 m										
2.2 m 2.3 m 2.4 m										
2.3 m 2.4 m	2.1 m									
2.4 m	2.2 m									
7.5 m	T	ND of Trial Hole @ 2.4	m							
2.5 III	<u>2.5 m</u>		<u></u>							

Test Hole dimensions:

Overall Depth 2.4m

Plan dimensions 2.6m X 1.2m at an IL of 0.9m below Ground Level.

1.5m X 2.6mX 1.2m, size of soak away tests hole



Trial Hole 4

Trial Hole 4 Log

Depth of trial hole (m):		tin excav	e and ne of vation:	27 th Au	ıg '16		and time of ination:		Aug '16 5am	
Depth from gr (if present):	round surface to bedr	ock (m))	> 2.4m (Not Encountered)						
Depth from g	round surface to wate	er table	(m)	> 2.4n	n (Not En	counter	ed)			
(if present):										
	Soil/Subsoil Texture & Classification**		So Struc		Dens Compa		Colou ***	r	Preferential flow paths	
0.1 m	Topsoil		Cru	mb	Loo	se	Brown	1	Abundant roots	
0.2 m										
0.3 m										
0.4 m 0.5 m										
0.5 m										
0.0 m	Sandy Gravely SILT		Massive		Fir	m	Light Bro	own	None Observed	
0.8 m										
0.9 m	op of Test Water_900mm	<u>l</u>								
1.0 m										
1.2 m										
1.3 m	Sandy Gravely SILT		Massi	ve	Uncon	npact	Grey Brow	wn	None Observed	
<mark>1.4 m</mark>										
1.5 m										
1.6 m 1.7 m										
1.7 m 1.8 m										
1.9 m										
2.0 m										
2.1 m										
2.2 m										
2.3 m										
2.4 m										
2.5 m —	END of Trial Hole @ 2.4	<u>m</u>								

Test Hole dimensions:

Overall Depth 2.4m

Plan dimensions 2.2m X 1.2m at an IL of 0.9m below Ground Level.

1.5m X 2.2mX 1.2m, size of soak away tests hole



Trial Hole 5 Log

Depth of tr hole (m):		2.4 Meters	Date a time excavat	of	27 th Au	ıg '16		nd time of ination:		¹ Aug '16 11am						
Depth from (if present)		und surface to bedr	ock (m)		> 2.4m	n (Not En	counter	ed)								
· • • · · · · · · · · · · · · · · · · ·	n gro	und surface to wate	r table (n	1)	> 2.4m	n (Not En	counter	ed)								
				Soil/Subsoil Texture &						So Struc		Dens Compa	•	Colour ***		Preferential flow paths
0.1 m 0.2 m 0.3 m 0.4 m		Topsoil		Crui	mb	Loo	se	Brown	1	Abundant roots						
0.4 m 0.5 m 0.6 m 0.7 m 0.8 m		Sandy Gravely SILT		Mass	sive	Fin	m Light l	Light Bro	own	None Observed						
0.9 m 1.0 m 1.1 m 1.2 m 1.3 m	<u>Top</u>	o of Test Water_900mm	1													
1.4 m 1.5 m 1.6 m 1.7 m 1.8 m 1.9 m 2.0 m 2.1 m		Sandy Gravely SILT		Massi	ve	Uncon	npact	Grey Brow	vn	None Observed						
2.1 m 2.2 m 2.3 m		Sandy GRAVEL		Gran	ular	Loo	se	Grey		Between grains						
2.4 m 2.5 m	<u>E</u> N	ND of Trial Hole @ 2.4	<u>m</u>													

Test Hole dimensions:

Overall Depth 2.4m

Plan dimensions 2.6m X 1.2m at an IL of 0.9m below Ground Level.

1.5m X 2.6mX 1.2m, size of soak away tests hole



<u>Trial Hole 6</u>

Trial Hole 6 Log

hole (m):	ole (m): ti exca		Date and time of excavation		ug '16	(nd time of nation:	27 th Aug '16 10:06am	
Depth from (if present		und surface to bedro	ock (m)	> 2.41	n (Not Er	ncountere	ed)		
	n gro	und surface to wate	r table (m)	> 2.41	n (Not Er	countere	ed)		
	5	Soil/Subsoil Texture Classification**		Soil ucture	Dens	•	Colour ***	Preferential flow paths	
0.1 m		Topsoil	0	rumb	Loc	ose	Brown	Abundant roots	
0.2 m									
0.3 m							·		
0.4 m									
0.5 m 0.6 m 0.7 m		Sandy Gravely SILT	Μ	assive	Fir	m	Light Bro	wn None Observed	
0.8 m 0.9 m 1.0 m 1.1 m	<u>_Top</u>	of Test Water_900mm							
1.2 m 1.3 m 1.4 m 1.5 m									
1.6 m 1.7 m 1.8 m 1.9 m 2.0 m	i	Sandy GRAVEL	G	anular	Loo	ose	Grey	Between grains	
2.1 m 2.2 m 2.3 m 2.4 m 2.5 m	<u>EN</u>	ID of Trial Hole @ 2.4r	<u>n</u>						

Test Hole dimensions:

Overall Depth 2.4m

Plan dimensions 2.2m X 1.2m at an IL of 0.9m below Ground Level.

1.5m X 2.2mX 1.2m, size of soak away tests hole.



Trial Hole 7 Log

Depth of tr hole (m):		2.4 Meters	tin excav	e and ne of vation:	27 th Au	ug '16		and time of ination:	27 th Aug '16 10:00am	
(if present)	:	und surface to bedr				n (Not En				
(if present)		und surface to wate	r table	(m)	> 2.4n	n (Not En	counter	ed)		
	5	Soil/Subsoil Texture Classification**	&	So Struc		Dens Compa	•	Colou: ***	r	Preferential flow paths
0.1 m 0.2 m 0.3 m 0.4 m		Topsoil		Cru	mb	Loc	ose	Brown	L	Abundant roots
0.5 m 0.6 m 0.7 m 0.8 m		Sandy Gravely SILT		Mas	sive	Fir	m	Light Bro	own	None Observed
0.9 m 1.0 m 1.1 m 1.2 m 1.3 m	_ <u>Top</u>	o of Test Water_900mm	<u></u>							
1.4 m 1.5 m 1.6 m 1.7 m 1.8 m 1.9 m 2.0 m 2.1 m 2.2 m	:	Sandy GRAVEL		Gran	ular	Loc	ose	Grey		Between grain
2.2 m 2.3 m 2.4 m 2.5 m	EN	ND of Trial Hole @ 2.4	<u>m</u>							

Test Hole dimensions:

Overall Depth 2.4m

Plan dimensions 2.4m X 1.2m at an IL of 0.9m below Ground Level.

1.5m X 2.4mX 1.2m, size of soak away tests hole.



Trial Hole 8 Log

hole (m):			Date and time of excavation:	27 th Aug '16		Date and time of examination:		27 th Aug '16 8:54am											
Depth from (if present		und surface to bedr	ock (m)	> 2.4r	n (Not En	counter	ed)												
	n gro	und surface to wate	r table (m)	> 2.4r	n (Not En	counter	ed)												
		Soil/Subsoil Texture & Classification** Topsoil												boil Icture			Coloui ***	r	Preferential flow paths
0.1 m 0.2 m				umb	Loc	ose	Brown	l	Abundant roots										
0.3 m 0.4 m 0.5 m 0.6 m 0.7 m 0.8 m		Sandy Gravely SILT	Ma	Massive		m	Light Bro	own	None Observed										
0.9 m 1.0 m 1.1 m 1.2 m	<u>_Top</u>	of Test Water 900mm																	
1.3 m 1.4 m 1.5 m 1.6 m 1.7 m 1.8 m 1.9 m 2.0 m	San	Sandy Gravely SILT		issive	Uncompact		Grey Brown		None Observe										
2.1 m 2.2 m 2.3 m		Sandy GRAVEL	Grai	nular	Loc	ose	Grey		Between grain										
2.4 m 2.5 m	<u>EN</u>	ND of Trial Hole @ 2.4	<u>m</u>																

Test Hole dimensions:

Overall Depth 2.4m

Plan dimensions 2.0m X 1.3m at an IL of 0.9m below Ground Level.

1.5m X 2.0mX 1.3m, size of soak away tests hole.



Trial Hole 9 Log

Depth of trial hole (m):	2.4 Meters	Date a time excava	of	27 th Au	ıg '16		and time of ination:		Aug '16 Iam
	cound surface to bedr	ock (m)		> 2.4n	n (Not En	counter	ed)		
(if present): Depth from gi	cound surface to wate	r table (n	n)	> 2.4n	n (Not En	counter	ed)		
(if present):									
	Soil/Subsoil Texture Classification**	&	So Struc		Dens Compa	•	Colou ***	ır	Preferential flow paths
0.1 m 0.2 m	Topsoil		Cru	mb	Loo	se	Brown	1	Abundant roots
0.3 m		-							
0.4 m 0.5 m 0.6 m 0.7 m	Sandy Gravely SILT	n	Massive		Firr	m	Light Bro	own	None Observed
0.8 m 0.9 m 1.0 m	op of Test Water_900mm								
1.1 m 1.2 m 1.3 m 1.4 m	Sandy Gravely SILT		Massi	ve	Uncon	npact	Grey Brov	wn	None Observed
1.5 m 1.6 m 1.7 m									
<mark>1.8 m</mark> 1.9 m									
2.0 m 2.1 m									
2.2 m									
$\begin{array}{c} 2.3 \text{ m} \\ \hline 2.4 \text{ m} \\ \hline 2.5 \text{ m} \end{array}$	END of Trial Hole @ 2.4	<u>m</u>							
2.5 m									

Test Hole dimensions:

Overall Depth 2.4m

Plan dimensions 2.5m X 1.2m at an IL of 0.9m below Ground Level.

1.5m X 2.5mX 1.2m, size of soak away tests hole

Tests Results

TEST Results T		27 th Aug	gust 2016			
	T1		T2		Т3	
Depth (m)		Min		Min		Min
0.0						
0.1						
0.2						
0.3						
0.4						
0.5						
0.6						
0.7						
0.8						
0.9	12:43	0				
1.0	-	-				
1.1	12:55	12				
1.2	-	-				
1.3	-	-				
1.4	13:28	33				
1.5	-					
1.6	14:04	36				
1.7	14:28	24				
1.8	14:59	31				
1.9	15:42	43				
2.0	END	END				
2.1						
2.2						
2.3						
2.4						
2.5						

Infiltration test result:

Soil Infiltration $f = \frac{V p_{75 \cdot 25}}{A p_{50} X t p_{75 \cdot 25}}$

The test hole dimensions are 1.0mX2mX1.0m effective depth.

Vp = 1.0*X*2.0*X*1.0= 2*m*3 Ap = 2(1.0X2.0) + 2(1.0X1.0) + (1X2) = 7.0m2*Tp* = *from table* = *179min* $F = \frac{2}{7.0X179X60} = 0.0000266 \text{m/s} = 0.09576 \text{m/hr}.$

TEST Results T	2	27 th Aug	gust 2016			
	T1		T2		Т3	
Depth (m)		Min		Min		Min
0.0						
0.1						
0.2						
0.3						
0.4						
0.5						
0.6						
0.7						
0.8						
0.9	11:16	0				
1.0	-	-				
1.1	13:37	141				
1.2	15:40	123				
1.3	END					
1.4						
1.5						
1.6						
1.7						
1.8						
1.9						
2.0						
2.1						
2.2						
2.3						
2.4						
2.5						

Infiltration test result:

Soil Infiltration $f = V_{p_{75-25}}$

Ap50 X tp75-25

The test hole dimensions are 1.8mX1.250mX0.3m effective depth.

Vp = 1.8*X*1.250*X*0.3= 0.675*m*3 Ap = 2(1.8X0.3) + 2(1.250X0.3) + (1.8X1.250) = 4.08m2 $Tp = from \ table = 264min$

$$F = \underbrace{0.675}_{4.08X264X60} = 0.0000104 \text{m/s} = 0.03744 \text{m/hr}.$$

TEST Results T	3	27 th Aug	gust 2016			
	T1		T2		Т3	
Depth (m)		Min		Min		Min
0.0						
0.1						
0.2						
0.3						
0.4						
0.5						
0.6						
0.7						
0.8						
0.9	11:37	0				
1.0	13:15	98				
1.1	13:37	176				
1.2	END					
1.3						
1.4						
1.5						
1.6						
1.7						
1.8						
1.9						
2.0						
2.1						
2.2						
2.3						
2.4						
2.5						

Soil Infiltration $f = \frac{Vp_{75-25}}{Ap_{50} X tp_{75-25}}$

The test hole dimensions are 2.6mX1.2mX0.2m effective depth.

Vp = 2.6X1.2X0.2 = 0.624m3 Ap = 2(2.6X0.2) + 2(1.2X0.2) + (2.6X1.2) = 4.64m2 $Tp = from \ table = 274min$ $F = \frac{0.624}{4.64X274X60} = 0.0000081m/s = 0.02916m/hr.$

TEST Results T	4	27 th Aug	gust 2016			
	T1		T2		Т3	
Depth (m)		Min		Min		Min
0.0						
0.1						
0.2						
0.3						
0.4						
0.5						
0.6						
0.7						
0.8						
0.9	9:15	0				
1.0	10:44	98				
1.1	14:12	208				
1.2	END					
1.3						
1.4						
1.5						
1.6						
1.7						
1.8						
1.9						
2.0						
2.1						
2.2						
2.3						
2.4						
2.5						

Soil Infiltration $f = \frac{V p_{75-25}}{A p_{50} X t p_{75-25}}$

The test hole dimensions are 2.2mX1.2mX0.2m effective depth.

Vp = 2.2X1.2X0.2 = 0.528m3 Ap = 2(2.2X0.2) + 2(1.2X0.2) + (2.2X1.2) = 4m2 $Tp = from \ table = 306min$ $F = \frac{0.528}{4X306X60} = 0.0000071m/s = 0.02556m/hr.$

TEST Results T	5	27 th Aug	gust 2016			
	T1		T2		Т3	
Depth (m)		Min		Min		Min
0.0						
0.1						
0.2						
0.3						
0.4						
0.5						
0.6						
0.7						
0.8						
0.9	10:11	0				
1.0	-	-				
1.1	10:26	15				
1.2	-	-				
1.3	10:42	16				
1.4	-	-				
1.5	-					
1.6	-	-				
1.7	-	-				
1.8	-	-				
1.9	11:40	58				
2.0	-	-				
2.1	13:45	125				
2.2	END	END				
2.3						
2.4						
2.5						

Soil Infiltration $f = \frac{Vp_{75-25}}{Ap_{50} X tp_{75-25}}$

The test hole dimensions are 2.6mX1.2mX1.2m effective depth.

Vp = 2.6X1.2X1.2 = 3.744m3 Ap = 2(2.6X1.2) + 2(1.20X1.2) + (2.6X1.2) = 12.24m2 $Tp = from \ table = 214min$ $F = \frac{3.744}{12.24X214X60} = 0.0000238m/s = 0.08568m/hr.$

TEST Results T	6	27 th Aug	gust 2016			
	T1		T2		Т3	
Depth (m)		Min		Min		Min
0.0						
0.1						
0.2						
0.3						
0.4						
0.5						
0.6						
0.7						
0.8						
0.9	10:06	0				
1.0	-	-				
1.1	10:13	7				
1.2	-	-				
1.3	-	-				
1.4	-	-				
1.5	10:37	24				
1.6	10:47	10				
1.7	-	-				
1.8	-	-				
1.9	-	-				
2.0	-	-				
2.1	11:26	39				
2.2	11:43	17				
2.3	-	-				
2.4	13.06	83				
2.5	END	END				

Soil Infiltration $f = \frac{V p_{75-25}}{A p_{50} X t p_{75-25}}$

The test hole dimensions are 2.2mX1.2mX1.5m effective depth.

Vp = 2.2X1.2X1.5 = 3.96m3 Ap = 2(2.2X1.5) + 2(1.2X1.5) + (2.2X1.2) = 12.24m2 $Tp = from \ table = 180min$ $F = \frac{3.96}{12.84X180X60} = 0.0000285m/s = 0.1026m/hr.$

TEST Results T	7	27 th Aug	gust 2016			
	T1		T2		Т3	
Depth (m)		Min		Min		Min
0.0						
0.1						
0.2						
0.3						
0.4						
0.5						
0.6						
0.7						
0.8						
0.9	10:00	0				
1.0	10:02	2				
1.1	-	-				
1.2	-	-				
1.3	10:17	15				
1.4	-	-				
1.5	10:48	31				
1.6	-	-				
1.7	11:45	57				
1.8	-	-				
1.9	13:02	77				
2.0	13:57	55				
2.1	END	END				
2.2						
2.3						
2.4						
2.5						

Soil Infiltration $f = \frac{Vp_{75-25}}{Ap_{50} X tp_{75-25}}$

The test hole dimensions are 2.4mX1.2mX1.1m effective depth.

Vp = 2.4X1.2X1.1 = 3.168m3 Ap = 2(2.4X1.1) + 2(1.2X1.1) + (2.4X1.2) = 10.8m2 $Tp = from \ table = 237min$ $F = \frac{3.168}{10.8X237X60} = 0.0000206m/s = 0.07416m/hr.$

TEST Results T	8	27 th Aug	gust 2016			
	T1		T2		Т3	
Depth (m)		Min		Min		Min
0.0						
0.1						
0.2						
0.3						
0.4						
0.5						
0.6						
0.7						
0.8						
0.9	8:54	0				
1.0	-	-				
1.1	-	-				
1.2	-	-				
1.3	9:55	61				
1.4	-	-				
1.5	10:53	58				
1.6	11:34	41				
1.7	-	-				
1.8	13:09	95				
1.9	14:16	67				
2.0	END	END				
2.1						
2.2						
2.3						
2.4						
2.5						

Soil Infiltration $f = \frac{Vp_{75-25}}{Ap_{50} X tp_{75-25}}$

The test hole dimensions are 2.0mX1.3mX1.0m effective depth.

Vp = 2.0X1.3X1.0 = 2.6m3 Ap = 2(2.0X1.0) + 2(1.3X1.0) + (2.0X1.3) = 9.2m2 $Tp = from \ table = 322min$ $F = \frac{2.6}{9.2X322X60} = 0.0000146m/s = 0.05256m/hr.$

TEST Results T	9	27 th Aug	gust 2016			
	T1		T2		Т3	
Depth (m)		Min		Min		Min
0.0						
0.1						
0.2						
0.3						
0.4						
0.5						
0.6						
0.7						
0.8						
0.9	8:41	0				
1.0	10:55	134				
1.1	13:49	174				
1.2	END	END				
1.3						
1.4						
1.5						
1.6						
1.7						
1.8						
1.9						
2.0						
2.1						
2.2						
2.3						
2.4						
2.5						

Soil Infiltration $f = \frac{Vp_{75-25}}{Ap_{50} X tp_{75-25}}$

The test hole dimensions are 2.5mX1.2mX0.2m effective depth.

Vp = 2.5X1.2X0.2 = 0.6m3 Ap = 2(2.5X0.2) + 2(1.2X0.2) + (2.5X1.2) = 4.48m2 $Tp = from \ table = 308min$ $F = \frac{0.6}{4.48X308X60} = 0.0000072m/s = 0.02592m/hr.$

```
T1 Infiltration Rate (f) = 0.0000266m/s= 0.09576m/hr.
T2 Infiltration Rate (f) = 0.0000104m/s= 0.03744m/hr.
T3 Infiltration Rate (f) = 0.0000081m/s= 0.02916m/hr.
T4 Infiltration Rate (f) = 0.000071m/s= 0.02556m/hr.
T5 Infiltration Rate (f) = 0.0000238m/s= 0.08568m/hr.
T6 Infiltration Rate (f) = 0.0000285m/s= 0.1026m/hr.
T7 Infiltration Rate (f) = 0.0000206m/s= 0.07416m/hr.
T8 Infiltration Rate (f) = 0.0000146m/s= 0.05256m/hr.
T9 Infiltration Rate (f) = 0.000072m/s= 0.02592m/hr.
```

Conclusion:

Variable conditions encountered on the site.

The results of T1, T5, T6, T7 & T8 show that the soil will allow some level of infiltration due to the presence of the GRAVEL layer.

The results of T2, T3, T4 & T9 show poor infiltration rates, GRAVEL was not encountered in these trial holes.

The Soil Infiltration Rate recorded from the site test shows that the subsoil will allow for some infiltration to the ground water. It should be noted that these results are based on 1 infiltration tests in each trial hole.

References:

• BRE Digest 365 Soakaway Design

Online Sources:

- Environmental Protection Agency <u>www.epa.ie</u>
- Geological Survey of Ireland <u>www.gsi.ie</u>

Report Prepared By: ... Larry Holton B. Eng. C. Eng. M. 9. E. 9...

Larry Holton B.Eng. C.Eng. M.I.E.I. Chartered Engineer. For and on behalf of L O H Consulting Ltd.

Date:28th August 2016......



Appendix C. Simulation Criteria

Atkins (Epsom)	1	Page 1
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:03	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Didiridge
Innovyze	Network 2019.1	
Simulati	ion Criteria for Storm	
	1.000 MADD Factor * 10m ³ /ha Storage 2. 0 Inlet Coefficcient 0. 0 Flow per Person per Day (1/per/day) 0. 0.500 Run Time (mins)	000 800 000 60 1 Diagrams 0
Synthe	tic Rainfall Details	
Rainfall Model Return Period (years) Region Scott M5-60 (mm) Ratio R As per Met Information	FSR Profile Type Summer 1 Cv (Summer) 0.750 and and Ireland Cv (Winter) 0.840 0.269 Storm Duration (mins) 30	



Appendix D. Outfall Details

Atkins (Epsom)			1				Page 1
Woodcoste Grove			Fassaro	e Housir	ng Dev.		
Ashley Road, Epsom				1-1			
Surrey, KT18 5BW Date 05/04/2022 11:0	0.5		Co. Wic		222722		Micro
File Storm Drainage		11 2		d by N.H by G.Ha			Drainago
Innovyze	Model_02.0	4.2	Network		aniatty		
	Free	Flowing	Outfall		s for St	torm	
	Outfall Pipe Number		C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
	S1.036	S91	23.520	22.070	0.000	0	existing drainage
	Free	Flowing	Outfall	Detail	s for St	<u>torm</u>	network
	Outfall Pipe Number		C. Level (m)		Min I. Level (m)	D,L (mm)	w (mm) Outfall from future
	S11.005			90.539	0.000		o catchment not require for this Phase 1
	<u>Free</u> Outfall		Outfall C. Level				
	Pipe Number		(m)	I. Level (m)	Min I. Level (m)	D,L (mm)	· · ·
	S17.015	S271	49.200	47.741	45.000	0	Outfall from Pond 1 a ⁰ Attenuation Tank A
	Free	Flowing	Outfall	Detail:	s for St	torm	
	Outfall Pipe Number		C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	w (mm) Outfall from future catchment not require
	S36.008	S292	95.000	92.927	0.000	0	
	Free	Flowing	Outfall	Details	s Ior Si	<u>torm</u>	
	Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	w (mm) Outfall from future catchment not require
	s39.004	s300	97.000	94.720	0.000		o for this Phase 1
	<u> Free</u>	<u>Flowing</u>	Outfall	Detail:	s for St	torm	
	Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
	S42.010	S336	96.407	93.629	0.000	0	⁰ Outfall to proposed OSoakaway
	Free	Flowing	Outfall	Detail:	s for St	<u>torm</u>	
	Outfall	Outfall	C. Level	I. Level	Min	D,L	W
	Pipe Number	Name	(m)	(m)	I. Level (m)		(mm) Outfall to existing sto drainage network
	S46.005	S343	101.000	99.671	0.000	0	⁰ construction under WCC planning ref;17



Appendix E. Pipe Schedules

Atkins (Epsom)		Page 1
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

<u>Upstream Manhole</u>

PN	-	Diam (mm)		C.Level (m)	vel I.Level D.Depth) (m) (m)		MH Connection	MH DIAM., L*W (mm)
S1.000	0	225	S1	85.635	84.210	1.200	Open Manhole	1200
S1.001	0	300	s2	84.315	82.815	1.200	Open Manhole	1200
S1.002	0	300	S3	81.500	79.566	1.634	Open Manhole	1200
S1.003	0	375	S4	77.818	74.879	2.564	Open Manhole	1200
S1.004	0	375	S5	74.208	72.389	1.444	Open Manhole	1200
S2.000	0	300	S6	80.591	79.166	1.125	Open Manhole	1200
S3.000	0	225	S7	81.058	79.302	1.531	Open Manhole	1200
S3.001	0	225	S8	80.378	78.934	1.219	Open Manhole	1200
S3.002	0	225	S9	80.151	78.726	1.200	Open Manhole	1200
S2.001	0	225	S10	79.511	76.850	2.436	Open Manhole	1200
S2.002	0	300	S11	76.271	74.363	1.608	Open Manhole	1200
S2.003	0	300	S12	75.193	73.618	1.275	Open Manhole	1200
S4.000	0	225	S13	76.900	75.275	1.400	Open Manhole	1200
S2.004	0	375	S14	75.012	73.227	1.410	Open Manhole	1200
S2.005	0	375	S15	74.762	73.112	1.275	Open Manhole	1200
ac 000	-	225	01.0	70 220	76 005	1 200	Onen Markela	1000
S5.000	0	225	S16	78.320	76.895		Open Manhole	1200
S5.001	0	225	S17	77.907	76.407		Open Manhole	1200
S5.002	0	300	S18	77.700	76.125	1.2/5	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1 000	37.681	28.5	s2	84.315	82.890	1 200	Open Manhole	e 1200
	90.000	20.0	S2	81.500	79.566		Open Manhole	
	90.000	27.7	S4	77.818	76.318		Open Manhole	
	89.834	40.0	S5	74.208	72.633		Open Manhole	
	56.548	40.0	S32	72.550	70.975		Open Manhole	
							-1	
S2.000	49.550	45.9	S10	79.511	78.086	1.125	Open Manhole	e 1200
							-	
S3.000	28.076	76.2	S8	80.378	78.934	1.219	Open Manhole	e 1200
S3.001	9.845	47.4	S9	80.151	78.726	1.200	Open Manhole	e 1200
S3.002	27.062	42.3	S10	79.511	78.086	1.200	Open Manhole	e 1200
S2.001	88.312	40.0	S11	76.271	74.642	1.404	Open Manhole	e 1200
	29.802	40.0	S12	75.193	73.618		Open Manhole	
S2.003	8.148	45.0	S14	75.012	73.437	1.275	Open Manhole	e 1200
S4.000	69.157	41.0	S14	75.012	73.587	1.200	Open Manhole	e 1200
~~ ~~ ~		1	~1 5			1 0 7 5		1000
	6.336	55.1	S15	74.762	73.112		Open Manhole	
52.005	14.784	59.1	S25	74.512	72.862	1.2/5	Open Manhole	e 1350
\$5 000	33.359	80.8	S17	77.907	76.482	1 200	Open Manhole	e 1200
	10.689	51.6	S17 S18	77.700	76.200		Open Manhole	
	31.601	70.7	S10 S19	77.253	75.678		Open Manhole	
50.002	01.001	, ,	010	200	,	1.210	Spen namore	1200

Atkins (Epsom)	Page 2	
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diginarye
Innovyze	Network 2019.1	1

<u>Upstream Manhole</u>

PN	-	Diam (mm)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection		MH DIAM., L* (mm)	۳
S5.003	0	300	S19	77.253	75.663	1.290	Open	Manhole	120	00
S5.004	0	300	S20	76.464	74.835	1.329	Open	Manhole	120	00
S5.005	0	300	S21	75.384	73.884	1.200	Open	Manhole	120	00
S5.006	0	375	S22	74.304	72.729	1.200	Open	Manhole	120	0
S5.007	0	375	s23	73.500	71.676	1.449	Open	Manhole	120	0
S5.008	0	375	S24	73.762	71.400	1.987	Open	Manhole	120)0
S2.006	0	450	S25	74.512	71.248		-	Manhole	135	
S2.007	0	375	S26	74.077	71.200	2.502	Open	Manhole	135	50
S2.008	0	300	S27	72.775	70.825	1.650	Open	Manhole	135	50
S2.009	0	300	S28	72.450	70.785		-	Manhole	135	
S2.010	0	300	S29	72.255	70.600	1.355	Open	Manhole	135	50
S2.011	0	375	S30	72.200	70.100	1.725	Open	Manhole	135	50
S2.012	0	375	S31	72.520	69.900	2.245	Open	Manhole	135	50
							_			
S1.005	0	525	S32	72.550	69.593		-	Manhole	150	
S1.006	0	525	S33	72.042	69.228		-	Manhole	150	
S1.007	0	525	S34	71.349	68.968		-	Manhole	150	
S1.008	0	525	S35	71.100	68.842		-	Manhole	150	
S1.009	0	525	S36	70.700	68.517		-	Manhole	150	
S1.010	0	525	S37	70.250	68.068	1.657	Open	Manhole	150)()
S6.000	0	675	S38	77.	utu wa T		pen	Manhole	135	50
S6.001	0	300	S39	77. FU	iture i	Phase	pen	Manhole	135	

Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S5.003	23.221	30.0	S20	76.464	74.889	1.275	Open Manhole	e 1200
S5.004	28.515	30.0	S21	75.384	73.884	1.200	Open Manhole	e 1200
S5.005	30.346	28.1	S22	74.304	72.804	1.200	Open Manhole	e 1200
S5.006	36.190	37.0	S23	73.500	71.750	1.375	Open Manhole	e 1200
S5.007	28.146	102.0	S24	73.762	71.400	1.987	Open Manhole	e 1200
S5.008	27.665	182.0	S25	74.512	71.248	2.889	Open Manhole	e 1350
S2.006	10.802	225.0	S26	74.077	71.200	2.427	Open Manhole	e 1350
S2.007	45.275	150.9	S27	72.775	70.900		Open Manhole	
S2.008	8.820	220.5	S28	72.450	70.785	1.365	Open Manhole	e 1350
S2.009	14.495	78.4	S29	72.255	70.600	1.355	Open Manhole	e 1350
S2.010	38.139	95.3	S30	72.200	70.200	1.700	Open Manhole	e 1350
S2.011	34.132	170.7	S31	72.520	69.900	2.245	Open Manhole	e 1350
S2.012	9.849	98.5	S32	72.550	69.800	2.375	Open Manhole	e 1500
s1.005	17.496	499.9	S33	72.042	69.558	1.959	Open Manhole	e 1500
S1.006	14.545	171.1	S34	71.349	69.143	1.681	Open Manhole	e 1500
S1.007	18.026	200.3	S35	71.100	68.878	1.697	Open Manhole	e 1500
S1.008	90.930	279.8	S36	70.700	68.517	1.658	Open Manhole	e 1500
S1.009	76.741	170.5	S37	70.250	68.067	1.658	Open Manhole	e 1500
S1.010	10.226	120.3	S42	69.933	67.983	1.425	Open Manhole	e 1500
S6.000	10.423	70.0	S39	Eute	ire Ph	260 3	Open Manhole	e 1350
S6.001	27.188	50.3	S40			ase	Open Manhole	e 1200

Atkins (Epsom)		Page 3
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	1

<u>Upstream Manhole</u>

PN	-	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S6.002	0	300	S40	74.900	72.229		Open Manhole	1200
S6.003	0	300	S41	73.000	69.088	3.612	Open Manhole	1200
S1.011	0	675	S42	69.933	67.833	1.425	Open Manhole	1500
S1.012	0	675	S43	69.933	66.643	2.615	Open Manhole	1500
S1.013	0	675	S44	68.300	64.605	3.020	Open Manhole	1500
S1.014	0	675	S45	66.239	62.697	2.867	Open Manhole	1500
S1.015	0	675	S46	64.289	60.684	2.930	Open Manhole	1500
S1.016	0	675	S47	62.339	57.512	4.152	Open Manhole	1500
S1.017	0	675	S48	59.089	54.490	3.924	Open Manhole	1500
S1.018	0	675	S49	56.159	53.599	1.885	Open Manhole	1500
S1.019	0	750	S50	55.321	49.286	5.285	Open Manhole	1500
S1.020	0	750	S51	50.500	48.475	1.275	Open Manhole	1500
S1.021	0	750	S52	49.800	47.975	1.075	Open Manhole	1500
S1.022	0	750	S53	49.800	43.350	5.700	Open Manhole	1500
S1.023	0	750	S54	45.500	40.456	4.294	Open Manhole	1500
S1.024	0	750	S55	42.000	37.690	3.560	Open Manhole	1500
S7.000	0	225	S56	70.500	68.647	1.628	Open Manhole	1200
S7.001	0	225	S57	69.600	67.940	1.435	Open Manhole	1200
S7.002	0	225	S58	69.200	67.596	1.379	Open Manhole	1200
S7.003	0	225	S59	68.900	66.796	1.879	Open Manhole	1200
S7.004	0	225	S60	67.500	65.364	1.911	Open Manhole	1200
S7.005	0	225	S61	66.000	64.087	1.688	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
\$6.002	29.175	35.8	S41	73.000	71.414	1.286	Open Manhole	1200
S6.003	37.067	53.4	S42	69.933	68.395		Open Manhole	
S1.011	13.117	100.1	S43	69.933	67.702	1.556	Open Manhole	1500
S1.012	29.275	99.9	S44	68.300	66.350	1.275	Open Manhole	1500
S1.013	31.584	99.9	S45	66.239	64.289	1.275	Open Manhole	1500
S1.014	35.824	100.1	S46	64.289	62.339	1.275	Open Manhole	1500
S1.015	29.515	100.1	S47	62.339	60.389	1.275	Open Manhole	1500
S1.016	75.652	99.9	S48	59.089	56.755	1.659	Open Manhole	1500
S1.017	28.115	100.1	S49	56.159	54.209	1.275	Open Manhole	1500
S1.018	22.820	100.1	S50	55.321	53.371	1.275	Open Manhole	1500
S1.019	73.577	100.0	S51	50.500	48.550	1.200	Open Manhole	1500
S1.020	48.546	97.1	S52	49.800	47.975	1.075	Open Manhole	1500
S1.021	37.142	212.2	S53	49.800	47.800	1.250	Open Manhole	1500
S1.022	30.432	121.7	S54	45.500	43.100	1.650	Open Manhole	1500
S1.023	30.148	100.2	S55	42.000	40.155	1.095	Open Manhole	1500
S1.024	28.361	120.2	S79	39.000	37.454	0.796	Open Manhole	1800
s7.000	14.157	30.0	S57	69.600	68.175	1.200	Open Manhole	1200
S7.001	4.964	30.1	S58	69.200	67.775		Open Manhole	
S7.002	3.635	30.0	S59	68.900	67.475		Open Manhole	
	21.629	30.0	S60	67.500	66.075		Open Manhole	
S7.004	23.665	30.0	S61	66.000	64.575		Open Manhole	
	21.374		S65	64.800	63.375		Open Manhole	

Atking (Engom)									Dago 1	
Atkins (Epsom)									Page 4	
Woodcoste Grove				I	Fassaroe					
Ashley Road, Epsom										
Surrey, KT18 5BW		Micro								
Date 05/04/2022 11:	06			Ι	Designed	l by N.F	Ranya			
File Storm Drainage		Drainage								
Innovyze Network 2019.1										
			PI	PELINE	SCHEDUI	LES for	Storm			
				<u>Up:</u>	stream N	<u>lanhole</u>				
PN	Hvd	Diam	мн	C Level	I.Level	D Depth	MH	MH DIAM., L*W	r	
	-	(mm)			(m)	(m)	Connection	(mm)		
\$8.000	0	225	562	65.400	63.865	1.310	Open Manhole	1200		
S8.001	0				63.668		Open Manhole			
\$8.002	0				63.111		Open Manhole			
\$7.006	0				61.323		Open Manhole			
\$7.007			S66		59.188		Open Manhole			
\$7.008	0		S67		57.481		Open Manhole			
\$7.009	0		S68		56.449		Open Manhole			
\$7.010	0		S69		50.617		Open Manhole			
S7.011					47.562		Open Manhole			
\$7.012	0	375			45.503		Open Manhole			
s7.013	0	450	S72	47.200	45.210	1.540	Open Manhole	1350		
S7.014	0	450	s73	46.866	45.141	1.275	Open Manhole	1350		
\$9.000	0	225	S74	50.800	49.375	1.200	Open Manhole	1200		
S7.015	0	450	s75	48.000	43.337	4.213	Open Manhole	1350		

S10.000	0	225	S76	48.800	45.309	3.266 Open Manhole 12	00
S7.016 S7.017						4.265 Open Manhole 13 2.585 Open Manhole 13	50 50

Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
58 000	9.260	76.2	S63	65.300	63.743	1 332	Open Manhole	1200
	52.582		S64	64.796	63.164		Open Manhole	
	34.179		S65	64.800			Open Manhole	
S7.006	38.417	55.0	S66	62.200	60.625	1.200	Open Manhole	1200
S7.007	30.960	55.0	S67	60.200	58.625	1.200	Open Manhole	1200
S7.008	25.090	55.0	S68	58.600	57.025	1.200	Open Manhole	1200
S7.009	15.113	55.0	S69	57.749	56.174	1.200	Open Manhole	1200
S7.010	14.144	39.4	S70	51.876	50.258	1.243	Open Manhole	1200
S7.011	6.573	38.0	S71	49.007	47.389	1.243	Open Manhole	1200
S7.012	5.434	38.0	s72	47.200	45.360	1.465	Open Manhole	1350
S7.013	23.911	346.5	S73	46.866	45.141	1.275	Open Manhole	1350
S7.014	40.714	496.5	s75	48.000	45.059	2.491	Open Manhole	1350
S9.000	55.535	19.8	s75	48.000	46.575	1.200	Open Manhole	1350
S7.015	45.947	80.0	S77	44.500	42.763	1.287	Open Manhole	1350
S10.000	56.150	25.0	S77	44.500	43.063	1.212	Open Manhole	1350
S7.016		72.9	S78	41.000	39.209		Open Manhole	
S7.017	42.717	60.0	S79	39.000	37.253	1.297	Open Manhole	1800

Atkins (Epsom)		Page 5
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Digitige
Innovyze	Network 2019.1	1

<u>Upstream Manhole</u>

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.025	0	750	S79	39.000	35.327	2,923	Open Manhole	1800
S1.026	0	750	S80	37.000	33.200		Open Manhole	
S1.027	0	825	S81	36.000	32.759		Open Manhole	
S1.028	0	825	S82	35.500	32.269		Open Manhole	
S1.029	0	825	S83	35.000	32.177		Open Manhole	
S1.030	0	825	S84	34.500	32.013	1.662	Open Manhole	1875
S1.031	0	825	S85	34.000	31.760	1.415	Open Manhole	1875
S1.032	0	825	S86	34.000	31.567	1.608	Open Manhole	1875
S1.033	0	375	S87	34.000	31.400	2.225	Open Manhole	1875
S1.034	0	300	S88	34.000	24.917	8.783	Open Manhole	1200
S1.035	0	300	S89	25.500	23.978	1.222	Open Manhole	1200
S1.036	0	300	S90	25.800	22.808	2.692	Open Manhole	1200
S11.000	0	300	S92	96.000	94.500	1.200	Open Manhole	1200
S12.000	0	225	S93	100.000	98.575	1.200	Open Manhole	1200
S12.001	0	300	S94	<u>99.000</u>	97.500	1.200	Open Manhole	1200
				Fut	ire Ph	ase		
S13.000	0	225	S95				Open Manhole	1200
S13.001	0	225	S96	100.732	98.222	2.285	Open Manhole	1200
S13.002	0	375	S97	98.542	96.967	1.200	Open Manhole	1200
S12.002	0	300	S98	98.542	96.448	1.794	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connectio		DIAM., L*W (mm)
S1.025	30.324	131.3	S80	37.000	35.096	1.154	Open Manho	ole	1875
S1.026	29.994	131.0	S81	36.000	32.971		Open Manho		1875
S1.027	10.764	119.6	S82	35.500	32.669	2.006	Open Manho	ole	1875
S1.028	11.099	120.6	S83	35.000	32.177	1.998	Open Manho	ole	1875
S1.029	18.295	111.6	S84	34.500	32.013	1.662	Open Manho	ole	1875
S1.030	30.400	120.2	S85	34.000	31.760	1.415	Open Manho	ole	1875
S1.031	29.670	153.7	S86	34.000	31.567	1.608	Open Manho	ole	1875
S1.032	15.460	119.8	S87	34.000	31.438	1.737	Open Manho	ole	1875
S1.033	11.133	30.0	S88	34.000	31.029	2.596	Open Manho	ole	1200
S1.034	27.782	30.0	S89	25.500	23.991	1.209	Open Manho	ole	1200
S1.035	22.033	30.0	S90	25.800	23.244	2.256	Open Manho	ole	1200
S1.036	22.127	30.0	S91	23.520	22.070	1.150	Open Manho	ole	0
S11.000	71.681	250.0	S102	97.000	94.213	2.487	Open Manho	ole	1200
S12.000	29.209	29.2	S94	99.000	97.575	1.200	Open Manho	ole	1200
S12.001	80.504	175.8	S98	98 542			Open Manho	ole	1200
012 000	F2 000	26.2	596	Futu	re Pha			. 1 .	1000
S13.000 S13.001				00 540	07 117		Open Manho		1200
		25.0	S97	98.542	97.117		Open Manho		1200
S13.002	52.508	500.0	S98	98.542	96.862	1.305	Open Manho	те	1200
S12.002	17.238	47.5	S100	97.700	96.085	1.315	Open Manho	ole	1200

Atkins (Epsom)		Page 6
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	1

<u>Upstream Manhole</u>

PN	-	Diam (mm)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S14.000	0	375	S99	97.893	96.318	1.200	Open Manhole	1200
S12.003				97.700			Open Manhole	
S12.004	0	450	S101	97.400	94.152	2.798	Open Manhole	1200
S11.001	0	450	S102	97.000	93.928	2.622	Open Manhole	1200
S15.000	0	225	S103	98.776	97.351	1.200	Open Manhole	1200
S15.001	0	225	S104	97.600	96.175	1.200	Open Manhole	1200
S15.002	0	225	S105		96 075		Open Manhole	1200
S15.003	0	300	S106	97. F U	iture F	Phase	pen Manhole	1200
S15.004	0	300	S107	96.		11000	pen Manhole	1200
S15.005	0	300	S108	96.069	94.569	1.200	Open Manhole	1200
S15.006	0	300	S109	95.331	93.831	1.200	Open Manhole	1200
S11.002	0	525	S110	94.628	92.726	1.377	Open Manhole	1350
S16.000	0	225	S111	97.950	96.448	1.277	Open Manhole	1200
S16.001	0	300	S112	97.409	95.806	1.303	Open Manhole	1200
S16.002	0	300	S113	96.087	94.484	1.303	Open Manhole	1200
S16.003	0	375	S114	95.462	93.399	1.688	Open Manhole	1200
S16.004	0	450	S115	94.330	92.529	1.351	Open Manhole	1200
S11.003	0	600	S116	94.350	92.042	1.708	Open Manhole	1350

Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)		MH nection	MH	DIAM., (mm)	L*W
S14.000	80.054	414.8	S100	97.700	96.125	1.200	Open	Manhole		1	200
S12.003	5.683	40.0	S101	97.400	95.753	1.272	Open	Manhole		1	200
S12.004	9.403	63.1	S102	97.000	94.003	2.547	Open	Manhole		1	200
S11.001	67.792	71.4	S110	94.628	92.978	1.200	Open	Manhole		1	350
S15.000	38.813	33.0	S104	97.600	96.175	1.200	Open	Manhole		1	200
S15.001	9.718	97.2	S105	97.500	96.075	1.200	Open	Manhole		1	200
S15.002	18.854	37.7	S106	9 <u>7 000</u>	95 575	1 200	Open	Manhole		1	200
S15.003	17.080	38.9	S107	⊴Futi	ire Ph	nase	Open	Manhole		1	200
S15.004	19.958	40.6	S108	9				Manhole		1	200
S15.005	29.946	40.6	S109	95.331	93.831	1.200	Open	Manhole		1	200
S15.006	32.889	46.8	S110	94.628	93.128	1.200	Open	Manhole		1	350
S11.002	8.096	80.2	S116	94.350	92.625	1.200	Open	Manhole		1	350
S16.000	35.143	62.0	S112	97.409	95.881	1.303	Open	Manhole		1	200
S16.001	39.927	30.2	S113	96.087	94.484	1.303	Open	Manhole		1	200
S16.002	18.620	29.8	S114	95.462	93.859	1.303	Open	Manhole		1	200
S16.003	64.328	80.9	S115	94.330	92.604	1.351	Open	Manhole		1	200
S16.004	10.768	500.0	S116	94.350	92.507	1.393	Open	Manhole		1	350
S11.003	14.227	100.2	S117	93.500	91.900	1.000	Open	Manhole		1	350

Atkins (Epsom)									Page 7
Woodcoste Grove				F	assaroe	Housin	ıg Dev.		
Ashley Road, Epsom									
Surrey, KT18 5BW				С	o. Wick	low.			Micco
Date 05/04/2022 11:0)6			D	esigned	by N.F	lanva		Micro
File Storm Drainage		1 02	0.4		-	by G.Ha	-		Drainad
Innovyze	110401		• • • • •		etwork		initacey		
				11	CEWOIN	2019.1			
			PI	PELINE	SCHEDUI	LES for	Storm		
				<u>Ups</u>	tream M	<u>lanhole</u>			
PN	Hvd I	Diam	мн	C.Level	I.Level	D.Depth	MH	MH DIAM., L*W	,
	Sect				(m)	(m)	Connection	(mm)	
S11.004	0	225	S117	93 500	91.900	1 375	Open Manhole	1350	
S11.004 S11.005	0				91.150		Open Manhole		
							1		
S17.000	0	225	S120	79.300	77.654	1.421	Open Manhole	1200	
S18.000	0	225	S121	85 800	84.081	1 494	Open Manhole	1200	
S18.001	0				82.881		Open Manhole		
S18.002	0				80.750		Open Manhole		
S18.003					79.091		Open Manhole		
S18.004	0				77.963		Open Manhole		
217 001		0.75	a10	70 500	76 704	1 400	o v l l	1000	
\$17.001	0				76.784		Open Manhole		
S17.002	0	3/5	S127	//.800	70.404	1.021	Open Manhole	1200	
S19.000	0	225	S128	77.220	75.733	1.261	Open Manhole	1200	
S19.001	0	225	S129	76.988	75.502	1.261	Open Manhole	1200	
S19.002	0		S130		75.347		Open Manhole		
S20.000	0	225	S131	77.000	76 676	1 200	- pen Manhole	1200	
s20.000	0		S131		ituro [Phase	pen Manhole		
				77.		ilase			
S20.002	0	223	S133	//.000	10.000	1.100	Jpen Manhole	1200	
s19.003	0	300	S134	76.900	75.012	1.588	Open Manhole	1200	

<u>Downstream Manhole</u>

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)		MH nection	MH	DIAM., L	*W
S11.004 S11.005				92.844 92.200	91.150 90.539			Manhole Manhole		12	0 0 0
S17.000	37.559	64.6	S126	78.568	77.073	1.270	Open	Manhole		12	00
\$18.000 \$18.001 \$18.002 \$18.003 \$18.004 \$17.001 \$17.002 \$19.000 \$19.001 \$19.002	37.935 47.505 37.125 35.808 19.365 21.129 15.744 3.130	36.6 30.0 37.5 30.8 40.0 30.0 67.9 113.7	<pre>S123 S124 S125 S126 S127 S136 S129</pre>	71.200 76.988	83.090 81.844 79.166 78.100 76.800 76.300 69.700 75.502 75.474 75.196	1.402 2.109 1.678 1.393 1.125 1.125 1.261 1.261	Open Open Open Open Open Open Open	Manhole Manhole Manhole Manhole Manhole Manhole Manhole Manhole		12 12 12 12 12 12 12 12 12 12 12 12 12 1	
\$20.000 \$20.001 \$20.002 \$19.003 \$19.004	39.137 23.955 29.550	294.4 294.4 250.4	\$133 \$134 \$135	70.900	74.894 69.950	ase 1.447	Open Open Open	Manhole Manhole Manhole Manhole		120 120 120 120 120	000000

Atkins (Epsom)									Page 8
Woodcoste Grove				I	Fassaroe	Housin	ng Dev.		
Ashley Road, Epsom									
Surrey, KT18 5BW				(Co. Wick	low.			Micro
Date 05/04/2022 11:	06			I	Designed	by N.F	Ranya		
File Storm Drainage	Mode	el 02	.04.	2 0	Checked	by G.Ha	inratty		Drainage
Innovyze					Network	-	-		
11110 V Y 2 C				1	NCCWOIN	2019.1			
PN	-	Diam (mm)	МН	Up: C.Level	SCHEDUI stream M L I.Level (m)	<u>lanhole</u>		MH DIAM., L*W (mm)	
		(/		(/	()	(/		(,	
\$17.003 \$17.004 \$17.005 \$17.006	0 0	450 225	S137 S138	70.500	68.599 68.200	1.451 1.475	Open Manhole Open Manhole Open Manhole Open Manhole	1200 1200	
S21.000 S21.001 S21.002	0	300	S141			3.205	Open Manhole Open Manhole Open Manhole	1200	

SZI.003	0	375	SI43	96.512	92.888	3.249	Open	Mannole	1200
S21.004	0	375	S144	94.735	92.377	1.983	Open	Manhole	1200
S21.005	0	375	S145	94.135	92.014	1.746	Open	Manhole	1200
S21.006	0	375	S146	91.836	90.249	1.212	Open	Manhole	1200
S22.000	0	300	S147	101.265	99.719	1.246	Open	Manhole	1200
S22.001	0	300	S148	101.143	99.558	1.285	Open	Manhole	1200
S22.002	0	300	S149	100.873	99.255	1.318	Open	Manhole	1200
S22.003	0	300	S150	100.131	98.631	1.200	Open	Manhole	1200
S22.004	0	300	S151	99.231	97.731	1.200	Open	Manhole	1200
S22.005	0	300	S152	98.331	96.831	1.200	Open	Manhole	1200
S22.006	0	375	S153	97.600	95.856	1.369	Open	Manhole	1200
S22.007	0	375	S154	97.200	95.414	1.411	Open	Manhole	1200
S22.008	0	375	S155	97.335	95.308	1.652	Open	Manhole	1200
S22.009	0	375	S156	97.289	95.214	1.700	Open	Manhole	1200

<u>Downstream Manhole</u>

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S17.003			S137	70.500	69.000		Open Manhole	
S17.004			S138	69.900	68.325		Open Manhole	
S17.005	10.686	35.0	S139	69.200	67.895	1.080	Open Manhole	1200
S17.006	41.981	33.8	S262	67.500	66.240	1.035	Open Manhole	1200
S21.000	55.204	137.3	S141	96.847	93.342	3.205	Open Manhole	1200
S21.001	19.629	96.2	S142	97.091	93.138	3.653	Open Manhole	1200
S21.002	20.013	114.4	S143	96.512	92.963	3.249	Open Manhole	1200
S21.003	59.856	134.2	S144	94.735	92.442	1.918	Open Manhole	1200
S21.004	21.053	58.2	S145	94.135	92.014	1.746	Open Manhole	1200
S21.005	83.140	47.1	S146	91.836	90.249	1.212	Open Manhole	1200
S21.006	19.451	57.7	S183	91.525	89.912	1.238	Open Manhole	1350
S22.000	25.411	157.8	S148	101.143	99.558	1.285	Open Manhole	1200
S22.001	29.977	98.9	S149	100.873	99.255	1.318	Open Manhole	1200
S22.002	59.895	96.0	S150	100.131	98.631	1.200	Open Manhole	1200
S22.003	29.770	33.1	S151	99.231	97.731	1.200	Open Manhole	1200
S22.004	29.788	33.1	S152	98.331	96.831	1.200	Open Manhole	1200
S22.005	29.523	32.8	S153	97.600	95.931	1.369	Open Manhole	1200
S22.006	32.596	73.7	S154	97.200	95.414		Open Manhole	
S22.007	6.457	60.9	S155	97.335	95.308		Open Manhole	
S22.008			S156	97.289	95.214		Open Manhole	
S22.009	7.499	32.7	S157	97.200	94.985		Open Manhole	
							-	

Atkins (Epsom)		Page 9
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	1

<u>Upstream Manhole</u>

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)		MH ection	MH DIAM., (mm)	L*W
S22.010	0	375	S157	97.200	94.985	1.840	Open i	Manhole		1200
S22.011	0		S158	96.900	94.823		-	Manhole		1200
s22.012	0		S159	96.800	94.580		-	Manhole		1200
S22.013	0	450	S160	96.750	94.447		-	Manhole		1200
S22.014	0	450	S161	96.650	94.249		-	Manhole		1200
S22.015	0	450	S162	96.550	94.044	2.056	Open 1	Manhole		1200
S22.016	0	450	S163	96.450	93.848	2.152	Open 1	Manhole		1200
S22.017	0	450	S164	95.930	92.948	2.532	Open 1	Manhole		1200
S22.018	0	450	S165	95.203	92.752	2.001	Open 1	Manhole		1200
~~~~~~~		0.05	~1.6.6	0.6 500	05 005	1 1 5 0				1000
S23.000	0	225	S166	96.700	95.005	1.470	Open I	Manhole		1200
S24.000	0	300	S167	97.	ituro [	)haaa	nen i	Manhole		1200
S21.000	0		S168	97. <b>FU</b>	питег	Phase	pen l	Manhole		1200
S24.002	0		S169	97.609	95.063	2,246	1 1	Manhole		1200
021.002	0	000	0100		30.000	2.210	opon i			1200
S23.001	0	300	S170	95.733	93.963	1.470	Open 1	Manhole		1200
S23.002	0	300	S171	95.026	93.526	1.200	Open 1	Manhole		1200
S22.019	0	450	S172	94.405	92.656	1.299	Open 1	Manhole		1200
S22.020	0	450	S173	94.405	92.000	1.955	Open 1	Manhole		1200
S25.000	0	300	S174	96.578	95.017	1.261	Open 1	Manhole		1200

#### Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)		MH nection	MH	DIAM., I (mm)	L*W
S22.010	5.819	35.9	S158	96.900	94.823	1.702	Open	Manhole		12	200
S22.011	11.746	70.1	S159	96.800	94.655	1.770	Open	Manhole		12	200
S22.012	13.258	99.7	S160	96.750	94.447	1.853	Open	Manhole		12	200
S22.013	19.809	100.0	S161	96.650	94.249	1.951	Open	Manhole		12	200
S22.014	20.476	100.0	S162	96.550	94.044	2.056	Open	Manhole		12	200
S22.015	19.614	100.0	S163	96.450	93.848	2.152	Open	Manhole		12	200
S22.016	90.000	100.0	S164	95.930	92.948	2.532	Open	Manhole		12	200
S22.017	19.639	100.0	S165	95.203	92.752	2.001	Open	Manhole		12	200
S22.018	9.637	100.4	S172	94.405	92.656	1.299	Open	Manhole		12	200
s23.000	38.846	40.2	S170	95.733	94.038	1.470	Open	Manhole		12	200
s24.000	70.000	200.0	S168	Futu	ire Ph	ase	Open	Manhole		12	200
S24.001	44.300	200.0	S169	<u> </u>			Open	Manhole		12	200
S24.002	54.228	65.1	S170	95.733	94.231	1.202	Open	Manhole		12	200
S23.001	16.031	36.7	S171	95.026	93.526	1.200	Open	Manhole		12	200
S23.002	17.587	24.4	S172	94.405	92.806	1.299	Open	Manhole		12	200
S22.019	10.912	60.0	S173	94.405	92.474	1.481	Open	Manhole		12	200
S22.020	18.268	99.8	S182	93.605	91.817		-	Manhole		13	350
S25.000	66.881	48.1	S180	95.188	93.627	1.261	Open	Manhole		12	200

Atkins (Epsom)		Page 10
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

#### <u>Upstream Manhole</u>

PN	Hyd Sect	Diam (mm)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S26.000	0	225	S175	97.449	96.024	1 200	Open Manhole	1200
S26.000	0		S175	97.449	95.024		Open Manhole	
S26.001	0		S170 S177	96.532			Open Manhole	
S26.002 S26.003	0		S177	96.196	94.974		Open Manhole	1200
S26.003			S170 S179	96.196	94.686		-	
526.004	0	225	5179	96.196	94.686	1.285	Open Manhole	1200
S25.001	0	300	S180	95.188	93.308	1.580	Open Manhole	1200
S25.002	0	300	S181	94.100	92.090	1.710	Open Manhole	1200
S22.021	0	525	S182	93.605	90.500	2 580	Open Manhole	1350
522.021	0	525	5102	55.005	50.500	2.500	open Mannore	1000
S21.007	0	675	S183	91.525	89.585	1.265	Open Manhole	1350
S27.000	0	225	S184	92.813	91.313	1.275	Open Manhole	1200
S21.008	0	675	S185	91.256	87.900	2.681	Open Manhole	1350
S21.009	0	750	S186	89.500	87.100	1.650	Open Manhole	1350
S21.010	0	750	S187	89.000	86.841	1.409	Open Manhole	1350
S21.011	0	750	S188	88.982	86.743	1.489	Open Manhole	1350
S21.012	0	750	S189	88.724	86.623	1.351	Open Manhole	1350
S21.013	0	750	S190	88.414	86.526		Open Manhole	1350
S21.014	0	750	S191	88.240	86.454	1.036	Open Manhole	1350
S21.015	0	750	S192	87.500	86.191	0.559	Open Manhole	1350
S21.016	0	750	S193	87.000	86.090	0.160	Open Manhole	1350

#### Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S26.000	16 274	28 0	S176	96.868	95.443	1 200	Open Manhol	e 1200
S26.000					95.107		Open Manhol	
S26.001					94.771		Open Manhol	
				96.196			Open Manhol	
S26.003							Open Manhol	
520.004	55.107	55.0	5100	55.100	55.102	1.201	open namor	1200
S25.001	32.076	42.8	S181	94.100	92.559	1.241	Open Manhol	e 1200
S25.002	22.697	64.5	S182	93.605	91.738		Open Manhol	
							1	
S22.021	49.737	65.0	S183	91.525	89.735	1.265	Open Manhol	e 1350
							-	
S21.007	6.679	99.7	S185	91.256	89.518	1.063	Open Manhol	e 1350
S27.000	57.012	36.6	S185	91.256	89.756	1.275	Open Manhol	e 1350
S21.008	52.610	100.0	S186	89.500	87.374	1.451	Open Manhol	e 1350
S21.009	31.023	119.8	S187	89.000	86.841	1.409	Open Manhol	e 1350
S21.010	11.832	120.7	S188	88.982	86.743	1.489	Open Manhol	e 1350
S21.011	10.570	88.1	S189	88.724	86.623	1.351	Open Manhol	e 1350
S21.012	13.703	141.3	S190	88.414	86.526	1.138	Open Manhol	e 1350
S21.013	8.915	123.8	S191	88.240	86.454	1.036	Open Manhol	e 1350
S21.014	14.666	55.8	S192	87.500	86.191	0.559	Open Manhol	e 1350
S21.015	17.813	176.4	S193	87.000	86.090	0.160	Open Manhol	e 1350
S21.016	20.188	224.3	S194	87.000	86.000	0.250	Open Manhol	e 1350

Atkins (Eps	om)									
oodcoste G	rove				E	Fassaroe	Housin	g Dev.		
shley Road	. Epsom							-		
Surrey, KT	-					Co. Wickl	~			
ate 05/04/		0.0								
						Designed	-	-		
'ile Storm	Drainage	Mode	1_02	.04.2		Checked b		nratty		
Innovyze					Ν	Network 2	019.1			
				PIP	ELINE	SCHEDULE	S for	<u>Storm</u>		
					<u>Ups</u>	stream Ma	<u>nhole</u>			
	PN	Hvd	Diam	мн с	Level	I.Level I	Denth	MH	MH DT	AM., L*W
			(mm)		(m)	(m)	(m)	Connectio		(mm)
		2000	()		()	(/	()			,
	S21.017	0				86.000		Open Manho		1350
	S21.018					85.840				1350
	S21.019					85.650				1350
	S21.020					84.918				1200
	S21.021					84.500				1200
	S21.022	0	450	S199	85.300	83.300	1.550	Open Manho	ole	1200
	S28.000	0	225	S200	89.500	87.439	1.836	Open Manho	le	1200
								-1		
	S29.000	0	225	S201	9			Open Manho	ole	1200
	S29.001	0	300	S202	91 <b>FU</b> 1	ture Ph	ase	Open Manho	ole	1200
	S29.002	0	300	S203	91.400	88.515	2.585	Open Manho	ole	1200
	S28.001	0	450	S204	88.400	86.658	1.292	Open Manho	ole	1200
	s30.000	0	300	\$205	94 300	92.800	1 200	Open Manho		1200
	s30.001					92.672		Open Manho		1200
	\$30.002					91.880		Open Manho		1200
	s30.003					90.598		Open Manho		1200
	s30.004					89.725		Open Manho		1200
	S30.005					89.153		Open Manho		1200
	S30.006					86.734		Open Manho	ole	1200
	S28.002	0	450	S212	89.850	86.350	3.125	Open Manho	ole	1200
					Dowr	nstream M	anhole			
	PN	-	-			el I.Level	-			IAM., L*
		(m)	(1:X)	Name	(m)	(m)	(m)	Connect	ion	(mm)
	S21.017	18.100	98.9	9 S195	87.0	00 85.817	0.433	3 Open Man	hole	135
	S21.018							3 Open Man		135
	S21.019			) S197				) Open Man		120
	S21.020							3 Open Man		120
	S21.021	29.635	70.6	5 S199	85.30	00 84.080		5 Open Man		120
	S21.022	19.362	86.8	3 S260	84.00	00 83.077	0.473	3 Open Man	hole	120
	000 000	22 21 2	E 0 (		0.0 1	00 00 000	1 0 0 1		<b>1</b> -	100
	S28.000	33.319	59.9	s S204	88.40	00 86.883	1.292	2 Open Man	noie	120

528.000	33.319	59.9	SZ04	88.400	80.883	1.292	Open	Mannole	1200
S29.000 S29.001 S29.002	36.027	30.0		Futur 88.400	e Pha	<b>Se</b> p7	Open	Manhole Manhole Manhole	1200 1200 1200
S28.001	43.238	140.4	S212	89.850	86.350	3.050	Open	Manhole	1200
\$30.000 \$30.001 \$30.002 \$30.003 \$30.004 \$30.005 \$30.006 \$28.002	36.825 39.210 24.187 7.271 20.399 9.355	215.2 40.0 40.0 40.0 40.0 40.0	S207 S208 S209 S210	94.001 92.400 91.493 91.043	92.672 92.501 90.900 89.993 89.543 88.643 86.500 86.074	1.200 1.200 1.200 1.200 1.200 3.050	Open Open Open Open Open	Manhole Manhole Manhole Manhole Manhole Manhole	1200 1200 1200 1200 1200 1200 1200 1200

Atkins (Epsom)										
Woodcoste Grove				F	assaroe	Housir	ng Dev.			
Ashley Road, Epsom										
Surrey, KT18 5BW				С	Co. Wicklow.					
Date 05/04/2022 11:	0.6			ם ת	esigned	by N F	lanva			
File Storm Drainage		1 02	0.4		hecked	-	-			
	Mode	<u></u>	.04.			-	lifatty			
Innovyze				N	etwork	2019.1				
			PI	PELINE	SCHEDUI	ES for	Storm			
				<u>Ups</u>	tream M	<u>lanhole</u>				
PN	TT	Diam		0.7	T Tamal		MH	MI DT3M T+N		
PN	-		Name		I.Level (m)	(m)	MH Connection	MH DIAM., L*W (mm)		
	Sect	(11011)	Name	(111)	(111)	(111)	Connection	(11111)		
\$31.000					93.500		Open Manhole			
S31.001							Open Manhole			
\$31.002	0	300	S215	94.600	92.938	1.362	Open Manhole	1200		
\$32.000	0	225	\$216	98 600	97 175	1 200	Open Manhole	1200		
\$32.001							Open Manhole			
\$32.002							Open Manhole			
							Open Manhole			
S32.004				97.400	95.866	1.309	Open Manhole			
S32.005	0	225	S221	97			Open Manhole	1200		
				FU		nase				
\$33.000				20.000	51.100	1.200	Open Manhole			
\$33.001							Open Manhole			
S33.002							Open Manhole			
\$33.003							Open Manhole			
S33.004	0	375	S226	95.340	93.486	1.479	Open Manhole	1200		
\$32.006	~	150	c227	95 254	93 310	1 / 00	Open Manhole	1200		
■ 33Z.000							Open Manhole			
							Open Manhole			
S32.007	$\sim$		0229				Open Manhole			
\$32.007 \$32.008		450	\$230	94 800	9/ 159					
S32.007		450	S230	94.800	92.159	2.171	open namore	1200		

#### <u>Downstream Manhole</u>

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)		MH nection	MH DIAM., L*1 (mm)	W
S31.000	78.548	250.2	S214	94.800	93.186	1.314	Open	Manhole	120	0
S31.001	62.125	250.0	S215	94.600	92.938	1.362	Open	Manhole	120	0
S31.002	13.794	151.6	S231	94.509	92.847	1.362	Open	Manhole	135	0
S32.000	23.310	233.1	S217	98.500	97.075		1	Manhole		0
S32.001	55.929	93.2	S218	97.900	96.475	1.200	Open	Manhole	120	0
S32.002	7.906	25.3	S219	97.600	96.163	1.212	Open	Manhole	120	0
S32.003	22.292	75.1	S220	97.400	95.866	1.309	Open	Manhole	120	0
S32.004	9.274	46.4	S221	97.200	95.666	1.309	Open	Manhole	120	0
S32.005	22.980	30.0	S227	Futu	re Ph	250	Open	Manhole	120	0
000	00 000	200.2	a		-		0	Maula - 1 -	100	
S33.000				95.400	93.975		-	Manhole		
S33.001				95.320	93.848			Manhole		· •
S33.002 S33.003				95.250 95.340	93.670			Manhole		· •
S33.003 S33.004					93.486 93.393		-	Manhole		
533.004	23.207	250.0	5227	95.256	93.393	1.488	Open	Manhole	120	U
S32.006	48.743	250.0	S228	95.200	93.123	1.627	Open	Manhole	120	0
S32.007	12.440	250.0	S229	95.512	93.073	1.989	Open	Manhole	120	0
S32.008	59.543	190.1	S230	94.800	92.159	2.191	Open	Manhole	120	0
S32.009	10.370	250.0	S231	94.509	92.117	1.942	Open	Manhole	135	0
s31.003	16.867	250.0	S232	94.509	91.975	2.009	Open	Manhole	135	0
							-			

Atkins (Epsom)		Page 13
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamarje
Innovyze	Network 2019.1	1

#### <u>Upstream Manhole</u>

PN	-	Diam (mm)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S31.004	0	525	S232	94.509	91.975	2.009	Open Manhole	1350
s34.000	0	225	s233	96.509	94.750	1.534	Open Manhole	1200
S34.001	0	300	S234	95.750	94.250	1.200	Open Manhole	1200
S34.002	0	300	S235	95.750	93.685	1.765	Open Manhole	1200
S34.003	0	300	S236	94.509	92.603	1.606	Open Manhole	1200
S34.004	0	300	S237	94.109	91.962	1.847	Open Manhole	1200
S31.005	0	600	S238	94.109	91.292	2.217	Open Manhole	1350
S31.006	0	600	S239	93			Open Manhole	1350
S31.007	0	675	S240	92 <b>Fut</b>	ure P	hase	Open Manhole	1350
S35.000	0	300	S241	95.800	94.300	1.200	- Open Manhole	1200
S35.001	0	300	S242	96.409	94.193		Open Manhole	
S35.002	0	300	S243	96.409	92.528	3.581	Open Manhole	1200
S35.003	0	300	S244	93.089	91.409		Open Manhole	
S31.008	0	675	S245	91.498	88.328	2.495	Open Manhole	1350
S31.009	0	900	S246	90.058	88.013		Open Manhole	
S31.010	0		S247	90.500	87.861		Open Manhole	
S31.011	0		S248	90.000	87.764		Open Manhole	
S31.012	0		S249	89.500	87.583		Open Manhole	
s31.013	0		S250	88.212	86.975		Open Manhole	

#### Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)		MH nection	MH	DIAM., (mm)	L*W
S31.004	18.486	250.0	S238	94.109	91.901	1.683	Open	Manhole		-	1350
S34.000	12.762	30.0	S234	95.750	94.325	1.200	Open	Manhole			1200
S34.001	40.419	71.5	S235	95.750	93.685	1.765	Open	Manhole			1200
S34.002	49.581	53.5	S236	94.509	92.759	1.450	Open	Manhole			1200
S34.003	18.288	42.3	S237	94.109	92.171	1.638	Open	Manhole			1200
S34.004	12.954	43.9	S238	94.109	91.667	2.142	Open	Manhole			1350
S31.005	29.229	250.0	S239	93.000	91.175	1.225	Open	Manhole			1350
S31.006	13.335	100.3	S240			0	Open	Manhole			1350
S31.007	30.397	100.0	S245	Futu	re Ph	ase 5	Open	Manhole			1350
s35.000	31.552	294.9	S242	96.409	94.193	1.916	Open	Manhole			1200
S35.001	61.516	294.4	S243	96.409	93.984	2.125	Open	Manhole			1200
S35.002	28.159	30.0	S244	93.089	91.589	1.200	Open	Manhole			1200
S35.003	42.340	30.0	S245	91.498	89.998	1.200	Open	Manhole		:	1350
S31.008	26.949	109.4	S246	90.058	88.082	1.301	Open	Manhole			1800
S31.009	9.264	120.0	S247	90.500	87.936	1.664	Open	Manhole			1875
S31.010	11.301	141.3	S248	90.000	87.781	1.244	Open	Manhole			1875
S31.011	10.961	55.1	S249	89.500	87.565	1.710	Open	Manhole			1200
S31.012	48.002	74.9	S250	88.212	86.942	1.045	Open	Manhole			1200
S31.013	40.112	78.9	S251	87.000	86.467	0.308	Open	Manhole			1500

Atkins (Epsom)		Page 14
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	1

#### <u>Upstream Manhole</u>

PN	-	Diam (mm)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
				. ,				
S28.003	0	750	S251	87.000	85.699	0.551	Open Manhole	1500
S28.004	0	825	S252	87.000	85.410	0.765	Open Manhole	1500
S28.005	0	900	S253	86.500	85.253	0.347	Open Manhole	1800
S28.006	0	225	S254	86.500	85.150	1.050	Open Manhole	1800
S28.007	0	225	S255	85.900	84.951	0.724	Open Manhole	1200
S28.008	0	225	S256	86.943	84.659	2.059	Open Manhole	1200
S28.009	0	225	S257	86.200	82.660	3.315	Open Manhole	1200
S28.010	0	225	S258	83.800	81.273	2.302	Open Manhole	1200
S28.011	0	225	S259	82.500	80.929	1.346	Open Manhole	1200
S21.023	0	225	S260	84.000	75.791	7.984	Open Manhole	1200
S21.024	0	225	S261	76.933	66.712	9.996	Open Manhole	1200
S17.007	0	225	S262	67.500	60.040	7.235	Open Manhole	1200
S17.008	0	225	S263	61.000	58.189	2.586	Open Manhole	1200
S17.009	0	225	S264	59.500	57.645	1.630	Open Manhole	1200
S17.010	0	225	S265	59.000	55.166	3.609	Open Manhole	1200
S17.011	0	225	S266	57.500	49.635	7.640	Open Manhole	1200
S17.012	0	300	S267	51.000	49.412	1.288	Open Manhole	1200
S17.013	0	300	S268	52.000	48.615	3.085	Open Manhole	1200
S17.014	0	300	S269	51.000	48.400	2.300	Open Manhole	1200
S17.015	0	300	S270	49.700	47.901	1.499	Open Manhole	1200
S36.000	0	225	S272	101.000	99.007	1.768	Open Manhole	1200

#### Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)		MH nection	MH	DIAM., L (mm)	.*W
S28.003	34.911	162.5	S252	87.000	85.485	0.765	Open	Manhole		15	500
S28.004	67.357	231.5	S253	86.500	85.119		-	Manhole		18	00
S28.005	18.722	302.0	S254	86.500	85.191	0.409	Open	Manhole		18	800
S28.006	18.454	94.6	S255	85.900	84.955	0.645	Open	Manhole		12	200
S28.007	27.140	89.0	S256	86.943	84.646	2.072	Open	Manhole		12	200
S28.008	11.596	84.3	S257	86.200	84.521			Manhole		12	200
S28.009	40.752	149.8	S258	83.800	82.388	1.187	Open	Manhole		12	200
S28.010	27.682	134.9	S259	82.500	81.068	1.207	Open	Manhole		12	200
S28.011	41.630	106.7	S260	84.000	80.539	3.236	Open	Manhole		12	200
				76.933			-	Manhole			200
S21.024	86.415	100.0	S262	67.500	65.848	1.427	Open	Manhole		12	200
							_				
				61.000	59.419		1	Manhole			200
S17.008				59.500	58.027		-	Manhole			200
S17.009				59.000	57.535		-	Manhole			200
S17.010				57.500	55.027		-	Manhole			200
S17.011				51.000	49.479		-	Manhole			200
S17.012				52.000 51.000	48.615 48.400		1	Manhole			200
S17.013 S17.014					48.400		1	Manhole Manhole			200
S17.014 S17.015				49.700	48.134		-	Manhole		12	00:
311.013	10.041	100.3	3211	49.200	4/./41	1.139	open	mannote			0
S36.000	12.970	30.0	s273	100.000	98.575	1.200	Open	Manhole		12	200

Atkins (Epsom)		Page 15
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Dialitacje
Innovyze	Network 2019.1	

#### <u>Upstream Manhole</u>

PN	-	Diam (mm)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S36.001	0	225	S273	100.000	97.947	1.828	Open Manhole	1200
S36.002	0	225	S274	99.000	97.575	1.200	Open Manhole	1200
S36.003	0	225	S275	98.000	96.116	1.659	Open Manhole	1200
S36.004	0	225	S276	97.000	95.191	1.584	Open Manhole	1200
S36.005	0	300	S277	96.000	94.500	1.200	Open Manhole	1200
S37.000	0	225	S278	100.000	98.575	1.200	Open Manhole	1200
S37.001	0	225	S279	100.000	98.505	1.270	Open Manhole	1200
S37.002	0	225	S280	99.000	97.575	1.200	Open Manhole	1200
S37.003	0	300	S281	20		1 000	Open Manhole	1200
S37.004	0	375	S282	∍'⊢ut	ure Pl	nase	Open Manhole	1200
S37.005	0	375	S283	97.000	90.009	1.230	Open Manhole	1200
S36.006	0	375	S284	96.000	94.251	1.374	Open Manhole	1200
S38.000	0	225	S285	99.000	97.575	1.200	Open Manhole	1200
S38.001	0	225	S286	99.000	97.362	1.413	Open Manhole	1200
S38.002	0	225	S287	99.000	97.322	1.453	Open Manhole	1200
S38.003	0	300	S288	99.000	97.157	1.543	Open Manhole	1200
S38.004	0	300	S289	99.000	93.864	4.836	Open Manhole	1200
S36.007	0	600	S290	95.000	93.200	1.200	Open Manhole	1350
S36.008	0	225	S291	95.000	93.100	1.675	Open Manhole	1350

#### Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)		MH nection	MH	DIAM., (mm)	L*W
S36.001	11.157	30.0	S274	99.000	97.575	1.200	Open	Manhole		1	200
S36.002	51.847	51.8	S275	98.000	96.575	1.200	Open	Manhole		1	200
S36.003	16.245	30.0	S276	97.000	95.574	1.201	Open	Manhole		1	200
S36.004	18.488	30.0	S277	96.000	94.575	1.200	Open	Manhole		1	200
S36.005	74.206	426.5	S284	96.000	94.326	1.374	Open	Manhole		1	200
s37.000	20.753	294.4	S279	100.000	98.505	1.270	Open	Manhole		1	200
S37.001	37.527	40.4	S280	99.000	97.575			Manhole		1	200
S37.002	23.824	23.8	S281	98.000	96.575	1.200	Open	Manhole		1	200
S37.003	64.791	64.8	S282			1 200				1	200
S37.004	15.498	425.9	S283	Futu	re Pha	ase ³⁶	Open	Manhole		1	200
S37.005	76.404	67.2	S284			4	Open	Manhole		1	200
S36.006	75.366	91.2	S290	95.000	93.425	1.200	Open	Manhole		1	350
S38.000				99.000	97.362		-	Manhole			200
S38.001				99.000	97.322	1.453	Open	Manhole			200
S38.002				99.000	97.232		-	Manhole			200
S38.003				99.000	97.021		-	Manhole			200
S38.004	18.215	50.0	S290	95.000	93.500	1.200	Open	Manhole		1	350
				95.000	93.160		-	Manhole		1	350
S36.008	6.914	40.0	S292	95.000	92.927	1.848	Open	Manhole			0

Atkins (Epsom)		Page 16
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Digitige
Innovyze	Network 2019.1	1

#### <u>Upstream Manhole</u>

PN	-	Diam (mm)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
s39.000	0	225	S293	98.000	96.575	1.200	Open Manhole	1200
S40.000	0	225	S294	99.000	97.550	1.225	Open Manhole	1200
s39.001	0	225	S295	Fut	ire Ph		Open Manhole	1200
S41.000	0	225	S296	97.000	90.002		Open Manhole	1200
S39.002	0	300	S297	97.500	95.179	2.021	Open Manhole	1200
S39.003	0	300	S298	97.300	95.102	1.898	Open Manhole	1200
S39.004	0	225	S299	97.200	94.800	2.175	Open Manhole	1200
a 10 000		0.05	0201	105 300	104 272	1 000	o	1000
S42.000	0	225					Open Manhole	1200
S42.001	0	225	S302	102.514			Open Manhole	1200
S42.002	0	300		100.078			Open Manhole	1200
S42.003	0	300			98.006		Open Manhole	1200
S42.004	0	375	S305		97.870		Open Manhole	1200
S42.005	0	375	S306	99.836			Open Manhole	1200
S42.006	0	375		98.751	97.076		Open Manhole	1200
S42.007	0	375	S308	98.065	96.389		Open Manhole	1200
S42.008	0	375		96.972			Open Manhole	1200
S42.009	0	375	S310	96.080	94.321	1.384	Open Manhole	1200
S43.000	0	225	S311	98.900	97.453	1.222	Open Manhole	1200

#### Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)		MH nection	MH	DIAM., L*W (mm)
S39.000	74.295	200.0	S295	99.000	96.204	2.571	Open	Manhole		1200
S40.000	45.817	200.0	S295	99.000	97.321	1.454	Open	Manhole		1200
S39.001	68.558	200.0	S297	Futur	e Pha		Open	Manhole		1200
S41.000	55.527	200.0	S297	97.500	93.234		Open	Manhole		1200
S39.002	15.379	200.0	S298	97.300	95.102	1.898	Open	Manhole		1200
S39.003	46.805	200.0	S299	97.200	94.868		-	Manhole		1200
S39.004	16.083	201.0	S300	97.000	94.720	2.055	Open	Manhole		0
S42.000	88.098	26.7	S302	102.514	101.076	1.212	Open	Manhole		1200
S42.001	61.537	23.1	S303	100.078	98.413	1.439	Open	Manhole		1200
S42.002	33.986	83.5	S304	99.703	98.006	1.397	Open	Manhole		1200
S42.003	20.845	340.5	S305	99.920	97.945	1.675	Open	Manhole		1200
S42.004	38.166	500.0	S306	99.836	97.793	1.667	Open	Manhole		1200
S42.005	43.215	60.2	S307	98.751	97.076		-	Manhole		1200
S42.006	27.836	40.5	S308	98.065	96.389			Manhole		1200
S42.007					95.210		1	Manhole		1200
S42.008					94.350		-	Manhole		1200
S42.009	30.651	76.0	S335	95.677	93.918	1.384	Open	Manhole		1350
S43.000	21.367	104.4	S312	98.800	97.248	1.327	Open	Manhole		1200

Atkins (Epsom)		Page 17
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	1

#### <u>Upstream Manhole</u>

PN	-	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)		MH nection	MH DIAM., L*W (mm)
S43.001	0	225	S312	98.800	97.248	1.327	Open	Manhole	1200
S43.002	0	225	S313	98.700	97.207	1.268	Open	Manhole	1200
S43.003	0	225	S314	98.500	97.026	1.249	Open	Manhole	1200
S43.004	0	225	S315	98.600	96.395	1.980	Open	Manhole	1200
S43.005	0	225	S316	97.700	96.096	1.379	Open	Manhole	1200
S43.006	0	225	S317	97.500	96.009	1.266	Open	Manhole	1200
							_		
S44.000	0	225	S318	102	ture P	haco	Open	Manhole	1200
S44.001	0	225	S319	102 U	luie i	nase	Open	Manhole	1200
S44.002	0	225	S320	101.900	100.446	1.229	Open	Manhole	1200
S44.003	0	225	S321	101.800	99.803	1.772	Open	Manhole	1200
S44.004	0	300	S322	101.200	99.052	1.848	Open	Manhole	1200
S44.005	0	300	S323	100.500	98.897	1.303	Open	Manhole	1200
S45.000	0	225	S324	103.000	101.575	1.200	Open	Manhole	1200
S45.001	0	300	S325	102.500	100.848	1.352	Open	Manhole	1200
S45.002	0	375	S326	101.500	99.603	1.522	Open	Manhole	1200
S45.003	0	375	S327	101.219	98.931	1.913	Open	Manhole	1200
S44.006	0	375	S328	100.390	98.203	1.812	Open	Manhole	1200
S44.007	0		S329	99.129	97.100		-	Manhole	1200
S44.008	0	375	S330	98.337	96.194	1.768	Open	Manhole	1200
\$43.007	0	450	S331	97.191	95.115	1.626	Open	Manhole	1200

#### Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)		MH nection	MH	DIAM., L*W (mm)
S43.001	12.202	297.6	S313	98.700	97.207	1.268	Open	Manhole		1200
S43.002	25.034	138.5	S314	98.500	97.026	1.249	Open	Manhole		1200
S43.003	9.000	300.0	S315	98.600	96.996	1.379	Open	Manhole		1200
S43.004	38.609	276.3	S316	97.700	96.256	1.219	Open	Manhole		1200
S43.005	17.507	200.1	S317	97.500	96.009	1.266	Open	Manhole		1200
S43.006	19.658	46.4	S331	97.191	95.585	1.380	Open	Manhole		1200
S44.000	29.527	183.0	S319	10		1 200	Open	Manhole		1200
				10 Futi		lase	Open	Manhole		1200
				101.800		1.243	-	Manhole		1200
				101.200	99.728		-	Manhole		1200
				100.500	98.897		±	Manhole		1200
S44.005	15.818	55.9	S328	100.390	98.614	1.476	Open	Manhole		1200
				102.500			-	Manhole		1200
				101.500	99.678		-	Manhole		1200
				101.219				Manhole		1200
S45.003	37.923	184.6	S328	100.390	98.726	1.290	Open	Manhole		1200
							_			
S44.006				99.129	97.554		-	Manhole		1200
S44.007					96.685		-	Manhole		1200
S44.008	28.908	50.0	S331	97.191	95.616	1.200	Open	Manhole		1200
\$43.007	22.508	201.8	S332	96.667	95.003	1.214	Open	Manhole		1200

Atkins (Epsom)		Page 18
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:06	Designed by N.Ranya	
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Drainage
Innovyze	Network 2019.1	,

#### <u>Upstream Manhole</u>

PN	Hyd Sect		MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S43.008	0	450	S332	96.667	94.720	1.497	Open Manhole	1200
S43.009	0	525	S333	96.370	94.467	1.378	Open Manhole	1350
S43.010	0	450	S334	96.170	94.004	1.716	Open Manhole	1350
S42.010	0	525	S335	95.677	93.716	1.436	Open Manhole	1350
S46.000	0	225	S337	105.788	104.314	1.249	Open Manhole	1200
S46.001	0	225	S338	104.667	103.073	1.369	Open Manhole	1200
S46.002	0	300	S339	103.559	101.642	1.617	Open Manhole	1200
S46.003	0	300	S340	103.000	101.485	1.215	Open Manhole	1200
S46.004	0	300	S341	103.000	101.005	1.695	Open Manhole	1200
S46.005	0	300	S342	102.500	100.089	2.111	Open Manhole	1200

#### Downstream Manhole

PN	Length (m)	Slope (1:X)		C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S43.008				96.370	94.542		Open Manhole	1350 1350
S43.009 S43.010					94.385 93.791		Open Manhole Open Manhole	1350
S42.010	17.325	199.1	S336	96.407	93.629	2.253	Open Manhole	0
S46.000	70.901	57.1	S338	104.667	103.073	1.369	Open Manhole	1200
S46.001	69.921	61.3	S339	103.559	101.933	1.401	Open Manhole	1200
S46.002	42.151	268.8	S340	103.000	101.485	1.215	Open Manhole	1200
S46.003	62.302	131.2	S341	103.000	101.011	1.689	Open Manhole	1200
S46.004	25.619	49.0	S342	102.500	100.483	1.717	Open Manhole	1200
S46.005	16.722	40.0	S343	101.000	99.671	1.029	Open Manhole	0



# Appendix F. Storage Structures



## F.1. Model Outputs

Atkins (Epsom)		Page 1
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:09	Designed by N.Ranya	
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Drainage
Innovyze	Network 2019.1	1
<u>Storage</u>	Structures for Storm	
Tank or Pond M	Manhole: S10, DS/PN: S2.001	
Inve	rt Level (m) 76.850	
Depth (m) Ar	ea (m²) Depth (m) Area (m²)	Attenuation
0.000	100.0 1.000 100.0	Tank B
Tank or Pond M	Manhole: S26, DS/PN: S2.007	
Inve	rt Level (m) 71.226	
Depth (m) Ar	ea (m²) Depth (m) Area (m²)	Attenuation
0.000		Tank C
Tank or Pond N	' Manhole: S39, DS/PN: S6.001	
	rt Level (m) 73.883	
	ea (m²) Depth (m) Area (m²)	Euturo Dhooo
0.000	1833.3 1.200 1833.3	Future Phase
<u>Tank or Pond M</u>	Manhole: S87, DS/PN: S1.033	
Inve	rt Level (m) 31.400	
Depth (m) Ar	ea (m²) Depth (m) Area (m²)	Attenuation
0.000	2200.0 1.000 2700.0	Pond 4
Tank or Pond Ma	anhole: S117, DS/PN: S11.004	
Inve	rt Level (m) 91.900	
Depth (m) Ar	ea (m²) Depth (m) Area (m²)	
0.000	1333.3 1.200 1333.3	Future Phase
Tank or Pond Ma	nhole: S138, DS/PN: S17.005	
Inve	rt Level (m) 68.200	
Depth (m) Ar	ea (m²) Depth (m) Area (m²)	Attenuation
0.000	516.7 1.200 516.7	Tank A
Tank or Pond Ma	nhole: S189, DS/PN: S21.012	
Inve	rt Level (m) 86.623	
Depth (m) Area (m ² ) Depth (m) Are	ea (m²) Depth (m) Area (m²) Dept	h (m) Area (m²)
0.000 1210.0 0.100	1210.0 0.200 1210.0	0.300 1210.0
		Forebay prior
©193	82-2019 Innovyze	to Pond 2

Atkins (Epsom)		Page 2
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micco
Date 05/04/2022 11:09	Designed by N.Ranya	
File Storm Drainage Model 02.04.2.		Drainage
Innovyze	Network 2019.1	
<u>Tank or Por</u>	nd Manhole: S196, DS/PN: S21.019	
	Invert Level (m) 85.650	
Doubh (	$(m^2)$ Area $(m^2)$ Depth $(m)$ Area $(m^2)$ Attenua	ation
Depth ()	m) Area $(m^2)$ Depth $(m)$ Area $(m^2)$ Pond 2	
0.0	00 1122.2 0.600 1122.0 I OTO Z	
Tank or Por	nd Manhole: S199, DS/PN: S21.022	
	Invert Level (m) 83.300	
		otion
Depth (	m) Area (m ² ) Depth (m) Area (m ² ) Attenua	
0.0	00 3125.0 0.600 3125.0 Pond 1	
<u>Tank or Por</u>	nd Manhole: S248, DS/PN: S31.011	
	Invert Level (m) 87.764	
Depth (1	m) Area (m²) Depth (m) Area (m²)	
	Future	Phase
0.0	00 2416.6 1.200 2416.6 <b>Fature</b>	
Tank or Por	nd Manhole: S254, DS/PN: S28.006	
	Invert Level (m) 85.150	
Depth ()	m) Area (m ² ) Depth (m) Area (m ² ) Attenua	ation
	Pond 3	
0.0	00 1066.1 0.600 1362.0 <b>FORCE</b>	
Tank or Por	nd Manhole: S291, DS/PN: S36.008	
	<u>a namore. 5251, 55, 11. 550.000</u>	
	Invert Level (m) 93.100	
Denth (	$(m^2)$ Amon $(m^2)$ Double $(m)$ Amon $(m^2)$	
Depth ()	m) Area (m ² ) Depth (m) Area (m ² )	
0.0	00 366.6 1.200 366.6 <b>Future</b>	Phase
	A Markelar 2000 DC (DN, 200 004	
Tank or Por	nd Manhole: S299, DS/PN: S39.004	
	Invert Level (m) 94.800	
Depth (1	m) Area (m ² ) Depth (m) Area (m ² )	
0.0	00 83.3 1.200 83.3 Future	Phase
	©1982-2019 Innovyze	



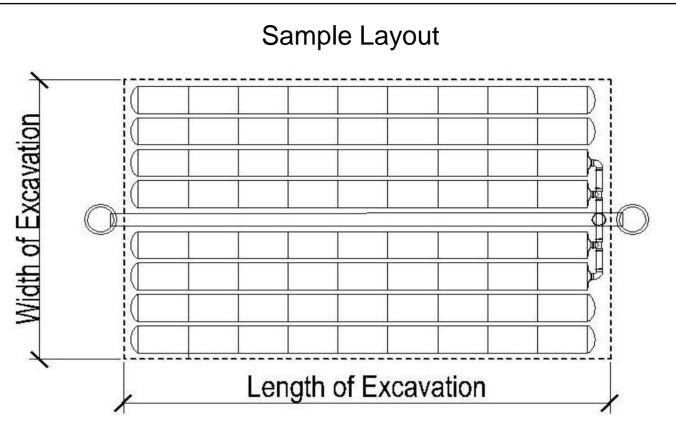
F.2. Underground Modular System Sizing Calculator

	Target Storage Capacity (m ³ )	620
Input	Foundation Stone Under Chambers (mm)	200
μηραι	Distribution Pipe Diameter (mm)	300
	Number of Chambers Wide	14.00
	Number of Chambers Long Indication	17.71
	Number of Chambers Long rounded up	18.00
	Estimated Porosity of Stone	0.4
	Actual Volume of Storage Provided (m ³ )	624.38
Output	Total Width of Excavation (m)	22.06
Julpul	Total Length of Excavation (m)	40.50
	Estimated Stone Requirement (Tons)	1209
	Actual No. of Chambers Required	252
	Actaul No. of Endcaps Required	28

## HydroChamber Calculator VR10

check with JFC for most recent publication

Issue Date: 11/11/08 Note: The Calculator can be updated at any time without prior notification. Please

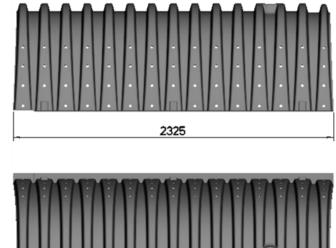


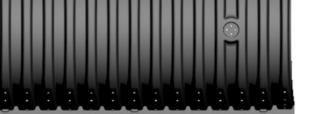
### Instructions

- Enter target storage capacity
- Select proposed foundation depth
- Select distribution pipe diameter
- Enter number of chambers wide to provide the required excavation width
- Modify number of chambers long to achieve the required actual storage volume.
- The number of chambers wide and long may be modified along with the foundation depth to provide the storage volume required within width and length constraints



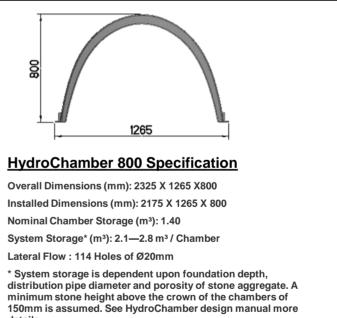






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details.



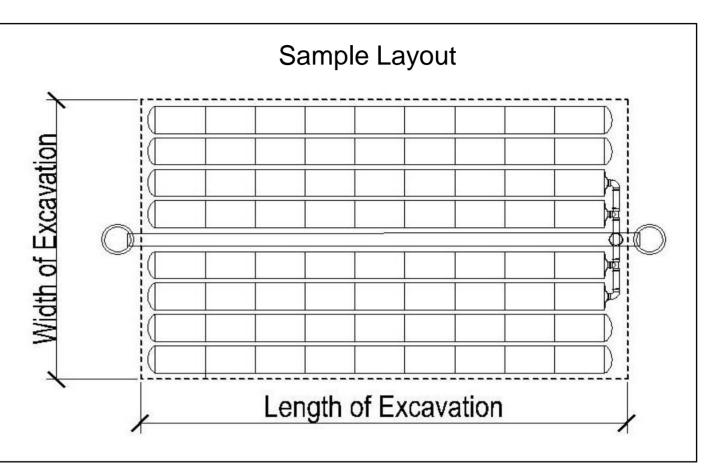
Input	Target Storage Capacity (m ³ )	100
	Foundation Stone Under Chambers (mm)	175
mput	Distribution Pipe Diameter (mm)	300
	Number of Chambers Wide	4.00
	Number of Chambers Long Indication	10.25
	Number of Chambers Long rounded up	9.00
	Estimated Porosity of Stone	0.4
	Actual Volume of Storage Provided (m ³ )	100.90
Output	Total Width of Excavation (m)	7.41
Output	Total Length of Excavation (m)	20.93
	Estimated Stone Requirement (Tons)	221
	Actual No. of Chambers Required	36
	Actaul No. of Endcaps Required	8

### HydroChamber Calculator VR10

Issue Date: 11/11/08

Note: The Calculator can be updated at any time without prior notification. Please check with JFC for most recent publication

	Target Storage Capacity (m ³ )	100
Input	Foundation Stone Under Chambers (mm)	175
	Distribution Pipe Diameter (mm)	300
	Number of Chambers Wide	4.00
	Number of Chambers Long Indication	10.25
	Number of Chambers Long rounded up	9.00
	Estimated Porosity of Stone	0.4
	Actual Volume of Storage Provided (m ³ )	100.90
Output	Total Width of Excavation (m)	7.41
	Total Length of Excavation (m)	20.93

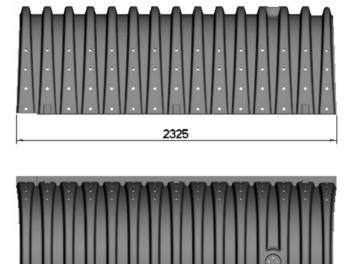


### Instructions

- Enter target storage capacity
- Select proposed foundation depth
- Select distribution pipe diameter
- Enter number of chambers wide to provide the required excavation width
- Modify number of chambers long to achieve the required actual storage volume.
- The number of chambers wide and long may be modified along with the foundation depth to provide the storage volume required within width and length constraints

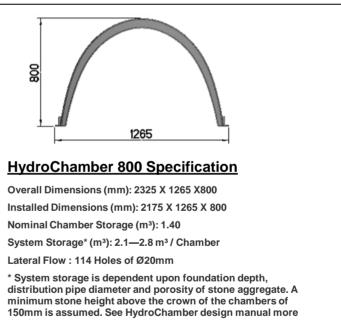






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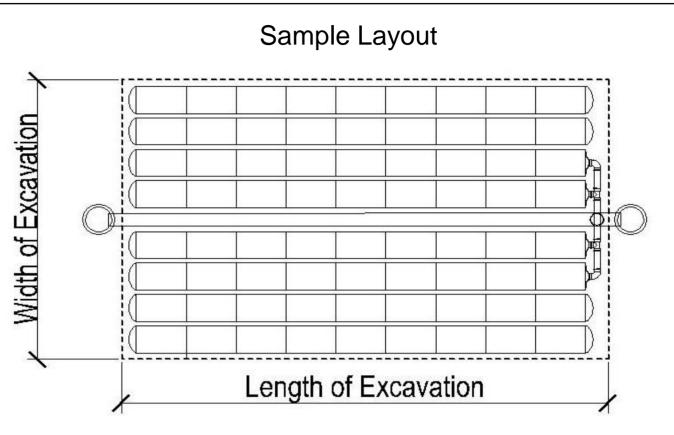


	Target Storage Capacity (m ³ )	400
Input	Foundation Stone Under Chambers (mm)	375
Πιραι	Distribution Pipe Diameter (mm)	300
	Number of Chambers Wide	9.00
	Number of Chambers Long Indication	16.67
	Number of Chambers Long rounded up	16.00
	Estimated Porosity of Stone	0.4
	Actual Volume of Storage Provided (m ³ )	404.81
Output	Total Width of Excavation (m)	14.74
Output	Total Length of Excavation (m)	36.15
	Estimated Stone Requirement (Tons)	903
	Actual No. of Chambers Required	144
	Actaul No. of Endcaps Required	18

## HydroChamber Calculator VR10

Note: The Calculator can be updated at any time without prior notification. Please check with JFC for most recent publication

Issue Date: 11/11/08

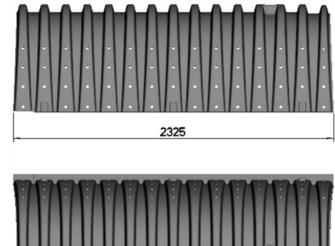


#### Instructions

- Enter target storage capacity
- Select proposed foundation depth
- Select distribution pipe diameter
- Enter number of chambers wide to provide the required excavation width
- Modify number of chambers long to achieve the required actual storage volume.
- The number of chambers wide and long may be modified along with the foundation depth to provide the storage volume required within width and length constraints



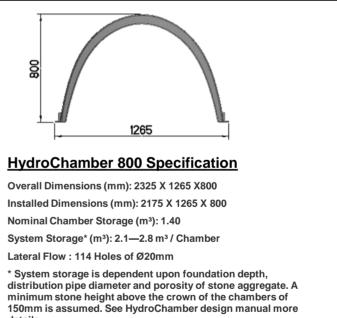






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details.





# Appendix G. Online Controls

					Page 1	
Woodcoste Grove		Fassaroe Housi	ng Dev.			
Ashley Road, Epsom	n					
Surrey, KT18 5BW		Co. Wicklow.	_		- Micro	
Date 05/04/2022 11		Designed by N.	-		Draina	
	ge Model_02.04.2				Brank	J
Innovyze		Network 2019.1	_			
	Onli	ne Controls for	<u>Storm</u>			
Hvdro-E	<u> Brake® Optimum Man</u> ł	nole: S10, DS/PN	: S2.001, Volu	me (m³):	7.5	
		nit Reference MD-SH				
		sign Head (m)		1.000		
	Desi	gn Flow (l/s)	- 1	20.0		
		Flush-Flo™ Objective Mini	Calcu mise upstream st.			
		Application	-	rface		
		ump Available		Yes		
		Diameter (mm) vert Level (m)	7	199 6.850		
	Minimum Outlet Pipe	, ,	/	225		
	Suggested Manhole			1500		
Control P	oints Head (m) H	Flow (1/s) Con	trol Points	Head (m)	Flow (l/s)	
Design Point (C	Calculated) 1.000 Flush-Flo™ 0.340	20.0 20.0 Mean Flow	Kick-Flo@ w over Head Range		17.1 16.8	
utilised then these	ed. Should another type storage routing calcone (m) Flow (1/s)	ulations will be inv	validated			7 (1/
0.100 6.9	0.800 18.0	2.000 27.		38.9	7.000	51
0.200 18.7	1.000 20.0	2.200 29.	.1 4.500	41.1	7.500	52.
0.300 19.9	1.200 21.8			43.3	8.000	54.
0.400 19.9 0.500 19.5	1.400 23.5 1.600 25.0	2.600 31. 3.000 33.		45.3 47.3	8.500 9.000	56. 57.
0.600 19.0	1.800 26.5	3.500 36.		49.2	9.500	59.
		nole. S26 DS/DN				
<u>Hydro-E</u>	Brake® Optimum Manh	<u>1016. 220, D3/11.</u>	: S2.007, Volu	me (m³):	5.6	
<u>Hydro-E</u>	-	nit Reference MD-SH			5.6	
<u>Hydro-E</u>	U De	nit Reference MD-SH sign Head (m)	IE-0359-8000-1000	-8000 1.000	5.6	
<u>Hydro-E</u>	U De	nit Reference MD-SH sign Head (m) gn Flow (l/s)	IE-0359-8000-1000	-8000 1.000 80.0	<u>5.6</u>	
<u>Hydro-E</u>	U De	nit Reference MD-SH sign Head (m) gn Flow (l/s) Flush-Flo™	E-0359-8000-1000 Calcu	-8000 1.000 80.0 lated	<u>5.6</u>	
<u>Hydro-E</u>	U De	nit Reference MD-SH sign Head (m) gn Flow (l/s) Flush-Flo™	E-0359-8000-1000 Calcu mise upstream st	-8000 1.000 80.0 lated	<u>5.6</u>	
<u>Hydro-E</u>	U De Desi S	nit Reference MD-SH sign Head (m) gn Flow (1/s) Flush-Flo™ Objective Mini Application wump Available	E-0359-8000-1000 Calcu mise upstream st	-8000 1.000 80.0 lated orage rface Yes	<u>5.6</u>	
<u>Hydro-E</u>	U De Desi S	Init Reference MD-SH sign Head (m) gn Flow (1/s) Flush-Flo™ Objective Mini Application Nump Available Diameter (mm)	E-0359-8000-1000 Calcu mise upstream st Su	-8000 1.000 80.0 lated orage rface Yes 359	<u>5.6</u>	
<u>Hydro-E</u>	U De Desi S Inv	Init Reference MD-SH sign Head (m) gn Flow (l/s) Flush-Flo™ Objective Mini Application Sump Available Diameter (mm) Pert Level (m)	E-0359-8000-1000 Calcu mise upstream st Su	-8000 1.000 80.0 lated orage rface Yes 359 1.200	<u>5.6</u>	
<u>Hydro-E</u>	U De Desi S	Init Reference MD-SH sign Head (m) gn Flow (1/s) Flush-Flo™ Objective Mini Application Sump Available Diameter (mm) Pert Level (m) Diameter (mm)	E-0359-8000-1000 Calcu mise upstream st Su	-8000 1.000 80.0 lated orage rface Yes 359	<u>5.6</u>	
<u>Hydro-E</u> Control P	U De Desi S Inv Minimum Outlet Pipe Suggested Manhole	Init Reference MD-SH sign Head (m) gn Flow (1/s) Flush-Flo™ Objective Mini Application Jump Available Diameter (mm) rert Level (m) Diameter (mm)	E-0359-8000-1000 Calcu mise upstream st Su	-8000 1.000 80.0 lated orage rface Yes 359 1.200 375 2100	<u>5.6</u> Flow (1/s)	
	U De Desi S S Minimum Outlet Pipe Suggested Manhole Points Head (m) H	Init Reference MD-SH sign Head (m) gn Flow (1/s) Flush-Flo™ Objective Mini Application fump Available Diameter (mm) Diameter (mm) Diameter (mm) Flow (1/s) 80.0	E-0359-8000-1000 Calcu mise upstream st Su 7	-8000 1.000 80.0 lated orage rface Yes 359 1.200 375 2100 Head (m) 0.827		
<b>Control P</b> Design Point (C The hydrological ca Optimum as specifie	U De Desi S Minimum Outlet Pipe Suggested Manhole Points Head (m) H Calculated) 1.000 Flush-Flo™ 0.516 alculations have been M ed. Should another typ	Init Reference MD-SH sign Head (m) gn Flow (1/s) Flush-Flo™ Objective Mini Application fump Available Diameter (mm) ert Level (m) Diameter (mm) Flow (1/s) Con 80.0 80.0 Mean Flow based on the Head/D: pe of control device	E-0359-8000-1000 Calcu mise upstream st Su 7 Atrol Points Kick-Flo@ w over Head Range ischarge relatior e other than a Hy	-8000 1.000 80.0 lated orage rface Yes 359 1.200 375 2100 Head (m) 0.827 e - ship for t	<b>Flow (1/s)</b> 73.0 62.1 the Hydro-Bra	ake®
Control P Design Point (C The hydrological ca Optimum as specifie utilised then these	U De Desi S S Minimum Outlet Pipe Suggested Manhole Points Head (m) H Calculated) 1.000 Flush-Flo™ 0.516 alculations have been M ad. Should another type e storage routing calcu	Init Reference MD-SH sign Head (m) gn Flow (1/s) Flush-Flo™ Objective Mini Application fump Available Diameter (mm) ert Level (m) Diameter (mm) Flow (1/s) S0.0 80.0 80.0 Mean Flow based on the Head/D: pe of control device ulations will be inv	E-0359-8000-1000 Calcu mise upstream st Su 7 Atrol Points Kick-Flo@ w over Head Range ischarge relatior e other than a Hy validated	-8000 1.000 80.0 lated orage rface Yes 359 1.200 375 2100 Head (m) 0.827 0.827 - ship for t rdro-Brake	Flow (1/s) 73.0 62.1 Che Hydro-Bra Optimum® be	
Control P Design Point (C The hydrological ca Optimum as specifie utilised then these	U De Desi S Minimum Outlet Pipe Suggested Manhole Points Head (m) H Calculated) 1.000 Flush-Flo™ 0.516 alculations have been M ed. Should another typ	Init Reference MD-SH sign Head (m) gn Flow (1/s) Flush-Flo™ Objective Mini Application fump Available Diameter (mm) ert Level (m) Diameter (mm) Flow (1/s) S0.0 80.0 80.0 Mean Flow based on the Head/D: pe of control device ulations will be inv	E-0359-8000-1000 Calcu mise upstream st Su 7 Atrol Points Kick-Flo@ w over Head Range ischarge relatior e other than a Hy validated (m) Flow	-8000 1.000 80.0 lated orage rface Yes 359 1.200 375 2100 Head (m) 0.827 0.827 - ship for t rdro-Brake	Flow (1/s) 73.0 62.1 Che Hydro-Bra Optimum® be	

	(Epsom)													Page	e 2	
Woodcost	ce Grove				Fa	assarc	se Ho	ousing	g Dev	7.						
Ashley F	Road, Eps	om												4		
Surrey,	KT18 5B	W			Co	o. Wic	cklow	1.						M	icro	
Date 05/	04/2022	11:09			De	esigne	ed by	/ N.Ra	anya							
File Sto	orm Drain	age Mod	lel_02.0	04.2	. Ch	necked	d by	G.Har	nratt	ЗУ				DI	aina	Iye
Innovyze	2				Ne	etwork	k 201	9.1								
	Hydro	-Brake®	) Optimu	ım Man	hole	: S26,	, DS/	PN:	52.00	)7, V	olum	e (m³	): 5.	6		
Depth (m)	Flow (l/s	) Depth	(m) Flow	r (l/s)	Deptl	<b>h (m)</b>	Flow	(1/s)	Depth	ı (m)	Flow	(1/s)	Depth	(m)	Flow	(1/s
1.600	100.	5 2.	400	122.4		4.000		157.1	6	5.000		191.6	8	.000		220.
1.800	106.	4 2.	600	127.3		4.500		166.4	6	5.500		199.2	8	.500		227.
2.000			000	136.5		5.000		175.2		7.000		206.6		.000		233.
2.200	117.	3 3.	500	147.2		5.500		183.6		7.500		213.7	9	.500		240.
	<u>Hydro</u>	-Brake®	<u>Optim</u>	ım Man	hole	<u>: s39</u>	, DS/	/PN:	S6.00	01, V	<u>'olum</u>	e (m³	): 7.	9		
						Referer		D-SHE-	0071-	2000-						
					-	Head (					0	.700				
				Des	2	low (l/ lush-Fl				C	alcul	2.0 ated				
						Objecti		Minimi	se up							
						plicati			-			face				
					-	Availak						Yes				
				_		eter (n	,					71				
		Minim	um Outle			Level (	. ,				/3	.883 100				
			gested N	-								1200				
	Control	Points	Hea	ad (m)	Flow	(1/s)		Contr	ol Po	ints		Head	(m) Fl	ow (	1/s)	
Des	sign Point	(Calcula Flush-		0.700		2.0	Mean	Flow o	over H	Kick- Head F		0.	450		1.6 1.7	
						1					-					_
Optimum	rological as specif d then the	ied. Sh	ould ano	ther ty	ype of	contr	col de	vice d	other	than		-		-		IKE®
Denth ()	Flow (l/s	) Depth	(m) Flow	r (l/s)	Deptl	h (m)	Flow	(l/s)	Depth	1 (m)	Flow	(l/s)	Depth	(m)	Flow	(1/s
veptn (m)			0.00	2.1		2.000		3.2	4	1.000		4.5	7	.000		
0.100	1.	8 0.	800													5.
0.100	2.	0 1.	000	2.4		2.200		3.4		1.500		4.7		.500		6.
0.100 0.200 0.300	2. 2.	0 1. 0 1.	000 200	2.4 2.6		2.400		3.5		5.000		5.0	8	.000		6. 6.
0.100 0.200 0.300 0.400	2. 2. 1.	0 1. 0 1. 8 1.	000 200 400	2.4 2.6 2.7		2.400 2.600		3.5 3.7		5.000 5.500		5.0 5.2	8	.000 .500		6. 6. 6.
0.100 0.200 0.300	2. 2. 1. 1.	0 1. 0 1. 8 1. 7 1.	000 200	2.4 2.6		2.400		3.5	, , ,	5.000		5.0	8 8 9	.000		6. 6. 6.
0.100 0.200 0.300 0.400 0.500	2. 2. 1. 1. 1.	0 1. 0 1. 8 1. 7 1.	000 200 400 600 800	2.4 2.6 2.7 2.9 3.1		2.400 2.600 3.000 3.500	_DS/	3.5 3.7 3.9 4.2	6	5.000 5.500 5.000 5.500	olume	5.0 5.2 5.4 5.6	8 8 9 9	.000 .500 .000 .500		6. 6. 6.
0.100 0.200 0.300 0.400 0.500	2. 2. 1. 1. 1.	0 1. 0 1. 8 1. 7 1. 9 1.	000 200 400 600 800	2.4 2.6 2.7 2.9 3.1 m Manl	hole:	2.400 2.600 3.000 3.500		3.5 3.7 3.9 4.2 PN: S	1.03	5.000 5.500 5.000 5.500 <u>3, V</u>		5.0 5.2 5.4 5.6 e (m ³	8 8 9 9	.000 .500 .000 .500		6. 6. 6.
0.100 0.200 0.300 0.400 0.500	2. 2. 1. 1. 1.	0 1. 0 1. 8 1. 7 1. 9 1.	000 200 400 600 800	2.4 2.6 2.7 2.9 3.1 m Manl	hole:	2.400 2.600 3.000 3.500	nce Mi	3.5 3.7 3.9 4.2 PN: S	1.03	5.000 5.500 5.000 5.500 <u>3, V</u>	1200-	5.0 5.2 5.4 5.6 e (m ³	8 8 9 9	.000 .500 .000 .500		6. 6. 6.
0.100 0.200 0.300 0.400 0.500	2. 2. 1. 1. 1.	0 1. 0 1. 8 1. 7 1. 9 1.	000 200 400 600 800	2.4 2.6 2.7 2.9 3.1 <u>m Manl</u> D	hole: Unit Fesign	2.400 2.600 3.000 3.500 <u>. S87,</u> Referer	nce Mi (m)	3.5 3.7 3.9 4.2 PN: S	1.03	5.000 5.500 5.000 5.500 <u>3, V</u>	-1200 1	5.0 5.2 5.4 5.6 e (m ³	8 8 9 9	.000 .500 .000 .500		6. 6. 6.
0.100 0.200 0.300 0.400 0.500	2. 2. 1. 1. 1.	0 1. 0 1. 8 1. 7 1. 9 1.	000 200 400 600 800	2.4 2.6 2.7 2.9 3.1 <u>m Manl</u> D	hole: Unit F esign ign FI	2.400 2.600 3.000 3.500 <u>887,</u> Referen Head ( low (1/ lush-F1	nce Mi (m) /s) lo™	3.5 3.7 3.9 4.2 <u>PN: S</u> D-SHE-	3 <u>1.03</u> 0315-	5.000 5.500 5.000 5.500 <u>3, V</u> 6000-	-1200 1 alcul	5.0 5.2 5.4 5.6 (m ³ ) 6000 .200 63.5 ated	8 8 9 9	.000 .500 .000 .500		6. 6. 6.
0.100 0.200 0.300 0.400 0.500	2. 2. 1. 1. 1.	0 1. 0 1. 8 1. 7 1. 9 1.	000 200 400 600 800	2.4 2.6 2.7 2.9 3.1 <u>m Manl</u> D	hole: Unit F esign ign FJ	2.400 2.600 3.000 3.500 	nce Mi (m) /s) lo™ ive I	3.5 3.7 3.9 4.2 PN: S	3 <u>1.03</u> 0315-	5.000 5.500 5.000 5.500 <u>3, V</u> 6000-	1200- 1 alcul m sto	5.0 5.2 5.4 5.6 (m ³ 6000 .200 63.5 ated rage	8 8 9 9	.000 .500 .000 .500		6. 6. 6.
0.100 0.200 0.300 0.400 0.500	2. 2. 1. 1. 1.	0 1. 0 1. 8 1. 7 1. 9 1.	000 200 400 600 800	2.4 2.6 2.7 2.9 3.1 <u>m Manl</u> Des	hole: Unit H esign ign Fl C App	2.400 2.600 3.000 3.500 	nce Mi (m) /s) lo™ ive I ion	3.5 3.7 3.9 4.2 <u>PN: S</u> D-SHE-	3 <u>1.03</u> 0315-	5.000 5.500 5.000 5.500 <u>3, V</u> 6000-	1200- 1 alcul m sto	5.0 5.2 5.4 5.6 (m ³ 6000 .200 63.5 ated rage face	8 8 9 9	.000 .500 .000 .500		6. 6. 6.
0.100 0.200 0.300 0.400 0.500	2. 2. 1. 1. 1.	0 1. 0 1. 8 1. 7 1. 9 1.	000 200 400 600 800	2.4 2.6 2.7 2.9 3.1 <u>m Manl</u> Des	hole: Unit F esign ign F] ( App Sump Z	2.400 2.600 3.000 3.500 	nce Mi (m) /s) lo™ ive I ion ble	3.5 3.7 3.9 4.2 <u>PN: S</u> D-SHE-	3 <u>1.03</u> 0315-	5.000 5.500 5.000 5.500 <u>3, V</u> 6000-	1200- 1 alcul m sto	5.0 5.2 5.4 5.6 (m ³ 6000 .200 63.5 ated rage face Yes	8 8 9 9	.000 .500 .000 .500		6. 6. 6.
0.100 0.200 0.300 0.400 0.500	2. 2. 1. 1. 1.	0 1. 0 1. 8 1. 7 1. 9 1.	000 200 400 600 800	2.4 2.6 2.7 2.9 3.1 <u>m Manl</u> Des	hole: Unit F esign ign F] C App Sump F Diame	2.400 2.600 3.000 3.500 	nce Mi (m) /s) lo™ ive I ion ble mm)	3.5 3.7 3.9 4.2 <u>PN: S</u> D-SHE-	3 <u>1.03</u> 0315-	5.000 5.500 5.000 5.500 <u>3, V</u> 6000-	1200- 1 alcul m sto Sur	5.0 5.2 5.4 5.6 (m ³ 6000 .200 63.5 ated rage face	8 8 9 9	.000 .500 .000 .500		6. 6. 6.
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0.100 0.200 0.300 0.400 0.500 0.600 Des The hyd	2. 2. 1. 1. <u>Hydro</u> <u>Control</u> sign Point	0 1. 0 1. 8 1. 7 1. 9 1. -Brake® Minim Sug Points (Calcula Flush- calculat.	000 200 400 600 800 Optimu Optimu unum Outle ggested M Hea ated) ∙Flo™ ions hav	2.4 2.6 2.7 2.9 3.1 D Des In et Pipe fanhole 1.20 0.490 e been	hole: Unit F esign ign Fl C App Sump A Diame Diame <b>Flow</b> based	2.400 2.600 3.000 3.500 Referer Head ( low (1/ lush-F1 Dbjecti plicati Availak eter (n eter (n eter (n (1/s) 63.5 63.5 i on th	nce Mi (m) /s) lo™ ive I ion ble mm) (m) mm) Mean ne Hea	3.5 3.7 3.9 4.2 PN: <u>S</u> D-SHE- Minimi Minimi Flow of	5 <u>1.03</u> 0315- se up <b>ol Po</b> over I	5.000 5.500 5.500 5.500 6000- C strea strea Kick- Head F e rela	1200- 1 alcul m sto Sur 31 •Flo® Range	5.0 5.2 5.4 5.6 e (m ³ 6000 .200 63.5 ated rage face Yes 315 .400 375 2100 Head 0.	(m) F1 912 - or the	.000 .500 .000 .500 <u>.4</u> Hydr	<b>1/s)</b> 52.6 49.0 ro-Bra	6. 6. 6.
0.100 0.200 0.300 0.400 0.500 0.600 Des The hyd Optimum	2. 2. 1. 1. <u>Hydro</u> Control	0 1. 0 1. 8 1. 7 1. 9 1. -Brake® Minim Sug Points (Calcula Flush- calculat. Fied. Sho	000 200 400 600 800 Optimu Optimu um Outle gested M Hea ated) ∙Flo™ ions hav ould ano	2.4 2.6 2.7 2.9 3.1 D Des In et Pipe fanhole <b>ad (m)</b> 1.20 0.490 e been ther ty	hole: Unit F esign ign Fl C App Sump F Diame Vert I Diame Diame Flow	2.400 2.600 3.000 3.500 Referer Head ( low (1/ lush-F1 Dbjecti plicati Availak eter (n Level ( eter (n (1/s)) 63.5 63.5 i on th contr	nce Mi (m) /s) lo™ ive I ion ble mm) (m) (m) mm) Mean ne Hea col de	3.5 3.7 3.9 4.2 PN: <u>S</u> D-SHE- Minimi Minimi Flow of evice of	ol Po charge	5.000 5.500 5.500 5.500 6000- C strea strea Kick- Head F e rela than	1200- 1 alcul m sto Sur 31 •Flo® Range	5.0 5.2 5.4 5.6 e (m ³ 6000 .200 63.5 ated rage face Yes 315 .400 375 2100 Head 0.	(m) F1 912 - or the	.000 .500 .000 .500 <u>.4</u> Hydr	<b>1/s)</b> 52.6 49.0 ro-Bra	6 6 6 6

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	<u>Hx</u>	/dro-E	<u>Brake® O</u>	otimum	1 Manł	nole:	<u>587, Ds</u>	/PN: 3	51.03	3, V	olume	<u>e (m³</u>	): 1	4.4		
Depth (m)	) Flow	(1/s)	Depth (m	) Flow	(l/s)	Depth	(m) Flow	r (l/s)	Depth	n (m)	Flow	(l/s)	Dep	th (m)	) Flow	/(1/s
0.100		9.5			56.5		000	76.8		1.000		107.6		7.00		141.
0.200		32.3 56.4			54.9 63.5		200 400	80.4 83.9		1.500 5.000		113.9		7.50		146. 150.
0.400		59.5			64.6		400 600	87.2	1	5.500		125.7		8.50		155.
0.500		60.0			68.9		000	93.5		5.000		131.1		9.00		159.
0.600	0	59.5	1.80	0	73.0		500	100.8	1	5.500		136.4		9.50	0	164.
	Hy	<u>dro-B</u>	rake® Op	timum	Manh	ole: S	5117, D	S/PN:	<u>s11.(</u>	004,	Volu	me (r	n³):	5.9		
							ference	MD-SHE-	-0064-	2000-	1200-:	2000				
						2	ead (m)				1	.200				
					Des	2	w (l/s) sh-Flo™			C	alcul	2.0				
							jective	Minim	se in							
							ication		up			face				
					2		ailable					Yes				
							er (mm)					64				
							vel (m)				91	.900				
			Minimum	Outlet	: Pipe	Diamet	er (mm)					100				
			Sugge	sted Ma	nhole	Diamet	er (mm)					1.200				
	Coi	ntrol 1	Sugge Points			Diamet	er (mm) L <b>/s)</b>	Conti	col Po	ints		1200 <b>Head</b>	<b>(m)</b>	Flow	(1/s)	
De			<b>Points</b> Calculate	Head	<b>d (m)</b> 1.200	Flow (]	L <b>/s)</b> 2.0			Kick-	Flo®	Head	(m) 1 573	Flow	1.4	
De			Points	Head	d (m)	Flow (]	L/s)			Kick-	Flo®	Head		Flow		
The hy	esign F drolog	oint ( ical c	<b>Points</b> Calculate	Head d) 1 o™ ( ns have	<b>d (m)</b> 1.200 0.282 been	Flow ()	2.0 1.8 Mea	n Flow ead/Dis	over H charge	Kick- Head H	-Flo® Range ations	<b>Head</b> 0.	573 - or th	пе Нус	1.4 1.6 lro-Bra	ake®
The hy Optimu utilis	drolog m as s ed the	point ( ical c pecifi n these	Points Calculate Flush-Fl alculatio ed. Shou e storage	Head d) 1 o™ ( ns have ld anot routin	<b>d (m)</b> 1.200 0.282 been her ty g calc	Flow () based of ype of of culation	2.0 1.8 Mean on the He control on ms will 1	n Flow ead/Dis device be inva	over H charge other lidate	Kick- Head H e rela than ed	-Flo® Range ations a Hyd	Head 0. Ship f hro-Br	573 - or th ake C	ne Hyd Optimu	1.4 1.6 dro-Bra m® be	
The hy Optimu utilis Depth (m)	drolog m as s ed the ) Flow	coint ( ical ca pecifion these (1/s)	Points Calculate Flush-Fl alculatio ed. Shou e storage	Head d) 1 o™ ( ns have ld anot routin ) Flow	i (m) 1.200 0.282 been her ty g calc (1/s)	Flow (] based of ppe of of culation	L/s) 2.0 1.8 Mean con the Here control of ms will 1 (m) Flow	n Flow ead/Dis device pe inva 7 (1/s)	over H charge other lidate	Kick- Head H e rela than ed (m)	-Flo® Range ations a Hyd	Head 0. Chip f dro-Br (1/s)	573 - or th ake C	he Hyd Dptimu <b>th (m</b> )	1.4 1.6 dro-Bra m® be	r (1/s
The hy Optimu utilis Depth (m) 0.100	esign F drolog m as s ed the ) Flow 0	Point ( ical ca pecifien thes (1/s) 1.5	Points Calculate Flush-Fl alculatio ed. Shou e storage Depth (m 0.80	Head d) 1 o™ ( ns have ld anot routin <b>) Flow</b> 0	<b>d (m)</b> 1.200 0.282 been her ty g calc ( <b>1/s</b> ) 1.7	Flow () based of pe of of culation Depth 2.	L/s) 2.0 1.8 Mean con the Here control of ms will 1 (m) Flow 000	n Flow ead/Dis device pe inva r (1/s) 2.5	over H charge other lidate	Kick- Head H than ed (m)	-Flo® Range ations a Hyd	Head 0. hip f lro-Br (1/s) 3.5	573 or th ake C	ne Hyd Dptimu <b>th (m</b> ) 7.000	1.4 1.6 dro-Bra um® be ) Flow	4.
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The hy Optimu utilis Depth (m) 0.100 0.200 0.300 0.400 0.500	drolog m as s red the ) Flow 0 0 0 0 0 0 0	<pre>Point ( ical c: pecifin n thes     (1/s)     1.5     1.7     1.8     1.7     1.6     1.5</pre>	Points Calculate Flush-Fl alculatio ed. Shou e storage Depth (m 0.80 1.00 1.20 1.40 1.80	Head d) 1 o™ () ns have ld anot routin ) Flow 0 0 0 0 0 0 0 0 0 0 0 0 0	<b>d</b> (m) 1.200 0.282 been her ty g calco (1/s) 1.7 1.8 2.0 2.1 2.3 2.4 <u>Manh</u>	Flow () based of ype of of culation Depth 2. 2. 2. 3. 3. ole: S Unit Re esign H	L/s) 2.0 1.8 Mean control of ms will 1 (m) Flow 000 200 400 600 000 500 5138, D ference ead (m)	n Flow ead/Dis device be inva 2.5 2.6 2.7 2.8 3.0 3.3 5/PN:	over H charge other lidate Depth 4 5 5 6 6 6 6 6 5 17.0	Kick- Head F e relathan ed (m) 1.000 1.500 5.500 5.500 5.500 5.500	-Flo® Range ations a Hyd Flow Volu 1200-:	Head 0. hip f hro-Br (1/s) 3.5 3.7 3.9 4.0 4.2 4.4 me (r 2000 .200	573 or th ake C	th (m) 7.000 7.500 8.000 8.500 9.000 9.500	1.4 1.6 aro-Br; um® be ) Flow	4. 4. 4. 5. 5.
The hy Optimu utilis Depth (m) 0.100 0.200 0.300 0.400 0.500	drolog m as s red the ) Flow 0 0 0 0 0 0 0	<pre>Point ( ical c: pecifin n thes     (1/s)     1.5     1.7     1.8     1.7     1.6     1.5</pre>	Points Calculate Flush-Fl alculatio ed. Shou e storage Depth (m 0.80 1.00 1.20 1.40 1.80	Head d) 1 o™ () ns have ld anot routin ) Flow 0 0 0 0 0 0 0 0 0 0 0 0 0	<b>d</b> (m) 1.200 0.282 been her ty g calco (1/s) 1.7 1.8 2.0 2.1 2.3 2.4 <u>Manh</u>	Flow () based of ype of of culation Depth 2. 2. 2. 3. 3. ole: S Unit Re esign H ign Flo	L/s) 2.0 1.8 Mean control of ms will 1 (m) Flow 000 200 400 600 000 500 5138, D ference ead (m) w (1/s)	n Flow ead/Dis device be inva 2.5 2.6 2.7 2.8 3.0 3.3 5/PN:	over H charge other lidate Depth 4 5 5 6 6 6 6 6 5 17.0	Kick- Head F e relathan ed (m) (.000 (.500 (.500 (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.500) (.	Flo® Ange ations a Hyd Flow <u>Volu</u> 1200-: 1	Head 0. hip f lro-Br (1/s) 3.5 3.7 3.9 4.0 4.2 4.4 <u>me (r</u> 2000 2.3	573 or th ake C	th (m) 7.000 7.500 8.000 8.500 9.000 9.500	1.4 1.6 aro-Br; um® be ) Flow	4. 4. 4. 5. 5.
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The hy Optimu utilis Depth (m) 0.100 0.200 0.300 0.400 0.500	esign F drolog m as s ded the ) Flow 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Point ( ical c pecifin n thes (1/s) 1.5 1.7 1.8 1.7 1.6 1.5 dro-B	Points Calculate Flush-Fl alculatio ed. Shou e storage Depth (m 0.80 1.00 1.20 1.40 1.60 1.80 rake® Op	Head d) 1 o™ () ns have ld anot routin ) Flow 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	d (m) 1.200 0.282 been her tyg g calc (1/s) 1.7 1.8 2.0 2.1 2.3 2.4 Manh Ues: Inv : Pipe anhole	Flow (J based of pe of of culation 2. 2. 2. 2. 3. 3. 0le: S Unit Re esign H ign Flo Ob Appl Sump Av Diamet vert Le Diamet	L/s) 2.0 1.8 Mean on the Here control of ms will 1 (m) Flow 000 200 400 600 000 500 5138, D ference ead (m) w (1/s) sh-Flo™ jective ication ailable er (mm) vel (m) er (mm)	n Flow ead/Dis device be inva 7 (1/s) 2.5 2.6 2.7 2.8 3.0 3.3 S/PN: MD-SHE- Minim:	over F charge other lidate <b>Depth</b> 4 5 5 6 6 6 6 5 5 7.( -0064-	Kick- Head F e rela than ed (m) 1.000 1.500 5.000 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.500 5.5000 5.5000 5.5000 5.5000 5.5000 5.5000 5.5000 5.5000 5.5000 5.50000 5.5000 5.5000 5.5000 5.5000000 5.500000000	Flo® Ange Ations a Hyd Flow Volu 1200-: 1 alcula Sur 68	Head 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	573 or th ake C Dep ⁽¹⁾	th (m) 7.000 7.500 8.000 9.000 9.500 <u>3.5</u>	1.4 1.6 iro-Bra um® be ) Flow 0 0 0 0 0 0 0	4. 4. 4. 5. 5.
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The hy Optimu utilis <b>Depth (m</b> ) 0.100 0.200 0.300 0.400 0.500 0.600	esign F drolog m as s ded the ) Flow 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	roint ( ical c pecifin n thes (1/s) 1.5 1.7 1.8 1.7 1.6 1.5 dro-B	Points Calculate Flush-Fl alculatio ed. Shou e storage Depth (m 0.80 1.00 1.20 1.40 1.60 1.80 rake® Og Minimum Sugge	Head d) 1 o™ () ns have ld anot routin ) Flow 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	<pre>d (m) 1.200 0.282 been her ty g calc (1/s) 1.7 1.8 2.0 2.1 2.3 2.4 Manh U Des: Inv c Pipe anhole d (m)</pre>	Flow (J based of pe of of culation 2. 2. 2. 2. 3. 3. 0le: S Unit Re esign H ign Flo Ob Appl Sump Av Diamet vert Le Diamet	L/s) 2.0 1.8 Mean on the Here control of ms will 1 (m) Flow 000 200 400 600 000 500 5138, D ference ead (m) w (1/s) sh-Flo™ jective ication ailable er (mm) vel (m) er (mm) er (mm)	n Flow ead/Dis device be inva 7 (1/s) 2.5 2.6 2.7 2.8 3.0 3.3 S/PN: MD-SHE- Minim:	over F charge other lidate Depth 2 2 3 5 6 6 6 6 6 7 7 0064- ise up	Kick- Head F e rela than ed (m) .000 .500 .500 .500 .500 .500 .500 .50	Flo® Ange Ations a Hyd Flow Volu 1200-: 1 alcula Sur 68 -Flo®	Head 0. hip f lro-Br (1/s) 3.5 3.7 3.9 4.0 4.2 4.4 me (n 2000 2.3 ated rage face Yes 64 .200 100 1200 Head	573 or th ake C Dep ⁽¹⁾ (m) 1	th (m) 7.000 7.500 8.000 9.000 9.500 <u>3.5</u>	1.4 1.6 dro-Bra um® be ) Flow 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4. 4. 4. 5. 5.

Atkins (Epsom)		Page 4
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:09	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

#### Hydro-Brake® Optimum Manhole: S138, DS/PN: S17.005, Volume (m³): 3.5

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

epth (m)	Flow (1,	/s) Dept	h (m)	Flow	(l/s)	Dept	h (m)	Flow	(l/s)	Depth	(m)	Flow	(1/s)	Dept	h (m)	Flow	(1/s
0.100	-	1.5	0.800		1.7		2.000		2.7	4	.000		3.5		7.000	)	4.
0.200		1.7	1.000		1.8		2.200		2.8	4	.500		3.7		7.500	)	4.
0.300	-	1.8	1.200		2.3		2.400		2.9	5	.000		3.9		8.000	)	4.
0.400	-	1.7	1.400		2.4	: 1	2.600		3.0	5	.500		4.0		8.500	)	5.
0.500		1.6	1.600		2.5		3.000		3.1	6	.000		4.2		9.000	)	5.
0.600	-	1.5	1.800		2.6		3.500		3.3	6	.500		4.4		9.500	)	5.
	Hydro	-Brake@	<u>Opt</u>	timum	Manh	nole:	<u>S196</u>	5, DS	/PN:	<u>s21.0</u>	19,	Volu	me (m	1 ³ ):	8.7		
						Unit H	Refere	ence M	D-SHE-	-0432-1	200-	0700-3	1200				
					D	esign	Head	(m)				0	.700				
					Des	ign Fl	Low (?	l/s)				1:	20.0				
						F	lush-H	Flo™			С	alcula	ated				
						(	Object	tive	Minimi	se ups	trea	m sto:	rage				
						App	plicat	tion				Sur	face				
						Sump A	Availa	able					Yes				
						Diame	eter	(mm)					432				
					In	vert 1	Level	(m)				85	.650				
		Min	imum	Outlet	: Pipe	Diame	eter	(mm)					450				
		S	ugges	ted Ma	anhole	Diame	eter	(mm)					2100				
	Contro	ol Points	5	Head	d (m)	Flow	(l/s)		Contr	col Poi	nts		Head	(m) F	low	(l/s)	
Des	ign Poin	t (Calcu	lated	l) (	0.700		119.6			I	Kick-	-Flo®	Ο.	673	1	17.4	
		Flus	h-Flc	TM (	0.547		119.6	Mean	Flow	over He	ead I	Range		-		78.5	
Optimum	as spec	l calcula ified. S hese sto:	Shoul	d anot	her t	ype of	cont	rol de	evice	other t	chan		-		-		ke®

Depth	(m)	Flow (	1/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	Depth	(m)	Flow	(l/s)	
0.	100		11.5	0.	.800		127.6	2	.000	1	L99.5	4.	000		280.3	7.	000		369.1	
0.	200		41.7	1.	.000		142.2	2	.200	2	209.1	4.	500		297.0	7.	500		376.6	
0.	300		82.1	1.	200		155.5	2	.400	2	218.2	5.	000		312.8	8.	000		389.3	
0.	400	1	16.0	1.	400		167.6	2	.600	2	226.9	5.	500		327.8	8.	500		401.6	
0.	500	1	19.2	1.	.600		178.9	3	.000	2	243.4	6.	000		342.1	9.	000		413.6	
0.	600	1	19.2	1.	.800		189.5	3	.500	2	262.5	6.	500		355.9	9.	500		425.2	
			'																	

Hydro-Brake® Optimum Manhole: S199, DS/PN: S21.022, Volume (m³): 5.4

Unit Reference	MD-SHE-0393-9600-0700-9600
Design Head (m)	0.700
Design Flow (l/s)	96.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	393
Invert Level (m)	83.300
Minimum Outlet Pipe Diameter (mm)	450
Suggested Manhole Diameter (mm)	2100

Atkins (	Epson	n)											Pa	age 5	
Woodcost						Fass	aroe	e Housi	na I	Dev.				- 5	
Ashley R	load,	Epsoi	m						ر						
Surrey,		-				Co.	Wic	klow.						Micco	
Date 05/			1:09				-	d by N.	Ran	va				Micro	
,	- / -			el 0	2.04.2		-	by G.H	-	-				Drain	age
Innovyze		arma	90 1104	<u></u>				2019.1		accy					
11110 1 9 2 0						Neew	OIN	2019.1							
	Hyc	dro-B	rake®	Opti	mum Manh	ole: S1	.99,	DS/PN:	S2	1.022	, Voli	ume (n	n³): 5.	4	
	Con	trol 1	Points		Head (m)	Flow (l/	s)	Cont	trol	Point	s	Head	(m) Flow	v (l/s)	
Des	sign Po	oint (	Calcula Flush-		0.700 0.505		.9 .8 M	lean Flow	ove		ck-Flo® d Range		656 -	92.9 65.4	
Optimum	as sp	ecifi	ed. Sh	ould	have been another ty uting calc	pe of co	ontro	l device	oth	er th					
Depth (m)	Flow	(l/s)	Depth	(m) F	[low (l/s)	Depth (	m) F	low (l/s	) De	pth (	n) Flow	7 (l/s)	Depth	(m) Flo	w (l/s)
0.100		10.9	0.	800	102.3	2.0	00	159.	9	4.0	00	224.5	7.0	000	295.6
0.200		38.9		000	114.1			167.		4.5	00	237.9		500	302.0
0.300		74.7	1.	200	124.6	2.4	00	174.	8	5.0	00	250.5	8.0	000	312.1
0.400		94.2	1.	400	134.4	2.6	00	181.	8	5.5	00	262.5	8.5	500	322.0
0.500		95.8		600	143.4	3.0		195.		6.0		274.0		000	331.5
0.600		94.6	1.	800	151.9	3.5	00	210.	3	6.5	00	285.0	9.5	500	340.8
	<u>Hyd</u>	<u>ro-Br</u>	ake® (	<u>Optin</u>	num Manho	ole: S2	48,	DS/PN:	S31	.011	, Volu	ıme (m	³ ): 13.	. 2	
					τ	Jnit Ref	erend	ce MD-SHI	E-00	64-200	0-1200.	-2000			
					De	esign He	ad (n	n)				1.200			
					Desi	ign Flow						2.0			
						Flus					Calcu				
						-		ve Minir	nise	upstr		-			
						Appli					Su	rface 			
					2	Sump Ava Diamete						Yes 64			
					Tn	vert Lev	`	,			8.	7.764			
			Minim	111m O11	utlet Pipe			,			0	100			
					ed Manhole							1200			
	Con	trol 1	Points		Head (m)	Flow (l/	s)	Cont	trol	Point	s	Head	(m) Flow	v (l/s)	
Des	sign Po	oint (	Calcula	ted)	1.200	2				Ki	ck-Flo®	0.	573	1.4	
			Flush-	Flo™	0.282	1	.8 M	lean Flow	ove	er Hea	d Range		-	1.6	
Optimum	as sp	ecifi	ed. Sh	ould	have been another ty uting calc	pe of co	ontro	l device	oth	er th		-		-	
Depth (m)	Flow	(1/s)	Depth	(m) F	flow (l/s)	Depth (	m) F	low (l/s	) De	pth (1	n) Flow	7 (l/s)	Depth	(m) Flo	w (l/s)
0.100		1.5	0.	800	1.7	2.0	00	2.	5	4.0	00	3.5	7.0	000	4.5
0.200		1.7		000	1.8	2.2	00	2.	6	4.5		3.7	7.5	500	4.7
0.300		1.8		200	2.0	2.4		2.		5.0		3.9	8.0	000	4.8
0.400		1.7	1.	400	2.1	2.6	00	2.	8	5.5	00	4.0	8.5	500	5.0
0.500		1.6	1.	600	2.3	3.0	00	3.	0	6.0	00	4.2	9.0	000	5.1
0.600		1.5	1.	800	2.4	3.5	00	3.	3	6.5	00	4.4	9.5	500	5.2
	<u>Hyd</u>	ro-Br	ake® (	Optin	num Manho	ole: S2	54,	DS/PN:	S28	3.006	, Volu	ıme (m	³ ): 14.	. 2	
					Unit Refe	erence M	D-SHI	E-0073-20	00-	0600-2	000				
					Design Hea			20,0 20			600				
					esign Flow						2.0				
					-	n-Flo™			C	alcula					
					Obje	ective	Minir	mise upst							
					Applic	cation				Surf	ace				
					Sump Avai						Yes				
					Diameter	c (mm)					73				
					C	01982-2	019	Innovyz	ze						
								-							

Atkins (Eps	som)							Page 6			
loodcoste (	Grove			Fassaroe	Housing	Dev.					
Ashley Road	d, Epsom										
Surrey, Ki	- 518 5BW			Co. Wick	Mico						
Date 05/04/		• 0 9		Designed	— Micr						
ile Storm			2 0 4 2	Checked	-	-		Drai	nage		
	Draillage	e Model_0.	2.04.2			Lally					
Innovyze				Network	2019.1						
н	vdro-Bra	ke® Ontim	uum Manhol	e: S254, I	19/PN • 92	28 006 Vo	lumo (m ³ )	• 14 2			
<u>-11</u>	yuro bie	ikee optin		e. 5254, 1	55/IN. 52	.0.000, 00		/ • 11.2			
				Inver	Level (m	) 85.150					
				let Pipe Dia Manhole Dia							
c	Control Po	oints	Head (m) F	Low (l/s)	Contro	l Points	Head (n	n) Flow (l/s	;)		
Design	Point (C	alculated)	0.600	2.0		Kick-Fl	Lo® 0.39	97 1.	7		
		Flush-Flo™	0.177		an Flow ou	ver Head Rar		- 1.			
-	-					-	-	the Hydro-			
							Hydro-Brak	e Optimum® 1	be		
utilised th	hen these	storage ro	uting calcu	lations will	be invali	dated					
epth (m) Flo	ow (l/s)  I	Depth (m) F	low (l/s)   [	epth (m) Fl	ow (1/s) I	epth (m) Fl	low (l/s)  I	Depth (m) Fl	Low (1/s		
0 100	1.9	0 000	0.0	2 . 0 . 0 .	2 5	4 000	4 0	7 000	C		
0.100 0.200	2.0	0.800 1.000	2.3	2.000 2.200	3.5 3.6	4.000 4.500	4.8 5.1	7.000 7.500	6. 6.		
0.300	1.9	1.200	2.3	2.200	3.8	5.000	5.3	8.000	0. 6.		
0.400	1.7	1.200	2.9	2.600	3.9	5.500	5.6	8.500	0. 6.		
0.500	1.8	1.600	3.1	3.000	4.2	6.000	5.8	9.000	7.		
0.600	2.0	1.800	3.3	3.500	4.5	6.500	6.0	9.500	7.		
	I		I		I		I				
<u>H</u>	Hydro-Br	<u>ake® Opti</u>	mum Manho	le: S291,	DS/PN: S	36.008, Vo	olume (m³	): 5.2			
			Un	it Reference	MD-SHE-0	064-2000-12	00-2000				
				ign Head (m)		001 2000 12	1.200				
				n Flow (l/s			2.0				
			2	Flush-Flo	м	Cal	culated				
				Objective	e Minimis	e upstream	storage				
				Application	ı		Surface				
				mp Available			Yes				
				iameter (mm)			64				
				rt Level (m			93.100				
			-	iameter (mm)			100 1200				
		buggebee		ranceer (num			1200				
C	Control Po	oints	Head (m) F	Low (1/s)	Contro	l Points	Head (n	n) Flow (l/s	;)		
Design	Point (C	alculated)	1.200	2.0		Kick-Fl	Lo® 0.57	73 1.	4		
		Flush-Flo™	0.282	1.8 Me	an Flow ov	ver Head Rar	nge	- 1.	6		
					• / •						
-	-					-	-	the Hydro-1			
-	-						нуаго-Brak	e Optimum® 1	bé		
utilised th	nen these	storage ro	uting calcu	lations will	pe invali	laated					
epth (m) Flo	ow (l/s)  I	Depth (m) F	low (l/s)  I	epth (m) Fl	ow (l/s) [	epth (m) Fl	low (l/s)  I	Depth (m) Fl	Low (l/s		
0.100	1.5	0.800		2.000	2.5	4.000	3.5	7.000	4.		
	1.J	0.000	1.7	2.000	2.0	4.000	3.5	/.000	4.		

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Hydro-Brake® Optimum Manhole: S299, DS/PN: S39.004, Volume (m³): 5.9

Unit Reference MD-SHE-0064-2000-1200-2000

2.200

2.400

2.600

3.000

3.500

2.6

2.7

2.8

3.0

3.3

4.500

5.000

5.500

6.000

6.500

1.200

2.0

Calculated

3.7

3.9

4.0

4.2

4.4

7.500

8.000

8.500

9.000

9.500

4.7

4.8

5.0

5.1

5.2

0.200

0.300

0.400

0.500

0.600

1.7

1.8

1.7

1.6

1.5

1.000

1.200

1.400

1.600

1.800

1.8

2.0

2.1

2.3

2.4

Design Head (m)

Flush-Flo™

Design Flow (l/s)

Atkins (Epsom)		Page 7
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:09	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	1

#### Hydro-Brake® Optimum Manhole: S299, DS/PN: S39.004, Volume (m³): 5.9

	Objective	Minimise	upstream storage
	Application		Surface
	Sump Available		Yes
	Diameter (mm)		64
	Invert Level (m)		94.800
Minimum Ou	tlet Pipe Diameter (mm)		100
Suggeste	d Manhole Diameter (mm)		1200

Control	Points	Head (m)	Flow (1/s)	Control Points	Head (m) Flow (1/s)
Design Point	(Calculated) Flush-Flo™		2.0 1.8	Kick-Flo® Mean Flow over Head Range	0.573 1.4 - 1.6

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)						
0.10	)	1.5	0.800	1.7	2.000	2.5	4.000	3.5	7.000	4.5
0.200		1.7	1.000	1.8		2.6		3.7	7.500	4.7
0.30	)	1.8	1.200	2.0	2.400	2.7	5.000	3.9	8.000	4.8
0.400	)	1.7	1.400	2.1	2.600	2.8	5.500	4.0	8.500	5.0
0.50	)	1.6	1.600	2.3	3.000	3.0	6.000	4.2	9.000	5.1
0.60	)	1.5	1.800	2.4	3.500	3.3	6.500	4.4	9.500	5.2



## Appendix H. Summary of Results

### H.1. Results Status Description

OK when the maximum water level is lower than the pipe's soffit.

SURCHARGED when the maximum water level is above the pipe's soffit and to within 300mm of the manhole cover level. (Allowable for 1 in 30 year storm events and greater in accordance with the GDSDS, refer to table 2-1)

FLOOD RISK when the maximum water level is above the pipe's soffit but below the manhole cover by the depth specified in the Preferences.

FLOOD when the maximum water level is above the manhole cover (No Flooding has been indicated within Summary of Results for up to the 1 in 100 year storm event)



## H.2. 1 in 100-year Outputs

Woodcost Ashley F		1)								Pa	age 1
Ashlev F		-				Fassaroe	Housing	Dev.			
-		-	n								
Surrey,			1 4 0			Co. Wickl	••				Micro
Date 05/	- , -			1 7 66	04 0	Designed 1	-	-			Drainage
File Sto		ainag	ge Mo	ae⊥_02	.04.2			atty			
Innovyze	2					Network 2	JTA'T				
		Summa	ry of	Criti	ical Re	sults by Maxi	.mum Leve	el (Rank	<u>1) for S</u>	Storm	
	ber of	Foul S Input	Hot Headlo Sewage Hydro	Hot St Start Dss Coef per hec Dgraphs	cart (min Level (r Ef (Globa ctare (l, 0 Nun	Simulation Cr tor 1.000 Add ns) 0 nm) 0 al) 0.500 Flow /s) 0.000 mber of Offline er of Storage S	itional F. MADD Fact per Person Controls	tor * 10m³ Inlet C n per Day 0 Number	/ha Storac peffiecier (l/per/day of Time/ <i>l</i>	ge 3.000 nt 0.800 y) 0.000 Area Dia	grams O
					Sy	nthetic Rainfal	l Details				
			F	Rainfall	L Model		FSR	Ratio R 0			
As p	er N	let			Region : 50 (mm)	Scotland and Ir		(Summer) 0 (Winter) 0			
Eirea		- •		10-0	55 (IIIII)	<b>&gt;</b>		("TULCET) 0	.0-0		
			Marg	gin for		isk Warning (mm)		DVD Sta			
Infor	mati	ion			Ar	nalysis Timester DTS Statu:		nertia Sta	tus OFF		
			-								o 6 hou
					Pro	ofile(s)	Sur	mmer and W	inter . 🦟		nt as
				Dui		) (mins) 15, 30					
								, 100, 210	, 500		<u>nnnn</u>
			Re		eriod(s) imate Cha	-		, 100, 110	100	per	GDSDS
			Re		eriod(s) imate Cha	-		, 100, 110		per	GDSDS
			Re			-		, 100, 110	100	u	
	US/MH			Cl:		ange (%)		First (Z)	100 20	Water	Surcharged Depth
PN	US/MH Name	Sto		Cl:	imate Cha	ange (%)			100 20	Water	Surcharged
<b>PN</b> S1.000	•			Cl:	imate Cha Climate	ange (%) First (X)	First (Y)	First (Z)	100 20 Overflow	Water Level	Surcharged Depth
S1.000 S1.001	Name S1 S2	15 W 15 W	orm inter inter	Cl: Return Period 100 100	imate Cha Climate Change +20% +20%	ange (%) First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041	Surcharged Depth (m) -0.124 -0.074
s1.000 s1.001 s1.002	Name S1 S2 S3	15 W 15 W 15 W	orm inter inter inter	Cl: Return Period 100 100 100	imate Cha Climate Change +20% +20% +20%	<pre>ange (%) First (X) Surcharge 100/15 Summer</pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233	Surcharged Depth (m) -0.124 -0.074 1.367
S1.000 S1.001 S1.002 S1.003	Name \$1 \$2 \$3 \$4	15 W 15 W 15 W 15 W	orm inter inter inter inter inter	Cl: Return Period 100 100 100	imate Cha Climate Change +20% +20% +20% +20%	<pre>ange (%) First (X) Surcharge 100/15 Summer 100/15 Summer</pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776	Surcharged Depth (m) -0.124 -0.074 1.367 0.522
S1.000 S1.001 S1.002 S1.003 S1.004	Name \$1 \$2 \$3 \$4 \$5	15 W 15 W 15 W 15 W 15 W	orm inter inter inter inter inter inter	Cl: Return Period 100 100 100 100	imate Cha Climate Change +20% +20% +20% +20% +20%	<pre>ange (%) First (X) Surcharge 100/15 Summer</pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705
s1.000 s1.001 s1.002 s1.003 s1.004 s2.000	Name \$1 \$2 \$3 \$4 \$5 \$6	15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100	imate Char Climate Change +20% +20% +20% +20% +20%	<pre>ange (%)  First (X) Surcharge  100/15 Summer 100/15 Summer 100/15 Summer</pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7	15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20%	<pre>ange (%)  First (X) Surcharge  100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer</pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	<pre>ange (%)  First (X) Surcharge  100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer</pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 100 100	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	<pre>ange (%)  First (X) Surcharge  100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer 100/15 Summer</pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	<pre>ange (%)  First (X) Surcharge  100/15 Summer /pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	<pre>First (%) First (X) Surcharge 100/15 Summer /pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	<pre>First (%) First (X) Surcharge 100/15 Summer /pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +	<pre>First (%) First (X) Surcharge 100/15 Summer /pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +	<pre>First (%) First (X) Surcharge 100/15 Summer /pre>	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14 \$15 \$16	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14 \$15	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144 77.115	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024 0.483
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14 \$15 \$16 \$17	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	orm inter inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14 \$15 \$16 \$17 \$18	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	orm inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144 77.115 76.500	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024 0.483 0.075
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14 \$15 \$16 \$17 \$18 \$19	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144 77.115 76.500 75.887	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024 0.483 0.124 1.024 0.483 0.755 -0.076
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14 \$15 \$16 \$17 \$18 \$19 \$20	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144 77.115 76.500 75.887 75.402	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024 0.403 0.124 1.024 0.483 0.755 -0.076 0.267
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004 \$5.005	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14 \$15 \$16 \$17 \$18 \$19 \$20 \$21	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	orm inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144 77.115 76.500 75.887 75.402 74.708	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024 0.403 0.124 1.024 0.483 0.075 -0.076 0.267 0.524
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004 \$5.005 \$5.006	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144 77.115 76.500 75.887 75.402 74.708 73.825	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024 0.403 0.124 1.024 0.483 0.075 -0.076 0.267 0.524 0.721
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004 \$5.005 \$5.006 \$5.007	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144 77.115 76.500 75.887 75.402 74.708 73.825 73.337	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024 0.403 0.124 1.024 0.483 0.075 -0.076 0.267 0.524 0.721 1.286
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004 \$5.005 \$5.006 \$5.007 \$5.008	Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S25 S25 S3 S4 S5 S5 S5 S5 S5 S5 S5 S5 S5 S5	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144 77.115 76.500 75.887 75.402 74.708 73.825 73.337 72.888	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024 0.403 0.124 1.024 0.483 0.075 -0.076 0.267 0.524 0.721 1.286 1.113
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004 \$5.005 \$5.006 \$5.007 \$5.008 \$2.006	Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S25 S25 S3 S4 S5 S5 S5 S5 S5 S5 S5 S5 S5 S5	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144 77.115 76.500 75.887 75.402 74.708 73.825 73.337 72.888 72.505	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024 0.403 0.124 1.024 0.483 0.075 -0.076 0.267 0.524 0.721 1.286 1.113 0.807
\$1.000         \$1.001         \$1.002         \$1.003         \$1.004         \$2.000         \$3.001         \$3.002         \$2.001         \$2.002         \$2.003         \$4.000         \$2.004         \$2.005         \$5.001         \$5.002         \$5.003         \$5.004         \$5.005         \$5.006         \$5.007         \$5.008         \$2.006	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$25 \$26 \$17 \$18 \$19 \$10 \$11 \$12 \$13 \$14 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$12 \$13 \$14 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$12 \$13 \$14 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$21 \$12 \$13 \$14 \$15 \$26 \$27 \$18 \$29 \$20 \$21 \$21 \$21 \$20 \$20 \$21 \$20 \$20 \$20 \$21 \$20 \$20 \$21 \$20 \$20 \$20 \$21 \$20 \$20 \$21 \$22 \$23 \$24 \$25 \$26 \$27 \$28 \$29 \$20 \$20 \$21 \$22 \$23 \$22 \$22 \$23 \$24 \$25 \$26 \$27 \$28 \$29 \$20 \$20 \$21 \$22 \$23 \$22 \$22 \$23 \$24 \$25 \$26 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$26 \$27 \$26 \$27 \$26 \$26 \$27 \$26 \$26 \$26 \$26 \$26 \$26 \$26 \$26	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144 77.115 76.500 75.887 75.402 74.708 73.825 73.337 72.888 72.505 72.391	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024 0.403 0.124 1.024 0.403 0.124 1.024 0.483 0.075 -0.076 0.267 0.524 0.721 1.286 1.113 0.807 0.816
S1.000 S1.001 S1.002 S1.003 S1.004 S2.000 S3.000 S3.001 S3.002 S2.001 S2.002 S2.003 S4.000 S2.004 S2.004 S2.005 S5.000 S5.001 S5.002 S5.003 S5.004 S5.005 S5.006 S5.007 S5.008 S2.006 S2.007 S2.008	Name \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 \$9 \$10 \$11 \$12 \$13 \$14 \$15 \$16 \$17 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$25 \$26 \$27 \$18 \$19 \$20 \$21 \$22 \$23 \$24 \$25 \$26 \$27 \$28 \$29 \$20 \$21 \$21 \$22 \$23 \$24 \$25 \$26 \$27 \$28 \$29 \$20 \$21 \$21 \$22 \$23 \$24 \$25 \$26 \$27 \$28 \$29 \$20 \$21 \$21 \$22 \$23 \$24 \$25 \$26 \$27 \$28 \$29 \$20 \$21 \$22 \$23 \$24 \$25 \$26 \$27 \$28 \$29 \$20 \$21 \$22 \$23 \$24 \$25 \$26 \$27 \$28 \$29 \$20 \$20 \$21 \$22 \$23 \$22 \$22 \$22 \$23 \$24 \$25 \$26 \$27 \$28 \$29 \$20 \$20 \$21 \$22 \$23 \$24 \$25 \$26 \$27 \$28 \$29 \$20 \$21 \$22 \$22 \$23 \$24 \$25 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$27 \$26 \$26 \$27 \$26 \$27 \$27 \$27 \$27 \$27 \$26 \$27 \$27 \$27 \$27 \$27 \$27 \$27 \$27	15 W 15 W 15 W 15 W 15 W 15 W 15 W 15 W	inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter inter	Cl: Return Period 100 100 100 100 100 100 100 10	imate Char Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	First (X) Surcharge	First (Y)	First (Z)	100 20 Overflow	Water Level (m) 84.311 83.041 81.233 75.776 73.469 79.351 79.933 79.409 79.133 79.067 74.759 74.268 76.724 74.005 73.611 78.144 77.115 76.500 75.887 75.402 74.708 73.825 73.337 72.888 72.505 72.391 71.692	Surcharged Depth (m) -0.124 -0.074 1.367 0.522 0.705 -0.115 0.406 0.251 0.182 1.992 0.096 0.350 1.224 0.403 0.124 1.024 0.403 0.124 1.024 0.403 0.124 1.024 0.483 0.075 -0.076 0.267 0.524 0.721 1.286 1.113 0.807 0.816 0.567

Atkins (Epsom)		Page 2
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	Flooded Volume (m ³ )	Flow / Cap.	Overflow (1/s)	Pipe Flow (1/s)	Status	Level Exceeded
			-				
S1.000	S1	0.000	0.42		38.4	OK	
S1.001	S2	0.000	0.82		169.0	OK	
S1.002	S3	0.000	1.19		243.7	FLOOD RISK	
S1.003	S4	0.000	1.01		305.0	SURCHARGED	
S1.004	S5	0.000	1.23		362.9	SURCHARGED	
S2.000	S6	0.000	0.70		108.0	OK	
S3.000	S7	0.000	1.22		67.7	SURCHARGED	
S3.001	S8	0.000	1.16		72.9	SURCHARGED	
S3.002	S9	0.000	1.13		84.2	SURCHARGED	
S2.001	S10	0.000	0.36		29.2	SURCHARGED	
S2.002	S11	0.000	0.82		131.2	SURCHARGED	
S2.003	S12	0.000	1.22		130.5	SURCHARGED	
S4.000	S13	0.000	1.26		99.4	FLOOD RISK	
S2.004	S14	0.000	1.83		243.1	SURCHARGED	
S2.005	S15	0.000	1.25		243.9	SURCHARGED	
S5.000	S16	0.000	1.57		85.3	FLOOD RISK	
S5.001	S17	0.000	1.72		105.0	SURCHARGED	
S5.002	S18	0.000	1.08		130.4	SURCHARGED	
S5.003	S19	0.000	0.83		149.0	OK	
S5.004	S20	0.000	0.88		162.5	SURCHARGED	
S5.005	S21	0.000	0.91		173.8	SURCHARGED	
S5.006	S22	0.000	0.71		210.5	SURCHARGED	
S5.007	S23	0.000	1.28		222.6	FLOOD RISK	
S5.008	S24	0.000	1.61		208.6	SURCHARGED	
S2.006	S25	0.000	3.05		465.4	SURCHARGED	
S2.007	S26	0.000	0.57		84.5	SURCHARGED	
S2.008	S27	0.000	1.72		97.8	SURCHARGED	
S2.009	S28	0.000	1.00		104.6	SURCHARGED	
S2.010	S29	0.000	1.05		110.8	SURCHARGED	
S2.011	S30	0.000	1.04		142.6	SURCHARGED	

Atkins (Epsom)		Page 3
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	s	torm		Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S2.012	S31	30	Winter	100	+2.0%	100/15 Summer				71.510
S1.005	S32		Winter	100		100/15 Summer				71.480
S1.006	S33		Winter	100		100/15 Summer				71.202
S1.007	S34		Winter	100		100/15 Summer				70.912
S1.008	S35		Winter	100		100/15 Summer				70.613
s1.009	S36		Winter	100		100/15 Summer				69.724
S1.010	S37		Winter	100		100/15 Summer				68.889
s6.000	S38	15	Winter	100		100/15 Summer				77.644
S6.001		360	Winter	100	⁺ Fu	ture Phas	e			75.094
S6.002			Winter	100			<b>`</b>			72.250
S6.003			Winter	100	+20%					69.114
S1.011	S42		Winter	100	+20% +20%					68.508
S1.012	S43		Winter	100						67.064
S1.013	S44		Winter Winter	100 100	+20% +20%					65.024 63.105
S1.014	S45				+20%					
S1.015	S46		Winter	100						61.128
S1.016 S1.017	S47 S48		Winter Winter	100 100	+20% +20%					57.914 54.971
S1.017 S1.018	548 S49		Winter	100	+20%					54.971
S1.018 S1.019	S49 S50		Winter	100	+20%					49.732
S1.019 S1.020	S50 S51		Winter	100		100/15 Summer				49.732
S1.020 S1.021	S51		Winter	100		100/15 Summer				49.922
S1.021 S1.022	S52		Winter	100		100/15 Summer				40.992
S1.022 S1.023	S53		Winter	100		100/15 Summer				41.310
S1.023	S54 S55		Winter	100		100/15 Summer				38.662
S7.000	S56		Winter	100	+20%	100/15 Summer				68.684
S7.000	S50		Summer	100	+20%					67.997
S7.001	S58		Summer	100	+20%					67.666
S7.002	S50		Summer	100	+20%					66.868
s7.003	S60		Winter	100	+20%					65.457
S7.005	S61		Winter	100	+20%					64.258
S8.000	S62		Winter	100		100/15 Summer				65.226
S8.001	S63		Winter	100		100/15 Summer				65.229
S8.002	S64		Winter	100		100/15 Summer				64.587
S7.006	S65		Winter	100		100/15 Summer				62.046
S7.007	S66		Winter	100		100/15 Summer				60.824
S7.008	S67		Winter	100		100/15 Summer				59.281
s7.009	S68		Winter	100		100/15 Summer				57.945
s7.010	S69		Winter	100		100/15 Summer				52.003
S7.011	S70		Winter	100		100/15 Summer				49.846
s7.012	S71	15	Winter	100	+20%	100/15 Summer				48.531
S7.013	S72		Winter	100		100/15 Summer				47.194
S7.014	S73		Winter	100		100/15 Summer				46.507
S9.000	S74		Winter	100	+20%					49.472
s7.015	s75		Winter	100		100/15 Summer				44.362
S10.000	S76		Winter	100	+20%					45.412
S7.016	S77		Winter	100		100/15 Summer				40.782
S7.017	S78		Winter	100		100/15 Summer				38.922
S1.025	s79		Winter	100		100/15 Summer				37.892
S1.026	S80		Winter	100		100/15 Summer				36.948
S1.027	S81		Winter	100		100/15 Summer				36.008
S1.028	S82		Winter	100		100/15 Summer				35.377
S1.029	S83		Winter	100		100/15 Summer				34.746
S1.030	S84		Winter	100		100/15 Summer				34.115
S1.031	S85		Winter	100		100/15 Summer				33.484
S1.032			Winter	100		100/15 Summer				33.087
					©198	32-2019 Innov	vyze			

Atkins (Eps	om)									Page 4
loodcoste G	rove			Fa	ssaroe	Housing	Dev.			
shley Road										
-	18 5BW				. Wick					Micro
ate 05/04/	2022 11:	:12		De	signed	by N.Ra	nya			Drainac
'ile Storm	Drainage	e Mode	1_02.04.2	Ch	lecked	by G.Har	ratty			
Innovyze				Ne	twork	2019.1			•	
	<u>Summar</u>		Critical F Surcharged		by Ma	<u>ximum Le</u>	vel (R Pipe	ank 1) fo	<u>r Storm</u>	
		US/MH	Depth		Flow /	Overflow	-		Level	
	PN	Name	(m)	(m³)	Cap.	(1/s)	(l/s)	Status	Exceeded	L
	02 012	0.21	1 005	0 000	1 05		164 0			
	S2.012 S1.005	S31 S32	1.235	0.000	1.25 3.02			SURCHARGED SURCHARGED		
	S1.005	S33	1.449	0.000	1.67			SURCHARGED		
	S1.007		1.419	0.000	1.69			SURCHARGED		
	S1.008	S35	1.246	0.000	1.64		443.9	SURCHARGED		
	S1.009		0.682	0.000	1.37			SURCHARGED		
	S1.010	S37	0.296	0.000	1.91			SURCHARGED		
	S6.000 S6.001	S38 S39	1.159	0.000	2.97			SURCHARGED		
	S6.001	S40	-0.278	Fut	ure P	hase	2.6	OK		
	S6.003		-0.274	0.000	0.02		2.6	OK		
	S1.011	S42	0.000	0.000	1.02		473.4	OK		
	S1.012	S43	-0.254	0.000	0.70		483.1	OK		
	S1.013 S1.014	S44 S45	-0.256 -0.267	0.000	0.70 0.67		496.3 510.2	OK OK		
	S1.014 S1.015	54J S46	-0.231	0.000	0.07		524.0	OK		
	S1.016	S47	-0.273	0.000	0.66		554.1	OK		
	S1.017	S48	-0.194	0.000	0.84		565.5	OK		
	S1.018	S49	-0.152	0.000	0.95		575.4	OK		
	S1.019		-0.304	0.000	0.55		602.7	OK		
	S1.020 S1.021		0.297 0.267	0.000	1.03 1.65			SURCHARGED SURCHARGED		
	S1.021	S53	0.210	0.000	1.41			SURCHARGED		
	S1.023	S54	0.158	0.000	1.28			SURCHARGED		
	S1.024			0.000			1099.8	SURCHARGED		
	S7.000	S56	-0.188	0.000	0.07		5.5	OK		
	S7.001 S7.002	S57 S58	-0.168 -0.155	0.000 0.000	0.14 0.21		8.3 10.3	OK OK		
	S7.002 S7.003	S58 S59	-0.155	0.000	0.21		10.3	OK		
	S7.004	S60	-0.132	0.000	0.36		31.2	OK		
	S7.005	S61	-0.054	0.000	0.93		80.7	OK		
	S8.000	S62	1.137	0.000	0.17			FLOOD RISK		
	S8.001	S63	1.260	0.000	1.14			FLOOD RISK FLOOD RISK		
	S8.002 S7.006	S64 S65	1.176 0.348	0.000	2.07 1.23			SURCHARGED		
	S7.007	S66	1.261	0.000	1.67			SURCHARGED		
	S7.008	S67	1.425	0.000	1.73		404.8	SURCHARGED		
	S7.009	S68	1.121	0.000	2.24			SURCHARGED		
	S7.010	S69	1.011	0.000	1.96			SURCHARGED		
	S7.011 S7.012	S70 S71	1.909 2.653	0.000	2.80 3.07			SURCHARGED SURCHARGED		
	s7.012	s71	1.534	0.000				FLOOD RISK		
	S7.014	S73	0.916	0.000	3.52		451.5	SURCHARGED		
	S9.000	S74	-0.128	0.000	0.39		43.6			
	S7.015	<mark>S75</mark> S76	0.575 -0.122	0.000	1.43			SURCHARGED		
	\$10.000 \$7.016	S76 S77	-0.122	0.000	0.43 1.41		43.6	OK SURCHARGED		
	\$7.010 \$7.017	S78	0.547	0.000	1.41			SURCHARGED		
	S1.025	S79	1.815	0.000	2.02			SURCHARGED		
	S1.026	S80	2.998	0.000	2.03			FLOOD RISK		
	S1.027	S81	2.424	8.099	1.96			FLOOD	1	
	S1.028	S82	2.283	0.000				FLOOD RISK		
	S1.029 S1.030	S83 S84	1.744 1.277	0.000	1.96 1.58			FLOOD RISK SURCHARGED		
	S1.030	S85	0.899	0.000	1.81			SURCHARGED		

Atkins (Epsom)		Page 5
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diginarye
Innovyze	Network 2019.1	

PN	US/MH Name	Surcharged Depth (m)			Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.032	S86	0.695	0.000	0.72		551.5	SURCHARGED	

Atkins (Epsom)		Page 6
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	Storm		Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
s1.033	S87	360 Winter	100	+20%	100/15 Summer				33.081	1.306
S1.034	S88	360 Winter	100	+20%					25.046	-0.171
S1.035	S89	360 Winter	100	+20%					24.108	-0.170
S1.036	S90	360 Winter	100	+20%					22.938	-0.170
\$11.000	S92	15 Winter	100		100/15 Summer				95.753	
\$12.000 \$12.001	S93 <mark>S94</mark>	15 Winter 15 Winter	100 100	+20%	100/15 Summer				98.772 98.541	-0.028 0.741
\$12.001 \$13.000	S94 S95	15 Winter	100	+20%	100/15 Summer				101.484	-0.106
S13.000	S95	15 Winter	100		100/15 Summer				100.154	1.707
s13.002	S97	15 Winter	100		100/15 Summer				98.311	0.969
S12.002	S98	15 Winter	100		100/15 Summer				98.071	1.323
S14.000	S99	15 Winter	100	+20%	100/15 Summer				97.338	0.645
S12.003	S100	15 Winter	100		100/15 Summer				97.021	0.751
S12.004	S101	15 Winter	100		100/15 Summer				96.080	1.478
S11.001	S102	15 Winter	100	+20%	Future P	hase			95.547	1.169
\$15.000 \$15.001	S103 S104	15 Winter 15 Winter	100 100	+20% +20%	100/15 Summer	1000			97.945 96.983	0.369 0.583
S15.001 S15.002	S104 S105	15 Winter 15 Winter	100		100/15 Summer 100/15 Summer				96.983	0.358
S15.002	S105	15 Winter	100	+20%	100,10 Dunmer				95.765	-0.035
S15.004	S107	15 Winter	100		100/15 Summer				95.505	0.144
S15.005	S108	15 Winter	100	+20%	100/15 Summer				95.142	0.273
S15.006	S109	15 Winter	100	+20%	100/15 Summer				94.523	0.392
S11.002	S110	15 Winter	100		100/15 Summer				93.852	0.601
S16.000	S111	15 Winter	100		100/15 Summer				96.987	0.313
S16.001	S112	15 Winter	100		100/15 Summer				96.383	0.277
S16.002 S16.003	S113 S114	15 Winter 15 Winter	100 100		100/15 Summer 100/15 Summer				95.186 94.446	0.401 0.672
S16.003	S114 S115	15 Winter 15 Winter	100		100/15 Summer				94.440	0.394
S11.003		360 Winter	100		100/15 Summer				93.247	
S11.004		360 Winter	100		100/15 Summer				93.247	1.122
S11.005	S118	360 Winter	100	+20%					91.180	-0.195
S17.000	S120	15 Winter	100		100/15 Summer				77.984	0.105
S18.000	S121	15 Winter	100	+20%					84.214	-0.091
S18.001	S122	15 Winter	100		100/15 Summer				83.273	0.167
S18.002	S123	15 Winter 15 Winter	100		100/15 Summer				82.619	1.644
\$18.003 \$18.004	S124 S125	15 Winter 15 Winter	100 100		100/15 Summer 100/15 Summer				80.106 78.503	0.715 0.165
S17.001	S125 S126	15 Winter	100		100/15 Summer				77.597	0.438
\$17.002	S120	15 Winter	100		100/15 Summer				71.128	0.349
		15 Winter	100	+20%					75.829	
S19.001		15 Summer	100	+20%					75.643	-0.084
S19.002		15 Winter	100		100/15 Winter				75.586	0.014
S20.000	S131	15 Winter	100	+20%	Euturo D	2220			76.544	0.744
S20.001	S132	15 Winter	100		Future Pl	เลวษ			76.502	0.835
\$20.002 \$19.003	S133 S134	15 Winter 15 Winter	<u>100</u> 100		100/15 Summer 100/15 Summer				75.997 75.570	0.463
S19.003 S19.004	S134 S135	15 Winter 15 Winter	100		100/15 Summer 100/15 Summer				70.685	0.258
S19.004 S17.003	S135 S136	15 Winter	100		100/15 Summer				70.173	0.386
S17.004		360 Winter	100		100/15 Summer				69.799	0.750
S17.005	S138	360 Winter	100	+20%	100/15 Summer				69.798	1.373
S17.006	S139	360 Winter	100	+20%					67.506	-0.201
S21.000	S140	15 Winter	100		100/15 Summer				94.346	0.302
S21.001	S141	15 Winter	100		100/15 Summer				94.194	0.552
S21.002	S142	15 Winter	100		100/15 Summer				94.101	0.663
\$21.003 \$21.004	S143 S144	15 Winter 15 Winter	100 100		100/15 Summer 100/15 Summer				94.008 93.692	0.745 0.940
521.004	5144	TO WILLEL	100							0.940
				(	©1982-2019 I	nnovyze				

Atkins (Epsom)									Page 7
Woodcoste Grove	2			Fass	aroe Ho	using	Dev.		
Ashley Road, Ep	som								
Surrey, KT18 5	BW			Co.	Wicklow	•			Micco
Date 05/04/2022	11:12			Desi	.gned by	N.Rai	nya		- Micro
File Storm Drai		1 02.	04.2		ked by		-		Drainage
Innovyze					ork 201				
11110 1 2 2 0				Neev	JOIN 201				
Su	mmary of	Criti	cal Resi	ults b	v Maximi	im Les	vel (Rank	1) for Stor	°m
<u></u>	MINULY OF	CIICI		ures p	y 1102311110			1/ 101 0001	
			Flooded	,		Pipe			
	PN	•		•	Overflow		Status	Level Exceeded	
	PN	Name	(m³)	Cap.	(l/s)	(1/s)	Status		
	S1.033	S87	0.000	0.30		63.5	SURCHARGED	Maximum	
	S1.034	S88	0.000	0.38		63.5	OK	-Downstrea	m of Pond 4 -
	S1.035	S89	0.000	0.39		63.5	OK	Catchment	t A
	S1.036 S11.000	S90 S92	0.000	0.39		63.5	OK FLOOD RISK	-	
	S11.000 S12.000	592 593	0.000	0.59		52.9	FLOOD RISK OK		
	S12.000	S94	0.000	1.52			SURCHARGED		
	S13.000	S95	0.000	0.55		53.6	OK		
	S13.001	S96	0.000	1.48			SURCHARGED		
	S13.002	S97	0.000	1.57			FLOOD RISK		
	S12.002 S14.000	S98 S99	0.000	1.66 1.59			SURCHARGED SURCHARGED		
	s12.003	S100	0.000	2.47			SURCHARGED		
	S12.004	S101	0.000	1.89			SURCHARGED		
	S11.001	S102	0.000	Futu	e Pha		SURCHARGED		
	S15.000	S103	0.000			'	SURCHARGED		
	S15.001	S104	0.000	1.83			SURCHARGED		
	\$15.002 \$15.003	<mark>S105</mark> S106	0.000	1.30 0.79		120.2	SURCHARGED OK		
	S15.004	S107	0.000	0.89			SURCHARGED		
	S15.005	S108	0.000	0.97		153.6	SURCHARGED		
	S15.006	S109	0.000	1.03			SURCHARGED		
	S11.002	S110	0.000	2.50			SURCHARGED		
	S16.000 S16.001	<mark>S111</mark> S112	0.000 0.000	1.04 0.96			SURCHARGED SURCHARGED		
	S16.002	S112 S113	0.000	1.09			SURCHARGED		
	S16.003	S114	0.000	1.20		251.5	SURCHARGED		
	S16.004	S115	0.000	3.07			SURCHARGED		
	S11.003		0.000	0.57			SURCHARGED		
	S11.004 S11.005	S117 S118	0.000	0.05 0.04		2.1	FLOOD RISK OK		
	S11.005 S17.000	S110 S120	0.000	0.04			SURCHARGED		
	S18.000	S121	0.000	0.66		54.9	OK		
	S18.001	S122	0.000	0.93			SURCHARGED		
	S18.002	S123	0.000	1.27			SURCHARGED		
	S18.003 S18.004	<mark>S124</mark> S125	0.000 0.000	1.26 0.88			SURCHARGED SURCHARGED		
	S18.004 S17.001	S125 S126	0.000	1.38			SURCHARGED		
	S17.001	S120 S127	0.000	1.18			SURCHARGED		
	S19.000	S128	0.000	0.38		21.0	OK		
	S19.001	S129	0.000	0.71		21.1	OK		
	S19.002	S130	0.000	0.36			SURCHARGED SURCHARGED		
	\$20.000 \$20.001	S131 <mark>S132</mark>	0.000	Futu	re Pha	se	SURCHARGED		
	S20.001	S133	0.000	7.79		63.3	SURCHARGED		
	S19.003	S134	0.000	1.79		113.6	SURCHARGED		
	S19.004	S135	0.000	1.10			SURCHARGED	N 4 *	
	S17.003	S136	0.000	1.45			SURCHARGED		mum Flow
	S17.004 S17.005	S137 S138	0.000 0.000	0.34 0.03			SURCHARGED		nstream of
	S17.005 S17.006	S138 S139	0.000	0.03		2.3		Tank	Α
	S17.000	S139 S140	0.000	0.05			SURCHARGED	N 4	
	S21.001	S141	0.000	0.87		85 4	SURCHARGED		mum Flow
	S21.002	S142	0.000	1.05			SURCHARGED		nstream of
	S21.003	S143	0.000	0.96		154.5	SURCHARGED	Pond	1

Atkins (Epsom)		Page 8
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

		Flooded			Pipe		
	US/MH	Volume	Flow /	Overflow	Flow		Level
PN	Name	(m³)	Cap.	(1/s)	(l/s)	Status	Exceeded
S21.004	S144	0.000	0.88		195.5	SURCHARGED	

Atkins (Epsom)		Page 9
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Digitige
Innovyze	Network 2019.1	1

PN	US/MH Name	Storm		Climate Change	First (X) Surcharge	First (Y Flood	) First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
				-	2	- 2004				
S21.005	S145	15 Winter	100	+20%	100/15 Summer				93.439	1.050
S21.006	S146	15 Winter	100	+20%	100/15 Summer				91.548	0.924
S22.000	S147	15 Winter	100	+20%					99.906	-0.113
S22.001 S22.002	S148 S149	15 Winter 15 Winter	100 100	+20% +20%	100/15 Summer				99.834 99.726	-0.024 0.171
S22.002	S149 S150	15 Winter	100	+20%	100/15 Summer				99.262	0.331
S22.003	S150 S151	15 Winter	100	+20%	100/15 Summer				98.853	0.822
S22.004	S151 S152	15 Winter	100	+20%	100/15 Summer				98.243	1.112
S22.006	S152	15 Winter	100	+20%	100/15 Summer				97.527	1.296
S22.007	S154	15 Winter	100	+20%	100/15 Summer				97.197	1.408
S22.008	S155	30 Winter	100	+20%	100/15 Summer				96.949	1.266
S22.009	S156	30 Winter	100	+20%	100/15 Summer				96.705	1.116
S22.010	S157	30 Winter	100	+20%	100/15 Summer				96.463	1.103
S22.011	S158	30 Winter	100	+20%	100/15 Summer				96.224	1.027
S22.012	S159	30 Winter	100	+20%	100/15 Summer				95.974	0.944
S22.013	S160	30 Winter	100	+20%	100/15 Summer				95.848	0.951
S22.014	S161	30 Winter	100	+20%	100/15 Summer				95.714	1.015
S22.015	S162	30 Winter	100	+20%	100/15 Summer				95.573	1.079
S22.016	S163	30 Winter	100	+20%	100/15 Summer				95.423	1.125
S22.017	S164	30 Winter	100	+20응	100/15 Summer				94.500	1.102
S22.018	S165	15 Winter	100	+20%	100/15 Summer				94.190	0.989
S23.000	S166	15 Winter	100	+20%	100/15 Summer				95.618	0.388
S24.000 S24.001	S167 S168	15 Winter 15 Winter	100 100	+20%	Future Pha	ase			96.875 96.508	0.744 0.727
S24.001	S100 S169	15 Winter	100	+20%	100/15 Summer				96.181	
S23.001	S100	15 Winter	100	+20%	100/15 Summer				95.211	0.948
S23.002	S171	15 Winter	100	+20%	100/15 Summer				94.577	0.751
S22.019	S172	15 Winter	100	+20%	100/15 Summer				93.884	0.778
S22.020	S173	15 Winter	100	+20%	100/15 Summer				93.075	0.625
S25.000	S174	15 Winter	100	+20%					95.186	-0.131
S26.000	S175	15 Winter	100	+20%					96.142	-0.107
S26.001	S176	15 Winter	100	+20%	100/15 Winter				95.500	0.004
S26.002	S177	15 Winter	100	+20%	100/15 Summer				95.421	0.222
S26.003	S178	15 Winter	100	+20%	100/15 Summer				95.341	0.345
S26.004	S179	15 Winter 15 Winter	100	+20%	100/15 Summer				95.264	0.353
S25.001 S25.002	S180 S181	15 Winter 15 Winter	100 100	+20% +20%	100/15 Summer 100/15 Summer				94.474 93.108	0.866
S23.002 S22.021	S181 S182	15 Winter	100	+20%	100/15 Summer				92.214	0.718 1.189
S22.021	S182	15 Winter	100	+20%	100/15 Summer				90.839	0.579
S27.000	S184	15 Winter	100	+20%	100/15 Summer				91.993	0.455
S21.008	S185	15 Winter	100	+20%	100/15 Summer				89.937	1.362
S21.009	S186	15 Winter	100	+20%	100/15 Summer				88.924	1.074
S21.010	S187	15 Winter	100	+20%	100/15 Summer				88.392	0.801
S21.011	S188	15 Winter	100	+20%	100/15 Summer				87.863	0.370
S21.012	S189	60 Winter	100	+20%					87.236	-0.137
S21.013	S190	60 Winter	100	+20%					87.157	-0.119
S21.014	S191	60 Winter	100	+20%					87.087	-0.117
S21.015	S192	60 Winter	100	+20%	100/60 Winter				86.992	0.051
S21.016	S193	60 Winter	100	+20%	100/60 Winter				86.865	0.025
S21.017		240 Winter	100		100/120 Winter				86.804	0.054
S21.018		240 Winter	100		100/120 Summer				86.785	0.195
S21.019		240 Winter	100	+20%	100/30 Summer				86.769	0.669
S21.020 S21.021		240 Winter 240 Winter	100 100	+20% +20%					85.196 84.735	-0.097 -0.140
S21.021 S21.022		360 Winter	100	+20%					83.717	-0.140
S21.022 S28.000	S200	15 Winter	100	+20%					87.616	-0.048
	2200	10	±00						5010	0.010
				(	©1982-2019 Ir	novyze				

Atkins (Epsom)									Page 10
Noodcoste Grov				Fas	saroe Ho	using	Dev.		
shley Road, E	-								
Surrey, KT18					Wicklow		– Micro		
Date 05/04/202	2 11:12			Des	igned by	N.Ran	iya		Drainag
File Storm Dra	inage Mod	el_02.	.04.2	. Che	cked by (	G.Hanr	atty		brainagi
Innovyze				Net	work 201	9.1			1
<u>Su</u>	ummary of	Criti	cal Res	ults k	oy Maximu	ım Lev	el (Rank 1	l) for Stor	<u>rm</u>
	-				Overflow	Pipe Flow	<b>Q</b> be been	Level	
	PN	Name	(m³)	Cap.	(l/s)	(l/s)	Status	Exceeded	
	S21.005	S145	0.000	1.03		286.8	SURCHARGED		
	S21.006		0.000	1.45			FLOOD RISK		
	S22.000		0.000	0.71		55.7	OK		
	\$22.001 \$22.002		0.000	0.72		73.0	OK SURCHARGED		
	S22.002 S22.003		0.000	0.80			SURCHARGED		
	S22.003		0.000	0.92			SURCHARGED		
	S22.005	S152	0.000	0.94		165.5	FLOOD RISK		
	S22.006		0.000	0.92			FLOOD RISK		
	S22.007 S22.008		0.000 0.000	1.69 1.68			FLOOD RISK SURCHARGED		
	S22.008 S22.009		0.000	1.68			SURCHARGED		
	S22.010		0.000	1.24			SURCHARGED		
	S22.011		0.000	1.26			SURCHARGED		
	S22.012		0.000	1.01			SURCHARGED		
	S22.013 S22.014		0.000	0.86 0.87			SURCHARGED SURCHARGED		
	S22.014 S22.015		0.000	0.87			SURCHARGED		
	S22.016		0.000	1.01			SURCHARGED		
	S22.017		0.000	1.26			SURCHARGED		
	S22.018		0.000	1.80			SURCHARGED		
	\$23.000 \$24.000		0.000	0.86			SURCHARGED		
	S24.001		0.000	Futu	ire Pha	<b>Se</b> 4	SURCHARGED		
	S24.002	S169	0.000	1.10			SURCHARGED		
	\$23.001 \$23.002	<mark>S170</mark> S171	0.000	1.23 0.98			SURCHARGED SURCHARGED		
	S23.002 S22.019	S171 S172	0.000	2.10			SURCHARGED		
	S22.020	S173	0.000	2.12			SURCHARGED		
	S25.000	S174	0.000	0.60		92.1	OK		
	S26.000	S175	0.000	0.54		47.4	OK		
	S26.001 S26.002	S176 S177	0.000 0.000	0.85 0.72			SURCHARGED SURCHARGED		
	S26.002 S26.003	S177 S178	0.000	1.02			SURCHARGED		
	S26.004	S179	0.000	0.93			SURCHARGED		
	S25.001	S180	0.000	1.36			SURCHARGED		
	S25.002	S181	0.000	1.70			SURCHARGED		
	S22.021 S21.007	S182 S183	0.000	1.34 2.23			SURCHARGED SURCHARGED		
	S27.000	S183	0.000	1.13			SURCHARGED		
	S21.008	S185	0.000	1.38			SURCHARGED		
	S21.009	S186	0.000	1.43			SURCHARGED		
	S21.010 S21.011	S187 S188	0.000 0.000	1.88 1.88			SURCHARGED SURCHARGED		
	S21.011 S21.012	S188 S189	0.000	1.00		606.4	OK		
	S21.013	S190	0.000	1.00		605.3	OK	Maximu	
	S21.014	S191	0.000	0.76		606.4	OK		
	S21.015	S192	0.000	1.00			SURCHARGED		ream of
	S21.016	S193	0.000	1.05			FLOOD BISK FLOOD RISK	Pond 2	
	S21.017 S21.018	S194 S195	0.000	0.61 0.62		407.5	FLOOD RISK	Maximu	
	S21.018	S195 S196	0.000	0.60			SURCHARGED		
	S21.020	S197	0.000	0.90		120.2	OK		ream of
	S21.021	S198 S199	0.000 0.000	0.71 0.36		120_2 94.7	ок ок	Pond 1	
	S21.022								

Atkins (Epsom)		Page 11
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	Flooded Volume (m³)	Flow /	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded	
S28.000	S200	0.000	0.02		1.5	OK		

Atkins (Epsom)		Page 12
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

									Water	Surcharged
PN	US/MH Name	Storm		Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)
				-	baronarge	11000	0001110#			
S29.000 S29.001	S201 S202	60 Winter 15 Winter		+20%					93.308	-0.225 0.488
S29.001 S29.002	S202	15 Winter		+203	Future Ph	ase			89.977	1.162
S28.001	S204	15 Winter			100/15 Summer				87.619	0.512
S30.000	S205	15 Winter			100/15 Summer				94.263	1.163
S30.001	S206	15 Winter	100		100/15 Summer				94.089	1.117
\$30.002	S207	15 Winter	100	+20%	100/15 Summer				93.583	1.403
\$30.003	S208	15 Winter			100/15 Summer				92.117	1.219
\$30.004	S209	15 Winter			100/15 Summer				90.866	0.841
\$30.005	S210	15 Winter			100/15 Summer				90.053	0.600
\$30.006	S211	15 Winter			100/15 Summer				88.098	1.064
S28.002	S212				100/15 Summer				87.258	0.458
S31.000 S31.001	S213 S214	15 Winter 15 Winter			100/15 Summer 100/15 Summer				94.675 93.910	0.875 0.424
S31.001	S214 S215	15 Winter			100/15 Summer				93.301	0.424
\$31.002 \$32.000	S215	15 Winter			100/15 Summer				97.652	0.252
\$32.001	S210	15 Winter			100/15 Summer				97.495	0.195
S32.002	S218	15 Winter			100/15 Summer				96.801	0.101
S32.003	S219	15 Winter			100/15 Summer				96.569	0.181
S32.004	S220	15 Winter	100	+20%	100/15 Summer				96.113	0.022
S32.005	S221	15 Winter	100	+20%	100/15 Cummon				95.337	0.515
S33.000	S222	15 Winter			Future Ph	lase			95.384	0.754
S33.001	S223	15 Winter		+20%					95.263	1.063
S33.002	S224	15 Winter			100/15 Summer				95.217	1.144
\$33.003	S225	15 Winter			100/15 Summer				95.170	1.201
\$33.004 \$32.006	S226 S227	15 Winter 15 Winter			100/15 Summer 100/15 Summer				95.122 94.885	1.262 1.117
S32.000	S227	15 Winter 15 Winter			100/15 Summer				94.509	0.937
S32.007	S220	15 Winter			100/15 Summer				94.292	1.370
\$32.009	S230	15 Winter			100/15 Summer				93.513	0.904
\$31.003	s231	15 Winter			100/15 Summer				93.143	0.576
S31.004	S232	15 Winter	100	+20%	100/15 Summer				92.769	0.269
S34.000	S233	15 Winter		+20%					94.817	-0.158
S34.001	S234	15 Winter		+20%					94.470	-0.080
\$34.002	S235	15 Winter			100/15 Summer				94.453	0.468
S34.003	S236	15 Winter			100/15 Summer				93.192	0.289
S34.004	S237 S238	15 Winter 15 Winter			100/15 Summer				92.648	0.386
\$31.005 \$31.006	5238 S239	15 Winter 15 Winter			100/15 Summer 100/15 Summer				92.223 91.838	0.331 0.305
S31.000	S239	15 Winter 15 Winter		+20%	100/10 Summer				90.531	-0.146
S31.007	S240 S241	15 Winter		+20%					94.459	-0.141
\$35.001	S242			+20%					94.345	-0.148
\$35.002	s243			+20%					92.720	-0.108
s35.003	S244	15 Winter		+20%					91.601	-0.108
S31.008	S245	15 Winter	100		100/15 Summer				89.515	0.512
S31.009	S246	15 Winter			100/15 Summer				89.077	0.164
S31.010		360 Winter			100/15 Summer				89.033	0.197
\$31.011		360 Winter			100/15 Summer				89.033	1.045
S31.012		360 Winter		+20%					87.611	-0.198
\$31.013 \$28.003		360 Winter 15 Winter		+20% +20%					87.003	-0.197
S28.003 S28.004		360 Winter		+20% +20%					86.153 85.969	-0.297 -0.266
S28.004 S28.005		360 Winter 360 Winter		+20%					85.969	-0.288
S28.005		360 Winter			100/15 Summer				85.969	0.594
S28.007		360 Winter		+20%					84.981	-0.195
S28.008		360 Winter		+20%					84.690	-0.194
					1000 0010 -					
				0	01982-2019 I	nnovyze				

Woodcoste Grove       Fassaroe Housing Dev.         Ashley Road, Epsom       Co. Wicklow.         Surrey, KT18 5BW       Co. Wicklow.         Date 05/04/2022 11:12       Designed by N.Ranya         File Storm Drainage Model_02.04.2       Checked by G.Hanratty         Innovyze       Network 2019.1         Flooded Pipe         US/MH Volume Flow / Overflow Flow         PN       Name (m³)         S29.000       S201         0.00       0.0	
Surrey, KT18 5BW       Co. Wicklow.         Date 05/04/2022 11:12       Designed by N.Ranya         File Storm Drainage Model_02.04.2       Checked by G.Hanratty         Innovyze       Network 2019.1         Flooded Pipe         US/MH Volume Flow / Overflow Flow         Level         PN       Name (m³)         Cap. (1/s)	
Surrey, KT18 5BW       Co. Wicklow.         Date 05/04/2022 11:12       Designed by N.Ranya         File Storm Drainage Model_02.04.2       Checked by G.Hanratty         Innovyze       Network 2019.1         Flooded Pipe         US/MH Volume Flow / Overflow Flow         Level         PN       Name (m³)         Cap. (1/s)	
Date 05/04/2022 11:12       Designed by N.Ranya         File Storm Drainage Model_02.04.2       Checked by G.Hanratty         Innovyze       Network 2019.1         Summary of Critical Results by Maximum Level (Rank 1) for Storm         Flooded       Pipe         US/MH Volume Flow / Overflow Flow       Level         PN       Name (m³)       Cap. (1/s)       Status	
File Storm Drainage Model_02.04.2       Checked by G.Hanratty         Innovyze       Network 2019.1         Summary of Critical Results by Maximum Level (Rank 1) for Storm         Flooded       Pipe         US/MH Volume Flow / Overflow Flow       Level         PN       Name       (m³)         Cap.       (1/s)       Status	nage
Innovyze Network 2019.1           Summary of Critical Results by Maximum Level (Rank 1) for Storm           Flooded         Pipe           US/MH Volume Flow / Overflow Flow         Level           PN         Name (m³)         Cap. (1/s)         Status         Exceeded	
Summary of Critical Results by Maximum Level (Rank 1) for Storm Flooded Pipe US/MH Volume Flow / Overflow Flow Level PN Name (m ³ ) Cap. (1/s) (1/s) Status Exceeded	
Flooded Pipe US/MH Volume Flow / Overflow Flow Level PN Name (m³) Cap. (l/s) (l/s) Status Exceeded	
US/MH Volume Flow / Overflow Flow Level PN Name (m³) Cap. (l/s) (l/s) Status Exceeded	
US/MH Volume Flow / Overflow Flow Level PN Name (m³) Cap. (l/s) (l/s) Status Exceeded	
US/MH Volume Flow / Overflow Flow Level PN Name (m³) Cap. (l/s) (l/s) Status Exceeded	
\$29,000,\$201,0,000,0,00,0,00,0K	
s29.001 s202 0.000 Future Phase 6 SURCHARGED 2 SURCHARGED	
S28.001 S204 0.000 1.08 263.5 SURCHARGED	
S30.000 S205 0.000 1.34 81.0 FLOOD RISK	
\$30.001\$2060.0001.91132.9\$URCHARGED\$30.002\$2070.0001.26205.5\$URCHARGED	
S30.002 S207 0.000 1.26 205.5 SURCHARGED S30.003 S208 0.000 1.43 224.6 FLOOD RISK	
S30.004 S209 0.000 2.11 225.6 SURCHARGED	
S30.005 S210 0.000 1.48 228.3 SURCHARGED	
S30.006 S211 0.000 1.89 229.0 SURCHARGED	
S28.002         S212         0.000         1.66         490.0         SURCHARGED           S31.000         S213         0.000         1.69         113.5         SURCHARGED	
S31.000       S213       0.000       1.69       113.5       SURCHARGED         S31.001       S214       0.000       1.52       101.2       SURCHARGED	
S31.002 S215 0.000 1.34 100.2 SURCHARGED	
S32.000 S216 0.000 1.34 41.5 SURCHARGED	
S32.001 S217 0.000 1.07 55.4 SURCHARGED	
S32.002 S218 0.000 0.87 68.4 SURCHARGED	
S32.003       S219       0.000       1.24       68.0       SURCHARGED         S32.004       S220       0.000       1.08       68.0       SURCHARGED	
s32.005 s221 0.00 Future Phase 2 SURCHARGED s33.000 s222 0.00 Future Phase 1 SURCHARGED	
S33.001 S223 0.000 1.30 36.9 FLOOD RISK	
S33.002 S224 0.000 0.96 56.0 FLOOD RISK	
\$33.003\$2250.0000.7482.1FLOOD RISK\$33.004\$2260.0001.71184.3FLOOD RISK	
S32.006 S227 0.000 1.39 256.3 SURCHARGED	
S32.007 S228 0.000 1.82 273.0 SURCHARGED	
S32.008 S229 0.000 1.56 335.9 SURCHARGED	
S32.009 S230 0.000 2.39 342.4 SURCHARGED S31.003 S231 0.000 2.02 465.1 SURCHARGED	
S31.004 S232 0.000 1.98 464.8 SURCHARGED	
S34.000 S233 0.000 0.19 15.9 OK	
S34.001 S234 0.000 0.12 14.4 OK	
S34.002 S235 0.000 1.20 172.4 SURCHARGED	
S34.003S2360.0001.16170.5SURCHARGEDS34.004S2370.0001.21164.2SURCHARGED	
S34.004 S237 0.000 1.21 164.2 SURCHARGED S31.005 S238 0.000 1.81 629.6 SURCHARGED	
S31.006 S239 0.000 1.86 678.0 SURCHARGED	
S31.007 S240 0.000 0.97 677.6 OK	
S35.000 S241 0.000 0.54 31.6 OK	
S35.001 S242 0.000 0.51 31.3 OK S35.002 S243 0.000 0.71 130.5 OK	
S35.002 S243 0.000 0.71 130.5 OK S35.003 S244 0.000 0.71 134.6 OK	
S31.008 S245 0.000 1.31 825.9 SURCHARGED	
S31.009 S246 0.000 0.90 847.6 SURCHARGED	
S31.010 S247 0.000 0.32 359.8 SURCHARGED	
S31.011 S248 0.000 0.03 2.0 SURCHARGED	
S31.012 S249 0.000 0.04 2.0 OK S31.013 S250 0.000 0.04 2.0 OK	
S28.003 S251 0.000 0.67 489.7 OK	
s28.004 s252 0.000 0.14 126.7 OK Maximum Flow	
528.005 5253 0.000 0.16 122.4 OK	
s28.006 s254 0.000 0.05 2.0 surcharge Downstream of	
s28.007 s255 0.000 0.05 2.0 ок Pond 3	

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Atkins (Epsom)		Page 14
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)		Status	Level Exceeded	
S28.008	S256	0.000	0.05		2.3	OK		

		5 15
Atkins (Epsom)		Page 15
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	s	torm		Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S28.009	S257	360	Winter	100	+20%					82.695	-0.190
S28.010			Winter	100	+20%					81.307	-0.191
S28.011	S259	360	Winter	100	+20%					80.960	-0.193
S21.023	S260	360	Winter	100	+20%	100/120 Summe:	2			77.888	1.872
S21.024	S261	360	Winter	100	+20%	100/120 Summe:	2			69.221	2.284
S17.007			Winter	100	+20%	100/120 Summe:	<u>-</u>			61.867	1.602
S17.008			Winter	100		100/120 Summe:				58.998	0.584
S17.009			Winter	100		100/120 Summe:				58.244	0.374
S17.010			Winter	100		100/120 Summe:				55.908	0.517
S17.011			Winter	100		100/120 Summe:	<u>-</u>			50.481	0.621
\$17.012 \$17.013			Winter Winter	100 100	+20%	100/180 Winte:	-			49.705 48.939	-0.007 0.024
S17.013			Winter	100	+20%	100/100 Wille	-			48.679	-0.021
S17.014 S17.015			Winter	100		100/360 Winte:	-			48.204	0.003
\$36.000	S272		Winter	100	+20%	100,000	-			99.007	-0.225
S36.001	S273		Winter	100	+20%					97.947	
S36.002	S274		Winter	100	+20%					97.755	-0.045
S36.003	S275	15	Winter	100	+20%	100/15 Summe:	<u>-</u>			96.446	0.105
S36.004	S276		Winter	100	+20%	100/15 Summe:	<u>-</u>			96.180	0.764
S36.005	S277		Winter	100	+20%	100/15 Summe:				95.866	1.066
S37.000	S278		Winter	100	+20%	100/15 Summe:				98.883	0.083
S37.001	S279		Winter	100	+20%	100/15 Summe:	<u></u>			98.886	0.156
\$37.002	S280		Winter	100	+20%	Future Ph	ase			98.069	0.269
S37.003	S281		Winter	100		100/15 Summe:				97.352	0.552
\$37.004 \$37.005	S282 S283		Winter Winter	100 100	+20% +20%	100/15 Summe.	-			95.906 95.641	0.106 -0.122
S36.006	S283		Winter	100	+20%	100/15 Summe:	~			95.179	0.553
S38.000	S285		Winter	100	+20%	100/15 Summe:				98.979	1.179
S38.001	S286		Winter	100	+20%	100/15 Summe:				98.279	0.693
S38.002	S287		Winter	100	+20%	100/15 Summe:				98.124	0.578
S38.003	S288	15	Winter	100	+20%	100/15 Summe:	<u> </u>			97.885	0.429
S38.004	S289	360	Winter	100	+20%	100/120 Summe:	<u>-</u>			94.902	0.738
S36.007			Winter	100	+20%	100/15 Winte:	-			94.901	1.101
S36.008			Winter	100	+20%	100/15 Summe:				94.901	1.576
S39.000	S293		Winter	100	+20%	100/15 Summe:	<u>-</u>			97.700	0.900
S40.000	S294		Winter	100	+20%					97.696	-0.079
S39.001	S295		Winter	100	+20%	100/15 Summe:				97.342	0.914
S41.000			Winter	100	+20%	100/15 Winte:				96.630	0.873
\$39.002 \$39.003			Winter Winter	100 100	+20% +20%	100/15 Summe: 100/15 Summe:				96.630 96.627	1.151 1.225
S39.003 S39.004			Winter	100		100/15 Summe:				96.623	1.598
S42.000	S200		Winter	100	+20%	100, 10 Dunnie.	-			104.512	-0.086
\$42.001	S302		Winter	100	+20%	100/15 Summe:	<u>-</u>			101.588	0.287
\$42.002	S303		Winter	100	+20%	100/15 Summe:				99.244	0.531
S42.003	S304		Winter	100	+20%	100/15 Summe:				98.795	0.489
S42.004	S305		Winter	100	+20%	100/15 Summe:	C			98.422	0.177
S42.005	S306		Winter	100	+20%					98.027	-0.141
S42.006	S307		Winter	100	+20%					97.297	-0.153
S42.007	S308		Winter	100	+20%	100/15				96.618	-0.146
S42.008	S309		Winter	100	+20%	100/15 Winte:				95.652	0.067
S42.009	S310		Winter Winter	100	+20% +20%	100/15 Summe:				95.180	0.484
\$43.000 \$43.001	S311 S312		Winter Winter	100 100	+20% +20%	100/15 Summe: 100/15 Summe:				98.050 98.010	0.372 0.537
\$43.001 \$43.002	S312 S313		Winter	100	+20% +20%	100/15 Summe:				97.980	0.548
\$43.002 \$43.003	S313		Winter	100	+20%	100/15 Summe:				97.789	0.538
\$43.004	S315		Winter	100	+20%	100/15 Summe:				97.714	1.094
						©1982-2019 I	nnovyze				

Rockooste Grove Ashler, Roud, Eppen Surrey, KT18 SBN         Parsarce Rousing Dev.           Surrey, KT18 SBN         Co. Nicklow.         Mich Date By04/2022 11:12         Designed by N.Ranya           Thie Storm Drainage Model_02.04.2         Checked by G.Hanratty         Mich Drainage Model_02.04.2         Checked by G.Hanratty           Innovyze         Network 2019.1         Summary of Critical Results by Maximum Level (Rank 1) for Storm           VE/068         V//Wime Flow / Overflow Flow         Level         Level           V8         Name (n)         0.06         2.3         Ox           S21.023         2240         0.00         0.06         2.3         Ox           S21.023         2240         0.00         1.9         9.2         SURCHARDED Brook Stream, Cathement A: S17.013         S246         0.00         1.9         9.2         SURCHARDED Brook Stream, Cathement A: S17.013         S246         0.00         0.0         Ox           S17.013         S246         0.00         0.0         9.2         SURCHARDED Brook Stream, Cathement A: S17.013         S246         0.00         0.0         Ox           S17.013         S246         0.00         0.0         0.0         Ox         S0.4         S0.4         S0.4         S0.4         S0.4         S0.4	kins (Epsom)								Page 16	
Surrey, K118 58M         Co. Wicklow.         Mitching           Date 05/04/2022 11:12         Designed by N.Ranya         Digital by N.Ranya         Digital by N.Ranya           File Storm Drainage Model_02.04.2         Checked by G.Harratty         Information         Digital by N.Ranya           Innovyze         Network 2019.1         Summary of Critical Results by Maximum Level (Rank 1) for Storm           FN         Name (ra)         Cap. (1/s)         (1/s)         Status         Exceeded           S28.009         5257         0.000         0.06         2.3         CK           S10.023         5258         0.000         0.06         2.3         CK           S28.009         5257         0.000         0.06         2.3         CK           S28.019         5259         0.000         0.06         2.3         CK           S28.019         5259         0.000         2.15         91.0         SURCHARD         Outoon           S17.019         5264         0.000         2.15         91.2         SURCHARD         Outoon           S17.019         5264         0.000         1.00         91.2         SURCHARD         Outoon           S17.019         5264         0.000         1.00	odcoste Grove			Fass	aroe Ho	using	Dev.			
Date 05/04/2022 11:12         Designed by N.Ranys         Difference           File Storm Drainage Model_02.04.2         Checked by G.Ranzatty         Difference           Innovyze         Network 2019.1         Network 2019.1           Summary of Critical Results by Maximum Level (Rank 1) for Storm           Network 2019.1           Notwork 2019.1           Summary of Critical Results by Maximum Level (Rank 1) for Storm           Notwork 2019.1	hley Road, Epsom									
UBAGE 03/00/2002 04.2         Designed by K.Hanysty           UBAGE 03/00/2002 04.2         Checkede by G.Hanyatty         Direction           Innovyze         Network 2019.1           Summary of Critical Results by Maximum Level (Rank 1) for Storm           Sign         Level           PN Name (m') Cap. (1/a) (1/a) Status Exceeded           Sign         Level           Notwork 2019.1           Notwork 2019.1           Notwork 2019.1           Level         Level           Notwork 2019.1           Notwork 2019.1           Notwork 2019.1           Level           Level           Sign           Level           Level <td><i></i></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Mirrn</td> <td></td>	<i></i>							Mirrn		
Innovyze         Network 2019.1           Network 2019.1           Symmary of Critical Results by Maximum Level (Rank 1) for Storm           Network 2019.1           Symmary of Critical Results by Maximum Level (Rank 1) for Storm           Network 2019.1           Maximum Flow           Structure Phase           Structure Phase           Structure Phase           Structure Phase           Structu	te 05/04/2022 11:12					=				
Summary of Critical Results by Maximum Level (Rank 1) for Storm           Ended         Fige           US/BH Volume Flow / Overflow Flow         Level           EN         Name (n*)         Gap.         (1/a)         for status         Exceeded           S220030         2537         0.000         0.06         2.3         000           S220031         2539         0.000         0.06         2.3         000           S220032         2537         0.000         1.01         97.0         SURCHARGED           S220033         2530         0.000         1.01         97.0         SURCHARGED           S21,002         2524         0.000         1.01         97.0         SURCHARGED           S17,007         2564         0.000         1.03         99.2         SURCHARGED           S17,013         2566         0.000         1.03         99.2         SURCHARGED           S34,000	le Storm Drainage Mode	1_02.	04.2	Chec	ked by (	G.Han:	ratty		Diama	JE
Rode         Pape (N)         Levit         Levit           10         Non         (n)         Cor         (Vor)         For         Statu         Exceeded           228         0.000         0.06         2.3         0.00         0.06         2.3         0.00           228         0.000         0.06         2.3         0.00         0.06         2.3         0.00           228         0.000         2.15         99.2         SUBCEMERCH         SUBLEMERCH         Outfail to Cour           237,013         258         0.000         2.12         99.2         SUBCEMERCH         Outfail to Cour           237,013         258         0.000         1.05         99.2         SUBCEMERCH         Outfail to Cour           237,013         259         0.000         1.06         99.2         SUBCEMERCH         Outfail to Cour           237,013         257         0.000         1.05         99.4         SUBCEMERCH         SUBCEMERCH           237,013         257         0.000         1.05         99.4         SUBCEMERCH         SUBCEMERCH           237,013         257         0.000         1.05         99.5         SUBCEMERCH         SUBCEMERCH	novyze			Netw	ork 201	9.1				
UPAHI         Volume         PLow         Cap.         (1/s)         Tow         Level           S28.003         2258         0.000         0.06         2.3         0K           S28.013         2258         0.000         0.06         2.3         0K           S28.013         2259         0.000         2.45         97.0         SURCHARCED           S21.023         5260         0.000         2.15         97.0         SURCHARCED           S17.008         8283         0.000         2.13         93.2         SURCHARCED           S17.010         8262         0.000         2.13         93.2         SURCHARCED           S17.012         8264         0.000         2.13         93.2         SURCHARCED           S17.012         8267         0.000         1.08         93.2         SURCHARCED           S17.012         8267         0.000         1.05         92.2         SURCHARCED           S36.001         8272         0.000         1.00         63.4         0K           S36.002         8274         0.000         1.01         92.6         SURCHARCED           S37.004         8282         0.000         1.13         SURCHARCE	Summary of	<u>Criti</u>		ults b	y Maximu		vel (Rank	<u>1) for Stor</u>	<u>cm</u>	
\$28.009       \$257       0.000       0.06       2.3       OK         \$28.011       \$258       0.000       0.05       2.3       OK         \$21.023       \$260       0.000       2.45       97.0       SUBCCHARGED         \$21.023       \$261       0.000       1.91       97.0       SUBCCHARGED         \$31.007       \$262       0.000       2.15       99.2       SUBCCHARGED         \$31.013       \$264       0.000       2.15       99.2       SUBCCHARGED         \$31.013       \$266       0.000       2.19       99.2       SUBCCHARGED         \$31.013       \$266       0.000       1.08       99.2       SUBCCHARGED         \$31.014       \$260       0.000       1.08       99.2       SUBCCHARGED         \$31.014       \$267       0.000       0.00       0.00       CK         \$34.001       \$272       0.000       0.00       CK       SUBCCHARGED         \$34.001       \$277       0.000       0.00       CK       SUBCCHARGED         \$33.002       \$271       0.000       0.00       CK       SUBCCHARGED         \$33.003       \$271       0.000       0.00       CK <t< th=""><th></th><th>US/MH</th><th>Volume</th><th>Flow /</th><th>Overflow</th><th>-</th><th></th><th>Level</th><th></th><th></th></t<>		US/MH	Volume	Flow /	Overflow	-		Level		
\$22.010       \$25.8       0.000       0.05       2.3       OK         \$22.021       \$22.020       \$20.00       2.45       \$91.0       SURCHARGED         \$21.024       \$261       0.000       1.90       \$92.2       SURCHARGED         \$17.008       \$261       0.000       2.15       \$92.2       SURCHARGED         \$17.008       \$261       0.000       2.12       \$92.2       SURCHARGED         \$17.018       \$266       0.000       2.23       \$92.2       SURCHARGED         \$17.013       \$266       0.000       0.98       \$92.2       SURCHARGED         \$17.014       \$269       0.000       1.08       \$92.2       SURCHARGED         \$17.015       \$270       0.000       1.05       \$99.0       SURCHARGED         \$17.014       \$269       0.000       1.05       \$92.0       SURCHARGED         \$17.014       \$269       0.000       0.00       CB       \$17.014         \$17.014       \$269       0.000       0.00       CB       \$17.014         \$17.014       \$269       0.000       0.00       CB       \$17.014         \$10.000       \$17       \$1.15       SURCHARGED <td< td=""><td>PN</td><td>Name</td><td>(m³)</td><td>Cap.</td><td>(1/s)</td><td>(l/s)</td><td>Status</td><td>Exceeded</td><td></td><td></td></td<>	PN	Name	(m³)	Cap.	(1/s)	(l/s)	Status	Exceeded		
828.010       8258       0.000       0.05       2.3       OK         821.023       8260       0.000       2.45       97.0       SUNCHARGED         821.024       8261       0.000       1.90       99.2       SUNCHARGED         817.005       8263       0.000       2.13       99.2       SUNCHARGED         817.005       8265       0.000       2.23       99.2       SUNCHARGED         817.015       8266       0.000       2.23       99.2       SUNCHARGED         817.013       8266       0.000       1.06       99.2       SUNCHARGED         817.014       8269       0.000       1.06       99.2       SUNCHARGED         817.015       8270       0.000       1.06       99.4       OUNCHARGED         836.001       8272       0.000       0.00       0.0       0.0         836.003       8275       0.000       0.00       0.0       0.0         836.003       8277       0.000       0.00       2.6       SUNCHARGED         837.003       8278       0.000       1.19       156.9       SUNCHARGED         837.003       8284       0.000       1.75       SUNCHARGED	528.009	S257	0.000	0.06		2.3	OK			
221.023       2260       0.000       2.45       97.0       SURCHARGED         S17.007       S262       0.000       1.90       99.2       SURCHARGED       OUtfall to Cours         S17.007       S264       0.000       2.13       99.2       SURCHARGED       OUtfall to Cours         S17.010       S265       0.000       2.13       99.2       SURCHARGED       DUtfall to Cours         S17.011       S265       0.000       2.23       99.2       SURCHARGED       Book Stream.         S17.013       S266       0.000       1.08       99.2       SURCHARGED       Book Stream.         S17.014       S265       0.000       1.08       99.2       SURCHARGED       Book Stream.         S17.015       S270       0.000       1.05       99.0       SURCHARGED       Att Catchmert         S36.001       S275       0.000       0.00       0.0       K       Att Catchmert         S37.001       S276       0.000       0.09       2.6       SURCHARGED       2       SURCHARGED         S37.001       S277       0.000       1.91       T57.0       SURCHARGED       2       SURCHARGED       2         S37.001       S278       0.										
\$21,024       \$261       0.000       1.91       97.0       SURCHARGED         \$17,005       \$263       0.000       2.15       99.2       SURCHARGED         \$17,010       \$226       0.000       2.12       99.2       SURCHARGED         \$17,010       \$226       0.000       2.13       99.2       SURCHARGED         \$17,011       \$226       0.000       0.98       99.2       SURCHARGED         \$17,013       \$226       0.000       1.08       99.2       SURCHARGED         \$17,014       \$226       0.000       1.09       99.0       SURCHARGED         \$17,015       \$270       0.000       1.00       64       0K         \$36,001       \$273       0.000       0.00       0.0       0K         \$36,002       \$274       0.000       0.00       0.0       0K         \$36,003       \$277       0.000       0.23       119.1       FLOOD RTSK         \$37,000       \$280       0.000       0.99       2.6       SURCHARGED         \$37,004       \$279       0.000       1.19       15.6       SURCHARGED         \$37,005       \$288       0.000       1.25       SURCHARGED										
s17.007       2262       0.000       1.90       99.2       SURCHARGED         s17.009       s264       0.000       2.12       99.2       SURCHARGED         s17.011       s266       0.000       2.13       99.2       SURCHARGED         s17.012       s266       0.000       2.23       99.2       SURCHARGED       Brook Stream.         s17.013       s266       0.000       1.08       99.2       SURCHARGED       Brook Stream.         s17.014       s269       0.000       1.08       99.2       SURCHARGED       Brook Stream.         s17.014       s269       0.000       1.08       99.2       SURCHARGED       Brook Stream.         s17.015       s270       0.000       1.05       99.0       WROHARGED       Brook Stream.         s36.001       s273       0.000       1.00       63.4       SURCHARGED       Stream.         s36.003       s274       0.000       1.71       61.1       SURCHARGED       Stream.         s37.01       s278       0.000       1.71       61.1       SURCHARGED       Stream.         s37.01       s274       0.000       1.71       15.1       FLOOD RTSK       Stream.										
S17,009       S263       0.000       2.15       99.2       SURCHARGED       Maximum Flow         S17,010       S265       0.000       2.12       99.2       SURCHARGED       Brock Stream,         S17,011       S266       0.000       2.23       99.2       SURCHARGED       Brock Stream,         S17,012       S267       0.000       0.98       99.2       SURCHARGED       Cathment A a         S17,014       S260       0.000       1.00       99.4       SURCHARGED       Cathment A a         S17,015       S270       0.000       0.00       0.0       0.0       Kathment A         S17,015       S270       0.000       0.00       0.0       Kathment A       SurcharGeD         S36,001       S273       0.000       0.00       0.0       Kathment A       SurcharGeD         S36,002       S274       0.000       0.10       G       F.4       Kathment A         S37,004       S278       0.000       C.12       IssurcharGeD       SurcharGeD         S37,004       S278       0.000       C.12       IssurcharGeD       SurcharGeD         S37,004       S282       0.000       1.9       IssurcharGeD       SurcharGeD       <										
S17.009         S264         0.000         2.12         99.2         SURCHARGED         Dutfall to Cours           S17.011         S266         0.000         2.13         99.2         SURCHARGED         Brook Stream,           S17.012         S267         0.000         1.08         99.2         SURCHARGED         Catchment A a           S17.013         S268         0.000         1.00         99.2         SURCHARGED         Catchment A a           S17.014         S269         0.000         1.00         99.0         OK         Catchment A a           S17.015         S270         0.000         1.00         69.4         OK         Catchment A a           S36.001         S271         0.000         0.00         0.0         OK         S36.001         S37.000         S278         OL000         0.0         OK           S36.002         S274         0.000         0.00         Catchmert B         S37.000         S278         OL000         2.32         119.1         FLOO RISK         S37.000         S278         OL000         2.37         157.0         SURCHARGED         SURCHARGED         SURCHARGED         SURCHARGED         SURCHARGED         SURCHARGED         SURCHARGED         SURCHARGED								Maxim	num Flow	٦
\$17.010       \$256       0.000       2.13       99.2       SURCHARGED       Brook Stream.         \$17.011       \$266       0.000       0.98       99.2       SURCHARGED       Catchment A a         \$17.013       \$266       0.000       1.08       99.2       SURCHARGED       Catchment A a         \$17.014       \$269       0.000       1.05       99.0       FURCHARGED       Catchment A a         \$36.000       \$272       0.000       0.00       0.0       0.0       OK         \$356.001       \$272       0.000       0.00       0.0       OK       S356.002       \$274       0.000       0.00       OK         \$356.001       \$275       0.000       0.60       67.3       SURCHARGED       S356.003       \$277       0.000       2.6       SURCHARGED       SURCHARGE										
S17.011       S267       0.000       2.1.2       91.2       SUBMERSED         S17.011       S268       0.000       1.08       99.2       SUBMERSED       Catchment A a gard Catcher and Ca	S17.010	S265								
S17.013         S268         0.000         1.08         99.2         SURCHARED           S17.014         S270         0.000         1.05         99.0         FURCHARED           S36.000         S272         0.000         0.00         0.0         0.0           S36.001         S273         0.000         0.00         0.0         0.0           S36.002         S274         0.000         1.00         69.4         0.0           S36.003         S275         0.000         0.00         67.3         SURCHARED           S36.004         S276         0.000         0.11         61.1         SURCHARED           S37.001         S278         0.000         0.09         2.6         SURCHARED           S37.001         S278         0.000         1.19         156.9         SURCHARED           S37.01         S278         0.000         1.19         156.9         SURCHARED           S37.004         S282         0.000         1.27         51.0         FUCOD RISK           S37.005         S283         0.000         2.02         52.0         SURCHARED           S38.001         S286         0.000         2.02         S2.0         SURCHARE							_			
S17.014         S269         0.000         1.00         S2         0.0         CR           S36.000         S272         0.000         0.00         0.0         0.0         0.0           S36.001         S273         0.000         0.00         0.0         0.0         0.0           S36.001         S273         0.000         1.00         63.4         0.0         0.0           S36.002         S274         0.000         1.01         63.4         0.0         0.0           S36.005         S277         0.000         2.32         119.1         FLOCD RISK         537.00         S278         0.000         1.0         9         2.6         SURCHARGED           S37.001         S279         0.00         1.19         156.9         SURCHARGED         0.9         0.0         URINARGED           S37.004         S281         0.000         1.19         156.9         SURCHARGED         S37.005         S283         0.000         1.28         253.6         SURCHARGED           S38.001         S286         0.000         2.02         52.0         SURCHARGED         S38.002         S287         0.000         1.92         SURCHARGED         S38.000         S38.002 <td></td>										
S36.000         S273         0.000         0.00         0.0         0K           S36.001         S273         0.000         1.00         69.4         0K           S36.003         S275         0.000         1.00         69.4         0K           S36.004         S276         0.000         0.71         61.1         SURCHARGED           S36.004         S277         0.000         2.32         119.1         FLOOD RISK           S37.001         S279         0.000         Future Phase         2         SURCHARGED           S37.001         S279         0.000         Future Phase         2         SURCHARGED           S37.001         S280         0.000         Future Phase         2         SURCHARGED           S37.001         S281         0.000         1.19         156.9         SURCHARGED           S37.005         S283         0.000         1.75         51.0         FLOOD RISK           S38.001         S286         0.000         1.91         53.3         SURCHARGED           S38.003         S284         0.000         1.91         53.3         SURCHARGED           S38.003         S284         0.000         1.91         53.3 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Part C</td> <td></td> <td><u>·</u></td>								Part C		<u>·</u>
S36.001       S273       0.000       0.00       0.0       0.0         S36.002       S274       0.000       1.00       69.4       0K         S36.002       S275       0.000       0.80       67.3       SURCHARGED         S36.004       S275       0.000       2.32       119.1       FLOOD RISK         S37.001       S278       0.000       0.09       2.6       SURCHARGED         S37.001       S278       0.000       Future Phase       2       SURCHARGED         S37.001       S280       0.000       1.19       156.9       SURCHARGED         S37.004       S282       0.000       1.75       S1.6       SURCHARGED         S37.004       S284       0.000       1.75       S1.0       FLOOD RISK         S38.001       S285       0.000       1.75       S1.0       FLOOD RISK         S38.001       S286       0.000       1.91       S3.3       SURCHARGED         S38.002       S287       0.000       1.91       S3.3       SURCHARGED         S38.001       S286       0.000       1.91       S3.3       SURCHARGED         S38.002       S287       0.000       1.91       S5.3						99.0				
\$36.002       \$271       0.000       1.00       69.4       OK         \$36.003       \$275       0.000       0.80       67.3       SURCHARGED         \$36.004       \$276       0.000       2.32       119.1       FLOOD RISK         \$37.001       \$277       0.000       2.32       119.1       FLOOD RISK         \$37.001       \$277       0.000       0.09       2.6       SURCHARGED         \$37.001       \$279       0.000       Future Phase       2       SURCHARGED         \$37.003       \$281       0.000       1.19       156.9       SURCHARGED         \$37.004       \$282       0.000       1.75       51.0       FLOOD RISK         \$38.001       \$286       0.000       1.75       51.0       FLOOD RISK         \$38.001       \$286       0.000       1.91       53.3       SURCHARGED         \$38.001       \$286       0.000       1.92										
\$36.003       \$276       0.000       0.80       67.3       SURCHARGED         \$36.004       \$276       0.000       0.71       61.1       SURCHARGED         \$37.001       \$278       0.000       0.09       2.6       SURCHARGED         \$37.001       \$279       0.000       Future Phase       2       SURCHARGED         \$37.001       \$281       0.000       1.19       156.9       SURCHARGED         \$37.004       \$282       0.000       1.19       156.9       SURCHARGED         \$37.005       \$283       0.000       1.28       253.6       SURCHARGED         \$37.004       \$282       0.000       1.28       253.6       SURCHARGED         \$38.001       \$286       0.000       2.02       52.0       SURCHARGED         \$38.001       \$286       0.000       2.01       102.0       SURCHARGED         \$38.001       \$286       0.000       0.19       25.9       SURCHARGED         \$38.001       \$286       0.000       0.19       25.9       SURCHARGED         \$38.001       \$286       0.000       0.19       25.9       SURCHARGED         \$38.001       \$286       0.000       0.75<										
S36.004       S276       0.000       0.71       61.1       SURCHARGED         S36.005       S277       0.000       2.32       119.1       FLOOD RISK         S37.000       S278       0.000       D.09       2.6       SURCHARGED         S37.001       S279       0.00       Future Phase       2       SURCHARGED         S37.002       S280       0.00       1.19       156.9       SURCHARGED         S37.004       S282       0.000       2.37       157.0       SURCHARGED         S37.005       S283       0.000       1.28       253.6       SURCHARGED         S38.001       S285       0.000       1.75       51.0       FLOOD RISK         S38.002       S287       0.000       1.91       53.3       SURCHARGED         S38.003       S288       0.000       2.01       102.0       SURCHARGED         S38.004       S289       0.000       0.19       25.9       SURCHARGED         S38.003       S284       0.000       0.19       25.9       SURCHARGED         S38.004       S289       0.000       0.19       25.9       SURCHARGED         S38.002       S291       0.000       0.75 <td></td>										
\$37.000       \$278       0.000       0.09       2.6       SURCHARGED         \$37.001       \$279       0.00       Future Phase       2       SURCHARGED         \$37.002       \$280       0.000       1.19       156.9       SURCHARGED         \$37.003       \$281       0.000       2.37       157.0       SURCHARGED         \$37.004       \$282       0.000       1.75       51.0       SURCHARGED         \$37.005       \$283       0.000       1.75       51.0       FLOOD RISK         \$38.000       \$285       0.000       1.91       53.3       SURCHARGED         \$38.001       \$286       0.000       2.02       \$2.0       SURCHARGED         \$38.002       \$287       0.000       1.91       53.3       SURCHARGED         \$38.004       \$289       0.000       0.19       25.9       SURCHARGED         \$38.003       \$288       0.000       0.19       25.9       SURCHARGED         \$38.004       \$289       0.000       0.19       25.9       SURCHARGED         \$38.004       \$289       0.000       0.75       26.1       0K         \$39.000       \$291       0.000       0.66       <										
\$37.001       \$279       0.00       Future Phase.       2       SURCHARGED         \$37.002       \$280       0.000       1.19       156.9       SURCHARGED         \$37.003       \$281       0.000       2.37       157.0       SURCHARGED         \$37.004       \$282       0.000       2.67       154.7       0K         \$37.005       \$283       0.000       1.75       51.0       FLOOD RISK         \$38.001       \$286       0.000       2.02       52.0       SURCHARGED         \$38.001       \$286       0.000       2.02       52.0       SURCHARGED         \$38.001       \$286       0.000       2.02       52.0       SURCHARGED         \$38.003       \$288       0.000       2.01       102.0       SURCHARGED         \$38.003       \$288       0.000       1.91       53.3       SURCHARGED         \$38.003       \$288       0.000       0.19       25.9       SURCHARGED         \$38.003       \$289       0.000       0.30       81.8       FLOOD RISK         \$39.001       \$290       0.000       0.75       26.1       OK         \$39.001       \$294       0.000       0.75       2										
\$37.002       \$280       0.00       FUTUPE PTHASE       0       SURCHARGED         \$37.003       \$281       0.000       1.19       156.9       SURCHARGED         \$37.004       \$282       0.000       2.37       157.0       SURCHARGED         \$37.005       \$283       0.000       0.67       154.7       OK         \$38.000       \$285       0.000       1.75       51.0       SURCHARGED         \$38.000       \$286       0.000       2.02       \$2.0       SURCHARGED         \$38.001       \$286       0.000       2.01       102.0       SURCHARGED         \$38.003       \$288       0.000       0.19       25.9       SURCHARGED         \$38.004       \$289       0.000       0.19       25.9       SURCHARGED         \$38.004       \$289       0.000       0.30       81.8       FLOOD RISK         \$36.008       \$291       0.000       0.4       2.4       FLOOD RISK         \$39.000       \$294       0.000       0.75       26.1       OK         \$39.001       \$295       0.000       0.36       23.3       SURCHARGED         \$39.002       \$297       0.000       0.36       23.										
\$37.003         \$281         0.000         1.19         156.9         SURCHARGED           \$37.004         \$282         0.000         2.37         157.0         SURCHARGED           \$37.005         \$283         0.000         1.67         154.7         OK           \$36.006         \$284         0.000         1.28         253.6         SURCHARGED           \$38.001         \$285         0.000         1.75         51.0         FLOOD RISK           \$38.001         \$286         0.000         2.02         52.0         SURCHARGED           \$38.002         \$287         0.000         1.91         53.3         SURCHARGED           \$38.003         \$288         0.000         2.01         102.0         SURCHARGED           \$38.004         \$289         0.000         0.30         81.8         FLOOD RISK           \$39.001         \$293         0.000         1.01         36.1         SURCHARGED           \$40.000         \$294         0.000         1.90         67.6         SURCHARGED           \$39.001         \$295         0.000         0.32         23.3         SURCHARGED           \$39.002         \$297         0.000         0.36         23				·uture	e Phas					
\$37.005       \$283       0.000       0.67       154.7       OK         \$36.006       \$284       0.000       1.28       \$253.6       SURCHARGED         \$38.001       \$286       0.000       2.75       \$51.0       FLOD FLOD FLSK         \$38.001       \$286       0.000       2.02       \$52.0       SURCHARGED         \$38.003       \$288       0.000       2.01       102.0       SURCHARGED         \$38.004       \$289       0.000       0.19       25.9       SURCHARGED         \$38.004       \$289       0.000       0.04       2.4       FLOOD RISK         \$36.007       \$290       0.000       0.04       2.4       FLOOD RISK         \$39.000       \$291       0.000       0.04       2.4       FLOOD RISK         \$39.000       \$2920       0.000       0.75       26.1       OK         \$39.001       \$294       0.000       0.75       26.1       OK         \$39.001       \$297       0.000       0.32       23.3       SURCHARGED         \$39.002       \$297       0.000       0.32       23.3       SURCHARGED         \$39.003       \$298       0.000       0.32       23.3				1.19						
\$36.006       \$284       0.000       1.28       253.6       SURCHARGED         \$38.000       \$285       0.000       1.75       51.0       FLOOD RISK         \$38.001       \$286       0.000       2.02       52.0       SURCHARGED         \$38.002       \$287       0.000       1.91       53.3       SURCHARGED         \$38.003       \$288       0.000       2.01       102.0       SURCHARGED         \$38.004       \$289       0.000       0.19       25.9       SURCHARGED         \$36.007       \$290       0.000       0.04       2.4       FLOOD RISK         \$36.008       \$291       0.000       0.04       2.4       FLOOD RISK         \$39.000       \$293       0.000       1.01       36.1       SURCHARGED         \$40.000       \$294       0.000       0.75       26.1       0K         \$39.001       \$295       0.000       1.90       67.6       SURCHARGED         \$41.000       \$294       0.000       0.36       23.6       SURCHARGED         \$39.002       \$297       0.000       0.36       23.3       SURCHARGED         \$39.003       \$299       0.000       0.07       2.										
\$38.000       \$285       0.000       1.75       51.0       FLOOD RISK         \$38.001       \$286       0.000       2.02       52.0       SURCHARGED         \$38.002       \$287       0.000       1.91       53.3       SURCHARGED         \$38.003       \$288       0.000       2.01       102.0       SURCHARGED         \$38.004       \$289       0.000       0.19       25.9       SURCHARGED         \$36.007       \$290       0.000       0.30       81.8       FLOOD RISK         \$36.007       \$290       0.000       0.30       81.8       FLOOD RISK         \$36.007       \$290       0.000       0.30       81.8       FLOOD RISK         \$36.008       \$291       0.000       0.04       2.4       FLOOD RISK         \$39.000       \$293       0.000       1.01       36.1       SURCHARGED         \$40.000       \$294       0.000       0.75       26.1       0K         \$39.001       \$295       0.000       1.02       20       SURCHARGED         \$39.002       \$297       0.000       0.32       23.3       SURCHARGED         \$39.003       \$298       0.000       0.67       8 <td></td>										
S38.001       S286       0.000       2.02       52.0       SURCHARGED         S38.002       S287       0.000       1.91       53.3       SURCHARGED         S38.003       S288       0.000       2.01       102.0       SURCHARGED         S38.004       S289       0.000       0.19       25.9       SURCHARGED         S36.007       S290       0.000       0.30       81.8       FLOOD RISK         S36.008       S291       0.000       0.04       2.4       FLOOD RISK         S39.000       S293       0.000       1.01       36.1       SURCHARGED         S40.000       S294       0.000       0.75       26.1       0K         S39.001       S295       0.000       1.90       67.6       SURCHARGED         S39.001       S295       0.000       0.36       23.6       SURCHARGED         S39.002       S297       0.000       0.36       23.3       SURCHARGED         S39.003       S298       0.000       0.32       23.3       SURCHARGED         S42.001       S301       0.000       0.69       67.8       0K         S42.001       S302       0.000       1.70       SURCHARGED										
S38.003       S288       0.000       2.01       102.0       SURCHARGED         S38.004       S289       0.000       0.19       25.9       SURCHARGED         S36.007       S290       0.000       0.30       81.8       FLOOD RISK         S36.000       S293       0.000       1.01       36.1       SURCHARGED         S40.000       S294       0.000       0.75       26.1       OK         S39.001       S295       0.000       1.90       67.6       SURCHARGED         S40.000       S294       0.000       0.06       2.0       SURCHARGED         S41.000       S296       0.000       0.36       23.6       SURCHARGED         S39.002       S297       0.000       0.36       23.3       SURCHARGED         S39.003       S298       0.000       0.32       23.3       SURCHARGED         S42.001       S302       0.000       0.69       67.8       OK         S42.002       S303       0.000       1.05       117.0       SURCHARGED         S42.002       S304       0.000       2.45       128.2       SURCHARGED         S42.004       S305       0.000       1.65       178.4 <td></td>										
S38.004       S289       0.000       0.19       25.9       SURCHARGED         S36.007       S290       0.000       0.30       81.8       FLOOD RISK         S36.008       S291       0.000       1.01       36.1       SURCHARGED         S40.000       S293       0.000       1.01       36.1       SURCHARGED         S40.000       S294       0.000       0.75       26.1       OK         S39.001       S295       0.000       1.90       67.6       SURCHARGED         S41.000       S296       0.000       0.36       23.6       SURCHARGED         S39.002       S297       0.000       0.36       23.3       SURCHARGED         S39.002       S297       0.000       0.36       23.3       SURCHARGED         S39.003       S298       0.000       0.32       23.3       SURCHARGED         S42.001       S301       0.000       0.69       67.8       OK         S42.002       S303       0.000       1.05       117.0       SURCHARGED         S42.003       S304       0.000       2.45       128.2       SURCHARGED         S42.003       S304       0.000       1.65       177.0 <td>\$38.002</td> <td>S287</td> <td>0.000</td> <td>1.91</td> <td></td> <td>53.3</td> <td>SURCHARGED</td> <td></td> <td></td> <td></td>	\$38.002	S287	0.000	1.91		53.3	SURCHARGED			
\$36.007       \$290       0.000       0.30       81.8       FLOOD RISK         \$36.008       \$291       0.000       0.04       2.4       FLOOD RISK         \$39.000       \$293       0.000       1.01       36.1       SURCHARGED         \$40.000       \$294       0.000       0.75       26.1       0K         \$39.001       \$295       0.000       1.90       67.6       SURCHARGED         \$41.000       \$296       0.000       0.36       23.6       SURCHARGED         \$39.002       \$297       0.000       0.36       23.3       SURCHARGED         \$39.003       \$298       0.000       0.32       23.3       SURCHARGED         \$39.004       \$299       0.000       0.32       23.3       SURCHARGED         \$42.000       \$301       0.000       0.69       67.8       0K         \$42.001       \$302       0.000       1.95       117.0       SURCHARGED         \$42.002       \$303       0.000       1.05       117.0       SURCHARGED         \$42.003       \$304       0.000       2.45       128.2       SURCHARGED         \$42.004       \$305       0.000       1.81       145.1 <td></td>										
S36.008       S291       0.000       0.04       2.4 FLOOD RISK         S39.000       S293       0.000       1.01       36.1       SURCHARGED         S40.000       S294       0.000       0.75       26.1       OK         S39.001       S295       0.000       1.90       67.6       SURCHARGED         S41.000       S296       0.000       0.06       2.0       SURCHARGED         S39.001       S297       0.000       0.36       23.6       SURCHARGED         S39.003       S298       0.000       0.32       23.3       SURCHARGED         S39.004       S299       0.000       0.07       2.4       SURCHARGED         S42.000       S301       0.000       0.69       67.8       OK         S42.001       S302       0.000       0.94       98.4       SURCHARGED         S42.001       S302       0.000       1.95       117.0       SURCHARGED         S42.002       S303       0.000       1.95       117.0       SURCHARGED         S42.004       S305       0.000       1.65       178.4       OK         S42.005       S306       0.000       0.65       178.4       OK										
\$39.000       \$293       0.000       1.01       36.1       SURCHARGED         \$40.000       \$294       0.000       0.75       26.1       OK         \$39.001       \$295       0.000       1.90       67.6       SURCHARGED         \$41.000       \$296       0.000       0.06       2.0       SURCHARGED         \$39.002       \$297       0.000       0.36       23.6       SURCHARGED         \$39.003       \$298       0.000       0.32       23.3       SURCHARGED         \$39.004       \$299       0.000       0.07       2.4       SURCHARGED         \$32.004       \$299       0.000       0.07       2.4       SURCHARGED         \$42.000       \$301       0.000       0.69       67.8       OK         \$42.001       \$302       0.000       1.05       117.0       SURCHARGED         \$42.002       \$303       0.000       1.05       117.0       SURCHARGED         \$42.003       \$304       0.000       2.45       128.2       SURCHARGED         \$42.004       \$305       0.000       1.70       165.2       OK         \$42.005       \$306       0.000       0.65       178.4										
\$39.001       \$295       0.000       1.90       67.6       SURCHARGED         \$41.000       \$296       0.000       0.06       2.0       SURCHARGED         \$39.002       \$297       0.000       0.36       23.6       SURCHARGED         \$39.003       \$298       0.000       0.32       23.3       SURCHARGED         \$39.004       \$299       0.000       0.07       2.4       SURCHARGED         \$42.000       \$301       0.000       0.69       67.8       OK         \$42.001       \$302       0.000       0.94       98.4       SURCHARGED         \$42.002       \$303       0.000       1.05       117.0       SURCHARGED         \$42.002       \$303       0.000       1.45       128.2       SURCHARGED         \$42.003       \$304       0.000       2.45       128.2       SURCHARGED         \$42.004       \$305       0.000       1.81       145.1       SURCHARGED         \$42.005       \$306       0.000       0.70       165.2       OK         \$42.006       \$307       0.000       0.65       178.4       OK         \$42.007       \$308       0.000       0.67       200.3		S293		1.01		36.1				
\$41.000       \$296       0.000       0.06       2.0       SURCHARGED         \$39.002       \$297       0.000       0.36       23.6       SURCHARGED         \$39.003       \$298       0.000       0.32       23.3       SURCHARGED         \$39.004       \$299       0.000       0.07       2.4       SURCHARGED         \$39.004       \$299       0.000       0.69       67.8       0K         \$42.000       \$301       0.000       0.69       67.8       0K         \$42.001       \$302       0.000       0.94       98.4       SURCHARGED         \$42.002       \$303       0.000       1.05       117.0       SURCHARGED         \$42.003       \$304       0.000       2.45       128.2       SURCHARGED         \$42.004       \$305       0.000       1.81       145.1       SURCHARGED         \$42.005       \$306       0.000       0.70       165.2       0K         \$42.006       \$307       0.000       0.65       178.4       0K         \$42.007       \$308       0.000       0.67       200.3       0K         \$42.008       \$309       0.000       0.74       207.7       SURCHARGE										
\$39.002       \$297       0.000       0.36       23.6       SURCHARGED         \$39.003       \$298       0.000       0.32       23.3       SURCHARGED         \$39.004       \$299       0.000       0.07       2.4       SURCHARGED         \$42.000       \$301       0.000       0.69       67.8       OK         \$42.001       \$302       0.000       0.94       98.4       SURCHARGED         \$42.002       \$303       0.000       1.05       117.0       SURCHARGED         \$42.003       \$304       0.000       2.45       128.2       SURCHARGED         \$42.004       \$305       0.000       1.81       145.1       SURCHARGED         \$42.004       \$305       0.000       1.65       178.4       OK         \$42.005       \$306       0.000       0.67       200.3       OK         \$42.006       \$307       0.000       0.67       200.3       OK         \$42.007       \$308       0.000       0.67       200.3       OK         \$42.008       \$309       0.000       0.74       207.7       SURCHARGED         \$42.009       \$310       0.000       0.59       27.4       SURCHAR										
\$39.003       \$298       0.000       0.32       23.3       SURCHARGED         \$39.004       \$299       0.000       0.07       2.4       SURCHARGED         \$42.000       \$301       0.000       0.69       67.8       OK         \$42.001       \$302       0.000       0.94       98.4       SURCHARGED         \$42.002       \$303       0.000       1.05       117.0       SURCHARGED         \$42.003       \$304       0.000       2.45       128.2       SURCHARGED         \$42.004       \$305       0.000       1.81       145.1       SURCHARGED         \$42.005       \$306       0.000       0.70       165.2       OK         \$42.006       \$307       0.000       0.65       178.4       OK         \$42.007       \$308       0.000       0.67       200.3       OK         \$42.008       \$309       0.000       0.67       200.3       OK         \$42.009       \$310       0.000       0.74       207.7       SURCHARGED         \$42.009       \$310       0.000       1.06       214.9       SURCHARGED         \$43.000       \$311       0.000       0.59       27.4       SURCHA										
\$42.000       \$301       0.000       0.69       67.8       OK         \$42.001       \$302       0.000       0.94       98.4       SURCHARGED         \$42.002       \$303       0.000       1.05       117.0       SURCHARGED         \$42.003       \$304       0.000       2.45       128.2       SURCHARGED         \$42.004       \$305       0.000       1.81       145.1       SURCHARGED         \$42.005       \$306       0.000       0.70       165.2       OK         \$42.006       \$307       0.000       0.65       178.4       OK         \$42.007       \$308       0.000       0.67       200.3       OK         \$42.008       \$309       0.000       0.74       207.7       SURCHARGED         \$42.009       \$310       0.000       1.06       214.9       SURCHARGED         \$43.000       \$311       0.000       0.59       27.4       SURCHARGED         \$43.001       \$312       0.000       1.06       214.9       SURCHARGED	\$39.003	S298	0.000	0.32						
\$42.001       \$302       0.000       0.94       98.4       SURCHARGED         \$42.002       \$303       0.000       1.05       117.0       SURCHARGED         \$42.003       \$304       0.000       2.45       128.2       SURCHARGED         \$42.004       \$305       0.000       1.81       145.1       SURCHARGED         \$42.005       \$306       0.000       0.70       165.2       OK         \$42.006       \$307       0.000       0.65       178.4       OK         \$42.007       \$308       0.000       0.67       200.3       OK         \$42.008       \$309       0.000       0.74       207.7       SURCHARGED         \$42.009       \$310       0.000       1.06       214.9       SURCHARGED         \$43.000       \$311       0.000       0.59       27.4       SURCHARGED         \$43.001       \$312       0.000       1.06       214.9       SURCHARGED										
\$42.002       \$303       0.000       1.05       117.0       SURCHARGED         \$42.003       \$304       0.000       2.45       128.2       SURCHARGED         \$42.004       \$305       0.000       1.81       145.1       SURCHARGED         \$42.005       \$306       0.000       0.70       165.2       0K         \$42.006       \$307       0.000       0.65       178.4       0K         \$42.007       \$308       0.000       0.67       200.3       0K         \$42.008       \$309       0.000       0.74       207.7       SURCHARGED         \$42.009       \$310       0.000       1.06       214.9       SURCHARGED         \$43.000       \$311       0.000       0.59       27.4       SURCHARGED         \$43.001       \$312       0.000       1.02       25.7       SURCHARGED										
\$42.003       \$304       0.000       2.45       128.2       SURCHARGED         \$42.004       \$305       0.000       1.81       145.1       SURCHARGED         \$42.005       \$306       0.000       0.70       165.2       0K         \$42.006       \$307       0.000       0.65       178.4       0K         \$42.007       \$308       0.000       0.67       200.3       0K         \$42.008       \$309       0.000       0.74       207.7       SURCHARGED         \$42.009       \$310       0.000       1.06       214.9       SURCHARGED         \$43.000       \$311       0.000       0.59       27.4       SURCHARGED         \$43.001       \$312       0.000       1.06       25.7       SURCHARGED										
\$42.005       \$306       0.000       0.70       165.2       OK         \$42.006       \$307       0.000       0.65       178.4       OK         \$42.007       \$308       0.000       0.67       200.3       OK         \$42.008       \$309       0.000       0.74       207.7       SURCHARGED         \$42.009       \$310       0.000       1.06       214.9       SURCHARGED         \$43.000       \$311       0.000       0.59       27.4       SURCHARGED         \$43.001       \$312       0.000       1.06       215.7       SURCHARGED										
\$42.006       \$307       0.000       0.65       178.4       OK         \$42.007       \$308       0.000       0.67       200.3       OK         \$42.008       \$309       0.000       0.74       207.7       SURCHARGED         \$42.009       \$310       0.000       1.06       214.9       SURCHARGED         \$43.000       \$311       0.000       0.59       27.4       SURCHARGED         \$43.001       \$312       0.000       1.00       25.7       SURCHARGED										
\$42.007       \$308       0.000       0.67       200.3       OK         \$42.008       \$309       0.000       0.74       207.7       SURCHARGED         \$42.009       \$310       0.000       1.06       214.9       SURCHARGED         \$43.000       \$311       0.000       0.59       27.4       SURCHARGED         \$43.001       \$312       0.000       1.00       25.7       SURCHARGED										
\$42.008       \$309       0.000       0.74       207.7       SURCHARGED         \$42.009       \$310       0.000       1.06       214.9       SURCHARGED         \$43.000       \$311       0.000       0.59       27.4       SURCHARGED         \$43.001       \$312       0.000       1.00       25.7       SURCHARGED										
\$42.009       \$310       0.000       1.06       214.9       SURCHARGED         \$43.000       \$311       0.000       0.59       27.4       SURCHARGED         \$43.001       \$312       0.000       1.00       25.7       SURCHARGED										
S43.001 S312 0.000 1.00 25 7 SURCHARGED	S42.009	S310	0.000	1.06		214.9	SURCHARGED			
S43.002 S313 0 000 FLITURE Phase 2 SURCHARGED				0.59		27.4				
				Futur	o Pha					
S43.002 S313 0.000 UIUIE THASE 2 SUCHARGED S43.003 S314 0.000 2.20 55.8 SURCHARGED										
©1982-2019 Innovyze				1000	010 -					

Atkins (Epsom)		Page 17
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

		Flooded			Pipe		
	US/MH	Volume	Flow /	Overflow	Flow		Level
PN	Name	(m³)	Cap.	(1/s)	(l/s)	Status	Exceeded
S43.004	S315	0.000	1.50		44.3	SURCHARGED	

Atkins (Epsom)		Page 18
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water Level	Surcharged Depth
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)
S43.005	S316	30 Winter	100	+20%	100/15 Summer				97.464	1.143
S43.006	S317	30 Winter	100	+20%	100/15 Summer				97.161	0.928
S44.000	S318	15 Winter	100	+20%	100/15 Summer	:			101.349	0.391
S44.001	S319	15 Winter	100	+20%	100/15 Summer	:			101.127	0.329
S44.002	S320	15 Winter	100	+20%					100.804	0.133
S44.003	S321	15 Winter	100	+20%	Future P	nase			100.138	0.110
S44.004		15 Winter	100	+20%	100/10 Summer				99.678	0.326
S44.005		15 Winter	100	+20%	100/15 Summer				99.424	0.227
S45.000		15 Winter	100	+20%					101.723	-0.077
S45.001		15 Winter	100		100/15 Summer				101.538	0.390
S45.002		15 Winter			100/15 Summer				100.298	
S45.003	S327	15 Winter	100	+20%	100/15 Summer				99.739	0.433
S44.006		15 Winter	100		100/15 Summer				99.289	0.711
S44.007		15 Winter	100		100/15 Summer				98.370	0.895
S44.008		15 Winter	100		100/15 Summer				97.724	1.155
S43.007		15 Winter	100		100/15 Summer				96.843	1.278
S43.008		30 Winter	100	+20%	100/15 Summer				96.414	1.244
S43.009		30 Winter	100		100/15 Summer				95.877	0.885
S43.010		30 Winter	100		100/15 Summer				95.630	1.175
S42.010		15 Winter	100		100/15 Summer				94.740	0.499
S46.000		15 Winter	100		100/15 Summer				104.649	0.110
S46.001		15 Winter	100		100/15 Summer				104.082	0.783
S46.002		15 Winter	100		100/15 Summer				102.213	0.271
S46.003		15 Winter	100		100/15 Summer				101.834	0.048
S46.004		15 Winter	100	+20%					101.188	-0.117
S46.005	S342	15 Winter	100	+20%					100.266	-0.123

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
\$43.005 \$43.006	S316 S317	0.000	2.09		68.5 73.5	FLOOD RISK SURCHARGED	
S44.000 S44.001	S318 S319	0.000	1.19		42.5	SURCHARGED SURCHARGED	
S44.002 S44.003	S320 S321	0.00 0.00	uture	Phas	<b>e</b> ⁹ ₇	SURCHARGED SURCHARGED	
S44.004 S44.005	<mark>S322</mark> S323	0.000 0.000	1.71 0.78		111.2 98.5	SURCHARGED	
\$45.000 \$45.001 \$45.002	\$324 \$325 \$326	0.000	0.57			OK SURCHARGED	
\$45.002 \$45.003 \$44.006	S326 S327 S328	0.000 0.000 0.000	1.81 1.73 1.27		230.0 320.6	SURCHARGED SURCHARGED SURCHARGED	
S44.007 S44.008	S329 S330	0.000 0.000	1.29 1.24		312.6 308.3	SURCHARGED SURCHARGED	Free maximum
S43.007 S43.008	S331 S332	0.000 0.000	1.99 1.74		372.3 375.3	SURCHARGED	discharge into proposed
\$43.009 \$43.010	\$333 \$334	0.000	1.59			SURCHARGED	Soakaway
\$42.010 \$46.000 \$46.001	\$335 \$337 \$338	0.000 0.000 0.000	2.41 0.78 1.27		599.2 52.0 81.6	SURCHARGED SURCHARGED SURCHARGED	Outfall to existing storm drainage network
S46.001 S46.002 S46.003	S339 S340	0.000	1.27 1.63 1.06		102.5	SURCHARGED SURCHARGED	constructed under WCC grant permission
		C	1982-20	)19 Innc	ovyze		

Atkins (Epsom)		Page 19
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:12	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)		Status	Level Exceeded
S46.004 S46.005		0.000	0.68 0.65		97.4 97.2	OK OK	



## H.3. 1 in 30-year Outputs

Atkins (1 Woodcost Ashley R	Epson,	/						I Dama I
	e Gro				Fassaroe	Housing Dev.		Page 1
101110, 10					labbaroe	nousing Dev.		
Surrey,		-			Co. Wick	OW		
Date 05/						by N.Ranya		Micro
File Storm Drainage Model 02.04.2					-			Drainage
File Storm Drainage Model_02.04.2       Checked by G.Hanratty         Innovyze       Network 2019.1								
					NCCWOLK 2	-019.1		
	2	Summary of	Criti	cal Res	ults by Max	imum Level (Rank	1) for Storr	<u>n</u>
Numh	F	Hot hole Headlc 'oul Sewage	Hot Start : ss Coef: per hect	art (mins Level (mr f (Globa tare (l/s	s) 0 n) 0 1) 0.500 Flow s) 0.000	ditional Flow - % of MADD Factor * 10m ³	/ha Storage 3. oeffiecient 0. (l/per/day) 0.	000 800 000
						Structures 13 Number		-
		R	ainfall		thetic Rainfa	<u>Il Details</u> FSR Ratio R O	.2.69	
Acno	r N/					reland Cv (Summer) O	.750	
As pe		כו	M5-60	O (mm)	<b></b>	16.900 Cv (Winter) 0	.840	
Eirea	nn	Maro	in for	Flood Ris	sk Warning (m	n) 300.0 DVD Sta	tus OFF	
Inforn						ep Fine Inertia Sta		
	ιαιι				DTS Stati	is ON		
			Profile	. ,			ummer and Winte	
		Duratio	on(s) (m	ins) 15	, 30, 60, 120	, 180, 240, 360, 480		
	Re	turn Period	(s) (ve	ars)			14	
	Re	turn Period Climate	l(s) (yea Change				:	40 30 20
	Re		-				:	30
	Re		-					30 20
	Re US/MH		Change	(%)	First (X)	First (Y) First (Z)	Wate	30 20 <b>r Surcharged</b>
PN			Change	(응) Climate		First (Y) First (Z) Flood Overflow	Wate	30 20 or Surcharged al Depth
	US/MH Name	Climate Storm	Return Period	(%) Climate Change			Wate Overflow Leva Act. (m)	30 20 er Surcharged el Depth (m)
<b>PN</b> S1.000 S1.001	US/MH	Climate	Change Return	(응) Climate			Wate Overflow Leve	or Surcharged Depth (m) 97 -0.138
S1.000	US/MH Name S1	Climate <b>Storm</b> 15 Winter	Return Period 30	(%) Climate Change +20% +20%			Wate Overflow Leve Act. (m) 84.23	30 20 er Surcharged el Depth (m) 97 -0.138 91 -0.124
S1.000 S1.001 S1.002 S1.003	<b>US/MH</b> Name S1 S2 S3 S4	Climate Storm 15 Winter 15 Summer 15 Winter 15 Winter	Return Period 30 30 30 30	(%) Climate Change +20% +20% +20%	Surcharge		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10	30 20 <b>ar Surcharged</b> <b>al Depth</b> (m) 97 -0.138 91 -0.124 09 0.243 62 -0.092
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004	<b>US/MH</b> Name S1 S2 S3 S4 S5	Climate Storm 15 Winter 15 Summer 15 Winter 15 Winter 15 Winter	Return Period 30 30 30 30 30	(%) Climate Change +20% +20% +20% +20% +20%	Surcharge		Wate           Overflow         Leve           Act.         (m)           84.22         82.92           80.11         75.16           73.02         73.02	30 20 <b>er Surcharged</b> <b>el Depth</b> (m) 97 -0.138 91 -0.124 09 0.243 62 -0.092 54 0.290
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000	<b>US/MH</b> Name S1 S2 S3 S4 S5 S6	Storm 15 Winter 15 Summer 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30	(%) Climate Change +20% +20% +20% +20% +20% +20%	Surcharge 30/15 Summer 30/15 Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.11         75.11           73.09         79.32	30 20 ar Surcharged al Depth (m) 97 -0.138 91 -0.124 09 0.243 62 -0.092 54 0.290 23 -0.143
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004	<b>US/MH</b> Name S1 S2 S3 S4 S5	Storm 15 Winter 15 Summer 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 30 30 30 30 30	(%) Climate Change +20% +20% +20% +20% +20% +20%	Surcharge		Wate           Overflow         Leve           Act.         (m)           84.22         82.92           80.11         75.16           73.02         73.02	30 20 ar Surcharged al Depth (m) 97 -0.138 91 -0.124 99 0.243 62 -0.092 54 0.290 23 -0.143 78 0.051
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000	<b>US/MH</b> Name S1 S2 S3 S4 S5 S6 S7	Storm 15 Winter 15 Summer 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30	(%) Climate Change +20% +20% +20% +20% +20% +20% +20%	Surcharge 30/15 Summer 30/15 Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.03         79.32           79.55         79.55	30 20 ar Surcharged al Depth (m) 97 -0.138 91 -0.124 99 0.243 62 -0.092 54 0.290 23 -0.143 78 0.051 57 -0.002
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10	Storm 15 Winter 15 Summer 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	(%) Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	Surcharge 30/15 Summer 30/15 Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.03         79.32           79.55         79.11           78.92         78.49	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         99       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11	Storm 15 Winter 15 Summer 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Summer	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	(%) Climate Change +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +2	Surcharge           30/15         Summer           30/15         Summer           30/15         Summer           30/15         Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.03         79.32           79.55         79.11           78.92         78.42           74.55         74.55	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12	Storm 15 Winter 15 Summer 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Winter 15 Summer 15 Summer 15 Summer	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	(%) Climate Change +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +2	Surcharge           30/15         Summer           30/15         Summer           30/15         Summer           30/15         Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.03         79.32           79.55         79.11           78.92         74.55           74.02         74.02	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	(%) <b>Climate</b> <b>Change</b> +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20%	Surcharge           30/15         Summer           30/15         Summer           30/15         Summer           30/15         Summer           30/15         Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.03         79.32           79.55         79.11           78.92         74.55           74.02         75.91	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14	Storm 15 Winter 15 Summer 15 Summer 15 Winter 15 Winter 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	(%) <b>Climate</b> <b>Change</b> +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20%	Surcharge           30/15         Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.03         79.32           79.55         79.11           78.92         74.55           74.02         75.9°           73.82         73.82	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	(%) <b>Climate</b> <b>Change</b> +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20% +20%	Surcharge           30/15         Summer           30/15         Summer           30/15         Summer           30/15         Summer           30/15         Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.03         79.32           79.55         79.11           78.92         74.55           74.02         75.91	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028
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\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>(%) Climate Change +20% +20% +20% +20% +20% +20% +20% +20%</pre>	Surcharge           30/15         Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.03         79.32           79.53         79.13           78.92         74.53           74.02         75.92           73.82         73.55           77.60         76.83           76.32         76.34	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028         00       0.480         56       0.224         53       -0.072
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>(%) Climate Change +20% +20% +20% +20% +20% +20% +20% +20%</pre>	Surcharge           30/15         Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.03         79.32           79.55         79.11           78.92         74.55           74.02         75.97           73.82         73.55           77.60         76.82           76.32         75.82	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028         00       0.480         56       0.224         53       -0.072         52       -0.111
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>(%) Climate Change +20% +20% +20% +20% +20% +20% +20% +20%</pre>	Surcharge           30/15         Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.02         79.32           79.52         79.11           78.92         74.52           74.02         75.92           73.82         73.52           77.60         76.82           75.92         75.82           75.02         75.02	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028         00       0.480         56       0.224         53       -0.072         52       -0.111         38       -0.097
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004 \$5.005	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>(%) Climate Change +20% +20% +20% +20% +20% +20% +20% +20%</pre>	Surcharge           30/15         Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.02         79.32           79.52         79.11           78.92         74.52           74.02         75.92           73.82         73.52           77.60         76.82           75.92         75.82           75.02         74.10	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028         00       0.480         56       0.224         53       -0.072         52       -0.111         38       -0.097         00       -0.084
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>(%) Climate Change +20% +20% +20% +20% +20% +20% +20% +20%</pre>	Surcharge           30/15         Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.02         79.32           79.52         79.11           78.92         74.52           74.02         75.92           73.82         73.52           77.60         76.82           75.92         75.82           75.02         75.02	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028         00       0.480         56       0.224         53       -0.072         52       -0.111         38       -0.097         00       -0.084         73       0.269
\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004 \$5.005 \$5.006	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>(%) Climate Change +20% +20% +20% +20% +20% +20% +20% +20%</pre>	Surcharge 30/15 Summer 30/15 Summer 30/15 Summer 30/15 Summer 30/15 Summer 30/15 Summer 30/15 Summer 30/15 Summer 30/15 Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.02         79.32           79.52         79.11           78.92         74.52           74.02         75.92           73.82         73.52           77.60         76.82           75.92         75.82           75.02         74.10           73.32         75.62	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028         00       0.480         56       0.224         53       -0.072         52       -0.111         38       -0.097         00       -0.084         73       0.269         67       0.916
<pre>\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004 \$5.005 \$5.006 \$5.007 \$5.008 \$2.006</pre>	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>(%)</pre> Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	Surcharge		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.02         79.32           79.52         79.11           78.92         74.52           74.02         75.99           73.82         73.52           77.66         76.82           75.02         74.10           73.32         72.90           72.66         72.23	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028         00       0.480         56       0.224         53       -0.072         52       -0.111         38       -0.097         00       -0.084         73       0.269         67       0.916         03       0.828         53       0.555
<pre>\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004 \$5.005 \$5.006 \$5.007 \$5.008 \$2.006 \$2.007</pre>	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S26	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>(%)</pre> Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	Surcharge		Wate           Overflow         Leve           Act.         (m)           84.22         80.10           75.10         73.00           79.33         79.55           79.11         78.92           74.52         74.02           75.99         73.83           73.55         77.66           76.83         75.92           75.92         73.83           75.92         73.83           75.92         73.83           75.93         75.92           73.83         75.92           74.10         75.92           75.92         73.83           75.93         75.93           75.94         75.92           75.95         75.93           75.92         75.93           75.93         75.93           75.94         75.94           75.95         75.95           75.92         75.93           75.93         75.92           75.94         75.92           75.95         75.92           75.92         75.92           75.93         75.92           75.94         75.92	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028         00       0.480         56       0.224         53       -0.072         52       -0.111         38       -0.097         00       -0.084         73       0.269         67       0.916         03       0.828         53       0.555         68       0.493
<pre>\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004 \$5.005 \$5.006 \$5.007 \$5.008 \$2.006 \$2.007 \$2.008</pre>	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S26 S27	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>(%)</pre> Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	Surcharge           30/15         Summer           30/15         Summer		Wate           Overflow         Leve           Act.         (m)           84.22         82.99           80.10         75.10           73.00         79.33           79.55         79.11           78.92         74.53           74.03         75.99           73.83         73.55           77.66         76.83           75.03         75.03           74.10         73.33           72.90         72.66           72.23         72.00           71.23         72.00 <td>30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028         00       0.480         56       0.224         53       -0.072         52       -0.111         38       -0.097         00       -0.844         73       0.269         67       0.916         03       0.828         53       0.555         68       0.493         34       0.109</td>	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028         00       0.480         56       0.224         53       -0.072         52       -0.111         38       -0.097         00       -0.844         73       0.269         67       0.916         03       0.828         53       0.555         68       0.493         34       0.109
<pre>\$1.000 \$1.001 \$1.002 \$1.003 \$1.004 \$2.000 \$3.000 \$3.001 \$3.002 \$2.001 \$2.002 \$2.003 \$4.000 \$2.004 \$2.005 \$5.000 \$5.001 \$5.002 \$5.003 \$5.004 \$5.005 \$5.006 \$5.007 \$5.008 \$2.006 \$2.007</pre>	US/MH Name S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S26	Storm 15 Winter 15 Winter	Return Period 30 30 30 30 30 30 30 30 30 30 30 30 30	<pre>(%)</pre> Climate Change +20% +20% +20% +20% +20% +20% +20% +20%	Surcharge		Wate           Overflow         Leve           Act.         (m)           84.22         80.10           75.10         73.00           79.33         79.55           79.11         78.92           74.52         74.02           75.99         73.83           73.55         77.66           76.83         75.92           75.92         73.83           75.92         73.83           75.92         73.83           75.93         75.92           73.83         75.92           74.10         75.92           75.92         73.83           75.93         75.93           75.94         75.92           75.95         75.93           75.92         75.93           75.93         75.93           75.94         75.94           75.95         75.95           75.92         75.93           75.93         75.92           75.94         75.92           75.95         75.92           75.92         75.92           75.93         75.92           75.94         75.92	30         20         ar       Surcharged         al       Depth         (m)         97       -0.138         91       -0.124         09       0.243         62       -0.092         54       0.290         23       -0.143         78       0.051         57       -0.002         18       -0.033         95       1.420         52       -0.111         24       0.106         79       0.479         15       0.213         15       0.028         00       0.480         56       0.224         53       -0.072         52       -0.111         38       -0.097         00       -0.844         73       0.269         67       0.916         03       0.828         53       0.555         68       0.493         34       0.109         36       0.051

Atkins (Epsom)		Page 2
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	1

PN	US/MH Name	Flooded Volume (m ³ )	Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.000	0.32		29.6	OK	
S1.001	S2	0.000	0.64		130.3	OK	
S1.002	<b>S</b> 3	0.000	1.04		212.0	SURCHARGED	
S1.003	S4	0.000	0.91		274.5	OK	
S1.004	S5	0.000	1.10		325.0	SURCHARGED	
S2.000	S6	0.000	0.54		83.3	OK	
S3.000	S7	0.000	1.05		57.9	SURCHARGED	
S3.001	S8	0.000	1.02		63.9	OK	
S3.002	S9	0.000	1.00		74.4	OK	
S2.001	S10	0.000	0.31		25.3	SURCHARGED	
S2.002	S11	0.000	0.72		115.0	OK	
S2.003	S12	0.000	1.06		113.4	SURCHARGED	
S4.000	S13	0.000	1.12		88.8	SURCHARGED	
S2.004	S14	0.000	1.61		214.0	SURCHARGED	
S2.005	S15	0.000	1.09		213.7	SURCHARGED	
S5.000	S16	0.000	1.32		72.0	SURCHARGED	
S5.001	S17	0.000	1.44		88.1	SURCHARGED	
S5.002	S18	0.000	0.92		110.9	OK	
S5.003	S19	0.000	0.70		127.0	OK	
S5.004	S20	0.000	0.78		143.8	OK	
S5.005	S21	0.000	0.85		162.3	OK	
S5.006	S22	0.000	0.64		190.8	SURCHARGED	
S5.007	S23	0.000	1.15		200.2	SURCHARGED	
S5.008	S24	0.000	1.55		200.8	SURCHARGED	
S2.006	S25	0.000	2.87		438.6		
S2.007	S26	0.000	0.53		79.7		
S2.008	S27	0.000	1.54		87.4	SURCHARGED	
S2.009	S28	0.000	0.90		94.1		
S2.010	S29	0.000	0.98		103.2	SURCHARGED	

Atkins (Epsom)		Page 3
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water Level	Surcharged Depth
PN	Name	Storm		Change	Surcharge	Flood	Overflow	Act.	(m)	(m)
S2.011	S30	15 Winter	30	+20%	30/15 Summer				70.812	0.337
S2.012	S31	15 Winter	30		30/15 Summer				70.744	0.469
S1.005	S32	15 Winter	30	+20%	30/15 Summer				70.714	0.596
S1.006	S33	15 Winter	30	+20%	30/15 Summer				70.468	0.715
S1.007	S34	30 Winter	30		30/15 Summer				70.226	0.733
S1.008	S35	30 Winter	30		30/15 Summer				70.010	0.643
S1.009	S36	30 Winter	30		30/15 Summer				69.374	0.332
S1.010	S37 S38	30 Winter 15 Winter	30 30		30/15 Summer 30/15 Summer				68.757	0.164
S6.000 S6.001		1440 Winter	30						77.153	0.668
S6.002		1440 Winter	30	Futt	ure Phase				72.252	-0.277
S6.003	S41	1440 Winter	30	+20%					69.116	-0.272
S1.011	S42	30 Winter	30	+20%					68.320	-0.188
S1.012	S43	30 Winter	30	+20%					67.021	-0.297
S1.013	S44	30 Winter	30	+20%					64.979	-0.301
S1.014	S45	30 Winter	30	+20%					63.060	-0.312
S1.015 S1.016	S46 S47	30 Winter 30 Winter	30 30	+20% +20%					61.073 57.863	-0.286 -0.324
S1.010 S1.017	S48	30 Winter	30	+20%					54.899	-0.266
S1.018	S49	30 Winter	30	+20%					54.040	-0.234
S1.019	S50	30 Winter	30	+20%					49.629	-0.407
S1.020	S51	30 Winter	30	+20%					49.154	-0.071
S1.021	S52	30 Winter	30	+20%	30/15 Summer				48.816	0.091
S1.022	S53	30 Winter	30		30/15 Winter				44.129	0.029
S1.023	S54	30 Winter	30	+20%	20 (15 57 )				41.206	0.000
\$1.024 \$7.000	<mark>S55</mark> S56	30 Winter 15 Winter	<mark>30</mark> 30	+20% +20%	30/15 Winter				38.483 68.679	0.043 -0.193
s7.000	S50 S57	15 WINCEI 15 Summer	30	+20%					67.990	-0.175
\$7.002	S58	15 Summer	30	+20%					67.657	-0.164
s7.003	S59	15 Summer	30	+20%					66.858	-0.163
S7.004	S60	15 Winter	30	+20%					65.444	-0.145
s7.005	S61	15 Winter	30	+20%					64.229	-0.083
S8.000	S62	15 Winter	30		30/15 Summer				64.546	0.456
S8.001	S63	15 Winter	30		30/15 Summer				64.546	0.578
\$8.002	<mark>S64</mark> S65	15 Winter 15 Winter	<mark>30</mark> 30	+20% +20%	30/15 Summer				64.098	0.687
\$7.006 \$7.007	565 566	15 Winter 15 Winter	30		30/15 Summer				61.631 60.090	-0.067 0.527
s7.007	S67	15 Winter	30		30/15 Summer				58.545	0.689
\$7.009	S68	15 Winter	30		30/15 Summer				57.550	0.726
s7.010	S69	15 Winter	30		30/15 Summer				51.621	0.629
S7.011	S70	15 Winter	30	+20%	30/15 Summer				48.741	0.804
\$7.012	S71	15 Winter	30	+20%	30/15 Summer				47.686	1.808
\$7.013	S72	15 Winter	30		30/15 Summer				46.719	1.059
S7.014	S73	15 Winter	30		30/15 Summer				46.229	0.638
\$9.000 \$7.015	S74 S75	15 Winter 15 Winter	30 <mark>30</mark>	+20%	30/15 Summer				49.459 44.036	-0.141 0.249
\$7.015 \$10.000	S75 S76	15 Winter 15 Winter	30	+20% +20%	SUTTS Summer				44.036	-0.136
S10.000	S70	15 Winter	30		30/15 Summer				40.468	0.233
s7.017	S78	15 Winter	30		30/15 Summer				38.523	0.108
S1.025	S79	15 Winter	30	+20%	30/15 Summer				36.466	0.389
S1.026	S80	30 Winter	30		30/15 Summer				35.483	1.533
S1.027	S81	30 Winter	30		30/15 Summer				34.868	1.284
S1.028	S82	30 Winter	30		30/15 Summer				34.429	1.335
S1.029 S1.030	S83 S84	30 Winter	30 30		30/15 Summer 30/15 Summer				33.989	0.987
S1.030 S1.031	S84 S85	30 Winter 30 Winter	30		30/15 Summer 30/15 Summer				33.547 33.105	0.709 0.520
51.051	500	JU WINCEL								0.020
				©2	1982-2019 Ir	novyze				

Atkins (Epsom)									Page 4
Woodcoste Grove			Fas	saroe Ho	usin	g	Dev.		
Ashley Road, Epsom									
Surrey, KT18 5BW		Co. Wicklow.				- Micro			
Date 05/04/2022 11:22	Des	igned by	N.R	an	ıya				
File Storm Drainage N	4odel_02	.04.2	. Che	cked by	G.Ha	nr	atty		Drainage
Innovyze			Net	work 201	9.1				
Summary	of Crit:	ical Res	ults ]	oy Maximu	ım Le	ev	el (Rank 1	.) for Stor	<u>cm</u>
		Flooded			Pip	e			
				Overflow				Level	
PN	Name	(m³)	Cap.	(1/s)	(1/s	3)	Status	Exceeded	
S2.	011 S30	0.000	0.93		127	.4	SURCHARGED		
S2.			1.15				SURCHARGED		
S1.			2.88				SURCHARGED		
S1. S1.			1.60 1.54				SURCHARGED SURCHARGED		
S1. S1.			1.45				SURCHARGED		
S1.			1.16				SURCHARGED		
S1.			1.61				SURCHARGED		
S6. S6.			2.34				SURCHARGED SURCHARGED		
56. 56.		0.000	-utur	e Phas	se	.8 .8	SURCHARGED OK		
S6.			0.02			.8	OK		
S1.			0.87		403		OK		
S1. S1.			0.60 0.59		410 419		OK OK		
S1. S1.			0.56		426		OK		
S1.			0.63		432		OK		
S1.			0.53		447				
S1.			0.67		452		OK		
S1. S1.			0.75 0.43		457 470		OK OK		
S1.			0.82		862		OK		
S1.	021 S52	0.000	1.32		861	.9	SURCHARGED		
S1.			1.12				SURCHARGED		
SI. S1.	023 S54 024 S55		1.02 1.16				OK SURCHARGED		
S7.			0.05			.2			
S7.			0.11			.4	OK		
S7.			0.16			.9	OK		
S7.			0.17		14		OK		
S7. S7.			0.27 0.72		24 62				
S8.			0.12				SURCHARGED		
S8.	001 S63	0.000	0.94		96	.1	SURCHARGED		
S8.			1.71				SURCHARGED		
S7. S7.			1.00 1.39		244		OK SURCHARGED		
57. S7.			1.39				SURCHARGED		
s7.			1.91				SURCHARGED		
S7.			1.67				SURCHARGED		
S7.			2.40				SURCHARGED		
S7. S7.			2.62 2.67				SURCHARGED SURCHARGED		
S7.			3.00				SURCHARGED		
S9.	000 S74	0.000	0.30		33	.6	OK		
S7.			1.21				SURCHARGED		
S10. S7.			0.33		33 405		OK SURCHARGED		
57. S7.			1.20				SURCHARGED		
S1.			1.68				SURCHARGED		
S1.	026 S80	0.000	1.64		1227	.6	SURCHARGED		
S1.			1.64				SURCHARGED		
S1. S1.			1.64 1.64				SURCHARGED SURCHARGED		
S1. S1.			1.64				SURCHARGED		
51.									

Atkins (Epsom)		Page 5
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	·

	TTC / MT	Flooded		Overflow	Pipe		T area 1
PN	Name		•	(1/s)	Flow (l/s)	Status	Level Exceeded
S1.031	S85	0.000	1.51		1258.2	SURCHARGED	

Atkins (Epsom)		Page 6
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	st	corm		Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.032	S86	960	Winter	30	+20%	30/15 Summer				32.867
S1.033	S87	960	Winter	30		30/15 Summer				32.861
S1.034	S88	960	Winter	30	+20%					25.041
S1.035	S89	960	Winter	30	+20%					24.104
S1.036	S90	960	Winter	30	+20%					22.933
S11.000	S92		Winter	30	+20%	30/15 Summer				95.017
S12.000	S93		Winter	30	+20%					98.683
S12.001	S94		Winter	30		30/15 Summer				98.109
S13.000	S95		Winter	30	+20%	00/15 0				101.467
S13.001	S96		Winter	30		30/15 Summer				99.211
\$13.002 \$12.002	S97 S98		Winter Winter	30 30		30/15 Summer 30/15 Summer				97.543 97.399
\$12.002 \$14.000	S90 S99		Winter	30		30/15 Summer				96.944
\$14.000 \$12.003	S100		Winter	30		30/15 Summer				96.676
S12.003	S100		Winter	30		30/15 Summer				95.193
S11.001	S102		Winter	30	±1					94.821
S15.000	S103		Winter	30	+] <b>-</b> [	uture Phas	e			97.527
S15.001	S104		Winter	30		30/15 Summer				96.736
S15.002	S105		Winter	30		30/15 Summer				96.473
s15.003	S106	15	Winter	30	+20%					95.687
S15.004	S107		Winter	30	+20%					95.271
S15.005	S108	15	Winter	30	+20%					94.807
S15.006	S109	15	Winter	30	+20%	30/15 Summer				94.227
S11.002	S110		Winter	30		30/15 Summer				93.601
S16.000	S111		Winter	30	+20%					96.624
S16.001	S112		Winter	30	+20%					96.030
S16.002	S113		Winter	30		30/15 Summer				94.828
S16.003	S114		Winter	30		30/15 Summer				94.096
S16.004 S11.003			Winter Winter	30 30		30/15 Summer 30/15 Summer				93.475 93.475
\$11.003 \$11.004			Winter	30		30/15 Summer				93.475
S11.004			Winter	30	+20%	JU/IJ JUILLIEI				91.181
S11.000	S110 S120		Winter	30	+20%					77.796
S18.000	S121		Winter	30	+20%					84.194
S18.001	S122		Winter	30	+20%					83.027
S18.002	S123	15	Winter	30	+20%	30/15 Summer				81.538
S18.003	S124	15	Winter	30	+20%	30/15 Summer				79.588
S18.004	S125	15	Winter	30	+20%					78.213
S17.001	S126	15	Winter	30	+20%	30/15 Summer				77.365
S17.002			Winter			30/15 Winter				70.797
S19.000	S128		Winter	30	+20%					75.816
S19.001	S129		Summer	30	+20%					75.621
S19.002	S130		Winter	30	+20%	20/15 Common				75.436
\$20.000 \$20.001	S131 S132		Winter Winter	30 30		30/15 Summer				76.123 76.088
\$20.001 \$20.002	S132 S133		Winter	30	+2 F	uture Pha	se			75.738
\$19.003	S133		Winter	30	+211	30/15 Summer				75.423
S19.004	S135		Winter	30	+20%					70.536
s17.003			Winter	30		30/15 Summer				69.961
S17.004			Winter	30		30/15 Summer				69.960
S17.005	S138	1440	Winter	30		30/15 Summer				69.959
S17.006	S139	1440	Winter	30	+20%					67.507
S21.000	S140	15	Winter	30	+20%					93.948
S21.001	S141		Winter	30	+20%					93.553
S21.002	S142		Winter	30	+20%					93.377
S21.003	S143	15	Winter	30	+20%					93.263
					©198	32-2019 Innov	yze			

Atkins (Epson Noodcoste Gro				Fa	ssaroe	Housing				Page 7
shley Road,				ra.	SSULUE	110401119	DCV.			
Surrey, KT18	-			Co	. Wicki	low.				Micco
ate 05/04/20		22				by N.Ra	nya			Micro
Tile Storm Dr			L 02.04.2.		-	oy G.Han	-			Drainac
Innovyze			_		twork 2					
7										
	Summary	y of C	ritical R	esults	by Max	imum Le	vel (1	Rank 1) fo	r Storm	
			Surcharged	Flooded			Pipe			
		US/MH	Depth			Overflow			Level	
	PN	Name	(m)	(m³)	Cap.	(l/s)	(1/s)	Status	Exceeded	
	S1.032	S86	0.475	0.000	0.34		258.0	SURCHARGED		
	S1.033	S87	1.086	0.000				SURCHARGED		
	S1.034	S88	-0.176	0.000			66.0	OK		
	S1.035 S1.036	S89 S90	-0.174 -0.175	0.000 0.000			66.0 66.0	OK OK		
	S11.000	S92	0.217					SURCHARGED		
	S12.000	S93	-0.117	0.000			42.3	OK		
	S12.001	S94	0.309	0.000				SURCHARGED		
	\$13.000 \$13.001	S95 <mark>S96</mark>	-0.123 0.764	0.000			41.3	OK SURCHARGED		
	s13.001	S97	0.201	0.000				SURCHARGED		
	s12.002	S98	0.651	0.000	1.41		194.5	SURCHARGED		
	S14.000	S99	0.251	0.000				SURCHARGED		
	\$12.003 \$12.004		0.406 0.591	0.000				SURCHARGED SURCHARGED		
	S12.001		0.443			haco		SURCHARGED		
	s15.000		-0.049			hase	72.8	OK		
	S15.001		0.336	0.000	1.63			SURCHARGED		
	s15.002 s15.003		0.173 -0.113	0.000			<b>89.2</b> 106.2	SURCHARGED OK		
	s15.003		-0.090	0.000			124.1	OK		
	S15.005		-0.062	0.000			143.1	OK		
	S15.006		0.096	0.000				SURCHARGED		
	S11.002 S16.000		0.350	0.000	2.13 0.96		530.6 60.2	SURCHARGED OK		
	S16.000	S111 S112	-0.077	0.000	0.90		170.2	OK		
	S16.002	S113	0.044	0.000	1.02		180.7	SURCHARGED		
	S16.003	S114	0.322	0.000	1.09			SURCHARGED		
	S16.004	S115 S116	0.496	0.000	0.20			SURCHARGED		
	S11.004	S117	1.349	0.000	0.05			FLOOD RISK		
	S11.005	S118	-0.194	0.000	0.05		2.3	OK		
	S17.000	S120	-0.083	0.000	0.71		43.8	OK		
	S18.000 S18.001	S121 S122	-0.111 -0.079	0.000	0.51 0.75		42.3 61.4	OK OK		
	s18.001	S122 S123	0.563	0.000	1.11			SURCHARGED		
	S18.003	S124	0.197	0.000	1.10			SURCHARGED		
	S18.004	S125	-0.125	0.000	0.76		246.7	OK		
	S17.001 S17.002	S126 S127	0.206 0.018	0.000 0.000	1.20 1.03			SURCHARGED SURCHARGED		
	\$17.002 \$19.000	S127 S128	-0.143	0.000	0.29		16.2	OK		
	S19.001	S129	-0.106	0.000	0.54		16.3	OK		
	S19.002	S130	-0.137	0.000	0.30		16.2	OK		
	\$20.000 \$20.001	S131 S132	0.323	0.000	0.44	1		SURCHARGED SURCHARGED		
	s20.001	S132 S133	0.421	Fut	ure P	hase		SURCHARGED		
	919 003	\$134	0 111	0 000	1 42		90 1	SURCHARGED		
	S19.004	S135	-0.085	0.000	0.87		89.3	OK		
	S17.003 S17.004	S136 S137	0.174 0.911	0.000	0.09 0.10			SURCHARGED SURCHARGED		
	S17.004	S137 S138	1.534	0.000	0.03			SURCHARGED		
	S17.006	S139	-0.200	0.000	0.03		2.4	OK		
	S21.000	S140	-0.096	0.000	0.77		69.2	OK		
	S21.001 S21.002	S141 S142	-0.089 -0.061	0.000	0.82 0.88		80.4 79.6	OK OK		
		~	0.001	0.000	0.00		, 0	ON		

Atkins (Epsom)		Page 8
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamaye
Innovyze	Network 2019.1	

PN	US/MH Name	Surcharged Depth (m)		Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded
s21.003	S143	0.000	0.000	0.92		149.2	OK	

Atkins (Epsom)		Page 9
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	Storm		Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.		Surcharged Depth (m)
PN	Name	Storm	Period	Change	Surcharge	F100d	Overiiow	ACT.		
S21.004	S144	15 Winter	30		30/15 Summer				92.933	0.182
S21.005	S145	15 Winter	30		30/15 Summer				92.721	0.332
S21.006	S146	15 Winter	30		30/15 Summer				91.252	0.628
S22.000	S147	15 Winter	30	+20%					99.877	-0.142
S22.001	S148	15 Winter		+20%					99.724	-0.134
S22.002	S149	15 Winter	30	+20% +20%					99.484	-0.071
S22.003 S22.004	S150 S151	15 Winter 15 Winter	30 30		30/15 Summer				98.832 98.230	-0.099 0.199
S22.004	S151 S152	15 Winter 15 Winter	30		30/15 Summer				97.574	0.199
S22.005	S152 S153	15 Winter	30		30/15 Summer				96.815	0.443
S22.000	S155 S154	15 Winter			30/15 Summer				96.475	0.686
S22.008	S151	15 Winter	30		30/15 Summer				96.233	0.550
S22.009	S156	15 Winter	30		30/15 Summer				95.991	0.402
S22.010	S157	15 Winter			30/15 Summer				95.747	0.387
S22.011	S158	15 Winter	30		30/15 Summer				95.504	0.306
S22.012	S159	15 Winter	30		30/15 Summer				95.251	0.221
S22.013	S160	15 Winter	30	+20%	30/15 Summer				95.125	0.228
S22.014	S161	15 Winter	30	+20%	30/15 Summer				94.993	0.294
S22.015	S162	15 Winter	30	+20%	30/15 Summer				94.856	0.362
S22.016	S163	15 Winter	30	+20%	30/15 Summer				94.713	0.415
S22.017	S164	15 Winter	30	+20%	30/15 Summer				94.011	0.613
S22.018	S165	15 Winter	30	+20%	30/15 Summer				93.778	0.576
S23.000	S166	15 Winter	30	+20%					95.176	-0.054
S24.000	S167	15 Winter	30	+20%		Phase			96.335	0.204
S24.001	S168	15 Winter				111400			95.866	0.085
S24.002	S169	15 Winter	30		30/15 Summer				95.528	0.165
S23.001	S170	15 Winter	30		30/15 Summer				94.712	0.449
\$23.002 \$22.019	S171 S172	15 Winter 15 Winter	30 30		30/15 Summer 30/15 Summer				94.142 93.542	0.316
S22.019	S172 S173	15 Winter 15 Winter	30		30/15 Summer				92.889	0.430
S25.000	S173	15 Winter		+20%	50/15 Summer				95.161	-0.156
S26.000	S175	15 Winter	30	+20%					96.125	-0.124
S26.001	S176	15 Summer	30	+20%					95.404	-0.092
S26.002	S177	15 Summer	30	+20%					95.103	-0.096
S26.003	S178	15 Summer	30	+20%					94.944	-0.052
S26.004	S179	15 Summer	30	+20%					94.850	-0.061
S25.001	S180	15 Winter	30	+20%	30/15 Summer				93.958	0.350
S25.002	S181	15 Winter	30	+20%	30/15 Summer				92.856	0.466
S22.021	S182	15 Winter	30	+20%	30/15 Summer				91.799	0.774
S21.007	S183	15 Winter	30	+20%	30/15 Summer				90.705	0.445
S27.000	S184	15 Winter	30	+20%	30/15 Summer				91.556	0.018
S21.008	S185	15 Winter	30		30/15 Summer				89.297	0.722
S21.009	S186	15 Winter			30/15 Summer				88.552	0.702
S21.010	S187	15 Winter	30		30/15 Summer				88.149	0.558
S21.011	S188	15 Winter	30		30/15 Summer				87.743	0.250
S21.012	S189	60 Winter	30	+20%					87.130	-0.243
S21.013	S190	60 Winter	30	+20%					87.033	-0.243
S21.014	S191	60 Winter	30	+20%					86.876	-0.328
S21.015	S192 S193	60 Winter	30	+20% +20%					86.703	-0.238
S21.016		60 Winter 240 Winter	30 30	+20% +20%					86.618	-0.222 -0.246
S21.017 S21.018		240 Winter 240 Winter	30	+20% +20%					86.504	
S21.018 S21.019		240 Winter 240 Winter	30		30/30 Winter				86.489 86.474	-0.101 0.374
S21.019 S21.020		240 Winter 240 Winter	30	+20%	20/20 WINCEL				85.168	-0.125
S21.020		240 Winter 240 Winter	30	+20%					84.713	-0.123
S21.021		720 Winter	30	+20%					83.663	-0.087
	~ _ ~ ~ ~		00	0 0						0.00/

Atkins (Epsom) Woodcoste Grove			Face	saroe Ho	laina	Dott		Page 10
Ashley Road, Epsom			rass	balle nu	JETIN	Dev.		
			Ca	Wicklow				
Surrey, KT18 5BW Date 05/04/2022 11:22								- Micro
	1.1.00	04 0		lgned by		-		Drainac
File Storm Drainage Mo	del_02.	.04.2		cked by (		ratty		
Innovyze			Netv	vork 201	9.1			
Summary of	<u>Criti</u>	<u>cal Res</u>	<u>ults b</u>	y Maximu	um Lev	vel (Rank	<u>1) for Sto</u>	<u>rm</u>
		Flooded	/		Pipe			
PN	US/MH Name	(m ³ )	Flow / Cap.	Overflow (1/s)	Flow (l/s)	Status	Level Exceeded	
EIN	Name	(111)	cap.	(1/5)	(1/5)	Status	Exceeded	
S21.00	4 S144	0.000	0.83		184.3	SURCHARGED		
S21.00		0.000	0.91			SURCHARGED		
S21.00		0.000	1.28			SURCHARGED		
S22.00 S22.00		0.000	0.54 0.58		42.9 58.6	OK OK		
S22.00 S22.00		0.000	0.38		97.2			
\$22.00		0.000	0.76		134.0	OK		
S22.00		0.000	0.90		158.3	SURCHARGED		
\$22.00		0.000	0.93			SURCHARGED		
S22.00		0.000	0.89			SURCHARGED		
S22.00 S22.00		0.000	1.61 1.68			SURCHARGED SURCHARGED		
S22.00		0.000	1.00			SURCHARGED		
S22.01		0.000	1.26			SURCHARGED		
S22.01	1 S158	0.000	1.25		200.0	SURCHARGED		
S22.01		0.000	0.98			SURCHARGED		
S22.01		0.000	0.82			SURCHARGED		
S22.01 S22.01		0.000	0.83 0.88			SURCHARGED SURCHARGED		
S22.01 S22.01		0.000	0.89			SURCHARGED		
S22.01		0.000	1.13			SURCHARGED		
S22.01	8 S165	0.000	1.63			SURCHARGED		
\$23.00	0 S166 0 S167	0.000	0.80		62.8	OK		
S24.00	1 S168			e Pha		SURCHARGED SURCHARGED		
\$24.00			1.01			SURCHARGED		
\$23.00 \$23.00		0.000	1.18 0.93			SURCHARGED SURCHARGED		
S22.01		0.000	1.87			SURCHARGED		
S22.02		0.000	1.87			SURCHARGED		
\$25.00		0.000	0.46		71.1	OK		
S26.00		0.000	0.42		36.6	OK		
S26.00 S26.00		0.000	0.66 0.61		37.4 38.8	OK OK		
S26.00 S26.00		0.000	0.01		38.6	OK		
\$26.00		0.000	0.87		73.3	OK		
\$25.00		0.000	1.21		188.9	SURCHARGED		
\$25.00		0.000	1.53			SURCHARGED		
S22.02		0.000	1.18			SURCHARGED		
S21.00 S27.00		0.000	2.00 1.00			SURCHARGED SURCHARGED		
S27.00 S21.00		0.000	1.00			SURCHARGED		
\$21.00		0.000	1.25			SURCHARGED		
\$21.01		0.000	1.63			SURCHARGED		
S21.01		0.000	1.64			SURCHARGED		
S21.01 S21.01		0.000	0.79 0.79		480.3 478.9	OK OK		
S21.01 S21.01		0.000	0.79		4/8.9	OK		
S21.01 S21.01		0.000	0.80		486.2	OK		
S21.01		0.000	0.84		489.6	OK		
S21.01		0.000	0.47		317.8	OK		
\$21.01		0.000	0.49		317.2	OK		
S21.01 S21.02		0.000	0.51 0.78		129.5 129.5	SURCHARGED OK		
		0.000	0.62					
S21.02	1 0190	0.000	0.02		129.5	OK		

Atkins (Epsom)		Page 11
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	Flooded Volume (m³)		Overflow (1/s)		Status	Level Exceeded	
S21.022	S199	0.000	0.35		92.7	OK		

Atkins (Epsom)		Page 12
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Drainage
Innovyze	Network 2019.1	1

PN	US/MH Name	Stor	rm		Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S28.000	S200	120 Wi		30	+20%					87.439	-0.225
S29.000	S201	120 Wi		30	+20%					93.308	-0.225
S29.001	S202		inter	30	+209	Future Ph	nase			91.348	-0.046
S29.002	S203		inter	30	+201					89.049	0.234
S28 001 S30.000	S204		inter	30	+20%	30/15 Summe				87 346 93.535	0 239
S30.000 S30.001	S205 S206	15 Wi 15 Wi	inter	30 30	+20% +20%	30/15 Summe 30/15 Summe				93.330	0.435 0.358
\$30.001 \$30.002	S200		inter	30	+20%	30/15 Summe				92.740	0.560
s30.002	S207		inter	30	+20%	30/15 Summe				91.523	0.625
\$30.004	S209		inter	30	+20%	30/15 Summe				90.511	0.486
s30.005	S210	15 Wi	inter	30	+20%	30/15 Summe				89.849	0.396
S30.006	S211	15 Wi	inter	30	+20%	30/15 Summe	er			87.771	0.737
S28.002	S212	15 Wi	inter	30	+20%	30/15 Summe	er			87.084	0.284
S31.000	S213	15 Wi	inter	30	+20%	30/15 Summe	er			94.208	0.408
S31.001	S214		inter	30	+20%	30/15 Summe	er			93.601	0.115
S31.002	S215	15 Wi		30	+20%	/				93.223	-0.015
S32.000	S216		inter	30	+20%	30/15 Summe	er			97.427	0.027
S32.001	S217		inter	30	+20%					97.254	-0.046
\$32.002 \$32.003	S218 S219		inter inter	30 30	+20% +20%	30/15 0				96.653 96.457	-0.047 0.070
\$32.003 \$32.004	S219 S220		inter	30	+20% +20%	Future P	haco			96.0437	-0.048
S32.004	S220	15 Wi		30	+20%	ruluie r	llase			94.737	-0.085
S33.000	S221	15 Wi		30	+20%					94.610	-0.020
S33.001	S223		inter	30	+20%	30/15 Summe	er			94.528	0.328
S33.002	S224	15 Wi	inter	30	+20%	30/15 Summe				94.475	0.402
S33.003	S225	15 Wi	inter	30	+20%	30/15 Summe	er			94.436	0.467
S33.004	S226	15 Wi	inter	30	+20%	30/15 Summe	er			94.398	0.537
S32.006	S227	15 Wi	inter	30	+20%	30/15 Summe	er			94.240	0.473
S32.007	S228	15 Wi		30	+20%	30/15 Summe				93.965	0.393
S32.008	S229		inter	30	+20%	30/15 Summe				93.787	0.865
S32.009	S230		inter	30	+20%	30/15 Summe				93.215	0.607
S31.003 S31.004	S231 S232	15 Wi 15 Wi	inter	<u>30</u> 30	+20% +20%	30/15 Summe 30/15 Summe				92.941	0.374 0.167
S31.004 S34.000	S232 S233		inter	30	+20%	SU/IS SUILLIE	έĽ.			92.867	-0.167
\$34.000 \$34.001	s233		ummer	30	+20%					94.313	-0.237
\$34.002	S231	15 Wi		30	+20%	30/15 Summe	er			94.042	0.057
S34.003	S236		inter	30	+20%	30/15 Summe				92.916	0.013
S34.004	S237	15 Wi	inter	30	+20%	30/15 Summe				92.371	0.109
S31.005	S238	15 Wi	inter	30	+20%	30/15 Summe	er			92.032	0.140
S31.006	S239	15 Wi	inter	30	+20%	30/15 Summe	er			91.702	0.169
S31.007			inter	30	+20%					90.469	
S35.000				30	+20%					94.436	
\$35.001		15 Wi		30	+20%					94.324	
S35.002		15 Wi		30	+20%					92.690	
\$35.003 \$31.008		15 Wi 1440 Wi		30 30	+20% +20%	30/15 Winte	ar a			91.570 89.283	
S31.008 S31.009				30		30/15 Winte 30/600 Winte				89.283	
S31.009 S31.010		1440 Wi 1440 Wi		30		30/480 Winte				89.283	
s31.010				30		30/15 Summe				89.283	
\$31.012				30	+20%					87.612	
s31.013				30	+20%					87.004	
S28.003	S251	1440 Wi	inter	30	+20%					86.133	
S28.004				30	+20%					86.133	
S28.005				30	+20%					86.133	
S28.006				30		30/15 Winte	er			86.133	
S28.007	S255	1440 Wi	inter	30	+20%					84.982	-0.193
					0	1982-2019	Innovyze				
<u> </u>							- 1				

Atkins (Epsom)								Page 13
Woodcoste Grove			Fass	aroe Ho	using	Dev.		
Ashley Road, Epsom								
Surrey, KT18 5BW				Wicklow				– Micro
Date 05/04/2022 11:22				gned by		-		Drainage
File Storm Drainage Mode	el_02.	04.2		ked by		ratty		brainiage
Innovyze			Netw	ork 201	9.1			
<u>Summary of</u>	<u>Criti</u>	cal Resu Flooded	<u>ilts b</u>	y Maximu	im Lev Pipe	vel (Rank	1) for Stor	<u>cm</u>
PN	US/MH Name		Flow / Cap.	Overflow (1/s)	-	Status	Level Exceeded	
S28.000	S200	0.000	0.00		0.0	OK		
S29.000		0.000	0.00		0.0	OK		
S29.001 S29.002	S202 S203	0.000	-utur	e Pha	Se 7	OK SURCHARGED		
S28.001	S204	0.000	0.92		225.6	SURCHARGED		
S30.000		0.000	1.25			SURCHARGED		
\$30.001 \$30.002		0.000 0.000	1.74 1.12			SURCHARGED SURCHARGED		
\$30.002		0.000	1.30			SURCHARGED		
\$30.004		0.000	1.91			SURCHARGED		
\$30.005		0.000	1.34			SURCHARGED		
S30.006 S28.002		0.000 0.000	1.72 1.45			SURCHARGED SURCHARGED		
\$31.000		0.000	1.43			SURCHARGED		
\$31.001		0.000	1.21			SURCHARGED		
\$31.002		0.000	1.00		74.5	OK		
\$32.000		0.000	1.12			SURCHARGED		
\$32.001 \$32.002		0.000 0.000	0.95 0.78		49.3 61.6	OK OK		
\$32.002		0.000	1.12			SURCHARGED		
S32.004		0.000	0.98		61.7	OK		
\$32.005		0.000	utur	e Phas		OK		
\$33.000 \$33.001		0.000 0.000	1.10			OK SURCHARGED		
\$33.001		0.000				SURCHARGED		
\$33.003		0.000	0.71			SURCHARGED		
\$33.004		0.000	1.55			SURCHARGED		
\$32.006		0.000	1.27			SURCHARGED		
\$32.007 \$32.008		0.000 0.000	1.63 1.33			SURCHARGED SURCHARGED		
\$32.009		0.000	2.04			SURCHARGED		
s31.003		0.000	1.72		395.5	SURCHARGED		
\$31.004		0.000	1.68			SURCHARGED		
S34.000 S34.001		0.000 0.000	0.15 0.10		12.2	OK OK		
\$34.002		0.000	1.03			SURCHARGED		
\$34.003	S236	0.000	1.03			SURCHARGED		
\$34.004		0.000	1.10			SURCHARGED		
S31.005 S31.006		0.000 0.000	1.53 1.57			SURCHARGED SURCHARGED		
\$31.000		0.000	0.82		572.8			
\$35.000		0.000	0.41		24.3			
\$35.001		0.000	0.39		24.1			
S35.002		0.000	0.55		101.1			
S35.003 S31.008		0.000	0.55 0.11		104.3	OK SURCHARGED		
s31.009		0.000	0.08			SURCHARGED		
\$31.010		0.000	0.10			SURCHARGED		
\$31.011		0.000	0.04			SURCHARGED		
S31.012 S31.013		0.000	0.04		2.2 2.2			
\$31.013 \$28.003		0.000	0.04		40.3			
\$28.004	S252	0.000	0.04		39.9			
S28.005		0.000	0.05		38.4			
\$28.006	S254	0.000	0.05		2.5	SURCHARGED		
		©1	982-2	019 Inno	ovyze			

Atkins (Epsom)		Page 14
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)		Status	Level Exceeded
S28.007	S255	0.000	0.05		2.5	OK	

Atkins (Epsom)		Page 15
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

PN	US/MH Name	St	corm		Climate Change	First Surcl	t (X) harge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S28.008	S256	1440	Winter	30	+20%						84.691
S28.009			Winter	30	+20%						82.696
S28.010			Winter	30	+20%						81.309
S28.011	S259	1440	Winter	30	+20%						80.962
S21.023	S260	720	Winter	30		30/120	Summer				77.795
S21.024	S261	720	Winter	30	+20%	30/120	Summer				69.091
S17.007	S262	720	Winter	30	+20%	30/120	Summer				61.773
S17.008	S263	720	Winter	30	+20%	30/120	Summer				58.959
S17.009	S264	720	Winter	30	+20%	30/120	Summer				58.223
S17.010	S265	720	Winter	30		30/120					55.880
S17.011	S266	720	Winter	30	+20%	30/120	Summer				50.437
S17.012	S267	720	Winter	30	+20%						49.661
S17.013	S268		Winter	30		30/480	Winter				48.925
S17.014	S269		Winter	30	+20%						48.637
<u>\$17.015</u>	S270		Winter	30	+20%						48.201
S36.000	S272		Winter	30	+20%						99.007
S36.001 S36.002	S273 S274		Winter Winter	30	+20응 +20응						97.947
S36.002 S36.003	S274 S275		Summer	30 30	+20%						97.724 96.247
\$36.003	S275 S276		Winter	30	+20%	30/15	Summer				90.247 95.619
S36.004	S270		Winter	30	+20%		Summer				95.422
\$37.000	S278		Winter	30	+20%		Duniner				98.669
\$37.001	S279		Winter	30				7			98.670
\$37.002	S280		Winter	30	FU	lure F	Phase				97.729
s37.003	S281		Winter	30	+20%	30/15	Summer	-			96.961
\$37.004	S282	15	Winter	30	+20%	30/15	Summer				95.868
S37.005	S283	15	Winter	30	+20%						95.595
S36.006	S284	1440	Winter	30	+20%		Summer				95.010
S38.000	S285		Winter	30	+20%		Summer				98.417
S38.001	S286		Winter	30	+20%		Summer				97.952
\$38.002	S287		Winter	30	+20%		Summer				97.841
S38.003	S288		Winter	30	+20%		Summer				97.654
S38.004			Winter Winter	30		30/180					95.008
S36.007 S36.008			Winter	30 30	+20% +20%		Summer Summer				95.007 95.007
S30.000	S291 S293		Winter	30	+20%		Summer				97.108
\$40.000	S295 S294		Winter	30	+20%	50715	DUILLICT				97.673
\$39.001	S291		Winter	30	+20%	30/15	Summer				96.921
S41.000	S296		Winter	30		30/120					96.289
s39.002	S297		Winter	30	+20%						96.289
s39.003	S298		Winter	30	+20%		Winter				96.287
S39.004	S299	960	Winter	30	+20%	30/15	Summer				96.283
S42.000	S301	15	Winter	30	+20%						104.490
S42.001	S302		Winter	30	+20%						101.234
S42.002	S303		Winter	30	+20%		Summer				98.890
S42.003	S304		Winter	30	+20%		Summer				98.586
\$42.004	S305		Winter	30	+20%	30/15	Summer				98.331
\$42.005	S306		Winter	30	+20%						97.996
S42.006	S307		Winter	30	+20%						97.267
S42.007 S42.008	S308 S309		Winter Winter	30 30	+20% +20%						96.586 95.427
\$42.008 \$42.009	S310		Winter	30	+20%	30/15	Summer				95.427 94.858
\$42.009 \$43.000	S310 S311		Winter	30	+20%		Winter				94.838 97.684
\$43.001	S312		Winter	30	+20%		Summer				97.636
\$43.002	S313		Winter	30	+20%		Summer				97.600
\$43.003	S314		Winter	30	+20%		Summer				97.332
					©19	82-201	9 Innovy	ze			

Atkins (Epsom)					Housta	Darr			Page 16
Noodcoste Grove			l'a:	ssaroe	Housing	Dev.			
Ashley Road, Epsom			_						
Surrey, KT18 5BW Date 05/04/2022 11:	2.2			. Wick					Micro
		1 00 04 0		-	by N.Ra	-			Drainad
File Storm Drainage	e Mode	1_02.04.2.			oy G.Han	ratty			
Innovyze			Ne	twork 2	2019.1				
Summar	y of (	Critical R	<u>esults</u>	by Max	aimum Lev	vel (1	Rank 1) fo	or Storm	
	US/MH	Surcharged Depth		Flow /	Overflow	Pipe Flow		Level	
PN	Name	(m)	(m³)	Cap.	(1/s)	(1/s)	Status	Exceeded	
S28.008	S256	-0.192	0.000	0.05		2.5	OK		
S28.009		-0.189	0.000	0.05		2.5	OK		
S28.010	S258	-0.189	0.000	0.06		2.5	OK		
S28.011		-0.192	0.000	0.05		2.5	OK		
S21.023		1.779	0.000	2.40			SURCHARGED		
S21.024		2.154	0.000				SURCHARGED		
S17.007		1.508	0.000				SURCHARGED		
S17.008		0.545	0.000	2.10			SURCHARGED		
S17.009		0.353	0.000	2.07 2.14			SURCHARGED		
S17.010 S17.011		0.489 0.578	0.000	2.14			SURCHARGED SURCHARGED		
\$17.011 \$17.012		-0.051	0.000	0.96		97.1	OK		
S17.012 S17.013		0.010	0.000	1.06			SURCHARGED		
s17.014		-0.063	0.000	0.98		97.1	OK		
S17.015		0.000	0.000	1.03		97.1	OK		
S36.000		-0.225	0.000			0.0	OK		
S36.001		-0.225	0.000	0.00		0.0	OK		
S36.002		-0.076	0.000	0.77		53.5	OK		
S36.003		-0.094	0.000	0.63		53.3	OK		
\$36.004 \$36.005		0.203	0.000	0.61 1.95			SURCHARGED SURCHARGED		
s37.000		-0.131	0.000	0.02		0.5	OK		
s37.001		-0.060				68.2	OK		
\$37.002	S280	-0.071	rulu	re Ph	lase	78.4	OK		
\$37.003	S281	0.161	0.000	1.04		136.8	SURCHARGED		
\$37.004		0.068	0.000	2.07			SURCHARGED		
\$37.005	S283	-0.168	0.000	0.58		134.9	OK		
S36.006	S284	0.384	0.000	0.09			SURCHARGED		
S38.000 S38.001		0.617 0.365	0.000	1.48 1.68			SURCHARGED SURCHARGED		
\$38.001 \$38.002		0.385	0.000	1.56			SURCHARGED		
\$38.002 \$38.003	S287	0.295	0.000	1.56			SURCHARGED		
S38.004	S289	0.844	0.000	0.06			SURCHARGED		
s36.007		1.207	7.499	0.09		25.3			
S36.008	S291	1.682	2.630	0.04		2.5			
s39.000		0.308	0.000	0.89			SURCHARGED		
S40.000		-0.102	0.000	0.58		20.1	OK		
\$39.001		0.492	0.000	1.55			SURCHARGED		
S41.000		0.532	0.000	0.03			SURCHARGED		
S39.002 S39.003	S297 S298	0.810 0.885	0.000	0.14 0.13			SURCHARGED SURCHARGED		
\$39.003 \$39.004		1.258	0.000	0.13			SURCHARGED		
S42.000		-0.107	0.000	0.53		52.3	OK		
S42.001		-0.067	0.000	0.81		85.1	OK		
S42.002	S303	0.177	0.000	0.88		98.7	SURCHARGED		
S42.003		0.280	0.000	2.02		105.9	SURCHARGED		
S42.004	S305	0.086	0.000	1.46			SURCHARGED		
S42.005	S306	-0.173	0.000	0.56		132.0	OK		
S42.006	S307	-0.183	0.000	0.51		141.7	OK		
S42.007		-0.178	0.000	0.53		158.1	OK		
S42.008	S309	-0.158	0.000	0.61		171.3	OK		
S42.009 S43.000	S310 S311	0.162 0.006	0.000	0.85 0.53			SURCHARGED SURCHARGED		
543.000		0.000	_	ire Pl			SURCHARGED		
			the states						

tkins (Epsom)		Page 17
oodcoste Grove	Fassaroe Housing Dev.	
shley Road, Epsom		
urrey, KT18 5BW	Co. Wicklow.	Micco
ate 05/04/2022 11:22	Designed by N.Ranya	
ile Storm Drainage Model_02.04.2	Checked by G.Hanratty	Drainage
nnovyze	Network 2019.1	
Surcharged Flo US/MH Depth Vo PN Name (m) (1	lume Flow / Overflow Flow Level	L
\$43.003 \$314 0.081 <b>F</b>	uture Phase 48.9 SURCHARGED	

Atkins (Epsom)		Page 18
		rage 10
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	

		US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water Level	Surcharged Depth
	PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)
	S43.004	S315	15 Winter	30	+20%	30/15 Summe	r			97.188	0.567
ſ	S43.005	S316	15 Winter	30	+20%	30/15 Summe	r			96.899	0.578
	S43.006	S317	15 Winter	30	+20%	30/15 Summe	r			96.649	0.416
	S44.000	S318	15 Winter	30	+20%	30/15 Summe	r			101.054	0.095
	S44.001	S319	15 Winter	30	+20%	30/15 Summe	r			100.914	0.117
	S44.002	S320	15 Winter	30	+20%	20/15 Cummo	<u> </u>			100.707	0.037
	S44.003	S321	15 Winter	30	+20%	Future F	hase			100.067	0.039
	S44.004	S322	15 Winter	30	+20%	00, 10 Dumino				99.501	0.149
	S44.005	S323	15 Winter	30	+20%					99.085	-0.112
	S45.000	S324	15 Winter	30	+20%					101.680	-0.120
	S45.001	S325	15 Winter	30	+20%					101.110	-0.038
	S45.002	S326	15 Winter	30	+20응	30/15 Summe	r			100.175	0.197
	S45.003	S327	15 Winter	30	+20%	30/15 Summe	r			99.555	0.249
	S44.006	S328	15 Winter	30	+20%	30/15 Summe	r			98.836	0.258
	S44.007	S329	15 Winter	30	+20%	30/15 Summe	r			97.752	0.277
	S44.008	S330	15 Winter	30	+20%	30/15 Summe	r			97.182	0.613
	S43.007	S331	15 Winter	30	+20%	30/15 Summe	r			96.390	0.825
	S43.008	S332	15 Winter	30	+20%	30/15 Summe	r			96.007	0.838
	S43.009	S333	15 Winter	30	+20%	30/15 Summe	r			95.540	0.548
	S43.010	S334	15 Winter	30	+20%	30/15 Summe	r			95.325	0.870
	S42.010	S335	15 Winter	30	+20%	30/15 Summe	r			94.586	0.345
	S46.000	S337	15 Winter	30	+20%					104.449	-0.090
	S46.001	S338	15 Winter	30	+20%	30/15 Summe	r			103.577	0.278
	S46.002	S339	15 Winter	30	+20%	30/15 Summe	r			102.097	0.155
	S46.003	S340	15 Winter	30	+20%					101.719	-0.067
	S46.004	S341	15 Winter	30	+20%					101.176	-0.130
	S46.005	S342	15 Winter	30	+20%					100.254	-0.135

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded
\$43.004	S315	0.000	1.50		44.2	SURCHARGED	
S43.005	S316	0.000	2.03		66.6	SURCHARGED	
S43.006	S317	0.000	0.98		67.7	SURCHARGED	
S44.000	S318	0.000	0.99		35.4	SURCHARGED	
S44.001	S319	0.00	·	Dhaa	. 0	SURCHARGED	
S44.002	S320	0.00	ulure	Phase	<b>e</b> .1	SURCHARGED	
S44.003	S321	0.000	1.29		41.4	SURCHARGED	
S44.004	S322	0.000	1.38		89.3	SURCHARGED	
S44.005	S323	0.000	0.70		88.5	OK	
S45.000	S324	0.000	0.45		32.5	OK	
S45.001	S325	0.000	0.89		138.9	OK	
S45.002	S326	0.000	1.56		188.6	SURCHARGED	
\$45.003	S327	0.000	1.51		200.5	SURCHARGED	
S44.006	S328	0.000	1.19		301.5	SURCHARGED	
S44.007	S329	0.000	1.27		307.7	SURCHARGED	
S44.008	S330	0.000	1.20		299.2	SURCHARGED	
S43.007	S331	0.000	1.86		348.0	SURCHARGED	
\$43.008	S332	0.000	1.63		352.6	SURCHARGED	
S43.009	S333	0.000	1.48		354.2	SURCHARGED	
S43.010	S334	0.000	1.86		361.2	SURCHARGED	
\$42.010	S335	0.000	2.09		518.4	SURCHARGED	
S46.000	S337	0.000	0.65		43.4	OK	
\$46.001	S338	0.000	1.11		71.4	SURCHARGED	
		C	1982-20	019 Innc	ovyze		

Atkins (Epsom)		Page 19
Woodcoste Grove	Fassaroe Housing Dev.	
Ashley Road, Epsom		
Surrey, KT18 5BW	Co. Wicklow.	Micro
Date 05/04/2022 11:22	Designed by N.Ranya	Drainage
File Storm Drainage Model_02.04.2	Checked by G.Hanratty	Diamage
Innovyze	Network 2019.1	1

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)	Pipe Flow (l/s)	Status	Level Exceeded
S46.002	S339	0.000	1.42		89.1	SURCHARGED	
S46.003	S340	0.000	0.95		87.7	OK	
S46.004	S341	0.000	0.62		87.6	OK	
S46.005	S342	0.000	0.58		87.3	OK	



# Appendix I. Soakaway Design

	-	ay Design	Fassaroe		ment - Roac	l Soakaw	ay			/	<b>\T</b> K	<b>(INS</b>		
1	Input r =	0.255	(From Figu	re 1)										
2	From Table		Data Sheet)	select Z1 va	alues and input		oths and inp	out below:						
	Storm Duration, D	Z1	M5-Dmin	Z2	M10-Dmin (R)									
	min 5	0.33	=20mm x Z1 6.6	1.19	=Z2xM5-Dmin 7.9									
	10	0.48	9.6	1.19	11.4									
	15 30	0.58 0.76	11.6 15.2	1.20 1.20	13.9 18.2									
	<u>60</u> 120	1.00 1.27	20.0 25.4	1.19 1.18	23.8 30.0									
	240	1.64	32.8	1.18	38.7									
	360 600	1.88 2.24	37.6 44.8	1.17 1.16	44.0 52.0									
	1140	3.10	62.0	1.15	71.3									
3 S = I - O S = the required storage in the soakaway I = the inflow from the impermeable area O = the outflow infiltrating into the soil														
	I = A x R				rea drained to t a design storm									
	O = a50 x	fxd	f = the soil i	= the internal surface area of the soakaway to 50% effective depth - excludes base area as this is assumed to become clogged to soil infiltration rate the storm duration										
Input Values A (sq m) = 7820 f (m/s) = 0.0000285 Catchment E Change soakaway dimensions until it states it is 'Suitable' in th														
	L (m) = W (m) =	75 20												
	eff D (m) =	1												
	a50 =	95	for rectang	ular soaka	way									
	year retur													
Dur	ation (min) Inflow, I =	<b>5</b> 51.612	10 75.072	15 90.712	<b>30</b> 118.864	60 156.4	<b>120</b> 198.628	<b>240</b> 256.496	<b>360</b> 294.032	600 350.336	<b>1440</b> 484.84			
0	Outflow, <b>O</b> =	0.81225	1.6245	2.43675	4.8735	9.747	19.494	38.988	58.482	97.47	233.928			
	S =	50.79975	73.4475	88.27525	113.9905	146.653	179.134	217.508	235.55	252.866	250.912			
	ve Storage, eff S issumed) =	1125	Soakaway	dimensions	suitable									
or a 10	0 year retu	ırn Period.	:											
Dur	ation (min)	5	10	15	30	60	120	240	360	600	1440			
0	Inflow, I = Outflow, O =	61.41828 0.81225	89.33568 1.6245	108.8544 2.43675	142.6368 4.8735	186.116 9.747	234.381 19.494	302.6653 38.988	344.0174 58.482	406.3898 97.47	557.566 233.928			
	S =		87.71118		137.7633					308.9198	323.638			
Effectiv	/e Storage, eff S	1125	Soakaway	dimensions	suitable									
(75% a	issumed) =	1120	Coakanay		Sullable									
	-		(growth fa		.64 applied)	)								
	ation (min) Inflow, I = Outflow, O =	<b>5</b> 70.5364 0.81225	<b>10</b> 102.5984 1.6245	<b>15</b> 123.973 2.43675	<b>30</b> 162.447 4.8735	<b>60</b> 213.747 9.747	<b>120</b> 271.458 19.494	<b>240</b> 350.545 38.988	<b>360</b> 401.844 58.482	<b>600</b> 478.793 97.47	1440 662.615 233.928			
	S = /e Storage,	69.72415	100.9739	121.5363	157.573967	203.9997	251.9643	311.5565	343.3617	381.3225	428.6867			
	eff S issumed) =	1125	Soakaway	dimensions	suitable									
or a 10	00 year rei	turn Perio	d (growth	factor of	1.96 applied	d)								
	Inflow, I = Dutflow, O =	<b>5</b> 84.2996 0.81225	<b>10</b> 122.6176 1.6245	<b>15</b> 148.163 2.43675	<b>30</b> 194.145 4.8735	<b>60</b> 255.453 9.747	<b>120</b> 324.426 19.494	<b>240</b> 418.943 38.988	<b>360</b> 480.252 58.482	<b>600</b> 572.215 97.47	<b>1440</b> 791.905 233.928			
	S =	83.48735	120.9931	145.7262	189.271033	245.7063	304.9317	379.9555	421.7703	474.7455	557.9773			
Effectiv														



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