# Porthcawl Waterfront Regeneration Area

## LDP Drainage Strategy Report

5 November 2020

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## Quality Management

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# Contents

1. Introduction 1
2. Existing drainage 5
3. Foul drainage 8
4. Surface water drainage and SuDS 10
5. Outline budget cost estimate 16
6. Conclusion 18

# Appendices

Appendix A
Appendix B
Appendix C
Appendix D
Appendix E
Appendix F

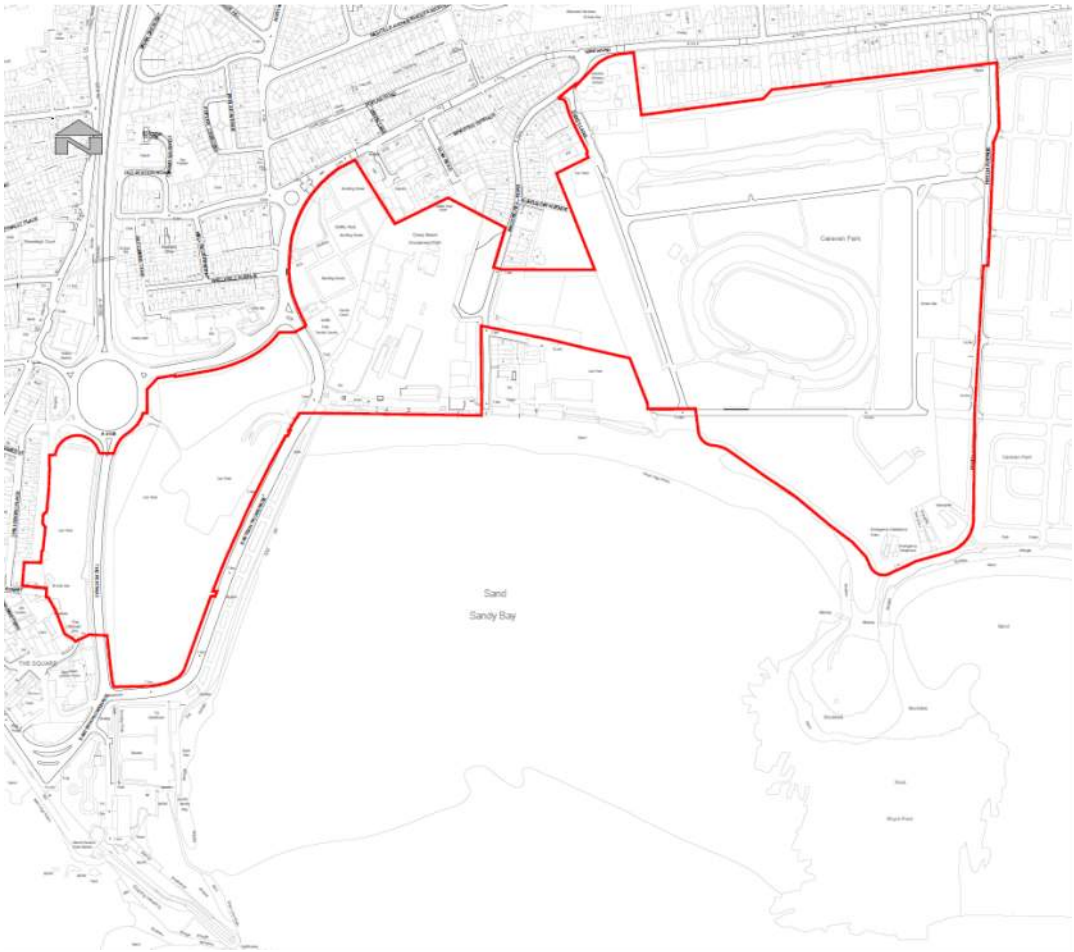
# 1. Introduction

Capita Redstart has been commissioned by Bridgend County Borough Council (BCBC) to provide a drainage strategy in support of the re-allocation of the Porthcawl Waterfront in the Replacement Local Development Plan (LDP). This document outlines and explores the feasibility to dispose and discharge of foul and surface water flows from the proposed masterplan to points either within the site or within close proximity to the site using both piped and Sustainable Drainage Systems (SuDS).

## 1.1 Site location

The site is located within the southern part the coastal town of Porthcawl and follows the existing harbour to the south east along Sandy Bay beach to the Relict Dunes to the south west. The existing site includes a number of land uses including several car parks, an area of open space, an Amusement park fun fair and a former municipal caravan/ camping park. See figure 1.1 for site extents.

***Figure 1.1 – Site location***



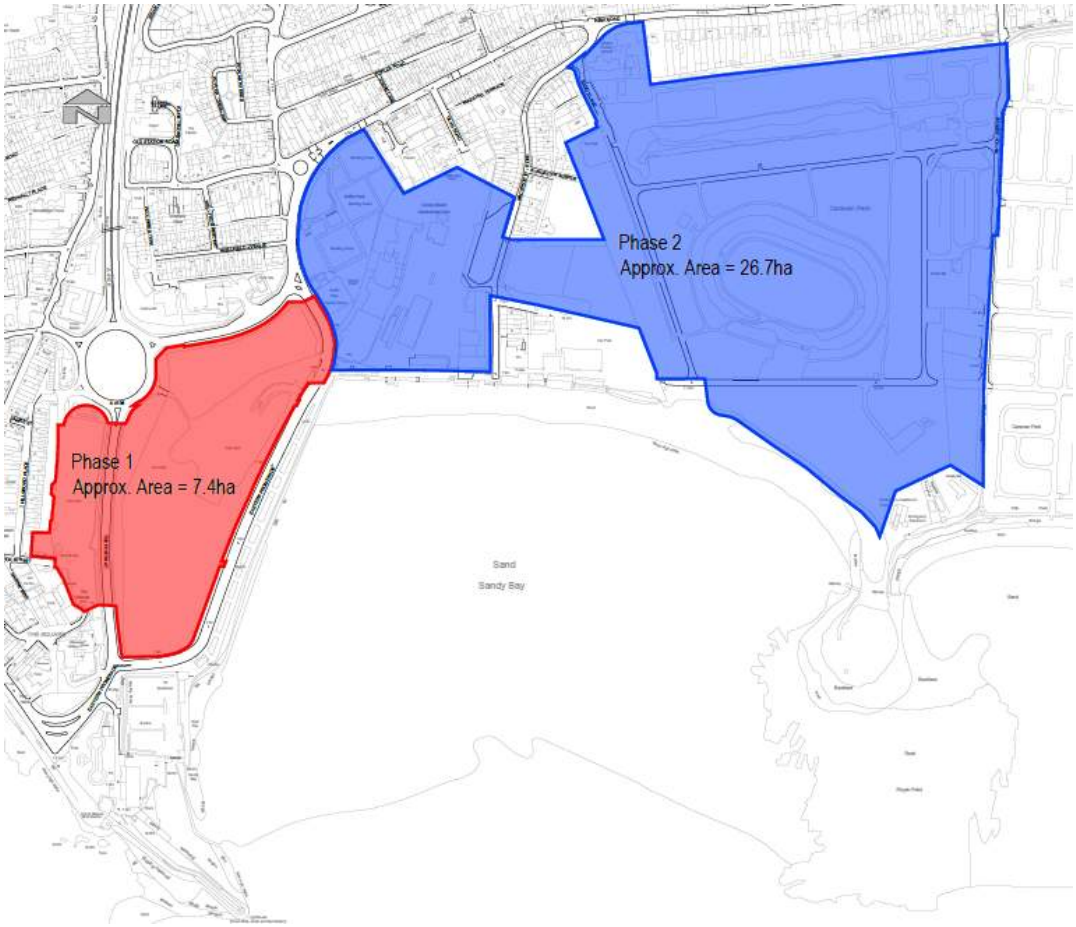

The site is approximately 34.1ha in total area consisting of two phases as shown under figure 1.2. Phase 1 includes the area west of the Eastern Promenade known as ‘Salt Lake’ and is

approximately 7.4 ha in area. Phase 2 consists of the existing Coney Beach Amusement Park, Sandy Bay Caravan Park, Newton Primary School and Griffin Park with an approximate area of 26.7 ha.

The majority of the 'Salt Lake' Phase 1 area bound between 'The Portway' and 'Eastern Promenade' was a dry dock that was filled in the 1960's. From previous geotechnical investigations it is understood that this filled area is underlain with material that is contaminated. This coupled with the proximity to the sea, directs us to directly discharge surface water flows to the harbour.

Phase 2 can be split into two further sub-phases with the Coney Beach Amusement Park and Sandy Bay Caravan Park areas. It is currently assumed that the Coney Beach Amusement Park area will discharge surface water flows via the same system that serves Phase 1 with a direct outfall to the harbour. Sandy Bay Caravan Park will discharge surface water flows to ground using infiltration.

***Figure 1.2 – Proposed phasing plan***



## 1.2 Masterplan

The following is a brief overview of the masterplan to provide context to the drainage strategy proposals in relation to the drainage strategy. Should the reader wish to obtain further information on the masterplan then we would like to direct them to the 'Porthcawl Waterfront Regeneration Area Land Use Framework 2020' document provided by BCBC.

The proposed masterplan is a mixed use development consisting of residential, commercial, leisure, car parking, new highway and pedestrian links and public open space. Figure 1.3 shows the proposed masterplan.

***Figure 1.3 – Masterplan***

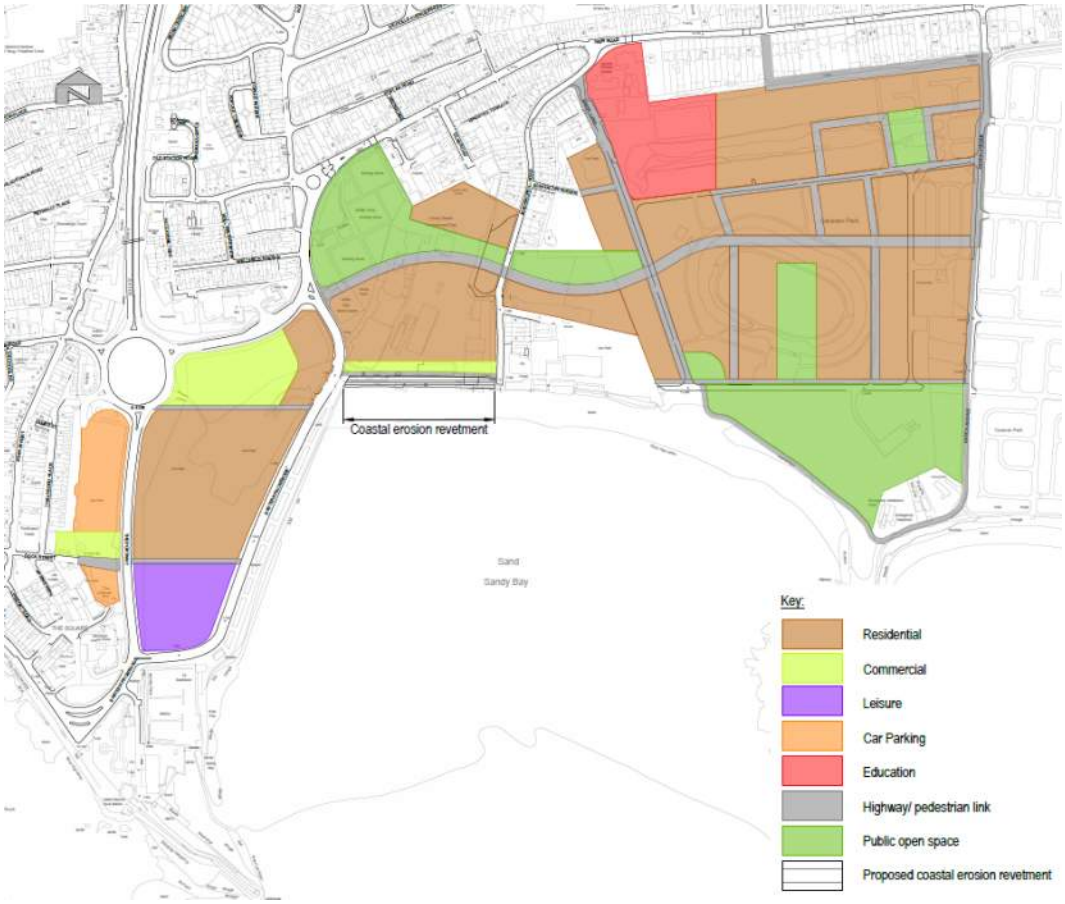



***Table 2.1 – Masterplan areas***

| Land Use | Area (ha) | % Impermeable | Impermeable Area (ha) |
|---|---|---|---|
| Residential | 17.590 | 60 | 10.554 |
| Commercial | 1.505 | 75 | 1.129 |
| Leisure | 1.044 | 75 | 0.783 |
| Car Parking | 0.926 | 90 | 0.833 |
| Education | 1.897 | 75 | 1.423 |
| Highway/ pedestrian link | 4.474 | 100 | 4.474 |
| Public open space | 6.554 | 0 | 0 |
| **Total** | **34.957** | **-** | **19.215** |

## 1.3 Coastal erosion revetment

A revetment structure is proposed along the southern edge of the Coney Beach amusement park and Sandy Bay to provide protection from coastal erosion. Further measures using rock armour are proposed between the existing fast food restaurants and Sandy Bay. For further information on the coastal erosion measures, please refer to the document *'Coney Beach Frontage Outline Feasibility Study Report to inform Local Development Plan submission'* produced by Arup.

# 2. Existing drainage

The proposed masterplan is traversed by drainage apparatus under the ownership of Dwr Cymru Welsh Water (DCWW), BCBC and private. This section is to be read in conjunction with drawing GC3432-RED-73-XX-SK-D-0002 Existing Drainage and Sewerage Plan located under Appendix A of this report. The following section will discuss the drainage and sewerage assets that are located within the masterplan. Existing drainage information for the Coney Beach Amusement Park area was obtained from the Evans Family (site owners).

## 2.1 Drainage assets under DCWW ownership

### *2.1.1 Public foul sewers*

There are several public foul sewers that cross the masterplan proposals, most notably within the existing car park off Dock Street, adjacent to the pavilion in Griffin Park, within the north east part of Coney Beach Amusement Park near Mackworth Road, through Mackworth Road and along the western and northern perimeter of the Sandy Bay Caravan Park. All public sewers will require a safety zone of a minimum of 3m either side of the centreline of the sewer, preventing structures being constructed within these areas. It is recommended that DCWW are involved within the further masterplan design stages to ensure that any potential diversions and alterations are agreed.

Any public sewers that are to be diverted must be done so in agreement with DCWW under Section 185 of the Water Industry Act. Should assets be deemed to have strategic importance, then DCWW may need to undertake such works from design to construction in-house.

### *2.1.2 Public foul rising main*

A 400mm diameter public foul rising main crosses the Salt Lake car park within Phase 1 of the masterplan. The rising main travels from the west originating from the Irongate Sewerage Pumping Station (SPS) located off West Drive. The rising main enters the Salt Lake car park opposite Dock Street and then immediately proceeds in a northerly direction along the western boundary of the car park adjacent to The Portway for approximately 120m. The rising main then changes direction traveling in an east to the Eastern Promenade for approximately 200m before changing direction again in a northerly direction behind the sea wall. The rising main then travels in an easterly direction under Sandy Bay beach and discharges to the 375mm diameter public foul sewer located in the south west corner of Sandy Bay Caravan Park.

Alterations and diversions of this rising main asset are expected to have a substantial cost. Therefore, it is recommended that the masterplan proposals make allowance for the rising main, providing space for the safety zone of 3m either side.

### *2.1.3 Public surface water sewers*

A 225mm diameter public surface water sewer travels in a southerly direction through Mackworth Road. This sewer originates from a Combined Sewerage Overflow (CSO) that is located further north within Mackworth Road, it is not currently understood whether this sewer conveys flows from the highway or other sources other than the CSO. The sewer travels past the southern end of Mackworth Road into Sandy Bay beach where it then changes to a westerly direction under the beach for approximately 220m until it discharges to the '600mm Ø' drain that is under BCBC ownership. This connection has been proven by dye testing undertaken by BCBC LLFA.

Due to the proposed coastal erosion defence revetment structure this asset with be required to be diverted. Please refer to section 4.6.1 for further information.

## 2.2 Drainage assets under BCBC ownership

### *2.2.1 Highway drainage*

Highway drainage is primarily located within A4106 The Portway and along the highway link to the north of Salt Lake car park. It appears that highway drainage crosses the Salt Lake car park site along the western boundary parallel to The Portway. The highway drain then connects to the public surface water sewer located at the junction of The Portway and Eastern Promenade which then immediately outfalls into the harbour.

A highway drain also crosses the north eastern part of the Salt Lake car park prior along with 'The Wilderness' drain where they merge together at a chamber.

### *2.2.2 'The Wilderness' drain*

This 1.1m diameter drain conveys flows from 'The Wilderness Lakes' located some 0.6 km to the north of the proposed masterplan site. It is also expected that this drain carries surface water flows as well as connections from public surface water sewers at the roundabout of New Road and Eastern Promenade. Past discussions with the LLFA at BCBC indicate that this drain is currently at capacity and cannot accommodate any further surface water flows.

As stated above this drain crosses the Salt Lake car park throughout, along its eastern edge until it exits the site through the south point before it discharges to the harbour.

### *2.2.3 '600mm Ø' drain*

This drain crosses the Salt Lake car park at the eastern edge adjacent to the car park entrance off of Eastern Promenade, where it also receives a connection from the public surface water system. This drain then travels south within Eastern Promenade and re-enters the Salt Lake car park along its eastern boundary further south prior to discharging to the harbour.

Due to the public surface water sewer connection it may be possible that this asset should be under the ownership of DCWW from the connection point to the outfall. Discussions are ongoing between BCBC and DCWW regarding this issue.

## 2.3 Drainage assets under private ownership

### *2.3.1 Sandy Bay Caravan Park*

The most notable private drainage assets are those that are located within the Sandy Bay Caravan Park and relict dunes. This drainage also appears to serve the existing properties located at the south point of the relict dunes and consideration must be made to ensure that these properties do not suffer any loss of service during the future development.

It is currently assumed that the majority of the existing private foul drainage located within the Sandy Bay Caravan Park will be abandoned and replaced with new drainage systems that will serve the proposed development.

### *2.3.2 Coney Beach Amusement Park*

The existing amusement park is served by a combined drainage system that discharges both foul and surface water flows to the public foul system located in Mackworth Road via a number of connections. Information from the amusement park operators shows that the amusement park has 107no. WCs on site. Using the unit discharge method as described under *BS EN 12056-2:2000* with a frequency factor of 0.7, the peak foul flow generated by the current amusement park is estimated at 10.24 litres/ second. In accordance with *'Sewers for Adoption 7th Edition,'* this provides an equivalent peak foul flow generated by 221no. dwellings.

It is currently assumed that the majority of the existing private foul drainage located within the Coney Beach Amusement Park will be abandoned and replaced with new drainage systems that will serve the proposed development.

# 3. Foul drainage

This section is to be read in conjunction with the Foul Drainage Strategy Layout drawing GC3432-RED-73-XX-SK-D-0007 located under Appendix A of this report.

The proposed masterplan is to provide an additional 1,240 residential units in parcels of varying density. Foul flows will also be generated by Commercial and Leisure development. In accordance with *'Sewers for Adoption 7th Edition'* peak foul flows from each residential unit equates to 4,000 litres/ unit/ day, commercial development has been estimated using 0.6 litres/ second/ ha of developable area and leisure is the same as commercial with an added 0.7 litres/ second/ ha of developable area for trade effluent as this is assumed to accommodate a swimming pool at this time.

## 3.1 Phase 1

Foul flows from Phase 1 are assumed to drain to the south of the phase to a pumping station that will then lift flows to the public foul sewerage system and are proposed to connect to public foul chamber reference SS81768601; referred to as 'Connection 1.' Foul flows from this area will be generated by 328no. residential units, 0.233 ha of commercial development and 0.926 ha of leisure development, which is estimated to give a peak foul flow of 16.5 litres/ second.

## 3.2 Phase 2

Phase 2 will require a number of connections to the existing public foul sewerage system, currently 7no. connections are assumed and are described below.

### *3.2.1 Connection 2*

Foul flows generated by 247no. residential units and 0.240ha of commercial development to be located south of Griffin Park, generating an estimated peak foul flow rate of 11.6 litres/ second to connect to public foul chamber reference SS82773001.

### *3.2.2 Connection 3*

Foul flows generated by 34no. residential units to be located north of Griffin Park within the north part of the current Coney Beach Amusement Park, generating an estimated peak foul flow rate of 1.6 litres/ second to connect to public foul chamber reference SS82773103.

### *3.2.3 Connection 4*

Foul flows generated by 27no. residential units to be located to the rear of Bungalow Avenue adjacent to the west boundary of the Sandy Bay Caravan park, generating an estimated peak foul flow rate of 1.3 litres/ second to connect to public foul chamber reference SS82774130.

### *3.2.4 Connection 5*

Foul flows generated by 117no. residential units to be located along the mid-section of the Sandy Bay Caravan park, generating an estimated peak foul flow rate of 5.4 litres/ second to connect to public foul chamber reference SS82774130.

### *3.2.5 Connection 6*

Foul flows generated by 357no. residential units to be located along the south-section of the Sandy Bay Caravan park and south of the existing Hi-Tide site, generating an estimated peak foul flow rate of 16.5 litres/ second to connect to public foul chamber reference SS82765901.

### *3.2.6 Connection 7*

Foul flows generated by 130no. residential units located along the north-section of the Sandy Bay Caravan park, generating an estimated peak foul flow rate of 6.0 litres/ second to connect to public foul chamber reference SS82778201.

### *3.2.7 Connection 8*

The existing school is to be extended by 1FE, which is estimated to provide an additional 30no. additional pupils and it is assumed that an additional 3no. staff will be required. Using the daily average foul flow rate from *'Flows and Loads - 4' (British Water, 2013)*, the additional persons on site will produce an estimated peak foul flow of 1.44 litres/ second.

## 3.3 DCWW response

A pre-planning advice application was submitted to DCWW on the 4th June 2020 providing the information shown under the foul drainage strategy drawing. DCWW responded on the 25th June 2020 confirming that due to the size of the development a hydraulic modelling assessment (HMA) will be required to be undertaken on the existing public sewerage, see response under Appendix B. This HMA will identify any upgrades required to the existing public sewerage system to accommodate the additional foul flows from the proposed development.

The HMA will be undertaken by DCWW in house and will be charged to the developer, the cost of which will be provided by DCWW. Allowance for the cost and programme implications of this exercise can be estimated at approximately £30,000 and likely to require between 3 to 6 months to complete, as this is dependent on required rainfall events. Costs and programme are to be confirmed with DCWW during the next stages of the masterplan development.

# 4. Surface water drainage and SuDS

## 4.1 Surface water drainage and SuDS preamble

This section is to be read in conjunction with the Surface Water Drainage Strategy Layout drawings GC3432-RED-73-XX-DR-D-0501 and GC3432-RED-73-XX-DR-D-0502 located under Appendix A of this report.

The surface water proposals have been modelled using Causeway Flow software. All systems have been simulated using the critical 100 year return period storm event plus an allowance of 40% for climate change in accordance with Table 4.1 of the guidance *'Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities in Wales' (Welsh Government, 2017)*. All calculation outputs are under Appendix C of this report.

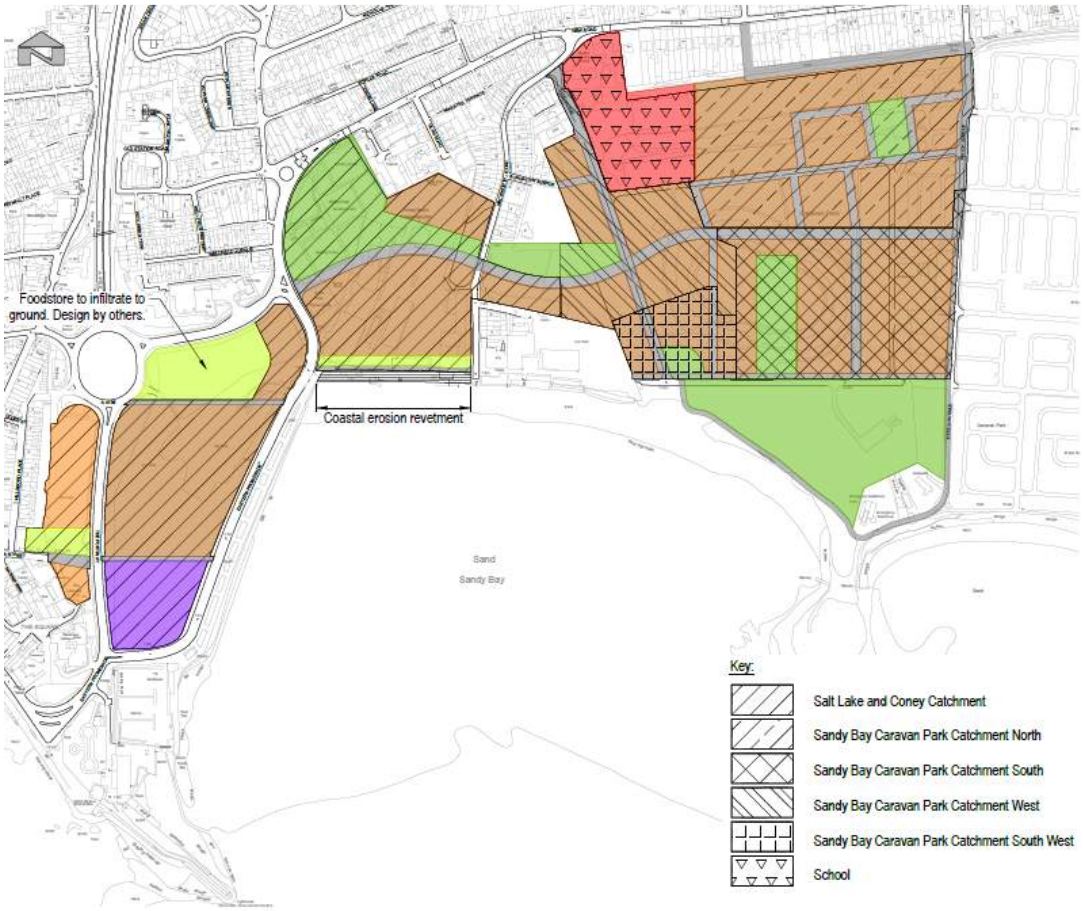
All surface water drainage shown within this drainage strategy are indicative and are to show feasibility only and that surface water flows generated by the masterplan proposals can be safely disposed of. It should also be understood that further design work will be required to establish a SuDS management train and ensure that all SAB criteria from S1 to S6 are satisfied in order to obtain SAB approval and conform to the standards set out under document *'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems' (Welsh Government, 2018).* All SuDS assets are to be designed in accordance with the guidelines set out under *'The SuDS Manual' (CIRIA c753, 2015)*.

It is assumed that all existing highways and associated footways are to be drained as per the existing regime and have not been included within this drainage strategy.

## 4.2 Surface water drainage and SuDS catchments

As discussed under section 1.1 of this report, the masterplan proposals are split into two phases of development. For surface water drainage purposes however, this does not strictly work as Phase 1 and parts of Phase 2 from the Coney Beach Amusement Park are to drain via the proposed new piped system that outfalls to the harbour. This is due to the higher risk of ground contamination within these areas. All other drainage catchments that are within or adjacent to the Sandy Bay Caravan Park are to discharge to the ground via infiltration. Recent infiltration testing undertaken in June 2020 gives favourable infiltration rates within this area, infiltration test logs can be found under Appendix D of this report. Figure 4.1 below shows the drainage catchments that have been used for this drainage strategy.

***Figure 4.1 – Drainage catchments***




## 4.3 Salt Lake and Coney catchment

Surface water flows from the 'Salt Lake and Coney Catchment' are to be conveyed by a new piped network to be designed in accordance with *BS EN 752: 2017*. For the purposes of exploring the worst-case scenario, it is assumed that all surface water flows are to enter this pipe network directly and not via a SuDS system, which will need to be implemented in further design stages.

The pipe network is to freely discharge to the existing harbour via a new outfall located in the north harbour wall. This outfall will be fitted with a flap valve or 'duck bill' tide valve for safety purposes as it is currently assumed that there is no tidal influence within the harbour due to the presence of a tide gate at the mouth of the harbour. This outfall will also be subject to a marine licence in agreement with NRW that is currently being explored under a separate order.

Should the harbour not be able to accommodate all of the proposed surface water flows then a split outfall to the sea through the Eastern Promenade sea wall may also need to be considered within the following stages.

From the drainage calculation model the proposed outfall and main surface water drain located below the Eastern Promenade will need to be of a maximum diameter of 1050mm to accommodate the 100 year return period critical storm event plus 40% climate change allowance.

As flows are to discharge freely to the harbour no formal flow attenuation will be required. However, a SuDS management train to satisfy SAB standards S3 to S6. By including SuDS assets to provide increased water quality, amenity and biodiversity these will help slow flows and reduce peak flows, this will in turn have a positive effect on the proposed drainage diameters.

When progressing with the masterplan in more detail SuDS techniques such as swales, bioretention areas and green roofs are to be considered within the developed areas and along the new highways and pedestrian links. Assets such as swales and bioretention areas can provide a more pleasing method of collecting and conveying surface water flows that can add to the streetscape.

Surface water flows from the food store site located at the north of Salt Lake/ Phase 1 are to discharge to the ground via infiltration through SuDS techniques such as permeable pavements. Therefore, this area has not been considered within this drainage strategy.

A summary of the impermeable areas from the proposed different land uses for this catchment area provided below in Table 4.1.

***Table 4.1 – Salt Lake and Coney catchment impermeable areas***

| Land Use | Area (ha) | % Impermeable | Impermeable Area (ha) |
|---|---|---|---|
| Residential | 6.640 | 60 | 3.984 |
| Commercial | 0.473 | 75 | 0.355 |
| Leisure | 1.044 | 75 | 0.783 |
| Car Parking | 0.926 | 90 | 0.833 |
| Highway/ pedestrian link | 0.804 | 100 | 0.804 |
| **Total** | **9.851** | **-** | **6.759** |

## 4.4 Sandy Bay Caravan Park catchment

For the Sandy Bay Caravan Park sub-catchments, piped systems have been modelled in order to simulate and represent the worst case scenario for the proposed infiltration basins by conveying surface water flows quickly and entirely to these SuDS assets. As stated above under section 4.3 a SuDS management train will be required to achieve SAB standards S3 to S6 to satisfy enhancements to water quality, amenity and biodiversity.

Infiltration basins are currently proposed for all Sandy Bay Caravan Park sub-catchments. These SuDS assets are grassed/ vegetated depressions that provide both attenuation storage, and depending on vegetation, some treatment. These assets allow surface water flows to be stored whilst slowly infiltrating to the underlying soil. During dry weather they can also accommodate recreational activities. An illustration of an infiltration basin is shown under figures 4.2 and 4.3.

Infiltration testing undertaken in June 2020 gave favourable infiltration rates across the Sandy Bay Caravan Park area ranging from $9.899 \times 10^{-5}$ m/s to $9.903 \times 10^{-4}$ m/s dependent on location. In addition to these infiltration rates a factor of safety of 10 has been used within the modelling in line with the recommendations set out under Table G1.1 of *'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems' (Welsh Government, 2018)*. Contamination testing was also undertaken within this area of the site to ensure that infiltration would not provide a pathway for contamination, these tests

have been assessed and are below limits. Please refer to Appendix D for Geotechnical information.

Due to the similar approach used for all Sandy Bay Caravan Park sub-catchments a summary of the proposed impermeable areas and infiltration basin sizes have been provided within Tables 4.2 and 4.3.

***Figure 4.2 – Plan view of infiltration basin taken from 'The SuDS Manual' c753 (CIRIA, 2015)***

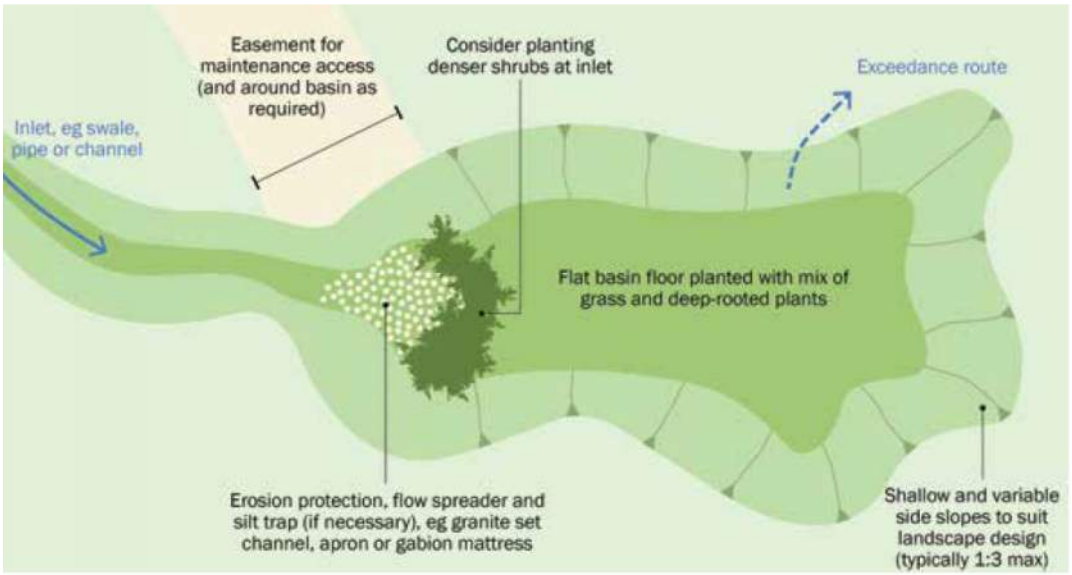



***Figure 4.3 – Elevation of infiltration basin taken from 'The SuDS Manual' c753 (CIRIA, 2015)***

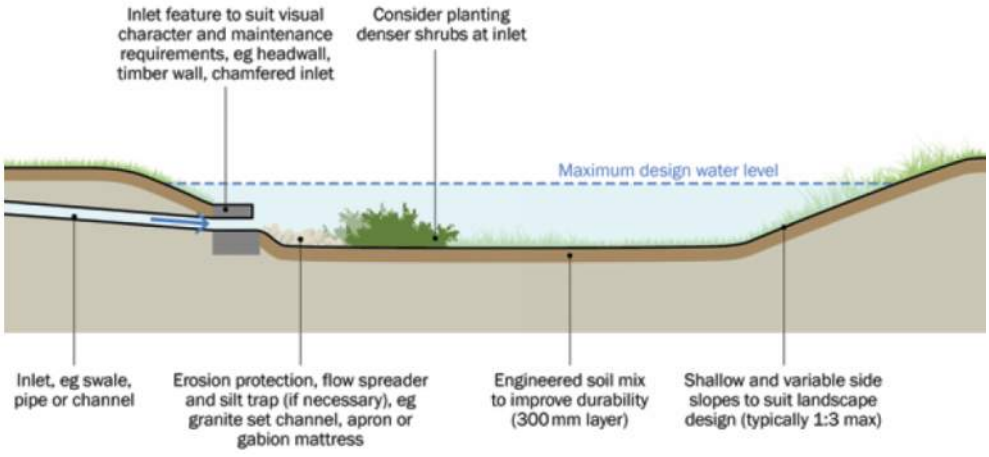


*Table 4.2 – Sandy Bay Caravan Park catchments impermeable areas*

| Land Use | Area (ha) | % Impermeable | Impermeable Area (ha) |
|---|---|---|---|
| **Sandy Bay Caravan Park North** | | | |
| Residential | 4.830 | 60 | 2.901 |
| Highway/ pedestrian link | 1.063 | 100 | 1.063 |
| **Sub-catchment Total** | **5.898** | **-** | **3.964** |
| **Sandy Bay Caravan Park South** | | | |
| Residential | 3.300 | 60 | 1.982 |
| Highway/ pedestrian link | 2.617 | 100 | 2.617 |
| **Sub-catchment Total** | **5.920** | **-** | **4.599** |
| **Sandy Bay Caravan Park West** | | | |
| Residential | 1.980 | 60 | 1.189 |
| Highway/ pedestrian link | 0.653 | 100 | 0.653 |
| **Sub-catchment Total** | **2.634** | **-** | **1.842** |
| **Sandy Bay Caravan Park South West** | | | |
| Residential | 0.840 | 60 | 0.504 |
| Highway/ pedestrian link | 0.357 | 100 | 0.357 |
| **Sub-catchment Total** | **1.197** | **-** | **0.861** |
| **Catchment Total** | **15.649** | **-** | **11.266** |

*Table 4.3 – Sandy Bay Caravan Park catchments infiltration basin sizes*

| Sub-catchment | Infiltration rate (m/s) | Depth (m) | Base Area ($m^2$) | Top of Bank Area ($m^2$) |
|---|---|---|---|---|
| Sandy Bay Caravan Park North – Infiltration Basin 1 | $9.899x10^{-5}$ | 2.000 | 1,279.1 | 2,337.0 |
| Sandy Bay Caravan Park South – Infiltration Basin 2 | $2.044x10^{-4}$ | 1.500 | 1,101.0 | 2,000.8 |
| Sandy Bay Caravan Park West – Infiltration Basin 3 | $1.000x10^{-4}$ | 1.850 | 693.1 | 1,424.9 |
| Sandy Bay Caravan Park South West – Infiltration Basin 4 | $1.944x10^{-4}$ | 1.700 | 286.4 | 760.8 |

## 4.5 School

The school, as per the Sandy Bay Caravan Park catchment, will be able to discharge of surface water flows by infiltration. From the infiltration test logs an infiltration rate of $6.142x10^{-4}$ m/s was established within the proposed school boundary. It is assumed that the existing school site will continue to drain as per the existing situation; however, the proposed additional area of 1.328ha will be drained via a new SuDS system.

It is recommended that the school manages surface water flows within the curtilage of the school site and not part of the overall residential area that surround it. A number of SuDS techniques including permeable paving and bioretention areas/ rain gardens could help demonstrate to young children sustainability in practice and could help provide teaching aids as part of the grounds.

However, for the purposes of this report a permeable pavement only has been assumed to demonstrate feasibility, scope and scale of the SuDS required for this site. The permeable

pavement could be used as the construction method of the school yard and would be consist of porous asphalt surface course, binder and base laid over an open graded clean stone sub-base providing a minimum void ratio of 0.3. From calculation, the minimum size of permeable pavement would be 2,720m$^2$ with a 300mm deep sub-base.

## 4.6 Surface water sewer diversions

### *4.6.1 Public surface water sewer diversion*

Due to the proposed coastal erosion defence revetment, that has been designed by Arup, the existing 225mm diameter public surface water sewer will need to be diverted. The existing public surface water sewer runs through the northern edge of Sandy Bay and connects to the existing '600mm Ø' drain. The proposed diversion will route the sewer within the proposed new Active Travel route located at the top of the revetment and back into the '600mm ø' drain.

### *4.6.2 'The Wilderness' drain diversion*

The existing 1.1m diameter drain is to be upgraded to a 1.2m diameter pipe from the existing manhole located within the junction of Eastern Promenade and The Portway highways and routed along the eastern kerb line of the Eastern Promenade highway following the proposed new surface water drain in a common trench. The drain diversion is to travel south along Eastern Promenade and discharge to the harbour as per the existing situation, albeit via a new outfall. This new outfall is required due to upsized pipe and service clashes with the proposed new surface water drainage system and the '600mm Ø' drain diversion.

### *4.6.3 '600mm ø' drain diversion*

The existing 600mm diameter drain is to start within Eastern Promenade highway from approximately 40m north of the existing Salt Lake car park access and routed along the eastern kerb line of the Eastern Promenade highway following the proposed new surface water drain in a common trench. The drain diversion is to travel south along Eastern Promenade and discharge to the harbour as per the existing situation, albeit via a new outfall. This new outfall is required due to service clashes with the proposed new surface water drainage system and the 'The Wilderness' drain diversion.

# 5. Outline budget cost estimate

An outline budget estimate has been generated for the proposed surface water drainage and SuDS system only as per the information shown on drawings GC3432-RED-73-XX-DR-D-0501 and GC3432-RED-73-XX-DR-D-0502, located under Appendix A.

## 5.1 Surface water drainage

An outline budget estimate has been generated for the proposed surface water drainage and SuDS system only as per the information shown on drawings GC3432-RED-73-XX-DR-D-0501 and GC3432-RED-73-XX-DR-D-0502.

The total cost for these works is approximately £3.45m. A summary of the costs is provided in Table 5.1 below.

***Table 5.1 – Outline budget cost estimate summary for surface water drainage and SuDS***

| Catchment | Total cost of designed surface water drainage and SuDS | Extra for connection drainage and SuDS (+120%) (£) | Total Cost per Catchment (£) |
|---|---|---|---|
| Salt Lake and Coney | 373,130.71 | 447,756.85 | 820,887.55 |
| Sandy Bay North | 416,921.84 | 500,306.20 | 917,228.04 |
| Sandy Bay South | 320,262.50 | 384,315.01 | 704,577.51 |
| Sandy Bay West | 157,984.66 | 189,581.60 | 347,566.26 |
| Sandy Bay South West | 75,441.81 | 90,530.17 | 165,971.98 |
| School | 224,443.44 | 269,332.13 | 493,775.57 |
| **Total** | **1,568,184.96** | **1,881,821.95** | **3,450,006.91** |

## 5.2 Surface water drainage diversions

Although general service diversions are normal costs the size, length and number of surface water systems to be diverted can be considered as abnormal.

***Table 5.2 – Outline budget cost estimate summary for surface water drainage diversions***

| Element | Cost (£) |
|---|---|
| Public surface water sewer diversion | 68,532.94 |
| The Wilderness drain diversion | 400,731.05 |
| 600mm Ø drain diversion | 194,794.76 |
| **Total** | **664,058.75** |

## 5.3 Foul drainage

Due the high level nature of the foul drainage strategy within this report, a cost per area of £20/m$^2$ will be applied to obtain a cost for the proposed new foul infrastructure on site. Using the developable area of 20.4ha (residential, commercial, leisure and education), this gives a high level outline budget cost of £4.08m. In addition to this cost it is currently assumed that a foul

pumping station will be required for Phase 1 to lift flows to the proposed connection point within Dock Street. Therefore, a provisional sum of £150,000 should be included to cover this element.

As stated under section 3.3 above DCWW have stated that an HMA will be required on the existing public sewerage system to identify any upgrades required to accommodate the proposed additional foul flows from the development. A provisional sum of £30,000 should be made for the HMA exercise. Furthermore, a provisional sum allowance between £1-2.5m should also be allowed for potential upgrade works to the public sewerage system, which are currently not known.

***Table 5.3 – High level outline budget cost estimate summary for foul drainage***

| Element | Cost (£) |
|---|---|
| **Normal costs** | |
| New foul infrastructure allowance | 4,080,000 |
| New Phase 1 foul pumping station – provisional sum | 150,000 |
| DCWW HMA exercise – provisional sum | 30,000 |
| **Normal costs subtotal** | **4,260,000** |
| **Abnormal costs** | |
| Potential public sewerage system upgrades – provisional sum | 1,000,000 – 2,500,000 |
| **Abnormal costs subtotal** | **1,000,000 – 2,500,000** |
| | |
| **Total** | **5,260,000 – 6,760,000** |

## 5.4 Total drainage outline budget cost estimate

***Table 5.4 – Total outline budget cost estimate for drainage***

| Element | Cost (£) |
|---|---|
| **Normal costs** | |
| Proposed surface water drainage | 3,450,007 |
| Proposed foul drainage | 4,260,000 |
| **Normal costs subtotal** | **7,710,007** |
| **Abnormal costs** | |
| Potential public sewerage system upgrades – provisional sum | 1,000,000 – 2,500,000 |
| Proposed surface water drainage diversions | 664,059 |
| **Abnormal costs subtotal** | **1,664,059 – 3,164,059** |
| | |
| **Total** | **9,374,066 – 10,874,066** |

# 6. Conclusion

## 6.1 Existing drainage

The proposed masterplan is traversed by drainage apparatus under the ownership of Dwr Cymru Welsh Water (DCWW), BCBC and private.

### *6.1.1 Drainage assets under DCWW ownership*

#### 6.1.1.1 Public foul sewers

There are several public foul sewers that cross the masterplan proposals, most notably within the existing car park off Dock Street, adjacent to the pavilion in Griffin Park, within the north east part of Coney Beach Amusement Park near Mackworth Road, through Mackworth Road and along the western and northern perimeter of the Sandy Bay Caravan Park.

#### 6.1.1.2 Public combined rising main

A 400mm diameter public combined rising main crosses the Salt Lake car park within Phase 1 of the masterplan. The rising main travels from the west originating from the Irongate Sewerage Pumping Station (SPS) located off West Drive. The rising main enters the Salt Lake car park opposite Dock Street and then immediately proceeds in a northerly direction along the western boundary of the car park adjacent to The Portway for approximately 120m. The rising main then changes direction traveling in an east to the Eastern Promenade for approximately 200m before changing direction again in a northerly direction behind the sea wall. The rising main then travels in an easterly direction under Sandy Bay beach and discharges to the 375mm diameter public foul sewer located in the south west corner of Sandy Bay Caravan Park.

#### 6.1.1.3 Public surface water sewers

A 225mm diameter public surface water sewer travels in a southerly direction through Mackworth Road. This sewer originates from a Combined Sewerage Overflow (CSO) that is located further north within Mackworth Road, it is not currently understood whether this sewer conveys flows from the highway or other sources other than the CSO. The sewer travels past the southern end of Mackworth Road into Sandy Bay beach where it then changes to a westerly direction under the beach for approximately 220m until it discharges to the '600mm Ø' drain that is under BCBC ownership. This connection has been proven by dye testing undertaken by BCBC LLFA.

All public sewers will require a safety zone of a minimum of 3m either side of the centreline of the sewer, preventing structures being constructed within these areas. It is recommended that DCWW are involved within the further masterplan design stages to ensure that any potential diversions and alterations are agreed. Any public sewers that are to be diverted must be done so in agreement with DCWW under Section 185 of the Water Industry Act. Should assets be deemed to have strategic importance, then DCWW may need to undertake such works from design to construction in-house. Therefore, it is recommended that the masterplan proposals make allowance for the rising main, providing space for the safety zone of 3m either side.

### *6.1.2 Drainage assets under BCBC ownership*

#### 6.1.2.1 Highway drainage

Located within A4106 The Portway and along the highway link to the north of Salt Lake car park. It appears that highway drainage crosses the Salt Lake car park site along the western boundary parallel to The Portway and then connects to the public surface water sewer located at the junction of The Portway and Eastern Promenade which then immediately outfalls into the harbour. An additional highway drain also crosses the north eastern part of the Salt Lake car park prior along with 'The Wilderness' drain where they merge together at a chamber.

#### 6.1.2.2 'The Wilderness' drain

This 1.1m diameter drain conveys flows from 'The Wilderness Lakes' located some 0.6 km to the north of the proposed masterplan site. It is also expected that this drain carries surface water flows as well as connections from public surface water sewers at the roundabout of New Road and Eastern Promenade. Past discussions with the LLFA at BCBC indicate that this drain is currently at capacity and cannot accommodate any further surface water flows. This drain crosses the Salt Lake car park throughout, along its eastern edge until it exits the site through the south point before it discharges to the harbour.

#### 6.1.2.3 '600mm Ø' drain

This drain crosses the Salt Lake car park at the eastern edge adjacent to the car park entrance off of Eastern Promenade, where it also receives a connection from the public surface water system. This drain then travels south within Eastern Promenade and re-enters the Salt Lake car park along its eastern boundary further south prior to discharging to the harbour. This asset may be under the ownership of DCWW from the connection point to the outfall. Discussions are ongoing between BCBC and DCWW regarding this issue.

## 6.2 Proposed foul drainage

### *6.2.1 Phase 1*

Foul flows from Phase 1 are assumed to drain to the south of the phase to a pumping station that will then lift flows to the public foul sewerage system and are proposed to connect to public foul chamber reference SS81768601. Foul flows from this area will be generated by 328no. residential units, 0.233 ha of commercial development and 0.926 ha of leisure development, which is estimated to give a peak foul flow of 16.5 litres/ second.

### *6.2.2 Phase 2*

#### 6.2.2.1 Connection 2

Foul flows generated by 247no. residential units and 0.240ha of commercial development to be located south of Griffin Park, generating an estimated peak foul flow rate of 11.6 litres/ second to connect to public foul chamber reference SS82773001.

6.2.2.2 Connection 3

Foul flows generated by 34no. residential units to be located north of Griffin Park within the north part of the current Coney Beach Amusement Park, generating an estimated peak foul flow rate of 1.6 litres/ second to connect to public foul chamber reference SS82773103.

6.2.2.3 Connection 4

Foul flows generated by 27no. residential units to be located to the rear of Bungalow Avenue adjacent to the west boundary of the Sandy Bay Caravan park, generating an estimated peak foul flow rate of 1.3 litres/ second to connect to public foul chamber reference SS82774130.

6.2.2.4 Connection 5

Foul flows generated by 117no. residential units to be located along the mid-section of the Sandy Bay Caravan park, generating an estimated peak foul flow rate of 5.4 litres/ second to connect to public foul chamber reference SS82774130.

6.2.2.5 Connection 6

Foul flows generated by 357no. residential units to be located along the south-section of the Sandy Bay Caravan park and south of the existing Hi-Tide site, generating an estimated peak foul flow rate of 16.5 litres/ second to connect to public foul chamber reference SS82765901.

6.2.2.6 Connection 7

Foul flows generated by 130no. residential units located along the north-section of the Sandy Bay Caravan park, generating an estimated peak foul flow rate of 6.0 litres/ second to connect to public foul chamber reference SS82778201.

6.2.2.7 Connection 8

The existing school is to be extended by 1FE, which is estimated to provide an additional 30no. additional pupils and it is assumed that an additional 3no. staff will be required that would produce an additional estimated peak foul flow of 1.44 litres/ second.

### *6.2.3 DCWW response*

A pre-planning advice application was submitted to DCWW, their response confirmed that due to the size of the development a hydraulic modelling assessment (HMA) will be required to identify any upgrades required to the existing public sewerage system to accommodate the additional foul flows from the proposed development.

## 6.3 Proposed surface water drainage and SuDS

All systems have been simulated using the critical 100 year return period storm event plus an allowance of 40% for climate change. All surface water drainage shown within this drainage strategy are indicative and are to show feasibility only and that surface water flows generated by the masterplan proposals can be safely disposed of. It should also be understood that further

design work will be required to establish a SuDS management train and ensure that all SAB criteria from S1 to S6 are satisfied.

### *6.3.1 Surface water drainage and SuDS catchments*

The LDP masterplan can generally be split into two drainage catchments: The Salt Lake and Coney catchment and the Sandy Bay Caravan Park catchment. It is currently proposed that the school expansion is dealt with within its own site boundary.

#### 6.3.1.1 Salt Lake and Coney catchment

Surface water flows from the 'Salt Lake and Coney Catchment' are to be conveyed by a new piped network to freely discharge to the existing harbour via a new 1050mm diameter pipe outfall located in the north harbour wall, subject to a marine licence in agreement with NRW.

Should the harbour not be able to accommodate all of the proposed surface water flows then a split outfall to the sea through the Eastern Promenade sea wall may also need to be considered within the following stages.

As flows are to discharge freely to the harbour no formal flow attenuation will be required. However, a SuDS management train to satisfy SAB standards S3 to S6.

#### 6.3.1.2 Sandy Bay Caravan Park catchment

Infiltration basins are currently proposed for all Sandy Bay Caravan Park sub-catchments. These SuDS assets are grassed/ vegetated depressions that provide both attenuation storage, and depending on vegetation, some treatment. These assets allow surface water flows to be stored whilst slowly infiltrating to the underlying soil. During dry weather they can also accommodate recreational activities.

#### 6.3.1.3 School

The school, as per the Sandy Bay Caravan Park catchment, will be able to discharge of surface water flows to the ground by infiltration. A permeable pavement drainage method has been assumed to demonstrate feasibility, scope and scale of the SuDS required for the school site. The permeable pavement could be used as the construction method of the school yard and would be consist of 2,7230m$^2$ of porous asphalt surface course, binder and base laid over a 300mm deep open graded clean stone sub-base providing a minimum void ratio of 0.3.

### *6.3.2 Surface water sewer diversions*

#### 6.3.2.1 Public surface water sewer diversion

Due to the proposed coastal erosion defence revetment, the existing 225mm diameter public surface water sewer will need to be diverted. The existing public surface water sewer runs through the northern edge of Sandy Bay and connects to the existing '600mm Ø' drain. The proposed diversion will route the sewer within the proposed new Active Travel route located at the top of the revetment and back into the '600mm Ø' drain.

#### 6.3.2.2 'The Wilderness' drain diversion

The existing 1.1m diameter drain is to be upgraded to a 1.2m diameter pipe from the existing manhole located within the junction of Eastern Promenade and The Portway highways and routed along the eastern kerb line of the Eastern Promenade highway following the proposed new surface water drain in a common trench. The drain diversion is to travel south along Eastern Promenade and discharge to the harbour as per the existing situation, albeit via a new outfall. This new outfall is required due to upsized pipe and service clashes with the proposed new surface water drainage system and the '600mm Ø' drain diversion.

6.3.2.3 '600mm Ø' drain diversion

The existing 600mm diameter drain is to start within Eastern Promenade highway from approximately 40m north of the existing Salt Lake car park access and routed along the eastern kerb line of the Eastern Promenade highway following the proposed new surface water drain in a common trench. The drain diversion is to travel south along Eastern Promenade and discharge to the harbour as per the existing situation, albeit via a new outfall. This new outfall is required due to service clashes with the proposed new surface water drainage system and the 'The Wilderness' drain diversion.

## 6.4 Outline budget cost estimate

An outline budget cost has been provided covering the proposed foul and surface water drainage systems as well as the surface water diversions has been produced. A rate of £20/m2 of developable area has been used to provide a cost for the foul drainage at this stage. The total budget cost has been estimated in the range of £9,374,066 to £10,874,066, of which £7,710,007 are normal costs and £1,664,059 to £3,164,059 of abnormal costs.

## 6.5 Next steps

The following work would be required in the next stages of the masterplan development:

- A more detailed masterplan is to be undertaken going forward that will need to consider SuDS techniques such as swales, bioretention areas and green roofs.
- A Hydraulic Modelling Assessment will need to be undertaken by DCWW in house and will be charged to the developer, the cost of which will be provided by DCWW.
- It may be beneficial to undertake further ground investigations within the Coney Beach Amusement Park to establish feasibility of draining surface water flows to ground. These investigations should include for both infiltration and contamination testing.

# Appendix A

# Drawings

A.1 GC3432-RED-73-XX-SK-D-0002 – Existing Drainage and Sewerage Plan

A.2 GC3432-RED-73-XX-SK-D-0007 – LDP Foul Drainage Strategy Plan

A.3 GC3432-RED-73-XX-DR-D-0501 – LDP Surface Water Drainage Strategy Sheet 1 of 2

A.4 GC3432-RED-73-XX-DR-D-0502 – LDP Surface Water Drainage Strategy Sheet 2 of 2

Combined Sewerage Overflow (CSO) located within Mackworth Road that discharges overflows into the public surface water sewer

Existing '600mm Ø' drain route not known from this point

Public surface water sewer assumed to connect to '600mm Ø' drain here. Proven by dye test undertaken by BCBC.

Private foul drainage serving the existing Sandy Bay Caravan Park

Both 'The Wilderness' and '600mm Ø' drains are to be diverted into the Eastern Promenade highway with any new drainage in a common trench.

Existing '600mm Ø' drain. Lamp Hole depth - 5.000m

Existing 400mm Ø public foul rising main crossing the Salt Lake Car Park. Rising main originates from the 'Irongate SPS' located to the west of the site.

Existing outfalls to harbour

Sand

Sandy Bay

Caravan Park

Boulders

Rock

Rhych Point

Notes:

1. The drainage and sewerage assets shown on this plan are indicative only and will require confirmation on site.
2. The locations of the assets shown have been taken from various sources including the following:
   - Topographical surveys;
   - CCTV drainage surveys; and
   - DCWW public sewer record plans.
3. Masterplan proposals to take existing drainage into account. Where existing drainage needs to be diverted this is to be undertaken under agreement with the relevant authority.

Key:

- Existing '600mm Ø' drain
- Existing 'Wilderness' drain
- Existing Highway drain
- G — Gully Connections
- Public Surface Water Sewer
- Public Foul Sewer
- Public Combined Rising Main (400mm Ø)
- P — Private Surface Water Drainage
- P — Private Foul Drainage
- CSO — Public Combined Sewerage Overflow (CSO)
- SPS — Public Sewerage Pumping Station
- Proposed Masterplan Boundary

| Rev | Description | Date |
|---|---|---|
| P01 | First Issue | 05/11/2020 |

Drwn RL Chkd DL Apprd KF

Purpose of Issue: S2 - Suitable for Information

Classification: Commercial in Confidence

Client: Bridgend County Borough Council

Project: Porthcawl Waterfront Regeneration Area

Drawing: Existing Drainage and Sewerage Plan

| Scale @ A1 | Drawn | Checked | Approved |
|---|---|---|---|
| 1:2,000 | RL | DL | KF |

Project No.: GC/003432

Date: Nov 2020

Drawing Identifier (Project - Originator - Zone - Level - File Type - Role - Number): GC3432-RED-73-XX-SK-D-0002

BS1192 Compliant revision: P01

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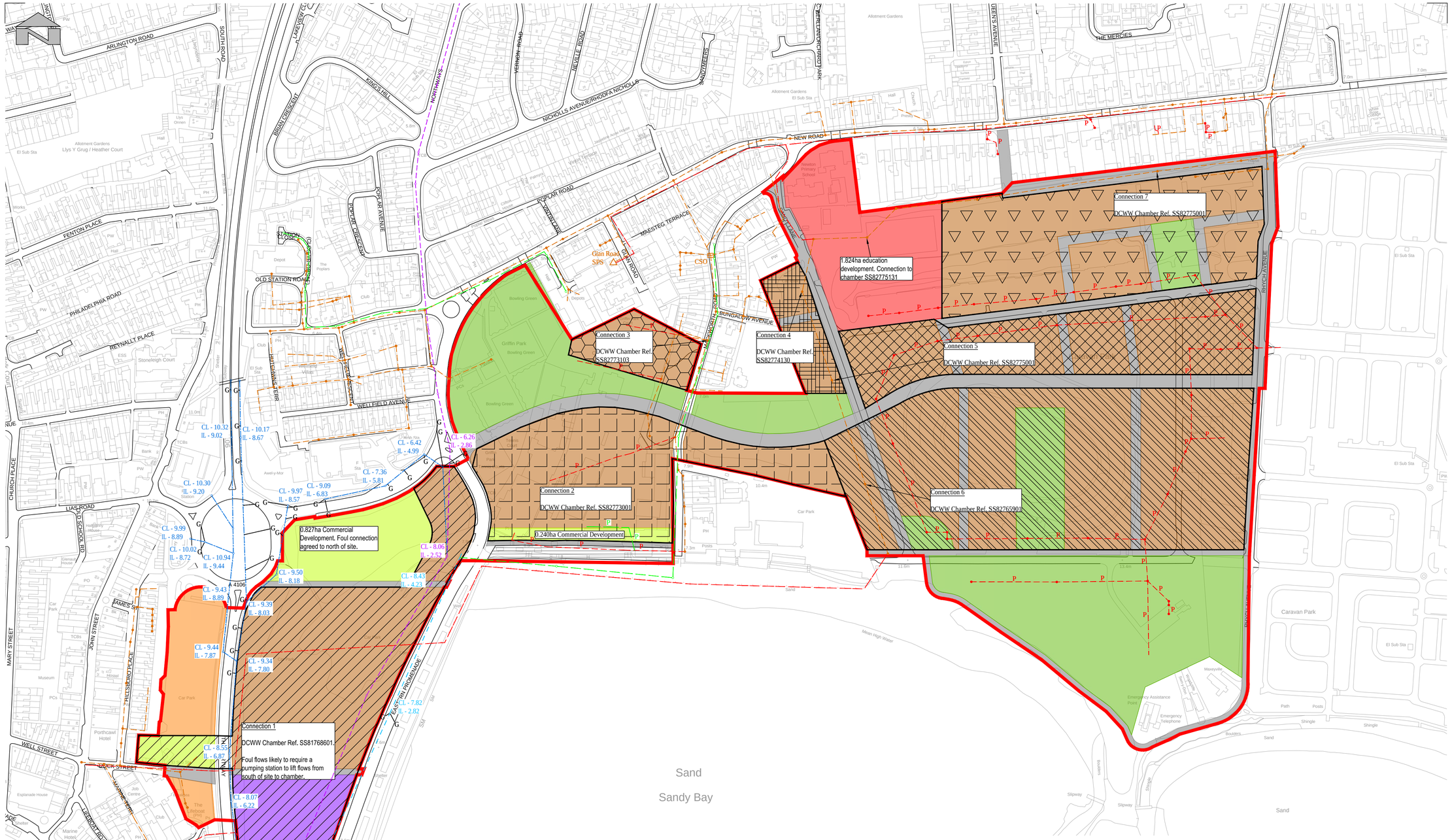


Notes:

1. The drainage and sewerage assets shown on this plan are indicative only and will require confirmation on site.
2. Proposed foul connections are subject to agreement with DCWW under Section 106 of the Water Industry Act.

Key:

- Existing '600mm Ø' drain
- Existing 'Wilderness' drain
- Existing Highway drain
- G — Gully Connections
- Public Surface Water Sewer
- Public Foul Sewer
- Public Combined Rising Main (400mm Ø)
- P — Private Surface Water Drainage
- P — Private Foul Drainage
- CSO — Public Combined Sewerage Overflow (CSO)
- SPS — Public Sewerage Pumping Station
- Proposed Masterplan Boundary

Masterplan Key:

- Residential
- Commercial
- Leisure
- Car Parking
- Education
- Highway/ pedestrian link
- Public open space
- Proposed coastal erosion revetment

## Connection Schedule

| Connection Reference | Key | Development | Estimated Peak Foul Flow (l/s) | DCWW Chamber Reference |
|---|---|---|---|---|
| Connection 1 | | 328no. residential units<br>0.233 ha of commercial development<br>0.926 ha of leisure development | 16.5 | SS81768601 |
| Connection 2 | | 247no. residential units<br>0.240 ha of commercial development | 11.6 | SS82773001 |
| Connection 3 | | 34no. residential units | 1.6 | SS82773103 |
| Connection 4 | | 27no. residential units | 1.3 | SS82774130 |
| Connection 5 | | 117no. residential units | 5.4 | SS82775001 |
| Connection 6 | | 357no. residential units | 16.5 | SS82765901 |
| Connection 7 | | 130no. residential units | 6.0 | SS82778201 |

| Rev | Dwn | Chkd | Apprd | Description | Date |
|---|---|---|---|---|---|
| P01 | RL | DL | KF | First Issue | 05/11/2020 |

Purpose of Issue
S2 - Suitable for Information

Classification
Commercial in Confidence

Client
Bridgend County Borough Council

Project
Porthcawl Waterfront Regeneration Area

Drawing
LDP
Foul Drainage Strategy

| Scale @ A1 | Drawn | Checked | Approved |
|---|---|---|---|
| 1:2,000 | RL | DL | KF |

Project No. GC/003432
Date Nov 2020

Drawing Identifier (Project - Originator - Zone - Level - File Type - Role - Number)
GC3432-RED-73-XX-SK-D-0007
BS1192 Compliant revision P01

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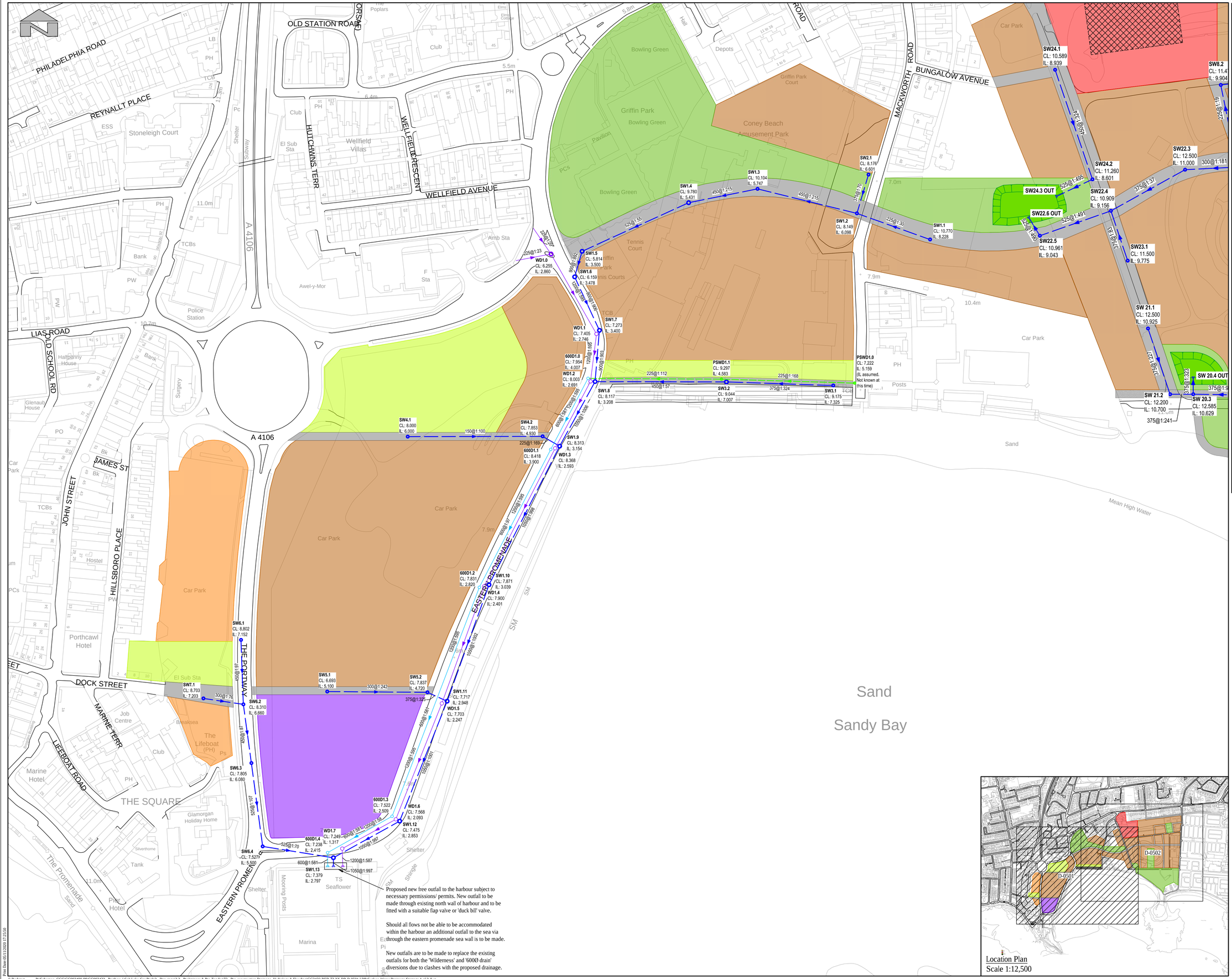


Key:

- xxx@1:xxx — Proposed surface water drain
- SWX.X CL: xx.xxx IL: xx.xxx — Proposed surface water chamber
- Proposed surface water headwall/ outfall
- xxx@1:xxx — Proposed public surface water sewer diversion
- PSWDX.X CL: xx.xxx IL: xx.xxx — Proposed public surface water sewer diversion chamber
- xxx@1:xxx — Proposed 'The Wilderness' drain diversion
- WDX.X CL: xx.xxx IL: xx.xxx — Proposed 'The Wilderness' drain diversion chamber
- Proposed 'The Wilderness' drain outfall
- xxx@1:xxx — Proposed '600mm Ø' drain diversion
- 600DX.X CL: xx.xxx IL: xx.xxx — Proposed '600mm Ø' drain diversion chamber
- Proposed '600mm Ø' drain outfall
- Proposed infiltration basin
- Proposed permeable pavement (school yard)

Development Area Key:

- Highway/ Active Travel (Impermeable area of 100%)
- Residential (Impermeable area of 60%)
- Commercial (Impermeable area of 75%)
- Leisure (Impermeable area of 75%)
- Car Parking (Impermeable area of 90%)
- Landscaping/ public open space (Impermeable area of 0%)
- Education (Impermeable area of 75%)
- Proposed coastal erosion revetment




Location Plan
Scale 1:12,500

| Rev | Description | Date |
|---|---|---|
| P01 | First Issue | 05/11/2020 |

Drawn: RL Chk'd: DL Appd: KF

Purpose of Issue: S2 - Suitable for Information

Classification: Commercial in Confidence

Client: Bridgend County Borough Council

Project: Porthcawl Waterfront Regeneration Area

Drawing: LDP Surface Water Drainage Strategy Layout Sheet 1 of 2

| Scale @ A1 | Drawn | Checked | Approved |
|---|---|---|---|
| 1:1,250 | RL | DL | KF |

Project No.: GC/3432

Date: Nov 2020

Drawing Identifier (Project - Originator - Zone - Level - File Type - Role - Number): GC3432-RED-73-XX-DR-D-0501

BS1192 Compliant revision: P01

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School - Permeable Pavement
2,720m² area of permeable pavement to consist of porous asphalt surface course, binder and base laid on top of 300mm deep sub-base of open graded clean stone to provide a minimum void ratio of 0.3. Water is to be stored and retained in the sub-base whilst infiltrating to ground at a design infiltration rate of $6.142x10^{-4}$ m/s with an applied factor of safety of 10. The permeable pavement has been designed to store flows up to the critical 100 year event plus an allowance of 40% for climate change.

Infiltration Basin 1
Grassed depression of 2.0m total depth including 0.3m freeboard. Surface water flows from north catchment of Sandy Bay Caravan Park site to discharge to basin. Water is to be stored and retained in the basin whilst infiltrating to ground at a design infiltration rate of $9.899x10^{-5}$ m/s with an applied factor of safety of 10. The basin has been designed to store flows up to the critical 100 year event plus an allowance of 40% for climate change.

Infiltration Basin 3
Grassed depression of 1.85m total depth including 0.3m freeboard. Surface water flows from west catchment of Sandy Bay Caravan Park site to discharge to basin. Water is to be stored and retained in the basin whilst infiltrating to ground at a design infiltration rate of $1x10^{-4}$ m/s with an applied factor of safety of 10. The basin has been designed to store flows up to the critical 100 year event plus an allowance of 40% for climate change.

Infiltration Basin 4
Grassed depression of 1.7m total depth including 0.3m freeboard. Surface water flows from south west catchment of Sandy Bay Caravan Park site to discharge to basin. Water is to be stored and retained in the basin whilst infiltrating to ground at a design infiltration rate of $1.944x10^{-4}$ m/s with an applied factor of safety of 10. The basin has been designed to store flows up to the critical 100 year event plus an allowance of 40% for climate change.

Infiltration Basin 2
Grassed depression of 1.5m total depth including 0.3m freeboard. Surface water flows from south catchment of Sandy Bay Caravan Park site to discharge to basin. Water is to be stored and retained in the basin whilst infiltrating to ground at a design infiltration rate of $2.044x10^{-4}$ m/s with an applied factor of safety of 10. The basin has been designed to store flows up to the critical 100 year event plus an allowance of 40% for climate change.

Location Plan
Scale 1:12,500

Key:
- xxx@1:xxx — Proposed surface water drain
- SWX.X CL: xx.xxx IL: xx.xxx — Proposed surface water chamber
- Proposed surface water headwall/ outfall
- xxx@1:xxx — Proposed public surface water sewer diversion
- PSWDX.X CL: xx.xxx IL: xx.xxx — Proposed public surface water sewer diversion chamber
- xxx@1:xxx — Proposed 'The Wilderness' drain diversion
- WDX.X CL: xx.xxx IL: xx.xxx — Proposed 'The Wilderness' drain diversion chamber
- Proposed 'The Wilderness' drain outfall
- xxx@1:xxx — Proposed '600mm Ø' drain diversion
- 600DX.X CL: xx.xxx IL: xx.xxx — Proposed '600mm Ø' drain diversion chamber
- Proposed '600mm Ø' drain outfall
- Proposed infiltration basin
- Proposed permeable pavement (school yard)

Development Area Key:
- Highway/ Active Travel (Impermeable area of 100%)
- Residential (Impermeable area of 60%)
- Commercial (Impermeable area of 75%)
- Leisure (Impermeable area of 75%)
- Car Parking (Impermeable area of 90%)
- Landscaping/ public open space (Impermeable area of 0%)
- Education (Impermeable area of 75%)
- Proposed coastal erosion revetment

| Rev | Drwn | Chk'd | Apprv'd | Description | Date |
|---|---|---|---|---|---|
| P01 | RL | DL | KF | First Issue | 05/11/2020 |

Purpose of Issue
S2 - Suitable for Information

Classification
Commercial in Confidence

Client
Cyngor Bwrdeistref Sirol Pen-y-bont ar Ogwr
BRIDGEND
County Borough Council

Project
Porthcawl Waterfront Regeneration Area

Drawing
LDP
Drainage Strategy Layout
Sheet 2 of 2

| Scale @ A1 | Drawn | Checked | Approved |
|---|---|---|---|
| 1:1,250 | RL | DL | KF |

Project No. GC/3432
Date Nov 2020

Drawing Identifier (Project - Originator - Zone - Level - File Type - Role - Number) GC3432-RED-73-XX-DR-D-0502
BS1192 Compliant revision P01

REDSTART
St David's House, Pascal Close, St Mellons, Cardiff, CF3 0LW
www.redstartwales.com

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P:\Schemes_CGC\GC003400-99\GC003432 - Porthcawl Salt Lake Car Park\2 - Drawings\2.2 - Preliminary & Pre-Tender\73 - Pre-construction Drainage, Hydrology & Flooding\GC3432-RED-73-XX-DR-D-0501 LDP Surface Water Drainage Strategy 2 of 2.dwg
Pen-Dam-Dell 01/12/2020 17:27:45

# Appendix B

# DCWW pre-planning advice

Dŵr Cymru
Welsh Water

Developer Services
PO Box 3146
Cardiff
CF30 0EH

Tel: +44 (0)800 917 2652
Fax: +44 (0)2920 740472
E.mail: developer.services@dwrcymru.com

Gwasanaethau Datblygu
Blwch Post 3146
Caerdydd
CF30 0EH

Ffôn: +44 (0)800 917 2652
Ffacs: +44 (0)2920 740472
E.bost: developer.services@dwrcymru.com

Mr Wayne Palmer
Bridgend County Borough Council
Civic Offices
Angel Street
Bridgend
Bridgend
CF31 4WB

**Date: 19/06/2020**
**Our Ref: PPA0004947**

Dear Mr Palmer

**Grid Ref: 282560 176969**
**Site Address: Porthcawl**
**Development: Porthcawl Regeneration Masterplan**

I refer to your pre-planning enquiry received relating to the above site, seeking our views on the capacity of our network of assets and infrastructure to accommodate your proposed development. Having reviewed the details submitted I can provide the following comments which should be taken into account within any future planning application for the development.

Firstly, we note that the proposal relates to Porthcawl Waterfront regeneration development, comprising of 1500 dwellings, 15,003sqm industrial, 9151sqm food & beverage, 21,547sqm retail, 32,113sqm education, and open space, and acknowledge that the site is allocated in the Local Development Plan (LDP) for mixed use (Ref: PLA3(8)) including 1050 no. units (Ref: COM1(25)). In reference to our representations during the LDP consultation process, we can confirm that an assessment has previously been undertaken of the public sewerage system in relation to Porthcawl Waterfront regeneration and informs our appraisal as follows.

**SEWERAGE**

Please note, notwithstanding the following assessment, we would advise there is also a mandatory requirement to undertake pre-application consultation with all 'Specialist Consultees', including Dwr Cymru Welsh Water as the statutory water and sewerage undertaker, in accordance with Schedule 4 of Town & Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016. As a major development, you will be statutorily required to consult Welsh Water and a substantive response will be issued within 28 days from the date of the notice as per the requirements of Article 2E.

glas
Glas Cymru Cyfyngedig

Welsh Water is owned by Glas Cymru – a 'not-for-profit' company.
Mae Dŵr Cymru yn eiddo i Glas Cymru – cwmni 'nid-er-elw'.

We welcome correspondence in
Welsh and English

Dŵr Cymru Cyf, a limited company registered in
Wales no 2366777. Registered office: Pentwyn Road,
Nelson, Treharris, Mid Glamorgan CF46 6LY

Rydym yn croesawu gohebiaeth yn y
Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng
Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn
Nelson, Treharris, Morgannwg Ganol CF46 6LY.

**Public Sewerage Network**

The proposed development site is located in the immediate vicinity of a separate sewerage system, comprising combined, foul and surface water public sewers, which drains to Wastewater Treatment Works (WwTW)). This site is crossed by a number of public sewerage assets including a 6" foul water sewer and 675mm combined sewer in the north portion of the site as well as a 9" surface water sewer and 400mm combined rising main in the south portion, with their approximate position being marked on the attached Statutory Public Sewer Record. In accordance with the Water Industry Act 1991, Dwr Cymru Welsh Water requires access to its apparatus at all times in order to carry out maintenance and repairs. Accordingly, no part of any building will be permitted within the protection zone of these public sewerage assets measured 3 metres either side of the centreline. Our strong recommendation is that your site layout takes into account the location of the assets crossing the site and should be referred to in any master-planning exercises or site layout plans submitted as part of any subsequent planning application. Further information regarding Asset Protection is provided in the attached Advice & Guidance note. You are also advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011.

The presence of such assets may affect the proposal. In order to assist you may contact Dwr Cymru Welsh Water on 0800 085 3968 to establish the location and status of the apparatus in and around your site. Please be mindful that under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times. Surface Water Drainage As of 7th January 2019, this proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems'. As highlighted in these standards, the developer is required to explore and fully exhaust all surface water drainage options in accordance with a hierarchy which states that discharge to a combined sewer shall only be made as a last resort. Disposal should be made through the hierarchical approach, preferring infiltration and, where infiltration is not possible, disposal to a surface water drainage body in liaison with the Land Drainage Authority and/or Natural Resources Wales. It is therefore recommended that the developer consult with the Bridgend County Borough Council, as the determining SuDS Approval Body (SAB), in relation to their proposals for SuDS features. Please note, DCWW is a statutory consultee to the SAB application process and will provide comments to any SuDS proposals by response to SAB consultation.

Please refer to further detailed advice relating to surface water management included in our attached Advice & Guidance note. In addition, please note that no highway or land drainage run-off will be permitted to discharge directly or indirectly into the public sewerage system.

**Foul Water Drainage – Sewerage Network**

We have considered the impact of foul flows generated by the proposed development and concluded it is unlikely that sufficient capacity exists to accommodate your development without causing detriment to the existing services we provide to our customers, or in regard to the protection of the environment which is consistent with our representations to the LDP consultation process. There are no planned reinforcement works within Dwr Cymru Welsh Water's Capital Investment Programme and therefore, at this stage, we are unable to provide you with a point of adequacy on the network. In light of the above our recommendation is that you instruct us to undertake a Hydraulic Modelling Assessment (HMA) which is at the developer's expense and will examine the impact of the introduction of flows from your development upon the performance of the existing network and consider. Where required and appropriate, the HMA will then identify solutions and points of communication to ensure that your site can be accommodated within the system.

For the developer to obtain a quotation for the HMA, we will require a fee of £250 + VAT. Please note that we will seek to control the outcomes of the HMA via appropriate planning conditions.

However, in the absence of known solutions to accommodate your site we will not be able to support your development through the planning process. We therefore recommend that the HMA is undertaken in advance of a planning application being submitted, in order to avoid any subsequent delays. Further information on Hydraulic Modelling Assessments as well as any implications on the planning process is provided in the attached Advice & Guidance note.

Alternatively, given that the site is located in the vicinity of a combined sewer, the developer may wish to investigate and explore any opportunities to remove surface water flows from the existing public sewerage system which may provide sufficient compensation for some foul flows generated by the proposed development. Should the developer wish to explore this option, we recommend that any scheme/strategy is provided, preferably in advance of a planning application being submitted, in order for us to assess whether suitable as a solution to accommodate some foul flows from the proposed development into the public sewerage system.

You may need to apply to Dwr Cymru Welsh Water for any connection to the public sewer under Section 106 of the Water industry Act 1991. However, if the connection to the public sewer network is either via a lateral drain (i.e. a drain which extends beyond the connecting property boundary) or via a new sewer (i.e. serves more than one property), it is now a mandatory requirement to first enter into a Section 104 Adoption Agreement (Water Industry Act 1991). The design of the sewers and lateral drains must also conform to the Welsh Ministers Standards for Foul Sewers and Lateral Drains and conform with the publication "Sewers for Adoption"- 7th Edition. Further information can be obtained via the Developer Services pages of www.dwrcymru.com.

If the development will give rise to a new discharge (or alter an existing discharge) of trade effluent, directly or indirectly to the public sewerage system, then a Discharge Consent under Section 118 of the Water Industry Act 1991 is required from Dwr Cymru / Welsh Water. Please note that the issuing of a Discharge Consent is independent of the planning process and a consent may be refused although planning permission is granted.

**WATER SUPPLY**

1500 props will increase the peak flow of the network by 60m3/hr & will pose a risk of discolouration & customer contacts In order to establish what would be required to serve the site with an adequate water supply, it will be necessary for the developer to fund the undertaking of a hydraulic modelling assessment on the water supply network. For the developer to obtain a quotation for the hydraulic modelling assessment, we will require a fee of £250 + VAT.

I trust the above information is helpful and will assist you in forming water and drainage strategies that should accompany any future planning application. I also attach copies of our water and sewer extract plans for the area, and a copy of our Planning Guidance Note which provides further information on our approach to the planning process, making connections to our systems and ensuring any existing public assets or infrastructure located within new development sites are protected.

Please note that our response is based on the information provided in your enquiry and should the information change we reserve the right to make a new representation. Should you have any queries or wish to discuss any aspect of our response please do not hesitate to contact our dedicated team of planning officers, either on 0800 917 2652 or via email at **developer.services@dwrcymru.com**

Please quote our reference number in all communications and correspondence.

Yours faithfully,

**Owain George**
**Planning Liaison Manager**
**Developer Services**

***Please Note** that demands upon the water and sewerage systems change continually; consequently the information given above should be regarded as reliable for a maximum period of 12 months from the date of this letter.*

Dŵr Cymru
Welsh Water

PPA0004947 Sewer Plan

N
W E
S

**LEGEND(Representative of most common features)**

**Waste network:**

- Foul chamber
- Surface water chamber
- Combined chamber
- Combined sewer overflow
- Special purpose chamber
- Treatment works
- Pumping station
- Outfall
- Lamphole (LH)
- Storm Overflow
- Rising main
- Gravity sewer
- Private sewer
- Private sewer subject to Sect. 104 adoption agreement (S 104)
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

NB: Sewer symbol colour indicates the type.

RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former S24 sewers (for indicative purposes only)

**Notes:**

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases, pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF) . It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cyfyngedig ("the Company") gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company is for the purpose of assisting persons in complying with the New Roads and Street Works Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

**EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.**

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| | |
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| Map Ref: | 282679,177046 |
| Map scale: | 1:1250 |
| Printed by: | Trower Chris |
| Printed on: | 25 Jun 2020 |

Dŵr Cymru
Welsh Water

PPA0004947 Water Plan

N
W E
S

## LEGEND(Representative of most common features)

**Waste network:**

- Foul chamber
- Surface water chamber
- Combined chamber
- Combined sewer overflow
- Special purpose chamber
- Treatment works
- Pumping station
- Outfall
- Lamphole
- Storm Overflow
- Rising main
- Gravity sewer
- Private sewer
- Private sewer subject to Sect. 104 adoption agreement
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

NB: Sewer symbol colour indicates the type.
RED - Combined
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**Notes:**

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases, pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF) . It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

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Service pipes are not generally shown but their presence should be anticipated.

**EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.**

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| Map Ref: | 282679,177046 |
| Map scale: | 1:1250 |
| Printed by: | Trower Chris |
| Printed on: | 25 Jun 2020 |

# Appendix C

# Calculation outputs

## Design Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Maximum Time of Concentration (mins) | 30.00 |
| Return Period (years) | 2 | Maximum Rainfall (mm/hr) | 75.0 |
| Additional Flow (%) | 0 | Minimum Velocity (m/s) | 1.00 |
| FSR Region | England and Wales | Connection Type | Level Soffits |
| M5-60 (mm) | 17.000 | Minimum Backdrop Height (m) | 0.200 |
| Ratio-R | 0.300 | Preferred Cover Depth (m) | 1.200 |
| CV | 0.750 | Include Intermediate Ground | ✓ |
| Time of Entry (mins) | 4.00 | Enforce best practice design rules | x |

## Nodes

| Name | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|---|---|---|---|---|---|---|---|
| SW1.1 | 0.219 | 4.00 | 10.770 | 1200 | 282394.217 | 177010.156 | 2.542 |
| SW2.1 | 0.365 | 4.00 | 8.176 | 1350 | 282348.821 | 177058.026 | 1.575 |
| SW1.2 | 0.075 | 4.00 | 8.149 | 1500 | 282340.245 | 177029.414 | 2.051 |
| SW1.3 | 0.200 | 4.00 | 10.104 | 1500 | 282266.963 | 177047.480 | 4.357 |
| SW1.4 | 0.241 | 4.00 | 9.780 | 1950 | 282216.097 | 177037.281 | 4.349 |
| SW1.5 | 0.139 | 4.00 | 5.814 | 2250 | 282137.548 | 177001.446 | 2.314 |
| SW1.6 | | | 6.159 | 2250 | 282132.050 | 176982.619 | 2.681 |
| SW1.7 | 0.430 | 4.00 | 7.273 | 2250 | 282150.328 | 176943.178 | 3.873 |
| SW3.1 | 0.568 | 4.00 | 9.175 | 1500 | 282322.782 | 176902.541 | 1.850 |
| SW3.2 | 0.265 | 4.00 | 9.044 | 1800 | 282244.010 | 176905.166 | 2.037 |
| SW1.8 | 0.177 | 4.00 | 8.117 | 2250 | 282147.137 | 176905.387 | 4.909 |
| SW4.1 | 0.050 | 4.00 | 8.000 | 1350 | 282008.938 | 176864.842 | 2.000 |
| SW4.2 | 0.176 | 4.00 | 7.853 | 1500 | 282108.434 | 176865.049 | 2.923 |
| SW1.9 | | | 8.313 | 2250 | 282120.994 | 176857.789 | 5.159 |
| SW1.10 | 1.091 | 4.00 | 7.871 | 2250 | 282068.876 | 176755.590 | 4.832 |
| SW5.1 | 0.034 | 4.00 | 6.693 | 1200 | 281949.560 | 176676.898 | 1.593 |
| SW5.2 | 0.706 | 4.00 | 7.837 | 1500 | 282023.473 | 176676.346 | 3.117 |
| SW1.11 | | | 7.717 | 2250 | 282037.992 | 176669.788 | 4.769 |
| SW1.12 | 0.402 | 4.00 | 7.475 | 2250 | 282003.010 | 176581.367 | 4.622 |
| SW6.1 | 0.701 | 4.00 | 8.802 | 1350 | 281885.944 | 176715.005 | 1.650 |
| SW7.1 | 0.241 | 4.00 | 8.703 | 1200 | 281858.240 | 176671.846 | 1.500 |
| SW6.2 | | | 8.310 | 1350 | 281887.698 | 176667.483 | 1.650 |
| SW6.3 | 0.322 | 4.00 | 7.805 | 1500 | 281893.618 | 176624.179 | 1.725 |
| SW6.4 | 0.191 | 4.00 | 7.527 | 1500 | 281901.955 | 176562.754 | 2.027 |
| SW1.13 | | | 7.379 | 2250 | 281954.109 | 176554.376 | 4.582 |
| OUT HARBOUR | | | 7.488 | 2250 | 281954.109 | 176548.392 | 4.697 |

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## Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.000 | SW1.1 | SW1.2 | 57.305 | 0.600 | 8.228 | 6.323 | 1.905 | 30.1 | 225 | 4.40 | 54.0 |
| 2.000 | SW2.1 | SW1.2 | 29.870 | 0.600 | 6.601 | 6.173 | 0.428 | 69.8 | 375 | 4.23 | 54.8 |
| 1.001 | SW1.2 | SW1.3 | 75.476 | 0.600 | 6.098 | 5.747 | 0.351 | 215.0 | 450 | 5.31 | 50.3 |
| 1.002 | SW1.3 | SW1.4 | 51.878 | 0.600 | 5.747 | 5.506 | 0.241 | 215.0 | 450 | 5.93 | 48.1 |
| 1.003 | SW1.4 | SW1.5 | 86.337 | 0.600 | 5.431 | 3.875 | 1.556 | 55.5 | 525 | 6.41 | 46.6 |
| 1.004 | SW1.5 | SW1.6 | 19.613 | 0.600 | 3.500 | 3.478 | 0.022 | 900.0 | 900 | 6.73 | 45.7 |
| 1.005 | SW1.6 | SW1.7 | 43.470 | 0.600 | 3.478 | 3.430 | 0.048 | 900.0 | 900 | 7.43 | 43.7 |
| 1.006 | SW1.7 | SW1.8 | 37.925 | 0.600 | 3.400 | 3.358 | 0.042 | 900.0 | 900 | 8.04 | 42.2 |
| 3.000 | SW3.1 | SW3.2 | 78.816 | 0.600 | 7.325 | 7.082 | 0.243 | 324.0 | 375 | 5.31 | 50.3 |
| 3.001 | SW3.2 | SW1.8 | 96.873 | 0.600 | 7.007 | 5.308 | 1.699 | 57.0 | 450 | 5.91 | 48.2 |
| 1.007 | SW1.8 | SW1.9 | 54.305 | 0.600 | 3.208 | 3.154 | 0.054 | 997.0 | 1050 | 8.87 | 40.3 |
| 4.000 | SW4.1 | SW4.2 | 99.496 | 0.600 | 6.000 | 5.005 | 0.995 | 100.0 | 150 | 5.65 | 49.1 |
| 4.001 | SW4.2 | SW1.9 | 14.507 | 0.600 | 4.930 | 4.844 | 0.086 | 168.0 | 225 | 5.89 | 48.3 |
| 1.008 | SW1.9 | SW1.10 | 114.721 | 0.600 | 3.154 | 3.039 | 0.115 | 997.0 | 1050 | 10.64 | 36.9 |
| 1.009 | SW1.10 | SW1.11 | 91.191 | 0.600 | 3.039 | 2.948 | 0.091 | 997.0 | 1050 | 12.04 | 34.7 |
| 5.000 | SW5.1 | SW5.2 | 73.915 | 0.600 | 5.100 | 4.795 | 0.305 | 242.0 | 300 | 5.22 | 50.6 |
| 5.001 | SW5.2 | SW1.11 | 15.931 | 0.600 | 4.720 | 4.671 | 0.049 | 324.0 | 375 | 5.49 | 49.7 |
| 1.010 | SW1.11 | SW1.12 | 95.090 | 0.600 | 2.948 | 2.853 | 0.095 | 997.0 | 1050 | 13.51 | 32.6 |
| 1.011 | SW1.12 | SW1.13 | 55.855 | 0.600 | 2.853 | 2.797 | 0.056 | 997.0 | 1050 | 14.37 | 31.6 |
| 6.000 | SW6.1 | SW6.2 | 47.554 | 0.600 | 7.152 | 6.660 | 0.492 | 96.7 | 450 | 4.38 | 54.1 |
| 7.000 | SW7.1 | SW6.2 | 29.779 | 0.600 | 7.203 | 6.810 | 0.393 | 75.8 | 300 | 4.27 | 54.5 |
| 6.001 | SW6.2 | SW6.3 | 43.707 | 0.600 | 6.660 | 6.155 | 0.505 | 86.5 | 450 | 4.72 | 52.6 |
| 6.002 | SW6.3 | SW6.4 | 61.988 | 0.600 | 6.080 | 5.500 | 0.580 | 106.9 | 525 | 5.19 | 50.7 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) |
|---|---|---|---|---|---|---|---|
| 1.000 | 2.394 | 95.2 | 32.1 | 2.317 | 1.601 | 0.219 | 0.0 |
| 2.000 | 2.171 | 239.8 | 54.2 | 1.200 | 1.601 | 0.365 | 0.0 |
| 1.001 | 1.382 | 219.8 | 90.0 | 1.601 | 3.907 | 0.660 | 0.0 |
| 1.002 | 1.382 | 219.8 | 112.2 | 3.907 | 3.824 | 0.860 | 0.0 |
| 1.003 | 3.011 | 651.8 | 139.1 | 3.824 | 1.414 | 1.101 | 0.0 |
| 1.004 | 1.036 | 659.0 | 153.5 | 1.414 | 1.781 | 1.241 | 0.0 |
| 1.005 | 1.036 | 659.0 | 147.0 | 1.781 | 2.943 | 1.241 | 0.0 |
| 1.006 | 1.036 | 659.0 | 191.1 | 2.973 | 3.859 | 1.671 | 0.0 |
| 3.000 | 1.001 | 110.5 | 77.5 | 1.475 | 1.587 | 0.568 | 0.0 |
| 3.001 | 2.696 | 428.8 | 108.8 | 1.587 | 2.359 | 0.833 | 0.0 |
| 1.007 | 1.083 | 937.5 | 292.8 | 3.859 | 4.109 | 2.681 | 0.0 |
| 4.000 | 1.005 | 17.8 | 6.7 | 1.850 | 2.698 | 0.050 | 0.0 |
| 4.001 | 1.006 | 40.0 | 29.7 | 2.698 | 3.244 | 0.227 | 0.0 |
| 1.008 | 1.083 | 937.5 | 290.8 | 4.109 | 3.782 | 2.908 | 0.0 |
| 1.009 | 1.083 | 937.5 | 375.6 | 3.782 | 3.719 | 3.999 | 0.0 |
| 5.000 | 1.006 | 71.1 | 4.6 | 1.293 | 2.742 | 0.034 | 0.0 |
| 5.001 | 1.001 | 110.5 | 99.6 | 2.742 | 2.671 | 0.740 | 0.0 |
| 1.010 | 1.083 | 937.5 | 419.2 | 3.719 | 3.572 | 4.739 | 0.0 |
| 1.011 | 1.083 | 937.5 | 440.1 | 3.572 | 3.532 | 5.141 | 0.0 |
| 6.000 | 2.068 | 328.9 | 102.6 | 1.200 | 1.200 | 0.701 | 0.0 |
| 7.000 | 1.808 | 127.8 | 35.6 | 1.200 | 1.200 | 0.241 | 0.0 |
| 6.001 | 2.186 | 347.7 | 134.3 | 1.200 | 1.200 | 0.941 | 0.0 |
| 6.002 | 2.166 | 468.9 | 173.7 | 1.200 | 1.502 | 1.263 | 0.0 |

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## Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6.003 | SW6.4 | SW1.13 | 52.823 | 0.600 | 5.500 | 4.747 | 0.753 | 70.1 | 525 | 5.52 | 49.5 |
| 1.012 | SW1.13 | OUT HARBOUR | 5.984 | 0.600 | 2.797 | 2.791 | 0.006 | 997.0 | 1050 | 14.46 | 31.5 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) |
|---|---|---|---|---|---|---|---|
| 6.003 | 2.676 | 579.4 | 195.3 | 1.502 | 2.107 | 1.454 | 0.0 |
| 1.012 | 1.083 | 937.5 | 562.7 | 3.532 | 3.647 | 6.595 | 0.0 |

## Pipeline Schedule

| Link | Length (m) | Slope (1:X) | Dia (mm) | Link Type | US CL (m) | US IL (m) | US Depth (m) | DS CL (m) | DS IL (m) | DS Depth (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.000 | 57.305 | 30.1 | 225 | Circular | 10.770 | 8.228 | 2.317 | 8.149 | 6.323 | 1.601 |
| 2.000 | 29.870 | 69.8 | 375 | Circular | 8.176 | 6.601 | 1.200 | 8.149 | 6.173 | 1.601 |
| 1.001 | 75.476 | 215.0 | 450 | Circular | 8.149 | 6.098 | 1.601 | 10.104 | 5.747 | 3.907 |
| 1.002 | 51.878 | 215.0 | 450 | Circular | 10.104 | 5.747 | 3.907 | 9.780 | 5.506 | 3.824 |
| 1.003 | 86.337 | 55.5 | 525 | Circular | 9.780 | 5.431 | 3.824 | 5.814 | 3.875 | 1.414 |
| 1.004 | 19.613 | 900.0 | 900 | Circular | 5.814 | 3.500 | 1.414 | 6.159 | 3.478 | 1.781 |
| 1.005 | 43.470 | 900.0 | 900 | Circular | 6.159 | 3.478 | 1.781 | 7.273 | 3.430 | 2.943 |
| 1.006 | 37.925 | 900.0 | 900 | Circular | 7.273 | 3.400 | 2.973 | 8.117 | 3.358 | 3.859 |
| 3.000 | 78.816 | 324.0 | 375 | Circular | 9.175 | 7.325 | 1.475 | 9.044 | 7.082 | 1.587 |
| 3.001 | 96.873 | 57.0 | 450 | Circular | 9.044 | 7.007 | 1.587 | 8.117 | 5.308 | 2.359 |
| 1.007 | 54.305 | 997.0 | 1050 | Circular | 8.117 | 3.208 | 3.859 | 8.313 | 3.154 | 4.109 |
| 4.000 | 99.496 | 100.0 | 150 | Circular | 8.000 | 6.000 | 1.850 | 7.853 | 5.005 | 2.698 |
| 4.001 | 14.507 | 168.0 | 225 | Circular | 7.853 | 4.930 | 2.698 | 8.313 | 4.844 | 3.244 |
| 1.008 | 114.721 | 997.0 | 1050 | Circular | 8.313 | 3.154 | 4.109 | 7.871 | 3.039 | 3.782 |
| 1.009 | 91.191 | 997.0 | 1050 | Circular | 7.871 | 3.039 | 3.782 | 7.717 | 2.948 | 3.719 |
| 5.000 | 73.915 | 242.0 | 300 | Circular | 6.693 | 5.100 | 1.293 | 7.837 | 4.795 | 2.742 |
| 5.001 | 15.931 | 324.0 | 375 | Circular | 7.837 | 4.720 | 2.742 | 7.717 | 4.671 | 2.671 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 1.000 | SW1.1 | 1200 | Manhole | Adoptable | SW1.2 | 1500 | Manhole | Adoptable |
| 2.000 | SW2.1 | 1350 | Manhole | Adoptable | SW1.2 | 1500 | Manhole | Adoptable |
| 1.001 | SW1.2 | 1500 | Manhole | Adoptable | SW1.3 | 1500 | Manhole | Adoptable |
| 1.002 | SW1.3 | 1500 | Manhole | Adoptable | SW1.4 | 1950 | Manhole | Adoptable |
| 1.003 | SW1.4 | 1950 | Manhole | Adoptable | SW1.5 | 2250 | Manhole | Adoptable |
| 1.004 | SW1.5 | 2250 | Manhole | Adoptable | SW1.6 | 2250 | Manhole | Adoptable |
| 1.005 | SW1.6 | 2250 | Manhole | Adoptable | SW1.7 | 2250 | Manhole | Adoptable |
| 1.006 | SW1.7 | 2250 | Manhole | Adoptable | SW1.8 | 2250 | Manhole | Adoptable |
| 3.000 | SW3.1 | 1500 | Manhole | Adoptable | SW3.2 | 1800 | Manhole | Adoptable |
| 3.001 | SW3.2 | 1800 | Manhole | Adoptable | SW1.8 | 2250 | Manhole | Adoptable |
| 1.007 | SW1.8 | 2250 | Manhole | Adoptable | SW1.9 | 2250 | Manhole | Adoptable |
| 4.000 | SW4.1 | 1350 | Manhole | Adoptable | SW4.2 | 1500 | Manhole | Adoptable |
| 4.001 | SW4.2 | 1500 | Manhole | Adoptable | SW1.9 | 2250 | Manhole | Adoptable |
| 1.008 | SW1.9 | 2250 | Manhole | Adoptable | SW1.10 | 2250 | Manhole | Adoptable |
| 1.009 | SW1.10 | 2250 | Manhole | Adoptable | SW1.11 | 2250 | Manhole | Adoptable |
| 5.000 | SW5.1 | 1200 | Manhole | Adoptable | SW5.2 | 1500 | Manhole | Adoptable |
| 5.001 | SW5.2 | 1500 | Manhole | Adoptable | SW1.11 | 2250 | Manhole | Adoptable |

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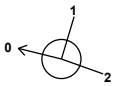
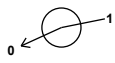
## Pipeline Schedule

| Link | Length (m) | Slope (1:X) | Dia (mm) | Link Type | US CL (m) | US IL (m) | US Depth (m) | DS CL (m) | DS IL (m) | DS Depth (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.010 | 95.090 | 997.0 | 1050 | Circular | 7.717 | 2.948 | 3.719 | 7.475 | 2.853 | 3.572 |
| 1.011 | 55.855 | 997.0 | 1050 | Circular | 7.475 | 2.853 | 3.572 | 7.379 | 2.797 | 3.532 |
| 6.000 | 47.554 | 96.7 | 450 | Circular | 8.802 | 7.152 | 1.200 | 8.310 | 6.660 | 1.200 |
| 7.000 | 29.779 | 75.8 | 300 | Circular | 8.703 | 7.203 | 1.200 | 8.310 | 6.810 | 1.200 |
| 6.001 | 43.707 | 86.5 | 450 | Circular | 8.310 | 6.660 | 1.200 | 7.805 | 6.155 | 1.200 |
| 6.002 | 61.988 | 106.9 | 525 | Circular | 7.805 | 6.080 | 1.200 | 7.527 | 5.500 | 1.502 |
| 6.003 | 52.823 | 70.1 | 525 | Circular | 7.527 | 5.500 | 1.502 | 7.379 | 4.747 | 2.107 |
| 1.012 | 5.984 | 997.0 | 1050 | Circular | 7.379 | 2.797 | 3.532 | 7.488 | 2.791 | 3.647 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 1.010 | SW1.11 | 2250 | Manhole | Adoptable | SW1.12 | 2250 | Manhole | Adoptable |
| 1.011 | SW1.12 | 2250 | Manhole | Adoptable | SW1.13 | 2250 | Manhole | Adoptable |
| 6.000 | SW6.1 | 1350 | Manhole | Adoptable | SW6.2 | 1350 | Manhole | Adoptable |
| 7.000 | SW7.1 | 1200 | Manhole | Adoptable | SW6.2 | 1350 | Manhole | Adoptable |
| 6.001 | SW6.2 | 1350 | Manhole | Adoptable | SW6.3 | 1500 | Manhole | Adoptable |
| 6.002 | SW6.3 | 1500 | Manhole | Adoptable | SW6.4 | 1500 | Manhole | Adoptable |
| 6.003 | SW6.4 | 1500 | Manhole | Adoptable | SW1.13 | 2250 | Manhole | Adoptable |
| 1.012 | SW1.13 | 2250 | Manhole | Adoptable | OUT HARBOUR | 2250 | Manhole | Adoptable |

## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| SW1.1 | 282394.217 | 177010.156 | 10.770 | 2.542 | 1200 | | 0 | 1.000 | 8.228 | 225 |
| SW2.1 | 282348.821 | 177058.026 | 8.176 | 1.575 | 1350 | | 0 | 2.000 | 6.601 | 375 |
| SW1.2 | 282340.245 | 177029.414 | 8.149 | 2.051 | 1500 |  | 1 | 2.000 | 6.173 | 375 |
| | | | | | | | 2 | 1.000 | 6.323 | 225 |
| | | | | | | | 0 | 1.001 | 6.098 | 450 |
| SW1.3 | 282266.963 | 177047.480 | 10.104 | 4.357 | 1500 | | 1 | 1.001 | 5.747 | 450 |
| | | | | | | | 0 | 1.002 | 5.747 | 450 |
| SW1.4 | 282216.097 | 177037.281 | 9.780 | 4.349 | 1950 |  | 1 | 1.002 | 5.506 | 450 |
| | | | | | | | 0 | 1.003 | 5.431 | 525 |
| SW1.5 | 282137.548 | 177001.446 | 5.814 | 2.314 | 2250 | | 1 | 1.003 | 3.875 | 525 |
| | | | | | | | 0 | 1.004 | 3.500 | 900 |
| SW1.6 | 282132.050 | 176982.619 | 6.159 | 2.681 | 2250 | | 1 | 1.004 | 3.478 | 900 |
| | | | | | | | 0 | 1.005 | 3.478 | 900 |

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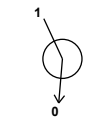
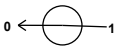
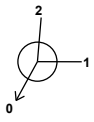
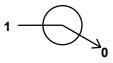
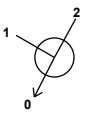
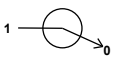
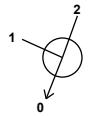
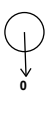
## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| SW1.7 | 282150.328 | 176943.178 | 7.273 | 3.873 | 2250 |  1 | 1.005 | 3.430 | 900 |
| | | | | | | 0 | 1.006 | 3.400 | 900 |
| SW3.1 | 282322.782 | 176902.541 | 9.175 | 1.850 | 1500 | | | | |
| | | | | | | 0 | 3.000 | 7.325 | 375 |
| SW3.2 | 282244.010 | 176905.166 | 9.044 | 2.037 | 1800 | 1 | 3.000 | 7.082 | 375 |
| | | | | | |  0 | 3.001 | 7.007 | 450 |
| SW1.8 | 282147.137 | 176905.387 | 8.117 | 4.909 | 2250 |  1 | 3.001 | 5.308 | 450 |
| | | | | | | 2 | 1.006 | 3.358 | 900 |
| | | | | | | 0 | 1.007 | 3.208 | 1050 |
| SW4.1 | 282008.938 | 176864.842 | 8.000 | 2.000 | 1350 | | | | |
| | | | | | | 0 | 4.000 | 6.000 | 150 |
| SW4.2 | 282108.434 | 176865.049 | 7.853 | 2.923 | 1500 | 1 | 4.000 | 5.005 | 150 |
| | | | | | |  0 | 4.001 | 4.930 | 225 |
| SW1.9 | 282120.994 | 176857.789 | 8.313 | 5.159 | 2250 |  1 | 4.001 | 4.844 | 225 |
| | | | | | | 2 | 1.007 | 3.154 | 1050 |
| | | | | | | 0 | 1.008 | 3.154 | 1050 |
| SW1.10 | 282068.876 | 176755.590 | 7.871 | 4.832 | 2250 | 1 | 1.008 | 3.039 | 1050 |
| | | | | | | 0 | 1.009 | 3.039 | 1050 |
| SW5.1 | 281949.560 | 176676.898 | 6.693 | 1.593 | 1200 | | | | |
| | | | | | | 0 | 5.000 | 5.100 | 300 |
| SW5.2 | 282023.473 | 176676.346 | 7.837 | 3.117 | 1500 | 1 | 5.000 | 4.795 | 300 |
| | | | | | |  0 | 5.001 | 4.720 | 375 |
| SW1.11 | 282037.992 | 176669.788 | 7.717 | 4.769 | 2250 |  1 | 5.001 | 4.671 | 375 |
| | | | | | | 2 | 1.009 | 2.948 | 1050 |
| | | | | | | 0 | 1.010 | 2.948 | 1050 |
| SW1.12 | 282003.010 | 176581.367 | 7.475 | 4.622 | 2250 | 1 | 1.010 | 2.853 | 1050 |
| | | | | | | 0 | 1.011 | 2.853 | 1050 |
| SW6.1 | 281885.944 | 176715.005 | 8.802 | 1.650 | 1350 |  | | | |
| | | | | | | 0 | 6.000 | 7.152 | 450 |

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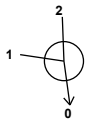
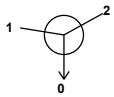
## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| SW7.1 | 281858.240 | 176671.846 | 8.703 | 1.500 | 1200 | | 0 | 7.000 | 7.203 | 300 |
| SW6.2 | 281887.698 | 176667.483 | 8.310 | 1.650 | 1350 |  | 1 | 7.000 | 6.810 | 300 |
| | | | | | | | 2 | 6.000 | 6.660 | 450 |
| | | | | | | | 0 | 6.001 | 6.660 | 450 |
| SW6.3 | 281893.618 | 176624.179 | 7.805 | 1.725 | 1500 | | 1 | 6.001 | 6.155 | 450 |
| | | | | | | | 0 | 6.002 | 6.080 | 525 |
| SW6.4 | 281901.955 | 176562.754 | 7.527 | 2.027 | 1500 | | 1 | 6.002 | 5.500 | 525 |
| | | | | | | | 0 | 6.003 | 5.500 | 525 |
| SW1.13 | 281954.109 | 176554.376 | 7.379 | 4.582 | 2250 |  | 1 | 6.003 | 4.747 | 525 |
| | | | | | | | 2 | 1.011 | 2.797 | 1050 |
| | | | | | | | 0 | 1.012 | 2.797 | 1050 |
| OUT HARBOUR | 281954.109 | 176548.392 | 7.488 | 4.697 | 2250 | | 1 | 1.012 | 2.791 | 1050 |

## Simulation Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Analysis Speed | Normal |
| FSR Region | England and Wales | Skip Steady State | x |
| M5-60 (mm) | 17.000 | Drain Down Time (mins) | 240 |
| Ratio-R | 0.300 | Additional Storage (m³/ha) | 20.0 |
| Summer CV | 0.750 | Check Discharge Rate(s) | x |
| Winter CV | 0.840 | Check Discharge Volume | x |

### Storm Durations

| 15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440 |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|---|---|---|---|
| 100 | 40 | 0 | 0 |

## Rainfall

| Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) | Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) |
|---|---|---|---|---|---|
| 100 year +40% CC 15 minute summer | 368.854 | 104.373 | 100 year +40% CC 120 minute winter | 77.126 | 30.679 |
| 100 year +40% CC 15 minute winter | 258.845 | 104.373 | 100 year +40% CC 180 minute summer | 90.626 | 23.321 |
| 100 year +40% CC 30 minute summer | 255.101 | 72.185 | 100 year +40% CC 180 minute winter | 58.909 | 23.321 |
| 100 year +40% CC 30 minute winter | 179.018 | 72.185 | 100 year +40% CC 240 minute summer | 72.104 | 19.055 |
| 100 year +40% CC 60 minute summer | 180.954 | 47.821 | 100 year +40% CC 240 minute winter | 47.904 | 19.055 |
| 100 year +40% CC 60 minute winter | 120.222 | 47.821 | 100 year +40% CC 360 minute summer | 55.175 | 14.198 |
| 100 year +40% CC 120 minute summer | 116.088 | 30.679 | 100 year +40% CC 360 minute winter | 35.865 | 14.198 |

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## Rainfall

| Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) | Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) |
|---|---|---|---|---|---|
| 100 year +40% CC 480 minute summer | 43.619 | 11.527 | 100 year +40% CC 720 minute winter | 21.495 | 8.572 |
| 100 year +40% CC 480 minute winter | 28.979 | 11.527 | 100 year +40% CC 960 minute summer | 26.337 | 6.935 |
| 100 year +40% CC 600 minute summer | 35.816 | 9.797 | 100 year +40% CC 960 minute winter | 17.446 | 6.935 |
| 100 year +40% CC 600 minute winter | 24.472 | 9.797 | 100 year +40% CC 1440 minute summer | 19.151 | 5.133 |
| 100 year +40% CC 720 minute summer | 31.983 | 8.572 | 100 year +40% CC 1440 minute winter | 12.870 | 5.133 |

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**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.71%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW1.1 | 11 | 9.410 | 1.182 | 110.2 | 3.3775 | 0.0000 | SURCHARGED |
| 15 minute winter | SW2.1 | 11 | 7.650 | 1.049 | 183.4 | 6.3652 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.2 | 11 | 7.402 | 1.304 | 283.8 | 3.2629 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.3 | 12 | 6.834 | 1.087 | 370.7 | 2.9208 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.4 | 12 | 6.214 | 0.783 | 479.9 | 3.2049 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.5 | 12 | 5.417 | 1.917 | 538.4 | 9.9301 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.6 | 12 | 5.495 | 2.017 | 520.5 | 8.0187 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.7 | 12 | 5.470 | 2.070 | 641.1 | 12.8277 | 0.0000 | SURCHARGED |
| 15 minute winter | SW3.1 | 11 | 8.797 | 1.472 | 285.3 | 11.6418 | 0.0000 | SURCHARGED |
| 15 minute winter | SW3.2 | 11 | 7.345 | 0.338 | 375.0 | 1.7373 | 0.0000 | OK |
| 15 minute winter | SW1.8 | 12 | 5.470 | 2.262 | 1026.1 | 10.6290 | 0.0000 | SURCHARGED |
| 15 minute winter | SW4.1 | 12 | 6.904 | 0.904 | 25.3 | 1.7500 | 0.0000 | SURCHARGED |
| 15 minute winter | SW4.2 | 10 | 5.786 | 0.856 | 104.6 | 2.5469 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.9 | 12 | 5.231 | 2.077 | 1122.8 | 8.2578 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.10 | 12 | 5.093 | 2.054 | 1371.6 | 17.4394 | 0.0000 | SURCHARGED |
| 15 minute summer | SW5.1 | 9 | 5.936 | 0.836 | 30.5 | 1.2974 | 0.0000 | SURCHARGED |
| 15 minute winter | SW5.2 | 10 | 5.851 | 1.131 | 379.4 | 7.1225 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.11 | 12 | 4.805 | 1.857 | 1723.9 | 7.3819 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.12 | 12 | 4.354 | 1.501 | 1888.5 | 8.5799 | 0.0000 | SURCHARGED |
| 15 minute winter | SW6.1 | 11 | 8.390 | 1.238 | 351.8 | 12.2828 | 0.0000 | SURCHARGED |
| 15 minute winter | SW7.1 | 11 | 8.200 | 0.997 | 120.8 | 4.3235 | 0.0000 | SURCHARGED |
| 15 minute winter | SW6.2 | 11 | 7.912 | 1.252 | 388.7 | 1.7912 | 0.0000 | SURCHARGED |
| 15 minute winter | SW6.3 | 11 | 7.118 | 1.038 | 542.5 | 5.7078 | 0.0000 | SURCHARGED |
| 15 minute winter | SW6.4 | 11 | 6.237 | 0.737 | 611.6 | 2.6921 | 0.0000 | SURCHARGED |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW1.1 | 1.000 | SW1.2 | 91.7 | 2.546 | 0.963 | 2.2791 | |
| 15 minute winter | SW2.1 | 2.000 | SW1.2 | 159.8 | 1.659 | 0.667 | 3.2946 | |
| 15 minute winter | SW1.2 | 1.001 | SW1.3 | 284.8 | 1.797 | 1.295 | 11.9587 | |
| 15 minute winter | SW1.3 | 1.002 | SW1.4 | 372.3 | 2.351 | 1.694 | 8.2197 | |
| 15 minute winter | SW1.4 | 1.003 | SW1.5 | 468.5 | 3.153 | 0.719 | 18.6516 | |
| 15 minute winter | SW1.5 | 1.004 | SW1.6 | 520.5 | 0.992 | 0.790 | 12.4302 | |
| 15 minute winter | SW1.6 | 1.005 | SW1.7 | 541.3 | 0.854 | 0.821 | 27.5501 | |
| 15 minute winter | SW1.7 | 1.006 | SW1.8 | 665.0 | 1.082 | 1.009 | 24.0359 | |
| 15 minute winter | SW3.1 | 3.000 | SW3.2 | 254.5 | 2.307 | 2.302 | 8.5627 | |
| 15 minute winter | SW3.2 | 3.001 | SW1.8 | 373.5 | 3.024 | 0.871 | 11.9603 | |
| 15 minute winter | SW1.8 | 1.007 | SW1.9 | 1047.9 | 1.215 | 1.118 | 46.8455 | |
| 15 minute winter | SW4.1 | 4.000 | SW4.2 | 19.3 | 1.105 | 1.087 | 1.7516 | |
| 15 minute winter | SW4.2 | 4.001 | SW1.9 | 101.5 | 2.553 | 2.540 | 0.5770 | |
| 15 minute winter | SW1.9 | 1.008 | SW1.10 | 1133.6 | 1.314 | 1.209 | 98.9625 | |
| 15 minute winter | SW1.10 | 1.009 | SW1.11 | 1452.5 | 1.684 | 1.549 | 78.6647 | |
| 15 minute summer | SW5.1 | 5.000 | SW5.2 | 32.3 | 0.546 | 0.454 | 5.2050 | |
| 15 minute winter | SW5.2 | 5.001 | SW1.11 | 365.6 | 3.315 | 3.308 | 1.7394 | |
| 15 minute winter | SW1.11 | 1.010 | SW1.12 | 1762.7 | 2.044 | 1.880 | 82.0281 | |
| 15 minute winter | SW1.12 | 1.011 | SW1.13 | 1926.2 | 2.233 | 2.055 | 48.1826 | |
| 15 minute winter | SW6.1 | 6.000 | SW6.2 | 292.8 | 1.899 | 0.890 | 7.5346 | |
| 15 minute winter | SW7.1 | 7.000 | SW6.2 | 99.3 | 1.747 | 0.777 | 2.0970 | |
| 15 minute winter | SW6.2 | 6.001 | SW6.3 | 390.0 | 2.513 | 1.122 | 6.9251 | |
| 15 minute winter | SW6.3 | 6.002 | SW6.4 | 524.1 | 2.426 | 1.118 | 13.3914 | |
| 15 minute winter | SW6.4 | 6.003 | SW1.13 | 605.9 | 2.968 | 1.046 | 11.2568 | |

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**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.71%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW1.13 | 12 | 4.017 | 1.220 | 2510.7 | 4.8524 | 0.0000 | SURCHARGED |
| 15 minute winter | OUT HARBOUR | 12 | 3.684 | 0.893 | 2516.2 | 0.0000 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 2516.2 | 2.936 | 2.684 | 4.9216 | 1440.6 |

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**Results for 100 year +40% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 99.86%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | SW1.1 | 11 | 9.315 | 1.087 | 110.2 | 3.1054 | 0.0000 | SURCHARGED |
| 15 minute summer | SW2.1 | 11 | 7.587 | 0.986 | 183.3 | 5.9848 | 0.0000 | SURCHARGED |
| 15 minute summer | SW1.2 | 11 | 7.349 | 1.251 | 278.9 | 3.1292 | 0.0000 | SURCHARGED |
| 15 minute summer | SW1.3 | 11 | 6.687 | 0.940 | 363.8 | 2.5254 | 0.0000 | SURCHARGED |
| 15 minute summer | SW1.4 | 12 | 5.824 | 0.393 | 471.2 | 1.6089 | 0.0000 | OK |
| 15 minute summer | SW1.5 | 12 | 5.251 | 1.751 | 540.1 | 9.0721 | 0.0000 | SURCHARGED |
| 15 minute summer | SW1.6 | 12 | 5.170 | 1.692 | 501.3 | 6.7264 | 0.0000 | SURCHARGED |
| 15 minute summer | SW1.7 | 12 | 5.263 | 1.863 | 656.6 | 11.5449 | 0.0000 | SURCHARGED |
| 15 minute summer | SW3.1 | 11 | 8.726 | 1.401 | 285.4 | 11.0853 | 0.0000 | SURCHARGED |
| 15 minute summer | SW3.2 | 11 | 7.338 | 0.331 | 367.8 | 1.7022 | 0.0000 | OK |
| 15 minute summer | SW1.8 | 12 | 5.009 | 1.801 | 1063.2 | 8.4613 | 0.0000 | SURCHARGED |
| 15 minute summer | SW4.1 | 11 | 6.832 | 0.832 | 25.3 | 1.6104 | 0.0000 | SURCHARGED |
| 15 minute summer | SW4.2 | 10 | 5.774 | 0.844 | 104.1 | 2.5096 | 0.0000 | SURCHARGED |
| 15 minute summer | SW1.9 | 12 | 4.983 | 1.829 | 1092.1 | 7.2709 | 0.0000 | SURCHARGED |
| 15 minute summer | SW1.10 | 12 | 4.826 | 1.787 | 1356.5 | 15.1705 | 0.0000 | SURCHARGED |
| 15 minute summer | SW5.1 | 9 | 5.936 | 0.836 | 30.5 | 1.2974 | 0.0000 | SURCHARGED |
| 15 minute summer | SW5.2 | 10 | 5.827 | 1.107 | 368.6 | 6.9717 | 0.0000 | SURCHARGED |
| 15 minute summer | SW1.11 | 11 | 4.565 | 1.617 | 1528.1 | 6.4300 | 0.0000 | SURCHARGED |
| 15 minute summer | SW1.12 | 11 | 4.141 | 1.288 | 1573.7 | 7.3648 | 0.0000 | SURCHARGED |
| 15 minute summer | SW6.1 | 11 | 8.318 | 1.166 | 351.7 | 11.5672 | 0.0000 | SURCHARGED |
| 15 minute summer | SW7.1 | 11 | 8.133 | 0.930 | 120.8 | 4.0328 | 0.0000 | SURCHARGED |
| 15 minute summer | SW6.2 | 11 | 7.850 | 1.190 | 385.7 | 1.7033 | 0.0000 | SURCHARGED |
| 15 minute summer | SW6.3 | 11 | 7.069 | 0.989 | 539.3 | 5.4395 | 0.0000 | SURCHARGED |
| 15 minute summer | SW6.4 | 11 | 6.209 | 0.709 | 614.9 | 2.5916 | 0.0000 | SURCHARGED |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | SW1.1 | 1.000 | SW1.2 | 90.7 | 2.587 | 0.953 | 2.2791 | |
| 15 minute summer | SW2.1 | 2.000 | SW1.2 | 156.9 | 1.698 | 0.654 | 3.2946 | |
| 15 minute summer | SW1.2 | 1.001 | SW1.3 | 280.7 | 1.772 | 1.277 | 11.9587 | |
| 15 minute summer | SW1.3 | 1.002 | SW1.4 | 366.2 | 2.312 | 1.666 | 8.0370 | |
| 15 minute summer | SW1.4 | 1.003 | SW1.5 | 482.4 | 3.205 | 0.740 | 16.8095 | |
| 15 minute summer | SW1.5 | 1.004 | SW1.6 | 501.3 | 1.007 | 0.761 | 12.4302 | |
| 15 minute summer | SW1.6 | 1.005 | SW1.7 | 546.2 | 0.865 | 0.829 | 27.5501 | |
| 15 minute summer | SW1.7 | 1.006 | SW1.8 | 726.2 | 1.146 | 1.102 | 24.0359 | |
| 15 minute summer | SW3.1 | 3.000 | SW3.2 | 248.1 | 2.250 | 2.244 | 8.5513 | |
| 15 minute summer | SW3.2 | 3.001 | SW1.8 | 365.0 | 3.016 | 0.851 | 11.7200 | |
| 15 minute summer | SW1.8 | 1.007 | SW1.9 | 1013.2 | 1.175 | 1.081 | 46.8455 | |
| 15 minute summer | SW4.1 | 4.000 | SW4.2 | 19.3 | 1.094 | 1.085 | 1.7516 | |
| 15 minute summer | SW4.2 | 4.001 | SW1.9 | 100.6 | 2.531 | 2.517 | 0.5711 | |
| 15 minute summer | SW1.9 | 1.008 | SW1.10 | 1083.2 | 1.256 | 1.155 | 98.9625 | |
| 15 minute summer | SW1.10 | 1.009 | SW1.11 | 1287.6 | 1.493 | 1.373 | 78.6647 | |
| 15 minute summer | SW5.1 | 5.000 | SW5.2 | 32.3 | 0.546 | 0.454 | 5.2050 | |
| 15 minute summer | SW5.2 | 5.001 | SW1.11 | 362.5 | 3.287 | 3.280 | 1.7394 | |
| 15 minute summer | SW1.11 | 1.010 | SW1.12 | 1490.5 | 1.728 | 1.590 | 82.0281 | |
| 15 minute summer | SW1.12 | 1.011 | SW1.13 | 1557.6 | 1.806 | 1.661 | 48.1826 | |
| 15 minute summer | SW6.1 | 6.000 | SW6.2 | 290.4 | 1.898 | 0.883 | 7.5346 | |
| 15 minute summer | SW7.1 | 7.000 | SW6.2 | 97.6 | 1.703 | 0.764 | 2.0970 | |
| 15 minute summer | SW6.2 | 6.001 | SW6.3 | 384.9 | 2.430 | 1.107 | 6.9251 | |
| 15 minute summer | SW6.3 | 6.002 | SW6.4 | 518.9 | 2.402 | 1.107 | 13.3914 | |
| 15 minute summer | SW6.4 | 6.003 | SW1.13 | 598.0 | 2.983 | 1.032 | 11.2488 | |

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**Results for 100 year +40% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 99.86%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | SW1.13 | 11 | 3.892 | 1.095 | 2136.4 | 4.3525 | 0.0000 | SURCHARGED |
| 15 minute summer | OUT HARBOUR | 11 | 3.623 | 0.832 | 2139.1 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 2139.1 | 2.580 | 2.282 | 4.7760 | 1286.2 |

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**Results for 100 year +40% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 99.71%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW1.1 | 11 | 9.410 | 1.182 | 110.2 | 3.3775 | 0.0000 | SURCHARGED |
| 15 minute winter | SW2.1 | 11 | 7.650 | 1.049 | 183.4 | 6.3652 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.2 | 11 | 7.402 | 1.304 | 283.8 | 3.2629 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.3 | 12 | 6.834 | 1.087 | 370.7 | 2.9208 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.4 | 12 | 6.214 | 0.783 | 479.9 | 3.2049 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.5 | 12 | 5.417 | 1.917 | 538.4 | 9.9301 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.6 | 12 | 5.495 | 2.017 | 520.5 | 8.0187 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.7 | 12 | 5.470 | 2.070 | 641.1 | 12.8277 | 0.0000 | SURCHARGED |
| 15 minute winter | SW3.1 | 11 | 8.797 | 1.472 | 285.3 | 11.6418 | 0.0000 | SURCHARGED |
| 15 minute winter | SW3.2 | 11 | 7.345 | 0.338 | 375.0 | 1.7373 | 0.0000 | OK |
| 15 minute winter | SW1.8 | 12 | 5.470 | 2.262 | 1026.1 | 10.6290 | 0.0000 | SURCHARGED |
| 15 minute winter | SW4.1 | 12 | 6.904 | 0.904 | 25.3 | 1.7500 | 0.0000 | SURCHARGED |
| 15 minute winter | SW4.2 | 10 | 5.786 | 0.856 | 104.6 | 2.5469 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.9 | 12 | 5.231 | 2.077 | 1122.8 | 8.2578 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.10 | 12 | 5.093 | 2.054 | 1371.6 | 17.4394 | 0.0000 | SURCHARGED |
| 15 minute winter | SW5.1 | 10 | 5.909 | 0.809 | 44.9 | 1.2550 | 0.0000 | SURCHARGED |
| 15 minute winter | SW5.2 | 10 | 5.851 | 1.131 | 379.4 | 7.1225 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.11 | 12 | 4.805 | 1.857 | 1723.9 | 7.3819 | 0.0000 | SURCHARGED |
| 15 minute winter | SW1.12 | 12 | 4.354 | 1.501 | 1888.5 | 8.5799 | 0.0000 | SURCHARGED |
| 15 minute winter | SW6.1 | 11 | 8.390 | 1.238 | 351.8 | 12.2828 | 0.0000 | SURCHARGED |
| 15 minute winter | SW7.1 | 11 | 8.200 | 0.997 | 120.8 | 4.3235 | 0.0000 | SURCHARGED |
| 15 minute winter | SW6.2 | 11 | 7.912 | 1.252 | 388.7 | 1.7912 | 0.0000 | SURCHARGED |
| 15 minute winter | SW6.3 | 11 | 7.118 | 1.038 | 542.5 | 5.7078 | 0.0000 | SURCHARGED |
| 15 minute winter | SW6.4 | 11 | 6.237 | 0.737 | 611.6 | 2.6921 | 0.0000 | SURCHARGED |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW1.1 | 1.000 | SW1.2 | 91.7 | 2.546 | 0.963 | 2.2791 | |
| 15 minute winter | SW2.1 | 2.000 | SW1.2 | 159.8 | 1.659 | 0.667 | 3.2946 | |
| 15 minute winter | SW1.2 | 1.001 | SW1.3 | 284.8 | 1.797 | 1.295 | 11.9587 | |
| 15 minute winter | SW1.3 | 1.002 | SW1.4 | 372.3 | 2.351 | 1.694 | 8.2197 | |
| 15 minute winter | SW1.4 | 1.003 | SW1.5 | 468.5 | 3.153 | 0.719 | 18.6516 | |
| 15 minute winter | SW1.5 | 1.004 | SW1.6 | 520.5 | 0.992 | 0.790 | 12.4302 | |
| 15 minute winter | SW1.6 | 1.005 | SW1.7 | 541.3 | 0.854 | 0.821 | 27.5501 | |
| 15 minute winter | SW1.7 | 1.006 | SW1.8 | 665.0 | 1.082 | 1.009 | 24.0359 | |
| 15 minute winter | SW3.1 | 3.000 | SW3.2 | 254.5 | 2.307 | 2.302 | 8.5627 | |
| 15 minute winter | SW3.2 | 3.001 | SW1.8 | 373.5 | 3.024 | 0.871 | 11.9603 | |
| 15 minute winter | SW1.8 | 1.007 | SW1.9 | 1047.9 | 1.215 | 1.118 | 46.8455 | |
| 15 minute winter | SW4.1 | 4.000 | SW4.2 | 19.3 | 1.105 | 1.087 | 1.7516 | |
| 15 minute winter | SW4.2 | 4.001 | SW1.9 | 101.5 | 2.553 | 2.540 | 0.5770 | |
| 15 minute winter | SW1.9 | 1.008 | SW1.10 | 1133.6 | 1.314 | 1.209 | 98.9625 | |
| 15 minute winter | SW1.10 | 1.009 | SW1.11 | 1452.5 | 1.684 | 1.549 | 78.6647 | |
| 15 minute winter | SW5.1 | 5.000 | SW5.2 | -30.5 | -0.459 | -0.429 | 5.2050 | |
| 15 minute winter | SW5.2 | 5.001 | SW1.11 | 365.6 | 3.315 | 3.308 | 1.7394 | |
| 15 minute winter | SW1.11 | 1.010 | SW1.12 | 1762.7 | 2.044 | 1.880 | 82.0281 | |
| 15 minute winter | SW1.12 | 1.011 | SW1.13 | 1926.2 | 2.233 | 2.055 | 48.1826 | |
| 15 minute winter | SW6.1 | 6.000 | SW6.2 | 292.8 | 1.899 | 0.890 | 7.5346 | |
| 15 minute winter | SW7.1 | 7.000 | SW6.2 | 99.3 | 1.747 | 0.777 | 2.0970 | |
| 15 minute winter | SW6.2 | 6.001 | SW6.3 | 390.0 | 2.513 | 1.122 | 6.9251 | |
| 15 minute winter | SW6.3 | 6.002 | SW6.4 | 524.1 | 2.426 | 1.118 | 13.3914 | |
| 15 minute winter | SW6.4 | 6.003 | SW1.13 | 605.9 | 2.968 | 1.046 | 11.2568 | |

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**Results for 100 year +40% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 99.71%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW1.13 | 12 | 4.017 | 1.220 | 2510.7 | 4.8524 | 0.0000 | SURCHARGED |
| 15 minute winter | OUT HARBOUR | 12 | 3.684 | 0.893 | 2516.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 2516.2 | 2.936 | 2.684 | 4.9216 | 1440.6 |

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**Results for 100 year +40% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.88%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute summer | SW1.1 | 19 | 8.945 | 0.717 | 101.7 | 2.0504 | 0.0000 | SURCHARGED |
| 30 minute summer | SW2.1 | 18 | 7.395 | 0.794 | 169.0 | 4.8154 | 0.0000 | SURCHARGED |
| 30 minute summer | SW1.2 | 18 | 7.179 | 1.081 | 275.1 | 2.7047 | 0.0000 | SURCHARGED |
| 30 minute summer | SW1.3 | 18 | 6.596 | 0.849 | 349.6 | 2.2805 | 0.0000 | SURCHARGED |
| 30 minute summer | SW1.4 | 20 | 5.922 | 0.491 | 451.0 | 2.0107 | 0.0000 | OK |
| 30 minute summer | SW1.5 | 19 | 5.390 | 1.890 | 520.5 | 9.7907 | 0.0000 | SURCHARGED |
| 30 minute summer | SW1.6 | 19 | 5.250 | 1.772 | 514.0 | 7.0454 | 0.0000 | SURCHARGED |
| 30 minute summer | SW1.7 | 19 | 5.363 | 1.963 | 624.4 | 12.1689 | 0.0000 | SURCHARGED |
| 30 minute summer | SW3.1 | 18 | 8.556 | 1.231 | 263.2 | 9.7372 | 0.0000 | SURCHARGED |
| 30 minute summer | SW3.2 | 18 | 7.324 | 0.317 | 348.2 | 1.6290 | 0.0000 | OK |
| 30 minute summer | SW1.8 | 19 | 5.164 | 1.956 | 1070.6 | 9.1889 | 0.0000 | SURCHARGED |
| 30 minute summer | SW4.1 | 19 | 6.728 | 0.728 | 23.4 | 1.4082 | 0.0000 | SURCHARGED |
| 30 minute summer | SW4.2 | 18 | 5.682 | 0.752 | 96.4 | 2.2361 | 0.0000 | SURCHARGED |
| 30 minute summer | SW1.9 | 19 | 5.126 | 1.972 | 1077.6 | 7.8406 | 0.0000 | SURCHARGED |
| 30 minute summer | SW1.10 | 19 | 4.992 | 1.953 | 1407.5 | 16.5822 | 0.0000 | SURCHARGED |
| 30 minute summer | SW5.1 | 17 | 5.682 | 0.582 | 25.2 | 0.9032 | 0.0000 | SURCHARGED |
| 30 minute summer | SW5.2 | 18 | 5.702 | 0.982 | 329.9 | 6.1874 | 0.0000 | SURCHARGED |
| 30 minute summer | SW1.11 | 19 | 4.687 | 1.739 | 1632.8 | 6.9158 | 0.0000 | SURCHARGED |
| 30 minute summer | SW1.12 | 20 | 4.249 | 1.396 | 1766.9 | 7.9833 | 0.0000 | SURCHARGED |
| 30 minute summer | SW6.1 | 18 | 7.995 | 0.843 | 324.5 | 8.3697 | 0.0000 | SURCHARGED |
| 30 minute summer | SW7.1 | 18 | 7.816 | 0.613 | 111.5 | 2.6587 | 0.0000 | SURCHARGED |
| 30 minute summer | SW6.2 | 18 | 7.543 | 0.883 | 390.6 | 1.2643 | 0.0000 | SURCHARGED |
| 30 minute summer | SW6.3 | 18 | 6.803 | 0.723 | 513.6 | 3.9764 | 0.0000 | SURCHARGED |
| 30 minute summer | SW6.4 | 19 | 6.048 | 0.548 | 591.6 | 2.0045 | 0.0000 | SURCHARGED |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 30 minute summer | SW1.1 | 1.000 | SW1.2 | 91.9 | 2.558 | 0.965 | 2.2791 | |
| 30 minute summer | SW2.1 | 2.000 | SW1.2 | 150.3 | 1.661 | 0.627 | 3.2946 | |
| 30 minute summer | SW1.2 | 1.001 | SW1.3 | 265.9 | 1.678 | 1.210 | 11.9587 | |
| 30 minute summer | SW1.3 | 1.002 | SW1.4 | 345.7 | 2.184 | 1.573 | 8.0804 | |
| 30 minute summer | SW1.4 | 1.003 | SW1.5 | 459.7 | 3.134 | 0.705 | 18.3942 | |
| 30 minute summer | SW1.5 | 1.004 | SW1.6 | 514.0 | 0.948 | 0.780 | 12.4302 | |
| 30 minute summer | SW1.6 | 1.005 | SW1.7 | 544.1 | 0.859 | 0.826 | 27.5501 | |
| 30 minute summer | SW1.7 | 1.006 | SW1.8 | 671.8 | 1.060 | 1.019 | 24.0359 | |
| 30 minute summer | SW3.1 | 3.000 | SW3.2 | 232.6 | 2.110 | 2.105 | 8.4992 | |
| 30 minute summer | SW3.2 | 3.001 | SW1.8 | 342.6 | 2.991 | 0.799 | 11.1554 | |
| 30 minute summer | SW1.8 | 1.007 | SW1.9 | 997.7 | 1.157 | 1.064 | 46.8455 | |
| 30 minute summer | SW4.1 | 4.000 | SW4.2 | 18.3 | 1.038 | 1.029 | 1.7516 | |
| 30 minute summer | SW4.2 | 4.001 | SW1.9 | 94.2 | 2.369 | 2.356 | 0.5770 | |
| 30 minute summer | SW1.9 | 1.008 | SW1.10 | 1103.7 | 1.280 | 1.177 | 98.9625 | |
| 30 minute summer | SW1.10 | 1.009 | SW1.11 | 1409.6 | 1.634 | 1.504 | 78.6647 | |
| 30 minute summer | SW5.1 | 5.000 | SW5.2 | 28.7 | 0.478 | 0.403 | 5.2050 | |
| 30 minute summer | SW5.2 | 5.001 | SW1.11 | 333.7 | 3.026 | 3.019 | 1.7394 | |
| 30 minute summer | SW1.11 | 1.010 | SW1.12 | 1663.2 | 1.928 | 1.774 | 82.0281 | |
| 30 minute summer | SW1.12 | 1.011 | SW1.13 | 1768.8 | 2.051 | 1.887 | 48.1826 | |
| 30 minute summer | SW6.1 | 6.000 | SW6.2 | 288.9 | 1.892 | 0.878 | 7.5346 | |
| 30 minute summer | SW7.1 | 7.000 | SW6.2 | 101.7 | 1.722 | 0.796 | 2.0970 | |
| 30 minute summer | SW6.2 | 6.001 | SW6.3 | 376.4 | 2.473 | 1.083 | 6.9251 | |
| 30 minute summer | SW6.3 | 6.002 | SW6.4 | 508.0 | 2.363 | 1.084 | 13.3914 | |
| 30 minute summer | SW6.4 | 6.003 | SW1.13 | 576.3 | 2.958 | 0.995 | 10.4177 | |

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**Results for 100 year +40% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.88%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute summer | SW1.13 | 20 | 3.961 | 1.164 | 2340.2 | 4.6288 | 0.0000 | SURCHARGED |
| 30 minute summer | OUT HARBOUR | 20 | 3.657 | 0.866 | 2341.6 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 30 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 2341.6 | 2.747 | 2.498 | 4.8601 | 1779.2 |

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**Results for 100 year +40% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 99.98%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | SW1.1 | 18 | 8.415 | 0.187 | 87.9 | 0.5346 | 0.0000 | OK |
| 30 minute winter | SW2.1 | 19 | 7.158 | 0.557 | 146.3 | 3.3809 | 0.0000 | SURCHARGED |
| 30 minute winter | SW1.2 | 19 | 6.980 | 0.882 | 248.5 | 2.2056 | 0.0000 | SURCHARGED |
| 30 minute winter | SW1.3 | 18 | 6.474 | 0.727 | 321.9 | 1.9541 | 0.0000 | SURCHARGED |
| 30 minute winter | SW1.4 | 20 | 5.825 | 0.394 | 412.0 | 1.6133 | 0.0000 | OK |
| 30 minute winter | SW1.5 | 20 | 5.268 | 1.768 | 453.9 | 9.1574 | 0.0000 | SURCHARGED |
| 30 minute winter | SW1.6 | 19 | 5.246 | 1.768 | 506.3 | 7.0314 | 0.0000 | SURCHARGED |
| 30 minute winter | SW1.7 | 19 | 5.257 | 1.857 | 601.1 | 11.5083 | 0.0000 | SURCHARGED |
| 30 minute winter | SW3.1 | 18 | 8.326 | 1.001 | 227.7 | 7.9163 | 0.0000 | SURCHARGED |
| 30 minute winter | SW3.2 | 18 | 7.302 | 0.295 | 315.7 | 1.5173 | 0.0000 | OK |
| 30 minute winter | SW1.8 | 19 | 5.193 | 1.985 | 978.1 | 9.3248 | 0.0000 | SURCHARGED |
| 30 minute winter | SW4.1 | 19 | 6.534 | 0.534 | 20.2 | 1.0324 | 0.0000 | SURCHARGED |
| 30 minute winter | SW4.2 | 18 | 5.563 | 0.633 | 85.5 | 1.8828 | 0.0000 | SURCHARGED |
| 30 minute winter | SW1.9 | 20 | 5.042 | 1.888 | 1077.5 | 7.5079 | 0.0000 | SURCHARGED |
| 30 minute winter | SW1.10 | 19 | 4.930 | 1.891 | 1391.6 | 16.0579 | 0.0000 | SURCHARGED |
| 30 minute winter | SW5.1 | 17 | 5.585 | 0.485 | 24.4 | 0.7520 | 0.0000 | SURCHARGED |
| 30 minute winter | SW5.2 | 17 | 5.546 | 0.826 | 298.7 | 5.2040 | 0.0000 | SURCHARGED |
| 30 minute winter | SW1.11 | 19 | 4.665 | 1.717 | 1647.9 | 6.8250 | 0.0000 | SURCHARGED |
| 30 minute winter | SW1.12 | 19 | 4.260 | 1.407 | 1776.7 | 8.0427 | 0.0000 | SURCHARGED |
| 30 minute winter | SW6.1 | 19 | 7.569 | 0.417 | 280.6 | 4.1395 | 0.0000 | OK |
| 30 minute winter | SW7.1 | 18 | 7.437 | 0.234 | 96.4 | 1.0149 | 0.0000 | OK |
| 30 minute winter | SW6.2 | 18 | 7.229 | 0.569 | 356.6 | 0.8143 | 0.0000 | SURCHARGED |
| 30 minute winter | SW6.3 | 18 | 6.598 | 0.518 | 482.3 | 2.8505 | 0.0000 | OK |
| 30 minute winter | SW6.4 | 18 | 5.957 | 0.457 | 549.3 | 1.6687 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | SW1.1 | 1.000 | SW1.2 | 86.2 | 2.596 | 0.905 | 2.1507 | |
| 30 minute winter | SW2.1 | 2.000 | SW1.2 | 135.8 | 1.651 | 0.566 | 3.2946 | |
| 30 minute winter | SW1.2 | 1.001 | SW1.3 | 246.9 | 1.559 | 1.123 | 11.9587 | |
| 30 minute winter | SW1.3 | 1.002 | SW1.4 | 320.7 | 2.030 | 1.459 | 7.9109 | |
| 30 minute winter | SW1.4 | 1.003 | SW1.5 | 398.1 | 3.034 | 0.611 | 16.8305 | |
| 30 minute winter | SW1.5 | 1.004 | SW1.6 | 506.3 | 0.907 | 0.768 | 12.4302 | |
| 30 minute winter | SW1.6 | 1.005 | SW1.7 | 487.7 | 0.793 | 0.740 | 27.5501 | |
| 30 minute winter | SW1.7 | 1.006 | SW1.8 | 631.2 | 1.040 | 0.958 | 24.0359 | |
| 30 minute winter | SW3.1 | 3.000 | SW3.2 | 212.8 | 1.932 | 1.925 | 8.4163 | |
| 30 minute winter | SW3.2 | 3.001 | SW1.8 | 312.6 | 2.939 | 0.729 | 10.3351 | |
| 30 minute winter | SW1.8 | 1.007 | SW1.9 | 999.9 | 1.159 | 1.067 | 46.8455 | |
| 30 minute winter | SW4.1 | 4.000 | SW4.2 | 17.4 | 0.990 | 0.981 | 1.7516 | |
| 30 minute winter | SW4.2 | 4.001 | SW1.9 | 84.8 | 2.131 | 2.120 | 0.5711 | |
| 30 minute winter | SW1.9 | 1.008 | SW1.10 | 1057.7 | 1.226 | 1.128 | 98.9625 | |
| 30 minute winter | SW1.10 | 1.009 | SW1.11 | 1406.3 | 1.630 | 1.500 | 78.6647 | |
| 30 minute winter | SW5.1 | 5.000 | SW5.2 | 23.2 | 0.396 | 0.327 | 5.2050 | |
| 30 minute winter | SW5.2 | 5.001 | SW1.11 | 290.2 | 2.631 | 2.625 | 1.7394 | |
| 30 minute winter | SW1.11 | 1.010 | SW1.12 | 1653.5 | 1.917 | 1.764 | 82.0281 | |
| 30 minute winter | SW1.12 | 1.011 | SW1.13 | 1772.0 | 2.054 | 1.890 | 48.1826 | |
| 30 minute winter | SW6.1 | 6.000 | SW6.2 | 265.5 | 1.870 | 0.807 | 7.4130 | |
| 30 minute winter | SW7.1 | 7.000 | SW6.2 | 93.4 | 1.740 | 0.731 | 1.9262 | |
| 30 minute winter | SW6.2 | 6.001 | SW6.3 | 353.3 | 2.361 | 1.016 | 6.9146 | |
| 30 minute winter | SW6.3 | 6.002 | SW6.4 | 474.9 | 2.353 | 1.013 | 12.8583 | |
| 30 minute winter | SW6.4 | 6.003 | SW1.13 | 549.3 | 2.943 | 0.948 | 9.8500 | |

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**Results for 100 year +40% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 99.98%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | SW1.13 | 19 | 3.957 | 1.160 | 2317.6 | 4.6107 | 0.0000 | SURCHARGED |
| 30 minute winter | OUT HARBOUR | 19 | 3.653 | 0.862 | 2317.3 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 2317.3 | 2.722 | 2.472 | 4.8503 | 1999.4 |

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**Results for 100 year +40% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute summer | SW1.1 | 32 | 8.380 | 0.152 | 77.3 | 0.4354 | 0.0000 | OK |
| 60 minute summer | SW2.1 | 33 | 6.835 | 0.234 | 128.5 | 1.4192 | 0.0000 | OK |
| 60 minute summer | SW1.2 | 33 | 6.738 | 0.640 | 231.9 | 1.6022 | 0.0000 | SURCHARGED |
| 60 minute summer | SW1.3 | 33 | 6.342 | 0.595 | 284.7 | 1.5979 | 0.0000 | SURCHARGED |
| 60 minute summer | SW1.4 | 33 | 5.716 | 0.285 | 366.2 | 1.1690 | 0.0000 | OK |
| 60 minute summer | SW1.5 | 35 | 4.780 | 1.280 | 418.4 | 6.6328 | 0.0000 | SURCHARGED |
| 60 minute summer | SW1.6 | 35 | 4.860 | 1.382 | 407.5 | 5.4936 | 0.0000 | SURCHARGED |
| 60 minute summer | SW1.7 | 35 | 4.770 | 1.370 | 499.9 | 8.4916 | 0.0000 | SURCHARGED |
| 60 minute summer | SW3.1 | 33 | 8.100 | 0.775 | 200.1 | 6.1347 | 0.0000 | SURCHARGED |
| 60 minute summer | SW3.2 | 33 | 7.277 | 0.270 | 277.6 | 1.3872 | 0.0000 | OK |
| 60 minute summer | SW1.8 | 35 | 4.738 | 1.530 | 823.4 | 7.1884 | 0.0000 | SURCHARGED |
| 60 minute summer | SW4.1 | 34 | 6.227 | 0.227 | 17.7 | 0.4388 | 0.0000 | SURCHARGED |
| 60 minute summer | SW4.2 | 33 | 5.456 | 0.526 | 77.7 | 1.5657 | 0.0000 | SURCHARGED |
| 60 minute summer | SW1.9 | 35 | 4.653 | 1.499 | 901.1 | 5.9604 | 0.0000 | SURCHARGED |
| 60 minute summer | SW1.10 | 35 | 4.514 | 1.475 | 1149.0 | 12.5273 | 0.0000 | SURCHARGED |
| 60 minute summer | SW5.1 | 33 | 5.447 | 0.347 | 17.6 | 0.5380 | 0.0000 | SURCHARGED |
| 60 minute summer | SW5.2 | 32 | 5.427 | 0.707 | 264.3 | 4.4562 | 0.0000 | SURCHARGED |
| 60 minute summer | SW1.11 | 35 | 4.326 | 1.378 | 1391.0 | 5.4782 | 0.0000 | SURCHARGED |
| 60 minute summer | SW1.12 | 35 | 4.044 | 1.191 | 1521.9 | 6.8104 | 0.0000 | SURCHARGED |
| 60 minute summer | SW6.1 | 32 | 7.468 | 0.316 | 246.5 | 3.1350 | 0.0000 | OK |
| 60 minute summer | SW7.1 | 32 | 7.393 | 0.190 | 84.7 | 0.8235 | 0.0000 | OK |
| 60 minute summer | SW6.2 | 33 | 7.048 | 0.388 | 328.2 | 0.5559 | 0.0000 | OK |
| 60 minute summer | SW6.3 | 33 | 6.518 | 0.438 | 438.0 | 2.4069 | 0.0000 | OK |
| 60 minute summer | SW6.4 | 33 | 5.915 | 0.415 | 504.5 | 1.5183 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 60 minute summer | SW1.1 | 1.000 | SW1.2 | 77.1 | 2.591 | 0.810 | 1.9594 | |
| 60 minute summer | SW2.1 | 2.000 | SW1.2 | 128.3 | 1.634 | 0.535 | 2.7267 | |
| 60 minute summer | SW1.2 | 1.001 | SW1.3 | 217.6 | 1.374 | 0.990 | 11.9587 | |
| 60 minute summer | SW1.3 | 1.002 | SW1.4 | 284.0 | 1.813 | 1.292 | 7.7520 | |
| 60 minute summer | SW1.4 | 1.003 | SW1.5 | 370.9 | 3.026 | 0.569 | 14.1968 | |
| 60 minute summer | SW1.5 | 1.004 | SW1.6 | 407.5 | 0.866 | 0.618 | 12.4302 | |
| 60 minute summer | SW1.6 | 1.005 | SW1.7 | 399.4 | 0.778 | 0.606 | 27.5501 | |
| 60 minute summer | SW1.7 | 1.006 | SW1.8 | 549.4 | 0.998 | 0.834 | 24.0359 | |
| 60 minute summer | SW3.1 | 3.000 | SW3.2 | 187.3 | 1.712 | 1.694 | 8.2522 | |
| 60 minute summer | SW3.2 | 3.001 | SW1.8 | 274.8 | 2.863 | 0.641 | 9.3263 | |
| 60 minute summer | SW1.8 | 1.007 | SW1.9 | 841.3 | 0.975 | 0.897 | 46.8455 | |
| 60 minute summer | SW4.1 | 4.000 | SW4.2 | 17.0 | 0.979 | 0.956 | 1.7516 | |
| 60 minute summer | SW4.2 | 4.001 | SW1.9 | 75.4 | 1.897 | 1.887 | 0.5702 | |
| 60 minute summer | SW1.9 | 1.008 | SW1.10 | 901.6 | 1.045 | 0.962 | 98.9625 | |
| 60 minute summer | SW1.10 | 1.009 | SW1.11 | 1173.6 | 1.361 | 1.252 | 78.6647 | |
| 60 minute summer | SW5.1 | 5.000 | SW5.2 | 20.8 | 0.345 | 0.293 | 5.2050 | |
| 60 minute summer | SW5.2 | 5.001 | SW1.11 | 254.2 | 2.305 | 2.300 | 1.7307 | |
| 60 minute summer | SW1.11 | 1.010 | SW1.12 | 1415.5 | 1.641 | 1.510 | 82.0281 | |
| 60 minute summer | SW1.12 | 1.011 | SW1.13 | 1523.8 | 1.767 | 1.625 | 48.1186 | |
| 60 minute summer | SW6.1 | 6.000 | SW6.2 | 244.2 | 1.847 | 0.742 | 6.2519 | |
| 60 minute summer | SW7.1 | 7.000 | SW6.2 | 84.0 | 1.732 | 0.658 | 1.5805 | |
| 60 minute summer | SW6.2 | 6.001 | SW6.3 | 328.2 | 2.355 | 0.944 | 6.1712 | |
| 60 minute summer | SW6.3 | 6.002 | SW6.4 | 439.2 | 2.337 | 0.937 | 11.6440 | |
| 60 minute summer | SW6.4 | 6.003 | SW1.13 | 501.7 | 2.923 | 0.866 | 9.0838 | |

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**Results for 100 year +40% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute summer | SW1.13 | 35 | 3.833 | 1.036 | 1984.0 | 4.1178 | 0.0000 | OK |
| 60 minute summer | OUT HARBOUR | 35 | 3.595 | 0.804 | 1989.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 60 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 1989.0 | 2.482 | 2.122 | 4.6959 | 2364.1 |

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**Results for 100 year +40% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute winter | SW1.1 | 32 | 8.362 | 0.134 | 60.7 | 0.3823 | 0.0000 | OK |
| 60 minute winter | SW2.1 | 32 | 6.779 | 0.178 | 101.0 | 1.0772 | 0.0000 | OK |
| 60 minute winter | SW1.2 | 33 | 6.417 | 0.319 | 182.0 | 0.7971 | 0.0000 | OK |
| 60 minute winter | SW1.3 | 34 | 6.174 | 0.427 | 236.6 | 1.1461 | 0.0000 | OK |
| 60 minute winter | SW1.4 | 32 | 5.685 | 0.254 | 299.7 | 1.0418 | 0.0000 | OK |
| 60 minute winter | SW1.5 | 36 | 4.310 | 0.810 | 340.7 | 4.1954 | 0.0000 | OK |
| 60 minute winter | SW1.6 | 36 | 4.298 | 0.820 | 324.6 | 3.2611 | 0.0000 | OK |
| 60 minute winter | SW1.7 | 37 | 4.276 | 0.876 | 415.4 | 5.4281 | 0.0000 | OK |
| 60 minute winter | SW3.1 | 33 | 7.855 | 0.530 | 157.3 | 4.1958 | 0.0000 | SURCHARGED |
| 60 minute winter | SW3.2 | 33 | 7.244 | 0.237 | 226.2 | 1.2186 | 0.0000 | OK |
| 60 minute winter | SW1.8 | 37 | 4.249 | 1.041 | 667.0 | 4.8917 | 0.0000 | OK |
| 60 minute winter | SW4.1 | 33 | 6.099 | 0.099 | 13.9 | 0.1918 | 0.0000 | OK |
| 60 minute winter | SW4.2 | 33 | 5.314 | 0.384 | 62.6 | 1.1418 | 0.0000 | SURCHARGED |
| 60 minute winter | SW1.9 | 36 | 4.211 | 1.057 | 726.2 | 4.2007 | 0.0000 | SURCHARGED |
| 60 minute winter | SW1.10 | 36 | 4.129 | 1.090 | 971.5 | 9.2591 | 0.0000 | SURCHARGED |
| 60 minute winter | SW5.1 | 33 | 5.261 | 0.161 | 9.3 | 0.2493 | 0.0000 | OK |
| 60 minute winter | SW5.2 | 33 | 5.252 | 0.532 | 202.5 | 3.3537 | 0.0000 | SURCHARGED |
| 60 minute winter | SW1.11 | 36 | 4.012 | 1.064 | 1152.0 | 4.2318 | 0.0000 | SURCHARGED |
| 60 minute winter | SW1.12 | 36 | 3.853 | 1.000 | 1245.2 | 5.7154 | 0.0000 | OK |
| 60 minute winter | SW6.1 | 32 | 7.414 | 0.262 | 193.9 | 2.6018 | 0.0000 | OK |
| 60 minute winter | SW7.1 | 32 | 7.365 | 0.162 | 66.6 | 0.7024 | 0.0000 | OK |
| 60 minute winter | SW6.2 | 33 | 6.973 | 0.313 | 259.8 | 0.4479 | 0.0000 | OK |
| 60 minute winter | SW6.3 | 33 | 6.437 | 0.357 | 347.9 | 1.9630 | 0.0000 | OK |
| 60 minute winter | SW6.4 | 33 | 5.845 | 0.345 | 400.8 | 1.2626 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 60 minute winter | SW1.1 | 1.000 | SW1.2 | 60.5 | 2.510 | 0.635 | 1.3809 | |
| 60 minute winter | SW2.1 | 2.000 | SW1.2 | 100.8 | 1.626 | 0.420 | 1.8929 | |
| 60 minute winter | SW1.2 | 1.001 | SW1.3 | 181.7 | 1.318 | 0.827 | 10.3819 | |
| 60 minute winter | SW1.3 | 1.002 | SW1.4 | 234.4 | 1.629 | 1.066 | 7.3769 | |
| 60 minute winter | SW1.4 | 1.003 | SW1.5 | 302.5 | 2.905 | 0.464 | 12.3472 | |
| 60 minute winter | SW1.5 | 1.004 | SW1.6 | 324.6 | 0.826 | 0.493 | 11.8407 | |
| 60 minute winter | SW1.6 | 1.005 | SW1.7 | 323.1 | 0.770 | 0.490 | 26.6148 | |
| 60 minute winter | SW1.7 | 1.006 | SW1.8 | 431.2 | 1.003 | 0.654 | 23.9319 | |
| 60 minute winter | SW3.1 | 3.000 | SW3.2 | 153.8 | 1.434 | 1.391 | 7.9385 | |
| 60 minute winter | SW3.2 | 3.001 | SW1.8 | 225.4 | 2.736 | 0.526 | 7.9861 | |
| 60 minute winter | SW1.8 | 1.007 | SW1.9 | 674.1 | 0.882 | 0.719 | 46.8070 | |
| 60 minute winter | SW4.1 | 4.000 | SW4.2 | 13.8 | 0.871 | 0.779 | 1.4900 | |
| 60 minute winter | SW4.2 | 4.001 | SW1.9 | 62.1 | 1.562 | 1.552 | 0.5612 | |
| 60 minute winter | SW1.9 | 1.008 | SW1.10 | 740.7 | 0.860 | 0.790 | 98.9447 | |
| 60 minute winter | SW1.10 | 1.009 | SW1.11 | 976.2 | 1.132 | 1.041 | 78.6647 | |
| 60 minute winter | SW5.1 | 5.000 | SW5.2 | 13.2 | 0.353 | 0.186 | 4.0215 | |
| 60 minute winter | SW5.2 | 5.001 | SW1.11 | 202.1 | 1.839 | 1.828 | 1.6886 | |
| 60 minute winter | SW1.11 | 1.010 | SW1.12 | 1155.5 | 1.347 | 1.232 | 81.3226 | |
| 60 minute winter | SW1.12 | 1.011 | SW1.13 | 1249.4 | 1.523 | 1.333 | 45.7780 | |
| 60 minute winter | SW6.1 | 6.000 | SW6.2 | 193.3 | 1.810 | 0.588 | 5.0699 | |
| 60 minute winter | SW7.1 | 7.000 | SW6.2 | 66.5 | 1.748 | 0.520 | 1.1561 | |
| 60 minute winter | SW6.2 | 6.001 | SW6.3 | 259.7 | 2.329 | 0.747 | 4.8703 | |
| 60 minute winter | SW6.3 | 6.002 | SW6.4 | 348.4 | 2.270 | 0.743 | 9.5151 | |
| 60 minute winter | SW6.4 | 6.003 | SW1.13 | 400.5 | 2.813 | 0.691 | 7.5198 | |

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**Results for 100 year +40% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute winter | SW1.13 | 36 | 3.702 | 0.905 | 1621.0 | 3.6002 | 0.0000 | OK |
| 60 minute winter | OUT HARBOUR | 36 | 3.518 | 0.727 | 1623.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 60 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 1623.0 | 2.255 | 1.731 | 4.2750 | 2648.9 |

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**Results for 100 year +40% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.98%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute summer | SW1.1 | 62 | 8.350 | 0.122 | 53.1 | 0.3493 | 0.0000 | OK |
| 120 minute summer | SW2.1 | 62 | 6.764 | 0.163 | 88.3 | 0.9885 | 0.0000 | OK |
| 120 minute summer | SW1.2 | 62 | 6.382 | 0.284 | 158.3 | 0.7103 | 0.0000 | OK |
| 120 minute summer | SW1.3 | 64 | 6.107 | 0.360 | 204.9 | 0.9666 | 0.0000 | OK |
| 120 minute summer | SW1.4 | 64 | 5.666 | 0.235 | 257.3 | 0.9634 | 0.0000 | OK |
| 120 minute summer | SW1.5 | 66 | 4.091 | 0.591 | 290.6 | 3.0590 | 0.0000 | OK |
| 120 minute summer | SW1.6 | 66 | 4.078 | 0.600 | 285.6 | 2.3842 | 0.0000 | OK |
| 120 minute summer | SW1.7 | 66 | 4.062 | 0.662 | 370.4 | 4.1004 | 0.0000 | OK |
| 120 minute summer | SW3.1 | 64 | 7.723 | 0.398 | 137.4 | 3.1496 | 0.0000 | SURCHARGED |
| 120 minute summer | SW3.2 | 64 | 7.222 | 0.215 | 192.3 | 1.1072 | 0.0000 | OK |
| 120 minute summer | SW1.8 | 66 | 4.039 | 0.831 | 587.2 | 3.9022 | 0.0000 | OK |
| 120 minute summer | SW4.1 | 62 | 6.090 | 0.090 | 12.2 | 0.1734 | 0.0000 | OK |
| 120 minute summer | SW4.2 | 62 | 5.232 | 0.302 | 54.6 | 0.8968 | 0.0000 | SURCHARGED |
| 120 minute summer | SW1.9 | 66 | 4.009 | 0.855 | 621.7 | 3.3983 | 0.0000 | OK |
| 120 minute summer | SW1.10 | 66 | 3.955 | 0.916 | 835.2 | 7.7773 | 0.0000 | OK |
| 120 minute summer | SW5.1 | 64 | 5.181 | 0.081 | 8.1 | 0.1251 | 0.0000 | OK |
| 120 minute summer | SW5.2 | 62 | 5.177 | 0.457 | 176.1 | 2.8779 | 0.0000 | SURCHARGED |
| 120 minute summer | SW1.11 | 66 | 3.872 | 0.924 | 980.9 | 3.6740 | 0.0000 | OK |
| 120 minute summer | SW1.12 | 66 | 3.745 | 0.892 | 1059.8 | 5.1012 | 0.0000 | OK |
| 120 minute summer | SW6.1 | 62 | 7.390 | 0.238 | 169.4 | 2.3658 | 0.0000 | OK |
| 120 minute summer | SW7.1 | 62 | 7.352 | 0.149 | 58.2 | 0.6462 | 0.0000 | OK |
| 120 minute summer | SW6.2 | 62 | 6.940 | 0.280 | 225.1 | 0.4012 | 0.0000 | OK |
| 120 minute summer | SW6.3 | 62 | 6.400 | 0.320 | 299.6 | 1.7606 | 0.0000 | OK |
| 120 minute summer | SW6.4 | 64 | 5.809 | 0.309 | 343.4 | 1.1282 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 120 minute summer | SW1.1 | 1.000 | SW1.2 | 52.4 | 2.428 | 0.551 | 1.2374 | |
| 120 minute summer | SW2.1 | 2.000 | SW1.2 | 87.7 | 1.616 | 0.366 | 1.6273 | |
| 120 minute summer | SW1.2 | 1.001 | SW1.3 | 156.4 | 1.299 | 0.711 | 9.0383 | |
| 120 minute summer | SW1.3 | 1.002 | SW1.4 | 202.9 | 1.585 | 0.923 | 6.6277 | |
| 120 minute summer | SW1.4 | 1.003 | SW1.5 | 259.1 | 2.845 | 0.397 | 7.8622 | |
| 120 minute summer | SW1.5 | 1.004 | SW1.6 | 285.6 | 0.798 | 0.433 | 8.7248 | |
| 120 minute summer | SW1.6 | 1.005 | SW1.7 | 273.2 | 0.760 | 0.415 | 20.0862 | |
| 120 minute summer | SW1.7 | 1.006 | SW1.8 | 354.0 | 1.000 | 0.537 | 19.2291 | |
| 120 minute summer | SW3.1 | 3.000 | SW3.2 | 131.4 | 1.271 | 1.189 | 7.6619 | |
| 120 minute summer | SW3.2 | 3.001 | SW1.8 | 193.1 | 2.638 | 0.450 | 7.0929 | |
| 120 minute summer | SW1.8 | 1.007 | SW1.9 | 569.1 | 0.846 | 0.607 | 40.3131 | |
| 120 minute summer | SW4.1 | 4.000 | SW4.2 | 11.9 | 0.859 | 0.671 | 1.4220 | |
| 120 minute summer | SW4.2 | 4.001 | SW1.9 | 52.9 | 1.341 | 1.324 | 0.5487 | |
| 120 minute summer | SW1.9 | 1.008 | SW1.10 | 614.5 | 0.798 | 0.655 | 88.9746 | |
| 120 minute summer | SW1.10 | 1.009 | SW1.11 | 829.2 | 1.035 | 0.885 | 73.1008 | |
| 120 minute summer | SW5.1 | 5.000 | SW5.2 | 10.5 | 0.325 | 0.148 | 3.1647 | |
| 120 minute summer | SW5.2 | 5.001 | SW1.11 | 174.0 | 1.601 | 1.574 | 1.6454 | |
| 120 minute summer | SW1.11 | 1.010 | SW1.12 | 981.0 | 1.239 | 1.046 | 75.4131 | |
| 120 minute summer | SW1.12 | 1.011 | SW1.13 | 1061.1 | 1.421 | 1.132 | 41.9753 | |
| 120 minute summer | SW6.1 | 6.000 | SW6.2 | 167.6 | 1.772 | 0.510 | 4.4958 | |
| 120 minute summer | SW7.1 | 7.000 | SW6.2 | 57.5 | 1.717 | 0.450 | 0.9977 | |
| 120 minute summer | SW6.2 | 6.001 | SW6.3 | 221.8 | 2.257 | 0.638 | 4.3007 | |
| 120 minute summer | SW6.3 | 6.002 | SW6.4 | 297.1 | 2.205 | 0.634 | 8.3529 | |
| 120 minute summer | SW6.4 | 6.003 | SW1.13 | 342.6 | 2.731 | 0.591 | 6.6269 | |

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**Results for 100 year +40% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.98%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute summer | SW1.13 | 66 | 3.615 | 0.818 | 1372.3 | 3.2520 | 0.0000 | OK |
| 120 minute summer | OUT HARBOUR | 66 | 3.458 | 0.667 | 1374.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 120 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 1374.2 | 2.106 | 1.466 | 3.8892 | 3031.3 |

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**Results for 100 year +40% CC 120 minute winter. 360 minute analysis at 2 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute winter | SW1.1 | 62 | 8.331 | 0.103 | 39.5 | 0.2938 | 0.0000 | OK |
| 120 minute winter | SW2.1 | 62 | 6.739 | 0.138 | 65.7 | 0.8353 | 0.0000 | OK |
| 120 minute winter | SW1.2 | 62 | 6.333 | 0.235 | 118.6 | 0.5882 | 0.0000 | OK |
| 120 minute winter | SW1.3 | 64 | 6.037 | 0.290 | 154.4 | 0.7803 | 0.0000 | OK |
| 120 minute winter | SW1.4 | 64 | 5.632 | 0.201 | 196.9 | 0.8249 | 0.0000 | OK |
| 120 minute winter | SW1.5 | 66 | 3.966 | 0.466 | 221.9 | 2.4114 | 0.0000 | OK |
| 120 minute winter | SW1.6 | 66 | 3.948 | 0.470 | 220.7 | 1.8697 | 0.0000 | OK |
| 120 minute winter | SW1.7 | 66 | 3.927 | 0.527 | 293.9 | 3.2675 | 0.0000 | OK |
| 120 minute winter | SW3.1 | 64 | 7.616 | 0.291 | 102.3 | 2.3045 | 0.0000 | OK |
| 120 minute winter | SW3.2 | 64 | 7.192 | 0.185 | 148.6 | 0.9527 | 0.0000 | OK |
| 120 minute winter | SW1.8 | 66 | 3.899 | 0.691 | 469.4 | 3.2468 | 0.0000 | OK |
| 120 minute winter | SW4.1 | 62 | 6.075 | 0.075 | 9.1 | 0.1460 | 0.0000 | OK |
| 120 minute winter | SW4.2 | 64 | 5.135 | 0.205 | 40.7 | 0.6094 | 0.0000 | OK |
| 120 minute winter | SW1.9 | 66 | 3.869 | 0.715 | 504.7 | 2.8416 | 0.0000 | OK |
| 120 minute winter | SW1.10 | 66 | 3.821 | 0.782 | 688.7 | 6.6421 | 0.0000 | OK |
| 120 minute winter | SW5.1 | 62 | 5.158 | 0.058 | 6.0 | 0.0901 | 0.0000 | OK |
| 120 minute winter | SW5.2 | 62 | 5.071 | 0.351 | 133.0 | 2.2133 | 0.0000 | OK |
| 120 minute winter | SW1.11 | 66 | 3.749 | 0.801 | 813.0 | 3.1865 | 0.0000 | OK |
| 120 minute winter | SW1.12 | 66 | 3.641 | 0.788 | 878.7 | 4.5053 | 0.0000 | OK |
| 120 minute winter | SW6.1 | 62 | 7.350 | 0.198 | 126.1 | 1.9671 | 0.0000 | OK |
| 120 minute winter | SW7.1 | 62 | 7.328 | 0.125 | 43.3 | 0.5442 | 0.0000 | OK |
| 120 minute winter | SW6.2 | 62 | 6.894 | 0.234 | 169.0 | 0.3342 | 0.0000 | OK |
| 120 minute winter | SW6.3 | 62 | 6.347 | 0.267 | 226.4 | 1.4692 | 0.0000 | OK |
| 120 minute winter | SW6.4 | 64 | 5.760 | 0.260 | 260.4 | 0.9487 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 120 minute winter | SW1.1 | 1.000 | SW1.2 | 39.4 | 2.267 | 0.414 | 0.9959 | |
| 120 minute winter | SW2.1 | 2.000 | SW1.2 | 65.6 | 1.611 | 0.274 | 1.2172 | |
| 120 minute winter | SW1.2 | 1.001 | SW1.3 | 118.3 | 1.233 | 0.538 | 7.2321 | |
| 120 minute winter | SW1.3 | 1.002 | SW1.4 | 154.1 | 1.482 | 0.701 | 5.3953 | |
| 120 minute winter | SW1.4 | 1.003 | SW1.5 | 197.2 | 2.653 | 0.303 | 6.4182 | |
| 120 minute winter | SW1.5 | 1.004 | SW1.6 | 220.7 | 0.769 | 0.335 | 6.5307 | |
| 120 minute winter | SW1.6 | 1.005 | SW1.7 | 217.5 | 0.750 | 0.330 | 15.0902 | |
| 120 minute winter | SW1.7 | 1.006 | SW1.8 | 289.9 | 0.990 | 0.440 | 14.8661 | |
| 120 minute winter | SW3.1 | 3.000 | SW3.2 | 101.5 | 1.230 | 0.918 | 6.4747 | |
| 120 minute winter | SW3.2 | 3.001 | SW1.8 | 148.7 | 2.468 | 0.347 | 5.8389 | |
| 120 minute winter | SW1.8 | 1.007 | SW1.9 | 465.0 | 0.813 | 0.496 | 33.3437 | |
| 120 minute winter | SW4.1 | 4.000 | SW4.2 | 9.0 | 0.867 | 0.508 | 1.2456 | |
| 120 minute winter | SW4.2 | 4.001 | SW1.9 | 40.4 | 1.147 | 1.012 | 0.5072 | |
| 120 minute winter | SW1.9 | 1.008 | SW1.10 | 501.5 | 0.762 | 0.535 | 75.4443 | |
| 120 minute winter | SW1.10 | 1.009 | SW1.11 | 684.5 | 0.981 | 0.730 | 63.6741 | |
| 120 minute winter | SW5.1 | 5.000 | SW5.2 | 5.9 | 0.326 | 0.084 | 2.8610 | |
| 120 minute winter | SW5.2 | 5.001 | SW1.11 | 132.3 | 1.358 | 1.197 | 1.5275 | |
| 120 minute winter | SW1.11 | 1.010 | SW1.12 | 811.1 | 1.158 | 0.865 | 66.6475 | |
| 120 minute winter | SW1.12 | 1.011 | SW1.13 | 879.8 | 1.319 | 0.938 | 37.3069 | |
| 120 minute winter | SW6.1 | 6.000 | SW6.2 | 125.8 | 1.675 | 0.383 | 3.5740 | |
| 120 minute winter | SW7.1 | 7.000 | SW6.2 | 43.2 | 1.603 | 0.338 | 0.8026 | |
| 120 minute winter | SW6.2 | 6.001 | SW6.3 | 168.5 | 2.126 | 0.485 | 3.4657 | |
| 120 minute winter | SW6.3 | 6.002 | SW6.4 | 226.0 | 2.087 | 0.482 | 6.7146 | |
| 120 minute winter | SW6.4 | 6.003 | SW1.13 | 260.4 | 2.564 | 0.449 | 5.3661 | |

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**Results for 100 year +40% CC 120 minute winter. 360 minute analysis at 2 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute winter | SW1.13 | 66 | 3.527 | 0.730 | 1131.2 | 2.9044 | 0.0000 | OK |
| 120 minute winter | OUT HARBOUR | 66 | 3.394 | 0.603 | 1130.7 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 120 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 1130.7 | 1.956 | 1.206 | 3.4521 | 3398.5 |

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**Results for 100 year +40% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute summer | SW1.1 | 92 | 8.333 | 0.105 | 41.4 | 0.3004 | 0.0000 | OK |
| 180 minute summer | SW2.1 | 92 | 6.742 | 0.141 | 68.9 | 0.8565 | 0.0000 | OK |
| 180 minute summer | SW1.2 | 92 | 6.339 | 0.241 | 123.4 | 0.6022 | 0.0000 | OK |
| 180 minute summer | SW1.3 | 92 | 6.039 | 0.292 | 159.5 | 0.7858 | 0.0000 | OK |
| 180 minute summer | SW1.4 | 92 | 5.633 | 0.202 | 199.8 | 0.8260 | 0.0000 | OK |
| 180 minute summer | SW1.5 | 96 | 3.956 | 0.456 | 222.9 | 2.3614 | 0.0000 | OK |
| 180 minute summer | SW1.6 | 96 | 3.938 | 0.460 | 219.2 | 1.8303 | 0.0000 | OK |
| 180 minute summer | SW1.7 | 96 | 3.917 | 0.517 | 291.0 | 3.2030 | 0.0000 | OK |
| 180 minute summer | SW3.1 | 92 | 7.620 | 0.295 | 107.3 | 2.3363 | 0.0000 | OK |
| 180 minute summer | SW3.2 | 92 | 7.193 | 0.186 | 152.3 | 0.9577 | 0.0000 | OK |
| 180 minute summer | SW1.8 | 96 | 3.888 | 0.680 | 460.1 | 3.1952 | 0.0000 | OK |
| 180 minute summer | SW4.1 | 92 | 6.077 | 0.077 | 9.5 | 0.1483 | 0.0000 | OK |
| 180 minute summer | SW4.2 | 92 | 5.139 | 0.209 | 42.5 | 0.6216 | 0.0000 | OK |
| 180 minute summer | SW1.9 | 96 | 3.858 | 0.704 | 497.7 | 2.7990 | 0.0000 | OK |
| 180 minute summer | SW1.10 | 96 | 3.810 | 0.771 | 674.7 | 6.5479 | 0.0000 | OK |
| 180 minute summer | SW5.1 | 92 | 5.159 | 0.059 | 6.3 | 0.0914 | 0.0000 | OK |
| 180 minute summer | SW5.2 | 92 | 5.081 | 0.361 | 139.5 | 2.2758 | 0.0000 | OK |
| 180 minute summer | SW1.11 | 96 | 3.739 | 0.791 | 796.6 | 3.1443 | 0.0000 | OK |
| 180 minute summer | SW1.12 | 96 | 3.631 | 0.778 | 860.1 | 4.4492 | 0.0000 | OK |
| 180 minute summer | SW6.1 | 92 | 7.356 | 0.204 | 132.3 | 2.0213 | 0.0000 | OK |
| 180 minute summer | SW7.1 | 92 | 7.331 | 0.128 | 45.4 | 0.5571 | 0.0000 | OK |
| 180 minute summer | SW6.2 | 92 | 6.898 | 0.238 | 175.7 | 0.3406 | 0.0000 | OK |
| 180 minute summer | SW6.3 | 92 | 6.352 | 0.272 | 233.7 | 1.4972 | 0.0000 | OK |
| 180 minute summer | SW6.4 | 92 | 5.762 | 0.262 | 267.6 | 0.9587 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 180 minute summer | SW1.1 | 1.000 | SW1.2 | 40.8 | 2.286 | 0.429 | 1.0240 | |
| 180 minute summer | SW2.1 | 2.000 | SW1.2 | 68.4 | 1.614 | 0.285 | 1.2669 | |
| 180 minute summer | SW1.2 | 1.001 | SW1.3 | 121.6 | 1.244 | 0.553 | 7.3702 | |
| 180 minute summer | SW1.3 | 1.002 | SW1.4 | 154.3 | 1.477 | 0.702 | 5.4203 | |
| 180 minute summer | SW1.4 | 1.003 | SW1.5 | 196.6 | 2.645 | 0.302 | 6.4170 | |
| 180 minute summer | SW1.5 | 1.004 | SW1.6 | 219.2 | 0.769 | 0.333 | 6.3586 | |
| 180 minute summer | SW1.6 | 1.005 | SW1.7 | 215.4 | 0.747 | 0.327 | 14.6951 | |
| 180 minute summer | SW1.7 | 1.006 | SW1.8 | 286.4 | 0.989 | 0.435 | 14.5079 | |
| 180 minute summer | SW3.1 | 3.000 | SW3.2 | 102.3 | 1.227 | 0.925 | 6.5368 | |
| 180 minute summer | SW3.2 | 3.001 | SW1.8 | 149.3 | 2.465 | 0.348 | 5.8682 | |
| 180 minute summer | SW1.8 | 1.007 | SW1.9 | 459.0 | 0.809 | 0.490 | 32.7588 | |
| 180 minute summer | SW4.1 | 4.000 | SW4.2 | 9.3 | 0.858 | 0.521 | 1.2763 | |
| 180 minute summer | SW4.2 | 4.001 | SW1.9 | 41.0 | 1.149 | 1.025 | 0.5124 | |
| 180 minute summer | SW1.9 | 1.008 | SW1.10 | 496.7 | 0.767 | 0.530 | 74.2513 | |
| 180 minute summer | SW1.10 | 1.009 | SW1.11 | 672.2 | 0.977 | 0.717 | 62.7736 | |
| 180 minute summer | SW5.1 | 5.000 | SW5.2 | 6.1 | 0.339 | 0.086 | 2.9203 | |
| 180 minute summer | SW5.2 | 5.001 | SW1.11 | 136.0 | 1.370 | 1.230 | 1.5504 | |
| 180 minute summer | SW1.11 | 1.010 | SW1.12 | 794.5 | 1.149 | 0.847 | 65.7680 | |
| 180 minute summer | SW1.12 | 1.011 | SW1.13 | 858.3 | 1.305 | 0.915 | 36.8173 | |
| 180 minute summer | SW6.1 | 6.000 | SW6.2 | 130.8 | 1.691 | 0.398 | 3.6797 | |
| 180 minute summer | SW7.1 | 7.000 | SW6.2 | 44.8 | 1.616 | 0.351 | 0.8265 | |
| 180 minute summer | SW6.2 | 6.001 | SW6.3 | 172.9 | 2.134 | 0.497 | 3.5419 | |
| 180 minute summer | SW6.3 | 6.002 | SW6.4 | 231.6 | 2.097 | 0.494 | 6.8446 | |
| 180 minute summer | SW6.4 | 6.003 | SW1.13 | 263.1 | 2.563 | 0.454 | 5.4234 | |

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**Results for 100 year +40% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute summer | SW1.13 | 96 | 3.519 | 0.722 | 1107.0 | 2.8692 | 0.0000 | OK |
| 180 minute summer | OUT HARBOUR | 96 | 3.387 | 0.596 | 1107.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 180 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 1107.0 | 1.942 | 1.181 | 3.4058 | 3448.2 |

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**Results for 100 year +40% CC 180 minute winter. 420 minute analysis at 4 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute winter | SW1.1 | 92 | 8.316 | 0.088 | 30.2 | 0.2523 | 0.0000 | OK |
| 180 minute winter | SW2.1 | 92 | 6.721 | 0.120 | 50.2 | 0.7263 | 0.0000 | OK |
| 180 minute winter | SW1.2 | 92 | 6.298 | 0.200 | 90.6 | 0.5008 | 0.0000 | OK |
| 180 minute winter | SW1.3 | 92 | 5.989 | 0.242 | 117.9 | 0.6514 | 0.0000 | OK |
| 180 minute winter | SW1.4 | 92 | 5.604 | 0.173 | 150.2 | 0.7098 | 0.0000 | OK |
| 180 minute winter | SW1.5 | 96 | 3.862 | 0.362 | 168.8 | 1.8770 | 0.0000 | OK |
| 180 minute winter | SW1.6 | 96 | 3.839 | 0.361 | 168.1 | 1.4353 | 0.0000 | OK |
| 180 minute winter | SW1.7 | 96 | 3.809 | 0.409 | 225.5 | 2.5326 | 0.0000 | OK |
| 180 minute winter | SW3.1 | 92 | 7.563 | 0.238 | 78.1 | 1.8802 | 0.0000 | OK |
| 180 minute winter | SW3.2 | 92 | 7.166 | 0.159 | 113.8 | 0.8200 | 0.0000 | OK |
| 180 minute winter | SW1.8 | 96 | 3.770 | 0.562 | 361.3 | 2.6382 | 0.0000 | OK |
| 180 minute winter | SW4.1 | 92 | 6.065 | 0.065 | 6.9 | 0.1248 | 0.0000 | OK |
| 180 minute winter | SW4.2 | 92 | 5.091 | 0.161 | 31.1 | 0.4800 | 0.0000 | OK |
| 180 minute winter | SW1.9 | 96 | 3.738 | 0.584 | 391.3 | 2.3202 | 0.0000 | OK |
| 180 minute winter | SW1.10 | 96 | 3.691 | 0.652 | 535.7 | 5.5368 | 0.0000 | OK |
| 180 minute winter | SW5.1 | 92 | 5.151 | 0.051 | 4.6 | 0.0793 | 0.0000 | OK |
| 180 minute winter | SW5.2 | 92 | 5.006 | 0.286 | 101.7 | 1.8019 | 0.0000 | OK |
| 180 minute winter | SW1.11 | 96 | 3.625 | 0.677 | 633.0 | 2.6925 | 0.0000 | OK |
| 180 minute winter | SW1.12 | 96 | 3.529 | 0.676 | 684.9 | 3.8658 | 0.0000 | OK |
| 180 minute winter | SW6.1 | 92 | 7.321 | 0.169 | 96.3 | 1.6782 | 0.0000 | OK |
| 180 minute winter | SW7.1 | 92 | 7.311 | 0.108 | 33.1 | 0.4675 | 0.0000 | OK |
| 180 minute winter | SW6.2 | 92 | 6.858 | 0.198 | 129.1 | 0.2838 | 0.0000 | OK |
| 180 minute winter | SW6.3 | 92 | 6.307 | 0.227 | 172.9 | 1.2501 | 0.0000 | OK |
| 180 minute winter | SW6.4 | 92 | 5.721 | 0.221 | 198.9 | 0.8068 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 180 minute winter | SW1.1 | 1.000 | SW1.2 | 30.1 | 2.115 | 0.316 | 0.8159 | |
| 180 minute winter | SW2.1 | 2.000 | SW1.2 | 50.1 | 1.609 | 0.209 | 0.9322 | |
| 180 minute winter | SW1.2 | 1.001 | SW1.3 | 90.3 | 1.164 | 0.411 | 5.8553 | |
| 180 minute winter | SW1.3 | 1.002 | SW1.4 | 117.1 | 1.395 | 0.533 | 4.3565 | |
| 180 minute winter | SW1.4 | 1.003 | SW1.5 | 149.7 | 2.464 | 0.230 | 5.2450 | |
| 180 minute winter | SW1.5 | 1.004 | SW1.6 | 168.1 | 0.743 | 0.255 | 4.6712 | |
| 180 minute winter | SW1.6 | 1.005 | SW1.7 | 167.8 | 0.739 | 0.255 | 10.6652 | |
| 180 minute winter | SW1.7 | 1.006 | SW1.8 | 225.1 | 0.984 | 0.342 | 10.6627 | |
| 180 minute winter | SW3.1 | 3.000 | SW3.2 | 77.4 | 1.149 | 0.700 | 5.3063 | |
| 180 minute winter | SW3.2 | 3.001 | SW1.8 | 113.3 | 2.296 | 0.264 | 4.7821 | |
| 180 minute winter | SW1.8 | 1.007 | SW1.9 | 360.8 | 0.779 | 0.385 | 26.1251 | |
| 180 minute winter | SW4.1 | 4.000 | SW4.2 | 6.9 | 0.862 | 0.386 | 0.8827 | |
| 180 minute winter | SW4.2 | 4.001 | SW1.9 | 30.9 | 1.066 | 0.772 | 0.4199 | |
| 180 minute winter | SW1.9 | 1.008 | SW1.10 | 389.9 | 0.738 | 0.416 | 60.5527 | |
| 180 minute winter | SW1.10 | 1.009 | SW1.11 | 533.6 | 0.927 | 0.569 | 52.5060 | |
| 180 minute winter | SW5.1 | 5.000 | SW5.2 | 4.6 | 0.333 | 0.064 | 2.2506 | |
| 180 minute winter | SW5.2 | 5.001 | SW1.11 | 101.2 | 1.241 | 0.915 | 1.2944 | |
| 180 minute winter | SW1.11 | 1.010 | SW1.12 | 631.1 | 1.073 | 0.673 | 55.9075 | |
| 180 minute winter | SW1.12 | 1.011 | SW1.13 | 683.3 | 1.211 | 0.729 | 31.6110 | |
| 180 minute winter | SW6.1 | 6.000 | SW6.2 | 96.1 | 1.580 | 0.292 | 2.8937 | |
| 180 minute winter | SW7.1 | 7.000 | SW6.2 | 33.0 | 1.496 | 0.258 | 0.6574 | |
| 180 minute winter | SW6.2 | 6.001 | SW6.3 | 128.7 | 1.992 | 0.370 | 2.8231 | |
| 180 minute winter | SW6.3 | 6.002 | SW6.4 | 172.6 | 1.965 | 0.368 | 5.4449 | |
| 180 minute winter | SW6.4 | 6.003 | SW1.13 | 198.2 | 2.398 | 0.342 | 4.3665 | |

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**Results for 100 year +40% CC 180 minute winter. 420 minute analysis at 4 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute winter | SW1.13 | 96 | 3.431 | 0.634 | 879.5 | 2.5199 | 0.0000 | OK |
| 180 minute winter | OUT HARBOUR | 96 | 3.319 | 0.528 | 879.1 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 180 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 879.1 | 1.795 | 0.938 | 2.9299 | 3871.4 |

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**Results for 100 year +40% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute summer | SW1.1 | 124 | 8.321 | 0.093 | 33.0 | 0.2654 | 0.0000 | OK |
| 240 minute summer | SW2.1 | 124 | 6.726 | 0.125 | 54.8 | 0.7594 | 0.0000 | OK |
| 240 minute summer | SW1.2 | 124 | 6.309 | 0.211 | 99.1 | 0.5280 | 0.0000 | OK |
| 240 minute summer | SW1.3 | 124 | 6.005 | 0.258 | 129.2 | 0.6925 | 0.0000 | OK |
| 240 minute summer | SW1.4 | 124 | 5.614 | 0.183 | 165.4 | 0.7487 | 0.0000 | OK |
| 240 minute summer | SW1.5 | 124 | 3.884 | 0.384 | 186.3 | 1.9899 | 0.0000 | OK |
| 240 minute summer | SW1.6 | 124 | 3.860 | 0.382 | 185.5 | 1.5204 | 0.0000 | OK |
| 240 minute summer | SW1.7 | 124 | 3.831 | 0.431 | 247.7 | 2.6705 | 0.0000 | OK |
| 240 minute summer | SW3.1 | 124 | 7.579 | 0.254 | 85.4 | 2.0119 | 0.0000 | OK |
| 240 minute summer | SW3.2 | 124 | 7.175 | 0.168 | 125.1 | 0.8649 | 0.0000 | OK |
| 240 minute summer | SW1.8 | 128 | 3.796 | 0.588 | 395.3 | 2.7606 | 0.0000 | OK |
| 240 minute summer | SW4.1 | 124 | 6.068 | 0.068 | 7.6 | 0.1322 | 0.0000 | OK |
| 240 minute summer | SW4.2 | 124 | 5.104 | 0.174 | 34.1 | 0.5185 | 0.0000 | OK |
| 240 minute summer | SW1.9 | 128 | 3.766 | 0.612 | 423.3 | 2.4314 | 0.0000 | OK |
| 240 minute summer | SW1.10 | 128 | 3.719 | 0.680 | 575.1 | 5.7742 | 0.0000 | OK |
| 240 minute summer | SW5.1 | 124 | 5.153 | 0.053 | 5.0 | 0.0828 | 0.0000 | OK |
| 240 minute summer | SW5.2 | 124 | 5.025 | 0.305 | 111.1 | 1.9242 | 0.0000 | OK |
| 240 minute summer | SW1.11 | 128 | 3.653 | 0.705 | 670.4 | 2.8019 | 0.0000 | OK |
| 240 minute summer | SW1.12 | 128 | 3.554 | 0.701 | 724.8 | 4.0083 | 0.0000 | OK |
| 240 minute summer | SW6.1 | 124 | 7.330 | 0.178 | 105.2 | 1.7673 | 0.0000 | OK |
| 240 minute summer | SW7.1 | 124 | 7.316 | 0.113 | 36.1 | 0.4912 | 0.0000 | OK |
| 240 minute summer | SW6.2 | 124 | 6.870 | 0.210 | 141.3 | 0.2999 | 0.0000 | OK |
| 240 minute summer | SW6.3 | 124 | 6.320 | 0.240 | 189.7 | 1.3205 | 0.0000 | OK |
| 240 minute summer | SW6.4 | 124 | 5.734 | 0.234 | 218.4 | 0.8536 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 240 minute summer | SW1.1 | 1.000 | SW1.2 | 33.0 | 2.167 | 0.347 | 0.8729 | |
| 240 minute summer | SW2.1 | 2.000 | SW1.2 | 54.8 | 1.610 | 0.229 | 1.0189 | |
| 240 minute summer | SW1.2 | 1.001 | SW1.3 | 99.1 | 1.188 | 0.451 | 6.2953 | |
| 240 minute summer | SW1.3 | 1.002 | SW1.4 | 129.2 | 1.428 | 0.588 | 4.6954 | |
| 240 minute summer | SW1.4 | 1.003 | SW1.5 | 165.4 | 2.532 | 0.254 | 5.6406 | |
| 240 minute summer | SW1.5 | 1.004 | SW1.6 | 185.5 | 0.755 | 0.281 | 5.0459 | |
| 240 minute summer | SW1.6 | 1.005 | SW1.7 | 183.1 | 0.741 | 0.278 | 11.5067 | |
| 240 minute summer | SW1.7 | 1.006 | SW1.8 | 243.6 | 0.986 | 0.370 | 11.4771 | |
| 240 minute summer | SW3.1 | 3.000 | SW3.2 | 85.3 | 1.179 | 0.772 | 5.6982 | |
| 240 minute summer | SW3.2 | 3.001 | SW1.8 | 125.1 | 2.358 | 0.292 | 5.1378 | |
| 240 minute summer | SW1.8 | 1.007 | SW1.9 | 389.3 | 0.788 | 0.415 | 27.6491 | |
| 240 minute summer | SW4.1 | 4.000 | SW4.2 | 7.6 | 0.866 | 0.428 | 1.0042 | |
| 240 minute summer | SW4.2 | 4.001 | SW1.9 | 34.1 | 1.096 | 0.852 | 0.4506 | |
| 240 minute summer | SW1.9 | 1.008 | SW1.10 | 415.9 | 0.747 | 0.444 | 63.8323 | |
| 240 minute summer | SW1.10 | 1.009 | SW1.11 | 566.4 | 0.939 | 0.604 | 55.0386 | |
| 240 minute summer | SW5.1 | 5.000 | SW5.2 | 5.0 | 0.338 | 0.070 | 2.4586 | |
| 240 minute summer | SW5.2 | 5.001 | SW1.11 | 111.1 | 1.280 | 1.005 | 1.3754 | |
| 240 minute summer | SW1.11 | 1.010 | SW1.12 | 672.3 | 1.095 | 0.717 | 58.3891 | |
| 240 minute summer | SW1.12 | 1.011 | SW1.13 | 729.7 | 1.239 | 0.778 | 32.8797 | |
| 240 minute summer | SW6.1 | 6.000 | SW6.2 | 105.2 | 1.611 | 0.320 | 3.1061 | |
| 240 minute summer | SW7.1 | 7.000 | SW6.2 | 36.1 | 1.532 | 0.283 | 0.7020 | |
| 240 minute summer | SW6.2 | 6.001 | SW6.3 | 141.3 | 2.039 | 0.406 | 3.0287 | |
| 240 minute summer | SW6.3 | 6.002 | SW6.4 | 189.7 | 2.008 | 0.405 | 5.8571 | |
| 240 minute summer | SW6.4 | 6.003 | SW1.13 | 218.4 | 2.457 | 0.377 | 4.6964 | |

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**Results for 100 year +40% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute summer | SW1.13 | 128 | 3.451 | 0.654 | 928.5 | 2.6003 | 0.0000 | OK |
| 240 minute summer | OUT HARBOUR | 128 | 3.335 | 0.544 | 930.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 240 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 930.8 | 1.830 | 0.993 | 3.0421 | 3759.7 |

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**Results for 100 year +40% CC 240 minute winter. 480 minute analysis at 4 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute winter | SW1.1 | 124 | 8.307 | 0.079 | 24.5 | 0.2254 | 0.0000 | OK |
| 240 minute winter | SW2.1 | 124 | 6.709 | 0.108 | 40.8 | 0.6563 | 0.0000 | OK |
| 240 minute winter | SW1.2 | 124 | 6.276 | 0.178 | 73.7 | 0.4453 | 0.0000 | OK |
| 240 minute winter | SW1.3 | 124 | 5.962 | 0.215 | 96.1 | 0.5771 | 0.0000 | OK |
| 240 minute winter | SW1.4 | 124 | 5.587 | 0.156 | 123.0 | 0.6385 | 0.0000 | OK |
| 240 minute winter | SW1.5 | 124 | 3.811 | 0.311 | 138.6 | 1.6126 | 0.0000 | OK |
| 240 minute winter | SW1.6 | 124 | 3.784 | 0.306 | 138.5 | 1.2153 | 0.0000 | OK |
| 240 minute winter | SW1.7 | 124 | 3.744 | 0.344 | 186.3 | 2.1346 | 0.0000 | OK |
| 240 minute winter | SW3.1 | 124 | 7.533 | 0.208 | 63.5 | 1.6491 | 0.0000 | OK |
| 240 minute winter | SW3.2 | 124 | 7.150 | 0.143 | 93.1 | 0.7374 | 0.0000 | OK |
| 240 minute winter | SW1.8 | 128 | 3.692 | 0.484 | 298.6 | 2.2754 | 0.0000 | OK |
| 240 minute winter | SW4.1 | 124 | 6.058 | 0.058 | 5.6 | 0.1117 | 0.0000 | OK |
| 240 minute winter | SW4.2 | 124 | 5.069 | 0.139 | 25.3 | 0.4143 | 0.0000 | OK |
| 240 minute winter | SW1.9 | 128 | 3.659 | 0.505 | 322.7 | 2.0068 | 0.0000 | OK |
| 240 minute winter | SW1.10 | 128 | 3.611 | 0.572 | 442.1 | 4.8609 | 0.0000 | OK |
| 240 minute winter | SW5.1 | 124 | 5.146 | 0.046 | 3.7 | 0.0715 | 0.0000 | OK |
| 240 minute winter | SW5.2 | 124 | 4.971 | 0.251 | 82.7 | 1.5783 | 0.0000 | OK |
| 240 minute winter | SW1.11 | 128 | 3.548 | 0.600 | 521.9 | 2.3852 | 0.0000 | OK |
| 240 minute winter | SW1.12 | 128 | 3.458 | 0.605 | 566.3 | 3.4584 | 0.0000 | OK |
| 240 minute winter | SW6.1 | 124 | 7.303 | 0.151 | 78.3 | 1.4945 | 0.0000 | OK |
| 240 minute winter | SW7.1 | 124 | 7.299 | 0.096 | 26.9 | 0.4179 | 0.0000 | OK |
| 240 minute winter | SW6.2 | 124 | 6.836 | 0.176 | 105.2 | 0.2525 | 0.0000 | OK |
| 240 minute winter | SW6.3 | 124 | 6.283 | 0.203 | 141.2 | 1.1140 | 0.0000 | OK |
| 240 minute winter | SW6.4 | 124 | 5.697 | 0.197 | 162.6 | 0.7199 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 240 minute winter | SW1.1 | 1.000 | SW1.2 | 24.5 | 2.001 | 0.257 | 0.7016 | |
| 240 minute winter | SW2.1 | 2.000 | SW1.2 | 40.8 | 1.602 | 0.170 | 0.7607 | |
| 240 minute winter | SW1.2 | 1.001 | SW1.3 | 73.7 | 1.110 | 0.335 | 5.0157 | |
| 240 minute winter | SW1.3 | 1.002 | SW1.4 | 96.1 | 1.331 | 0.437 | 3.7469 | |
| 240 minute winter | SW1.4 | 1.003 | SW1.5 | 123.0 | 2.338 | 0.189 | 4.5418 | |
| 240 minute winter | SW1.5 | 1.004 | SW1.6 | 138.5 | 0.728 | 0.210 | 3.7668 | |
| 240 minute winter | SW1.6 | 1.005 | SW1.7 | 138.2 | 0.732 | 0.210 | 8.4059 | |
| 240 minute winter | SW1.7 | 1.006 | SW1.8 | 185.7 | 0.978 | 0.282 | 8.2902 | |
| 240 minute winter | SW3.1 | 3.000 | SW3.2 | 63.5 | 1.090 | 0.574 | 4.5892 | |
| 240 minute winter | SW3.2 | 3.001 | SW1.8 | 93.1 | 2.178 | 0.217 | 4.1413 | |
| 240 minute winter | SW1.8 | 1.007 | SW1.9 | 297.4 | 0.760 | 0.317 | 21.6930 | |
| 240 minute winter | SW4.1 | 4.000 | SW4.2 | 5.6 | 0.865 | 0.315 | 0.6691 | |
| 240 minute winter | SW4.2 | 4.001 | SW1.9 | 25.3 | 1.027 | 0.633 | 0.3572 | |
| 240 minute winter | SW1.9 | 1.008 | SW1.10 | 321.5 | 0.722 | 0.343 | 51.1160 | |
| 240 minute winter | SW1.10 | 1.009 | SW1.11 | 441.0 | 0.891 | 0.470 | 45.1634 | |
| 240 minute winter | SW5.1 | 5.000 | SW5.2 | 3.7 | 0.334 | 0.052 | 1.8346 | |
| 240 minute winter | SW5.2 | 5.001 | SW1.11 | 82.7 | 1.164 | 0.748 | 1.1305 | |
| 240 minute winter | SW1.11 | 1.010 | SW1.12 | 522.5 | 1.020 | 0.557 | 48.6967 | |
| 240 minute winter | SW1.12 | 1.011 | SW1.13 | 566.8 | 1.141 | 0.605 | 27.7561 | |
| 240 minute winter | SW6.1 | 6.000 | SW6.2 | 78.3 | 1.506 | 0.238 | 2.4744 | |
| 240 minute winter | SW7.1 | 7.000 | SW6.2 | 26.9 | 1.417 | 0.211 | 0.5653 | |
| 240 minute winter | SW6.2 | 6.001 | SW6.3 | 105.2 | 1.895 | 0.303 | 2.4265 | |
| 240 minute winter | SW6.3 | 6.002 | SW6.4 | 141.2 | 1.874 | 0.301 | 4.6712 | |
| 240 minute winter | SW6.4 | 6.003 | SW1.13 | 162.6 | 2.282 | 0.281 | 3.7644 | |

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**Results for 100 year +40% CC 240 minute winter. 480 minute analysis at 4 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute winter | SW1.13 | 128 | 3.368 | 0.571 | 726.5 | 2.2691 | 0.0000 | OK |
| 240 minute winter | OUT HARBOUR | 128 | 3.269 | 0.478 | 726.7 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 240 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 726.7 | 1.687 | 0.775 | 2.5777 | 4219.4 |

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**Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute summer | SW1.1 | 184 | 8.308 | 0.080 | 25.2 | 0.2280 | 0.0000 | OK |
| 360 minute summer | SW2.1 | 184 | 6.711 | 0.110 | 42.0 | 0.6655 | 0.0000 | OK |
| 360 minute summer | SW1.2 | 184 | 6.278 | 0.180 | 75.5 | 0.4507 | 0.0000 | OK |
| 360 minute summer | SW1.3 | 184 | 5.962 | 0.215 | 97.8 | 0.5790 | 0.0000 | OK |
| 360 minute summer | SW1.4 | 184 | 5.587 | 0.156 | 124.0 | 0.6390 | 0.0000 | OK |
| 360 minute summer | SW1.5 | 184 | 3.807 | 0.307 | 138.9 | 1.5916 | 0.0000 | OK |
| 360 minute summer | SW1.6 | 184 | 3.778 | 0.300 | 138.1 | 1.1915 | 0.0000 | OK |
| 360 minute summer | SW1.7 | 184 | 3.736 | 0.336 | 185.7 | 2.0797 | 0.0000 | OK |
| 360 minute summer | SW3.1 | 184 | 7.535 | 0.210 | 65.3 | 1.6597 | 0.0000 | OK |
| 360 minute summer | SW3.2 | 184 | 7.151 | 0.144 | 94.3 | 0.7390 | 0.0000 | OK |
| 360 minute summer | SW1.8 | 192 | 3.678 | 0.470 | 296.0 | 2.2086 | 0.0000 | OK |
| 360 minute summer | SW4.1 | 184 | 6.058 | 0.058 | 5.8 | 0.1129 | 0.0000 | OK |
| 360 minute summer | SW4.2 | 184 | 5.071 | 0.141 | 26.0 | 0.4202 | 0.0000 | OK |
| 360 minute summer | SW1.9 | 192 | 3.645 | 0.491 | 316.8 | 1.9536 | 0.0000 | OK |
| 360 minute summer | SW1.10 | 192 | 3.598 | 0.559 | 431.5 | 4.7495 | 0.0000 | OK |
| 360 minute summer | SW5.1 | 184 | 5.147 | 0.047 | 3.9 | 0.0727 | 0.0000 | OK |
| 360 minute summer | SW5.2 | 184 | 4.973 | 0.253 | 85.0 | 1.5957 | 0.0000 | OK |
| 360 minute summer | SW1.11 | 192 | 3.536 | 0.588 | 502.5 | 2.3366 | 0.0000 | OK |
| 360 minute summer | SW1.12 | 192 | 3.447 | 0.594 | 546.5 | 3.3941 | 0.0000 | OK |
| 360 minute summer | SW6.1 | 184 | 7.305 | 0.153 | 80.5 | 1.5155 | 0.0000 | OK |
| 360 minute summer | SW7.1 | 184 | 7.301 | 0.098 | 27.7 | 0.4234 | 0.0000 | OK |
| 360 minute summer | SW6.2 | 184 | 6.838 | 0.178 | 107.5 | 0.2548 | 0.0000 | OK |
| 360 minute summer | SW6.3 | 184 | 6.284 | 0.204 | 143.6 | 1.1239 | 0.0000 | OK |
| 360 minute summer | SW6.4 | 184 | 5.698 | 0.198 | 164.9 | 0.7230 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 360 minute summer | SW1.1 | 1.000 | SW1.2 | 25.0 | 2.012 | 0.263 | 0.7125 | |
| 360 minute summer | SW2.1 | 2.000 | SW1.2 | 41.8 | 1.608 | 0.174 | 0.7774 | |
| 360 minute summer | SW1.2 | 1.001 | SW1.3 | 74.8 | 1.116 | 0.340 | 5.0641 | |
| 360 minute summer | SW1.3 | 1.002 | SW1.4 | 96.3 | 1.329 | 0.438 | 3.7577 | |
| 360 minute summer | SW1.4 | 1.003 | SW1.5 | 122.9 | 2.336 | 0.189 | 4.5429 | |
| 360 minute summer | SW1.5 | 1.004 | SW1.6 | 138.1 | 0.736 | 0.210 | 3.6830 | |
| 360 minute summer | SW1.6 | 1.005 | SW1.7 | 136.2 | 0.734 | 0.207 | 8.1310 | |
| 360 minute summer | SW1.7 | 1.006 | SW1.8 | 182.3 | 0.963 | 0.277 | 7.8858 | |
| 360 minute summer | SW3.1 | 3.000 | SW3.2 | 63.9 | 1.090 | 0.578 | 4.6169 | |
| 360 minute summer | SW3.2 | 3.001 | SW1.8 | 93.2 | 2.177 | 0.217 | 4.1501 | |
| 360 minute summer | SW1.8 | 1.007 | SW1.9 | 291.0 | 0.766 | 0.310 | 20.9121 | |
| 360 minute summer | SW4.1 | 4.000 | SW4.2 | 5.7 | 0.866 | 0.322 | 0.6886 | |
| 360 minute summer | SW4.2 | 4.001 | SW1.9 | 25.8 | 1.030 | 0.644 | 0.3628 | |
| 360 minute summer | SW1.9 | 1.008 | SW1.10 | 309.8 | 0.721 | 0.330 | 49.5300 | |
| 360 minute summer | SW1.10 | 1.009 | SW1.11 | 425.6 | 0.885 | 0.454 | 43.9605 | |
| 360 minute summer | SW5.1 | 5.000 | SW5.2 | 3.8 | 0.338 | 0.054 | 1.8705 | |
| 360 minute summer | SW5.2 | 5.001 | SW1.11 | 84.0 | 1.168 | 0.759 | 1.1433 | |
| 360 minute summer | SW1.11 | 1.010 | SW1.12 | 506.5 | 1.013 | 0.540 | 47.5393 | |
| 360 minute summer | SW1.12 | 1.011 | SW1.13 | 551.3 | 1.136 | 0.588 | 27.1164 | |
| 360 minute summer | SW6.1 | 6.000 | SW6.2 | 80.0 | 1.516 | 0.243 | 2.5126 | |
| 360 minute summer | SW7.1 | 7.000 | SW6.2 | 27.5 | 1.424 | 0.215 | 0.5751 | |
| 360 minute summer | SW6.2 | 6.001 | SW6.3 | 106.6 | 1.900 | 0.307 | 2.4533 | |
| 360 minute summer | SW6.3 | 6.002 | SW6.4 | 142.9 | 1.880 | 0.305 | 4.7133 | |
| 360 minute summer | SW6.4 | 6.003 | SW1.13 | 163.4 | 2.282 | 0.282 | 3.7826 | |

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**Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute summer | SW1.13 | 192 | 3.357 | 0.560 | 699.6 | 2.2261 | 0.0000 | OK |
| 360 minute summer | OUT HARBOUR | 192 | 3.261 | 0.470 | 701.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 360 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 701.5 | 1.668 | 0.748 | 2.5173 | 4200.5 |

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**Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | SW1.1 | 184 | 8.296 | 0.068 | 18.4 | 0.1935 | 0.0000 | OK |
| 360 minute winter | SW2.1 | 184 | 6.694 | 0.093 | 30.5 | 0.5626 | 0.0000 | OK |
| 360 minute winter | SW1.2 | 184 | 6.250 | 0.152 | 55.1 | 0.3794 | 0.0000 | OK |
| 360 minute winter | SW1.3 | 184 | 5.928 | 0.181 | 71.8 | 0.4870 | 0.0000 | OK |
| 360 minute winter | SW1.4 | 184 | 5.565 | 0.134 | 91.8 | 0.5475 | 0.0000 | OK |
| 360 minute winter | SW1.5 | 184 | 3.758 | 0.258 | 103.3 | 1.3370 | 0.0000 | OK |
| 360 minute winter | SW1.6 | 184 | 3.728 | 0.250 | 103.2 | 0.9943 | 0.0000 | OK |
| 360 minute winter | SW1.7 | 184 | 3.677 | 0.277 | 138.9 | 1.7175 | 0.0000 | OK |
| 360 minute winter | SW3.1 | 184 | 7.500 | 0.175 | 47.6 | 1.3823 | 0.0000 | OK |
| 360 minute winter | SW3.2 | 184 | 7.130 | 0.123 | 69.5 | 0.6316 | 0.0000 | OK |
| 360 minute winter | SW1.8 | 192 | 3.600 | 0.392 | 222.5 | 1.8416 | 0.0000 | OK |
| 360 minute winter | SW4.1 | 184 | 6.050 | 0.050 | 4.2 | 0.0962 | 0.0000 | OK |
| 360 minute winter | SW4.2 | 184 | 5.046 | 0.116 | 19.0 | 0.3443 | 0.0000 | OK |
| 360 minute winter | SW1.9 | 192 | 3.562 | 0.408 | 240.8 | 1.6241 | 0.0000 | OK |
| 360 minute winter | SW1.10 | 192 | 3.512 | 0.473 | 330.2 | 4.0180 | 0.0000 | OK |
| 360 minute winter | SW5.1 | 184 | 5.140 | 0.040 | 2.8 | 0.0624 | 0.0000 | OK |
| 360 minute winter | SW5.2 | 184 | 4.930 | 0.210 | 61.9 | 1.3209 | 0.0000 | OK |
| 360 minute winter | SW1.11 | 192 | 3.450 | 0.502 | 390.0 | 1.9952 | 0.0000 | OK |
| 360 minute winter | SW1.12 | 192 | 3.366 | 0.513 | 423.7 | 2.9316 | 0.0000 | OK |
| 360 minute winter | SW6.1 | 184 | 7.281 | 0.129 | 58.6 | 1.2752 | 0.0000 | OK |
| 360 minute winter | SW7.1 | 184 | 7.285 | 0.082 | 20.1 | 0.3574 | 0.0000 | OK |
| 360 minute winter | SW6.2 | 184 | 6.810 | 0.150 | 78.6 | 0.2145 | 0.0000 | OK |
| 360 minute winter | SW6.3 | 184 | 6.252 | 0.172 | 105.4 | 0.9482 | 0.0000 | OK |
| 360 minute winter | SW6.4 | 184 | 5.667 | 0.167 | 121.3 | 0.6118 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | SW1.1 | 1.000 | SW1.2 | 18.4 | 1.849 | 0.193 | 0.5693 | |
| 360 minute winter | SW2.1 | 2.000 | SW1.2 | 30.5 | 1.480 | 0.127 | 0.6151 | |
| 360 minute winter | SW1.2 | 1.001 | SW1.3 | 55.0 | 1.034 | 0.250 | 4.0236 | |
| 360 minute winter | SW1.3 | 1.002 | SW1.4 | 71.6 | 1.235 | 0.326 | 3.0082 | |
| 360 minute winter | SW1.4 | 1.003 | SW1.5 | 91.6 | 2.155 | 0.141 | 3.6716 | |
| 360 minute winter | SW1.5 | 1.004 | SW1.6 | 103.2 | 0.703 | 0.157 | 2.8787 | |
| 360 minute winter | SW1.6 | 1.005 | SW1.7 | 102.9 | 0.724 | 0.156 | 6.1884 | |
| 360 minute winter | SW1.7 | 1.006 | SW1.8 | 138.4 | 0.971 | 0.210 | 5.7328 | |
| 360 minute winter | SW3.1 | 3.000 | SW3.2 | 47.4 | 1.007 | 0.429 | 3.7085 | |
| 360 minute winter | SW3.2 | 3.001 | SW1.8 | 69.3 | 2.007 | 0.162 | 3.3458 | |
| 360 minute winter | SW1.8 | 1.007 | SW1.9 | 221.8 | 0.739 | 0.237 | 16.3994 | |
| 360 minute winter | SW4.1 | 4.000 | SW4.2 | 4.2 | 0.824 | 0.235 | 0.5046 | |
| 360 minute winter | SW4.2 | 4.001 | SW1.9 | 19.0 | 0.962 | 0.474 | 0.2859 | |
| 360 minute winter | SW1.9 | 1.008 | SW1.10 | 239.7 | 0.699 | 0.256 | 39.4419 | |
| 360 minute winter | SW1.10 | 1.009 | SW1.11 | 329.6 | 0.841 | 0.352 | 35.7613 | |
| 360 minute winter | SW5.1 | 5.000 | SW5.2 | 2.8 | 0.332 | 0.039 | 1.3392 | |
| 360 minute winter | SW5.2 | 5.001 | SW1.11 | 61.7 | 1.065 | 0.558 | 0.9233 | |
| 360 minute winter | SW1.11 | 1.010 | SW1.12 | 390.9 | 0.947 | 0.417 | 39.2556 | |
| 360 minute winter | SW1.12 | 1.011 | SW1.13 | 424.4 | 1.046 | 0.453 | 22.6691 | |
| 360 minute winter | SW6.1 | 6.000 | SW6.2 | 58.5 | 1.405 | 0.178 | 1.9838 | |
| 360 minute winter | SW7.1 | 7.000 | SW6.2 | 20.1 | 1.309 | 0.157 | 0.4566 | |
| 360 minute winter | SW6.2 | 6.001 | SW6.3 | 78.5 | 1.755 | 0.226 | 1.9539 | |
| 360 minute winter | SW6.3 | 6.002 | SW6.4 | 105.3 | 1.742 | 0.224 | 3.7450 | |
| 360 minute winter | SW6.4 | 6.003 | SW1.13 | 121.0 | 2.112 | 0.209 | 3.0278 | |

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**Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | SW1.13 | 192 | 3.285 | 0.488 | 543.4 | 1.9422 | 0.0000 | OK |
| 360 minute winter | OUT HARBOUR | 192 | 3.202 | 0.411 | 543.6 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 543.6 | 1.540 | 0.580 | 2.1136 | 4714.1 |

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**Results for 100 year +40% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute summer | SW1.1 | 248 | 8.299 | 0.071 | 19.9 | 0.2018 | 0.0000 | OK |
| 480 minute summer | SW2.1 | 248 | 6.698 | 0.097 | 33.2 | 0.5883 | 0.0000 | OK |
| 480 minute summer | SW1.2 | 248 | 6.257 | 0.159 | 59.9 | 0.3970 | 0.0000 | OK |
| 480 minute summer | SW1.3 | 248 | 5.937 | 0.190 | 78.1 | 0.5114 | 0.0000 | OK |
| 480 minute summer | SW1.4 | 248 | 5.571 | 0.140 | 100.0 | 0.5728 | 0.0000 | OK |
| 480 minute summer | SW1.5 | 248 | 3.772 | 0.272 | 112.7 | 1.4106 | 0.0000 | OK |
| 480 minute summer | SW1.6 | 248 | 3.743 | 0.265 | 112.7 | 1.0527 | 0.0000 | OK |
| 480 minute summer | SW1.7 | 248 | 3.695 | 0.295 | 151.7 | 1.8292 | 0.0000 | OK |
| 480 minute summer | SW3.1 | 248 | 7.509 | 0.184 | 51.6 | 1.4528 | 0.0000 | OK |
| 480 minute summer | SW3.2 | 248 | 7.135 | 0.128 | 75.6 | 0.6606 | 0.0000 | OK |
| 480 minute summer | SW1.8 | 248 | 3.625 | 0.417 | 243.2 | 1.9594 | 0.0000 | OK |
| 480 minute summer | SW4.1 | 248 | 6.052 | 0.052 | 4.6 | 0.1011 | 0.0000 | OK |
| 480 minute summer | SW4.2 | 248 | 5.052 | 0.122 | 20.6 | 0.3624 | 0.0000 | OK |
| 480 minute summer | SW1.9 | 248 | 3.588 | 0.434 | 263.3 | 1.7254 | 0.0000 | OK |
| 480 minute summer | SW1.10 | 248 | 3.538 | 0.499 | 360.9 | 4.2398 | 0.0000 | OK |
| 480 minute summer | SW5.1 | 248 | 5.142 | 0.042 | 3.0 | 0.0646 | 0.0000 | OK |
| 480 minute summer | SW5.2 | 248 | 4.940 | 0.220 | 67.2 | 1.3889 | 0.0000 | OK |
| 480 minute summer | SW1.11 | 248 | 3.475 | 0.527 | 426.0 | 2.0968 | 0.0000 | OK |
| 480 minute summer | SW1.12 | 248 | 3.390 | 0.537 | 460.6 | 3.0690 | 0.0000 | OK |
| 480 minute summer | SW6.1 | 248 | 7.286 | 0.134 | 63.7 | 1.3344 | 0.0000 | OK |
| 480 minute summer | SW7.1 | 248 | 7.289 | 0.086 | 21.9 | 0.3742 | 0.0000 | OK |
| 480 minute summer | SW6.2 | 248 | 6.817 | 0.157 | 85.6 | 0.2249 | 0.0000 | OK |
| 480 minute summer | SW6.3 | 248 | 6.261 | 0.181 | 114.9 | 0.9939 | 0.0000 | OK |
| 480 minute summer | SW6.4 | 248 | 5.676 | 0.176 | 132.3 | 0.6421 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 480 minute summer | SW1.1 | 1.000 | SW1.2 | 19.9 | 1.891 | 0.209 | 0.6032 | |
| 480 minute summer | SW2.1 | 2.000 | SW1.2 | 33.2 | 1.515 | 0.138 | 0.6547 | |
| 480 minute summer | SW1.2 | 1.001 | SW1.3 | 59.9 | 1.055 | 0.272 | 4.2883 | |
| 480 minute summer | SW1.3 | 1.002 | SW1.4 | 78.1 | 1.263 | 0.355 | 3.2082 | |
| 480 minute summer | SW1.4 | 1.003 | SW1.5 | 100.0 | 2.209 | 0.153 | 3.9098 | |
| 480 minute summer | SW1.5 | 1.004 | SW1.6 | 112.7 | 0.716 | 0.171 | 3.1096 | |
| 480 minute summer | SW1.6 | 1.005 | SW1.7 | 112.6 | 0.730 | 0.171 | 6.7641 | |
| 480 minute summer | SW1.7 | 1.006 | SW1.8 | 151.5 | 0.958 | 0.230 | 6.4098 | |
| 480 minute summer | SW3.1 | 3.000 | SW3.2 | 51.6 | 1.031 | 0.467 | 3.9465 | |
| 480 minute summer | SW3.2 | 3.001 | SW1.8 | 75.6 | 2.057 | 0.176 | 3.5603 | |
| 480 minute summer | SW1.8 | 1.007 | SW1.9 | 242.7 | 0.754 | 0.259 | 17.8030 | |
| 480 minute summer | SW4.1 | 4.000 | SW4.2 | 4.6 | 0.847 | 0.259 | 0.5407 | |
| 480 minute summer | SW4.2 | 4.001 | SW1.9 | 20.6 | 0.981 | 0.515 | 0.3046 | |
| 480 minute summer | SW1.9 | 1.008 | SW1.10 | 261.8 | 0.707 | 0.279 | 42.5055 | |
| 480 minute summer | SW1.10 | 1.009 | SW1.11 | 358.8 | 0.856 | 0.383 | 38.2250 | |
| 480 minute summer | SW5.1 | 5.000 | SW5.2 | 3.0 | 0.332 | 0.042 | 1.4693 | |
| 480 minute summer | SW5.2 | 5.001 | SW1.11 | 67.2 | 1.093 | 0.608 | 0.9792 | |
| 480 minute summer | SW1.11 | 1.010 | SW1.12 | 424.0 | 0.966 | 0.452 | 41.7270 | |
| 480 minute summer | SW1.12 | 1.011 | SW1.13 | 459.0 | 1.068 | 0.490 | 24.0154 | |
| 480 minute summer | SW6.1 | 6.000 | SW6.2 | 63.7 | 1.434 | 0.194 | 2.1156 | |
| 480 minute summer | SW7.1 | 7.000 | SW6.2 | 21.9 | 1.341 | 0.171 | 0.4864 | |
| 480 minute summer | SW6.2 | 6.001 | SW6.3 | 85.6 | 1.796 | 0.246 | 2.0828 | |
| 480 minute summer | SW6.3 | 6.002 | SW6.4 | 114.9 | 1.781 | 0.245 | 3.9993 | |
| 480 minute summer | SW6.4 | 6.003 | SW1.13 | 132.3 | 2.162 | 0.228 | 3.2328 | |

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**Results for 100 year +40% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute summer | SW1.13 | 248 | 3.307 | 0.510 | 591.3 | 2.0297 | 0.0000 | OK |
| 480 minute summer | OUT HARBOUR | 248 | 3.220 | 0.429 | 590.7 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 480 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 590.7 | 1.581 | 0.630 | 2.2372 | 4550.0 |

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**Results for 100 year +40% CC 480 minute winter. 720 minute analysis at 8 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute winter | SW1.1 | 248 | 8.289 | 0.061 | 14.8 | 0.1729 | 0.0000 | OK |
| 480 minute winter | SW2.1 | 248 | 6.684 | 0.083 | 24.7 | 0.5043 | 0.0000 | OK |
| 480 minute winter | SW1.2 | 248 | 6.233 | 0.135 | 44.6 | 0.3388 | 0.0000 | OK |
| 480 minute winter | SW1.3 | 248 | 5.908 | 0.161 | 58.2 | 0.4338 | 0.0000 | OK |
| 480 minute winter | SW1.4 | 248 | 5.551 | 0.120 | 74.5 | 0.4921 | 0.0000 | OK |
| 480 minute winter | SW1.5 | 248 | 3.729 | 0.229 | 83.9 | 1.1883 | 0.0000 | OK |
| 480 minute winter | SW1.6 | 248 | 3.699 | 0.221 | 83.9 | 0.8800 | 0.0000 | OK |
| 480 minute winter | SW1.7 | 248 | 3.641 | 0.241 | 113.0 | 1.4954 | 0.0000 | OK |
| 480 minute winter | SW3.1 | 248 | 7.480 | 0.155 | 38.4 | 1.2253 | 0.0000 | OK |
| 480 minute winter | SW3.2 | 248 | 7.117 | 0.110 | 56.3 | 0.5675 | 0.0000 | OK |
| 480 minute winter | SW1.8 | 248 | 3.551 | 0.343 | 181.3 | 1.6100 | 0.0000 | OK |
| 480 minute winter | SW4.1 | 248 | 6.045 | 0.045 | 3.4 | 0.0863 | 0.0000 | OK |
| 480 minute winter | SW4.2 | 248 | 5.032 | 0.102 | 15.3 | 0.3030 | 0.0000 | OK |
| 480 minute winter | SW1.9 | 248 | 3.509 | 0.355 | 196.5 | 1.4130 | 0.0000 | OK |
| 480 minute winter | SW1.10 | 248 | 3.456 | 0.417 | 270.0 | 3.5385 | 0.0000 | OK |
| 480 minute winter | SW5.1 | 248 | 5.137 | 0.037 | 2.3 | 0.0570 | 0.0000 | OK |
| 480 minute winter | SW5.2 | 248 | 4.906 | 0.186 | 50.1 | 1.1690 | 0.0000 | OK |
| 480 minute winter | SW1.11 | 248 | 3.393 | 0.445 | 319.8 | 1.7686 | 0.0000 | OK |
| 480 minute winter | SW1.12 | 248 | 3.311 | 0.458 | 346.6 | 2.6192 | 0.0000 | OK |
| 480 minute winter | SW6.1 | 248 | 7.267 | 0.115 | 47.4 | 1.1398 | 0.0000 | OK |
| 480 minute winter | SW7.1 | 248 | 7.277 | 0.074 | 16.3 | 0.3207 | 0.0000 | OK |
| 480 minute winter | SW6.2 | 248 | 6.794 | 0.134 | 63.7 | 0.1915 | 0.0000 | OK |
| 480 minute winter | SW6.3 | 248 | 6.234 | 0.154 | 85.5 | 0.8480 | 0.0000 | OK |
| 480 minute winter | SW6.4 | 248 | 5.650 | 0.150 | 98.4 | 0.5469 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 480 minute winter | SW1.1 | 1.000 | SW1.2 | 14.8 | 1.741 | 0.155 | 0.4872 | |
| 480 minute winter | SW2.1 | 2.000 | SW1.2 | 24.7 | 1.397 | 0.103 | 0.5281 | |
| 480 minute winter | SW1.2 | 1.001 | SW1.3 | 44.6 | 0.980 | 0.203 | 3.4414 | |
| 480 minute winter | SW1.3 | 1.002 | SW1.4 | 58.2 | 1.170 | 0.265 | 2.5813 | |
| 480 minute winter | SW1.4 | 1.003 | SW1.5 | 74.5 | 2.034 | 0.114 | 3.1627 | |
| 480 minute winter | SW1.5 | 1.004 | SW1.6 | 83.9 | 0.677 | 0.127 | 2.4318 | |
| 480 minute winter | SW1.6 | 1.005 | SW1.7 | 83.9 | 0.718 | 0.127 | 5.0854 | |
| 480 minute winter | SW1.7 | 1.006 | SW1.8 | 113.0 | 0.966 | 0.171 | 4.4703 | |
| 480 minute winter | SW3.1 | 3.000 | SW3.2 | 38.4 | 0.951 | 0.347 | 3.1830 | |
| 480 minute winter | SW3.2 | 3.001 | SW1.8 | 56.3 | 1.894 | 0.131 | 2.8808 | |
| 480 minute winter | SW1.8 | 1.007 | SW1.9 | 181.2 | 0.726 | 0.193 | 13.6103 | |
| 480 minute winter | SW4.1 | 4.000 | SW4.2 | 3.4 | 0.778 | 0.192 | 0.4347 | |
| 480 minute winter | SW4.2 | 4.001 | SW1.9 | 15.3 | 0.913 | 0.383 | 0.2433 | |
| 480 minute winter | SW1.9 | 1.008 | SW1.10 | 196.2 | 0.682 | 0.209 | 33.0221 | |
| 480 minute winter | SW1.10 | 1.009 | SW1.11 | 269.7 | 0.809 | 0.288 | 30.3915 | |
| 480 minute winter | SW5.1 | 5.000 | SW5.2 | 2.3 | 0.337 | 0.032 | 1.0518 | |
| 480 minute winter | SW5.2 | 5.001 | SW1.11 | 50.1 | 1.003 | 0.453 | 0.7958 | |
| 480 minute winter | SW1.11 | 1.010 | SW1.12 | 319.4 | 0.901 | 0.341 | 33.7257 | |
| 480 minute winter | SW1.12 | 1.011 | SW1.13 | 346.3 | 0.984 | 0.369 | 19.6498 | |
| 480 minute winter | SW6.1 | 6.000 | SW6.2 | 47.4 | 1.331 | 0.144 | 1.6955 | |
| 480 minute winter | SW7.1 | 7.000 | SW6.2 | 16.3 | 1.236 | 0.128 | 0.3928 | |
| 480 minute winter | SW6.2 | 6.001 | SW6.3 | 63.7 | 1.661 | 0.183 | 1.6759 | |
| 480 minute winter | SW6.3 | 6.002 | SW6.4 | 85.5 | 1.653 | 0.182 | 3.2061 | |
| 480 minute winter | SW6.4 | 6.003 | SW1.13 | 98.4 | 1.999 | 0.170 | 2.6006 | |

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**Results for 100 year +40% CC 480 minute winter. 720 minute analysis at 8 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute winter | SW1.13 | 248 | 3.236 | 0.439 | 444.7 | 1.7466 | 0.0000 | OK |
| 480 minute winter | OUT HARBOUR | 248 | 3.162 | 0.371 | 444.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 480 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 444.5 | 1.449 | 0.474 | 1.8376 | 5106.1 |

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**Results for 100 year +40% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute summer | SW1.1 | 315 | 8.292 | 0.064 | 16.4 | 0.1823 | 0.0000 | OK |
| 600 minute summer | SW2.1 | 315 | 6.688 | 0.087 | 27.2 | 0.5301 | 0.0000 | OK |
| 600 minute summer | SW1.2 | 315 | 6.241 | 0.143 | 49.2 | 0.3569 | 0.0000 | OK |
| 600 minute summer | SW1.3 | 315 | 5.917 | 0.170 | 64.2 | 0.4579 | 0.0000 | OK |
| 600 minute summer | SW1.4 | 315 | 5.557 | 0.126 | 82.2 | 0.5177 | 0.0000 | OK |
| 600 minute summer | SW1.5 | 315 | 3.743 | 0.243 | 92.6 | 1.2569 | 0.0000 | OK |
| 600 minute summer | SW1.6 | 315 | 3.713 | 0.235 | 92.6 | 0.9330 | 0.0000 | OK |
| 600 minute summer | SW1.7 | 315 | 3.658 | 0.258 | 124.7 | 1.6013 | 0.0000 | OK |
| 600 minute summer | SW3.1 | 315 | 7.489 | 0.164 | 42.4 | 1.2957 | 0.0000 | OK |
| 600 minute summer | SW3.2 | 315 | 7.123 | 0.116 | 62.1 | 0.5966 | 0.0000 | OK |
| 600 minute summer | SW1.8 | 315 | 3.574 | 0.366 | 200.0 | 1.7199 | 0.0000 | OK |
| 600 minute summer | SW4.1 | 315 | 6.047 | 0.047 | 3.8 | 0.0915 | 0.0000 | OK |
| 600 minute summer | SW4.2 | 315 | 5.038 | 0.108 | 17.0 | 0.3224 | 0.0000 | OK |
| 600 minute summer | SW1.9 | 315 | 3.535 | 0.381 | 216.9 | 1.5130 | 0.0000 | OK |
| 600 minute summer | SW1.10 | 315 | 3.483 | 0.444 | 298.1 | 3.7660 | 0.0000 | OK |
| 600 minute summer | SW5.1 | 315 | 5.138 | 0.038 | 2.5 | 0.0593 | 0.0000 | OK |
| 600 minute summer | SW5.2 | 315 | 4.916 | 0.196 | 55.2 | 1.2362 | 0.0000 | OK |
| 600 minute summer | SW1.11 | 315 | 3.420 | 0.472 | 353.1 | 1.8759 | 0.0000 | OK |
| 600 minute summer | SW1.12 | 315 | 3.337 | 0.484 | 382.8 | 2.7668 | 0.0000 | OK |
| 600 minute summer | SW6.1 | 315 | 7.273 | 0.121 | 52.3 | 1.2006 | 0.0000 | OK |
| 600 minute summer | SW7.1 | 315 | 7.281 | 0.078 | 17.9 | 0.3366 | 0.0000 | OK |
| 600 minute summer | SW6.2 | 315 | 6.801 | 0.141 | 70.2 | 0.2018 | 0.0000 | OK |
| 600 minute summer | SW6.3 | 315 | 6.242 | 0.162 | 94.2 | 0.8929 | 0.0000 | OK |
| 600 minute summer | SW6.4 | 315 | 5.658 | 0.158 | 108.5 | 0.5764 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 600 minute summer | SW1.1 | 1.000 | SW1.2 | 16.4 | 1.792 | 0.172 | 0.5245 | |
| 600 minute summer | SW2.1 | 2.000 | SW1.2 | 27.2 | 1.435 | 0.113 | 0.5664 | |
| 600 minute summer | SW1.2 | 1.001 | SW1.3 | 49.2 | 1.004 | 0.224 | 3.7018 | |
| 600 minute summer | SW1.3 | 1.002 | SW1.4 | 64.2 | 1.201 | 0.292 | 2.7743 | |
| 600 minute summer | SW1.4 | 1.003 | SW1.5 | 82.2 | 2.091 | 0.126 | 3.3949 | |
| 600 minute summer | SW1.5 | 1.004 | SW1.6 | 92.6 | 0.691 | 0.141 | 2.6364 | |
| 600 minute summer | SW1.6 | 1.005 | SW1.7 | 92.6 | 0.724 | 0.140 | 5.5985 | |
| 600 minute summer | SW1.7 | 1.006 | SW1.8 | 124.7 | 0.963 | 0.189 | 5.0627 | |
| 600 minute summer | SW3.1 | 3.000 | SW3.2 | 42.4 | 0.977 | 0.384 | 3.4228 | |
| 600 minute summer | SW3.2 | 3.001 | SW1.8 | 62.1 | 1.946 | 0.145 | 3.0910 | |
| 600 minute summer | SW1.8 | 1.007 | SW1.9 | 199.9 | 0.739 | 0.213 | 14.9236 | |
| 600 minute summer | SW4.1 | 4.000 | SW4.2 | 3.8 | 0.803 | 0.214 | 0.4710 | |
| 600 minute summer | SW4.2 | 4.001 | SW1.9 | 17.0 | 0.937 | 0.425 | 0.2633 | |
| 600 minute summer | SW1.9 | 1.008 | SW1.10 | 216.7 | 0.690 | 0.231 | 36.0507 | |
| 600 minute summer | SW1.10 | 1.009 | SW1.11 | 297.9 | 0.825 | 0.318 | 32.9299 | |
| 600 minute summer | SW5.1 | 5.000 | SW5.2 | 2.5 | 0.335 | 0.035 | 1.1773 | |
| 600 minute summer | SW5.2 | 5.001 | SW1.11 | 55.2 | 1.032 | 0.499 | 0.8524 | |
| 600 minute summer | SW1.11 | 1.010 | SW1.12 | 352.8 | 0.923 | 0.376 | 36.3348 | |
| 600 minute summer | SW1.12 | 1.011 | SW1.13 | 382.6 | 1.014 | 0.408 | 21.0693 | |
| 600 minute summer | SW6.1 | 6.000 | SW6.2 | 52.3 | 1.365 | 0.159 | 1.8239 | |
| 600 minute summer | SW7.1 | 7.000 | SW6.2 | 17.9 | 1.268 | 0.140 | 0.4203 | |
| 600 minute summer | SW6.2 | 6.001 | SW6.3 | 70.2 | 1.705 | 0.202 | 1.7999 | |
| 600 minute summer | SW6.3 | 6.002 | SW6.4 | 94.2 | 1.694 | 0.201 | 3.4469 | |
| 600 minute summer | SW6.4 | 6.003 | SW1.13 | 108.5 | 2.052 | 0.187 | 2.7933 | |

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**Results for 100 year +40% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute summer | SW1.13 | 315 | 3.259 | 0.462 | 491.1 | 1.8385 | 0.0000 | OK |
| 600 minute summer | OUT HARBOUR | 315 | 3.181 | 0.390 | 491.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 600 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 491.0 | 1.495 | 0.524 | 1.9667 | 4824.2 |

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**Results for 100 year +40% CC 600 minute winter. 840 minute analysis at 15 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | SW1.1 | 315 | 8.284 | 0.056 | 12.5 | 0.1586 | 0.0000 | OK |
| 600 minute winter | SW2.1 | 315 | 6.677 | 0.076 | 20.8 | 0.4617 | 0.0000 | OK |
| 600 minute winter | SW1.2 | 315 | 6.222 | 0.124 | 37.6 | 0.3096 | 0.0000 | OK |
| 600 minute winter | SW1.3 | 315 | 5.894 | 0.147 | 49.0 | 0.3952 | 0.0000 | OK |
| 600 minute winter | SW1.4 | 315 | 5.541 | 0.110 | 62.8 | 0.4511 | 0.0000 | OK |
| 600 minute winter | SW1.5 | 315 | 3.710 | 0.210 | 70.8 | 1.0855 | 0.0000 | OK |
| 600 minute winter | SW1.6 | 315 | 3.680 | 0.202 | 70.8 | 0.8044 | 0.0000 | OK |
| 600 minute winter | SW1.7 | 315 | 3.622 | 0.222 | 95.4 | 1.3739 | 0.0000 | OK |
| 600 minute winter | SW3.1 | 315 | 7.466 | 0.141 | 32.4 | 1.1152 | 0.0000 | OK |
| 600 minute winter | SW3.2 | 315 | 7.108 | 0.101 | 47.5 | 0.5203 | 0.0000 | OK |
| 600 minute winter | SW1.8 | 315 | 3.516 | 0.308 | 153.0 | 1.4454 | 0.0000 | OK |
| 600 minute winter | SW4.1 | 315 | 6.041 | 0.041 | 2.9 | 0.0795 | 0.0000 | OK |
| 600 minute winter | SW4.2 | 315 | 5.023 | 0.093 | 13.0 | 0.2758 | 0.0000 | OK |
| 600 minute winter | SW1.9 | 315 | 3.472 | 0.318 | 166.0 | 1.2631 | 0.0000 | OK |
| 600 minute winter | SW1.10 | 315 | 3.415 | 0.376 | 228.3 | 3.1920 | 0.0000 | OK |
| 600 minute winter | SW5.1 | 315 | 5.134 | 0.034 | 1.9 | 0.0521 | 0.0000 | OK |
| 600 minute winter | SW5.2 | 315 | 4.888 | 0.168 | 42.2 | 1.0605 | 0.0000 | OK |
| 600 minute winter | SW1.11 | 315 | 3.351 | 0.403 | 270.4 | 1.6035 | 0.0000 | OK |
| 600 minute winter | SW1.12 | 315 | 3.271 | 0.418 | 293.4 | 2.3886 | 0.0000 | OK |
| 600 minute winter | SW6.1 | 315 | 7.257 | 0.105 | 40.0 | 1.0431 | 0.0000 | OK |
| 600 minute winter | SW7.1 | 315 | 7.271 | 0.068 | 13.7 | 0.2931 | 0.0000 | OK |
| 600 minute winter | SW6.2 | 315 | 6.782 | 0.122 | 53.7 | 0.1749 | 0.0000 | OK |
| 600 minute winter | SW6.3 | 315 | 6.221 | 0.141 | 72.1 | 0.7754 | 0.0000 | OK |
| 600 minute winter | SW6.4 | 315 | 5.637 | 0.137 | 83.0 | 0.4999 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | SW1.1 | 1.000 | SW1.2 | 12.5 | 1.659 | 0.131 | 0.4318 | |
| 600 minute winter | SW2.1 | 2.000 | SW1.2 | 20.8 | 1.332 | 0.087 | 0.4667 | |
| 600 minute winter | SW1.2 | 1.001 | SW1.3 | 37.6 | 0.938 | 0.171 | 3.0316 | |
| 600 minute winter | SW1.3 | 1.002 | SW1.4 | 49.0 | 1.117 | 0.223 | 2.2760 | |
| 600 minute winter | SW1.4 | 1.003 | SW1.5 | 62.8 | 1.938 | 0.096 | 2.7984 | |
| 600 minute winter | SW1.5 | 1.004 | SW1.6 | 70.8 | 0.649 | 0.107 | 2.1401 | |
| 600 minute winter | SW1.6 | 1.005 | SW1.7 | 70.8 | 0.692 | 0.107 | 4.4532 | |
| 600 minute winter | SW1.7 | 1.006 | SW1.8 | 95.4 | 0.923 | 0.145 | 3.9349 | |
| 600 minute winter | SW3.1 | 3.000 | SW3.2 | 32.4 | 0.907 | 0.293 | 2.8150 | |
| 600 minute winter | SW3.2 | 3.001 | SW1.8 | 47.5 | 1.805 | 0.111 | 2.5495 | |
| 600 minute winter | SW1.8 | 1.007 | SW1.9 | 153.0 | 0.714 | 0.163 | 11.6869 | |
| 600 minute winter | SW4.1 | 4.000 | SW4.2 | 2.9 | 0.744 | 0.163 | 0.3879 | |
| 600 minute winter | SW4.2 | 4.001 | SW1.9 | 13.0 | 0.876 | 0.325 | 0.2154 | |
| 600 minute winter | SW1.9 | 1.008 | SW1.10 | 166.0 | 0.668 | 0.177 | 28.5325 | |
| 600 minute winter | SW1.10 | 1.009 | SW1.11 | 228.2 | 0.784 | 0.243 | 26.5599 | |
| 600 minute winter | SW5.1 | 5.000 | SW5.2 | 1.9 | 0.324 | 0.027 | 0.8485 | |
| 600 minute winter | SW5.2 | 5.001 | SW1.11 | 42.2 | 0.955 | 0.382 | 0.7042 | |
| 600 minute winter | SW1.11 | 1.010 | SW1.12 | 270.4 | 0.865 | 0.288 | 29.7152 | |
| 600 minute winter | SW1.12 | 1.011 | SW1.13 | 293.3 | 0.941 | 0.313 | 17.4196 | |
| 600 minute winter | SW6.1 | 6.000 | SW6.2 | 40.0 | 1.275 | 0.122 | 1.4943 | |
| 600 minute winter | SW7.1 | 7.000 | SW6.2 | 13.7 | 1.178 | 0.107 | 0.3464 | |
| 600 minute winter | SW6.2 | 6.001 | SW6.3 | 53.7 | 1.586 | 0.154 | 1.4800 | |
| 600 minute winter | SW6.3 | 6.002 | SW6.4 | 72.1 | 1.581 | 0.154 | 2.8274 | |
| 600 minute winter | SW6.4 | 6.003 | SW1.13 | 83.0 | 1.908 | 0.143 | 2.2982 | |

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**Results for 100 year +40% CC 600 minute winter. 840 minute analysis at 15 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | SW1.13 | 315 | 3.199 | 0.402 | 376.3 | 1.5986 | 0.0000 | OK |
| 600 minute winter | OUT HARBOUR | 315 | 3.131 | 0.340 | 376.3 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 376.3 | 1.382 | 0.401 | 1.6311 | 5420.1 |

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**Results for 100 year +40% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute summer | SW1.1 | 375 | 8.288 | 0.060 | 14.6 | 0.1717 | 0.0000 | OK |
| 720 minute summer | SW2.1 | 375 | 6.683 | 0.082 | 24.3 | 0.5000 | 0.0000 | OK |
| 720 minute summer | SW1.2 | 375 | 6.232 | 0.134 | 43.9 | 0.3359 | 0.0000 | OK |
| 720 minute summer | SW1.3 | 375 | 5.907 | 0.160 | 57.3 | 0.4301 | 0.0000 | OK |
| 720 minute summer | SW1.4 | 375 | 5.550 | 0.119 | 73.4 | 0.4884 | 0.0000 | OK |
| 720 minute summer | SW1.5 | 375 | 3.728 | 0.228 | 82.7 | 1.1789 | 0.0000 | OK |
| 720 minute summer | SW1.6 | 375 | 3.698 | 0.219 | 82.7 | 0.8727 | 0.0000 | OK |
| 720 minute summer | SW1.7 | 375 | 3.639 | 0.239 | 111.4 | 1.4813 | 0.0000 | OK |
| 720 minute summer | SW3.1 | 375 | 7.479 | 0.154 | 37.9 | 1.2164 | 0.0000 | OK |
| 720 minute summer | SW3.2 | 375 | 7.117 | 0.110 | 55.5 | 0.5634 | 0.0000 | OK |
| 720 minute summer | SW1.8 | 375 | 3.548 | 0.340 | 178.7 | 1.5962 | 0.0000 | OK |
| 720 minute summer | SW4.1 | 375 | 6.045 | 0.045 | 3.4 | 0.0863 | 0.0000 | OK |
| 720 minute summer | SW4.2 | 375 | 5.031 | 0.101 | 15.2 | 0.3018 | 0.0000 | OK |
| 720 minute summer | SW1.9 | 375 | 3.506 | 0.352 | 193.8 | 1.4008 | 0.0000 | OK |
| 720 minute summer | SW1.10 | 375 | 3.452 | 0.413 | 266.4 | 3.5107 | 0.0000 | OK |
| 720 minute summer | SW5.1 | 375 | 5.136 | 0.036 | 2.2 | 0.0558 | 0.0000 | OK |
| 720 minute summer | SW5.2 | 375 | 4.904 | 0.184 | 49.3 | 1.1582 | 0.0000 | OK |
| 720 minute summer | SW1.11 | 375 | 3.389 | 0.441 | 315.6 | 1.7554 | 0.0000 | OK |
| 720 minute summer | SW1.12 | 375 | 3.308 | 0.455 | 342.2 | 2.6010 | 0.0000 | OK |
| 720 minute summer | SW6.1 | 375 | 7.266 | 0.114 | 46.7 | 1.1310 | 0.0000 | OK |
| 720 minute summer | SW7.1 | 375 | 7.276 | 0.073 | 16.0 | 0.3176 | 0.0000 | OK |
| 720 minute summer | SW6.2 | 375 | 6.793 | 0.133 | 62.7 | 0.1899 | 0.0000 | OK |
| 720 minute summer | SW6.3 | 375 | 6.233 | 0.153 | 84.1 | 0.8406 | 0.0000 | OK |
| 720 minute summer | SW6.4 | 375 | 5.648 | 0.148 | 96.9 | 0.5425 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 720 minute summer | SW1.1 | 1.000 | SW1.2 | 14.6 | 1.734 | 0.153 | 0.4825 | |
| 720 minute summer | SW2.1 | 2.000 | SW1.2 | 24.3 | 1.391 | 0.101 | 0.5219 | |
| 720 minute summer | SW1.2 | 1.001 | SW1.3 | 43.9 | 0.976 | 0.200 | 3.4012 | |
| 720 minute summer | SW1.3 | 1.002 | SW1.4 | 57.3 | 1.165 | 0.261 | 2.5520 | |
| 720 minute summer | SW1.4 | 1.003 | SW1.5 | 73.4 | 2.026 | 0.113 | 3.1288 | |
| 720 minute summer | SW1.5 | 1.004 | SW1.6 | 82.7 | 0.675 | 0.125 | 2.4039 | |
| 720 minute summer | SW1.6 | 1.005 | SW1.7 | 82.7 | 0.717 | 0.125 | 5.0171 | |
| 720 minute summer | SW1.7 | 1.006 | SW1.8 | 111.4 | 0.965 | 0.169 | 4.3953 | |
| 720 minute summer | SW3.1 | 3.000 | SW3.2 | 37.9 | 0.948 | 0.343 | 3.1529 | |
| 720 minute summer | SW3.2 | 3.001 | SW1.8 | 55.5 | 1.886 | 0.129 | 2.8513 | |
| 720 minute summer | SW1.8 | 1.007 | SW1.9 | 178.6 | 0.731 | 0.191 | 13.4498 | |
| 720 minute summer | SW4.1 | 4.000 | SW4.2 | 3.4 | 0.778 | 0.192 | 0.4347 | |
| 720 minute summer | SW4.2 | 4.001 | SW1.9 | 15.2 | 0.911 | 0.380 | 0.2421 | |
| 720 minute summer | SW1.9 | 1.008 | SW1.10 | 193.8 | 0.681 | 0.207 | 32.6559 | |
| 720 minute summer | SW1.10 | 1.009 | SW1.11 | 266.3 | 0.807 | 0.284 | 30.0822 | |
| 720 minute summer | SW5.1 | 5.000 | SW5.2 | 2.2 | 0.334 | 0.031 | 1.0280 | |
| 720 minute summer | SW5.2 | 5.001 | SW1.11 | 49.3 | 0.999 | 0.446 | 0.7866 | |
| 720 minute summer | SW1.11 | 1.010 | SW1.12 | 315.4 | 0.898 | 0.336 | 33.4045 | |
| 720 minute summer | SW1.12 | 1.011 | SW1.13 | 342.0 | 0.981 | 0.365 | 19.4718 | |
| 720 minute summer | SW6.1 | 6.000 | SW6.2 | 46.7 | 1.327 | 0.142 | 1.6763 | |
| 720 minute summer | SW7.1 | 7.000 | SW6.2 | 16.0 | 1.230 | 0.125 | 0.3875 | |
| 720 minute summer | SW6.2 | 6.001 | SW6.3 | 62.7 | 1.655 | 0.180 | 1.6567 | |
| 720 minute summer | SW6.3 | 6.002 | SW6.4 | 84.1 | 1.646 | 0.179 | 3.1684 | |
| 720 minute summer | SW6.4 | 6.003 | SW1.13 | 96.9 | 1.990 | 0.167 | 2.5718 | |

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**Results for 100 year +40% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute summer | SW1.13 | 375 | 3.233 | 0.436 | 438.9 | 1.7348 | 0.0000 | OK |
| 720 minute summer | OUT HARBOUR | 375 | 3.159 | 0.368 | 438.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 720 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 438.9 | 1.444 | 0.468 | 1.8210 | 5068.7 |

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**Results for 100 year +40% CC 720 minute winter. 960 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute winter | SW1.1 | 375 | 8.280 | 0.052 | 11.0 | 0.1487 | 0.0000 | OK |
| 720 minute winter | SW2.1 | 375 | 6.672 | 0.071 | 18.3 | 0.4326 | 0.0000 | OK |
| 720 minute winter | SW1.2 | 375 | 6.214 | 0.116 | 33.1 | 0.2903 | 0.0000 | OK |
| 720 minute winter | SW1.3 | 375 | 5.884 | 0.137 | 43.2 | 0.3693 | 0.0000 | OK |
| 720 minute winter | SW1.4 | 375 | 5.534 | 0.103 | 55.3 | 0.4232 | 0.0000 | OK |
| 720 minute winter | SW1.5 | 375 | 3.696 | 0.196 | 62.3 | 1.0149 | 0.0000 | OK |
| 720 minute winter | SW1.6 | 375 | 3.667 | 0.189 | 62.3 | 0.7530 | 0.0000 | OK |
| 720 minute winter | SW1.7 | 375 | 3.609 | 0.209 | 83.9 | 1.2931 | 0.0000 | OK |
| 720 minute winter | SW3.1 | 375 | 7.457 | 0.132 | 28.5 | 1.0404 | 0.0000 | OK |
| 720 minute winter | SW3.2 | 375 | 7.102 | 0.095 | 41.8 | 0.4877 | 0.0000 | OK |
| 720 minute winter | SW1.8 | 375 | 3.492 | 0.284 | 134.6 | 1.3352 | 0.0000 | OK |
| 720 minute winter | SW4.1 | 375 | 6.038 | 0.038 | 2.5 | 0.0738 | 0.0000 | OK |
| 720 minute winter | SW4.2 | 375 | 5.016 | 0.086 | 11.3 | 0.2548 | 0.0000 | OK |
| 720 minute winter | SW1.9 | 375 | 3.446 | 0.292 | 145.9 | 1.1609 | 0.0000 | OK |
| 720 minute winter | SW1.10 | 375 | 3.387 | 0.348 | 200.6 | 2.9522 | 0.0000 | OK |
| 720 minute winter | SW5.1 | 375 | 5.132 | 0.032 | 1.7 | 0.0494 | 0.0000 | OK |
| 720 minute winter | SW5.2 | 375 | 4.877 | 0.157 | 37.1 | 0.9864 | 0.0000 | OK |
| 720 minute winter | SW1.11 | 375 | 3.322 | 0.374 | 237.6 | 1.4881 | 0.0000 | OK |
| 720 minute winter | SW1.12 | 375 | 3.242 | 0.389 | 257.8 | 2.2264 | 0.0000 | OK |
| 720 minute winter | SW6.1 | 375 | 7.250 | 0.098 | 35.1 | 0.9746 | 0.0000 | OK |
| 720 minute winter | SW7.1 | 375 | 7.266 | 0.063 | 12.1 | 0.2750 | 0.0000 | OK |
| 720 minute winter | SW6.2 | 375 | 6.774 | 0.114 | 47.2 | 0.1634 | 0.0000 | OK |
| 720 minute winter | SW6.3 | 375 | 6.212 | 0.132 | 63.3 | 0.7247 | 0.0000 | OK |
| 720 minute winter | SW6.4 | 375 | 5.628 | 0.128 | 72.9 | 0.4673 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 720 minute winter | SW1.1 | 1.000 | SW1.2 | 11.0 | 1.600 | 0.116 | 0.3940 | |
| 720 minute winter | SW2.1 | 2.000 | SW1.2 | 18.3 | 1.283 | 0.076 | 0.4260 | |
| 720 minute winter | SW1.2 | 1.001 | SW1.3 | 33.1 | 0.905 | 0.151 | 2.7640 | |
| 720 minute winter | SW1.3 | 1.002 | SW1.4 | 43.2 | 1.080 | 0.197 | 2.0755 | |
| 720 minute winter | SW1.4 | 1.003 | SW1.5 | 55.3 | 1.868 | 0.085 | 2.5555 | |
| 720 minute winter | SW1.5 | 1.004 | SW1.6 | 62.3 | 0.628 | 0.095 | 1.9461 | |
| 720 minute winter | SW1.6 | 1.005 | SW1.7 | 62.3 | 0.671 | 0.095 | 4.0395 | |
| 720 minute winter | SW1.7 | 1.006 | SW1.8 | 83.9 | 0.886 | 0.127 | 3.6054 | |
| 720 minute winter | SW3.1 | 3.000 | SW3.2 | 28.5 | 0.876 | 0.258 | 2.5647 | |
| 720 minute winter | SW3.2 | 3.001 | SW1.8 | 41.8 | 1.740 | 0.097 | 2.3275 | |
| 720 minute winter | SW1.8 | 1.007 | SW1.9 | 134.6 | 0.703 | 0.144 | 10.4241 | |
| 720 minute winter | SW4.1 | 4.000 | SW4.2 | 2.5 | 0.713 | 0.141 | 0.3490 | |
| 720 minute winter | SW4.2 | 4.001 | SW1.9 | 11.3 | 0.845 | 0.283 | 0.1941 | |
| 720 minute winter | SW1.9 | 1.008 | SW1.10 | 145.9 | 0.657 | 0.156 | 25.5162 | |
| 720 minute winter | SW1.10 | 1.009 | SW1.11 | 200.5 | 0.764 | 0.214 | 23.9378 | |
| 720 minute winter | SW5.1 | 5.000 | SW5.2 | 1.7 | 0.327 | 0.024 | 0.7187 | |
| 720 minute winter | SW5.2 | 5.001 | SW1.11 | 37.1 | 0.922 | 0.336 | 0.6412 | |
| 720 minute winter | SW1.11 | 1.010 | SW1.12 | 237.6 | 0.839 | 0.253 | 26.9468 | |
| 720 minute winter | SW1.12 | 1.011 | SW1.13 | 257.8 | 0.907 | 0.275 | 15.8779 | |
| 720 minute winter | SW6.1 | 6.000 | SW6.2 | 35.1 | 1.231 | 0.107 | 1.3575 | |
| 720 minute winter | SW7.1 | 7.000 | SW6.2 | 12.1 | 1.137 | 0.095 | 0.3169 | |
| 720 minute winter | SW6.2 | 6.001 | SW6.3 | 47.2 | 1.531 | 0.136 | 1.3479 | |
| 720 minute winter | SW6.3 | 6.002 | SW6.4 | 63.3 | 1.527 | 0.135 | 2.5701 | |
| 720 minute winter | SW6.4 | 6.003 | SW1.13 | 72.9 | 1.841 | 0.126 | 2.0918 | |

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**Results for 100 year +40% CC 720 minute winter. 960 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute winter | SW1.13 | 375 | 3.173 | 0.376 | 330.7 | 1.4951 | 0.0000 | OK |
| 720 minute winter | OUT HARBOUR | 375 | 3.109 | 0.318 | 330.7 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 720 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 330.7 | 1.330 | 0.353 | 1.4896 | 5694.9 |

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**Results for 100 year +40% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute summer | SW1.1 | 495 | 8.282 | 0.054 | 12.0 | 0.1554 | 0.0000 | OK |
| 960 minute summer | SW2.1 | 495 | 6.676 | 0.075 | 20.0 | 0.4526 | 0.0000 | OK |
| 960 minute summer | SW1.2 | 495 | 6.219 | 0.121 | 36.1 | 0.3033 | 0.0000 | OK |
| 960 minute summer | SW1.3 | 495 | 5.891 | 0.144 | 47.1 | 0.3868 | 0.0000 | OK |
| 960 minute summer | SW1.4 | 495 | 5.539 | 0.108 | 60.3 | 0.4420 | 0.0000 | OK |
| 960 minute summer | SW1.5 | 495 | 3.705 | 0.205 | 67.9 | 1.0619 | 0.0000 | OK |
| 960 minute summer | SW1.6 | 495 | 3.676 | 0.198 | 67.9 | 0.7870 | 0.0000 | OK |
| 960 minute summer | SW1.7 | 495 | 3.617 | 0.217 | 91.5 | 1.3469 | 0.0000 | OK |
| 960 minute summer | SW3.1 | 495 | 7.463 | 0.138 | 31.2 | 1.0926 | 0.0000 | OK |
| 960 minute summer | SW3.2 | 495 | 7.106 | 0.099 | 45.7 | 0.5102 | 0.0000 | OK |
| 960 minute summer | SW1.8 | 495 | 3.508 | 0.300 | 146.9 | 1.4089 | 0.0000 | OK |
| 960 minute summer | SW4.1 | 495 | 6.040 | 0.040 | 2.8 | 0.0781 | 0.0000 | OK |
| 960 minute summer | SW4.2 | 495 | 5.021 | 0.091 | 12.5 | 0.2697 | 0.0000 | OK |
| 960 minute summer | SW1.9 | 495 | 3.463 | 0.309 | 159.4 | 1.2295 | 0.0000 | OK |
| 960 minute summer | SW1.10 | 495 | 3.406 | 0.367 | 219.1 | 3.1134 | 0.0000 | OK |
| 960 minute summer | SW5.1 | 495 | 5.133 | 0.033 | 1.8 | 0.0508 | 0.0000 | OK |
| 960 minute summer | SW5.2 | 495 | 4.885 | 0.165 | 40.6 | 1.0374 | 0.0000 | OK |
| 960 minute summer | SW1.11 | 495 | 3.342 | 0.394 | 259.6 | 1.5658 | 0.0000 | OK |
| 960 minute summer | SW1.12 | 495 | 3.262 | 0.409 | 281.6 | 2.3362 | 0.0000 | OK |
| 960 minute summer | SW6.1 | 495 | 7.255 | 0.103 | 38.4 | 1.0211 | 0.0000 | OK |
| 960 minute summer | SW7.1 | 495 | 7.269 | 0.066 | 13.2 | 0.2876 | 0.0000 | OK |
| 960 minute summer | SW6.2 | 495 | 6.780 | 0.120 | 51.6 | 0.1713 | 0.0000 | OK |
| 960 minute summer | SW6.3 | 495 | 6.218 | 0.138 | 69.3 | 0.7595 | 0.0000 | OK |
| 960 minute summer | SW6.4 | 495 | 5.634 | 0.134 | 79.8 | 0.4897 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 960 minute summer | SW1.1 | 1.000 | SW1.2 | 12.0 | 1.640 | 0.126 | 0.4193 | |
| 960 minute summer | SW2.1 | 2.000 | SW1.2 | 20.0 | 1.317 | 0.083 | 0.4538 | |
| 960 minute summer | SW1.2 | 1.001 | SW1.3 | 36.1 | 0.927 | 0.164 | 2.9443 | |
| 960 minute summer | SW1.3 | 1.002 | SW1.4 | 47.1 | 1.105 | 0.214 | 2.2109 | |
| 960 minute summer | SW1.4 | 1.003 | SW1.5 | 60.3 | 1.915 | 0.093 | 2.7183 | |
| 960 minute summer | SW1.5 | 1.004 | SW1.6 | 67.9 | 0.642 | 0.103 | 2.0739 | |
| 960 minute summer | SW1.6 | 1.005 | SW1.7 | 67.9 | 0.685 | 0.103 | 4.3124 | |
| 960 minute summer | SW1.7 | 1.006 | SW1.8 | 91.5 | 0.911 | 0.139 | 3.8229 | |
| 960 minute summer | SW3.1 | 3.000 | SW3.2 | 31.2 | 0.898 | 0.282 | 2.7384 | |
| 960 minute summer | SW3.2 | 3.001 | SW1.8 | 45.7 | 1.786 | 0.107 | 2.4796 | |
| 960 minute summer | SW1.8 | 1.007 | SW1.9 | 146.9 | 0.714 | 0.157 | 11.2655 | |
| 960 minute summer | SW4.1 | 4.000 | SW4.2 | 2.8 | 0.737 | 0.158 | 0.3783 | |
| 960 minute summer | SW4.2 | 4.001 | SW1.9 | 12.5 | 0.867 | 0.313 | 0.2092 | |
| 960 minute summer | SW1.9 | 1.008 | SW1.10 | 159.3 | 0.665 | 0.170 | 27.5354 | |
| 960 minute summer | SW1.10 | 1.009 | SW1.11 | 219.0 | 0.777 | 0.234 | 25.6967 | |
| 960 minute summer | SW5.1 | 5.000 | SW5.2 | 1.8 | 0.332 | 0.025 | 0.8053 | |
| 960 minute summer | SW5.2 | 5.001 | SW1.11 | 40.6 | 0.945 | 0.367 | 0.6844 | |
| 960 minute summer | SW1.11 | 1.010 | SW1.12 | 259.5 | 0.857 | 0.277 | 28.8110 | |
| 960 minute summer | SW1.12 | 1.011 | SW1.13 | 281.5 | 0.929 | 0.300 | 16.9211 | |
| 960 minute summer | SW6.1 | 6.000 | SW6.2 | 38.4 | 1.261 | 0.117 | 1.4502 | |
| 960 minute summer | SW7.1 | 7.000 | SW6.2 | 13.2 | 1.166 | 0.103 | 0.3372 | |
| 960 minute summer | SW6.2 | 6.001 | SW6.3 | 51.6 | 1.569 | 0.148 | 1.4377 | |
| 960 minute summer | SW6.3 | 6.002 | SW6.4 | 69.3 | 1.564 | 0.148 | 2.7464 | |
| 960 minute summer | SW6.4 | 6.003 | SW1.13 | 79.8 | 1.887 | 0.138 | 2.2337 | |

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**Results for 100 year +40% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute summer | SW1.13 | 495 | 3.191 | 0.394 | 361.3 | 1.5655 | 0.0000 | OK |
| 960 minute summer | OUT HARBOUR | 495 | 3.124 | 0.333 | 361.3 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 960 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 361.3 | 1.365 | 0.385 | 1.5856 | 5474.9 |

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**Results for 100 year +40% CC 960 minute winter. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | SW1.1 | 495 | 8.275 | 0.047 | 8.9 | 0.1336 | 0.0000 | OK |
| 960 minute winter | SW2.1 | 495 | 6.665 | 0.064 | 14.9 | 0.3903 | 0.0000 | OK |
| 960 minute winter | SW1.2 | 495 | 6.203 | 0.105 | 26.9 | 0.2616 | 0.0000 | OK |
| 960 minute winter | SW1.3 | 495 | 5.870 | 0.123 | 35.1 | 0.3310 | 0.0000 | OK |
| 960 minute winter | SW1.4 | 495 | 5.524 | 0.093 | 44.9 | 0.3818 | 0.0000 | OK |
| 960 minute winter | SW1.5 | 495 | 3.676 | 0.176 | 50.6 | 0.9112 | 0.0000 | OK |
| 960 minute winter | SW1.6 | 495 | 3.648 | 0.170 | 50.6 | 0.6773 | 0.0000 | OK |
| 960 minute winter | SW1.7 | 495 | 3.589 | 0.189 | 68.1 | 1.1700 | 0.0000 | OK |
| 960 minute winter | SW3.1 | 495 | 7.443 | 0.118 | 23.1 | 0.9310 | 0.0000 | OK |
| 960 minute winter | SW3.2 | 495 | 7.092 | 0.085 | 33.9 | 0.4393 | 0.0000 | OK |
| 960 minute winter | SW1.8 | 495 | 3.459 | 0.251 | 109.2 | 1.1814 | 0.0000 | OK |
| 960 minute winter | SW4.1 | 495 | 6.035 | 0.035 | 2.1 | 0.0676 | 0.0000 | OK |
| 960 minute winter | SW4.2 | 495 | 5.007 | 0.077 | 9.3 | 0.2289 | 0.0000 | OK |
| 960 minute winter | SW1.9 | 495 | 3.410 | 0.256 | 118.5 | 1.0178 | 0.0000 | OK |
| 960 minute winter | SW1.10 | 495 | 3.346 | 0.307 | 162.9 | 2.6108 | 0.0000 | OK |
| 960 minute winter | SW5.1 | 495 | 5.129 | 0.029 | 1.4 | 0.0450 | 0.0000 | OK |
| 960 minute winter | SW5.2 | 495 | 4.860 | 0.140 | 30.2 | 0.8807 | 0.0000 | OK |
| 960 minute winter | SW1.11 | 495 | 3.281 | 0.333 | 193.1 | 1.3226 | 0.0000 | OK |
| 960 minute winter | SW1.12 | 495 | 3.201 | 0.348 | 209.5 | 1.9903 | 0.0000 | OK |
| 960 minute winter | SW6.1 | 495 | 7.240 | 0.088 | 28.5 | 0.8763 | 0.0000 | OK |
| 960 minute winter | SW7.1 | 495 | 7.260 | 0.057 | 9.8 | 0.2473 | 0.0000 | OK |
| 960 minute winter | SW6.2 | 495 | 6.762 | 0.102 | 38.3 | 0.1466 | 0.0000 | OK |
| 960 minute winter | SW6.3 | 495 | 6.198 | 0.118 | 51.4 | 0.6512 | 0.0000 | OK |
| 960 minute winter | SW6.4 | 495 | 5.615 | 0.115 | 59.2 | 0.4194 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | SW1.1 | 1.000 | SW1.2 | 8.9 | 1.506 | 0.094 | 0.3388 | |
| 960 minute winter | SW2.1 | 2.000 | SW1.2 | 14.9 | 1.210 | 0.062 | 0.3678 | |
| 960 minute winter | SW1.2 | 1.001 | SW1.3 | 26.9 | 0.855 | 0.122 | 2.3779 | |
| 960 minute winter | SW1.3 | 1.002 | SW1.4 | 35.1 | 1.020 | 0.160 | 1.7853 | |
| 960 minute winter | SW1.4 | 1.003 | SW1.5 | 44.9 | 1.758 | 0.069 | 2.2053 | |
| 960 minute winter | SW1.5 | 1.004 | SW1.6 | 50.6 | 0.594 | 0.077 | 1.6700 | |
| 960 minute winter | SW1.6 | 1.005 | SW1.7 | 50.6 | 0.639 | 0.077 | 3.4408 | |
| 960 minute winter | SW1.7 | 1.006 | SW1.8 | 68.1 | 0.835 | 0.103 | 3.1074 | |
| 960 minute winter | SW3.1 | 3.000 | SW3.2 | 23.1 | 0.827 | 0.209 | 2.2025 | |
| 960 minute winter | SW3.2 | 3.001 | SW1.8 | 33.9 | 1.637 | 0.079 | 2.0063 | |
| 960 minute winter | SW1.8 | 1.007 | SW1.9 | 109.2 | 0.681 | 0.116 | 8.7115 | |
| 960 minute winter | SW4.1 | 4.000 | SW4.2 | 2.1 | 0.678 | 0.118 | 0.3082 | |
| 960 minute winter | SW4.2 | 4.001 | SW1.9 | 9.3 | 0.802 | 0.233 | 0.1682 | |
| 960 minute winter | SW1.9 | 1.008 | SW1.10 | 118.5 | 0.637 | 0.126 | 21.3762 | |
| 960 minute winter | SW1.10 | 1.009 | SW1.11 | 162.9 | 0.733 | 0.174 | 20.2789 | |
| 960 minute winter | SW5.1 | 5.000 | SW5.2 | 1.4 | 0.338 | 0.020 | 0.5408 | |
| 960 minute winter | SW5.2 | 5.001 | SW1.11 | 30.2 | 0.872 | 0.273 | 0.5523 | |
| 960 minute winter | SW1.11 | 1.010 | SW1.12 | 193.1 | 0.797 | 0.206 | 23.0229 | |
| 960 minute winter | SW1.12 | 1.011 | SW1.13 | 209.4 | 0.856 | 0.223 | 13.6613 | |
| 960 minute winter | SW6.1 | 6.000 | SW6.2 | 28.5 | 1.165 | 0.087 | 1.1649 | |
| 960 minute winter | SW7.1 | 7.000 | SW6.2 | 9.8 | 1.070 | 0.077 | 0.2726 | |
| 960 minute winter | SW6.2 | 6.001 | SW6.3 | 38.3 | 1.445 | 0.110 | 1.1584 | |
| 960 minute winter | SW6.3 | 6.002 | SW6.4 | 51.4 | 1.445 | 0.110 | 2.2061 | |
| 960 minute winter | SW6.4 | 6.003 | SW1.13 | 59.2 | 1.738 | 0.102 | 1.7991 | |

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**Results for 100 year +40% CC 960 minute winter. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | SW1.13 | 495 | 3.135 | 0.338 | 268.6 | 1.3427 | 0.0000 | OK |
| 960 minute winter | OUT HARBOUR | 495 | 3.077 | 0.286 | 268.6 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 268.6 | 1.254 | 0.287 | 1.2838 | 6143.2 |

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**Results for 100 year +40% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW1.1 | 750 | 8.274 | 0.046 | 8.8 | 0.1329 | 0.0000 | OK |
| 1440 minute summer | SW2.1 | 750 | 6.665 | 0.064 | 14.6 | 0.3863 | 0.0000 | OK |
| 1440 minute summer | SW1.2 | 750 | 6.202 | 0.104 | 26.4 | 0.2591 | 0.0000 | OK |
| 1440 minute summer | SW1.3 | 750 | 5.869 | 0.122 | 34.4 | 0.3275 | 0.0000 | OK |
| 1440 minute summer | SW1.4 | 750 | 5.523 | 0.092 | 44.0 | 0.3780 | 0.0000 | OK |
| 1440 minute summer | SW1.5 | 750 | 3.674 | 0.174 | 49.6 | 0.9019 | 0.0000 | OK |
| 1440 minute summer | SW1.6 | 750 | 3.647 | 0.169 | 49.6 | 0.6706 | 0.0000 | OK |
| 1440 minute summer | SW1.7 | 750 | 3.587 | 0.187 | 66.8 | 1.1592 | 0.0000 | OK |
| 1440 minute summer | SW3.1 | 750 | 7.442 | 0.117 | 22.7 | 0.9225 | 0.0000 | OK |
| 1440 minute summer | SW3.2 | 750 | 7.092 | 0.085 | 33.3 | 0.4354 | 0.0000 | OK |
| 1440 minute summer | SW1.8 | 750 | 3.457 | 0.249 | 107.2 | 1.1687 | 0.0000 | OK |
| 1440 minute summer | SW4.1 | 750 | 6.034 | 0.034 | 2.0 | 0.0659 | 0.0000 | OK |
| 1440 minute summer | SW4.2 | 750 | 5.006 | 0.076 | 9.0 | 0.2249 | 0.0000 | OK |
| 1440 minute summer | SW1.9 | 750 | 3.407 | 0.253 | 116.2 | 1.0055 | 0.0000 | OK |
| 1440 minute summer | SW1.10 | 750 | 3.343 | 0.304 | 159.7 | 2.5806 | 0.0000 | OK |
| 1440 minute summer | SW5.1 | 750 | 5.128 | 0.028 | 1.3 | 0.0435 | 0.0000 | OK |
| 1440 minute summer | SW5.2 | 750 | 4.858 | 0.138 | 29.5 | 0.8696 | 0.0000 | OK |
| 1440 minute summer | SW1.11 | 750 | 3.277 | 0.329 | 189.2 | 1.3077 | 0.0000 | OK |
| 1440 minute summer | SW1.12 | 750 | 3.197 | 0.344 | 205.3 | 1.9692 | 0.0000 | OK |
| 1440 minute summer | SW6.1 | 750 | 7.239 | 0.087 | 27.9 | 0.8669 | 0.0000 | OK |
| 1440 minute summer | SW7.1 | 750 | 7.259 | 0.056 | 9.6 | 0.2447 | 0.0000 | OK |
| 1440 minute summer | SW6.2 | 750 | 6.761 | 0.101 | 37.5 | 0.1451 | 0.0000 | OK |
| 1440 minute summer | SW6.3 | 750 | 6.197 | 0.117 | 50.3 | 0.6440 | 0.0000 | OK |
| 1440 minute summer | SW6.4 | 750 | 5.613 | 0.113 | 57.9 | 0.4146 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW1.1 | 1.000 | SW1.2 | 8.8 | 1.501 | 0.092 | 0.3361 | |
| 1440 minute summer | SW2.1 | 2.000 | SW1.2 | 14.6 | 1.203 | 0.061 | 0.3625 | |
| 1440 minute summer | SW1.2 | 1.001 | SW1.3 | 26.4 | 0.851 | 0.120 | 2.3445 | |
| 1440 minute summer | SW1.3 | 1.002 | SW1.4 | 34.4 | 1.014 | 0.156 | 1.7595 | |
| 1440 minute summer | SW1.4 | 1.003 | SW1.5 | 44.0 | 1.748 | 0.068 | 2.1736 | |
| 1440 minute summer | SW1.5 | 1.004 | SW1.6 | 49.6 | 0.591 | 0.075 | 1.6461 | |
| 1440 minute summer | SW1.6 | 1.005 | SW1.7 | 49.6 | 0.636 | 0.075 | 3.3896 | |
| 1440 minute summer | SW1.7 | 1.006 | SW1.8 | 66.8 | 0.830 | 0.101 | 3.0640 | |
| 1440 minute summer | SW3.1 | 3.000 | SW3.2 | 22.7 | 0.823 | 0.205 | 2.1744 | |
| 1440 minute summer | SW3.2 | 3.001 | SW1.8 | 33.3 | 1.628 | 0.078 | 1.9812 | |
| 1440 minute summer | SW1.8 | 1.007 | SW1.9 | 107.2 | 0.681 | 0.114 | 8.5714 | |
| 1440 minute summer | SW4.1 | 4.000 | SW4.2 | 2.0 | 0.669 | 0.113 | 0.2976 | |
| 1440 minute summer | SW4.2 | 4.001 | SW1.9 | 9.0 | 0.795 | 0.225 | 0.1642 | |
| 1440 minute summer | SW1.9 | 1.008 | SW1.10 | 116.2 | 0.635 | 0.124 | 21.0221 | |
| 1440 minute summer | SW1.10 | 1.009 | SW1.11 | 159.7 | 0.730 | 0.170 | 19.9561 | |
| 1440 minute summer | SW5.1 | 5.000 | SW5.2 | 1.3 | 0.334 | 0.018 | 0.5184 | |
| 1440 minute summer | SW5.2 | 5.001 | SW1.11 | 29.5 | 0.866 | 0.267 | 0.5430 | |
| 1440 minute summer | SW1.11 | 1.010 | SW1.12 | 189.2 | 0.794 | 0.202 | 22.6747 | |
| 1440 minute summer | SW1.12 | 1.011 | SW1.13 | 205.3 | 0.852 | 0.219 | 13.4664 | |
| 1440 minute summer | SW6.1 | 6.000 | SW6.2 | 27.9 | 1.158 | 0.085 | 1.1470 | |
| 1440 minute summer | SW7.1 | 7.000 | SW6.2 | 9.6 | 1.064 | 0.075 | 0.2687 | |
| 1440 minute summer | SW6.2 | 6.001 | SW6.3 | 37.5 | 1.437 | 0.108 | 1.1409 | |
| 1440 minute summer | SW6.3 | 6.002 | SW6.4 | 50.3 | 1.437 | 0.107 | 2.1712 | |
| 1440 minute summer | SW6.4 | 6.003 | SW1.13 | 57.9 | 1.727 | 0.100 | 1.7707 | |

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**Results for 100 year +40% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW1.13 | 750 | 3.131 | 0.334 | 263.2 | 1.3292 | 0.0000 | OK |
| 1440 minute summer | OUT HARBOUR | 750 | 3.074 | 0.283 | 263.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW1.13 | 1.012 | OUT HARBOUR | 263.2 | 1.246 | 0.281 | 1.2658 | 6071.0 |

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**Results for 100 year +40% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW1.1 | 750 | 8.268 | 0.040 | 6.6 | 0.1153 | 0.0000 | OK |
| 1440 minute winter | SW2.1 | 750 | 6.656 | 0.055 | 11.0 | 0.3354 | 0.0000 | OK |
| 1440 minute winter | SW1.2 | 750 | 6.188 | 0.090 | 19.9 | 0.2252 | 0.0000 | OK |
| 1440 minute winter | SW1.3 | 750 | 5.852 | 0.105 | 25.9 | 0.2828 | 0.0000 | OK |
| 1440 minute winter | SW1.4 | 750 | 5.511 | 0.080 | 33.1 | 0.3282 | 0.0000 | OK |
| 1440 minute winter | SW1.5 | 750 | 3.651 | 0.151 | 37.3 | 0.7798 | 0.0000 | OK |
| 1440 minute winter | SW1.6 | 750 | 3.624 | 0.146 | 37.3 | 0.5819 | 0.0000 | OK |
| 1440 minute winter | SW1.7 | 750 | 3.564 | 0.164 | 50.2 | 1.0150 | 0.0000 | OK |
| 1440 minute winter | SW3.1 | 750 | 7.426 | 0.101 | 17.1 | 0.7967 | 0.0000 | OK |
| 1440 minute winter | SW3.2 | 750 | 7.080 | 0.073 | 25.0 | 0.3780 | 0.0000 | OK |
| 1440 minute winter | SW1.8 | 750 | 3.420 | 0.212 | 80.5 | 0.9971 | 0.0000 | OK |
| 1440 minute winter | SW4.1 | 720 | 6.030 | 0.030 | 1.5 | 0.0571 | 0.0000 | OK |
| 1440 minute winter | SW4.2 | 750 | 4.995 | 0.065 | 6.8 | 0.1934 | 0.0000 | OK |
| 1440 minute winter | SW1.9 | 750 | 3.367 | 0.213 | 87.3 | 0.8465 | 0.0000 | OK |
| 1440 minute winter | SW1.10 | 750 | 3.297 | 0.258 | 120.1 | 2.1919 | 0.0000 | OK |
| 1440 minute winter | SW5.1 | 720 | 5.125 | 0.025 | 1.0 | 0.0385 | 0.0000 | OK |
| 1440 minute winter | SW5.2 | 750 | 4.838 | 0.118 | 22.2 | 0.7464 | 0.0000 | OK |
| 1440 minute winter | SW1.11 | 750 | 3.229 | 0.281 | 142.3 | 1.1157 | 0.0000 | OK |
| 1440 minute winter | SW1.12 | 750 | 3.149 | 0.296 | 154.4 | 1.6909 | 0.0000 | OK |
| 1440 minute winter | SW6.1 | 750 | 7.228 | 0.076 | 21.0 | 0.7544 | 0.0000 | OK |
| 1440 minute winter | SW7.1 | 750 | 7.252 | 0.049 | 7.2 | 0.2121 | 0.0000 | OK |
| 1440 minute winter | SW6.2 | 750 | 6.748 | 0.088 | 28.2 | 0.1254 | 0.0000 | OK |
| 1440 minute winter | SW6.3 | 750 | 6.182 | 0.102 | 37.9 | 0.5582 | 0.0000 | OK |
| 1440 minute winter | SW6.4 | 750 | 5.598 | 0.098 | 43.6 | 0.3591 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW1.1 | 1.000 | SW1.2 | 6.6 | 1.379 | 0.069 | 0.2743 | |
| 1440 minute winter | SW2.1 | 2.000 | SW1.2 | 11.0 | 1.109 | 0.046 | 0.2962 | |
| 1440 minute winter | SW1.2 | 1.001 | SW1.3 | 19.9 | 0.787 | 0.091 | 1.9112 | |
| 1440 minute winter | SW1.3 | 1.002 | SW1.4 | 25.9 | 0.937 | 0.118 | 1.4338 | |
| 1440 minute winter | SW1.4 | 1.003 | SW1.5 | 33.1 | 1.611 | 0.051 | 1.7746 | |
| 1440 minute winter | SW1.5 | 1.004 | SW1.6 | 37.3 | 0.547 | 0.057 | 1.3379 | |
| 1440 minute winter | SW1.6 | 1.005 | SW1.7 | 37.3 | 0.596 | 0.057 | 2.7266 | |
| 1440 minute winter | SW1.7 | 1.006 | SW1.8 | 50.2 | 0.762 | 0.076 | 2.5123 | |
| 1440 minute winter | SW3.1 | 3.000 | SW3.2 | 17.1 | 0.761 | 0.155 | 1.7714 | |
| 1440 minute winter | SW3.2 | 3.001 | SW1.8 | 25.0 | 1.498 | 0.058 | 1.6168 | |
| 1440 minute winter | SW1.8 | 1.007 | SW1.9 | 80.5 | 0.646 | 0.086 | 6.7717 | |
| 1440 minute winter | SW4.1 | 4.000 | SW4.2 | 1.5 | 0.615 | 0.084 | 0.2427 | |
| 1440 minute winter | SW4.2 | 4.001 | SW1.9 | 6.8 | 0.738 | 0.170 | 0.1337 | |
| 1440 minute winter | SW1.9 | 1.008 | SW1.10 | 87.3 | 0.605 | 0.093 | 16.5995 | |
| 1440 minute winter | SW1.10 | 1.009 | SW1.11 | 120.1 | 0.688 | 0.128 | 15.9300 | |
| 1440 minute winter | SW5.1 | 5.000 | SW5.2 | 1.0 | 0.334 | 0.014 | 0.3336 | |
| 1440 minute winter | SW5.2 | 5.001 | SW1.11 | 22.2 | 0.802 | 0.201 | 0.4415 | |
| 1440 minute winter | SW1.11 | 1.010 | SW1.12 | 142.3 | 0.741 | 0.152 | 18.2620 | |
| 1440 minute winter | SW1.12 | 1.011 | SW1.13 | 154.4 | 0.789 | 0.165 | 10.9331 | |
| 1440 minute winter | SW6.1 | 6.000 | SW6.2 | 21.0 | 1.070 | 0.064 | 0.9349 | |
| 1440 minute winter | SW7.1 | 7.000 | SW6.2 | 7.2 | 0.980 | 0.056 | 0.2189 | |
| 1440 minute winter | SW6.2 | 6.001 | SW6.3 | 28.2 | 1.325 | 0.081 | 0.9300 | |
| 1440 minute winter | SW6.3 | 6.002 | SW6.4 | 37.9 | 1.328 | 0.081 | 1.7687 | |
| 1440 minute winter | SW6.4 | 6.003 | SW1.13 | 43.6 | 1.593 | 0.075 | 1.4459 | |

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**Results for 100 year +40% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW1.13 | 750 | 3.086 | 0.289 | 198.0 | 1.1471 | 0.0000 | OK |
| 1440 minute winter | OUT HARBOUR | 750 | 3.035 | 0.244 | 198.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|---|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW1.13 | 1.012 | OUT HARBOUR | 198.0 | 1.153 | 0.211 | 1.0292 | 6817.9 |

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## Design Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Maximum Time of Concentration (mins) | 30.00 |
| Return Period (years) | 2 | Maximum Rainfall (mm/hr) | 75.0 |
| Additional Flow (%) | 0 | Minimum Velocity (m/s) | 1.00 |
| FSR Region | England and Wales | Connection Type | Level Soffits |
| M5-60 (mm) | 17.000 | Minimum Backdrop Height (m) | 0.200 |
| Ratio-R | 0.300 | Preferred Cover Depth (m) | 1.200 |
| CV | 0.750 | Include Intermediate Ground | ✓ |
| Time of Entry (mins) | 4.00 | Enforce best practice design rules | x |

## Nodes

| Name | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|---|---|---|---|---|---|---|---|
| SW8.1 | 0.190 | 4.00 | 13.406 | 1200 | 282615.306 | 177091.501 | 1.481 |
| SW8.2 | 0.030 | 4.00 | 11.470 | 1350 | 282608.656 | 177124.076 | 1.566 |
| SW9.1 | 0.346 | 4.00 | 12.033 | 1200 | 282728.687 | 177106.908 | 1.500 |
| SW8.3 | 0.118 | 4.00 | 10.631 | 1350 | 282724.670 | 177138.370 | 1.659 |
| SW10.1 | 0.422 | 4.00 | 11.354 | 1200 | 282793.364 | 177114.671 | 1.893 |
| SW8.4 | 0.060 | 4.00 | 10.340 | 1350 | 282789.125 | 177146.851 | 1.823 |
| SW11.1 | 0.510 | 4.00 | 10.000 | 1350 | 282905.083 | 177162.208 | 1.623 |
| SW8.5 | 0.131 | 4.00 | 10.074 | 1500 | 282847.285 | 177154.504 | 2.177 |
| SW8.6 OUT | | | 10.430 | 1500 | 282845.676 | 177165.708 | 3.344 |
| SW12.1 | 0.413 | 4.00 | 12.783 | 1200 | 282732.163 | 177177.556 | 1.425 |
| SW12.2 | 0.668 | 4.00 | 10.227 | 1500 | 282729.142 | 177205.437 | 2.484 |
| SW12.3 | 0.500 | 4.00 | 9.256 | 1800 | 282808.667 | 177215.401 | 1.977 |
| SW12.4 OUT | | | 10.229 | 1800 | 282827.387 | 177202.902 | 3.143 |
| SW13.2 | 0.469 | 4.00 | 9.237 | 1500 | 282864.473 | 177224.377 | 1.937 |
| SW13.1 | 0.106 | 4.00 | 10.000 | 1200 | 282931.168 | 177233.007 | 1.925 |
| SW13.3 OUT | | | 10.882 | 1500 | 282850.841 | 177204.429 | 3.796 |
| INF BASIN 1 | | | 9.000 | | 282841.213 | 177194.236 | 2.000 |

## Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.000 | SW8.1 | SW8.2 | 33.247 | 0.600 | 11.925 | 10.129 | 1.796 | 18.5 | 225 | 4.18 | 55.0 |
| 8.001 | SW8.2 | SW8.3 | 116.891 | 0.600 | 9.904 | 8.972 | 0.932 | 125.4 | 450 | 5.26 | 50.5 |
| 9.000 | SW9.1 | SW8.3 | 31.717 | 0.600 | 10.533 | 9.122 | 1.411 | 22.5 | 300 | 4.16 | 55.1 |
| 8.002 | SW8.3 | SW8.4 | 65.011 | 0.600 | 8.972 | 8.517 | 0.455 | 142.9 | 450 | 5.89 | 48.3 |
| 10.000 | SW10.1 | SW8.4 | 32.458 | 0.600 | 9.461 | 8.667 | 0.794 | 40.9 | 300 | 4.22 | 54.8 |
| 8.003 | SW8.4 | SW8.5 | 58.661 | 0.600 | 8.517 | 8.122 | 0.395 | 148.5 | 450 | 6.48 | 46.4 |
| 11.000 | SW11.1 | SW8.5 | 58.309 | 0.600 | 8.377 | 8.197 | 0.180 | 323.9 | 375 | 4.97 | 51.6 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 8.000 | 3.055 | 121.5 | 28.3 | 1.256 | 1.116 | 0.190 | 0.0 | 73 | 2.499 |
| 8.001 | 1.814 | 288.5 | 30.0 | 1.116 | 1.209 | 0.219 | 0.0 | 97 | 1.190 |
| 9.000 | 3.330 | 235.4 | 51.6 | 1.200 | 1.209 | 0.346 | 0.0 | 95 | 2.690 |
| 8.002 | 1.698 | 270.1 | 89.4 | 1.209 | 1.373 | 0.683 | 0.0 | 178 | 1.532 |
| 10.000 | 2.466 | 174.3 | 62.7 | 1.593 | 1.373 | 0.422 | 0.0 | 124 | 2.269 |
| 8.003 | 1.666 | 264.9 | 146.6 | 1.373 | 1.502 | 1.166 | 0.0 | 240 | 1.707 |
| 11.000 | 1.001 | 110.6 | 71.3 | 1.248 | 1.502 | 0.510 | 0.0 | 219 | 1.061 |

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## Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.004 | SW8.5 | SW8.6 OUT | 11.319 | 0.600 | 7.897 | 7.877 | 0.020 | 573.0 | 675 | 6.65 | 45.9 |
| 12.000 | SW12.1 | SW12.2 | 28.044 | 0.600 | 11.358 | 8.802 | 2.556 | 11.0 | 225 | 4.12 | 55.3 |
| 12.001 | SW12.2 | SW12.3 | 80.147 | 0.600 | 7.743 | 7.504 | 0.239 | 335.2 | 525 | 5.21 | 50.7 |
| 12.002 | SW12.3 | SW12.4 OUT | 22.509 | 0.600 | 7.279 | 7.249 | 0.030 | 750.3 | 750 | 5.58 | 49.3 |
| 13.000 | SW13.1 | SW13.2 | 67.251 | 0.600 | 8.075 | 7.675 | 0.400 | 168.0 | 225 | 5.11 | 51.0 |
| 13.001 | SW13.2 | SW13.3 OUT | 24.161 | 0.600 | 7.300 | 7.258 | 0.042 | 575.3 | 600 | 5.51 | 49.6 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 8.004 | 1.087 | 389.1 | 224.7 | 1.502 | 1.878 | 1.807 | 0.0 | 369 | 1.125 |
| 12.000 | 3.972 | 157.9 | 61.8 | 1.200 | 1.200 | 0.413 | 0.0 | 98 | 3.743 |
| 12.001 | 1.218 | 263.6 | 148.4 | 1.959 | 1.227 | 1.081 | 0.0 | 282 | 1.252 |
| 12.002 | 1.014 | 447.8 | 211.3 | 1.227 | 2.230 | 1.580 | 0.0 | 362 | 0.999 |
| 13.000 | 1.006 | 40.0 | 14.7 | 1.700 | 1.337 | 0.106 | 0.0 | 94 | 0.931 |
| 13.001 | 1.008 | 285.0 | 77.2 | 1.337 | 3.024 | 0.575 | 0.0 | 212 | 0.862 |

## Pipeline Schedule

| Link | Length (m) | Slope (1:X) | Dia (mm) | Link Type | US CL (m) | US IL (m) | US Depth (m) | DS CL (m) | DS IL (m) | DS Depth (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 8.000 | 33.247 | 18.5 | 225 | Circular | 13.406 | 11.925 | 1.256 | 11.470 | 10.129 | 1.116 |
| 8.001 | 116.891 | 125.4 | 450 | Circular | 11.470 | 9.904 | 1.116 | 10.631 | 8.972 | 1.209 |
| 9.000 | 31.717 | 22.5 | 300 | Circular | 12.033 | 10.533 | 1.200 | 10.631 | 9.122 | 1.209 |
| 8.002 | 65.011 | 142.9 | 450 | Circular | 10.631 | 8.972 | 1.209 | 10.340 | 8.517 | 1.373 |
| 10.000 | 32.458 | 40.9 | 300 | Circular | 11.354 | 9.461 | 1.593 | 10.340 | 8.667 | 1.373 |
| 8.003 | 58.661 | 148.5 | 450 | Circular | 10.340 | 8.517 | 1.373 | 10.074 | 8.122 | 1.502 |
| 11.000 | 58.309 | 323.9 | 375 | Circular | 10.000 | 8.377 | 1.248 | 10.074 | 8.197 | 1.502 |
| 8.004 | 11.319 | 573.0 | 675 | Circular | 10.074 | 7.897 | 1.502 | 10.430 | 7.877 | 1.878 |
| 12.000 | 28.044 | 11.0 | 225 | Circular | 12.783 | 11.358 | 1.200 | 10.227 | 8.802 | 1.200 |
| 12.001 | 80.147 | 335.2 | 525 | Circular | 10.227 | 7.743 | 1.959 | 9.256 | 7.504 | 1.227 |
| 12.002 | 22.509 | 750.3 | 750 | Circular | 9.256 | 7.279 | 1.227 | 10.229 | 7.249 | 2.230 |
| 13.000 | 67.251 | 168.0 | 225 | Circular | 10.000 | 8.075 | 1.700 | 9.237 | 7.675 | 1.337 |
| 13.001 | 24.161 | 575.3 | 600 | Circular | 9.237 | 7.300 | 1.337 | 10.882 | 7.258 | 3.024 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 8.000 | SW8.1 | 1200 | Manhole | Adoptable | SW8.2 | 1350 | Manhole | Adoptable |
| 8.001 | SW8.2 | 1350 | Manhole | Adoptable | SW8.3 | 1350 | Manhole | Adoptable |
| 9.000 | SW9.1 | 1200 | Manhole | Adoptable | SW8.3 | 1350 | Manhole | Adoptable |
| 8.002 | SW8.3 | 1350 | Manhole | Adoptable | SW8.4 | 1350 | Manhole | Adoptable |
| 10.000 | SW10.1 | 1200 | Manhole | Adoptable | SW8.4 | 1350 | Manhole | Adoptable |
| 8.003 | SW8.4 | 1350 | Manhole | Adoptable | SW8.5 | 1500 | Manhole | Adoptable |
| 11.000 | SW11.1 | 1350 | Manhole | Adoptable | SW8.5 | 1500 | Manhole | Adoptable |
| 8.004 | SW8.5 | 1500 | Manhole | Adoptable | SW8.6 OUT | 1500 | Manhole | Adoptable |
| 12.000 | SW12.1 | 1200 | Manhole | Adoptable | SW12.2 | 1500 | Manhole | Adoptable |
| 12.001 | SW12.2 | 1500 | Manhole | Adoptable | SW12.3 | 1800 | Manhole | Adoptable |
| 12.002 | SW12.3 | 1800 | Manhole | Adoptable | SW12.4 OUT | 1800 | Manhole | Adoptable |
| 13.000 | SW13.1 | 1200 | Manhole | Adoptable | SW13.2 | 1500 | Manhole | Adoptable |
| 13.001 | SW13.2 | 1500 | Manhole | Adoptable | SW13.3 OUT | 1500 | Manhole | Adoptable |

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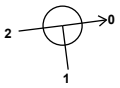
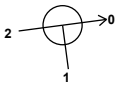
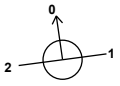
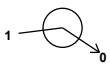
## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| SW8.1 | 282615.306 | 177091.501 | 13.406 | 1.481 | 1200 | | 0 | 8.000 | 11.925 | 225 |
| SW8.2 | 282608.656 | 177124.076 | 11.470 | 1.566 | 1350 | | 1 | 8.000 | 10.129 | 225 |
| | | | | | | | 0 | 8.001 | 9.904 | 450 |
| SW9.1 | 282728.687 | 177106.908 | 12.033 | 1.500 | 1200 | | 0 | 9.000 | 10.533 | 300 |
| SW8.3 | 282724.670 | 177138.370 | 10.631 | 1.659 | 1350 | | 1 | 9.000 | 9.122 | 300 |
| | | | | | |  | 2 | 8.001 | 8.972 | 450 |
| | | | | | | | 0 | 8.002 | 8.972 | 450 |
| SW10.1 | 282793.364 | 177114.671 | 11.354 | 1.893 | 1200 | | 0 | 10.000 | 9.461 | 300 |
| SW8.4 | 282789.125 | 177146.851 | 10.340 | 1.823 | 1350 | | 1 | 10.000 | 8.667 | 300 |
| | | | | | |  | 2 | 8.002 | 8.517 | 450 |
| | | | | | | | 0 | 8.003 | 8.517 | 450 |
| SW11.1 | 282905.083 | 177162.208 | 10.000 | 1.623 | 1350 | | 0 | 11.000 | 8.377 | 375 |
| SW8.5 | 282847.285 | 177154.504 | 10.074 | 2.177 | 1500 | | 1 | 11.000 | 8.197 | 375 |
| | | | | | |  | 2 | 8.003 | 8.122 | 450 |
| | | | | | | | 0 | 8.004 | 7.897 | 675 |
| SW8.6 OUT | 282845.676 | 177165.708 | 10.430 | 3.344 | 1500 | | 1 | 8.004 | 7.877 | 675 |
| | | | | | | | | | | |
| SW12.1 | 282732.163 | 177177.556 | 12.783 | 1.425 | 1200 | | 0 | 12.000 | 11.358 | 225 |
| SW12.2 | 282729.142 | 177205.437 | 10.227 | 2.484 | 1500 | | 1 | 12.000 | 8.802 | 225 |
| | | | | | | | 0 | 12.001 | 7.743 | 525 |
| SW12.3 | 282808.667 | 177215.401 | 9.256 | 1.977 | 1800 | | 1 | 12.001 | 7.504 | 525 |
| | | | | | |  | 0 | 12.002 | 7.279 | 750 |
| SW12.4 OUT | 282827.387 | 177202.902 | 10.229 | 3.143 | 1800 | | 1 | 12.002 | 7.249 | 750 |
| | | | | | | | | | | |

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## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| SW13.2 | 282864.473 | 177224.377 | 9.237 | 1.937 | 1500 | 1 | 13.000 | 7.675 | 225 |
| | | | | | | 0 | 13.001 | 7.300 | 600 |
| SW13.1 | 282931.168 | 177233.007 | 10.000 | 1.925 | 1200 | 0 | 13.000 | 8.075 | 225 |
| SW13.3 OUT | 282850.841 | 177204.429 | 10.882 | 3.796 | 1500 | 1 | 13.001 | 7.258 | 600 |
| INF BASIN 1 | 282841.213 | 177194.236 | 9.000 | 2.000 | | | | | |

## Simulation Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Analysis Speed | Normal |
| FSR Region | England and Wales | Skip Steady State | x |
| M5-60 (mm) | 17.000 | Drain Down Time (mins) | 240 |
| Ratio-R | 0.300 | Additional Storage (m³/ha) | 20.0 |
| Summer CV | 0.750 | Check Discharge Rate(s) | x |
| Winter CV | 0.840 | Check Discharge Volume | x |

**Storm Durations**

| 15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440 |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|---|---|---|---|
| 100 | 40 | 0 | 0 |

## Node INF BASIN 1 Flow through Pond Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.35600 | Porosity | 1.00 | Main Channel Length (m) | 43.000 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m) | 7.000 | Main Channel Slope (1:X) | 500.0 |
| Safety Factor | 10.0 | Time to half empty (mins) | | Main Channel n | 0.350 |

**Inlets**

| SW8.6 OUT | SW12.4 OUT | SW13.3 OUT |
|---|---|---|

| Depth (m) | Area (m²) | Inf Area (m²) | Depth (m) | Area (m²) | Inf Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 1279.1 | 1279.1 | 2.000 | 2337.0 | 1279.1 |

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## Rainfall

| Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) | Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) |
|---|---|---|---|---|---|
| 100 year +40% CC 15 minute summer | 368.854 | 104.373 | 100 year +40% CC 360 minute summer | 55.175 | 14.198 |
| 100 year +40% CC 15 minute winter | 258.845 | 104.373 | 100 year +40% CC 360 minute winter | 35.865 | 14.198 |
| 100 year +40% CC 30 minute summer | 255.101 | 72.185 | 100 year +40% CC 480 minute summer | 43.619 | 11.527 |
| 100 year +40% CC 30 minute winter | 179.018 | 72.185 | 100 year +40% CC 480 minute winter | 28.979 | 11.527 |
| 100 year +40% CC 60 minute summer | 180.954 | 47.821 | 100 year +40% CC 600 minute summer | 35.816 | 9.797 |
| 100 year +40% CC 60 minute winter | 120.222 | 47.821 | 100 year +40% CC 600 minute winter | 24.472 | 9.797 |
| 100 year +40% CC 120 minute summer | 116.088 | 30.679 | 100 year +40% CC 720 minute summer | 31.983 | 8.572 |
| 100 year +40% CC 120 minute winter | 77.126 | 30.679 | 100 year +40% CC 720 minute winter | 21.495 | 8.572 |
| 100 year +40% CC 180 minute summer | 90.626 | 23.321 | 100 year +40% CC 960 minute summer | 26.337 | 6.935 |
| 100 year +40% CC 180 minute winter | 58.909 | 23.321 | 100 year +40% CC 960 minute winter | 17.446 | 6.935 |
| 100 year +40% CC 240 minute summer | 72.104 | 19.055 | 100 year +40% CC 1440 minute summer | 19.151 | 5.133 |
| 100 year +40% CC 240 minute winter | 47.904 | 19.055 | 100 year +40% CC 1440 minute winter | 12.870 | 5.133 |

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**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.81%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW8.1 | 10 | 12.085 | 0.160 | 95.2 | 0.5908 | 0.0000 | OK |
| 15 minute winter | SW8.2 | 12 | 10.526 | 0.622 | 110.2 | 1.1256 | 0.0000 | SURCHARGED |
| 15 minute winter | SW9.1 | 11 | 10.949 | 0.416 | 173.6 | 2.3909 | 0.0000 | SURCHARGED |
| 15 minute winter | SW8.3 | 12 | 10.432 | 1.460 | 323.0 | 4.1691 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW10.1 | 11 | 10.964 | 1.503 | 212.1 | 8.4055 | 0.0000 | SURCHARGED |
| 15 minute winter | SW8.4 | 12 | 9.951 | 1.434 | 430.7 | 3.0035 | 0.0000 | SURCHARGED |
| 15 minute winter | SW11.1 | 11 | 9.606 | 1.229 | 256.1 | 9.4802 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW8.5 | 1440 | 8.777 | 0.880 | 54.2 | 2.6127 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW8.6 OUT | 1410 | 8.802 | 1.716 | 60.5 | 3.0319 | 0.0000 | OK |
| 15 minute winter | SW12.1 | 11 | 12.655 | 1.297 | 207.2 | 8.9842 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW12.2 | 11 | 9.366 | 1.623 | 491.2 | 11.5909 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW12.3 | 1380 | 8.764 | 1.486 | 46.2 | 11.2914 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW12.4 OUT | 1380 | 8.763 | 1.677 | 49.1 | 4.2675 | 0.0000 | OK |
| 1440 minute winter | SW13.2 | 1410 | 8.767 | 1.467 | 17.3 | 9.6951 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW13.1 | 1410 | 8.768 | 0.693 | 3.2 | 1.5464 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW13.3 OUT | 1320 | 8.757 | 1.671 | 33.2 | 2.9527 | 0.0000 | OK |
| 1440 minute winter | INF BASIN 1 | 1410 | 8.761 | 1.761 | 160.3 | 0.0000 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute winter | SW8.1 | 8.000 | SW8.2 | 95.3 | 3.281 | 0.785 | 0.9894 |
| 15 minute winter | SW8.2 | 8.001 | SW8.3 | 122.9 | 0.933 | 0.426 | 18.5206 |
| 15 minute winter | SW9.1 | 9.000 | SW8.3 | 164.7 | 3.323 | 0.700 | 2.2335 |
| 15 minute winter | SW8.3 | 8.002 | SW8.4 | 252.7 | 1.595 | 0.936 | 10.3006 |
| 15 minute winter | SW10.1 | 10.000 | SW8.4 | 177.6 | 2.522 | 1.019 | 2.2857 |
| 15 minute winter | SW8.4 | 8.003 | SW8.5 | 430.2 | 2.715 | 1.624 | 9.2945 |
| 15 minute winter | SW11.1 | 11.000 | SW8.5 | 229.9 | 2.085 | 2.079 | 6.4313 |
| 1440 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 54.1 | 0.878 | 0.139 | 4.0406 |
| 1440 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 160.3 | 0.016 | 0.005 | 2978.3779 |
| 15 minute winter | SW12.1 | 12.000 | SW12.2 | 167.0 | 4.462 | 1.058 | 1.1153 |
| 15 minute winter | SW12.2 | 12.001 | SW12.3 | 462.3 | 2.140 | 1.754 | 17.3144 |
| 1440 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 45.6 | 0.633 | 0.102 | 9.9067 |
| 1440 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 160.3 | 0.016 | 0.005 | 2978.3779 |
| 1440 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 18.8 | 0.478 | 0.066 | 6.8056 |
| 1440 minute winter | SW13.1 | 13.000 | SW13.2 | 3.2 | 0.577 | 0.080 | 2.6746 |
| 1440 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 160.3 | 0.016 | 0.005 | 2978.3779 |
| 1440 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 98.81%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | SW8.1 | 10 | 12.085 | 0.160 | 95.2 | 0.5908 | 0.0000 | OK |
| 15 minute summer | SW8.2 | 12 | 10.304 | 0.400 | 110.2 | 0.7238 | 0.0000 | OK |
| 15 minute summer | SW9.1 | 11 | 10.825 | 0.292 | 173.6 | 1.6777 | 0.0000 | OK |
| 15 minute summer | SW8.3 | 11 | 10.255 | 1.283 | 329.6 | 3.6616 | 0.0000 | SURCHARGED |
| 15 minute summer | SW10.1 | 11 | 10.852 | 1.391 | 212.0 | 7.7816 | 0.0000 | SURCHARGED |
| 15 minute summer | SW8.4 | 11 | 9.890 | 1.373 | 420.9 | 2.8747 | 0.0000 | SURCHARGED |
| 15 minute summer | SW11.1 | 11 | 9.537 | 1.160 | 255.9 | 8.9475 | 0.0000 | SURCHARGED |
| 15 minute summer | SW8.5 | 11 | 8.698 | 0.801 | 698.8 | 2.3799 | 0.0000 | SURCHARGED |
| 15 minute summer | SW8.6 OUT | 11 | 8.541 | 1.455 | 697.4 | 2.5717 | 0.0000 | OK |
| 15 minute summer | SW12.1 | 11 | 12.560 | 1.202 | 207.2 | 8.3241 | 0.0000 | FLOOD RISK |
| 15 minute summer | SW12.2 | 11 | 9.288 | 1.545 | 491.0 | 11.0341 | 0.0000 | SURCHARGED |
| 15 minute summer | SW12.3 | 11 | 8.477 | 1.198 | 706.7 | 9.1056 | 0.0000 | SURCHARGED |
| 15 minute summer | SW12.4 OUT | 11 | 8.357 | 1.271 | 677.5 | 3.2359 | 0.0000 | OK |
| 15 minute summer | SW13.2 | 11 | 7.775 | 0.475 | 280.7 | 3.1366 | 0.0000 | OK |
| 15 minute summer | SW13.1 | 11 | 8.390 | 0.315 | 53.3 | 0.7029 | 0.0000 | SURCHARGED |
| 15 minute summer | SW13.3 OUT | 11 | 7.720 | 0.634 | 269.1 | 1.1199 | 0.0000 | OK |
| 15 minute summer | INF BASIN 1 | 23 | 7.562 | 0.562 | 1308.6 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute summer | SW8.1 | 8.000 | SW8.2 | 95.3 | 3.281 | 0.785 | 0.9654 |
| 15 minute summer | SW8.2 | 8.001 | SW8.3 | 123.8 | 0.897 | 0.429 | 17.9637 |
| 15 minute summer | SW9.1 | 9.000 | SW8.3 | 174.2 | 3.264 | 0.740 | 2.2253 |
| 15 minute summer | SW8.3 | 8.002 | SW8.4 | 249.6 | 1.576 | 0.924 | 10.3006 |
| 15 minute summer | SW10.1 | 10.000 | SW8.4 | 171.7 | 2.487 | 0.985 | 2.2857 |
| 15 minute summer | SW8.4 | 8.003 | SW8.5 | 420.6 | 2.655 | 1.588 | 9.2945 |
| 15 minute summer | SW11.1 | 11.000 | SW8.5 | 227.3 | 2.061 | 2.056 | 6.4313 |
| 15 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 697.4 | 1.991 | 1.792 | 4.0334 |
| 15 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 1308.6 | 0.115 | 0.039 | 735.9121 |
| 15 minute summer | SW12.1 | 12.000 | SW12.2 | 166.1 | 4.202 | 1.052 | 1.1153 |
| 15 minute summer | SW12.2 | 12.001 | SW12.3 | 456.6 | 2.114 | 1.732 | 17.3144 |
| 15 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 677.5 | 1.540 | 1.513 | 9.9067 |
| 15 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 1308.6 | 0.115 | 0.039 | 735.9121 |
| 15 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 269.1 | 1.403 | 0.944 | 5.6995 |
| 15 minute summer | SW13.1 | 13.000 | SW13.2 | 47.0 | 1.202 | 1.174 | 2.4878 |
| 15 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 1308.6 | 0.115 | 0.039 | 735.9121 |
| 15 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 98.91%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW8.1 | 10 | 12.085 | 0.160 | 95.2 | 0.5908 | 0.0000 | OK |
| 15 minute winter | SW8.2 | 12 | 10.526 | 0.622 | 110.2 | 1.1256 | 0.0000 | SURCHARGED |
| 15 minute winter | SW9.1 | 11 | 10.949 | 0.416 | 173.6 | 2.3909 | 0.0000 | SURCHARGED |
| 15 minute winter | SW8.3 | 12 | 10.432 | 1.460 | 323.0 | 4.1691 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW10.1 | 11 | 10.964 | 1.503 | 212.1 | 8.4055 | 0.0000 | SURCHARGED |
| 15 minute winter | SW8.4 | 12 | 9.951 | 1.434 | 430.7 | 3.0035 | 0.0000 | SURCHARGED |
| 15 minute winter | SW11.1 | 11 | 9.606 | 1.229 | 256.1 | 9.4802 | 0.0000 | SURCHARGED |
| 15 minute winter | SW8.5 | 11 | 8.741 | 0.844 | 703.8 | 2.5053 | 0.0000 | SURCHARGED |
| 15 minute winter | SW8.6 OUT | 11 | 8.581 | 1.495 | 703.0 | 2.6417 | 0.0000 | OK |
| 15 minute winter | SW12.1 | 11 | 12.655 | 1.297 | 207.2 | 8.9842 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW12.2 | 11 | 9.366 | 1.623 | 491.2 | 11.5909 | 0.0000 | SURCHARGED |
| 15 minute winter | SW12.3 | 11 | 8.531 | 1.252 | 710.7 | 9.5145 | 0.0000 | SURCHARGED |
| 15 minute winter | SW12.4 OUT | 11 | 8.406 | 1.320 | 686.0 | 3.3602 | 0.0000 | OK |
| 15 minute winter | SW13.2 | 11 | 7.802 | 0.502 | 281.4 | 3.3160 | 0.0000 | OK |
| 15 minute winter | SW13.1 | 11 | 8.407 | 0.332 | 53.3 | 0.7404 | 0.0000 | SURCHARGED |
| 15 minute winter | SW13.3 OUT | 11 | 7.751 | 0.665 | 270.3 | 1.1747 | 0.0000 | OK |
| 15 minute winter | INF BASIN 1 | 23 | 7.619 | 0.619 | 1370.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute winter | SW8.1 | 8.000 | SW8.2 | 95.3 | 3.281 | 0.785 | 0.9894 |
| 15 minute winter | SW8.2 | 8.001 | SW8.3 | 122.9 | 0.933 | 0.426 | 18.5206 |
| 15 minute winter | SW9.1 | 9.000 | SW8.3 | 164.7 | 3.323 | 0.700 | 2.2335 |
| 15 minute winter | SW8.3 | 8.002 | SW8.4 | 252.7 | 1.595 | 0.936 | 10.3006 |
| 15 minute winter | SW10.1 | 10.000 | SW8.4 | 177.6 | 2.522 | 1.019 | 2.2857 |
| 15 minute winter | SW8.4 | 8.003 | SW8.5 | 430.2 | 2.715 | 1.624 | 9.2945 |
| 15 minute winter | SW11.1 | 11.000 | SW8.5 | 229.9 | 2.085 | 2.079 | 6.4313 |
| 15 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 703.0 | 1.970 | 1.807 | 4.0406 |
| 15 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 1370.2 | 0.115 | 0.041 | 825.0261 |
| 15 minute winter | SW12.1 | 12.000 | SW12.2 | 167.0 | 4.462 | 1.058 | 1.1153 |
| 15 minute winter | SW12.2 | 12.001 | SW12.3 | 462.3 | 2.140 | 1.754 | 17.3144 |
| 15 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 686.0 | 1.559 | 1.532 | 9.9067 |
| 15 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 1370.2 | 0.115 | 0.041 | 825.0261 |
| 15 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 270.3 | 1.366 | 0.949 | 6.0327 |
| 15 minute winter | SW13.1 | 13.000 | SW13.2 | 47.6 | 1.217 | 1.191 | 2.4944 |
| 15 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 1370.2 | 0.115 | 0.041 | 825.0261 |
| 15 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.42%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute summer | SW8.1 | 17 | 12.074 | 0.149 | 87.9 | 0.5512 | 0.0000 | OK |
| 30 minute summer | SW8.2 | 20 | 10.207 | 0.303 | 100.5 | 0.5484 | 0.0000 | OK |
| 30 minute summer | SW9.1 | 18 | 10.760 | 0.227 | 160.3 | 1.3031 | 0.0000 | OK |
| 30 minute summer | SW8.3 | 19 | 10.170 | 1.198 | 304.3 | 3.4201 | 0.0000 | SURCHARGED |
| 30 minute summer | SW10.1 | 19 | 10.637 | 1.176 | 195.7 | 6.5764 | 0.0000 | SURCHARGED |
| 30 minute summer | SW8.4 | 19 | 9.790 | 1.273 | 410.8 | 2.6657 | 0.0000 | SURCHARGED |
| 30 minute summer | SW11.1 | 18 | 9.400 | 1.023 | 236.2 | 7.8948 | 0.0000 | SURCHARGED |
| 30 minute summer | SW8.5 | 19 | 8.644 | 0.747 | 673.4 | 2.2180 | 0.0000 | SURCHARGED |
| 30 minute summer | SW8.6 OUT | 19 | 8.487 | 1.401 | 668.6 | 2.4752 | 0.0000 | OK |
| 30 minute summer | SW12.1 | 19 | 12.250 | 0.892 | 191.3 | 6.1742 | 0.0000 | SURCHARGED |
| 30 minute summer | SW12.2 | 18 | 9.183 | 1.440 | 460.2 | 10.2836 | 0.0000 | SURCHARGED |
| 30 minute summer | SW12.3 | 18 | 8.417 | 1.138 | 657.3 | 8.6504 | 0.0000 | SURCHARGED |
| 30 minute summer | SW12.4 OUT | 18 | 8.300 | 1.214 | 649.7 | 3.0905 | 0.0000 | OK |
| 30 minute summer | SW13.2 | 18 | 7.780 | 0.480 | 259.5 | 3.1696 | 0.0000 | OK |
| 30 minute summer | SW13.1 | 18 | 8.334 | 0.259 | 49.2 | 0.5784 | 0.0000 | SURCHARGED |
| 30 minute summer | SW13.3 OUT | 39 | 7.741 | 0.655 | 246.9 | 1.1572 | 0.0000 | OK |
| 30 minute summer | INF BASIN 1 | 38 | 7.737 | 0.737 | 1262.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 30 minute summer | SW8.1 | 8.000 | SW8.2 | 86.8 | 3.224 | 0.714 | 0.8949 |
| 30 minute summer | SW8.2 | 8.001 | SW8.3 | 106.6 | 0.884 | 0.369 | 15.8992 |
| 30 minute summer | SW9.1 | 9.000 | SW8.3 | 152.6 | 3.189 | 0.648 | 2.0234 |
| 30 minute summer | SW8.3 | 8.002 | SW8.4 | 248.1 | 1.566 | 0.918 | 10.3006 |
| 30 minute summer | SW10.1 | 10.000 | SW8.4 | 162.3 | 2.433 | 0.931 | 2.2857 |
| 30 minute summer | SW8.4 | 8.003 | SW8.5 | 413.4 | 2.609 | 1.560 | 9.2945 |
| 30 minute summer | SW11.1 | 11.000 | SW8.5 | 214.1 | 1.941 | 1.936 | 6.4313 |
| 30 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 668.6 | 1.897 | 1.718 | 3.9408 |
| 30 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 1262.5 | 0.102 | 0.038 | 1015.7624 |
| 30 minute summer | SW12.1 | 12.000 | SW12.2 | 159.5 | 4.261 | 1.010 | 1.1153 |
| 30 minute summer | SW12.2 | 12.001 | SW12.3 | 439.0 | 2.033 | 1.666 | 17.3144 |
| 30 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 649.7 | 1.476 | 1.451 | 9.9067 |
| 30 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 1262.5 | 0.102 | 0.038 | 1015.7624 |
| 30 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 246.9 | 1.243 | 0.866 | 5.7356 |
| 30 minute summer | SW13.1 | 13.000 | SW13.2 | 44.3 | 1.190 | 1.108 | 2.4581 |
| 30 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 1262.5 | 0.102 | 0.038 | 1015.7624 |
| 30 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 99.67%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | SW8.1 | 17 | 12.060 | 0.135 | 76.0 | 0.4991 | 0.0000 | OK |
| 30 minute winter | SW8.2 | 18 | 10.070 | 0.166 | 87.4 | 0.3001 | 0.0000 | OK |
| 30 minute winter | SW9.1 | 19 | 10.717 | 0.184 | 138.5 | 1.0582 | 0.0000 | OK |
| 30 minute winter | SW8.3 | 19 | 10.026 | 1.054 | 267.9 | 3.0094 | 0.0000 | SURCHARGED |
| 30 minute winter | SW10.1 | 19 | 10.355 | 0.894 | 169.2 | 4.9992 | 0.0000 | SURCHARGED |
| 30 minute winter | SW8.4 | 19 | 9.629 | 1.112 | 402.2 | 2.3280 | 0.0000 | SURCHARGED |
| 30 minute winter | SW11.1 | 18 | 9.180 | 0.803 | 204.3 | 6.1996 | 0.0000 | SURCHARGED |
| 30 minute winter | SW8.5 | 19 | 8.577 | 0.680 | 636.2 | 2.0192 | 0.0000 | SURCHARGED |
| 30 minute winter | SW8.6 OUT | 19 | 8.399 | 1.313 | 635.8 | 2.3208 | 0.0000 | OK |
| 30 minute winter | SW12.1 | 19 | 11.844 | 0.486 | 165.3 | 3.3648 | 0.0000 | SURCHARGED |
| 30 minute winter | SW12.2 | 18 | 8.917 | 1.174 | 412.5 | 8.3876 | 0.0000 | SURCHARGED |
| 30 minute winter | SW12.3 | 18 | 8.274 | 0.995 | 597.0 | 7.5613 | 0.0000 | SURCHARGED |
| 30 minute winter | SW12.4 OUT | 18 | 8.177 | 1.091 | 592.9 | 2.7761 | 0.0000 | OK |
| 30 minute winter | SW13.2 | 38 | 7.815 | 0.515 | 227.4 | 3.4037 | 0.0000 | OK |
| 30 minute winter | SW13.1 | 18 | 8.274 | 0.199 | 42.5 | 0.4449 | 0.0000 | OK |
| 30 minute winter | SW13.3 OUT | 38 | 7.820 | 0.734 | 222.1 | 1.2977 | 0.0000 | OK |
| 30 minute winter | INF BASIN 1 | 36 | 7.812 | 0.812 | 1146.3 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 30 minute winter | SW8.1 | 8.000 | SW8.2 | 75.5 | 3.138 | 0.621 | 0.7998 |
| 30 minute winter | SW8.2 | 8.001 | SW8.3 | 86.5 | 0.884 | 0.300 | 12.3591 |
| 30 minute winter | SW9.1 | 9.000 | SW8.3 | 134.9 | 3.199 | 0.573 | 1.8363 |
| 30 minute winter | SW8.3 | 8.002 | SW8.4 | 236.2 | 1.491 | 0.874 | 10.3006 |
| 30 minute winter | SW10.1 | 10.000 | SW8.4 | 150.3 | 2.346 | 0.862 | 2.2857 |
| 30 minute winter | SW8.4 | 8.003 | SW8.5 | 401.2 | 2.532 | 1.514 | 9.2941 |
| 30 minute winter | SW11.1 | 11.000 | SW8.5 | 194.3 | 1.762 | 1.757 | 6.4313 |
| 30 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 635.8 | 1.912 | 1.634 | 3.6971 |
| 30 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 1146.3 | 0.096 | 0.034 | 1141.2902 |
| 30 minute winter | SW12.1 | 12.000 | SW12.2 | 153.0 | 4.270 | 0.969 | 1.0136 |
| 30 minute winter | SW12.2 | 12.001 | SW12.3 | 402.7 | 1.864 | 1.528 | 17.3144 |
| 30 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 592.9 | 1.390 | 1.324 | 9.9067 |
| 30 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 1146.3 | 0.096 | 0.034 | 1141.2902 |
| 30 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 222.1 | 1.194 | 0.779 | 6.4177 |
| 30 minute winter | SW13.1 | 13.000 | SW13.2 | 40.8 | 1.176 | 1.021 | 2.3300 |
| 30 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 1146.3 | 0.096 | 0.034 | 1141.2902 |
| 30 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.84%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute summer | SW8.1 | 32 | 12.049 | 0.124 | 66.8 | 0.4584 | 0.0000 | OK |
| 60 minute summer | SW8.2 | 33 | 10.059 | 0.155 | 76.7 | 0.2801 | 0.0000 | OK |
| 60 minute summer | SW9.1 | 31 | 10.691 | 0.158 | 121.7 | 0.9091 | 0.0000 | OK |
| 60 minute summer | SW8.3 | 34 | 9.651 | 0.679 | 238.1 | 1.9377 | 0.0000 | SURCHARGED |
| 60 minute summer | SW10.1 | 34 | 9.895 | 0.434 | 148.6 | 2.4306 | 0.0000 | SURCHARGED |
| 60 minute summer | SW8.4 | 34 | 9.332 | 0.815 | 357.2 | 1.7068 | 0.0000 | SURCHARGED |
| 60 minute summer | SW11.1 | 33 | 8.976 | 0.599 | 179.5 | 4.6235 | 0.0000 | SURCHARGED |
| 60 minute summer | SW8.5 | 34 | 8.510 | 0.613 | 564.5 | 1.8215 | 0.0000 | OK |
| 60 minute summer | SW8.6 OUT | 34 | 8.249 | 1.163 | 565.9 | 2.0557 | 0.0000 | OK |
| 60 minute summer | SW12.1 | 32 | 11.546 | 0.188 | 145.2 | 1.3016 | 0.0000 | OK |
| 60 minute summer | SW12.2 | 33 | 8.649 | 0.906 | 378.9 | 6.4716 | 0.0000 | SURCHARGED |
| 60 minute summer | SW12.3 | 34 | 8.125 | 0.846 | 534.4 | 6.4334 | 0.0000 | SURCHARGED |
| 60 minute summer | SW12.4 OUT | 34 | 8.058 | 0.972 | 527.3 | 2.4734 | 0.0000 | OK |
| 60 minute summer | SW13.2 | 62 | 7.925 | 0.625 | 200.2 | 4.1325 | 0.0000 | SURCHARGED |
| 60 minute summer | SW13.1 | 33 | 8.248 | 0.173 | 37.4 | 0.3867 | 0.0000 | OK |
| 60 minute summer | SW13.3 OUT | 62 | 7.927 | 0.841 | 194.9 | 1.4866 | 0.0000 | OK |
| 60 minute summer | INF BASIN 1 | 68 | 7.924 | 0.924 | 740.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 60 minute summer | SW8.1 | 8.000 | SW8.2 | 66.3 | 3.051 | 0.546 | 0.7230 |
| 60 minute summer | SW8.2 | 8.001 | SW8.3 | 75.9 | 0.882 | 0.263 | 12.0811 |
| 60 minute summer | SW9.1 | 9.000 | SW8.3 | 121.5 | 3.122 | 0.516 | 1.6709 |
| 60 minute summer | SW8.3 | 8.002 | SW8.4 | 209.3 | 1.350 | 0.775 | 10.3006 |
| 60 minute summer | SW10.1 | 10.000 | SW8.4 | 137.7 | 2.323 | 0.790 | 2.2857 |
| 60 minute summer | SW8.4 | 8.003 | SW8.5 | 356.2 | 2.250 | 1.344 | 9.0614 |
| 60 minute summer | SW11.1 | 11.000 | SW8.5 | 174.0 | 1.598 | 1.573 | 6.0841 |
| 60 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 565.9 | 1.829 | 1.454 | 3.4626 |
| 60 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 740.2 | 0.058 | 0.022 | 1332.0602 |
| 60 minute summer | SW12.1 | 12.000 | SW12.2 | 143.9 | 4.292 | 0.911 | 0.9401 |
| 60 minute summer | SW12.2 | 12.001 | SW12.3 | 363.9 | 1.685 | 1.381 | 17.3144 |
| 60 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 527.3 | 1.312 | 1.177 | 9.9067 |
| 60 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 740.2 | 0.058 | 0.022 | 1332.0602 |
| 60 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 194.9 | 1.151 | 0.684 | 6.8056 |
| 60 minute summer | SW13.1 | 13.000 | SW13.2 | 36.3 | 1.153 | 0.908 | 2.1169 |
| 60 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 740.2 | 0.058 | 0.022 | 1332.0602 |
| 60 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 99.81%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute winter | SW8.1 | 32 | 12.032 | 0.107 | 52.5 | 0.3959 | 0.0000 | OK |
| 60 minute winter | SW8.2 | 33 | 10.041 | 0.137 | 60.6 | 0.2486 | 0.0000 | OK |
| 60 minute winter | SW9.1 | 32 | 10.673 | 0.140 | 95.7 | 0.8045 | 0.0000 | OK |
| 60 minute winter | SW8.3 | 34 | 9.277 | 0.305 | 188.3 | 0.8695 | 0.0000 | OK |
| 60 minute winter | SW10.1 | 33 | 9.655 | 0.194 | 116.9 | 1.0861 | 0.0000 | OK |
| 60 minute winter | SW8.4 | 34 | 9.103 | 0.586 | 310.4 | 1.2272 | 0.0000 | SURCHARGED |
| 60 minute winter | SW11.1 | 33 | 8.796 | 0.419 | 141.1 | 3.2327 | 0.0000 | SURCHARGED |
| 60 minute winter | SW8.5 | 33 | 8.450 | 0.553 | 483.9 | 1.6424 | 0.0000 | OK |
| 60 minute winter | SW8.6 OUT | 37 | 8.150 | 1.064 | 483.6 | 1.8795 | 0.0000 | OK |
| 60 minute winter | SW12.1 | 32 | 11.510 | 0.152 | 114.2 | 1.0529 | 0.0000 | OK |
| 60 minute winter | SW12.2 | 34 | 8.248 | 0.505 | 298.7 | 3.6100 | 0.0000 | OK |
| 60 minute winter | SW12.3 | 66 | 8.019 | 0.740 | 432.4 | 5.6254 | 0.0000 | OK |
| 60 minute winter | SW12.4 OUT | 66 | 8.021 | 0.935 | 418.6 | 2.3790 | 0.0000 | OK |
| 60 minute winter | SW13.2 | 65 | 8.019 | 0.719 | 158.6 | 4.7509 | 0.0000 | SURCHARGED |
| 60 minute winter | SW13.1 | 33 | 8.220 | 0.145 | 29.4 | 0.3239 | 0.0000 | OK |
| 60 minute winter | SW13.3 OUT | 62 | 8.020 | 0.934 | 153.5 | 1.6497 | 0.0000 | OK |
| 60 minute winter | INF BASIN 1 | 65 | 8.017 | 1.017 | 575.1 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 60 minute winter | SW8.1 | 8.000 | SW8.2 | 52.4 | 2.888 | 0.431 | 0.6032 |
| 60 minute winter | SW8.2 | 8.001 | SW8.3 | 60.4 | 0.865 | 0.209 | 9.0384 |
| 60 minute winter | SW9.1 | 9.000 | SW8.3 | 95.5 | 3.079 | 0.406 | 1.0553 |
| 60 minute winter | SW8.3 | 8.002 | SW8.4 | 182.0 | 1.327 | 0.674 | 8.8618 |
| 60 minute winter | SW10.1 | 10.000 | SW8.4 | 116.3 | 2.282 | 0.667 | 1.9256 |
| 60 minute winter | SW8.4 | 8.003 | SW8.5 | 309.7 | 1.965 | 1.169 | 8.8956 |
| 60 minute winter | SW11.1 | 11.000 | SW8.5 | 139.8 | 1.319 | 1.265 | 5.7511 |
| 60 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 483.6 | 1.714 | 1.243 | 3.1753 |
| 60 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 575.1 | 0.060 | 0.017 | 1497.8682 |
| 60 minute winter | SW12.1 | 12.000 | SW12.2 | 114.0 | 4.172 | 0.722 | 0.7660 |
| 60 minute winter | SW12.2 | 12.001 | SW12.3 | 294.4 | 1.540 | 1.117 | 16.8500 |
| 60 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 418.6 | 1.270 | 0.935 | 9.8943 |
| 60 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 575.1 | 0.060 | 0.017 | 1497.8682 |
| 60 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 153.5 | 1.110 | 0.539 | 6.8056 |
| 60 minute winter | SW13.1 | 13.000 | SW13.2 | 29.2 | 1.096 | 0.730 | 1.8000 |
| 60 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 575.1 | 0.060 | 0.017 | 1497.8682 |
| 60 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.88%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute summer | SW8.1 | 62 | 12.024 | 0.099 | 45.9 | 0.3649 | 0.0000 | OK |
| 120 minute summer | SW8.2 | 62 | 10.031 | 0.127 | 52.7 | 0.2296 | 0.0000 | OK |
| 120 minute summer | SW9.1 | 62 | 10.662 | 0.129 | 83.7 | 0.7414 | 0.0000 | OK |
| 120 minute summer | SW8.3 | 62 | 9.215 | 0.243 | 163.4 | 0.6951 | 0.0000 | OK |
| 120 minute summer | SW10.1 | 62 | 9.627 | 0.166 | 102.1 | 0.9302 | 0.0000 | OK |
| 120 minute summer | SW8.4 | 64 | 8.936 | 0.419 | 275.6 | 0.8771 | 0.0000 | OK |
| 120 minute summer | SW11.1 | 62 | 8.714 | 0.337 | 123.2 | 2.5998 | 0.0000 | OK |
| 120 minute summer | SW8.5 | 64 | 8.403 | 0.506 | 420.0 | 1.5038 | 0.0000 | OK |
| 120 minute summer | SW8.6 OUT | 140 | 8.123 | 1.037 | 420.6 | 1.8329 | 0.0000 | OK |
| 120 minute summer | SW12.1 | 62 | 11.496 | 0.138 | 99.7 | 0.9531 | 0.0000 | OK |
| 120 minute summer | SW12.2 | 62 | 8.169 | 0.426 | 260.5 | 3.0448 | 0.0000 | OK |
| 120 minute summer | SW12.3 | 124 | 8.121 | 0.842 | 375.0 | 6.4037 | 0.0000 | SURCHARGED |
| 120 minute summer | SW12.4 OUT | 124 | 8.129 | 1.043 | 355.7 | 2.6537 | 0.0000 | OK |
| 120 minute summer | SW13.2 | 122 | 8.128 | 0.828 | 138.2 | 5.4706 | 0.0000 | SURCHARGED |
| 120 minute summer | SW13.1 | 62 | 8.206 | 0.131 | 25.7 | 0.2918 | 0.0000 | OK |
| 120 minute summer | SW13.3 OUT | 126 | 8.130 | 1.044 | 131.0 | 1.8442 | 0.0000 | OK |
| 120 minute summer | INF BASIN 1 | 124 | 8.117 | 1.117 | 463.6 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 120 minute summer | SW8.1 | 8.000 | SW8.2 | 45.5 | 2.788 | 0.375 | 0.5431 |
| 120 minute summer | SW8.2 | 8.001 | SW8.3 | 51.7 | 0.841 | 0.179 | 7.2565 |
| 120 minute summer | SW9.1 | 9.000 | SW8.3 | 83.1 | 2.974 | 0.353 | 0.8860 |
| 120 minute summer | SW8.3 | 8.002 | SW8.4 | 159.3 | 1.319 | 0.590 | 7.8350 |
| 120 minute summer | SW10.1 | 10.000 | SW8.4 | 101.7 | 2.263 | 0.584 | 1.6872 |
| 120 minute summer | SW8.4 | 8.003 | SW8.5 | 271.8 | 1.882 | 1.026 | 8.5526 |
| 120 minute summer | SW11.1 | 11.000 | SW8.5 | 118.6 | 1.277 | 1.073 | 5.3546 |
| 120 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 420.6 | 1.628 | 1.081 | 2.9149 |
| 120 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 463.6 | 0.034 | 0.014 | 1679.4542 |
| 120 minute summer | SW12.1 | 12.000 | SW12.2 | 99.1 | 4.060 | 0.628 | 0.6846 |
| 120 minute summer | SW12.2 | 12.001 | SW12.3 | 254.2 | 1.458 | 0.964 | 15.3489 |
| 120 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 355.7 | 1.168 | 0.794 | 9.9067 |
| 120 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 463.6 | 0.034 | 0.014 | 1679.4542 |
| 120 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 131.0 | 0.979 | 0.460 | 6.8056 |
| 120 minute summer | SW13.1 | 13.000 | SW13.2 | 24.8 | 1.060 | 0.621 | 1.7872 |
| 120 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 463.6 | 0.034 | 0.014 | 1679.4542 |
| 120 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 120 minute winter. 360 minute analysis at 2 minute timestep. Mass balance: 99.83%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute winter | SW8.1 | 62 | 12.009 | 0.084 | 34.1 | 0.3092 | 0.0000 | OK |
| 120 minute winter | SW8.2 | 62 | 10.014 | 0.110 | 39.4 | 0.1996 | 0.0000 | OK |
| 120 minute winter | SW9.1 | 62 | 10.642 | 0.109 | 62.2 | 0.6273 | 0.0000 | OK |
| 120 minute winter | SW8.3 | 64 | 9.180 | 0.208 | 122.6 | 0.5937 | 0.0000 | OK |
| 120 minute winter | SW10.1 | 62 | 9.602 | 0.141 | 76.0 | 0.7911 | 0.0000 | OK |
| 120 minute winter | SW8.4 | 64 | 8.833 | 0.316 | 208.8 | 0.6615 | 0.0000 | OK |
| 120 minute winter | SW11.1 | 62 | 8.644 | 0.267 | 91.8 | 2.0609 | 0.0000 | OK |
| 120 minute winter | SW8.5 | 64 | 8.331 | 0.434 | 322.8 | 1.2883 | 0.0000 | OK |
| 120 minute winter | SW8.6 OUT | 132 | 8.237 | 1.151 | 323.0 | 2.0345 | 0.0000 | OK |
| 120 minute winter | SW12.1 | 62 | 11.472 | 0.114 | 74.3 | 0.7888 | 0.0000 | OK |
| 120 minute winter | SW12.2 | 128 | 8.234 | 0.491 | 194.4 | 3.5050 | 0.0000 | OK |
| 120 minute winter | SW12.3 | 130 | 8.233 | 0.954 | 282.8 | 7.2543 | 0.0000 | SURCHARGED |
| 120 minute winter | SW12.4 OUT | 128 | 8.242 | 1.156 | 271.0 | 2.9419 | 0.0000 | OK |
| 120 minute winter | SW13.2 | 118 | 8.232 | 0.932 | 103.3 | 6.1610 | 0.0000 | SURCHARGED |
| 120 minute winter | SW13.1 | 120 | 8.232 | 0.157 | 19.1 | 0.3510 | 0.0000 | OK |
| 120 minute winter | SW13.3 OUT | 122 | 8.229 | 1.143 | 98.0 | 2.0193 | 0.0000 | OK |
| 120 minute winter | INF BASIN 1 | 124 | 8.231 | 1.231 | 353.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 120 minute winter | SW8.1 | 8.000 | SW8.2 | 34.1 | 2.589 | 0.280 | 0.4374 |
| 120 minute winter | SW8.2 | 8.001 | SW8.3 | 39.2 | 0.783 | 0.136 | 5.9416 |
| 120 minute winter | SW9.1 | 9.000 | SW8.3 | 62.1 | 2.765 | 0.264 | 0.7126 |
| 120 minute winter | SW8.3 | 8.002 | SW8.4 | 122.0 | 1.277 | 0.452 | 6.1923 |
| 120 minute winter | SW10.1 | 10.000 | SW8.4 | 75.9 | 2.229 | 0.436 | 1.1746 |
| 120 minute winter | SW8.4 | 8.003 | SW8.5 | 208.5 | 1.825 | 0.787 | 6.6994 |
| 120 minute winter | SW11.1 | 11.000 | SW8.5 | 91.1 | 1.200 | 0.824 | 4.4223 |
| 120 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 323.0 | 1.484 | 0.830 | 2.4610 |
| 120 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 353.9 | 0.037 | 0.011 | 1892.3805 |
| 120 minute winter | SW12.1 | 12.000 | SW12.2 | 74.2 | 3.811 | 0.470 | 0.5461 |
| 120 minute winter | SW12.2 | 12.001 | SW12.3 | 192.9 | 1.395 | 0.732 | 17.0720 |
| 120 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 271.0 | 1.161 | 0.605 | 9.9067 |
| 120 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 353.9 | 0.037 | 0.011 | 1892.3805 |
| 120 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 98.0 | 0.935 | 0.344 | 6.8056 |
| 120 minute winter | SW13.1 | 13.000 | SW13.2 | 18.9 | 0.994 | 0.474 | 2.3333 |
| 120 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 353.9 | 0.037 | 0.011 | 1892.3805 |
| 120 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 99.84%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute summer | SW8.1 | 92 | 12.011 | 0.086 | 35.8 | 0.3168 | 0.0000 | OK |
| 180 minute summer | SW8.2 | 92 | 10.016 | 0.112 | 41.1 | 0.2023 | 0.0000 | OK |
| 180 minute summer | SW9.1 | 92 | 10.645 | 0.112 | 65.3 | 0.6429 | 0.0000 | OK |
| 180 minute summer | SW8.3 | 92 | 9.182 | 0.210 | 127.3 | 0.6001 | 0.0000 | OK |
| 180 minute summer | SW10.1 | 92 | 9.607 | 0.146 | 79.8 | 0.8157 | 0.0000 | OK |
| 180 minute summer | SW8.4 | 92 | 8.835 | 0.318 | 215.0 | 0.6660 | 0.0000 | OK |
| 180 minute summer | SW11.1 | 92 | 8.649 | 0.272 | 96.3 | 2.1021 | 0.0000 | OK |
| 180 minute summer | SW8.5 | 92 | 8.333 | 0.436 | 326.4 | 1.2951 | 0.0000 | OK |
| 180 minute summer | SW8.6 OUT | 208 | 8.230 | 1.144 | 324.9 | 2.0220 | 0.0000 | OK |
| 180 minute summer | SW12.1 | 92 | 11.475 | 0.117 | 77.9 | 0.8103 | 0.0000 | OK |
| 180 minute summer | SW12.2 | 184 | 8.226 | 0.483 | 203.4 | 3.4517 | 0.0000 | OK |
| 180 minute summer | SW12.3 | 180 | 8.227 | 0.948 | 293.2 | 7.2091 | 0.0000 | SURCHARGED |
| 180 minute summer | SW12.4 OUT | 184 | 8.224 | 1.138 | 280.0 | 2.8951 | 0.0000 | OK |
| 180 minute summer | SW13.2 | 188 | 8.229 | 0.929 | 107.8 | 6.1358 | 0.0000 | SURCHARGED |
| 180 minute summer | SW13.1 | 184 | 8.230 | 0.155 | 20.0 | 0.3457 | 0.0000 | OK |
| 180 minute summer | SW13.3 OUT | 188 | 8.237 | 1.151 | 101.9 | 2.0330 | 0.0000 | OK |
| 180 minute summer | INF BASIN 1 | 184 | 8.225 | 1.225 | 358.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 180 minute summer | SW8.1 | 8.000 | SW8.2 | 35.5 | 2.616 | 0.292 | 0.4513 |
| 180 minute summer | SW8.2 | 8.001 | SW8.3 | 40.3 | 0.791 | 0.140 | 6.0351 |
| 180 minute summer | SW9.1 | 9.000 | SW8.3 | 64.8 | 2.793 | 0.275 | 0.7356 |
| 180 minute summer | SW8.3 | 8.002 | SW8.4 | 124.2 | 1.285 | 0.460 | 6.2533 |
| 180 minute summer | SW10.1 | 10.000 | SW8.4 | 79.4 | 2.234 | 0.455 | 1.2100 |
| 180 minute summer | SW8.4 | 8.003 | SW8.5 | 208.7 | 1.820 | 0.788 | 6.7260 |
| 180 minute summer | SW11.1 | 11.000 | SW8.5 | 93.0 | 1.202 | 0.841 | 4.5005 |
| 180 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 324.9 | 1.485 | 0.835 | 2.4731 |
| 180 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 358.5 | 0.030 | 0.011 | 1880.9213 |
| 180 minute summer | SW12.1 | 12.000 | SW12.2 | 77.4 | 3.846 | 0.490 | 0.5641 |
| 180 minute summer | SW12.2 | 12.001 | SW12.3 | 198.8 | 1.347 | 0.754 | 16.9917 |
| 180 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 280.0 | 1.070 | 0.625 | 9.9067 |
| 180 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 358.5 | 0.030 | 0.011 | 1880.9213 |
| 180 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 101.9 | 0.856 | 0.357 | 6.8056 |
| 180 minute summer | SW13.1 | 13.000 | SW13.2 | 19.3 | 0.996 | 0.483 | 2.3167 |
| 180 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 358.5 | 0.030 | 0.011 | 1880.9213 |
| 180 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 180 minute winter. 420 minute analysis at 4 minute timestep. Mass balance: 99.85%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute winter | SW8.1 | 92 | 11.997 | 0.072 | 26.1 | 0.2674 | 0.0000 | OK |
| 180 minute winter | SW8.2 | 92 | 10.001 | 0.097 | 30.2 | 0.1746 | 0.0000 | OK |
| 180 minute winter | SW9.1 | 92 | 10.627 | 0.094 | 47.5 | 0.5412 | 0.0000 | OK |
| 180 minute winter | SW8.3 | 92 | 9.151 | 0.179 | 93.6 | 0.5109 | 0.0000 | OK |
| 180 minute winter | SW10.1 | 92 | 9.585 | 0.124 | 58.1 | 0.6948 | 0.0000 | OK |
| 180 minute winter | SW8.4 | 92 | 8.778 | 0.261 | 159.4 | 0.5471 | 0.0000 | OK |
| 180 minute winter | SW11.1 | 92 | 8.599 | 0.222 | 70.1 | 1.7126 | 0.0000 | OK |
| 180 minute winter | SW8.5 | 184 | 8.359 | 0.462 | 246.2 | 1.3718 | 0.0000 | OK |
| 180 minute winter | SW8.6 OUT | 184 | 8.368 | 1.282 | 246.0 | 2.2648 | 0.0000 | OK |
| 180 minute winter | SW12.1 | 92 | 11.455 | 0.097 | 56.7 | 0.6712 | 0.0000 | OK |
| 180 minute winter | SW12.2 | 176 | 8.360 | 0.617 | 148.4 | 4.4086 | 0.0000 | SURCHARGED |
| 180 minute winter | SW12.3 | 184 | 8.357 | 1.078 | 217.4 | 8.1928 | 0.0000 | SURCHARGED |
| 180 minute winter | SW12.4 OUT | 184 | 8.364 | 1.278 | 206.3 | 3.2527 | 0.0000 | OK |
| 180 minute winter | SW13.2 | 180 | 8.360 | 1.060 | 79.0 | 7.0008 | 0.0000 | SURCHARGED |
| 180 minute winter | SW13.1 | 188 | 8.356 | 0.281 | 14.6 | 0.6273 | 0.0000 | SURCHARGED |
| 180 minute winter | SW13.3 OUT | 180 | 8.364 | 1.278 | 74.0 | 2.2587 | 0.0000 | OK |
| 180 minute winter | INF BASIN 1 | 184 | 8.352 | 1.352 | 269.1 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 180 minute winter | SW8.1 | 8.000 | SW8.2 | 26.1 | 2.409 | 0.214 | 0.3596 |
| 180 minute winter | SW8.2 | 8.001 | SW8.3 | 30.0 | 0.731 | 0.104 | 4.8856 |
| 180 minute winter | SW9.1 | 9.000 | SW8.3 | 47.4 | 2.575 | 0.201 | 0.5843 |
| 180 minute winter | SW8.3 | 8.002 | SW8.4 | 93.2 | 1.210 | 0.345 | 5.0105 |
| 180 minute winter | SW10.1 | 10.000 | SW8.4 | 58.0 | 2.177 | 0.333 | 0.8645 |
| 180 minute winter | SW8.4 | 8.003 | SW8.5 | 158.6 | 1.725 | 0.599 | 5.3932 |
| 180 minute winter | SW11.1 | 11.000 | SW8.5 | 69.6 | 1.115 | 0.630 | 3.6388 |
| 180 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 246.0 | 1.359 | 0.632 | 3.0363 |
| 180 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 269.1 | 0.032 | 0.008 | 2128.0869 |
| 180 minute winter | SW12.1 | 12.000 | SW12.2 | 56.6 | 3.568 | 0.358 | 0.4451 |
| 180 minute winter | SW12.2 | 12.001 | SW12.3 | 148.7 | 1.269 | 0.564 | 17.3144 |
| 180 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 206.3 | 1.054 | 0.461 | 9.9067 |
| 180 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 269.1 | 0.032 | 0.008 | 2128.0869 |
| 180 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 74.0 | 0.840 | 0.260 | 6.8056 |
| 180 minute winter | SW13.1 | 13.000 | SW13.2 | 14.6 | 0.919 | 0.366 | 2.6746 |
| 180 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 269.1 | 0.032 | 0.008 | 2128.0869 |
| 180 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 99.85%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute summer | SW8.1 | 124 | 12.001 | 0.076 | 28.5 | 0.2806 | 0.0000 | OK |
| 240 minute summer | SW8.2 | 124 | 10.005 | 0.101 | 32.9 | 0.1828 | 0.0000 | OK |
| 240 minute summer | SW9.1 | 124 | 10.632 | 0.099 | 52.0 | 0.5689 | 0.0000 | OK |
| 240 minute summer | SW8.3 | 124 | 9.161 | 0.189 | 102.6 | 0.5386 | 0.0000 | OK |
| 240 minute summer | SW10.1 | 120 | 9.591 | 0.130 | 63.5 | 0.7293 | 0.0000 | OK |
| 240 minute summer | SW8.4 | 124 | 8.796 | 0.279 | 175.2 | 0.5839 | 0.0000 | OK |
| 240 minute summer | SW11.1 | 124 | 8.613 | 0.236 | 76.6 | 1.8218 | 0.0000 | OK |
| 240 minute summer | SW8.5 | 256 | 8.299 | 0.402 | 271.4 | 1.1936 | 0.0000 | OK |
| 240 minute summer | SW8.6 OUT | 256 | 8.306 | 1.220 | 271.4 | 2.1564 | 0.0000 | OK |
| 240 minute summer | SW12.1 | 124 | 11.460 | 0.102 | 62.0 | 0.7077 | 0.0000 | OK |
| 240 minute summer | SW12.2 | 244 | 8.300 | 0.557 | 162.3 | 3.9789 | 0.0000 | SURCHARGED |
| 240 minute summer | SW12.3 | 236 | 8.305 | 1.027 | 238.1 | 7.8031 | 0.0000 | SURCHARGED |
| 240 minute summer | SW12.4 OUT | 244 | 8.309 | 1.223 | 226.9 | 3.1135 | 0.0000 | OK |
| 240 minute summer | SW13.2 | 248 | 8.300 | 1.000 | 86.5 | 6.6090 | 0.0000 | SURCHARGED |
| 240 minute summer | SW13.1 | 240 | 8.300 | 0.225 | 15.9 | 0.5033 | 0.0000 | SURCHARGED |
| 240 minute summer | SW13.3 OUT | 244 | 8.310 | 1.224 | 81.1 | 2.1624 | 0.0000 | OK |
| 240 minute summer | INF BASIN 1 | 244 | 8.297 | 1.297 | 295.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 240 minute summer | SW8.1 | 8.000 | SW8.2 | 28.5 | 2.468 | 0.235 | 0.3840 |
| 240 minute summer | SW8.2 | 8.001 | SW8.3 | 32.9 | 0.747 | 0.114 | 5.2329 |
| 240 minute summer | SW9.1 | 9.000 | SW8.3 | 52.0 | 2.638 | 0.221 | 0.6252 |
| 240 minute summer | SW8.3 | 8.002 | SW8.4 | 102.6 | 1.234 | 0.380 | 5.4007 |
| 240 minute summer | SW10.1 | 10.000 | SW8.4 | 63.5 | 2.219 | 0.364 | 0.9442 |
| 240 minute summer | SW8.4 | 8.003 | SW8.5 | 175.1 | 1.763 | 0.661 | 5.8243 |
| 240 minute summer | SW11.1 | 11.000 | SW8.5 | 76.6 | 1.145 | 0.693 | 3.8970 |
| 240 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 271.4 | 1.401 | 0.697 | 2.6014 |
| 240 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 295.5 | 0.027 | 0.009 | 2020.4983 |
| 240 minute summer | SW12.1 | 12.000 | SW12.2 | 62.0 | 3.650 | 0.393 | 0.4764 |
| 240 minute summer | SW12.2 | 12.001 | SW12.3 | 163.0 | 1.277 | 0.618 | 17.3144 |
| 240 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 226.9 | 1.004 | 0.507 | 9.9067 |
| 240 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 295.5 | 0.027 | 0.009 | 2020.4983 |
| 240 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 81.1 | 0.762 | 0.285 | 6.8056 |
| 240 minute summer | SW13.1 | 13.000 | SW13.2 | 16.1 | 0.940 | 0.403 | 2.6736 |
| 240 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 295.5 | 0.027 | 0.009 | 2020.4983 |
| 240 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 240 minute winter. 480 minute analysis at 4 minute timestep. Mass balance: 99.85%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute winter | SW8.1 | 124 | 11.990 | 0.065 | 21.2 | 0.2396 | 0.0000 | OK |
| 240 minute winter | SW8.2 | 124 | 9.991 | 0.087 | 24.5 | 0.1580 | 0.0000 | OK |
| 240 minute winter | SW9.1 | 124 | 10.618 | 0.084 | 38.7 | 0.4853 | 0.0000 | OK |
| 240 minute winter | SW8.3 | 124 | 9.133 | 0.161 | 76.4 | 0.4591 | 0.0000 | OK |
| 240 minute winter | SW10.1 | 124 | 9.571 | 0.110 | 47.2 | 0.6181 | 0.0000 | OK |
| 240 minute winter | SW8.4 | 124 | 8.748 | 0.231 | 130.4 | 0.4829 | 0.0000 | OK |
| 240 minute winter | SW11.1 | 124 | 8.573 | 0.196 | 57.0 | 1.5097 | 0.0000 | OK |
| 240 minute winter | SW8.5 | 248 | 8.438 | 0.541 | 202.0 | 1.6081 | 0.0000 | OK |
| 240 minute winter | SW8.6 OUT | 272 | 8.442 | 1.356 | 202.0 | 2.3953 | 0.0000 | OK |
| 240 minute winter | SW12.1 | 124 | 11.444 | 0.086 | 46.1 | 0.5969 | 0.0000 | OK |
| 240 minute winter | SW12.2 | 236 | 8.437 | 0.694 | 120.7 | 4.9540 | 0.0000 | SURCHARGED |
| 240 minute winter | SW12.3 | 240 | 8.437 | 1.158 | 176.9 | 8.8012 | 0.0000 | SURCHARGED |
| 240 minute winter | SW12.4 OUT | 236 | 8.439 | 1.353 | 168.6 | 3.4437 | 0.0000 | OK |
| 240 minute winter | SW13.2 | 240 | 8.442 | 1.142 | 64.3 | 7.5446 | 0.0000 | SURCHARGED |
| 240 minute winter | SW13.1 | 244 | 8.435 | 0.360 | 11.9 | 0.8037 | 0.0000 | SURCHARGED |
| 240 minute winter | SW13.3 OUT | 240 | 8.444 | 1.358 | 60.3 | 2.3996 | 0.0000 | OK |
| 240 minute winter | INF BASIN 1 | 240 | 8.434 | 1.434 | 221.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 240 minute winter | SW8.1 | 8.000 | SW8.2 | 21.2 | 2.278 | 0.175 | 0.3094 |
| 240 minute winter | SW8.2 | 8.001 | SW8.3 | 24.5 | 0.690 | 0.085 | 4.2300 |
| 240 minute winter | SW9.1 | 9.000 | SW8.3 | 38.7 | 2.438 | 0.164 | 0.5036 |
| 240 minute winter | SW8.3 | 8.002 | SW8.4 | 76.4 | 1.155 | 0.283 | 4.3091 |
| 240 minute winter | SW10.1 | 10.000 | SW8.4 | 47.2 | 2.066 | 0.271 | 0.7416 |
| 240 minute winter | SW8.4 | 8.003 | SW8.5 | 130.4 | 1.650 | 0.492 | 4.6354 |
| 240 minute winter | SW11.1 | 11.000 | SW8.5 | 57.0 | 1.057 | 0.516 | 3.1449 |
| 240 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 202.0 | 1.279 | 0.519 | 3.5166 |
| 240 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 221.5 | 0.030 | 0.007 | 2290.2703 |
| 240 minute winter | SW12.1 | 12.000 | SW12.2 | 46.1 | 3.387 | 0.292 | 0.3818 |
| 240 minute winter | SW12.2 | 12.001 | SW12.3 | 121.0 | 1.207 | 0.459 | 17.3144 |
| 240 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 168.6 | 0.981 | 0.376 | 9.9067 |
| 240 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 221.5 | 0.030 | 0.007 | 2290.2703 |
| 240 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 60.3 | 0.760 | 0.212 | 6.8056 |
| 240 minute winter | SW13.1 | 13.000 | SW13.2 | 11.9 | 0.870 | 0.298 | 2.6746 |
| 240 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 221.5 | 0.030 | 0.007 | 2290.2703 |
| 240 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.85%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute summer | SW8.1 | 184 | 11.991 | 0.066 | 21.8 | 0.2427 | 0.0000 | OK |
| 360 minute summer | SW8.2 | 184 | 9.992 | 0.088 | 25.1 | 0.1589 | 0.0000 | OK |
| 360 minute summer | SW9.1 | 184 | 10.619 | 0.086 | 39.8 | 0.4916 | 0.0000 | OK |
| 360 minute summer | SW8.3 | 184 | 9.133 | 0.161 | 78.0 | 0.4610 | 0.0000 | OK |
| 360 minute summer | SW10.1 | 184 | 9.573 | 0.112 | 48.6 | 0.6269 | 0.0000 | OK |
| 360 minute summer | SW8.4 | 184 | 8.748 | 0.231 | 132.2 | 0.4840 | 0.0000 | OK |
| 360 minute summer | SW11.1 | 184 | 8.574 | 0.197 | 58.6 | 1.5230 | 0.0000 | OK |
| 360 minute summer | SW8.5 | 368 | 8.386 | 0.489 | 203.1 | 1.4529 | 0.0000 | OK |
| 360 minute summer | SW8.6 OUT | 392 | 8.394 | 1.308 | 202.5 | 2.3111 | 0.0000 | OK |
| 360 minute summer | SW12.1 | 184 | 11.445 | 0.087 | 47.4 | 0.6053 | 0.0000 | OK |
| 360 minute summer | SW12.2 | 368 | 8.383 | 0.640 | 124.0 | 4.5729 | 0.0000 | SURCHARGED |
| 360 minute summer | SW12.3 | 360 | 8.387 | 1.108 | 181.3 | 8.4216 | 0.0000 | SURCHARGED |
| 360 minute summer | SW12.4 OUT | 368 | 8.388 | 1.302 | 171.5 | 3.3128 | 0.0000 | OK |
| 360 minute summer | SW13.2 | 368 | 8.384 | 1.084 | 66.0 | 7.1644 | 0.0000 | SURCHARGED |
| 360 minute summer | SW13.1 | 360 | 8.386 | 0.311 | 12.2 | 0.6946 | 0.0000 | SURCHARGED |
| 360 minute summer | SW13.3 OUT | 352 | 8.391 | 1.305 | 61.0 | 2.3063 | 0.0000 | OK |
| 360 minute summer | INF BASIN 1 | 368 | 8.385 | 1.385 | 222.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 360 minute summer | SW8.1 | 8.000 | SW8.2 | 21.7 | 2.292 | 0.179 | 0.3148 |
| 360 minute summer | SW8.2 | 8.001 | SW8.3 | 24.8 | 0.694 | 0.086 | 4.2581 |
| 360 minute summer | SW9.1 | 9.000 | SW8.3 | 39.6 | 2.453 | 0.168 | 0.5124 |
| 360 minute summer | SW8.3 | 8.002 | SW8.4 | 77.0 | 1.159 | 0.285 | 4.3268 |
| 360 minute summer | SW10.1 | 10.000 | SW8.4 | 48.3 | 2.078 | 0.277 | 0.7552 |
| 360 minute summer | SW8.4 | 8.003 | SW8.5 | 130.4 | 1.648 | 0.492 | 4.6430 |
| 360 minute summer | SW11.1 | 11.000 | SW8.5 | 57.6 | 1.058 | 0.521 | 3.1738 |
| 360 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 202.5 | 1.279 | 0.520 | 3.2094 |
| 360 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 222.9 | 0.023 | 0.007 | 2192.2388 |
| 360 minute summer | SW12.1 | 12.000 | SW12.2 | 47.2 | 3.407 | 0.299 | 0.3887 |
| 360 minute summer | SW12.2 | 12.001 | SW12.3 | 123.8 | 1.186 | 0.470 | 17.3144 |
| 360 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 171.5 | 0.873 | 0.383 | 9.9067 |
| 360 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 222.9 | 0.023 | 0.007 | 2192.2388 |
| 360 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 61.0 | 0.656 | 0.214 | 6.8056 |
| 360 minute summer | SW13.1 | 13.000 | SW13.2 | 12.1 | 0.845 | 0.302 | 2.6746 |
| 360 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 222.9 | 0.023 | 0.007 | 2192.2388 |
| 360 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 99.84%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | SW8.1 | 184 | 11.981 | 0.056 | 15.9 | 0.2063 | 0.0000 | OK |
| 360 minute winter | SW8.2 | 184 | 9.980 | 0.076 | 18.4 | 0.1371 | 0.0000 | OK |
| 360 minute winter | SW9.1 | 184 | 10.606 | 0.073 | 28.9 | 0.4166 | 0.0000 | OK |
| 360 minute winter | SW8.3 | 184 | 9.110 | 0.138 | 57.1 | 0.3937 | 0.0000 | OK |
| 360 minute winter | SW10.1 | 184 | 9.555 | 0.094 | 35.3 | 0.5271 | 0.0000 | OK |
| 360 minute winter | SW8.4 | 184 | 8.711 | 0.194 | 97.3 | 0.4053 | 0.0000 | OK |
| 360 minute winter | SW11.1 | 360 | 8.544 | 0.167 | 42.7 | 1.2873 | 0.0000 | OK |
| 360 minute winter | SW8.5 | 360 | 8.541 | 0.644 | 150.6 | 1.9120 | 0.0000 | OK |
| 360 minute winter | SW8.6 OUT | 352 | 8.536 | 1.450 | 150.5 | 2.5623 | 0.0000 | OK |
| 360 minute winter | SW12.1 | 184 | 11.432 | 0.074 | 34.5 | 0.5090 | 0.0000 | OK |
| 360 minute winter | SW12.2 | 360 | 8.535 | 0.792 | 90.4 | 5.6604 | 0.0000 | SURCHARGED |
| 360 minute winter | SW12.3 | 368 | 8.533 | 1.254 | 132.0 | 9.5346 | 0.0000 | SURCHARGED |
| 360 minute winter | SW12.4 OUT | 360 | 8.544 | 1.458 | 126.0 | 3.7107 | 0.0000 | OK |
| 360 minute winter | SW13.2 | 360 | 8.541 | 1.241 | 48.1 | 8.2000 | 0.0000 | SURCHARGED |
| 360 minute winter | SW13.1 | 360 | 8.546 | 0.471 | 8.9 | 1.0511 | 0.0000 | SURCHARGED |
| 360 minute winter | SW13.3 OUT | 360 | 8.546 | 1.460 | 45.5 | 2.5799 | 0.0000 | OK |
| 360 minute winter | INF BASIN 1 | 360 | 8.533 | 1.533 | 167.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 360 minute winter | SW8.1 | 8.000 | SW8.2 | 15.9 | 2.101 | 0.131 | 0.2513 |
| 360 minute winter | SW8.2 | 8.001 | SW8.3 | 18.3 | 0.638 | 0.064 | 3.4306 |
| 360 minute winter | SW9.1 | 9.000 | SW8.3 | 28.9 | 2.248 | 0.123 | 0.4074 |
| 360 minute winter | SW8.3 | 8.002 | SW8.4 | 56.9 | 1.075 | 0.211 | 3.4552 |
| 360 minute winter | SW10.1 | 10.000 | SW8.4 | 35.3 | 1.913 | 0.202 | 0.5986 |
| 360 minute winter | SW8.4 | 8.003 | SW8.5 | 97.0 | 1.534 | 0.366 | 4.8761 |
| 360 minute winter | SW11.1 | 11.000 | SW8.5 | 42.5 | 0.975 | 0.385 | 4.4648 |
| 360 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 150.5 | 1.170 | 0.387 | 3.9958 |
| 360 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 167.2 | 0.026 | 0.005 | 2493.8132 |
| 360 minute winter | SW12.1 | 12.000 | SW12.2 | 34.5 | 3.135 | 0.218 | 0.3084 |
| 360 minute winter | SW12.2 | 12.001 | SW12.3 | 90.2 | 1.087 | 0.342 | 17.3144 |
| 360 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 126.0 | 0.880 | 0.281 | 9.9067 |
| 360 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 167.2 | 0.026 | 0.005 | 2493.8132 |
| 360 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 45.5 | 0.672 | 0.159 | 6.8056 |
| 360 minute winter | SW13.1 | 13.000 | SW13.2 | 8.9 | 0.792 | 0.222 | 2.6746 |
| 360 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 167.2 | 0.026 | 0.005 | 2493.8132 |
| 360 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 99.87%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute summer | SW8.1 | 248 | 11.983 | 0.058 | 17.2 | 0.2149 | 0.0000 | OK |
| 480 minute summer | SW8.2 | 248 | 9.983 | 0.079 | 19.9 | 0.1428 | 0.0000 | OK |
| 480 minute summer | SW9.1 | 248 | 10.609 | 0.076 | 31.4 | 0.4349 | 0.0000 | OK |
| 480 minute summer | SW8.3 | 248 | 9.116 | 0.144 | 62.0 | 0.4115 | 0.0000 | OK |
| 480 minute summer | SW10.1 | 248 | 9.560 | 0.099 | 38.4 | 0.5520 | 0.0000 | OK |
| 480 minute summer | SW8.4 | 248 | 8.721 | 0.204 | 105.9 | 0.4263 | 0.0000 | OK |
| 480 minute summer | SW11.1 | 248 | 8.550 | 0.173 | 46.3 | 1.3347 | 0.0000 | OK |
| 480 minute summer | SW8.5 | 480 | 8.449 | 0.552 | 164.1 | 1.6388 | 0.0000 | OK |
| 480 minute summer | SW8.6 OUT | 504 | 8.454 | 1.368 | 164.1 | 2.4171 | 0.0000 | OK |
| 480 minute summer | SW12.1 | 248 | 11.435 | 0.077 | 37.5 | 0.5326 | 0.0000 | OK |
| 480 minute summer | SW12.2 | 488 | 8.448 | 0.705 | 98.2 | 5.0342 | 0.0000 | SURCHARGED |
| 480 minute summer | SW12.3 | 488 | 8.444 | 1.165 | 143.6 | 8.8580 | 0.0000 | SURCHARGED |
| 480 minute summer | SW12.4 OUT | 472 | 8.450 | 1.364 | 137.2 | 3.4701 | 0.0000 | OK |
| 480 minute summer | SW13.2 | 488 | 8.445 | 1.145 | 52.2 | 7.5672 | 0.0000 | SURCHARGED |
| 480 minute summer | SW13.1 | 488 | 8.443 | 0.368 | 9.6 | 0.8214 | 0.0000 | SURCHARGED |
| 480 minute summer | SW13.3 OUT | 480 | 8.445 | 1.359 | 49.2 | 2.4017 | 0.0000 | OK |
| 480 minute summer | INF BASIN 1 | 488 | 8.444 | 1.444 | 181.6 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 480 minute summer | SW8.1 | 8.000 | SW8.2 | 17.2 | 2.149 | 0.142 | 0.2662 |
| 480 minute summer | SW8.2 | 8.001 | SW8.3 | 19.9 | 0.651 | 0.069 | 3.6445 |
| 480 minute summer | SW9.1 | 9.000 | SW8.3 | 31.4 | 2.301 | 0.133 | 0.4329 |
| 480 minute summer | SW8.3 | 8.002 | SW8.4 | 62.0 | 1.098 | 0.230 | 3.6851 |
| 480 minute summer | SW10.1 | 10.000 | SW8.4 | 38.4 | 1.956 | 0.220 | 0.6372 |
| 480 minute summer | SW8.4 | 8.003 | SW8.5 | 105.9 | 1.569 | 0.400 | 3.9609 |
| 480 minute summer | SW11.1 | 11.000 | SW8.5 | 46.3 | 0.999 | 0.419 | 2.7045 |
| 480 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 164.1 | 1.202 | 0.422 | 3.5943 |
| 480 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 181.6 | 0.021 | 0.005 | 2311.6086 |
| 480 minute summer | SW12.1 | 12.000 | SW12.2 | 37.5 | 3.207 | 0.237 | 0.3280 |
| 480 minute summer | SW12.2 | 12.001 | SW12.3 | 98.2 | 1.072 | 0.373 | 17.3144 |
| 480 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 137.2 | 0.804 | 0.306 | 9.9067 |
| 480 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 181.6 | 0.021 | 0.005 | 2311.6086 |
| 480 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 49.2 | 0.615 | 0.173 | 6.8056 |
| 480 minute summer | SW13.1 | 13.000 | SW13.2 | 9.6 | 0.795 | 0.240 | 2.6746 |
| 480 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 181.6 | 0.021 | 0.005 | 2311.6086 |
| 480 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 480 minute winter. 720 minute analysis at 8 minute timestep. Mass balance: 99.49%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute winter | SW8.1 | 248 | 11.975 | 0.050 | 12.8 | 0.1848 | 0.0000 | OK |
| 480 minute winter | SW8.2 | 248 | 9.972 | 0.068 | 14.8 | 0.1236 | 0.0000 | OK |
| 480 minute winter | SW9.1 | 248 | 10.598 | 0.065 | 23.4 | 0.3737 | 0.0000 | OK |
| 480 minute winter | SW8.3 | 248 | 9.096 | 0.124 | 46.2 | 0.3536 | 0.0000 | OK |
| 480 minute winter | SW10.1 | 248 | 9.545 | 0.084 | 28.6 | 0.4712 | 0.0000 | OK |
| 480 minute winter | SW8.4 | 248 | 8.689 | 0.172 | 78.9 | 0.3604 | 0.0000 | OK |
| 480 minute winter | SW11.1 | 480 | 8.619 | 0.242 | 34.5 | 1.8684 | 0.0000 | OK |
| 480 minute winter | SW8.5 | 480 | 8.618 | 0.721 | 122.3 | 2.1411 | 0.0000 | SURCHARGED |
| 480 minute winter | SW8.6 OUT | 480 | 8.633 | 1.547 | 122.3 | 2.7327 | 0.0000 | OK |
| 480 minute winter | SW12.1 | 248 | 11.424 | 0.066 | 27.9 | 0.4545 | 0.0000 | OK |
| 480 minute winter | SW12.2 | 464 | 8.608 | 0.865 | 73.1 | 6.1780 | 0.0000 | SURCHARGED |
| 480 minute winter | SW12.3 | 488 | 8.606 | 1.327 | 106.4 | 10.0860 | 0.0000 | SURCHARGED |
| 480 minute winter | SW12.4 OUT | 488 | 8.613 | 1.527 | 101.8 | 3.8856 | 0.0000 | OK |
| 480 minute winter | SW13.2 | 480 | 8.603 | 1.303 | 38.9 | 8.6121 | 0.0000 | SURCHARGED |
| 480 minute winter | SW13.1 | 472 | 8.602 | 0.527 | 7.2 | 1.1772 | 0.0000 | SURCHARGED |
| 480 minute winter | SW13.3 OUT | 472 | 8.602 | 1.516 | 37.6 | 2.6796 | 0.0000 | OK |
| 480 minute winter | INF BASIN 1 | 480 | 8.602 | 1.602 | 137.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 480 minute winter | SW8.1 | 8.000 | SW8.2 | 12.8 | 1.978 | 0.105 | 0.2152 |
| 480 minute winter | SW8.2 | 8.001 | SW8.3 | 14.8 | 0.599 | 0.051 | 2.9527 |
| 480 minute winter | SW9.1 | 9.000 | SW8.3 | 23.4 | 2.121 | 0.099 | 0.3500 |
| 480 minute winter | SW8.3 | 8.002 | SW8.4 | 46.2 | 1.019 | 0.171 | 2.9619 |
| 480 minute winter | SW10.1 | 10.000 | SW8.4 | 28.6 | 1.807 | 0.164 | 0.5137 |
| 480 minute winter | SW8.4 | 8.003 | SW8.5 | 78.9 | 1.455 | 0.298 | 5.4817 |
| 480 minute winter | SW11.1 | 11.000 | SW8.5 | 34.5 | 0.920 | 0.312 | 5.4092 |
| 480 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 122.3 | 1.103 | 0.314 | 4.0406 |
| 480 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 137.0 | 0.024 | 0.004 | 2636.8311 |
| 480 minute winter | SW12.1 | 12.000 | SW12.2 | 27.9 | 2.962 | 0.177 | 0.2642 |
| 480 minute winter | SW12.2 | 12.001 | SW12.3 | 72.6 | 1.017 | 0.275 | 17.3144 |
| 480 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 101.8 | 0.801 | 0.227 | 9.9067 |
| 480 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 137.0 | 0.024 | 0.004 | 2636.8311 |
| 480 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 37.6 | 0.613 | 0.132 | 6.8056 |
| 480 minute winter | SW13.1 | 13.000 | SW13.2 | 7.2 | 0.736 | 0.180 | 2.6746 |
| 480 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 137.0 | 0.024 | 0.004 | 2636.8311 |
| 480 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 99.88%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute summer | SW8.1 | 315 | 11.978 | 0.053 | 14.2 | 0.1948 | 0.0000 | OK |
| 600 minute summer | SW8.2 | 315 | 9.976 | 0.072 | 16.4 | 0.1299 | 0.0000 | OK |
| 600 minute summer | SW9.1 | 315 | 10.601 | 0.068 | 25.8 | 0.3929 | 0.0000 | OK |
| 600 minute summer | SW8.3 | 315 | 9.102 | 0.130 | 51.0 | 0.3719 | 0.0000 | OK |
| 600 minute summer | SW10.1 | 315 | 9.550 | 0.089 | 31.5 | 0.4961 | 0.0000 | OK |
| 600 minute summer | SW8.4 | 315 | 8.699 | 0.182 | 87.0 | 0.3807 | 0.0000 | OK |
| 600 minute summer | SW11.1 | 315 | 8.532 | 0.155 | 38.1 | 1.1946 | 0.0000 | OK |
| 600 minute summer | SW8.5 | 600 | 8.482 | 0.585 | 134.9 | 1.7382 | 0.0000 | OK |
| 600 minute summer | SW8.6 OUT | 615 | 8.483 | 1.397 | 134.9 | 2.4692 | 0.0000 | OK |
| 600 minute summer | SW12.1 | 315 | 11.427 | 0.069 | 30.8 | 0.4791 | 0.0000 | OK |
| 600 minute summer | SW12.2 | 615 | 8.488 | 0.745 | 80.6 | 5.3249 | 0.0000 | SURCHARGED |
| 600 minute summer | SW12.3 | 615 | 8.488 | 1.210 | 117.2 | 9.1937 | 0.0000 | SURCHARGED |
| 600 minute summer | SW12.4 OUT | 615 | 8.493 | 1.407 | 111.1 | 3.5813 | 0.0000 | OK |
| 600 minute summer | SW13.2 | 600 | 8.483 | 1.183 | 42.9 | 7.8156 | 0.0000 | SURCHARGED |
| 600 minute summer | SW13.1 | 615 | 8.480 | 0.405 | 7.9 | 0.9054 | 0.0000 | SURCHARGED |
| 600 minute summer | SW13.3 OUT | 585 | 8.484 | 1.398 | 41.3 | 2.4703 | 0.0000 | OK |
| 600 minute summer | INF BASIN 1 | 615 | 8.481 | 1.481 | 149.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 600 minute summer | SW8.1 | 8.000 | SW8.2 | 14.2 | 2.036 | 0.117 | 0.2319 |
| 600 minute summer | SW8.2 | 8.001 | SW8.3 | 16.4 | 0.618 | 0.057 | 3.1703 |
| 600 minute summer | SW9.1 | 9.000 | SW8.3 | 25.8 | 2.179 | 0.110 | 0.3755 |
| 600 minute summer | SW8.3 | 8.002 | SW8.4 | 51.0 | 1.046 | 0.189 | 3.1846 |
| 600 minute summer | SW10.1 | 10.000 | SW8.4 | 31.5 | 1.856 | 0.181 | 0.5511 |
| 600 minute summer | SW8.4 | 8.003 | SW8.5 | 87.0 | 1.492 | 0.328 | 4.2919 |
| 600 minute summer | SW11.1 | 11.000 | SW8.5 | 38.1 | 0.947 | 0.345 | 3.2994 |
| 600 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 134.9 | 1.135 | 0.347 | 3.7622 |
| 600 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 149.5 | 0.019 | 0.004 | 2386.4614 |
| 600 minute summer | SW12.1 | 12.000 | SW12.2 | 30.8 | 3.042 | 0.195 | 0.2840 |
| 600 minute summer | SW12.2 | 12.001 | SW12.3 | 79.9 | 1.038 | 0.303 | 17.3144 |
| 600 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 111.1 | 0.748 | 0.248 | 9.9067 |
| 600 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 149.5 | 0.019 | 0.004 | 2386.4614 |
| 600 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 41.3 | 0.586 | 0.145 | 6.8056 |
| 600 minute summer | SW13.1 | 13.000 | SW13.2 | 7.9 | 0.738 | 0.198 | 2.6746 |
| 600 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 149.5 | 0.019 | 0.004 | 2386.4614 |
| 600 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 600 minute winter. 840 minute analysis at 15 minute timestep. Mass balance: 99.61%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | SW8.1 | 315 | 11.971 | 0.046 | 10.8 | 0.1695 | 0.0000 | OK |
| 600 minute winter | SW8.2 | 315 | 9.967 | 0.063 | 12.5 | 0.1139 | 0.0000 | OK |
| 600 minute winter | SW9.1 | 315 | 10.593 | 0.060 | 19.8 | 0.3433 | 0.0000 | OK |
| 600 minute winter | SW8.3 | 315 | 9.086 | 0.114 | 39.0 | 0.3246 | 0.0000 | OK |
| 600 minute winter | SW10.1 | 315 | 9.538 | 0.077 | 24.1 | 0.4308 | 0.0000 | OK |
| 600 minute winter | SW8.4 | 315 | 8.674 | 0.157 | 66.5 | 0.3279 | 0.0000 | OK |
| 600 minute winter | SW11.1 | 570 | 8.663 | 0.286 | 29.1 | 2.2060 | 0.0000 | OK |
| 600 minute winter | SW8.5 | 570 | 8.657 | 0.760 | 103.1 | 2.2558 | 0.0000 | SURCHARGED |
| 600 minute winter | SW8.6 OUT | 615 | 8.684 | 1.598 | 103.1 | 2.8241 | 0.0000 | OK |
| 600 minute winter | SW12.1 | 315 | 11.418 | 0.060 | 23.6 | 0.4163 | 0.0000 | OK |
| 600 minute winter | SW12.2 | 585 | 8.653 | 0.910 | 61.7 | 6.4988 | 0.0000 | SURCHARGED |
| 600 minute winter | SW12.3 | 600 | 8.648 | 1.369 | 87.1 | 10.4091 | 0.0000 | SURCHARGED |
| 600 minute winter | SW12.4 OUT | 600 | 8.652 | 1.566 | 84.6 | 3.9856 | 0.0000 | OK |
| 600 minute winter | SW13.2 | 585 | 8.658 | 1.358 | 32.9 | 8.9724 | 0.0000 | SURCHARGED |
| 600 minute winter | SW13.1 | 585 | 8.652 | 0.577 | 6.1 | 1.2892 | 0.0000 | SURCHARGED |
| 600 minute winter | SW13.3 OUT | 600 | 8.647 | 1.561 | 31.7 | 2.7589 | 0.0000 | OK |
| 600 minute winter | INF BASIN 1 | 600 | 8.649 | 1.649 | 117.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 600 minute winter | SW8.1 | 8.000 | SW8.2 | 10.8 | 1.884 | 0.089 | 0.1906 |
| 600 minute winter | SW8.2 | 8.001 | SW8.3 | 12.5 | 0.571 | 0.043 | 2.6196 |
| 600 minute winter | SW9.1 | 9.000 | SW8.3 | 19.8 | 2.023 | 0.084 | 0.3106 |
| 600 minute winter | SW8.3 | 8.002 | SW8.4 | 39.0 | 0.975 | 0.144 | 2.6135 |
| 600 minute winter | SW10.1 | 10.000 | SW8.4 | 24.1 | 1.724 | 0.138 | 0.4539 |
| 600 minute winter | SW8.4 | 8.003 | SW8.5 | 66.5 | 1.391 | 0.251 | 6.0343 |
| 600 minute winter | SW11.1 | 11.000 | SW8.5 | 29.1 | 0.879 | 0.263 | 5.8443 |
| 600 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 103.1 | 1.051 | 0.265 | 4.0406 |
| 600 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 117.0 | 0.022 | 0.004 | 2736.4785 |
| 600 minute winter | SW12.1 | 12.000 | SW12.2 | 23.6 | 2.828 | 0.149 | 0.2341 |
| 600 minute winter | SW12.2 | 12.001 | SW12.3 | 58.6 | 0.958 | 0.222 | 17.3144 |
| 600 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 84.6 | 0.741 | 0.189 | 9.9067 |
| 600 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 117.0 | 0.022 | 0.004 | 2736.4785 |
| 600 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 31.7 | 0.594 | 0.111 | 6.8056 |
| 600 minute winter | SW13.1 | 13.000 | SW13.2 | 6.1 | 0.701 | 0.153 | 2.6746 |
| 600 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 117.0 | 0.022 | 0.004 | 2736.4785 |
| 600 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 99.88%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute summer | SW8.1 | 375 | 11.975 | 0.050 | 12.6 | 0.1833 | 0.0000 | OK |
| 720 minute summer | SW8.2 | 375 | 9.972 | 0.068 | 14.6 | 0.1228 | 0.0000 | OK |
| 720 minute summer | SW9.1 | 375 | 10.597 | 0.064 | 23.0 | 0.3704 | 0.0000 | OK |
| 720 minute summer | SW8.3 | 375 | 9.095 | 0.123 | 45.5 | 0.3509 | 0.0000 | OK |
| 720 minute summer | SW10.1 | 375 | 9.544 | 0.083 | 28.1 | 0.4669 | 0.0000 | OK |
| 720 minute summer | SW8.4 | 375 | 8.687 | 0.170 | 77.6 | 0.3570 | 0.0000 | OK |
| 720 minute summer | SW11.1 | 375 | 8.522 | 0.145 | 34.0 | 1.1213 | 0.0000 | OK |
| 720 minute summer | SW8.5 | 735 | 8.508 | 0.611 | 120.3 | 1.8157 | 0.0000 | OK |
| 720 minute summer | SW8.6 OUT | 735 | 8.511 | 1.425 | 120.3 | 2.5180 | 0.0000 | OK |
| 720 minute summer | SW12.1 | 375 | 11.423 | 0.065 | 27.5 | 0.4510 | 0.0000 | OK |
| 720 minute summer | SW12.2 | 720 | 8.519 | 0.776 | 72.0 | 5.5442 | 0.0000 | SURCHARGED |
| 720 minute summer | SW12.3 | 735 | 8.513 | 1.234 | 104.7 | 9.3787 | 0.0000 | SURCHARGED |
| 720 minute summer | SW12.4 OUT | 750 | 8.517 | 1.431 | 99.4 | 3.6417 | 0.0000 | OK |
| 720 minute summer | SW13.2 | 735 | 8.511 | 1.211 | 38.3 | 8.0022 | 0.0000 | SURCHARGED |
| 720 minute summer | SW13.1 | 720 | 8.527 | 0.452 | 7.1 | 1.0083 | 0.0000 | SURCHARGED |
| 720 minute summer | SW13.3 OUT | 690 | 8.506 | 1.420 | 36.8 | 2.5093 | 0.0000 | OK |
| 720 minute summer | INF BASIN 1 | 735 | 8.510 | 1.510 | 133.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 720 minute summer | SW8.1 | 8.000 | SW8.2 | 12.6 | 1.969 | 0.104 | 0.2127 |
| 720 minute summer | SW8.2 | 8.001 | SW8.3 | 14.6 | 0.597 | 0.051 | 2.9220 |
| 720 minute summer | SW9.1 | 9.000 | SW8.3 | 23.0 | 2.110 | 0.098 | 0.3457 |
| 720 minute summer | SW8.3 | 8.002 | SW8.4 | 45.5 | 1.016 | 0.168 | 2.9268 |
| 720 minute summer | SW10.1 | 10.000 | SW8.4 | 28.1 | 1.799 | 0.161 | 0.5072 |
| 720 minute summer | SW8.4 | 8.003 | SW8.5 | 77.6 | 1.449 | 0.293 | 4.5213 |
| 720 minute summer | SW11.1 | 11.000 | SW8.5 | 34.0 | 0.917 | 0.308 | 3.9095 |
| 720 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 120.3 | 1.097 | 0.309 | 3.9017 |
| 720 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 133.9 | 0.019 | 0.004 | 2445.1130 |
| 720 minute summer | SW12.1 | 12.000 | SW12.2 | 27.5 | 2.950 | 0.174 | 0.2615 |
| 720 minute summer | SW12.2 | 12.001 | SW12.3 | 71.4 | 0.964 | 0.271 | 17.3144 |
| 720 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 99.4 | 0.703 | 0.222 | 9.9067 |
| 720 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 133.9 | 0.019 | 0.004 | 2445.1130 |
| 720 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 36.8 | 0.546 | 0.129 | 6.8056 |
| 720 minute summer | SW13.1 | 13.000 | SW13.2 | 7.1 | 0.722 | 0.178 | 2.6746 |
| 720 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 133.9 | 0.019 | 0.004 | 2445.1130 |
| 720 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 720 minute winter. 960 minute analysis at 15 minute timestep. Mass balance: 99.73%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute winter | SW8.1 | 375 | 11.968 | 0.043 | 9.5 | 0.1590 | 0.0000 | OK |
| 720 minute winter | SW8.2 | 375 | 9.963 | 0.059 | 11.0 | 0.1072 | 0.0000 | OK |
| 720 minute winter | SW9.1 | 375 | 10.589 | 0.056 | 17.3 | 0.3208 | 0.0000 | OK |
| 720 minute winter | SW8.3 | 375 | 9.078 | 0.106 | 34.2 | 0.3039 | 0.0000 | OK |
| 720 minute winter | SW10.1 | 375 | 9.533 | 0.072 | 21.2 | 0.4032 | 0.0000 | OK |
| 720 minute winter | SW8.4 | 720 | 8.692 | 0.175 | 58.4 | 0.3663 | 0.0000 | OK |
| 720 minute winter | SW11.1 | 720 | 8.700 | 0.323 | 25.6 | 2.4953 | 0.0000 | OK |
| 720 minute winter | SW8.5 | 720 | 8.705 | 0.808 | 90.6 | 2.3986 | 0.0000 | SURCHARGED |
| 720 minute winter | SW8.6 OUT | 720 | 8.723 | 1.637 | 90.6 | 2.8929 | 0.0000 | OK |
| 720 minute winter | SW12.1 | 375 | 11.414 | 0.056 | 20.7 | 0.3890 | 0.0000 | OK |
| 720 minute winter | SW12.2 | 705 | 8.685 | 0.942 | 54.2 | 6.7304 | 0.0000 | SURCHARGED |
| 720 minute winter | SW12.3 | 720 | 8.689 | 1.410 | 76.6 | 10.7150 | 0.0000 | SURCHARGED |
| 720 minute winter | SW12.4 OUT | 720 | 8.684 | 1.598 | 74.9 | 4.0670 | 0.0000 | OK |
| 720 minute winter | SW13.2 | 705 | 8.689 | 1.389 | 28.8 | 9.1741 | 0.0000 | SURCHARGED |
| 720 minute winter | SW13.1 | 705 | 8.687 | 0.612 | 5.3 | 1.3671 | 0.0000 | SURCHARGED |
| 720 minute winter | SW13.3 OUT | 705 | 8.690 | 1.604 | 30.0 | 2.8348 | 0.0000 | OK |
| 720 minute winter | INF BASIN 1 | 720 | 8.685 | 1.685 | 105.7 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 720 minute winter | SW8.1 | 8.000 | SW8.2 | 9.5 | 1.815 | 0.078 | 0.1741 |
| 720 minute winter | SW8.2 | 8.001 | SW8.3 | 11.0 | 0.550 | 0.038 | 2.3884 |
| 720 minute winter | SW9.1 | 9.000 | SW8.3 | 17.3 | 1.944 | 0.074 | 0.2822 |
| 720 minute winter | SW8.3 | 8.002 | SW8.4 | 34.2 | 0.941 | 0.127 | 2.3761 |
| 720 minute winter | SW10.1 | 10.000 | SW8.4 | 21.2 | 1.664 | 0.122 | 0.4137 |
| 720 minute winter | SW8.4 | 8.003 | SW8.5 | 58.4 | 1.343 | 0.220 | 6.3174 |
| 720 minute winter | SW11.1 | 11.000 | SW8.5 | 25.6 | 0.848 | 0.232 | 6.1629 |
| 720 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 90.6 | 1.013 | 0.233 | 4.0406 |
| 720 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 105.7 | 0.021 | 0.003 | 2813.0576 |
| 720 minute winter | SW12.1 | 12.000 | SW12.2 | 20.7 | 2.726 | 0.131 | 0.2130 |
| 720 minute winter | SW12.2 | 12.001 | SW12.3 | 51.9 | 0.916 | 0.197 | 17.3144 |
| 720 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 74.9 | 0.730 | 0.167 | 9.9067 |
| 720 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 105.7 | 0.021 | 0.003 | 2813.0576 |
| 720 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 30.0 | 0.558 | 0.105 | 6.8056 |
| 720 minute winter | SW13.1 | 13.000 | SW13.2 | 5.3 | 0.665 | 0.133 | 2.6746 |
| 720 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 105.7 | 0.021 | 0.003 | 2813.0576 |
| 720 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 99.81%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute summer | SW8.1 | 495 | 11.970 | 0.045 | 10.4 | 0.1664 | 0.0000 | OK |
| 960 minute summer | SW8.2 | 495 | 9.966 | 0.062 | 12.0 | 0.1117 | 0.0000 | OK |
| 960 minute summer | SW9.1 | 495 | 10.592 | 0.059 | 19.0 | 0.3362 | 0.0000 | OK |
| 960 minute summer | SW8.3 | 495 | 9.083 | 0.111 | 37.5 | 0.3183 | 0.0000 | OK |
| 960 minute summer | SW10.1 | 495 | 9.537 | 0.076 | 23.2 | 0.4224 | 0.0000 | OK |
| 960 minute summer | SW8.4 | 495 | 8.670 | 0.153 | 64.0 | 0.3212 | 0.0000 | OK |
| 960 minute summer | SW11.1 | 960 | 8.549 | 0.172 | 28.0 | 1.3265 | 0.0000 | OK |
| 960 minute summer | SW8.5 | 945 | 8.545 | 0.648 | 99.2 | 1.9260 | 0.0000 | OK |
| 960 minute summer | SW8.6 OUT | 945 | 8.548 | 1.462 | 99.2 | 2.5841 | 0.0000 | OK |
| 960 minute summer | SW12.1 | 495 | 11.417 | 0.059 | 22.6 | 0.4070 | 0.0000 | OK |
| 960 minute summer | SW12.2 | 960 | 8.547 | 0.804 | 59.2 | 5.7462 | 0.0000 | SURCHARGED |
| 960 minute summer | SW12.3 | 945 | 8.542 | 1.263 | 86.2 | 9.6003 | 0.0000 | SURCHARGED |
| 960 minute summer | SW12.4 OUT | 1005 | 8.542 | 1.456 | 82.1 | 3.7043 | 0.0000 | OK |
| 960 minute summer | SW13.2 | 945 | 8.542 | 1.242 | 31.5 | 8.2030 | 0.0000 | SURCHARGED |
| 960 minute summer | SW13.1 | 960 | 8.544 | 0.469 | 5.8 | 1.0475 | 0.0000 | SURCHARGED |
| 960 minute summer | SW13.3 OUT | 930 | 8.548 | 1.462 | 38.2 | 2.5842 | 0.0000 | OK |
| 960 minute summer | INF BASIN 1 | 960 | 8.541 | 1.541 | 110.6 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 960 minute summer | SW8.1 | 8.000 | SW8.2 | 10.4 | 1.864 | 0.086 | 0.1856 |
| 960 minute summer | SW8.2 | 8.001 | SW8.3 | 12.0 | 0.563 | 0.042 | 2.5469 |
| 960 minute summer | SW9.1 | 9.000 | SW8.3 | 19.0 | 1.998 | 0.081 | 0.3016 |
| 960 minute summer | SW8.3 | 8.002 | SW8.4 | 37.5 | 0.965 | 0.139 | 2.5409 |
| 960 minute summer | SW10.1 | 10.000 | SW8.4 | 23.2 | 1.706 | 0.133 | 0.4415 |
| 960 minute summer | SW8.4 | 8.003 | SW8.5 | 64.0 | 1.376 | 0.242 | 4.7747 |
| 960 minute summer | SW11.1 | 11.000 | SW8.5 | 28.0 | 0.870 | 0.253 | 4.5014 |
| 960 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 99.2 | 1.040 | 0.255 | 4.0098 |
| 960 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 110.6 | 0.017 | 0.003 | 2509.7161 |
| 960 minute summer | SW12.1 | 12.000 | SW12.2 | 22.6 | 2.794 | 0.143 | 0.2269 |
| 960 minute summer | SW12.2 | 12.001 | SW12.3 | 58.8 | 0.906 | 0.223 | 17.3144 |
| 960 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 82.1 | 0.668 | 0.183 | 9.9067 |
| 960 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 110.6 | 0.017 | 0.003 | 2509.7161 |
| 960 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 29.5 | 0.508 | 0.104 | 6.8056 |
| 960 minute summer | SW13.1 | 13.000 | SW13.2 | 5.8 | 0.665 | 0.145 | 2.6746 |
| 960 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 110.6 | 0.017 | 0.003 | 2509.7161 |
| 960 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 960 minute winter. 1200 minute analysis at 15 minute timestep. Mass balance: 99.81%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | SW8.1 | 495 | 11.964 | 0.039 | 7.7 | 0.1434 | 0.0000 | OK |
| 960 minute winter | SW8.2 | 495 | 9.958 | 0.054 | 8.9 | 0.0969 | 0.0000 | OK |
| 960 minute winter | SW9.1 | 495 | 10.583 | 0.050 | 14.1 | 0.2897 | 0.0000 | OK |
| 960 minute winter | SW8.3 | 495 | 9.068 | 0.096 | 27.8 | 0.2740 | 0.0000 | OK |
| 960 minute winter | SW10.1 | 495 | 9.526 | 0.065 | 17.2 | 0.3620 | 0.0000 | OK |
| 960 minute winter | SW8.4 | 930 | 8.746 | 0.229 | 47.5 | 0.4794 | 0.0000 | OK |
| 960 minute winter | SW11.1 | 960 | 8.742 | 0.365 | 20.8 | 2.8158 | 0.0000 | OK |
| 960 minute winter | SW8.5 | 915 | 8.742 | 0.845 | 73.6 | 2.5102 | 0.0000 | SURCHARGED |
| 960 minute winter | SW8.6 OUT | 945 | 8.771 | 1.685 | 73.4 | 2.9773 | 0.0000 | OK |
| 960 minute winter | SW12.1 | 495 | 11.408 | 0.050 | 16.8 | 0.3494 | 0.0000 | OK |
| 960 minute winter | SW12.2 | 945 | 8.732 | 0.989 | 44.0 | 7.0631 | 0.0000 | SURCHARGED |
| 960 minute winter | SW12.3 | 945 | 8.731 | 1.452 | 62.1 | 11.0387 | 0.0000 | SURCHARGED |
| 960 minute winter | SW12.4 OUT | 945 | 8.731 | 1.645 | 61.3 | 4.1861 | 0.0000 | OK |
| 960 minute winter | SW13.2 | 945 | 8.737 | 1.437 | 23.4 | 9.4935 | 0.0000 | SURCHARGED |
| 960 minute winter | SW13.1 | 945 | 8.737 | 0.662 | 4.3 | 1.4775 | 0.0000 | SURCHARGED |
| 960 minute winter | SW13.3 OUT | 960 | 8.730 | 1.644 | 31.7 | 2.9056 | 0.0000 | OK |
| 960 minute winter | INF BASIN 1 | 945 | 8.731 | 1.731 | 101.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 960 minute winter | SW8.1 | 8.000 | SW8.2 | 7.7 | 1.707 | 0.063 | 0.1500 |
| 960 minute winter | SW8.2 | 8.001 | SW8.3 | 8.9 | 0.516 | 0.031 | 2.0618 |
| 960 minute winter | SW9.1 | 9.000 | SW8.3 | 14.1 | 1.833 | 0.060 | 0.2440 |
| 960 minute winter | SW8.3 | 8.002 | SW8.4 | 27.8 | 0.889 | 0.103 | 2.8176 |
| 960 minute winter | SW10.1 | 10.000 | SW8.4 | 17.2 | 1.569 | 0.099 | 0.3558 |
| 960 minute winter | SW8.4 | 8.003 | SW8.5 | 47.5 | 1.270 | 0.179 | 7.0228 |
| 960 minute winter | SW11.1 | 11.000 | SW8.5 | 20.8 | 0.801 | 0.188 | 6.4066 |
| 960 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 73.4 | 0.956 | 0.189 | 4.0406 |
| 960 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 101.9 | 0.019 | 0.003 | 2911.4473 |
| 960 minute winter | SW12.1 | 12.000 | SW12.2 | 16.8 | 2.572 | 0.106 | 0.1832 |
| 960 minute winter | SW12.2 | 12.001 | SW12.3 | 41.8 | 0.858 | 0.159 | 17.3144 |
| 960 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 61.3 | 0.678 | 0.137 | 9.9067 |
| 960 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 101.9 | 0.019 | 0.003 | 2911.4473 |
| 960 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 24.8 | 0.527 | 0.087 | 6.8056 |
| 960 minute winter | SW13.1 | 13.000 | SW13.2 | 4.3 | 0.628 | 0.108 | 2.6746 |
| 960 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 101.9 | 0.019 | 0.003 | 2911.4473 |
| 960 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 99.65%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW8.1 | 750 | 11.964 | 0.039 | 7.6 | 0.1424 | 0.0000 | OK |
| 1440 minute summer | SW8.2 | 750 | 9.957 | 0.053 | 8.8 | 0.0964 | 0.0000 | OK |
| 1440 minute summer | SW9.1 | 750 | 10.583 | 0.050 | 13.8 | 0.2866 | 0.0000 | OK |
| 1440 minute summer | SW8.3 | 750 | 9.067 | 0.095 | 27.3 | 0.2715 | 0.0000 | OK |
| 1440 minute summer | SW10.1 | 750 | 9.525 | 0.064 | 16.9 | 0.3588 | 0.0000 | OK |
| 1440 minute summer | SW8.4 | 750 | 8.646 | 0.129 | 46.6 | 0.2710 | 0.0000 | OK |
| 1440 minute summer | SW11.1 | 1440 | 8.547 | 0.170 | 20.3 | 1.3144 | 0.0000 | OK |
| 1440 minute summer | SW8.5 | 1410 | 8.551 | 0.654 | 72.1 | 1.9428 | 0.0000 | OK |
| 1440 minute summer | SW8.6 OUT | 1350 | 8.560 | 1.474 | 72.1 | 2.6047 | 0.0000 | OK |
| 1440 minute summer | SW12.1 | 750 | 11.408 | 0.050 | 16.5 | 0.3462 | 0.0000 | OK |
| 1440 minute summer | SW12.2 | 1410 | 8.545 | 0.802 | 43.1 | 5.7279 | 0.0000 | SURCHARGED |
| 1440 minute summer | SW12.3 | 1350 | 8.550 | 1.272 | 62.8 | 9.6649 | 0.0000 | SURCHARGED |
| 1440 minute summer | SW12.4 OUT | 1440 | 8.546 | 1.460 | 59.8 | 3.7159 | 0.0000 | OK |
| 1440 minute summer | SW13.2 | 1410 | 8.547 | 1.247 | 22.9 | 8.2400 | 0.0000 | SURCHARGED |
| 1440 minute summer | SW13.1 | 1410 | 8.554 | 0.479 | 4.2 | 1.0700 | 0.0000 | SURCHARGED |
| 1440 minute summer | SW13.3 OUT | 1290 | 8.549 | 1.463 | 34.1 | 2.5851 | 0.0000 | OK |
| 1440 minute summer | INF BASIN 1 | 1440 | 8.544 | 1.544 | 82.7 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW8.1 | 8.000 | SW8.2 | 7.6 | 1.700 | 0.063 | 0.1486 |
| 1440 minute summer | SW8.2 | 8.001 | SW8.3 | 8.8 | 0.516 | 0.031 | 2.0387 |
| 1440 minute summer | SW9.1 | 9.000 | SW8.3 | 13.8 | 1.822 | 0.059 | 0.2403 |
| 1440 minute summer | SW8.3 | 8.002 | SW8.4 | 27.3 | 0.886 | 0.101 | 2.0156 |
| 1440 minute summer | SW10.1 | 10.000 | SW8.4 | 16.9 | 1.561 | 0.097 | 0.3513 |
| 1440 minute summer | SW8.4 | 8.003 | SW8.5 | 46.6 | 1.264 | 0.176 | 4.7644 |
| 1440 minute summer | SW11.1 | 11.000 | SW8.5 | 20.3 | 0.796 | 0.184 | 4.5269 |
| 1440 minute summer | SW8.5 | 8.004 | SW8.6 OUT | 72.1 | 0.952 | 0.185 | 4.0134 |
| 1440 minute summer | SW8.6 OUT | Flow through pond | INF BASIN 1 | 82.7 | 0.014 | 0.002 | 2515.4617 |
| 1440 minute summer | SW12.1 | 12.000 | SW12.2 | 16.5 | 2.559 | 0.104 | 0.1809 |
| 1440 minute summer | SW12.2 | 12.001 | SW12.3 | 42.9 | 0.839 | 0.163 | 17.3144 |
| 1440 minute summer | SW12.3 | 12.002 | SW12.4 OUT | 59.8 | 0.652 | 0.134 | 9.9067 |
| 1440 minute summer | SW12.4 OUT | Flow through pond | INF BASIN 1 | 82.7 | 0.014 | 0.002 | 2515.4617 |
| 1440 minute summer | SW13.2 | 13.001 | SW13.3 OUT | 23.2 | 0.482 | 0.081 | 6.8056 |
| 1440 minute summer | SW13.1 | 13.000 | SW13.2 | 4.2 | 0.623 | 0.105 | 2.6746 |
| 1440 minute summer | SW13.3 OUT | Flow through pond | INF BASIN 1 | 82.7 | 0.014 | 0.002 | 2515.4617 |
| 1440 minute summer | INF BASIN 1 | Infiltration | | 12.6 | | | |

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**Results for 100 year +40% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 99.85%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW8.1 | 750 | 11.958 | 0.033 | 5.7 | 0.1236 | 0.0000 | OK |
| 1440 minute winter | SW8.2 | 750 | 9.951 | 0.047 | 6.6 | 0.0842 | 0.0000 | OK |
| 1440 minute winter | SW9.1 | 750 | 10.576 | 0.043 | 10.4 | 0.2492 | 0.0000 | OK |
| 1440 minute winter | SW8.3 | 750 | 9.055 | 0.083 | 20.5 | 0.2359 | 0.0000 | OK |
| 1440 minute winter | SW10.1 | 750 | 9.517 | 0.056 | 12.7 | 0.3107 | 0.0000 | OK |
| 1440 minute winter | SW8.4 | 1440 | 8.774 | 0.257 | 35.0 | 0.5377 | 0.0000 | OK |
| 1440 minute winter | SW11.1 | 1440 | 8.781 | 0.404 | 15.3 | 3.1175 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW8.5 | 1440 | 8.777 | 0.880 | 54.2 | 2.6127 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW8.6 OUT | 1410 | 8.802 | 1.716 | 60.5 | 3.0319 | 0.0000 | OK |
| 1440 minute winter | SW12.1 | 750 | 11.401 | 0.043 | 12.4 | 0.2997 | 0.0000 | OK |
| 1440 minute winter | SW12.2 | 1410 | 8.765 | 1.022 | 32.5 | 7.2980 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW12.3 | 1380 | 8.764 | 1.486 | 46.2 | 11.2914 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW12.4 OUT | 1380 | 8.763 | 1.677 | 49.1 | 4.2675 | 0.0000 | OK |
| 1440 minute winter | SW13.2 | 1410 | 8.767 | 1.467 | 17.3 | 9.6951 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW13.1 | 1410 | 8.768 | 0.693 | 3.2 | 1.5464 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW13.3 OUT | 1320 | 8.757 | 1.671 | 33.2 | 2.9527 | 0.0000 | OK |
| 1440 minute winter | INF BASIN 1 | 1410 | 8.761 | 1.761 | 160.3 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW8.1 | 8.000 | SW8.2 | 5.7 | 1.564 | 0.047 | 0.1212 |
| 1440 minute winter | SW8.2 | 8.001 | SW8.3 | 6.6 | 0.474 | 0.023 | 1.6671 |
| 1440 minute winter | SW9.1 | 9.000 | SW8.3 | 10.4 | 1.679 | 0.044 | 0.1965 |
| 1440 minute winter | SW8.3 | 8.002 | SW8.4 | 20.5 | 0.818 | 0.076 | 3.1617 |
| 1440 minute winter | SW10.1 | 10.000 | SW8.4 | 12.7 | 1.438 | 0.073 | 0.3896 |
| 1440 minute winter | SW8.4 | 8.003 | SW8.5 | 35.0 | 1.167 | 0.132 | 7.3881 |
| 1440 minute winter | SW11.1 | 11.000 | SW8.5 | 15.3 | 0.737 | 0.138 | 6.4313 |
| 1440 minute winter | SW8.5 | 8.004 | SW8.6 OUT | 54.1 | 0.878 | 0.139 | 4.0406 |
| 1440 minute winter | SW8.6 OUT | Flow through pond | INF BASIN 1 | 160.3 | 0.016 | 0.005 | 2978.3779 |
| 1440 minute winter | SW12.1 | 12.000 | SW12.2 | 12.4 | 2.357 | 0.079 | 0.1476 |
| 1440 minute winter | SW12.2 | 12.001 | SW12.3 | 31.2 | 0.797 | 0.118 | 17.3144 |
| 1440 minute winter | SW12.3 | 12.002 | SW12.4 OUT | 45.6 | 0.633 | 0.102 | 9.9067 |
| 1440 minute winter | SW12.4 OUT | Flow through pond | INF BASIN 1 | 160.3 | 0.016 | 0.005 | 2978.3779 |
| 1440 minute winter | SW13.2 | 13.001 | SW13.3 OUT | 18.8 | 0.478 | 0.066 | 6.8056 |
| 1440 minute winter | SW13.1 | 13.000 | SW13.2 | 3.2 | 0.577 | 0.080 | 2.6746 |
| 1440 minute winter | SW13.3 OUT | Flow through pond | INF BASIN 1 | 160.3 | 0.016 | 0.005 | 2978.3779 |
| 1440 minute winter | INF BASIN 1 | Infiltration | | 12.6 | | | |

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## Design Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Maximum Time of Concentration (mins) | 30.00 |
| Return Period (years) | 2 | Maximum Rainfall (mm/hr) | 75.0 |
| Additional Flow (%) | 0 | Minimum Velocity (m/s) | 1.00 |
| FSR Region | England and Wales | Connection Type | Level Soffits |
| M5-60 (mm) | 17.000 | Minimum Backdrop Height (m) | 0.200 |
| Ratio-R | 0.300 | Preferred Cover Depth (m) | 1.200 |
| CV | 0.750 | Include Intermediate Ground | ✓ |
| Time of Entry (mins) | 4.00 | Enforce best practice design rules | ✓ |

## Nodes

| Name | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|---|---|---|---|---|---|---|---|
| SW 20.1 | 0.217 | 4.00 | 13.000 | 1200 | 282626.703 | 176959.049 | 1.500 |
| SW 20.2 | 0.173 | 4.00 | 12.800 | 1350 | 282627.364 | 176895.474 | 1.753 |
| SW 21.1 | 0.342 | 4.00 | 12.500 | 1350 | 282554.980 | 176944.586 | 1.575 |
| SW 21.2 | 0.034 | 4.00 | 12.200 | 1350 | 282571.245 | 176896.108 | 1.500 |
| SW 20.3 | 0.038 | 4.00 | 12.585 | 1350 | 282588.330 | 176896.109 | 1.956 |
| SW 20.4 OUT | | | 12.000 | 1350 | 282588.330 | 176908.380 | 1.988 |
| INF BASIN 4 | | | 11.700 | | 282589.700 | 176914.239 | 1.700 |

## Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.000 | SW 20.1 | SW 20.2 | 63.578 | 0.600 | 11.500 | 11.122 | 0.378 | 168.2 | 300 | 4.88 | 52.0 |
| 20.001 | SW 20.2 | SW 20.3 | 39.039 | 0.600 | 11.047 | 10.629 | 0.418 | 93.4 | 375 | 5.22 | 50.6 |
| 21.000 | SW 21.1 | SW 21.2 | 51.134 | 0.600 | 10.925 | 10.700 | 0.225 | 227.3 | 375 | 4.71 | 52.7 |
| 21.001 | SW 21.2 | SW 20.3 | 17.085 | 0.600 | 10.700 | 10.629 | 0.071 | 242.0 | 375 | 4.96 | 51.7 |
| 20.002 | SW 20.3 | SW 20.4 OUT | 12.271 | 0.600 | 10.629 | 10.591 | 0.038 | 324.0 | 375 | 5.43 | 49.9 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 20.000 | 1.209 | 85.5 | 30.6 | 1.200 | 1.378 | 0.217 | 0.0 | 124 | 1.112 |
| 20.001 | 1.875 | 207.1 | 53.5 | 1.378 | 1.581 | 0.390 | 0.0 | 129 | 1.581 |
| 21.000 | 1.197 | 132.3 | 48.8 | 1.200 | 1.125 | 0.342 | 0.0 | 157 | 1.109 |
| 21.001 | 1.160 | 128.1 | 52.6 | 1.125 | 1.581 | 0.376 | 0.0 | 167 | 1.105 |
| 20.002 | 1.001 | 110.5 | 108.7 | 1.581 | 1.034 | 0.804 | 0.0 | 304 | 1.134 |

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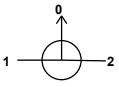
## Pipeline Schedule

| Link | Length (m) | Slope (1:X) | Dia (mm) | Link Type | US CL (m) | US IL (m) | US Depth (m) | DS CL (m) | DS IL (m) | DS Depth (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 20.000 | 63.578 | 168.2 | 300 | Circular | 13.000 | 11.500 | 1.200 | 12.800 | 11.122 | 1.378 |
| 20.001 | 39.039 | 93.4 | 375 | Circular | 12.800 | 11.047 | 1.378 | 12.585 | 10.629 | 1.581 |
| 21.000 | 51.134 | 227.3 | 375 | Circular | 12.500 | 10.925 | 1.200 | 12.200 | 10.700 | 1.125 |
| 21.001 | 17.085 | 242.0 | 375 | Circular | 12.200 | 10.700 | 1.125 | 12.585 | 10.629 | 1.581 |
| 20.002 | 12.271 | 324.0 | 375 | Circular | 12.585 | 10.629 | 1.581 | 12.000 | 10.591 | 1.034 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 20.000 | SW 20.1 | 1200 | Manhole | Adoptable | SW 20.2 | 1350 | Manhole | Adoptable |
| 20.001 | SW 20.2 | 1350 | Manhole | Adoptable | SW 20.3 | 1350 | Manhole | Adoptable |
| 21.000 | SW 21.1 | 1350 | Manhole | Adoptable | SW 21.2 | 1350 | Manhole | Adoptable |
| 21.001 | SW 21.2 | 1350 | Manhole | Adoptable | SW 20.3 | 1350 | Manhole | Adoptable |
| 20.002 | SW 20.3 | 1350 | Manhole | Adoptable | SW 20.4 OUT | 1350 | Manhole | Adoptable |

## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| SW 20.1 | 282626.703 | 176959.049 | 13.000 | 1.500 | 1200 | 0 | 20.000 | 11.500 | 300 |
| SW 20.2 | 282627.364 | 176895.474 | 12.800 | 1.753 | 1350 | 1 | 20.000 | 11.122 | 300 |
| | | | | | | 0 | 20.001 | 11.047 | 375 |
| SW 21.1 | 282554.980 | 176944.586 | 12.500 | 1.575 | 1350 | 0 | 21.000 | 10.925 | 375 |
| SW 21.2 | 282571.245 | 176896.108 | 12.200 | 1.500 | 1350 | 1 | 21.000 | 10.700 | 375 |
| | | | | | | 0 | 21.001 | 10.700 | 375 |
| SW 20.3 | 282588.330 | 176896.109 | 12.585 | 1.956 | 1350 |  1 | 21.001 | 10.629 | 375 |
| | | | | | | 2 | 20.001 | 10.629 | 375 |
| | | | | | | 0 | 20.002 | 10.629 | 375 |
| SW 20.4 OUT | 282588.330 | 176908.380 | 12.000 | 1.988 | 1350 | 1 | 20.002 | 10.591 | 375 |
| INF BASIN 4 | 282589.700 | 176914.239 | 11.700 | 1.700 | | | | | |

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## Simulation Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Analysis Speed | Detailed |
| FSR Region | England and Wales | Skip Steady State | x |
| M5-60 (mm) | 17.000 | Drain Down Time (mins) | 240 |
| Ratio-R | 0.300 | Additional Storage (m³/ha) | 20.0 |
| Summer CV | 0.750 | Check Discharge Rate(s) | x |
| Winter CV | 0.840 | Check Discharge Volume | x |

### Storm Durations

| 15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440 |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|---|---|---|---|
| 100 | 40 | 0 | 0 |

## Node INF BASIN 4 Flow through Pond Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.69984 | Porosity | 1.00 | Main Channel Length (m) | 6.000 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m) | 10.000 | Main Channel Slope (1:X) | 500.0 |
| Safety Factor | 10.0 | Time to half empty (mins) | | Main Channel n | 0.350 |

### Inlets

SW 20.4 OUT

| Depth (m) | Area (m²) | Inf Area (m²) | Depth (m) | Area (m²) | Inf Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 286.4 | 286.4 | 1.700 | 760.8 | 286.4 |

## Rainfall

| Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) | Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) |
|---|---|---|---|---|---|
| 100 year +40% CC 15 minute summer | 368.854 | 104.373 | 100 year +40% CC 360 minute summer | 55.175 | 14.198 |
| 100 year +40% CC 15 minute winter | 258.845 | 104.373 | 100 year +40% CC 360 minute winter | 35.865 | 14.198 |
| 100 year +40% CC 30 minute summer | 255.101 | 72.185 | 100 year +40% CC 480 minute summer | 43.619 | 11.527 |
| 100 year +40% CC 30 minute winter | 179.018 | 72.185 | 100 year +40% CC 480 minute winter | 28.979 | 11.527 |
| 100 year +40% CC 60 minute summer | 180.954 | 47.821 | 100 year +40% CC 600 minute summer | 35.816 | 9.797 |
| 100 year +40% CC 60 minute winter | 120.222 | 47.821 | 100 year +40% CC 600 minute winter | 24.472 | 9.797 |
| 100 year +40% CC 120 minute summer | 116.088 | 30.679 | 100 year +40% CC 720 minute summer | 31.983 | 8.572 |
| 100 year +40% CC 120 minute winter | 77.126 | 30.679 | 100 year +40% CC 720 minute winter | 21.495 | 8.572 |
| 100 year +40% CC 180 minute summer | 90.626 | 23.321 | 100 year +40% CC 960 minute summer | 26.337 | 6.935 |
| 100 year +40% CC 180 minute winter | 58.909 | 23.321 | 100 year +40% CC 960 minute winter | 17.446 | 6.935 |
| 100 year +40% CC 240 minute summer | 72.104 | 19.055 | 100 year +40% CC 1440 minute summer | 19.151 | 5.133 |
| 100 year +40% CC 240 minute winter | 47.904 | 19.055 | 100 year +40% CC 1440 minute winter | 12.870 | 5.133 |

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**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.67%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW 20.1 | 11 | 12.531 | 1.031 | 109.0 | 4.1491 | 0.0000 | SURCHARGED |
| 15 minute winter | SW 20.2 | 11 | 11.985 | 0.938 | 176.3 | 3.1900 | 0.0000 | SURCHARGED |
| 15 minute winter | SW 21.1 | 11 | 12.172 | 1.247 | 171.8 | 7.2044 | 0.0000 | SURCHARGED |
| 15 minute winter | SW 21.2 | 11 | 11.813 | 1.113 | 171.0 | 2.0930 | 0.0000 | SURCHARGED |
| 15 minute winter | SW 20.3 | 11 | 11.626 | 0.997 | 360.0 | 1.8188 | 0.0000 | SURCHARGED |
| 600 minute winter | SW 20.4 OUT | 585 | 11.070 | 1.058 | 45.9 | 1.5142 | 0.0000 | OK |
| 600 minute winter | INF BASIN 4 | 585 | 11.070 | 1.070 | 25.8 | 0.0000 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute winter | SW 20.1 | 20.000 | SW 20.2 | 96.1 | 1.365 | 1.124 | 4.4771 |
| 15 minute winter | SW 20.2 | 20.001 | SW 20.3 | 172.7 | 1.566 | 0.834 | 4.3059 |
| 15 minute winter | SW 21.1 | 21.000 | SW 21.2 | 155.0 | 1.406 | 1.172 | 5.6399 |
| 15 minute winter | SW 21.2 | 21.001 | SW 20.3 | 170.8 | 1.549 | 1.333 | 1.8844 |
| 15 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 360.9 | 3.273 | 3.265 | 1.3398 |
| 600 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 25.8 | 0.006 | 0.001 | 462.6914 |
| 600 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 99.78%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | SW 20.1 | 11 | 12.467 | 0.967 | 108.9 | 3.8925 | 0.0000 | SURCHARGED |
| 15 minute summer | SW 20.2 | 11 | 11.943 | 0.896 | 173.2 | 3.0483 | 0.0000 | SURCHARGED |
| 15 minute summer | SW 21.1 | 11 | 12.125 | 1.200 | 171.8 | 6.9338 | 0.0000 | SURCHARGED |
| 15 minute summer | SW 21.2 | 11 | 11.781 | 1.081 | 168.8 | 2.0314 | 0.0000 | SURCHARGED |
| 15 minute summer | SW 20.3 | 11 | 11.600 | 0.971 | 352.9 | 1.7712 | 0.0000 | SURCHARGED |
| 15 minute summer | SW 20.4 OUT | 22 | 10.437 | 0.425 | 354.0 | 0.6082 | 0.0000 | OK |
| 15 minute summer | INF BASIN 4 | 22 | 10.437 | 0.437 | 181.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute summer | SW 20.1 | 20.000 | SW 20.2 | 94.1 | 1.337 | 1.101 | 4.4771 |
| 15 minute summer | SW 20.2 | 20.001 | SW 20.3 | 169.1 | 1.533 | 0.816 | 4.3059 |
| 15 minute summer | SW 21.1 | 21.000 | SW 21.2 | 152.3 | 1.381 | 1.151 | 5.6399 |
| 15 minute summer | SW 21.2 | 21.001 | SW 20.3 | 167.9 | 1.523 | 1.311 | 1.8844 |
| 15 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 354.0 | 3.210 | 3.203 | 1.3398 |
| 15 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 181.9 | 0.036 | 0.009 | 149.4285 |
| 15 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 99.77%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW 20.1 | 11 | 12.531 | 1.031 | 109.0 | 4.1491 | 0.0000 | SURCHARGED |
| 15 minute winter | SW 20.2 | 11 | 11.985 | 0.938 | 176.3 | 3.1900 | 0.0000 | SURCHARGED |
| 15 minute winter | SW 21.1 | 11 | 12.172 | 1.247 | 171.8 | 7.2044 | 0.0000 | SURCHARGED |
| 15 minute winter | SW 21.2 | 11 | 11.813 | 1.113 | 171.0 | 2.0930 | 0.0000 | SURCHARGED |
| 15 minute winter | SW 20.3 | 11 | 11.626 | 0.997 | 360.0 | 1.8188 | 0.0000 | SURCHARGED |
| 15 minute winter | SW 20.4 OUT | 22 | 10.483 | 0.471 | 360.9 | 0.6735 | 0.0000 | OK |
| 15 minute winter | INF BASIN 4 | 22 | 10.483 | 0.483 | 184.7 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute winter | SW 20.1 | 20.000 | SW 20.2 | 96.1 | 1.365 | 1.124 | 4.4771 |
| 15 minute winter | SW 20.2 | 20.001 | SW 20.3 | 172.7 | 1.566 | 0.834 | 4.3059 |
| 15 minute winter | SW 21.1 | 21.000 | SW 21.2 | 155.0 | 1.406 | 1.172 | 5.6399 |
| 15 minute winter | SW 21.2 | 21.001 | SW 20.3 | 170.8 | 1.549 | 1.333 | 1.8844 |
| 15 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 360.9 | 3.273 | 3.265 | 1.3398 |
| 15 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 184.7 | 0.037 | 0.010 | 168.2227 |
| 15 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.74%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute summer | SW 20.1 | 18 | 12.297 | 0.797 | 100.6 | 3.2092 | 0.0000 | SURCHARGED |
| 30 minute summer | SW 20.2 | 18 | 11.839 | 0.792 | 162.6 | 2.6949 | 0.0000 | SURCHARGED |
| 30 minute summer | SW 21.1 | 18 | 12.011 | 1.086 | 158.5 | 6.2711 | 0.0000 | SURCHARGED |
| 30 minute summer | SW 21.2 | 18 | 11.691 | 0.991 | 159.5 | 1.8633 | 0.0000 | SURCHARGED |
| 30 minute summer | SW 20.3 | 18 | 11.529 | 0.900 | 334.2 | 1.6409 | 0.0000 | SURCHARGED |
| 30 minute summer | SW 20.4 OUT | 37 | 10.568 | 0.556 | 333.0 | 0.7961 | 0.0000 | OK |
| 30 minute summer | INF BASIN 4 | 37 | 10.568 | 0.568 | 170.1 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 30 minute summer | SW 20.1 | 20.000 | SW 20.2 | 88.8 | 1.285 | 1.039 | 4.4771 |
| 30 minute summer | SW 20.2 | 20.001 | SW 20.3 | 159.3 | 1.444 | 0.769 | 4.3059 |
| 30 minute summer | SW 21.1 | 21.000 | SW 21.2 | 144.8 | 1.313 | 1.095 | 5.6399 |
| 30 minute summer | SW 21.2 | 21.001 | SW 20.3 | 158.1 | 1.434 | 1.234 | 1.8844 |
| 30 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 333.0 | 3.019 | 3.012 | 1.3398 |
| 30 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 170.1 | 0.023 | 0.009 | 205.2166 |
| 30 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 99.67%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | SW 20.1 | 18 | 12.057 | 0.557 | 87.0 | 2.2404 | 0.0000 | SURCHARGED |
| 30 minute winter | SW 20.2 | 18 | 11.678 | 0.631 | 149.6 | 2.1460 | 0.0000 | SURCHARGED |
| 30 minute winter | SW 21.1 | 18 | 11.812 | 0.887 | 137.1 | 5.1270 | 0.0000 | SURCHARGED |
| 30 minute winter | SW 21.2 | 18 | 11.554 | 0.854 | 143.5 | 1.6064 | 0.0000 | SURCHARGED |
| 30 minute winter | SW 20.3 | 18 | 11.423 | 0.794 | 302.0 | 1.4475 | 0.0000 | SURCHARGED |
| 30 minute winter | SW 20.4 OUT | 36 | 10.626 | 0.614 | 301.3 | 0.8786 | 0.0000 | OK |
| 30 minute winter | INF BASIN 4 | 36 | 10.626 | 0.626 | 153.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 30 minute winter | SW 20.1 | 20.000 | SW 20.2 | 82.5 | 1.320 | 0.966 | 4.4771 |
| 30 minute winter | SW 20.2 | 20.001 | SW 20.3 | 145.0 | 1.314 | 0.700 | 4.3059 |
| 30 minute winter | SW 21.1 | 21.000 | SW 21.2 | 130.4 | 1.182 | 0.986 | 5.6399 |
| 30 minute winter | SW 21.2 | 21.001 | SW 20.3 | 142.7 | 1.294 | 1.114 | 1.8844 |
| 30 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 301.3 | 2.732 | 2.726 | 1.3398 |
| 30 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 153.9 | 0.025 | 0.008 | 231.1987 |
| 30 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.75%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute summer | SW 20.1 | 34 | 11.732 | 0.232 | 76.4 | 0.9333 | 0.0000 | OK |
| 60 minute summer | SW 20.2 | 33 | 11.518 | 0.471 | 138.5 | 1.6027 | 0.0000 | SURCHARGED |
| 60 minute summer | SW 21.1 | 33 | 11.618 | 0.693 | 120.5 | 4.0012 | 0.0000 | SURCHARGED |
| 60 minute summer | SW 21.2 | 33 | 11.419 | 0.719 | 126.0 | 1.3518 | 0.0000 | SURCHARGED |
| 60 minute summer | SW 20.3 | 33 | 11.318 | 0.689 | 266.6 | 1.2563 | 0.0000 | SURCHARGED |
| 60 minute summer | SW 20.4 OUT | 65 | 10.701 | 0.689 | 266.4 | 0.9857 | 0.0000 | OK |
| 60 minute summer | INF BASIN 4 | 65 | 10.701 | 0.701 | 136.3 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 60 minute summer | SW 20.1 | 20.000 | SW 20.2 | 77.7 | 1.323 | 0.909 | 4.0962 |
| 60 minute summer | SW 20.2 | 20.001 | SW 20.3 | 128.9 | 1.169 | 0.623 | 4.3059 |
| 60 minute summer | SW 21.1 | 21.000 | SW 21.2 | 114.2 | 1.036 | 0.864 | 5.6399 |
| 60 minute summer | SW 21.2 | 21.001 | SW 20.3 | 124.8 | 1.132 | 0.974 | 1.8844 |
| 60 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 266.4 | 2.415 | 2.410 | 1.3365 |
| 60 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 136.3 | 0.018 | 0.007 | 266.3888 |
| 60 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 99.83%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute winter | SW 20.1 | 33 | 11.689 | 0.189 | 60.1 | 0.7626 | 0.0000 | OK |
| 60 minute winter | SW 20.2 | 33 | 11.276 | 0.229 | 107.2 | 0.7798 | 0.0000 | OK |
| 60 minute winter | SW 21.1 | 33 | 11.384 | 0.459 | 94.7 | 2.6507 | 0.0000 | SURCHARGED |
| 60 minute winter | SW 21.2 | 33 | 11.252 | 0.552 | 102.6 | 1.0370 | 0.0000 | SURCHARGED |
| 60 minute winter | SW 20.3 | 33 | 11.184 | 0.555 | 219.1 | 1.0118 | 0.0000 | SURCHARGED |
| 60 minute winter | SW 20.4 OUT | 63 | 10.770 | 0.758 | 218.8 | 1.0844 | 0.0000 | OK |
| 60 minute winter | INF BASIN 4 | 63 | 10.770 | 0.770 | 112.3 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 60 minute winter | SW 20.1 | 20.000 | SW 20.2 | 59.8 | 1.305 | 0.699 | 2.9124 |
| 60 minute winter | SW 20.2 | 20.001 | SW 20.3 | 106.2 | 1.070 | 0.513 | 3.5307 |
| 60 minute winter | SW 21.1 | 21.000 | SW 21.2 | 93.4 | 0.856 | 0.706 | 5.6399 |
| 60 minute winter | SW 21.2 | 21.001 | SW 20.3 | 102.4 | 0.929 | 0.799 | 1.8844 |
| 60 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 218.8 | 1.986 | 1.979 | 1.3144 |
| 60 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 112.3 | 0.020 | 0.006 | 300.1605 |
| 60 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.83%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute summer | SW 20.1 | 62 | 11.671 | 0.171 | 52.5 | 0.6899 | 0.0000 | OK |
| 120 minute summer | SW 20.2 | 62 | 11.220 | 0.173 | 92.8 | 0.5870 | 0.0000 | OK |
| 120 minute summer | SW 21.1 | 64 | 11.221 | 0.296 | 82.8 | 1.7083 | 0.0000 | OK |
| 120 minute summer | SW 21.2 | 64 | 11.149 | 0.449 | 86.7 | 0.8447 | 0.0000 | SURCHARGED |
| 120 minute summer | SW 20.3 | 64 | 11.100 | 0.471 | 185.7 | 0.8594 | 0.0000 | SURCHARGED |
| 120 minute summer | SW 20.4 OUT | 124 | 10.821 | 0.809 | 186.4 | 1.1575 | 0.0000 | OK |
| 120 minute summer | INF BASIN 4 | 124 | 10.821 | 0.821 | 96.1 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 120 minute summer | SW 20.1 | 20.000 | SW 20.2 | 51.0 | 1.260 | 0.597 | 2.5808 |
| 120 minute summer | SW 20.2 | 20.001 | SW 20.3 | 92.2 | 0.999 | 0.445 | 3.1192 |
| 120 minute summer | SW 21.1 | 21.000 | SW 21.2 | 79.1 | 0.835 | 0.598 | 5.2036 |
| 120 minute summer | SW 21.2 | 21.001 | SW 20.3 | 87.2 | 0.791 | 0.681 | 1.8844 |
| 120 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 186.4 | 1.704 | 1.686 | 1.2838 |
| 120 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 96.1 | 0.015 | 0.005 | 326.0285 |
| 120 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 120 minute winter. 360 minute analysis at 2 minute timestep. Mass balance: 99.87%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute winter | SW 20.1 | 62 | 11.644 | 0.144 | 39.1 | 0.5814 | 0.0000 | OK |
| 120 minute winter | SW 20.2 | 62 | 11.195 | 0.148 | 69.9 | 0.5028 | 0.0000 | OK |
| 120 minute winter | SW 21.1 | 62 | 11.101 | 0.176 | 61.6 | 1.0190 | 0.0000 | OK |
| 120 minute winter | SW 21.2 | 64 | 11.026 | 0.326 | 67.4 | 0.6131 | 0.0000 | OK |
| 120 minute winter | SW 20.3 | 64 | 11.003 | 0.374 | 143.5 | 0.6829 | 0.0000 | OK |
| 120 minute winter | SW 20.4 OUT | 122 | 10.902 | 0.890 | 143.7 | 1.2742 | 0.0000 | OK |
| 120 minute winter | INF BASIN 4 | 122 | 10.902 | 0.902 | 74.7 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 120 minute winter | SW 20.1 | 20.000 | SW 20.2 | 38.8 | 1.181 | 0.454 | 2.0915 |
| 120 minute winter | SW 20.2 | 20.001 | SW 20.3 | 69.8 | 0.860 | 0.337 | 2.9375 |
| 120 minute winter | SW 21.1 | 21.000 | SW 21.2 | 61.4 | 0.814 | 0.465 | 3.8964 |
| 120 minute winter | SW 21.2 | 21.001 | SW 20.3 | 67.2 | 0.627 | 0.525 | 1.8108 |
| 120 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 143.7 | 1.408 | 1.300 | 1.2176 |
| 120 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 74.7 | 0.016 | 0.004 | 368.8518 |
| 120 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 99.85%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute summer | SW 20.1 | 92 | 11.647 | 0.147 | 41.0 | 0.5918 | 0.0000 | OK |
| 180 minute summer | SW 20.2 | 92 | 11.197 | 0.150 | 72.4 | 0.5111 | 0.0000 | OK |
| 180 minute summer | SW 21.1 | 92 | 11.105 | 0.180 | 64.6 | 1.0407 | 0.0000 | OK |
| 180 minute summer | SW 21.2 | 92 | 11.028 | 0.328 | 70.0 | 0.6163 | 0.0000 | OK |
| 180 minute summer | SW 20.3 | 92 | 11.005 | 0.376 | 145.9 | 0.6862 | 0.0000 | SURCHARGED |
| 180 minute summer | SW 20.4 OUT | 184 | 10.879 | 0.867 | 144.0 | 1.2405 | 0.0000 | OK |
| 180 minute summer | INF BASIN 4 | 184 | 10.879 | 0.879 | 74.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 180 minute summer | SW 20.1 | 20.000 | SW 20.2 | 39.8 | 1.186 | 0.466 | 2.1354 |
| 180 minute summer | SW 20.2 | 20.001 | SW 20.3 | 71.9 | 0.870 | 0.347 | 2.9563 |
| 180 minute summer | SW 21.1 | 21.000 | SW 21.2 | 63.7 | 0.818 | 0.482 | 3.9505 |
| 180 minute summer | SW 21.2 | 21.001 | SW 20.3 | 66.8 | 0.624 | 0.521 | 1.8147 |
| 180 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 144.0 | 1.408 | 1.303 | 1.2184 |
| 180 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 74.9 | 0.013 | 0.004 | 356.2492 |
| 180 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 180 minute winter. 420 minute analysis at 4 minute timestep. Mass balance: 99.89%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute winter | SW 20.1 | 92 | 11.624 | 0.124 | 29.8 | 0.4973 | 0.0000 | OK |
| 180 minute winter | SW 20.2 | 92 | 11.175 | 0.128 | 53.3 | 0.4350 | 0.0000 | OK |
| 180 minute winter | SW 21.1 | 92 | 11.077 | 0.152 | 47.0 | 0.8758 | 0.0000 | OK |
| 180 minute winter | SW 21.2 | 180 | 10.969 | 0.269 | 51.5 | 0.5064 | 0.0000 | OK |
| 180 minute winter | SW 20.3 | 180 | 10.970 | 0.341 | 109.7 | 0.6217 | 0.0000 | OK |
| 180 minute winter | SW 20.4 OUT | 180 | 10.970 | 0.958 | 109.3 | 1.3713 | 0.0000 | OK |
| 180 minute winter | INF BASIN 4 | 180 | 10.970 | 0.970 | 57.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 180 minute winter | SW 20.1 | 20.000 | SW 20.2 | 29.6 | 1.102 | 0.347 | 1.7090 |
| 180 minute winter | SW 20.2 | 20.001 | SW 20.3 | 53.2 | 0.819 | 0.257 | 2.4955 |
| 180 minute winter | SW 21.1 | 21.000 | SW 21.2 | 46.9 | 0.799 | 0.354 | 3.0125 |
| 180 minute winter | SW 21.2 | 21.001 | SW 20.3 | 51.1 | 0.596 | 0.399 | 1.6230 |
| 180 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 109.3 | 1.276 | 0.989 | 1.3224 |
| 180 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 57.5 | 0.014 | 0.003 | 405.8899 |
| 180 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 99.89%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute summer | SW 20.1 | 124 | 11.630 | 0.130 | 32.6 | 0.5247 | 0.0000 | OK |
| 240 minute summer | SW 20.2 | 124 | 11.181 | 0.134 | 58.5 | 0.4571 | 0.0000 | OK |
| 240 minute summer | SW 21.1 | 124 | 11.085 | 0.160 | 51.4 | 0.9215 | 0.0000 | OK |
| 240 minute summer | SW 21.2 | 124 | 10.968 | 0.268 | 56.4 | 0.5039 | 0.0000 | OK |
| 240 minute summer | SW 20.3 | 124 | 10.951 | 0.322 | 120.6 | 0.5880 | 0.0000 | OK |
| 240 minute summer | SW 20.4 OUT | 244 | 10.913 | 0.901 | 120.6 | 1.2886 | 0.0000 | OK |
| 240 minute summer | INF BASIN 4 | 244 | 10.913 | 0.913 | 63.1 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 240 minute summer | SW 20.1 | 20.000 | SW 20.2 | 32.6 | 1.130 | 0.381 | 1.8339 |
| 240 minute summer | SW 20.2 | 20.001 | SW 20.3 | 58.5 | 0.840 | 0.282 | 2.6605 |
| 240 minute summer | SW 21.1 | 21.000 | SW 21.2 | 51.4 | 0.810 | 0.389 | 3.2962 |
| 240 minute summer | SW 21.2 | 21.001 | SW 20.3 | 56.3 | 0.605 | 0.440 | 1.5814 |
| 240 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 120.6 | 1.322 | 1.091 | 1.1649 |
| 240 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 63.1 | 0.012 | 0.003 | 374.2650 |
| 240 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 240 minute winter. 480 minute analysis at 4 minute timestep. Mass balance: 99.89%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute winter | SW 20.1 | 124 | 11.611 | 0.111 | 24.3 | 0.4453 | 0.0000 | OK |
| 240 minute winter | SW 20.2 | 124 | 11.162 | 0.115 | 43.6 | 0.3920 | 0.0000 | OK |
| 240 minute winter | SW 21.1 | 124 | 11.061 | 0.136 | 38.3 | 0.7852 | 0.0000 | OK |
| 240 minute winter | SW 21.2 | 236 | 11.011 | 0.311 | 42.1 | 0.5846 | 0.0000 | OK |
| 240 minute winter | SW 20.3 | 236 | 11.011 | 0.382 | 90.0 | 0.6967 | 0.0000 | SURCHARGED |
| 240 minute winter | SW 20.4 OUT | 240 | 11.011 | 0.999 | 90.0 | 1.4295 | 0.0000 | OK |
| 240 minute winter | INF BASIN 4 | 240 | 11.011 | 1.011 | 47.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 240 minute winter | SW 20.1 | 20.000 | SW 20.2 | 24.3 | 1.046 | 0.284 | 1.4765 |
| 240 minute winter | SW 20.2 | 20.001 | SW 20.3 | 43.6 | 0.781 | 0.211 | 2.3113 |
| 240 minute winter | SW 21.1 | 21.000 | SW 21.2 | 38.3 | 0.789 | 0.290 | 2.9814 |
| 240 minute winter | SW 21.2 | 21.001 | SW 20.3 | 42.1 | 0.579 | 0.329 | 1.7769 |
| 240 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 90.0 | 1.196 | 0.814 | 1.3535 |
| 240 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 47.8 | 0.012 | 0.002 | 428.6791 |
| 240 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.88%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute summer | SW 20.1 | 184 | 11.611 | 0.111 | 24.9 | 0.4482 | 0.0000 | OK |
| 360 minute summer | SW 20.2 | 184 | 11.163 | 0.116 | 44.3 | 0.3945 | 0.0000 | OK |
| 360 minute summer | SW 21.1 | 184 | 11.062 | 0.137 | 39.3 | 0.7928 | 0.0000 | OK |
| 360 minute summer | SW 21.2 | 360 | 10.940 | 0.240 | 42.9 | 0.4510 | 0.0000 | OK |
| 360 minute summer | SW 20.3 | 360 | 10.940 | 0.311 | 90.7 | 0.5670 | 0.0000 | OK |
| 360 minute summer | SW 20.4 OUT | 360 | 10.940 | 0.928 | 89.9 | 1.3274 | 0.0000 | OK |
| 360 minute summer | INF BASIN 4 | 360 | 10.940 | 0.940 | 47.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 360 minute summer | SW 20.1 | 20.000 | SW 20.2 | 24.5 | 1.048 | 0.287 | 1.4878 |
| 360 minute summer | SW 20.2 | 20.001 | SW 20.3 | 44.1 | 0.787 | 0.213 | 2.1858 |
| 360 minute summer | SW 21.1 | 21.000 | SW 21.2 | 39.0 | 0.793 | 0.295 | 2.5188 |
| 360 minute summer | SW 21.2 | 21.001 | SW 20.3 | 42.2 | 0.580 | 0.329 | 1.4704 |
| 360 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 89.9 | 1.195 | 0.813 | 1.2549 |
| 360 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 47.8 | 0.010 | 0.002 | 388.9303 |
| 360 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 99.90%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | SW 20.1 | 184 | 11.595 | 0.095 | 18.2 | 0.3808 | 0.0000 | OK |
| 360 minute winter | SW 20.2 | 184 | 11.146 | 0.099 | 32.5 | 0.3373 | 0.0000 | OK |
| 360 minute winter | SW 21.1 | 352 | 11.049 | 0.124 | 28.6 | 0.7180 | 0.0000 | OK |
| 360 minute winter | SW 21.2 | 352 | 11.049 | 0.349 | 31.4 | 0.6567 | 0.0000 | OK |
| 360 minute winter | SW 20.3 | 352 | 11.049 | 0.420 | 67.0 | 0.7666 | 0.0000 | SURCHARGED |
| 360 minute winter | SW 20.4 OUT | 352 | 11.049 | 1.037 | 66.8 | 1.4841 | 0.0000 | OK |
| 360 minute winter | INF BASIN 4 | 352 | 11.049 | 1.049 | 36.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 360 minute winter | SW 20.1 | 20.000 | SW 20.2 | 18.1 | 0.966 | 0.212 | 1.1936 |
| 360 minute winter | SW 20.2 | 20.001 | SW 20.3 | 32.5 | 0.727 | 0.157 | 2.3219 |
| 360 minute winter | SW 21.1 | 21.000 | SW 21.2 | 28.6 | 0.777 | 0.216 | 3.5494 |
| 360 minute winter | SW 21.2 | 21.001 | SW 20.3 | 31.3 | 0.558 | 0.244 | 1.8560 |
| 360 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 66.8 | 1.090 | 0.605 | 1.3535 |
| 360 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 36.2 | 0.010 | 0.002 | 450.4958 |
| 360 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 99.90%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute summer | SW 20.1 | 248 | 11.599 | 0.099 | 19.7 | 0.3978 | 0.0000 | OK |
| 480 minute summer | SW 20.2 | 248 | 11.151 | 0.104 | 35.4 | 0.3522 | 0.0000 | OK |
| 480 minute summer | SW 21.1 | 248 | 11.047 | 0.122 | 31.1 | 0.7039 | 0.0000 | OK |
| 480 minute summer | SW 21.2 | 480 | 10.949 | 0.249 | 34.2 | 0.4673 | 0.0000 | OK |
| 480 minute summer | SW 20.3 | 480 | 10.948 | 0.319 | 73.1 | 0.5828 | 0.0000 | OK |
| 480 minute summer | SW 20.4 OUT | 480 | 10.948 | 0.936 | 73.1 | 1.3399 | 0.0000 | OK |
| 480 minute summer | INF BASIN 4 | 480 | 10.948 | 0.948 | 39.4 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 480 minute summer | SW 20.1 | 20.000 | SW 20.2 | 19.7 | 0.988 | 0.230 | 1.2674 |
| 480 minute summer | SW 20.2 | 20.001 | SW 20.3 | 35.4 | 0.744 | 0.171 | 2.0386 |
| 480 minute summer | SW 21.1 | 21.000 | SW 21.2 | 31.1 | 0.785 | 0.235 | 2.1235 |
| 480 minute summer | SW 21.2 | 21.001 | SW 20.3 | 34.2 | 0.564 | 0.267 | 1.5170 |
| 480 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 73.1 | 1.120 | 0.661 | 1.2789 |
| 480 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 39.4 | 0.009 | 0.002 | 393.7626 |
| 480 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 480 minute winter. 720 minute analysis at 8 minute timestep. Mass balance: 99.89%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute winter | SW 20.1 | 248 | 11.585 | 0.085 | 14.7 | 0.3409 | 0.0000 | OK |
| 480 minute winter | SW 20.2 | 248 | 11.136 | 0.089 | 26.4 | 0.3038 | 0.0000 | OK |
| 480 minute winter | SW 21.1 | 464 | 11.067 | 0.142 | 23.1 | 0.8223 | 0.0000 | OK |
| 480 minute winter | SW 21.2 | 472 | 11.067 | 0.367 | 25.4 | 0.6906 | 0.0000 | OK |
| 480 minute winter | SW 20.3 | 472 | 11.067 | 0.438 | 54.4 | 0.7995 | 0.0000 | SURCHARGED |
| 480 minute winter | SW 20.4 OUT | 472 | 11.067 | 1.055 | 54.4 | 1.5100 | 0.0000 | OK |
| 480 minute winter | INF BASIN 4 | 472 | 11.067 | 1.067 | 30.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 480 minute winter | SW 20.1 | 20.000 | SW 20.2 | 14.7 | 0.912 | 0.172 | 1.0250 |
| 480 minute winter | SW 20.2 | 20.001 | SW 20.3 | 26.4 | 0.690 | 0.127 | 2.3391 |
| 480 minute winter | SW 21.1 | 21.000 | SW 21.2 | 23.1 | 0.772 | 0.175 | 3.7845 |
| 480 minute winter | SW 21.2 | 21.001 | SW 20.3 | 25.4 | 0.546 | 0.198 | 1.8793 |
| 480 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 54.4 | 1.025 | 0.492 | 1.3535 |
| 480 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 30.0 | 0.009 | 0.002 | 460.9879 |
| 480 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 99.91%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute summer | SW 20.1 | 315 | 11.589 | 0.089 | 16.2 | 0.3587 | 0.0000 | OK |
| 600 minute summer | SW 20.2 | 315 | 11.141 | 0.094 | 29.1 | 0.3190 | 0.0000 | OK |
| 600 minute summer | SW 21.1 | 315 | 11.035 | 0.110 | 25.5 | 0.6350 | 0.0000 | OK |
| 600 minute summer | SW 21.2 | 585 | 10.947 | 0.246 | 28.0 | 0.4634 | 0.0000 | OK |
| 600 minute summer | SW 20.3 | 585 | 10.946 | 0.317 | 60.0 | 0.5791 | 0.0000 | OK |
| 600 minute summer | SW 20.4 OUT | 585 | 10.946 | 0.934 | 60.0 | 1.3370 | 0.0000 | OK |
| 600 minute summer | INF BASIN 4 | 585 | 10.946 | 0.946 | 32.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 600 minute summer | SW 20.1 | 20.000 | SW 20.2 | 16.2 | 0.937 | 0.190 | 1.0995 |
| 600 minute summer | SW 20.2 | 20.001 | SW 20.3 | 29.1 | 0.708 | 0.141 | 2.0227 |
| 600 minute summer | SW 21.1 | 21.000 | SW 21.2 | 25.5 | 0.778 | 0.193 | 2.0953 |
| 600 minute summer | SW 21.2 | 21.001 | SW 20.3 | 28.0 | 0.551 | 0.219 | 1.5061 |
| 600 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 60.0 | 1.055 | 0.543 | 1.2737 |
| 600 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 32.8 | 0.008 | 0.002 | 392.6580 |
| 600 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 600 minute winter. 840 minute analysis at 15 minute timestep. Mass balance: 99.90%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | SW 20.1 | 315 | 11.578 | 0.078 | 12.4 | 0.3123 | 0.0000 | OK |
| 600 minute winter | SW 20.2 | 315 | 11.129 | 0.082 | 22.3 | 0.2792 | 0.0000 | OK |
| 600 minute winter | SW 21.1 | 585 | 11.070 | 0.145 | 19.5 | 0.8393 | 0.0000 | OK |
| 600 minute winter | SW 21.2 | 585 | 11.070 | 0.370 | 21.4 | 0.6961 | 0.0000 | OK |
| 600 minute winter | SW 20.3 | 585 | 11.070 | 0.441 | 45.9 | 0.8049 | 0.0000 | SURCHARGED |
| 600 minute winter | SW 20.4 OUT | 585 | 11.070 | 1.058 | 45.9 | 1.5142 | 0.0000 | OK |
| 600 minute winter | INF BASIN 4 | 585 | 11.070 | 1.070 | 25.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 600 minute winter | SW 20.1 | 20.000 | SW 20.2 | 12.4 | 0.869 | 0.145 | 0.9072 |
| 600 minute winter | SW 20.2 | 20.001 | SW 20.3 | 22.3 | 0.661 | 0.108 | 2.3363 |
| 600 minute winter | SW 21.1 | 21.000 | SW 21.2 | 19.5 | 0.764 | 0.147 | 3.8197 |
| 600 minute winter | SW 21.2 | 21.001 | SW 20.3 | 21.4 | 0.536 | 0.167 | 1.8819 |
| 600 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 45.9 | 0.976 | 0.415 | 1.3535 |
| 600 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 25.8 | 0.006 | 0.001 | 462.6914 |
| 600 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 99.91%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute summer | SW 20.1 | 375 | 11.584 | 0.084 | 14.5 | 0.3385 | 0.0000 | OK |
| 720 minute summer | SW 20.2 | 375 | 11.136 | 0.089 | 26.0 | 0.3014 | 0.0000 | OK |
| 720 minute summer | SW 21.1 | 375 | 11.029 | 0.104 | 22.8 | 0.5996 | 0.0000 | OK |
| 720 minute summer | SW 21.2 | 630 | 10.940 | 0.240 | 25.0 | 0.4511 | 0.0000 | OK |
| 720 minute summer | SW 20.3 | 630 | 10.940 | 0.311 | 53.6 | 0.5672 | 0.0000 | OK |
| 720 minute summer | SW 20.4 OUT | 630 | 10.940 | 0.928 | 53.6 | 1.3277 | 0.0000 | OK |
| 720 minute summer | INF BASIN 4 | 630 | 10.940 | 0.940 | 29.6 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 720 minute summer | SW 20.1 | 20.000 | SW 20.2 | 14.5 | 0.908 | 0.170 | 1.0150 |
| 720 minute summer | SW 20.2 | 20.001 | SW 20.3 | 26.0 | 0.688 | 0.126 | 1.9892 |
| 720 minute summer | SW 21.1 | 21.000 | SW 21.2 | 22.8 | 0.775 | 0.172 | 2.0351 |
| 720 minute summer | SW 21.2 | 21.001 | SW 20.3 | 25.0 | 0.545 | 0.195 | 1.4708 |
| 720 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 53.6 | 1.021 | 0.485 | 1.2553 |
| 720 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 29.6 | 0.008 | 0.002 | 389.0440 |
| 720 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 720 minute winter. 960 minute analysis at 15 minute timestep. Mass balance: 99.91%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute winter | SW 20.1 | 375 | 11.573 | 0.073 | 10.9 | 0.2924 | 0.0000 | OK |
| 720 minute winter | SW 20.2 | 375 | 11.124 | 0.077 | 19.6 | 0.2618 | 0.0000 | OK |
| 720 minute winter | SW 21.1 | 690 | 11.064 | 0.139 | 17.2 | 0.8028 | 0.0000 | OK |
| 720 minute winter | SW 21.2 | 690 | 11.064 | 0.364 | 18.9 | 0.6842 | 0.0000 | OK |
| 720 minute winter | SW 20.3 | 690 | 11.064 | 0.435 | 40.4 | 0.7933 | 0.0000 | SURCHARGED |
| 720 minute winter | SW 20.4 OUT | 690 | 11.064 | 1.052 | 40.4 | 1.5050 | 0.0000 | OK |
| 720 minute winter | INF BASIN 4 | 690 | 11.064 | 1.064 | 23.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 720 minute winter | SW 20.1 | 20.000 | SW 20.2 | 10.9 | 0.838 | 0.128 | 0.8270 |
| 720 minute winter | SW 20.2 | 20.001 | SW 20.3 | 19.6 | 0.639 | 0.095 | 2.3236 |
| 720 minute winter | SW 21.1 | 21.000 | SW 21.2 | 17.2 | 0.757 | 0.130 | 3.7443 |
| 720 minute winter | SW 21.2 | 21.001 | SW 20.3 | 18.9 | 0.530 | 0.148 | 1.8763 |
| 720 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 40.4 | 0.941 | 0.365 | 1.3535 |
| 720 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 23.0 | 0.007 | 0.001 | 458.9548 |
| 720 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 99.93%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute summer | SW 20.1 | 495 | 11.576 | 0.076 | 11.9 | 0.3058 | 0.0000 | OK |
| 960 minute summer | SW 20.2 | 495 | 11.127 | 0.080 | 21.4 | 0.2735 | 0.0000 | OK |
| 960 minute summer | SW 21.1 | 495 | 11.019 | 0.094 | 18.8 | 0.5439 | 0.0000 | OK |
| 960 minute summer | SW 21.2 | 765 | 10.924 | 0.224 | 20.6 | 0.4215 | 0.0000 | OK |
| 960 minute summer | SW 20.3 | 765 | 10.924 | 0.295 | 44.1 | 0.5383 | 0.0000 | OK |
| 960 minute summer | SW 20.4 OUT | 765 | 10.924 | 0.912 | 44.1 | 1.3051 | 0.0000 | OK |
| 960 minute summer | INF BASIN 4 | 765 | 10.924 | 0.924 | 24.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 960 minute summer | SW 20.1 | 20.000 | SW 20.2 | 11.9 | 0.859 | 0.139 | 0.8808 |
| 960 minute summer | SW 20.2 | 20.001 | SW 20.3 | 21.4 | 0.654 | 0.103 | 1.8974 |
| 960 minute summer | SW 21.1 | 21.000 | SW 21.2 | 18.8 | 0.765 | 0.142 | 1.8893 |
| 960 minute summer | SW 21.2 | 21.001 | SW 20.3 | 20.6 | 0.534 | 0.161 | 1.3820 |
| 960 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 44.1 | 0.965 | 0.399 | 1.2058 |
| 960 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 24.9 | 0.006 | 0.001 | 380.4152 |
| 960 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 960 minute winter. 1200 minute analysis at 15 minute timestep. Mass balance: 99.94%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | SW 20.1 | 495 | 11.565 | 0.065 | 8.8 | 0.2623 | 0.0000 | OK |
| 960 minute winter | SW 20.2 | 495 | 11.116 | 0.069 | 15.8 | 0.2356 | 0.0000 | OK |
| 960 minute winter | SW 21.1 | 885 | 11.045 | 0.120 | 13.9 | 0.6935 | 0.0000 | OK |
| 960 minute winter | SW 21.2 | 885 | 11.045 | 0.345 | 15.3 | 0.6486 | 0.0000 | OK |
| 960 minute winter | SW 20.3 | 885 | 11.045 | 0.416 | 32.7 | 0.7587 | 0.0000 | SURCHARGED |
| 960 minute winter | SW 20.4 OUT | 885 | 11.045 | 1.033 | 32.7 | 1.4779 | 0.0000 | OK |
| 960 minute winter | INF BASIN 4 | 885 | 11.045 | 1.045 | 19.1 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 960 minute winter | SW 20.1 | 20.000 | SW 20.2 | 8.8 | 0.789 | 0.103 | 0.7094 |
| 960 minute winter | SW 20.2 | 20.001 | SW 20.3 | 15.8 | 0.603 | 0.076 | 2.2998 |
| 960 minute winter | SW 21.1 | 21.000 | SW 21.2 | 13.9 | 0.739 | 0.105 | 3.4897 |
| 960 minute winter | SW 21.2 | 21.001 | SW 20.3 | 15.3 | 0.516 | 0.119 | 1.8487 |
| 960 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 32.7 | 0.887 | 0.296 | 1.3535 |
| 960 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 19.1 | 0.007 | 0.001 | 448.0389 |
| 960 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 99.92%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW 20.1 | 750 | 11.565 | 0.065 | 8.7 | 0.2608 | 0.0000 | OK |
| 1440 minute summer | SW 20.2 | 750 | 11.116 | 0.069 | 15.6 | 0.2342 | 0.0000 | OK |
| 1440 minute summer | SW 21.1 | 750 | 11.006 | 0.081 | 13.7 | 0.4679 | 0.0000 | OK |
| 1440 minute summer | SW 21.2 | 1020 | 10.893 | 0.193 | 15.0 | 0.3622 | 0.0000 | OK |
| 1440 minute summer | SW 20.3 | 1020 | 10.893 | 0.264 | 32.1 | 0.4808 | 0.0000 | OK |
| 1440 minute summer | SW 20.4 OUT | 1020 | 10.892 | 0.880 | 32.1 | 1.2599 | 0.0000 | OK |
| 1440 minute summer | INF BASIN 4 | 1020 | 10.892 | 0.892 | 18.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW 20.1 | 20.000 | SW 20.2 | 8.7 | 0.786 | 0.102 | 0.7037 |
| 1440 minute summer | SW 20.2 | 20.001 | SW 20.3 | 15.6 | 0.603 | 0.075 | 1.6978 |
| 1440 minute summer | SW 21.1 | 21.000 | SW 21.2 | 13.7 | 0.740 | 0.104 | 1.5884 |
| 1440 minute summer | SW 21.2 | 21.001 | SW 20.3 | 15.0 | 0.514 | 0.117 | 1.1942 |
| 1440 minute summer | SW 20.3 | 20.002 | SW 20.4 OUT | 32.1 | 0.883 | 0.290 | 1.0906 |
| 1440 minute summer | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 18.8 | 0.006 | 0.001 | 363.5348 |
| 1440 minute summer | INF BASIN 4 | Infiltration | | 5.6 | | | |

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**Results for 100 year +40% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 99.94%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW 20.1 | 750 | 11.556 | 0.056 | 6.5 | 0.2255 | 0.0000 | OK |
| 1440 minute winter | SW 20.2 | 750 | 11.107 | 0.060 | 11.7 | 0.2035 | 0.0000 | OK |
| 1440 minute winter | SW 21.1 | 1110 | 11.003 | 0.078 | 10.3 | 0.4489 | 0.0000 | OK |
| 1440 minute winter | SW 21.2 | 1110 | 11.003 | 0.303 | 11.3 | 0.5690 | 0.0000 | OK |
| 1440 minute winter | SW 20.3 | 1110 | 11.003 | 0.374 | 24.2 | 0.6815 | 0.0000 | OK |
| 1440 minute winter | SW 20.4 OUT | 1110 | 11.002 | 0.990 | 24.2 | 1.4173 | 0.0000 | OK |
| 1440 minute winter | INF BASIN 4 | 1110 | 11.002 | 1.002 | 14.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW 20.1 | 20.000 | SW 20.2 | 6.5 | 0.722 | 0.076 | 0.5725 |
| 1440 minute winter | SW 20.2 | 20.001 | SW 20.3 | 11.7 | 0.557 | 0.056 | 2.2402 |
| 1440 minute winter | SW 21.1 | 21.000 | SW 21.2 | 10.3 | 0.694 | 0.078 | 2.8577 |
| 1440 minute winter | SW 21.2 | 21.001 | SW 20.3 | 11.3 | 0.484 | 0.088 | 1.7554 |
| 1440 minute winter | SW 20.3 | 20.002 | SW 20.4 OUT | 24.2 | 0.818 | 0.219 | 1.3527 |
| 1440 minute winter | SW 20.4 OUT | Flow through pond | INF BASIN 4 | 14.9 | 0.005 | 0.001 | 423.8336 |
| 1440 minute winter | INF BASIN 4 | Infiltration | | 5.6 | | | |

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## Design Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Maximum Time of Concentration (mins) | 30.00 |
| Return Period (years) | 2 | Maximum Rainfall (mm/hr) | 75.0 |
| Additional Flow (%) | 0 | Minimum Velocity (m/s) | 1.00 |
| FSR Region | England and Wales | Connection Type | Level Soffits |
| M5-60 (mm) | 17.000 | Minimum Backdrop Height (m) | 0.200 |
| Ratio-R | 0.300 | Preferred Cover Depth (m) | 1.200 |
| CV | 0.750 | Include Intermediate Ground | ✓ |
| Time of Entry (mins) | 4.00 | Enforce best practice design rules | x |

## Nodes

| Name | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|---|---|---|---|---|---|---|---|
| SW14.1 | 0.193 | 4.00 | 13.000 | 1500 | 282917.478 | 177066.359 | 1.725 |
| SW14.2 | 0.272 | 4.00 | 13.000 | 1500 | 282867.702 | 177064.737 | 1.922 |
| SW15.1 | 0.512 | 4.00 | 13.593 | 1350 | 282799.550 | 177010.913 | 1.500 |
| SW14.3 | 0.099 | 4.00 | 13.132 | 1500 | 282799.671 | 177063.554 | 2.172 |
| SW16.1 | 0.265 | 4.00 | 13.000 | 1350 | 282663.120 | 177064.493 | 1.425 |
| SW14.4 | 0.340 | 4.00 | 13.262 | 1500 | 282705.686 | 177064.932 | 2.465 |
| SW14.5 OUT | | | 13.000 | 1500 | 282705.169 | 177008.554 | 2.578 |
| SW17.1 | 0.359 | 4.00 | 15.866 | 1200 | 282888.749 | 176896.223 | 3.102 |
| SW18.1 | 0.221 | 4.00 | 13.500 | 1350 | 282798.223 | 176935.683 | 1.575 |
| SW17.2 | 0.262 | 4.00 | 13.725 | 1500 | 282798.154 | 176896.231 | 2.113 |
| SW19.1 | 0.131 | 4.00 | 13.700 | 1200 | 282679.091 | 176896.380 | 1.425 |
| SW17.3 | 0.201 | 4.00 | 13.701 | 1500 | 282704.072 | 176896.380 | 2.279 |
| SW17.4 OUT | | | 13.907 | 1500 | 282703.787 | 176931.957 | 3.485 |
| INF BASIN 2 | | | 11.800 | | 282703.857 | 176970.257 | 1.500 |

## Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14.000 | SW14.1 | SW14.2 | 49.802 | 0.600 | 11.275 | 11.153 | 0.122 | 408.2 | 525 | 4.75 | 52.5 |
| 14.001 | SW14.2 | SW14.3 | 68.041 | 0.600 | 11.078 | 10.960 | 0.118 | 577.0 | 600 | 5.88 | 48.3 |
| 15.000 | SW15.1 | SW14.3 | 52.641 | 0.600 | 12.093 | 11.110 | 0.983 | 53.6 | 450 | 4.32 | 54.4 |
| 14.002 | SW14.3 | SW14.4 | 93.995 | 0.600 | 10.960 | 10.797 | 0.163 | 577.0 | 600 | 7.44 | 43.7 |
| 16.000 | SW16.1 | SW14.4 | 42.568 | 0.600 | 11.575 | 10.947 | 0.628 | 67.8 | 450 | 4.29 | 54.5 |
| 14.003 | SW14.4 | SW14.5 OUT | 56.380 | 0.600 | 10.797 | 10.700 | 0.097 | 581.2 | 600 | 8.37 | 41.4 |
| 17.000 | SW17.1 | SW17.2 | 90.595 | 0.600 | 12.764 | 11.837 | 0.927 | 97.7 | 300 | 4.95 | 51.7 |
| 18.000 | SW18.1 | SW17.2 | 39.452 | 0.600 | 11.925 | 11.762 | 0.163 | 242.0 | 375 | 4.57 | 53.3 |
| 17.001 | SW17.2 | SW17.3 | 94.082 | 0.600 | 11.612 | 11.422 | 0.190 | 495.0 | 525 | 6.52 | 46.3 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 14.000 | 1.102 | 238.6 | 27.5 | 1.200 | 1.322 | 0.193 | 0.0 | 119 | 0.744 |
| 14.001 | 1.006 | 284.5 | 61.0 | 1.322 | 1.572 | 0.466 | 0.0 | 187 | 0.807 |
| 15.000 | 2.782 | 442.5 | 75.4 | 1.050 | 1.572 | 0.512 | 0.0 | 124 | 2.095 |
| 14.002 | 1.006 | 284.5 | 127.4 | 1.572 | 1.865 | 1.076 | 0.0 | 281 | 0.980 |
| 16.000 | 2.472 | 393.1 | 39.1 | 0.975 | 1.865 | 0.265 | 0.0 | 94 | 1.598 |
| 14.003 | 1.003 | 283.5 | 188.5 | 1.865 | 1.700 | 1.680 | 0.0 | 358 | 1.069 |
| 17.000 | 1.590 | 112.4 | 50.3 | 2.802 | 1.588 | 0.359 | 0.0 | 140 | 1.547 |
| 18.000 | 1.160 | 128.1 | 31.9 | 1.200 | 1.588 | 0.221 | 0.0 | 127 | 0.969 |
| 17.001 | 1.000 | 216.4 | 105.6 | 1.588 | 1.754 | 0.842 | 0.0 | 259 | 0.994 |

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## Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 19.000 | SW19.1 | SW17.3 | 24.981 | 0.600 | 12.275 | 11.722 | 0.553 | 45.2 | 225 | 4.21 | 54.8 |
| 17.002 | SW17.3 | SW17.4 OUT | 35.578 | 0.600 | 11.422 | 11.350 | 0.072 | 494.1 | 525 | 7.11 | 44.6 |

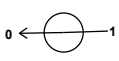
| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 19.000 | 1.951 | 77.6 | 19.4 | 1.200 | 1.754 | 0.131 | 0.0 | 77 | 1.634 |
| 17.002 | 1.001 | 216.6 | 141.8 | 1.754 | 2.032 | 1.174 | 0.0 | 310 | 1.064 |

## Pipeline Schedule

| Link | Length (m) | Slope (1:X) | Dia (mm) | Link Type | US CL (m) | US IL (m) | US Depth (m) | DS CL (m) | DS IL (m) | DS Depth (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 14.000 | 49.802 | 408.2 | 525 | Circular | 13.000 | 11.275 | 1.200 | 13.000 | 11.153 | 1.322 |
| 14.001 | 68.041 | 577.0 | 600 | Circular | 13.000 | 11.078 | 1.322 | 13.132 | 10.960 | 1.572 |
| 15.000 | 52.641 | 53.6 | 450 | Circular | 13.593 | 12.093 | 1.050 | 13.132 | 11.110 | 1.572 |
| 14.002 | 93.995 | 577.0 | 600 | Circular | 13.132 | 10.960 | 1.572 | 13.262 | 10.797 | 1.865 |
| 16.000 | 42.568 | 67.8 | 450 | Circular | 13.000 | 11.575 | 0.975 | 13.262 | 10.947 | 1.865 |
| 14.003 | 56.380 | 581.2 | 600 | Circular | 13.262 | 10.797 | 1.865 | 13.000 | 10.700 | 1.700 |
| 17.000 | 90.595 | 97.7 | 300 | Circular | 15.866 | 12.764 | 2.802 | 13.725 | 11.837 | 1.588 |
| 18.000 | 39.452 | 242.0 | 375 | Circular | 13.500 | 11.925 | 1.200 | 13.725 | 11.762 | 1.588 |
| 17.001 | 94.082 | 495.0 | 525 | Circular | 13.725 | 11.612 | 1.588 | 13.701 | 11.422 | 1.754 |
| 19.000 | 24.981 | 45.2 | 225 | Circular | 13.700 | 12.275 | 1.200 | 13.701 | 11.722 | 1.754 |
| 17.002 | 35.578 | 494.1 | 525 | Circular | 13.701 | 11.422 | 1.754 | 13.907 | 11.350 | 2.032 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 14.000 | SW14.1 | 1500 | Manhole | Adoptable | SW14.2 | 1500 | Manhole | Adoptable |
| 14.001 | SW14.2 | 1500 | Manhole | Adoptable | SW14.3 | 1500 | Manhole | Adoptable |
| 15.000 | SW15.1 | 1350 | Manhole | Adoptable | SW14.3 | 1500 | Manhole | Adoptable |
| 14.002 | SW14.3 | 1500 | Manhole | Adoptable | SW14.4 | 1500 | Manhole | Adoptable |
| 16.000 | SW16.1 | 1350 | Manhole | Adoptable | SW14.4 | 1500 | Manhole | Adoptable |
| 14.003 | SW14.4 | 1500 | Manhole | Adoptable | SW14.5 OUT | 1500 | Manhole | Adoptable |
| 17.000 | SW17.1 | 1200 | Manhole | Adoptable | SW17.2 | 1500 | Manhole | Adoptable |
| 18.000 | SW18.1 | 1350 | Manhole | Adoptable | SW17.2 | 1500 | Manhole | Adoptable |
| 17.001 | SW17.2 | 1500 | Manhole | Adoptable | SW17.3 | 1500 | Manhole | Adoptable |
| 19.000 | SW19.1 | 1200 | Manhole | Adoptable | SW17.3 | 1500 | Manhole | Adoptable |
| 17.002 | SW17.3 | 1500 | Manhole | Adoptable | SW17.4 OUT | 1500 | Manhole | Adoptable |

## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| SW14.1 | 282917.478 | 177066.359 | 13.000 | 1.725 | 1500 | | | | |
| | | | | | | 0 | 14.000 | 11.275 | 525 |
| SW14.2 | 282867.702 | 177064.737 | 13.000 | 1.922 | 1500 | 1 | 14.000 | 11.153 | 525 |
| | | | | | |  | | | |
| | | | | | | 0 | 14.001 | 11.078 | 600 |

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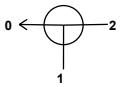
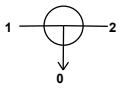
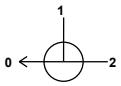
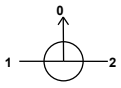
## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| SW15.1 | 282799.550 | 177010.913 | 13.593 | 1.500 | 1350 | | | | |
| | | | | | | 0 | 15.000 | 12.093 | 450 |
| SW14.3 | 282799.671 | 177063.554 | 13.132 | 2.172 | 1500 | | 1 | 15.000 | 11.110 | 450 |
| | | | | | |  | 2 | 14.001 | 10.960 | 600 |
| | | | | | | | 0 | 14.002 | 10.960 | 600 |
| SW16.1 | 282663.120 | 177064.493 | 13.000 | 1.425 | 1350 | | | | |
| | | | | | | 0 | 16.000 | 11.575 | 450 |
| SW14.4 | 282705.686 | 177064.932 | 13.262 | 2.465 | 1500 | | 1 | 16.000 | 10.947 | 450 |
| | | | | | |  | 2 | 14.002 | 10.797 | 600 |
| | | | | | | | 0 | 14.003 | 10.797 | 600 |
| SW14.5 OUT | 282705.169 | 177008.554 | 13.000 | 2.578 | 1500 | | 1 | 14.003 | 10.700 | 600 |
| SW17.1 | 282888.749 | 176896.223 | 15.866 | 3.102 | 1200 | | | | | |
| | | | | | | 0 | 17.000 | 12.764 | 300 |
| SW18.1 | 282798.223 | 176935.683 | 13.500 | 1.575 | 1350 | | | | |
| | | | | | | 0 | 18.000 | 11.925 | 375 |
| SW17.2 | 282798.154 | 176896.231 | 13.725 | 2.113 | 1500 | | 1 | 18.000 | 11.762 | 375 |
| | | | | | |  | 2 | 17.000 | 11.837 | 300 |
| | | | | | | | 0 | 17.001 | 11.612 | 525 |
| SW19.1 | 282679.091 | 176896.380 | 13.700 | 1.425 | 1200 | | | | |
| | | | | | | 0 | 19.000 | 12.275 | 225 |
| SW17.3 | 282704.072 | 176896.380 | 13.701 | 2.279 | 1500 | | 1 | 19.000 | 11.722 | 225 |
| | | | | | |  | 2 | 17.001 | 11.422 | 525 |
| | | | | | | | 0 | 17.002 | 11.422 | 525 |
| SW17.4 OUT | 282703.787 | 176931.957 | 13.907 | 3.485 | 1500 | | 1 | 17.002 | 11.350 | 525 |
| | | | | | | | | | | |
| INF BASIN 2 | 282703.857 | 176970.257 | 11.800 | 1.500 | | | | | | |

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## Simulation Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Analysis Speed | Normal |
| FSR Region | England and Wales | Skip Steady State | x |
| M5-60 (mm) | 17.000 | Drain Down Time (mins) | 240 |
| Ratio-R | 0.300 | Additional Storage (m³/ha) | 20.0 |
| Summer CV | 0.750 | Check Discharge Rate(s) | x |
| Winter CV | 0.840 | Check Discharge Volume | x |

### Storm Durations

| 15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440 |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|---|---|---|---|
| 100 | 40 | 0 | 0 |

## Node INF BASIN 2 Flow through Pond Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.73580 | Porosity | 1.00 | Main Channel Length (m) | 61.000 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m) | 10.300 | Main Channel Slope (1:X) | 500.0 |
| Safety Factor | 10.0 | Time to half empty (mins) | | Main Channel n | 0.350 |

### Inlets

SW14.5 OUT | SW17.4 OUT

| Depth (m) | Area (m²) | Inf Area (m²) | Depth (m) | Area (m²) | Inf Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 1101.0 | 1101.0 | 1.500 | 2000.8 | 1101.0 |

## Rainfall

| Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) | Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) |
|---|---|---|---|---|---|
| 100 year +40% CC 15 minute summer | 368.854 | 104.373 | 100 year +40% CC 360 minute summer | 55.175 | 14.198 |
| 100 year +40% CC 15 minute winter | 258.845 | 104.373 | 100 year +40% CC 360 minute winter | 35.865 | 14.198 |
| 100 year +40% CC 30 minute summer | 255.101 | 72.185 | 100 year +40% CC 480 minute summer | 43.619 | 11.527 |
| 100 year +40% CC 30 minute winter | 179.018 | 72.185 | 100 year +40% CC 480 minute winter | 28.979 | 11.527 |
| 100 year +40% CC 60 minute summer | 180.954 | 47.821 | 100 year +40% CC 600 minute summer | 35.816 | 9.797 |
| 100 year +40% CC 60 minute winter | 120.222 | 47.821 | 100 year +40% CC 600 minute winter | 24.472 | 9.797 |
| 100 year +40% CC 120 minute summer | 116.088 | 30.679 | 100 year +40% CC 720 minute summer | 31.983 | 8.572 |
| 100 year +40% CC 120 minute winter | 77.126 | 30.679 | 100 year +40% CC 720 minute winter | 21.495 | 8.572 |
| 100 year +40% CC 180 minute summer | 90.626 | 23.321 | 100 year +40% CC 960 minute summer | 26.337 | 6.935 |
| 100 year +40% CC 180 minute winter | 58.909 | 23.321 | 100 year +40% CC 960 minute winter | 17.446 | 6.935 |
| 100 year +40% CC 240 minute summer | 72.104 | 19.055 | 100 year +40% CC 1440 minute summer | 19.151 | 5.133 |
| 100 year +40% CC 240 minute winter | 47.904 | 19.055 | 100 year +40% CC 1440 minute winter | 12.870 | 5.133 |

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**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.72%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW14.1 | 12 | 12.992 | 1.717 | 97.2 | 6.8855 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW14.2 | 12 | 12.948 | 1.870 | 217.8 | 8.6016 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW15.1 | 12 | 13.098 | 1.005 | 256.9 | 8.2958 | 0.0000 | SURCHARGED |
| 15 minute winter | SW14.3 | 12 | 12.897 | 1.937 | 416.7 | 5.1793 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW16.1 | 12 | 12.607 | 1.032 | 132.9 | 5.3129 | 0.0000 | SURCHARGED |
| 15 minute winter | SW14.4 | 12 | 12.565 | 1.768 | 599.5 | 7.9961 | 0.0000 | SURCHARGED |
| 15 minute winter | SW14.5 OUT | 12 | 12.064 | 1.642 | 596.0 | 2.9015 | 0.0000 | OK |
| 15 minute winter | SW17.1 | 11 | 15.055 | 2.291 | 180.2 | 7.8922 | 0.0000 | SURCHARGED |
| 15 minute winter | SW18.1 | 11 | 13.235 | 1.310 | 111.0 | 5.5539 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW17.2 | 11 | 13.127 | 1.515 | 373.0 | 6.4298 | 0.0000 | SURCHARGED |
| 15 minute winter | SW19.1 | 11 | 12.879 | 0.604 | 65.7 | 1.7928 | 0.0000 | SURCHARGED |
| 15 minute winter | SW17.3 | 11 | 12.546 | 1.124 | 508.1 | 3.9674 | 0.0000 | SURCHARGED |
| 15 minute winter | SW17.4 OUT | 11 | 12.041 | 1.619 | 495.9 | 2.8608 | 0.0000 | OK |
| 480 minute winter | INF BASIN 2 | 464 | 11.455 | 1.155 | 106.4 | 0.0000 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute winter | SW14.1 | 14.000 | SW14.2 | 81.5 | 0.785 | 0.342 | 10.7589 |
| 15 minute winter | SW14.2 | 14.001 | SW14.3 | 218.0 | 0.774 | 0.766 | 19.1656 |
| 15 minute winter | SW15.1 | 15.000 | SW14.3 | 237.6 | 2.226 | 0.537 | 8.3406 |
| 15 minute winter | SW14.3 | 14.002 | SW14.4 | 381.3 | 1.354 | 1.340 | 26.4763 |
| 15 minute winter | SW16.1 | 16.000 | SW14.4 | 120.4 | 1.494 | 0.306 | 6.7446 |
| 15 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 596.0 | 2.116 | 2.103 | 15.8810 |
| 15 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 766.2 | 0.108 | 0.042 | 593.4553 |
| 15 minute winter | SW17.1 | 17.000 | SW17.2 | 153.5 | 2.181 | 1.366 | 6.3796 |
| 15 minute winter | SW18.1 | 18.000 | SW17.2 | 95.6 | 0.981 | 0.746 | 4.3514 |
| 15 minute winter | SW17.2 | 17.001 | SW17.3 | 357.8 | 1.656 | 1.653 | 20.3248 |
| 15 minute winter | SW19.1 | 19.000 | SW17.3 | 58.1 | 1.858 | 0.748 | 0.9935 |
| 15 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 495.9 | 2.296 | 2.289 | 7.6860 |
| 15 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 766.2 | 0.108 | 0.042 | 593.4553 |
| 480 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 99.88%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | SW14.1 | 12 | 12.721 | 1.446 | 97.1 | 5.7980 | 0.0000 | FLOOD RISK |
| 15 minute summer | SW14.2 | 12 | 12.710 | 1.632 | 223.1 | 7.5076 | 0.0000 | FLOOD RISK |
| 15 minute summer | SW15.1 | 11 | 12.845 | 0.752 | 257.0 | 6.2046 | 0.0000 | SURCHARGED |
| 15 minute summer | SW14.3 | 11 | 12.645 | 1.685 | 398.4 | 4.5046 | 0.0000 | SURCHARGED |
| 15 minute summer | SW16.1 | 11 | 12.469 | 0.894 | 132.9 | 4.6000 | 0.0000 | SURCHARGED |
| 15 minute summer | SW14.4 | 11 | 12.372 | 1.575 | 604.2 | 7.1220 | 0.0000 | SURCHARGED |
| 15 minute summer | SW14.5 OUT | 12 | 11.890 | 1.468 | 567.5 | 2.5942 | 0.0000 | OK |
| 15 minute summer | SW17.1 | 11 | 14.897 | 2.133 | 180.3 | 7.3489 | 0.0000 | SURCHARGED |
| 15 minute summer | SW18.1 | 11 | 13.140 | 1.215 | 111.0 | 5.1496 | 0.0000 | SURCHARGED |
| 15 minute summer | SW17.2 | 11 | 13.033 | 1.421 | 367.3 | 6.0294 | 0.0000 | SURCHARGED |
| 15 minute summer | SW19.1 | 11 | 12.797 | 0.522 | 65.7 | 1.5495 | 0.0000 | SURCHARGED |
| 15 minute summer | SW17.3 | 11 | 12.470 | 1.048 | 504.0 | 3.6990 | 0.0000 | SURCHARGED |
| 15 minute summer | SW17.4 OUT | 11 | 11.979 | 1.557 | 492.3 | 2.7509 | 0.0000 | OK |
| 15 minute summer | INF BASIN 2 | 26 | 10.789 | 0.489 | 668.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute summer | SW14.1 | 14.000 | SW14.2 | 86.6 | 0.793 | 0.363 | 10.7589 |
| 15 minute summer | SW14.2 | 14.001 | SW14.3 | 182.8 | 0.649 | 0.642 | 19.1656 |
| 15 minute summer | SW15.1 | 15.000 | SW14.3 | 255.8 | 2.287 | 0.578 | 8.3406 |
| 15 minute summer | SW14.3 | 14.002 | SW14.4 | 362.7 | 1.288 | 1.275 | 26.4763 |
| 15 minute summer | SW16.1 | 16.000 | SW14.4 | 128.5 | 1.396 | 0.327 | 6.7446 |
| 15 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 567.5 | 2.015 | 2.002 | 15.8810 |
| 15 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 668.8 | 0.102 | 0.037 | 527.6710 |
| 15 minute summer | SW17.1 | 17.000 | SW17.2 | 150.9 | 2.144 | 1.343 | 6.3796 |
| 15 minute summer | SW18.1 | 18.000 | SW17.2 | 94.3 | 0.997 | 0.736 | 4.3514 |
| 15 minute summer | SW17.2 | 17.001 | SW17.3 | 353.2 | 1.635 | 1.632 | 20.3248 |
| 15 minute summer | SW19.1 | 19.000 | SW17.3 | 59.0 | 1.889 | 0.761 | 0.9935 |
| 15 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 492.3 | 2.279 | 2.273 | 7.6860 |
| 15 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 668.8 | 0.102 | 0.037 | 527.6710 |
| 15 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 99.79%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW14.1 | 12 | 12.992 | 1.717 | 97.2 | 6.8855 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW14.2 | 12 | 12.948 | 1.870 | 217.8 | 8.6016 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW15.1 | 12 | 13.098 | 1.005 | 256.9 | 8.2958 | 0.0000 | SURCHARGED |
| 15 minute winter | SW14.3 | 12 | 12.897 | 1.937 | 416.7 | 5.1793 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW16.1 | 12 | 12.607 | 1.032 | 132.9 | 5.3129 | 0.0000 | SURCHARGED |
| 15 minute winter | SW14.4 | 12 | 12.565 | 1.768 | 599.5 | 7.9961 | 0.0000 | SURCHARGED |
| 15 minute winter | SW14.5 OUT | 12 | 12.064 | 1.642 | 596.0 | 2.9015 | 0.0000 | OK |
| 15 minute winter | SW17.1 | 11 | 15.055 | 2.291 | 180.2 | 7.8922 | 0.0000 | SURCHARGED |
| 15 minute winter | SW18.1 | 11 | 13.235 | 1.310 | 111.0 | 5.5539 | 0.0000 | FLOOD RISK |
| 15 minute winter | SW17.2 | 11 | 13.127 | 1.515 | 373.0 | 6.4298 | 0.0000 | SURCHARGED |
| 15 minute winter | SW19.1 | 11 | 12.879 | 0.604 | 65.7 | 1.7928 | 0.0000 | SURCHARGED |
| 15 minute winter | SW17.3 | 11 | 12.546 | 1.124 | 508.1 | 3.9674 | 0.0000 | SURCHARGED |
| 15 minute winter | SW17.4 OUT | 11 | 12.041 | 1.619 | 495.9 | 2.8608 | 0.0000 | OK |
| 15 minute winter | INF BASIN 2 | 26 | 10.837 | 0.537 | 766.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute winter | SW14.1 | 14.000 | SW14.2 | 81.5 | 0.785 | 0.342 | 10.7589 |
| 15 minute winter | SW14.2 | 14.001 | SW14.3 | 218.0 | 0.774 | 0.766 | 19.1656 |
| 15 minute winter | SW15.1 | 15.000 | SW14.3 | 237.6 | 2.226 | 0.537 | 8.3406 |
| 15 minute winter | SW14.3 | 14.002 | SW14.4 | 381.3 | 1.354 | 1.340 | 26.4763 |
| 15 minute winter | SW16.1 | 16.000 | SW14.4 | 120.4 | 1.494 | 0.306 | 6.7446 |
| 15 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 596.0 | 2.116 | 2.103 | 15.8810 |
| 15 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 766.2 | 0.108 | 0.042 | 593.4553 |
| 15 minute winter | SW17.1 | 17.000 | SW17.2 | 153.5 | 2.181 | 1.366 | 6.3796 |
| 15 minute winter | SW18.1 | 18.000 | SW17.2 | 95.6 | 0.981 | 0.746 | 4.3514 |
| 15 minute winter | SW17.2 | 17.001 | SW17.3 | 357.8 | 1.656 | 1.653 | 20.3248 |
| 15 minute winter | SW19.1 | 19.000 | SW17.3 | 58.1 | 1.858 | 0.748 | 0.9935 |
| 15 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 495.9 | 2.296 | 2.289 | 7.6860 |
| 15 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 766.2 | 0.108 | 0.042 | 593.4553 |
| 15 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.72%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute summer | SW14.1 | 19 | 12.775 | 1.500 | 112.9 | 6.0157 | 0.0000 | FLOOD RISK |
| 30 minute summer | SW14.2 | 19 | 12.744 | 1.666 | 203.9 | 7.6619 | 0.0000 | FLOOD RISK |
| 30 minute summer | SW15.1 | 19 | 12.884 | 0.791 | 236.7 | 6.5313 | 0.0000 | SURCHARGED |
| 30 minute summer | SW14.3 | 19 | 12.685 | 1.725 | 381.6 | 4.6114 | 0.0000 | SURCHARGED |
| 30 minute summer | SW16.1 | 19 | 12.443 | 0.868 | 122.4 | 4.4689 | 0.0000 | SURCHARGED |
| 30 minute summer | SW14.4 | 19 | 12.394 | 1.597 | 555.0 | 7.2225 | 0.0000 | SURCHARGED |
| 30 minute summer | SW14.5 OUT | 19 | 11.937 | 1.515 | 552.0 | 2.6773 | 0.0000 | OK |
| 30 minute summer | SW17.1 | 18 | 14.564 | 1.800 | 166.0 | 6.2016 | 0.0000 | SURCHARGED |
| 30 minute summer | SW18.1 | 18 | 12.976 | 1.051 | 102.3 | 4.4547 | 0.0000 | SURCHARGED |
| 30 minute summer | SW17.2 | 18 | 12.886 | 1.274 | 345.1 | 5.4045 | 0.0000 | SURCHARGED |
| 30 minute summer | SW19.1 | 19 | 12.675 | 0.400 | 60.5 | 1.1878 | 0.0000 | SURCHARGED |
| 30 minute summer | SW17.3 | 19 | 12.383 | 0.961 | 473.6 | 3.3918 | 0.0000 | SURCHARGED |
| 30 minute summer | SW17.4 OUT | 19 | 11.953 | 1.531 | 467.1 | 2.7056 | 0.0000 | OK |
| 30 minute summer | INF BASIN 2 | 37 | 10.930 | 0.630 | 802.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 30 minute summer | SW14.1 | 14.000 | SW14.2 | 85.1 | 0.752 | 0.357 | 10.7589 |
| 30 minute summer | SW14.2 | 14.001 | SW14.3 | 199.8 | 0.709 | 0.702 | 19.1656 |
| 30 minute summer | SW15.1 | 15.000 | SW14.3 | 223.0 | 2.115 | 0.504 | 8.3406 |
| 30 minute summer | SW14.3 | 14.002 | SW14.4 | 368.0 | 1.307 | 1.293 | 26.4763 |
| 30 minute summer | SW16.1 | 16.000 | SW14.4 | 112.2 | 1.231 | 0.285 | 6.7446 |
| 30 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 552.0 | 1.960 | 1.947 | 15.8810 |
| 30 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 802.0 | 0.106 | 0.044 | 724.7969 |
| 30 minute summer | SW17.1 | 17.000 | SW17.2 | 143.0 | 2.030 | 1.272 | 6.3796 |
| 30 minute summer | SW18.1 | 18.000 | SW17.2 | 88.3 | 0.971 | 0.690 | 4.3514 |
| 30 minute summer | SW17.2 | 17.001 | SW17.3 | 336.1 | 1.556 | 1.553 | 20.3248 |
| 30 minute summer | SW19.1 | 19.000 | SW17.3 | 53.3 | 1.784 | 0.687 | 0.9935 |
| 30 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 467.1 | 2.163 | 2.157 | 7.6860 |
| 30 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 802.0 | 0.106 | 0.044 | 724.7969 |
| 30 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 99.98%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | SW14.1 | 20 | 12.659 | 1.384 | 77.4 | 5.5491 | 0.0000 | SURCHARGED |
| 30 minute winter | SW14.2 | 20 | 12.645 | 1.567 | 183.6 | 7.2044 | 0.0000 | SURCHARGED |
| 30 minute winter | SW15.1 | 20 | 12.773 | 0.680 | 204.8 | 5.6107 | 0.0000 | SURCHARGED |
| 30 minute winter | SW14.3 | 20 | 12.611 | 1.651 | 384.5 | 4.4137 | 0.0000 | SURCHARGED |
| 30 minute winter | SW16.1 | 20 | 12.378 | 0.803 | 106.0 | 4.1314 | 0.0000 | SURCHARGED |
| 30 minute winter | SW14.4 | 20 | 12.346 | 1.549 | 559.5 | 7.0045 | 0.0000 | SURCHARGED |
| 30 minute winter | SW14.5 OUT | 20 | 11.919 | 1.497 | 534.7 | 2.6453 | 0.0000 | OK |
| 30 minute winter | SW17.1 | 18 | 14.112 | 1.348 | 143.6 | 4.6423 | 0.0000 | SURCHARGED |
| 30 minute winter | SW18.1 | 18 | 12.749 | 0.824 | 88.5 | 3.4947 | 0.0000 | SURCHARGED |
| 30 minute winter | SW17.2 | 18 | 12.663 | 1.051 | 318.0 | 4.4596 | 0.0000 | SURCHARGED |
| 30 minute winter | SW19.1 | 18 | 12.444 | 0.169 | 52.3 | 0.5007 | 0.0000 | OK |
| 30 minute winter | SW17.3 | 19 | 12.221 | 0.799 | 444.5 | 2.8201 | 0.0000 | SURCHARGED |
| 30 minute winter | SW17.4 OUT | 19 | 11.846 | 1.424 | 439.0 | 2.5159 | 0.0000 | OK |
| 30 minute winter | INF BASIN 2 | 37 | 10.992 | 0.692 | 834.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 30 minute winter | SW14.1 | 14.000 | SW14.2 | 77.8 | 0.740 | 0.326 | 10.7589 |
| 30 minute winter | SW14.2 | 14.001 | SW14.3 | 165.8 | 0.589 | 0.583 | 19.1656 |
| 30 minute winter | SW15.1 | 15.000 | SW14.3 | 195.8 | 2.067 | 0.442 | 8.3406 |
| 30 minute winter | SW14.3 | 14.002 | SW14.4 | 347.2 | 1.233 | 1.220 | 26.4763 |
| 30 minute winter | SW16.1 | 16.000 | SW14.4 | 101.2 | 1.313 | 0.258 | 6.7446 |
| 30 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 534.7 | 1.898 | 1.886 | 15.8810 |
| 30 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 834.0 | 0.104 | 0.046 | 815.2432 |
| 30 minute winter | SW17.1 | 17.000 | SW17.2 | 133.4 | 1.895 | 1.187 | 6.3796 |
| 30 minute winter | SW18.1 | 18.000 | SW17.2 | 83.8 | 0.960 | 0.654 | 4.3514 |
| 30 minute winter | SW17.2 | 17.001 | SW17.3 | 316.1 | 1.463 | 1.460 | 20.3248 |
| 30 minute winter | SW19.1 | 19.000 | SW17.3 | 50.8 | 1.795 | 0.655 | 0.8958 |
| 30 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 439.0 | 2.034 | 2.027 | 7.6011 |
| 30 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 834.0 | 0.104 | 0.046 | 815.2432 |
| 30 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.92%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute summer | SW14.1 | 35 | 12.268 | 0.993 | 130.1 | 3.9800 | 0.0000 | SURCHARGED |
| 60 minute summer | SW14.2 | 35 | 12.249 | 1.171 | 147.3 | 5.3835 | 0.0000 | SURCHARGED |
| 60 minute summer | SW15.1 | 34 | 12.301 | 0.208 | 180.1 | 1.7200 | 0.0000 | OK |
| 60 minute summer | SW14.3 | 35 | 12.208 | 1.248 | 336.4 | 3.3373 | 0.0000 | SURCHARGED |
| 60 minute summer | SW16.1 | 34 | 12.071 | 0.496 | 93.1 | 2.5527 | 0.0000 | SURCHARGED |
| 60 minute summer | SW14.4 | 34 | 12.017 | 1.220 | 497.1 | 5.5188 | 0.0000 | SURCHARGED |
| 60 minute summer | SW14.5 OUT | 35 | 11.658 | 1.236 | 480.6 | 2.1843 | 0.0000 | OK |
| 60 minute summer | SW17.1 | 33 | 13.567 | 0.803 | 126.3 | 2.7661 | 0.0000 | SURCHARGED |
| 60 minute summer | SW18.1 | 33 | 12.521 | 0.596 | 77.8 | 2.5245 | 0.0000 | SURCHARGED |
| 60 minute summer | SW17.2 | 33 | 12.453 | 0.841 | 278.1 | 3.5665 | 0.0000 | SURCHARGED |
| 60 minute summer | SW19.1 | 33 | 12.402 | 0.127 | 46.1 | 0.3777 | 0.0000 | OK |
| 60 minute summer | SW17.3 | 33 | 12.096 | 0.674 | 391.4 | 2.3786 | 0.0000 | SURCHARGED |
| 60 minute summer | SW17.4 OUT | 34 | 11.619 | 1.197 | 389.3 | 2.1148 | 0.0000 | OK |
| 60 minute summer | INF BASIN 2 | 66 | 11.072 | 0.772 | 679.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 60 minute summer | SW14.1 | 14.000 | SW14.2 | 62.6 | 0.731 | 0.263 | 10.7589 |
| 60 minute summer | SW14.2 | 14.001 | SW14.3 | 148.7 | 0.558 | 0.523 | 19.1656 |
| 60 minute summer | SW15.1 | 15.000 | SW14.3 | 179.1 | 2.028 | 0.405 | 6.0588 |
| 60 minute summer | SW14.3 | 14.002 | SW14.4 | 323.9 | 1.150 | 1.138 | 26.4763 |
| 60 minute summer | SW16.1 | 16.000 | SW14.4 | 92.7 | 1.119 | 0.236 | 6.7446 |
| 60 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 480.6 | 1.706 | 1.695 | 15.8810 |
| 60 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 679.0 | 0.086 | 0.037 | 936.3526 |
| 60 minute summer | SW17.1 | 17.000 | SW17.2 | 117.7 | 1.727 | 1.047 | 6.3796 |
| 60 minute summer | SW18.1 | 18.000 | SW17.2 | 73.5 | 0.953 | 0.574 | 4.3514 |
| 60 minute summer | SW17.2 | 17.001 | SW17.3 | 278.1 | 1.287 | 1.285 | 20.3248 |
| 60 minute summer | SW19.1 | 19.000 | SW17.3 | 45.4 | 1.753 | 0.585 | 0.7859 |
| 60 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 389.3 | 1.835 | 1.797 | 7.1475 |
| 60 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 679.0 | 0.086 | 0.037 | 936.3526 |
| 60 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute winter | SW14.1 | 35 | 11.925 | 0.650 | 53.5 | 2.6049 | 0.0000 | SURCHARGED |
| 60 minute winter | SW14.2 | 35 | 11.923 | 0.845 | 119.1 | 3.8840 | 0.0000 | SURCHARGED |
| 60 minute winter | SW15.1 | 32 | 12.265 | 0.172 | 141.5 | 1.4189 | 0.0000 | OK |
| 60 minute winter | SW14.3 | 35 | 11.890 | 0.930 | 278.8 | 2.4861 | 0.0000 | SURCHARGED |
| 60 minute winter | SW16.1 | 36 | 11.738 | 0.163 | 73.2 | 0.8369 | 0.0000 | OK |
| 60 minute winter | SW14.4 | 36 | 11.725 | 0.928 | 423.5 | 4.1969 | 0.0000 | SURCHARGED |
| 60 minute winter | SW14.5 OUT | 36 | 11.472 | 1.050 | 412.9 | 1.8558 | 0.0000 | OK |
| 60 minute winter | SW17.1 | 32 | 12.981 | 0.217 | 99.3 | 0.7489 | 0.0000 | OK |
| 60 minute winter | SW18.1 | 34 | 12.218 | 0.293 | 61.2 | 1.2405 | 0.0000 | OK |
| 60 minute winter | SW17.2 | 34 | 12.187 | 0.575 | 228.0 | 2.4415 | 0.0000 | SURCHARGED |
| 60 minute winter | SW19.1 | 32 | 12.382 | 0.107 | 36.2 | 0.3183 | 0.0000 | OK |
| 60 minute winter | SW17.3 | 34 | 11.963 | 0.541 | 311.7 | 1.9092 | 0.0000 | SURCHARGED |
| 60 minute winter | SW17.4 OUT | 35 | 11.347 | 0.925 | 311.0 | 1.6339 | 0.0000 | OK |
| 60 minute winter | INF BASIN 2 | 64 | 11.145 | 0.845 | 563.1 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 60 minute winter | SW14.1 | 14.000 | SW14.2 | 50.3 | 0.727 | 0.211 | 10.7589 |
| 60 minute winter | SW14.2 | 14.001 | SW14.3 | 115.9 | 0.553 | 0.407 | 19.1656 |
| 60 minute winter | SW15.1 | 15.000 | SW14.3 | 141.3 | 1.978 | 0.319 | 5.6346 |
| 60 minute winter | SW14.3 | 14.002 | SW14.4 | 270.6 | 0.961 | 0.951 | 26.4763 |
| 60 minute winter | SW16.1 | 16.000 | SW14.4 | 73.1 | 1.157 | 0.186 | 4.4708 |
| 60 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 412.9 | 1.466 | 1.457 | 15.8810 |
| 60 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 563.1 | 0.079 | 0.031 | 1049.5984 |
| 60 minute winter | SW17.1 | 17.000 | SW17.2 | 100.2 | 1.739 | 0.891 | 5.6327 |
| 60 minute winter | SW18.1 | 18.000 | SW17.2 | 60.1 | 0.950 | 0.469 | 3.9961 |
| 60 minute winter | SW17.2 | 17.001 | SW17.3 | 223.5 | 1.035 | 1.033 | 20.3248 |
| 60 minute winter | SW19.1 | 19.000 | SW17.3 | 36.1 | 1.718 | 0.466 | 0.7296 |
| 60 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 311.0 | 1.552 | 1.436 | 6.8068 |
| 60 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 563.1 | 0.079 | 0.031 | 1049.5984 |
| 60 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.96%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute summer | SW14.1 | 66 | 11.519 | 0.244 | 46.8 | 0.9780 | 0.0000 | OK |
| 120 minute summer | SW14.2 | 66 | 11.513 | 0.435 | 106.1 | 1.9998 | 0.0000 | OK |
| 120 minute summer | SW15.1 | 62 | 12.253 | 0.160 | 123.7 | 1.3174 | 0.0000 | OK |
| 120 minute summer | SW14.3 | 66 | 11.499 | 0.539 | 237.7 | 1.4410 | 0.0000 | OK |
| 120 minute summer | SW16.1 | 62 | 11.696 | 0.121 | 64.0 | 0.6205 | 0.0000 | OK |
| 120 minute summer | SW14.4 | 66 | 11.415 | 0.618 | 359.5 | 2.7956 | 0.0000 | SURCHARGED |
| 120 minute summer | SW14.5 OUT | 68 | 11.274 | 0.852 | 341.5 | 1.5053 | 0.0000 | OK |
| 120 minute summer | SW17.1 | 62 | 12.963 | 0.199 | 86.8 | 0.6864 | 0.0000 | OK |
| 120 minute summer | SW18.1 | 62 | 12.090 | 0.165 | 53.5 | 0.7003 | 0.0000 | OK |
| 120 minute summer | SW17.2 | 64 | 12.043 | 0.431 | 200.7 | 1.8273 | 0.0000 | OK |
| 120 minute summer | SW19.1 | 62 | 12.374 | 0.099 | 31.6 | 0.2941 | 0.0000 | OK |
| 120 minute summer | SW17.3 | 64 | 11.897 | 0.475 | 270.6 | 1.6772 | 0.0000 | OK |
| 120 minute summer | SW17.4 OUT | 66 | 11.226 | 0.804 | 271.2 | 1.4206 | 0.0000 | OK |
| 120 minute summer | INF BASIN 2 | 124 | 11.200 | 0.900 | 365.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 120 minute summer | SW14.1 | 14.000 | SW14.2 | 42.3 | 0.720 | 0.177 | 6.3724 |
| 120 minute summer | SW14.2 | 14.001 | SW14.3 | 92.1 | 0.547 | 0.324 | 16.5174 |
| 120 minute summer | SW15.1 | 15.000 | SW14.3 | 122.9 | 1.943 | 0.278 | 4.9865 |
| 120 minute summer | SW14.3 | 14.002 | SW14.4 | 213.9 | 0.870 | 0.752 | 25.7751 |
| 120 minute summer | SW16.1 | 16.000 | SW14.4 | 63.5 | 1.124 | 0.162 | 4.0697 |
| 120 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 341.5 | 1.432 | 1.205 | 15.7601 |
| 120 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 365.2 | 0.048 | 0.020 | 1136.2208 |
| 120 minute summer | SW17.1 | 17.000 | SW17.2 | 84.5 | 1.733 | 0.752 | 4.4809 |
| 120 minute summer | SW18.1 | 18.000 | SW17.2 | 52.9 | 0.943 | 0.413 | 2.6337 |
| 120 minute summer | SW17.2 | 17.001 | SW17.3 | 195.0 | 0.986 | 0.901 | 18.5877 |
| 120 minute summer | SW19.1 | 19.000 | SW17.3 | 31.4 | 1.704 | 0.405 | 0.6156 |
| 120 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 271.2 | 1.485 | 1.252 | 6.4044 |
| 120 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 365.2 | 0.048 | 0.020 | 1136.2208 |
| 120 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 120 minute winter. 360 minute analysis at 2 minute timestep. Mass balance: 99.98%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute winter | SW14.1 | 68 | 11.408 | 0.133 | 34.8 | 0.5350 | 0.0000 | OK |
| 120 minute winter | SW14.2 | 68 | 11.393 | 0.315 | 83.7 | 1.4467 | 0.0000 | OK |
| 120 minute winter | SW15.1 | 62 | 12.230 | 0.137 | 92.1 | 1.1315 | 0.0000 | OK |
| 120 minute winter | SW14.3 | 68 | 11.379 | 0.419 | 189.4 | 1.1199 | 0.0000 | OK |
| 120 minute winter | SW16.1 | 62 | 11.679 | 0.104 | 47.6 | 0.5358 | 0.0000 | OK |
| 120 minute winter | SW14.4 | 70 | 11.321 | 0.524 | 290.3 | 2.3709 | 0.0000 | OK |
| 120 minute winter | SW14.5 OUT | 120 | 11.290 | 0.868 | 281.5 | 1.5336 | 0.0000 | OK |
| 120 minute winter | SW17.1 | 62 | 12.929 | 0.165 | 64.6 | 0.5685 | 0.0000 | OK |
| 120 minute winter | SW18.1 | 62 | 12.068 | 0.143 | 39.8 | 0.6077 | 0.0000 | OK |
| 120 minute winter | SW17.2 | 64 | 11.946 | 0.334 | 151.1 | 1.4160 | 0.0000 | OK |
| 120 minute winter | SW19.1 | 60 | 12.362 | 0.087 | 23.5 | 0.2590 | 0.0000 | OK |
| 120 minute winter | SW17.3 | 64 | 11.815 | 0.393 | 209.4 | 1.3867 | 0.0000 | OK |
| 120 minute winter | SW17.4 OUT | 122 | 11.295 | 0.873 | 209.6 | 1.5423 | 0.0000 | OK |
| 120 minute winter | INF BASIN 2 | 122 | 11.289 | 0.989 | 271.4 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 120 minute winter | SW14.1 | 14.000 | SW14.2 | 34.7 | 0.713 | 0.145 | 3.4615 |
| 120 minute winter | SW14.2 | 14.001 | SW14.3 | 79.7 | 0.540 | 0.280 | 12.2351 |
| 120 minute winter | SW15.1 | 15.000 | SW14.3 | 91.9 | 1.895 | 0.208 | 3.6089 |
| 120 minute winter | SW14.3 | 14.002 | SW14.4 | 182.1 | 0.855 | 0.640 | 22.1092 |
| 120 minute winter | SW16.1 | 16.000 | SW14.4 | 47.5 | 1.119 | 0.121 | 3.5285 |
| 120 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 281.5 | 1.382 | 0.993 | 14.9353 |
| 120 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 271.4 | 0.050 | 0.015 | 1281.5138 |
| 120 minute winter | SW17.1 | 17.000 | SW17.2 | 64.2 | 1.646 | 0.571 | 3.5359 |
| 120 minute winter | SW18.1 | 18.000 | SW17.2 | 39.8 | 0.949 | 0.311 | 1.8133 |
| 120 minute winter | SW17.2 | 17.001 | SW17.3 | 150.4 | 0.944 | 0.695 | 14.9616 |
| 120 minute winter | SW19.1 | 19.000 | SW17.3 | 23.5 | 1.671 | 0.303 | 0.3667 |
| 120 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 209.6 | 1.367 | 0.968 | 5.4321 |
| 120 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 271.4 | 0.050 | 0.015 | 1281.5138 |
| 120 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute summer | SW14.1 | 92 | 11.410 | 0.135 | 36.5 | 0.5404 | 0.0000 | OK |
| 180 minute summer | SW14.2 | 96 | 11.384 | 0.306 | 87.3 | 1.4055 | 0.0000 | OK |
| 180 minute summer | SW15.1 | 92 | 12.233 | 0.140 | 96.6 | 1.1566 | 0.0000 | OK |
| 180 minute summer | SW14.3 | 96 | 11.368 | 0.408 | 194.4 | 1.0915 | 0.0000 | OK |
| 180 minute summer | SW16.1 | 92 | 11.681 | 0.106 | 50.0 | 0.5477 | 0.0000 | OK |
| 180 minute summer | SW14.4 | 96 | 11.298 | 0.501 | 294.4 | 2.2660 | 0.0000 | OK |
| 180 minute summer | SW14.5 OUT | 184 | 11.263 | 0.841 | 278.2 | 1.4858 | 0.0000 | OK |
| 180 minute summer | SW17.1 | 92 | 12.932 | 0.168 | 67.8 | 0.5798 | 0.0000 | OK |
| 180 minute summer | SW18.1 | 92 | 12.072 | 0.147 | 41.7 | 0.6242 | 0.0000 | OK |
| 180 minute summer | SW17.2 | 92 | 11.948 | 0.336 | 156.7 | 1.4244 | 0.0000 | OK |
| 180 minute summer | SW19.1 | 92 | 12.365 | 0.090 | 24.7 | 0.2670 | 0.0000 | OK |
| 180 minute summer | SW17.3 | 92 | 11.813 | 0.391 | 213.7 | 1.3800 | 0.0000 | OK |
| 180 minute summer | SW17.4 OUT | 184 | 11.267 | 0.845 | 206.7 | 1.4924 | 0.0000 | OK |
| 180 minute summer | INF BASIN 2 | 184 | 11.261 | 0.961 | 266.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 180 minute summer | SW14.1 | 14.000 | SW14.2 | 35.9 | 0.713 | 0.150 | 3.2782 |
| 180 minute summer | SW14.2 | 14.001 | SW14.3 | 80.0 | 0.532 | 0.281 | 11.8531 |
| 180 minute summer | SW15.1 | 15.000 | SW14.3 | 95.8 | 1.900 | 0.217 | 3.4836 |
| 180 minute summer | SW14.3 | 14.002 | SW14.4 | 180.7 | 0.847 | 0.635 | 21.4144 |
| 180 minute summer | SW16.1 | 16.000 | SW14.4 | 49.6 | 1.108 | 0.126 | 3.3786 |
| 180 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 278.2 | 1.337 | 0.981 | 14.3326 |
| 180 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 266.2 | 0.035 | 0.015 | 1236.0746 |
| 180 minute summer | SW17.1 | 17.000 | SW17.2 | 65.9 | 1.652 | 0.586 | 3.6145 |
| 180 minute summer | SW18.1 | 18.000 | SW17.2 | 41.4 | 0.932 | 0.323 | 1.8645 |
| 180 minute summer | SW17.2 | 17.001 | SW17.3 | 151.1 | 0.948 | 0.698 | 14.9677 |
| 180 minute summer | SW19.1 | 19.000 | SW17.3 | 24.7 | 1.655 | 0.318 | 0.3722 |
| 180 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 206.7 | 1.361 | 0.954 | 5.3946 |
| 180 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 266.2 | 0.035 | 0.015 | 1236.0746 |
| 180 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 180 minute winter. 420 minute analysis at 4 minute timestep. Mass balance: 99.99%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute winter | SW14.1 | 92 | 11.391 | 0.116 | 26.6 | 0.4639 | 0.0000 | OK |
| 180 minute winter | SW14.2 | 172 | 11.363 | 0.285 | 63.9 | 1.3125 | 0.0000 | OK |
| 180 minute winter | SW15.1 | 92 | 12.212 | 0.119 | 70.3 | 0.9854 | 0.0000 | OK |
| 180 minute winter | SW14.3 | 172 | 11.363 | 0.403 | 145.9 | 1.0776 | 0.0000 | OK |
| 180 minute winter | SW16.1 | 92 | 11.666 | 0.091 | 36.4 | 0.4689 | 0.0000 | OK |
| 180 minute winter | SW14.4 | 180 | 11.365 | 0.568 | 225.8 | 2.5678 | 0.0000 | OK |
| 180 minute winter | SW14.5 OUT | 180 | 11.381 | 0.959 | 219.8 | 1.6953 | 0.0000 | OK |
| 180 minute winter | SW17.1 | 92 | 12.904 | 0.140 | 49.3 | 0.4829 | 0.0000 | OK |
| 180 minute winter | SW18.1 | 92 | 12.052 | 0.127 | 30.4 | 0.5377 | 0.0000 | OK |
| 180 minute winter | SW17.2 | 92 | 11.884 | 0.272 | 115.3 | 1.1553 | 0.0000 | OK |
| 180 minute winter | SW19.1 | 92 | 12.351 | 0.076 | 18.0 | 0.2254 | 0.0000 | OK |
| 180 minute winter | SW17.3 | 92 | 11.752 | 0.330 | 160.2 | 1.1660 | 0.0000 | OK |
| 180 minute winter | SW17.4 OUT | 180 | 11.368 | 0.946 | 159.2 | 1.6708 | 0.0000 | OK |
| 180 minute winter | INF BASIN 2 | 180 | 11.362 | 1.062 | 205.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 180 minute winter | SW14.1 | 14.000 | SW14.2 | 26.5 | 0.711 | 0.111 | 2.6179 |
| 180 minute winter | SW14.2 | 14.001 | SW14.3 | 62.3 | 0.532 | 0.219 | 11.3412 |
| 180 minute winter | SW15.1 | 15.000 | SW14.3 | 70.2 | 1.885 | 0.159 | 2.6450 |
| 180 minute winter | SW14.3 | 14.002 | SW14.4 | 142.7 | 0.827 | 0.502 | 22.4073 |
| 180 minute winter | SW16.1 | 16.000 | SW14.4 | 36.3 | 1.092 | 0.092 | 3.3785 |
| 180 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 219.8 | 1.292 | 0.775 | 15.7197 |
| 180 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 205.5 | 0.038 | 0.011 | 1403.4996 |
| 180 minute winter | SW17.1 | 17.000 | SW17.2 | 49.0 | 1.542 | 0.436 | 2.8813 |
| 180 minute winter | SW18.1 | 18.000 | SW17.2 | 30.3 | 0.948 | 0.236 | 1.2609 |
| 180 minute winter | SW17.2 | 17.001 | SW17.3 | 114.6 | 0.895 | 0.530 | 12.0441 |
| 180 minute winter | SW19.1 | 19.000 | SW17.3 | 18.0 | 1.564 | 0.232 | 0.2869 |
| 180 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 159.2 | 1.256 | 0.735 | 4.5086 |
| 180 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 205.5 | 0.038 | 0.011 | 1403.4996 |
| 180 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 99.95%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute summer | SW14.1 | 124 | 11.396 | 0.121 | 29.1 | 0.4860 | 0.0000 | OK |
| 240 minute summer | SW14.2 | 124 | 11.326 | 0.248 | 70.0 | 1.1410 | 0.0000 | OK |
| 240 minute summer | SW15.1 | 124 | 12.218 | 0.125 | 76.9 | 1.0320 | 0.0000 | OK |
| 240 minute summer | SW14.3 | 124 | 11.305 | 0.345 | 159.9 | 0.9230 | 0.0000 | OK |
| 240 minute summer | SW16.1 | 124 | 11.670 | 0.095 | 39.8 | 0.4904 | 0.0000 | OK |
| 240 minute summer | SW14.4 | 240 | 11.296 | 0.499 | 246.8 | 2.2566 | 0.0000 | OK |
| 240 minute summer | SW14.5 OUT | 244 | 11.296 | 0.874 | 240.4 | 1.5441 | 0.0000 | OK |
| 240 minute summer | SW17.1 | 124 | 12.912 | 0.148 | 53.9 | 0.5104 | 0.0000 | OK |
| 240 minute summer | SW18.1 | 124 | 12.058 | 0.133 | 33.2 | 0.5637 | 0.0000 | OK |
| 240 minute summer | SW17.2 | 124 | 11.904 | 0.292 | 126.4 | 1.2375 | 0.0000 | OK |
| 240 minute summer | SW19.1 | 124 | 12.355 | 0.080 | 19.7 | 0.2369 | 0.0000 | OK |
| 240 minute summer | SW17.3 | 124 | 11.773 | 0.351 | 176.2 | 1.2393 | 0.0000 | OK |
| 240 minute summer | SW17.4 OUT | 240 | 11.299 | 0.877 | 175.9 | 1.5504 | 0.0000 | OK |
| 240 minute summer | INF BASIN 2 | 244 | 11.295 | 0.995 | 226.4 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 240 minute summer | SW14.1 | 14.000 | SW14.2 | 29.1 | 0.705 | 0.122 | 2.4801 |
| 240 minute summer | SW14.2 | 14.001 | SW14.3 | 68.2 | 0.531 | 0.240 | 9.4490 |
| 240 minute summer | SW15.1 | 15.000 | SW14.3 | 76.9 | 1.888 | 0.174 | 2.6788 |
| 240 minute summer | SW14.3 | 14.002 | SW14.4 | 156.0 | 0.838 | 0.548 | 19.4145 |
| 240 minute summer | SW16.1 | 16.000 | SW14.4 | 39.8 | 1.097 | 0.101 | 2.9018 |
| 240 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 240.4 | 1.320 | 0.848 | 14.9929 |
| 240 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 226.4 | 0.031 | 0.012 | 1290.7810 |
| 240 minute summer | SW17.1 | 17.000 | SW17.2 | 53.9 | 1.579 | 0.479 | 3.0929 |
| 240 minute summer | SW18.1 | 18.000 | SW17.2 | 33.2 | 0.938 | 0.259 | 1.4406 |
| 240 minute summer | SW17.2 | 17.001 | SW17.3 | 126.3 | 0.912 | 0.584 | 13.0089 |
| 240 minute summer | SW19.1 | 19.000 | SW17.3 | 19.7 | 1.604 | 0.254 | 0.3069 |
| 240 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 175.9 | 1.294 | 0.812 | 4.8283 |
| 240 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 226.4 | 0.031 | 0.012 | 1290.7810 |
| 240 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 240 minute winter. 480 minute analysis at 4 minute timestep. Mass balance: 99.97%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute winter | SW14.1 | 232 | 11.411 | 0.136 | 21.6 | 0.5472 | 0.0000 | OK |
| 240 minute winter | SW14.2 | 248 | 11.410 | 0.332 | 52.0 | 1.5253 | 0.0000 | OK |
| 240 minute winter | SW15.1 | 120 | 12.201 | 0.108 | 57.2 | 0.8923 | 0.0000 | OK |
| 240 minute winter | SW14.3 | 256 | 11.408 | 0.448 | 119.7 | 1.1970 | 0.0000 | OK |
| 240 minute winter | SW16.1 | 124 | 11.657 | 0.082 | 29.6 | 0.4241 | 0.0000 | OK |
| 240 minute winter | SW14.4 | 244 | 11.409 | 0.612 | 186.1 | 2.7668 | 0.0000 | SURCHARGED |
| 240 minute winter | SW14.5 OUT | 244 | 11.444 | 1.022 | 182.5 | 1.8066 | 0.0000 | OK |
| 240 minute winter | SW17.1 | 124 | 12.889 | 0.125 | 40.1 | 0.4302 | 0.0000 | OK |
| 240 minute winter | SW18.1 | 124 | 12.039 | 0.114 | 24.7 | 0.4816 | 0.0000 | OK |
| 240 minute winter | SW17.2 | 124 | 11.850 | 0.238 | 94.0 | 1.0091 | 0.0000 | OK |
| 240 minute winter | SW19.1 | 124 | 12.343 | 0.068 | 14.6 | 0.2015 | 0.0000 | OK |
| 240 minute winter | SW17.3 | 124 | 11.716 | 0.294 | 131.1 | 1.0380 | 0.0000 | OK |
| 240 minute winter | SW17.4 OUT | 236 | 11.409 | 0.987 | 131.1 | 1.7444 | 0.0000 | OK |
| 240 minute winter | INF BASIN 2 | 240 | 11.403 | 1.103 | 169.3 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 240 minute winter | SW14.1 | 14.000 | SW14.2 | 21.7 | 0.706 | 0.091 | 3.6881 |
| 240 minute winter | SW14.2 | 14.001 | SW14.3 | 51.5 | 0.526 | 0.181 | 13.0736 |
| 240 minute winter | SW15.1 | 15.000 | SW14.3 | 57.2 | 1.854 | 0.129 | 3.1042 |
| 240 minute winter | SW14.3 | 14.002 | SW14.4 | 118.5 | 0.798 | 0.416 | 23.8367 |
| 240 minute winter | SW16.1 | 16.000 | SW14.4 | 29.6 | 1.107 | 0.075 | 3.4918 |
| 240 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 182.5 | 1.216 | 0.644 | 15.8810 |
| 240 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 169.3 | 0.033 | 0.009 | 1475.0870 |
| 240 minute winter | SW17.1 | 17.000 | SW17.2 | 40.1 | 1.465 | 0.357 | 2.4806 |
| 240 minute winter | SW18.1 | 18.000 | SW17.2 | 24.7 | 0.898 | 0.193 | 1.0848 |
| 240 minute winter | SW17.2 | 17.001 | SW17.3 | 94.0 | 0.857 | 0.434 | 10.3194 |
| 240 minute winter | SW19.1 | 19.000 | SW17.3 | 14.6 | 1.480 | 0.188 | 0.2464 |
| 240 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 131.1 | 1.184 | 0.605 | 3.9365 |
| 240 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 169.3 | 0.033 | 0.009 | 1475.0870 |
| 240 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.97%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute summer | SW14.1 | 184 | 11.383 | 0.108 | 22.2 | 0.4337 | 0.0000 | OK |
| 360 minute summer | SW14.2 | 360 | 11.320 | 0.242 | 53.4 | 1.1137 | 0.0000 | OK |
| 360 minute summer | SW15.1 | 184 | 12.203 | 0.110 | 58.8 | 0.9066 | 0.0000 | OK |
| 360 minute summer | SW14.3 | 360 | 11.320 | 0.360 | 121.6 | 0.9629 | 0.0000 | OK |
| 360 minute summer | SW16.1 | 184 | 11.658 | 0.083 | 30.4 | 0.4288 | 0.0000 | OK |
| 360 minute summer | SW14.4 | 360 | 11.320 | 0.523 | 187.6 | 2.3646 | 0.0000 | OK |
| 360 minute summer | SW14.5 OUT | 360 | 11.321 | 0.899 | 181.1 | 1.5891 | 0.0000 | OK |
| 360 minute summer | SW17.1 | 184 | 12.890 | 0.126 | 41.3 | 0.4344 | 0.0000 | OK |
| 360 minute summer | SW18.1 | 184 | 12.040 | 0.115 | 25.4 | 0.4865 | 0.0000 | OK |
| 360 minute summer | SW17.2 | 184 | 11.852 | 0.240 | 95.9 | 1.0163 | 0.0000 | OK |
| 360 minute summer | SW19.1 | 184 | 12.344 | 0.069 | 15.0 | 0.2040 | 0.0000 | OK |
| 360 minute summer | SW17.3 | 184 | 11.716 | 0.294 | 132.6 | 1.0366 | 0.0000 | OK |
| 360 minute summer | SW17.4 OUT | 368 | 11.322 | 0.900 | 130.3 | 1.5906 | 0.0000 | OK |
| 360 minute summer | INF BASIN 2 | 360 | 11.318 | 1.018 | 168.4 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 360 minute summer | SW14.1 | 14.000 | SW14.2 | 22.1 | 0.707 | 0.092 | 1.6956 |
| 360 minute summer | SW14.2 | 14.001 | SW14.3 | 51.7 | 0.527 | 0.182 | 9.6289 |
| 360 minute summer | SW15.1 | 15.000 | SW14.3 | 58.6 | 1.858 | 0.132 | 2.0471 |
| 360 minute summer | SW14.3 | 14.002 | SW14.4 | 118.4 | 0.797 | 0.416 | 20.5479 |
| 360 minute summer | SW16.1 | 16.000 | SW14.4 | 30.3 | 1.095 | 0.077 | 3.0654 |
| 360 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 181.1 | 1.181 | 0.639 | 15.2872 |
| 360 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 168.4 | 0.027 | 0.009 | 1329.2169 |
| 360 minute summer | SW17.1 | 17.000 | SW17.2 | 40.7 | 1.469 | 0.362 | 2.5099 |
| 360 minute summer | SW18.1 | 18.000 | SW17.2 | 25.1 | 0.901 | 0.196 | 1.0987 |
| 360 minute summer | SW17.2 | 17.001 | SW17.3 | 94.6 | 0.860 | 0.437 | 10.3509 |
| 360 minute summer | SW19.1 | 19.000 | SW17.3 | 14.9 | 1.488 | 0.192 | 0.2504 |
| 360 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 130.3 | 1.181 | 0.602 | 3.9255 |
| 360 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 168.4 | 0.027 | 0.009 | 1329.2169 |
| 360 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 99.96%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | SW14.1 | 368 | 11.452 | 0.177 | 16.2 | 0.7087 | 0.0000 | OK |
| 360 minute winter | SW14.2 | 360 | 11.448 | 0.370 | 38.9 | 1.7011 | 0.0000 | OK |
| 360 minute winter | SW15.1 | 184 | 12.188 | 0.095 | 42.8 | 0.7877 | 0.0000 | OK |
| 360 minute winter | SW14.3 | 360 | 11.451 | 0.491 | 89.8 | 1.3139 | 0.0000 | OK |
| 360 minute winter | SW16.1 | 184 | 11.647 | 0.072 | 22.2 | 0.3684 | 0.0000 | OK |
| 360 minute winter | SW14.4 | 344 | 11.445 | 0.648 | 139.8 | 2.9306 | 0.0000 | SURCHARGED |
| 360 minute winter | SW14.5 OUT | 360 | 11.483 | 1.061 | 137.0 | 1.8745 | 0.0000 | OK |
| 360 minute winter | SW17.1 | 184 | 12.870 | 0.106 | 30.0 | 0.3662 | 0.0000 | OK |
| 360 minute winter | SW18.1 | 184 | 12.023 | 0.098 | 18.5 | 0.4134 | 0.0000 | OK |
| 360 minute winter | SW17.2 | 184 | 11.812 | 0.200 | 70.3 | 0.8505 | 0.0000 | OK |
| 360 minute winter | SW19.1 | 184 | 12.333 | 0.058 | 10.9 | 0.1727 | 0.0000 | OK |
| 360 minute winter | SW17.3 | 184 | 11.671 | 0.249 | 97.8 | 0.8779 | 0.0000 | OK |
| 360 minute winter | SW17.4 OUT | 344 | 11.443 | 1.021 | 97.4 | 1.8039 | 0.0000 | OK |
| 360 minute winter | INF BASIN 2 | 352 | 11.441 | 1.141 | 128.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 360 minute winter | SW14.1 | 14.000 | SW14.2 | 16.1 | 0.680 | 0.068 | 4.6031 |
| 360 minute winter | SW14.2 | 14.001 | SW14.3 | 38.8 | 0.523 | 0.136 | 14.6053 |
| 360 minute winter | SW15.1 | 15.000 | SW14.3 | 42.7 | 1.776 | 0.097 | 3.4981 |
| 360 minute winter | SW14.3 | 14.002 | SW14.4 | 89.3 | 0.746 | 0.314 | 24.8470 |
| 360 minute winter | SW16.1 | 16.000 | SW14.4 | 22.2 | 1.101 | 0.056 | 3.5039 |
| 360 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 137.0 | 1.111 | 0.483 | 15.8810 |
| 360 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 128.8 | 0.028 | 0.007 | 1541.1010 |
| 360 minute winter | SW17.1 | 17.000 | SW17.2 | 29.9 | 1.354 | 0.266 | 2.0007 |
| 360 minute winter | SW18.1 | 18.000 | SW17.2 | 18.5 | 0.829 | 0.144 | 0.8786 |
| 360 minute winter | SW17.2 | 17.001 | SW17.3 | 70.1 | 0.796 | 0.324 | 8.2952 |
| 360 minute winter | SW19.1 | 19.000 | SW17.3 | 10.9 | 1.365 | 0.140 | 0.1993 |
| 360 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 97.4 | 1.085 | 0.450 | 3.1972 |
| 360 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 128.8 | 0.028 | 0.007 | 1541.1010 |
| 360 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 99.97%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute summer | SW14.1 | 248 | 11.373 | 0.098 | 17.6 | 0.3929 | 0.0000 | OK |
| 480 minute summer | SW14.2 | 464 | 11.324 | 0.246 | 42.3 | 1.1307 | 0.0000 | OK |
| 480 minute summer | SW15.1 | 248 | 12.193 | 0.100 | 46.5 | 0.8225 | 0.0000 | OK |
| 480 minute summer | SW14.3 | 464 | 11.324 | 0.364 | 97.8 | 0.9722 | 0.0000 | OK |
| 480 minute summer | SW16.1 | 248 | 11.650 | 0.075 | 24.1 | 0.3837 | 0.0000 | OK |
| 480 minute summer | SW14.4 | 464 | 11.323 | 0.526 | 152.6 | 2.3787 | 0.0000 | OK |
| 480 minute summer | SW14.5 OUT | 480 | 11.327 | 0.905 | 150.9 | 1.5999 | 0.0000 | OK |
| 480 minute summer | SW17.1 | 248 | 12.875 | 0.111 | 32.6 | 0.3836 | 0.0000 | OK |
| 480 minute summer | SW18.1 | 248 | 12.027 | 0.102 | 20.1 | 0.4320 | 0.0000 | OK |
| 480 minute summer | SW17.2 | 248 | 11.822 | 0.210 | 76.5 | 0.8919 | 0.0000 | OK |
| 480 minute summer | SW19.1 | 248 | 12.336 | 0.061 | 11.9 | 0.1809 | 0.0000 | OK |
| 480 minute summer | SW17.3 | 248 | 11.683 | 0.261 | 106.7 | 0.9231 | 0.0000 | OK |
| 480 minute summer | SW17.4 OUT | 464 | 11.325 | 0.903 | 106.7 | 1.5949 | 0.0000 | OK |
| 480 minute summer | INF BASIN 2 | 472 | 11.320 | 1.020 | 140.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 480 minute summer | SW14.1 | 14.000 | SW14.2 | 17.6 | 0.697 | 0.074 | 1.7654 |
| 480 minute summer | SW14.2 | 14.001 | SW14.3 | 42.3 | 0.526 | 0.149 | 9.7724 |
| 480 minute summer | SW15.1 | 15.000 | SW14.3 | 46.5 | 1.820 | 0.105 | 2.0740 |
| 480 minute summer | SW14.3 | 14.002 | SW14.4 | 97.6 | 0.769 | 0.343 | 20.7034 |
| 480 minute summer | SW16.1 | 16.000 | SW14.4 | 24.1 | 1.101 | 0.061 | 3.0816 |
| 480 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 150.9 | 1.158 | 0.532 | 15.3227 |
| 480 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 140.8 | 0.024 | 0.008 | 1333.2753 |
| 480 minute summer | SW17.1 | 17.000 | SW17.2 | 32.6 | 1.387 | 0.290 | 2.1301 |
| 480 minute summer | SW18.1 | 18.000 | SW17.2 | 20.1 | 0.849 | 0.157 | 0.9343 |
| 480 minute summer | SW17.2 | 17.001 | SW17.3 | 76.5 | 0.814 | 0.353 | 8.8454 |
| 480 minute summer | SW19.1 | 19.000 | SW17.3 | 11.9 | 1.399 | 0.153 | 0.2125 |
| 480 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 106.7 | 1.115 | 0.493 | 3.4066 |
| 480 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 140.8 | 0.024 | 0.008 | 1333.2753 |
| 480 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 480 minute winter. 720 minute analysis at 8 minute timestep. Mass balance: 99.98%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute winter | SW14.1 | 464 | 11.465 | 0.190 | 13.1 | 0.7638 | 0.0000 | OK |
| 480 minute winter | SW14.2 | 456 | 11.461 | 0.383 | 31.5 | 1.7592 | 0.0000 | OK |
| 480 minute winter | SW15.1 | 248 | 12.179 | 0.086 | 34.6 | 0.7079 | 0.0000 | OK |
| 480 minute winter | SW14.3 | 456 | 11.462 | 0.502 | 72.8 | 1.3429 | 0.0000 | OK |
| 480 minute winter | SW16.1 | 248 | 11.640 | 0.065 | 17.9 | 0.3322 | 0.0000 | OK |
| 480 minute winter | SW14.4 | 464 | 11.459 | 0.662 | 113.7 | 2.9945 | 0.0000 | SURCHARGED |
| 480 minute winter | SW14.5 OUT | 496 | 11.484 | 1.062 | 111.3 | 1.8764 | 0.0000 | OK |
| 480 minute winter | SW17.1 | 248 | 12.859 | 0.095 | 24.3 | 0.3278 | 0.0000 | OK |
| 480 minute winter | SW18.1 | 248 | 12.013 | 0.088 | 15.0 | 0.3714 | 0.0000 | OK |
| 480 minute winter | SW17.2 | 248 | 11.792 | 0.180 | 57.0 | 0.7619 | 0.0000 | OK |
| 480 minute winter | SW19.1 | 248 | 12.327 | 0.052 | 8.8 | 0.1547 | 0.0000 | OK |
| 480 minute winter | SW17.3 | 248 | 11.644 | 0.222 | 79.4 | 0.7844 | 0.0000 | OK |
| 480 minute winter | SW17.4 OUT | 464 | 11.457 | 1.035 | 79.4 | 1.8292 | 0.0000 | OK |
| 480 minute winter | INF BASIN 2 | 464 | 11.455 | 1.155 | 106.4 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 480 minute winter | SW14.1 | 14.000 | SW14.2 | 13.1 | 0.641 | 0.055 | 5.0146 |
| 480 minute winter | SW14.2 | 14.001 | SW14.3 | 31.5 | 0.495 | 0.111 | 15.0217 |
| 480 minute winter | SW15.1 | 15.000 | SW14.3 | 34.6 | 1.672 | 0.078 | 3.6474 |
| 480 minute winter | SW14.3 | 14.002 | SW14.4 | 72.8 | 0.704 | 0.256 | 25.0789 |
| 480 minute winter | SW16.1 | 16.000 | SW14.4 | 17.9 | 1.084 | 0.046 | 3.5127 |
| 480 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 111.3 | 1.051 | 0.393 | 15.8810 |
| 480 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 106.4 | 0.026 | 0.006 | 1564.9851 |
| 480 minute winter | SW17.1 | 17.000 | SW17.2 | 24.3 | 1.280 | 0.216 | 1.7207 |
| 480 minute winter | SW18.1 | 18.000 | SW17.2 | 15.0 | 0.782 | 0.117 | 0.7566 |
| 480 minute winter | SW17.2 | 17.001 | SW17.3 | 57.0 | 0.751 | 0.263 | 7.1524 |
| 480 minute winter | SW19.1 | 19.000 | SW17.3 | 8.8 | 1.286 | 0.113 | 0.1709 |
| 480 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 79.4 | 1.023 | 0.367 | 2.7641 |
| 480 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 106.4 | 0.026 | 0.006 | 1564.9851 |
| 480 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 99.97%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute summer | SW14.1 | 315 | 11.364 | 0.089 | 14.4 | 0.3565 | 0.0000 | OK |
| 600 minute summer | SW14.2 | 525 | 11.314 | 0.236 | 34.7 | 1.0837 | 0.0000 | OK |
| 600 minute summer | SW15.1 | 315 | 12.183 | 0.090 | 38.2 | 0.7442 | 0.0000 | OK |
| 600 minute summer | SW14.3 | 540 | 11.314 | 0.354 | 80.3 | 0.9455 | 0.0000 | OK |
| 600 minute summer | SW16.1 | 315 | 11.643 | 0.068 | 19.8 | 0.3488 | 0.0000 | OK |
| 600 minute summer | SW14.4 | 540 | 11.314 | 0.517 | 125.4 | 2.3359 | 0.0000 | OK |
| 600 minute summer | SW14.5 OUT | 525 | 11.316 | 0.894 | 123.9 | 1.5799 | 0.0000 | OK |
| 600 minute summer | SW17.1 | 315 | 12.864 | 0.100 | 26.8 | 0.3453 | 0.0000 | OK |
| 600 minute summer | SW18.1 | 315 | 12.017 | 0.092 | 16.5 | 0.3901 | 0.0000 | OK |
| 600 minute summer | SW17.2 | 315 | 11.801 | 0.189 | 62.8 | 0.8018 | 0.0000 | OK |
| 600 minute summer | SW19.1 | 315 | 12.330 | 0.055 | 9.8 | 0.1636 | 0.0000 | OK |
| 600 minute summer | SW17.3 | 315 | 11.656 | 0.234 | 87.6 | 0.8272 | 0.0000 | OK |
| 600 minute summer | SW17.4 OUT | 585 | 11.315 | 0.893 | 87.6 | 1.5771 | 0.0000 | OK |
| 600 minute summer | INF BASIN 2 | 540 | 11.312 | 1.012 | 117.3 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 600 minute summer | SW14.1 | 14.000 | SW14.2 | 14.4 | 0.659 | 0.060 | 1.5705 |
| 600 minute summer | SW14.2 | 14.001 | SW14.3 | 34.7 | 0.508 | 0.122 | 9.3687 |
| 600 minute summer | SW15.1 | 15.000 | SW14.3 | 38.2 | 1.722 | 0.086 | 1.9546 |
| 600 minute summer | SW14.3 | 14.002 | SW14.4 | 80.3 | 0.737 | 0.282 | 20.2481 |
| 600 minute summer | SW16.1 | 16.000 | SW14.4 | 19.8 | 1.064 | 0.050 | 3.0095 |
| 600 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 123.9 | 1.098 | 0.437 | 15.2150 |
| 600 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 117.3 | 0.023 | 0.006 | 1319.2037 |
| 600 minute summer | SW17.1 | 17.000 | SW17.2 | 26.8 | 1.314 | 0.238 | 1.8476 |
| 600 minute summer | SW18.1 | 18.000 | SW17.2 | 16.5 | 0.804 | 0.129 | 0.8104 |
| 600 minute summer | SW17.2 | 17.001 | SW17.3 | 62.8 | 0.771 | 0.290 | 7.6700 |
| 600 minute summer | SW19.1 | 19.000 | SW17.3 | 9.8 | 1.326 | 0.126 | 0.1847 |
| 600 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 87.6 | 1.053 | 0.404 | 2.9612 |
| 600 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 117.3 | 0.023 | 0.006 | 1319.2037 |
| 600 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 600 minute winter. 840 minute analysis at 15 minute timestep. Mass balance: 99.96%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | SW14.1 | 570 | 11.459 | 0.184 | 11.0 | 0.7397 | 0.0000 | OK |
| 600 minute winter | SW14.2 | 570 | 11.459 | 0.381 | 26.5 | 1.7524 | 0.0000 | OK |
| 600 minute winter | SW15.1 | 315 | 12.172 | 0.079 | 29.2 | 0.6509 | 0.0000 | OK |
| 600 minute winter | SW14.3 | 570 | 11.458 | 0.498 | 61.3 | 1.3320 | 0.0000 | OK |
| 600 minute winter | SW16.1 | 315 | 11.635 | 0.060 | 15.1 | 0.3064 | 0.0000 | OK |
| 600 minute winter | SW14.4 | 570 | 11.456 | 0.659 | 95.8 | 2.9814 | 0.0000 | SURCHARGED |
| 600 minute winter | SW14.5 OUT | 585 | 11.453 | 1.031 | 94.1 | 1.8225 | 0.0000 | OK |
| 600 minute winter | SW17.1 | 315 | 12.851 | 0.087 | 20.5 | 0.2999 | 0.0000 | OK |
| 600 minute winter | SW18.1 | 315 | 12.005 | 0.080 | 12.6 | 0.3397 | 0.0000 | OK |
| 600 minute winter | SW17.2 | 315 | 11.776 | 0.164 | 48.0 | 0.6965 | 0.0000 | OK |
| 600 minute winter | SW19.1 | 315 | 12.323 | 0.048 | 7.5 | 0.1426 | 0.0000 | OK |
| 600 minute winter | SW17.3 | 315 | 11.625 | 0.203 | 67.0 | 0.7157 | 0.0000 | OK |
| 600 minute winter | SW17.4 OUT | 570 | 11.454 | 1.032 | 67.0 | 1.8237 | 0.0000 | OK |
| 600 minute winter | INF BASIN 2 | 585 | 11.452 | 1.152 | 91.6 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 600 minute winter | SW14.1 | 14.000 | SW14.2 | 11.0 | 0.608 | 0.046 | 4.9366 |
| 600 minute winter | SW14.2 | 14.001 | SW14.3 | 26.5 | 0.471 | 0.093 | 14.9296 |
| 600 minute winter | SW15.1 | 15.000 | SW14.3 | 29.2 | 1.592 | 0.066 | 3.5936 |
| 600 minute winter | SW14.3 | 14.002 | SW14.4 | 61.3 | 0.675 | 0.215 | 24.9919 |
| 600 minute winter | SW16.1 | 16.000 | SW14.4 | 15.1 | 1.075 | 0.038 | 3.5040 |
| 600 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 94.1 | 1.008 | 0.332 | 15.8810 |
| 600 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 91.6 | 0.024 | 0.005 | 1559.2319 |
| 600 minute winter | SW17.1 | 17.000 | SW17.2 | 20.5 | 1.221 | 0.182 | 1.5213 |
| 600 minute winter | SW18.1 | 18.000 | SW17.2 | 12.6 | 0.745 | 0.098 | 0.6675 |
| 600 minute winter | SW17.2 | 17.001 | SW17.3 | 48.0 | 0.715 | 0.222 | 6.3245 |
| 600 minute winter | SW19.1 | 19.000 | SW17.3 | 7.5 | 1.230 | 0.097 | 0.1524 |
| 600 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 67.0 | 0.976 | 0.309 | 2.4459 |
| 600 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 91.6 | 0.024 | 0.005 | 1559.2319 |
| 600 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 99.97%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute summer | SW14.1 | 375 | 11.359 | 0.084 | 12.9 | 0.3380 | 0.0000 | OK |
| 720 minute summer | SW14.2 | 600 | 11.303 | 0.225 | 31.0 | 1.0341 | 0.0000 | OK |
| 720 minute summer | SW15.1 | 375 | 12.178 | 0.085 | 34.1 | 0.7028 | 0.0000 | OK |
| 720 minute summer | SW14.3 | 585 | 11.303 | 0.343 | 71.7 | 0.9166 | 0.0000 | OK |
| 720 minute summer | SW16.1 | 375 | 11.639 | 0.064 | 17.6 | 0.3295 | 0.0000 | OK |
| 720 minute summer | SW14.4 | 585 | 11.303 | 0.506 | 111.9 | 2.2865 | 0.0000 | OK |
| 720 minute summer | SW14.5 OUT | 600 | 11.305 | 0.883 | 110.9 | 1.5599 | 0.0000 | OK |
| 720 minute summer | SW17.1 | 375 | 12.858 | 0.094 | 23.9 | 0.3250 | 0.0000 | OK |
| 720 minute summer | SW18.1 | 375 | 12.012 | 0.087 | 14.7 | 0.3676 | 0.0000 | OK |
| 720 minute summer | SW17.2 | 375 | 11.790 | 0.178 | 56.0 | 0.7548 | 0.0000 | OK |
| 720 minute summer | SW19.1 | 375 | 12.327 | 0.052 | 8.7 | 0.1538 | 0.0000 | OK |
| 720 minute summer | SW17.3 | 375 | 11.642 | 0.220 | 78.1 | 0.7775 | 0.0000 | OK |
| 720 minute summer | SW17.4 OUT | 585 | 11.316 | 0.894 | 78.1 | 1.5804 | 0.0000 | OK |
| 720 minute summer | INF BASIN 2 | 600 | 11.301 | 1.001 | 106.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 720 minute summer | SW14.1 | 14.000 | SW14.2 | 12.9 | 0.638 | 0.054 | 1.3868 |
| 720 minute summer | SW14.2 | 14.001 | SW14.3 | 31.0 | 0.492 | 0.109 | 8.9368 |
| 720 minute summer | SW15.1 | 15.000 | SW14.3 | 34.1 | 1.665 | 0.077 | 1.8281 |
| 720 minute summer | SW14.3 | 14.002 | SW14.4 | 71.7 | 0.714 | 0.252 | 19.7296 |
| 720 minute summer | SW16.1 | 16.000 | SW14.4 | 17.6 | 1.065 | 0.045 | 2.9277 |
| 720 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 110.9 | 1.063 | 0.391 | 15.0812 |
| 720 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 106.0 | 0.023 | 0.006 | 1301.4282 |
| 720 minute summer | SW17.1 | 17.000 | SW17.2 | 23.9 | 1.274 | 0.213 | 1.7000 |
| 720 minute summer | SW18.1 | 18.000 | SW17.2 | 14.7 | 0.778 | 0.115 | 0.7456 |
| 720 minute summer | SW17.2 | 17.001 | SW17.3 | 56.0 | 0.747 | 0.259 | 7.0659 |
| 720 minute summer | SW19.1 | 19.000 | SW17.3 | 8.7 | 1.282 | 0.112 | 0.1695 |
| 720 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 78.1 | 1.018 | 0.361 | 2.7324 |
| 720 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 106.0 | 0.023 | 0.006 | 1301.4282 |
| 720 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 720 minute winter. 960 minute analysis at 15 minute timestep. Mass balance: 99.96%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute winter | SW14.1 | 705 | 11.464 | 0.189 | 9.7 | 0.7567 | 0.0000 | OK |
| 720 minute winter | SW14.2 | 705 | 11.458 | 0.380 | 23.3 | 1.7459 | 0.0000 | OK |
| 720 minute winter | SW15.1 | 375 | 12.167 | 0.074 | 25.7 | 0.6104 | 0.0000 | OK |
| 720 minute winter | SW14.3 | 705 | 11.453 | 0.493 | 53.9 | 1.3192 | 0.0000 | OK |
| 720 minute winter | SW16.1 | 375 | 11.631 | 0.056 | 13.3 | 0.2883 | 0.0000 | OK |
| 720 minute winter | SW14.4 | 675 | 11.449 | 0.652 | 84.2 | 2.9499 | 0.0000 | SURCHARGED |
| 720 minute winter | SW14.5 OUT | 720 | 11.476 | 1.054 | 82.7 | 1.8621 | 0.0000 | OK |
| 720 minute winter | SW17.1 | 375 | 12.845 | 0.081 | 18.0 | 0.2804 | 0.0000 | OK |
| 720 minute winter | SW18.1 | 375 | 12.000 | 0.075 | 11.1 | 0.3187 | 0.0000 | OK |
| 720 minute winter | SW17.2 | 375 | 11.766 | 0.154 | 42.2 | 0.6516 | 0.0000 | OK |
| 720 minute winter | SW19.1 | 375 | 12.320 | 0.045 | 6.6 | 0.1337 | 0.0000 | OK |
| 720 minute winter | SW17.3 | 375 | 11.611 | 0.189 | 58.9 | 0.6686 | 0.0000 | OK |
| 720 minute winter | SW17.4 OUT | 675 | 11.442 | 1.020 | 58.9 | 1.8017 | 0.0000 | OK |
| 720 minute winter | INF BASIN 2 | 675 | 11.440 | 1.140 | 81.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 720 minute winter | SW14.1 | 14.000 | SW14.2 | 9.7 | 0.591 | 0.041 | 4.9719 |
| 720 minute winter | SW14.2 | 14.001 | SW14.3 | 23.3 | 0.454 | 0.082 | 14.8275 |
| 720 minute winter | SW15.1 | 15.000 | SW14.3 | 25.7 | 1.535 | 0.058 | 3.5039 |
| 720 minute winter | SW14.3 | 14.002 | SW14.4 | 53.9 | 0.648 | 0.189 | 24.8893 |
| 720 minute winter | SW16.1 | 16.000 | SW14.4 | 13.3 | 1.072 | 0.034 | 3.4944 |
| 720 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 82.7 | 0.958 | 0.292 | 15.8810 |
| 720 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 81.9 | 0.023 | 0.005 | 1538.0400 |
| 720 minute winter | SW17.1 | 17.000 | SW17.2 | 18.0 | 1.177 | 0.160 | 1.3858 |
| 720 minute winter | SW18.1 | 18.000 | SW17.2 | 11.1 | 0.719 | 0.087 | 0.6097 |
| 720 minute winter | SW17.2 | 17.001 | SW17.3 | 42.2 | 0.690 | 0.195 | 5.7669 |
| 720 minute winter | SW19.1 | 19.000 | SW17.3 | 6.6 | 1.186 | 0.085 | 0.1390 |
| 720 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 58.9 | 0.940 | 0.272 | 2.2324 |
| 720 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 81.9 | 0.023 | 0.005 | 1538.0400 |
| 720 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute summer | SW14.1 | 495 | 11.352 | 0.077 | 10.6 | 0.3076 | 0.0000 | OK |
| 960 minute summer | SW14.2 | 720 | 11.284 | 0.206 | 25.5 | 0.9488 | 0.0000 | OK |
| 960 minute summer | SW15.1 | 495 | 12.170 | 0.077 | 28.1 | 0.6383 | 0.0000 | OK |
| 960 minute summer | SW14.3 | 720 | 11.284 | 0.324 | 59.0 | 0.8670 | 0.0000 | OK |
| 960 minute summer | SW16.1 | 495 | 11.633 | 0.058 | 14.5 | 0.3005 | 0.0000 | OK |
| 960 minute summer | SW14.4 | 720 | 11.284 | 0.487 | 92.1 | 2.2025 | 0.0000 | OK |
| 960 minute summer | SW14.5 OUT | 720 | 11.285 | 0.863 | 91.6 | 1.5244 | 0.0000 | OK |
| 960 minute summer | SW17.1 | 495 | 12.849 | 0.085 | 19.7 | 0.2937 | 0.0000 | OK |
| 960 minute summer | SW18.1 | 495 | 12.004 | 0.079 | 12.1 | 0.3328 | 0.0000 | OK |
| 960 minute summer | SW17.2 | 495 | 11.773 | 0.161 | 46.2 | 0.6828 | 0.0000 | OK |
| 960 minute summer | SW19.1 | 495 | 12.322 | 0.047 | 7.2 | 0.1397 | 0.0000 | OK |
| 960 minute summer | SW17.3 | 495 | 11.620 | 0.198 | 64.4 | 0.7008 | 0.0000 | OK |
| 960 minute summer | SW17.4 OUT | 840 | 11.287 | 0.865 | 64.4 | 1.5289 | 0.0000 | OK |
| 960 minute summer | INF BASIN 2 | 720 | 11.282 | 0.982 | 89.4 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 960 minute summer | SW14.1 | 14.000 | SW14.2 | 10.6 | 0.603 | 0.044 | 1.1708 |
| 960 minute summer | SW14.2 | 14.001 | SW14.3 | 25.5 | 0.466 | 0.090 | 8.2007 |
| 960 minute summer | SW15.1 | 15.000 | SW14.3 | 28.1 | 1.575 | 0.063 | 1.6137 |
| 960 minute summer | SW14.3 | 14.002 | SW14.4 | 59.0 | 0.676 | 0.207 | 18.8166 |
| 960 minute summer | SW16.1 | 16.000 | SW14.4 | 14.5 | 1.083 | 0.037 | 2.7782 |
| 960 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 91.6 | 1.008 | 0.323 | 14.7948 |
| 960 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 89.4 | 0.023 | 0.005 | 1270.7010 |
| 960 minute summer | SW17.1 | 17.000 | SW17.2 | 19.7 | 1.207 | 0.175 | 1.4783 |
| 960 minute summer | SW18.1 | 18.000 | SW17.2 | 12.1 | 0.736 | 0.094 | 0.6485 |
| 960 minute summer | SW17.2 | 17.001 | SW17.3 | 46.2 | 0.708 | 0.213 | 6.1497 |
| 960 minute summer | SW19.1 | 19.000 | SW17.3 | 7.2 | 1.216 | 0.093 | 0.1480 |
| 960 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 64.4 | 0.964 | 0.297 | 2.3784 |
| 960 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 89.4 | 0.023 | 0.005 | 1270.7010 |
| 960 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 960 minute winter. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | SW14.1 | 960 | 11.416 | 0.141 | 7.9 | 0.5654 | 0.0000 | OK |
| 960 minute winter | SW14.2 | 750 | 11.413 | 0.335 | 19.0 | 1.5405 | 0.0000 | OK |
| 960 minute winter | SW15.1 | 495 | 12.160 | 0.067 | 20.8 | 0.5497 | 0.0000 | OK |
| 960 minute winter | SW14.3 | 960 | 11.417 | 0.457 | 43.8 | 1.2214 | 0.0000 | OK |
| 960 minute winter | SW16.1 | 495 | 11.626 | 0.051 | 10.8 | 0.2615 | 0.0000 | OK |
| 960 minute winter | SW14.4 | 960 | 11.422 | 0.625 | 68.4 | 2.8258 | 0.0000 | SURCHARGED |
| 960 minute winter | SW14.5 OUT | 930 | 11.416 | 0.994 | 67.4 | 1.7564 | 0.0000 | OK |
| 960 minute winter | SW17.1 | 495 | 12.837 | 0.073 | 14.6 | 0.2520 | 0.0000 | OK |
| 960 minute winter | SW18.1 | 495 | 11.993 | 0.068 | 9.0 | 0.2871 | 0.0000 | OK |
| 960 minute winter | SW17.2 | 495 | 11.750 | 0.138 | 34.2 | 0.5855 | 0.0000 | OK |
| 960 minute winter | SW19.1 | 495 | 12.315 | 0.040 | 5.3 | 0.1199 | 0.0000 | OK |
| 960 minute winter | SW17.3 | 495 | 11.592 | 0.170 | 47.7 | 0.5990 | 0.0000 | OK |
| 960 minute winter | SW17.4 OUT | 735 | 11.416 | 0.994 | 47.7 | 1.7568 | 0.0000 | OK |
| 960 minute winter | INF BASIN 2 | 765 | 11.406 | 1.106 | 68.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 960 minute winter | SW14.1 | 14.000 | SW14.2 | 7.9 | 0.558 | 0.033 | 3.7990 |
| 960 minute winter | SW14.2 | 14.001 | SW14.3 | 19.0 | 0.429 | 0.067 | 13.3107 |
| 960 minute winter | SW15.1 | 15.000 | SW14.3 | 20.8 | 1.444 | 0.047 | 3.1132 |
| 960 minute winter | SW14.3 | 14.002 | SW14.4 | 43.8 | 0.612 | 0.154 | 24.0577 |
| 960 minute winter | SW16.1 | 16.000 | SW14.4 | 10.8 | 1.070 | 0.027 | 3.4664 |
| 960 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 67.4 | 0.913 | 0.238 | 15.8810 |
| 960 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 68.8 | 0.024 | 0.004 | 1480.0618 |
| 960 minute winter | SW17.1 | 17.000 | SW17.2 | 14.6 | 1.109 | 0.130 | 1.1929 |
| 960 minute winter | SW18.1 | 18.000 | SW17.2 | 9.0 | 0.676 | 0.070 | 0.5255 |
| 960 minute winter | SW17.2 | 17.001 | SW17.3 | 34.2 | 0.650 | 0.158 | 4.9619 |
| 960 minute winter | SW19.1 | 19.000 | SW17.3 | 5.3 | 1.112 | 0.068 | 0.1190 |
| 960 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 47.7 | 0.886 | 0.220 | 1.9185 |
| 960 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 68.8 | 0.024 | 0.004 | 1480.0618 |
| 960 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW14.1 | 750 | 11.341 | 0.066 | 7.7 | 0.2649 | 0.0000 | OK |
| 1440 minute summer | SW14.2 | 990 | 11.243 | 0.165 | 18.6 | 0.7593 | 0.0000 | OK |
| 1440 minute summer | SW15.1 | 750 | 12.159 | 0.066 | 20.4 | 0.5445 | 0.0000 | OK |
| 1440 minute summer | SW14.3 | 990 | 11.243 | 0.283 | 42.9 | 0.7566 | 0.0000 | OK |
| 1440 minute summer | SW16.1 | 720 | 11.626 | 0.051 | 10.6 | 0.2623 | 0.0000 | OK |
| 1440 minute summer | SW14.4 | 990 | 11.243 | 0.446 | 67.0 | 2.0158 | 0.0000 | OK |
| 1440 minute summer | SW14.5 OUT | 1020 | 11.243 | 0.821 | 66.5 | 1.4511 | 0.0000 | OK |
| 1440 minute summer | SW17.1 | 750 | 12.836 | 0.072 | 14.3 | 0.2494 | 0.0000 | OK |
| 1440 minute summer | SW18.1 | 750 | 11.992 | 0.067 | 8.8 | 0.2839 | 0.0000 | OK |
| 1440 minute summer | SW17.2 | 750 | 11.749 | 0.137 | 33.5 | 0.5794 | 0.0000 | OK |
| 1440 minute summer | SW19.1 | 750 | 12.315 | 0.040 | 5.2 | 0.1188 | 0.0000 | OK |
| 1440 minute summer | SW17.3 | 750 | 11.590 | 0.168 | 46.7 | 0.5926 | 0.0000 | OK |
| 1440 minute summer | SW17.4 OUT | 1050 | 11.247 | 0.825 | 46.7 | 1.4583 | 0.0000 | OK |
| 1440 minute summer | INF BASIN 2 | 990 | 11.242 | 0.942 | 67.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW14.1 | 14.000 | SW14.2 | 7.7 | 0.554 | 0.032 | 0.7369 |
| 1440 minute summer | SW14.2 | 14.001 | SW14.3 | 18.6 | 0.426 | 0.065 | 6.5859 |
| 1440 minute summer | SW15.1 | 15.000 | SW14.3 | 20.4 | 1.436 | 0.046 | 1.1527 |
| 1440 minute summer | SW14.3 | 14.002 | SW14.4 | 42.9 | 0.617 | 0.151 | 16.6930 |
| 1440 minute summer | SW16.1 | 16.000 | SW14.4 | 10.6 | 1.085 | 0.027 | 2.4205 |
| 1440 minute summer | SW14.4 | 14.003 | SW14.5 OUT | 66.5 | 0.922 | 0.235 | 13.8929 |
| 1440 minute summer | SW14.5 OUT | Flow through pond | INF BASIN 2 | 67.8 | 0.023 | 0.004 | 1203.3313 |
| 1440 minute summer | SW17.1 | 17.000 | SW17.2 | 14.3 | 1.102 | 0.127 | 1.1753 |
| 1440 minute summer | SW18.1 | 18.000 | SW17.2 | 8.8 | 0.672 | 0.069 | 0.5171 |
| 1440 minute summer | SW17.2 | 17.001 | SW17.3 | 33.5 | 0.646 | 0.155 | 4.8889 |
| 1440 minute summer | SW19.1 | 19.000 | SW17.3 | 5.2 | 1.107 | 0.067 | 0.1174 |
| 1440 minute summer | SW17.3 | 17.002 | SW17.4 OUT | 46.7 | 0.880 | 0.216 | 1.8903 |
| 1440 minute summer | SW17.4 OUT | Flow through pond | INF BASIN 2 | 67.8 | 0.023 | 0.004 | 1203.3313 |
| 1440 minute summer | INF BASIN 2 | Infiltration | | 22.5 | | | |

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**Results for 100 year +40% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 99.96%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW14.1 | 1080 | 11.353 | 0.078 | 5.8 | 0.3143 | 0.0000 | OK |
| 1440 minute winter | SW14.2 | 1080 | 11.353 | 0.275 | 14.0 | 1.2668 | 0.0000 | OK |
| 1440 minute winter | SW15.1 | 750 | 12.151 | 0.058 | 15.4 | 0.4750 | 0.0000 | OK |
| 1440 minute winter | SW14.3 | 1110 | 11.352 | 0.391 | 32.4 | 1.0469 | 0.0000 | OK |
| 1440 minute winter | SW16.1 | 720 | 11.619 | 0.044 | 7.9 | 0.2278 | 0.0000 | OK |
| 1440 minute winter | SW14.4 | 1080 | 11.351 | 0.554 | 50.5 | 2.5070 | 0.0000 | OK |
| 1440 minute winter | SW14.5 OUT | 1080 | 11.363 | 0.941 | 50.3 | 1.6620 | 0.0000 | OK |
| 1440 minute winter | SW17.1 | 750 | 12.827 | 0.063 | 10.8 | 0.2164 | 0.0000 | OK |
| 1440 minute winter | SW18.1 | 750 | 11.983 | 0.058 | 6.6 | 0.2463 | 0.0000 | OK |
| 1440 minute winter | SW17.2 | 750 | 11.731 | 0.119 | 25.3 | 0.5032 | 0.0000 | OK |
| 1440 minute winter | SW19.1 | 750 | 12.310 | 0.035 | 3.9 | 0.1030 | 0.0000 | OK |
| 1440 minute winter | SW17.3 | 750 | 11.567 | 0.145 | 35.2 | 0.5126 | 0.0000 | OK |
| 1440 minute winter | SW17.4 OUT | 1110 | 11.353 | 0.931 | 35.2 | 1.6459 | 0.0000 | OK |
| 1440 minute winter | INF BASIN 2 | 1080 | 11.350 | 1.050 | 53.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW14.1 | 14.000 | SW14.2 | 5.8 | 0.507 | 0.024 | 2.3854 |
| 1440 minute winter | SW14.2 | 14.001 | SW14.3 | 14.0 | 0.392 | 0.049 | 10.8818 |
| 1440 minute winter | SW15.1 | 15.000 | SW14.3 | 15.4 | 1.321 | 0.035 | 2.4092 |
| 1440 minute winter | SW14.3 | 14.002 | SW14.4 | 32.4 | 0.573 | 0.114 | 21.9370 |
| 1440 minute winter | SW16.1 | 16.000 | SW14.4 | 7.9 | 0.995 | 0.020 | 3.2628 |
| 1440 minute winter | SW14.4 | 14.003 | SW14.5 OUT | 50.3 | 0.845 | 0.178 | 15.6091 |
| 1440 minute winter | SW14.5 OUT | Flow through pond | INF BASIN 2 | 53.8 | 0.023 | 0.003 | 1382.9675 |
| 1440 minute winter | SW17.1 | 17.000 | SW17.2 | 10.8 | 1.017 | 0.096 | 0.9620 |
| 1440 minute winter | SW18.1 | 18.000 | SW17.2 | 6.6 | 0.620 | 0.052 | 0.4198 |
| 1440 minute winter | SW17.2 | 17.001 | SW17.3 | 25.3 | 0.597 | 0.117 | 3.9989 |
| 1440 minute winter | SW19.1 | 19.000 | SW17.3 | 3.9 | 1.019 | 0.050 | 0.0956 |
| 1440 minute winter | SW17.3 | 17.002 | SW17.4 OUT | 35.2 | 0.814 | 0.163 | 1.5407 |
| 1440 minute winter | SW17.4 OUT | Flow through pond | INF BASIN 2 | 53.8 | 0.023 | 0.003 | 1382.9675 |
| 1440 minute winter | INF BASIN 2 | Infiltration | | 22.5 | | | |

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## Design Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Maximum Time of Concentration (mins) | 30.00 |
| Return Period (years) | 2 | Maximum Rainfall (mm/hr) | 75.0 |
| Additional Flow (%) | 0 | Minimum Velocity (m/s) | 1.00 |
| FSR Region | England and Wales | Connection Type | Level Soffits |
| M5-60 (mm) | 17.000 | Minimum Backdrop Height (m) | 0.200 |
| Ratio-R | 0.300 | Preferred Cover Depth (m) | 1.200 |
| CV | 0.750 | Include Intermediate Ground | ✓ |
| Time of Entry (mins) | 4.00 | Enforce best practice design rules | x |

## Nodes

| Name | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|---|---|---|---|---|---|---|---|
| SW22.2 | 0.071 | 4.00 | 13.000 | 1200 | 282625.608 | 177063.807 | 1.685 |
| SW22.1 | 0.178 | 4.00 | 13.000 | 1200 | 282625.608 | 177033.053 | 1.425 |
| SW22.3 | 0.160 | 4.00 | 12.500 | 1350 | 282582.291 | 177061.620 | 1.500 |
| SW23.1 | 0.306 | 4.00 | 11.500 | 1350 | 282539.988 | 176994.542 | 1.725 |
| SW22.4 | 0.095 | 4.00 | 10.909 | 1500 | 282527.620 | 177031.265 | 1.753 |
| SW22.5 | 0.272 | 4.00 | 10.961 | 1500 | 282475.204 | 177012.936 | 1.918 |
| SW22.6 OUT | | | 12.915 | 1500 | 282467.060 | 177026.338 | 4.365 |
| SW24.1 | 0.234 | 4.00 | 10.589 | 1200 | 282486.459 | 177135.239 | 1.650 |
| SW24.2 | 0.681 | 4.00 | 11.260 | 1200 | 282514.015 | 177054.532 | 2.659 |
| SW24.3 OUT | | | 12.411 | 1200 | 282487.634 | 177042.046 | 3.869 |
| INF BASIN 3 | | | 10.350 | | 282467.105 | 177035.989 | 1.850 |

## Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 22.000 | SW22.1 | SW22.2 | 30.754 | 0.600 | 11.575 | 11.390 | 0.185 | 166.2 | 225 | 4.51 | 53.5 |
| 22.001 | SW22.2 | SW22.3 | 43.372 | 0.600 | 11.315 | 11.075 | 0.240 | 180.7 | 300 | 5.13 | 51.0 |
| 22.002 | SW22.3 | SW22.4 | 62.533 | 0.600 | 11.000 | 9.307 | 1.693 | 36.9 | 375 | 5.48 | 49.7 |
| 23.000 | SW23.1 | SW22.4 | 38.750 | 0.600 | 9.775 | 9.306 | 0.469 | 82.7 | 375 | 4.32 | 54.3 |
| 22.003 | SW22.4 | SW22.5 | 55.528 | 0.600 | 9.156 | 9.043 | 0.113 | 491.4 | 525 | 6.40 | 46.6 |
| 22.004 | SW22.5 | SW22.6 OUT | 15.682 | 0.600 | 9.043 | 9.011 | 0.032 | 490.1 | 525 | 6.66 | 45.9 |
| 24.000 | SW24.1 | SW24.2 | 85.282 | 0.600 | 8.939 | 8.676 | 0.263 | 324.0 | 450 | 5.26 | 50.5 |
| 24.001 | SW24.2 | SW24.3 OUT | 29.187 | 0.600 | 8.601 | 8.542 | 0.059 | 494.7 | 525 | 5.75 | 48.7 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| 22.000 | 1.011 | 40.2 | 25.8 | 1.200 | 1.385 | 0.178 | 0.0 | 131 | 1.072 |
| 22.001 | 1.166 | 82.4 | 34.5 | 1.385 | 1.125 | 0.249 | 0.0 | 135 | 1.115 |
| 22.002 | 2.989 | 330.1 | 55.2 | 1.125 | 1.227 | 0.410 | 0.0 | 103 | 2.239 |
| 23.000 | 1.993 | 220.2 | 45.0 | 1.350 | 1.228 | 0.306 | 0.0 | 115 | 1.580 |
| 22.003 | 1.003 | 217.2 | 102.5 | 1.228 | 1.393 | 0.811 | 0.0 | 254 | 0.989 |
| 22.004 | 1.005 | 217.5 | 134.6 | 1.393 | 3.379 | 1.083 | 0.0 | 299 | 1.055 |
| 24.000 | 1.124 | 178.7 | 32.0 | 1.200 | 2.134 | 0.234 | 0.0 | 128 | 0.857 |
| 24.001 | 1.000 | 216.5 | 120.9 | 2.134 | 3.344 | 0.915 | 0.0 | 281 | 1.026 |

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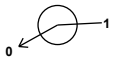
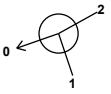
## Pipeline Schedule

| Link | Length (m) | Slope (1:X) | Dia (mm) | Link Type | US CL (m) | US IL (m) | US Depth (m) | DS CL (m) | DS IL (m) | DS Depth (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 22.000 | 30.754 | 166.2 | 225 | Circular | 13.000 | 11.575 | 1.200 | 13.000 | 11.390 | 1.385 |
| 22.001 | 43.372 | 180.7 | 300 | Circular | 13.000 | 11.315 | 1.385 | 12.500 | 11.075 | 1.125 |
| 22.002 | 62.533 | 36.9 | 375 | Circular | 12.500 | 11.000 | 1.125 | 10.909 | 9.307 | 1.227 |
| 23.000 | 38.750 | 82.7 | 375 | Circular | 11.500 | 9.775 | 1.350 | 10.909 | 9.306 | 1.228 |
| 22.003 | 55.528 | 491.4 | 525 | Circular | 10.909 | 9.156 | 1.228 | 10.961 | 9.043 | 1.393 |
| 22.004 | 15.682 | 490.1 | 525 | Circular | 10.961 | 9.043 | 1.393 | 12.915 | 9.011 | 3.379 |
| 24.000 | 85.282 | 324.0 | 450 | Circular | 10.589 | 8.939 | 1.200 | 11.260 | 8.676 | 2.134 |
| 24.001 | 29.187 | 494.7 | 525 | Circular | 11.260 | 8.601 | 2.134 | 12.411 | 8.542 | 3.344 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|---|---|---|---|---|---|---|---|---|
| 22.000 | SW22.1 | 1200 | Manhole | Adoptable | SW22.2 | 1200 | Manhole | Adoptable |
| 22.001 | SW22.2 | 1200 | Manhole | Adoptable | SW22.3 | 1350 | Manhole | Adoptable |
| 22.002 | SW22.3 | 1350 | Manhole | Adoptable | SW22.4 | 1500 | Manhole | Adoptable |
| 23.000 | SW23.1 | 1350 | Manhole | Adoptable | SW22.4 | 1500 | Manhole | Adoptable |
| 22.003 | SW22.4 | 1500 | Manhole | Adoptable | SW22.5 | 1500 | Manhole | Adoptable |
| 22.004 | SW22.5 | 1500 | Manhole | Adoptable | SW22.6 OUT | 1500 | Manhole | Adoptable |
| 24.000 | SW24.1 | 1200 | Manhole | Adoptable | SW24.2 | 1200 | Manhole | Adoptable |
| 24.001 | SW24.2 | 1200 | Manhole | Adoptable | SW24.3 OUT | 1200 | Manhole | Adoptable |

## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| SW22.2 | 282625.608 | 177063.807 | 13.000 | 1.685 | 1200 | 1 | 22.000 | 11.390 | 225 |
| | | | | | | | | | |
| | | | | | | 0 | 22.001 | 11.315 | 300 |
| SW22.1 | 282625.608 | 177033.053 | 13.000 | 1.425 | 1200 | | | | |
| | | | | | | 0 | 22.000 | 11.575 | 225 |
| SW22.3 | 282582.291 | 177061.620 | 12.500 | 1.500 | 1350 | 1 | 22.001 | 11.075 | 300 |
| | | | | | |  | | | |
| | | | | | | 0 | 22.002 | 11.000 | 375 |
| SW23.1 | 282539.988 | 176994.542 | 11.500 | 1.725 | 1350 | | | | |
| | | | | | | 0 | 23.000 | 9.775 | 375 |
| SW22.4 | 282527.620 | 177031.265 | 10.909 | 1.753 | 1500 | 1 | 23.000 | 9.306 | 375 |
| | | | | | | 2 | 22.002 | 9.307 | 375 |
| | | | | | |  | | | |
| | | | | | | 0 | 22.003 | 9.156 | 525 |
| SW22.5 | 282475.204 | 177012.936 | 10.961 | 1.918 | 1500 | 1 | 22.003 | 9.043 | 525 |
| | | | | | | | | | |
| | | | | | | 0 | 22.004 | 9.043 | 525 |
| SW22.6 OUT | 282467.060 | 177026.338 | 12.915 | 4.365 | 1500 | 1 | 22.004 | 9.011 | 525 |
| | | | | | | | | | |

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## Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|---|---|---|---|---|---|---|---|---|---|
| SW24.1 | 282486.459 | 177135.239 | 10.589 | 1.650 | 1200 | 0 | 24.000 | 8.939 | 450 |
| SW24.2 | 282514.015 | 177054.532 | 11.260 | 2.659 | 1200 | 1 | 24.000 | 8.676 | 450 |
| | | | | | | 0 | 24.001 | 8.601 | 525 |
| SW24.3 OUT | 282487.634 | 177042.046 | 12.411 | 3.869 | 1200 | 1 | 24.001 | 8.542 | 525 |
| INF BASIN 3 | 282467.105 | 177035.989 | 10.350 | 1.850 | | | | | |

## Simulation Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Analysis Speed | Detailed |
| FSR Region | England and Wales | Skip Steady State | x |
| M5-60 (mm) | 17.000 | Drain Down Time (mins) | 240 |
| Ratio-R | 0.300 | Additional Storage (m³/ha) | 20.0 |
| Summer CV | 0.750 | Check Discharge Rate(s) | x |
| Winter CV | 0.840 | Check Discharge Volume | x |

**Storm Durations**

| 15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440 |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|---|---|---|---|
| 100 | 40 | 0 | 0 |

## Node INF BASIN 3 Flow through Pond Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 0.36000 | Porosity | 1.00 | Main Channel Length (m) | 25.000 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m) | 8.500 | Main Channel Slope (1:X) | 500.0 |
| Safety Factor | 10.0 | Time to half empty (mins) | | Main Channel n | 0.350 |

**Inlets**

| SW24.3 OUT | SW22.6 OUT |
|---|---|

| Depth (m) | Area (m²) | Inf Area (m²) | Depth (m) | Area (m²) | Inf Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 693.1 | 693.1 | 1.850 | 1424.9 | 693.1 |

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## Rainfall

| Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) | Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) |
|---|---|---|---|---|---|
| 100 year +40% CC 15 minute summer | 368.854 | 104.373 | 100 year +40% CC 360 minute summer | 55.175 | 14.198 |
| 100 year +40% CC 15 minute winter | 258.845 | 104.373 | 100 year +40% CC 360 minute winter | 35.865 | 14.198 |
| 100 year +40% CC 30 minute summer | 255.101 | 72.185 | 100 year +40% CC 480 minute summer | 43.619 | 11.527 |
| 100 year +40% CC 30 minute winter | 179.018 | 72.185 | 100 year +40% CC 480 minute winter | 28.979 | 11.527 |
| 100 year +40% CC 60 minute summer | 180.954 | 47.821 | 100 year +40% CC 600 minute summer | 35.816 | 9.797 |
| 100 year +40% CC 60 minute winter | 120.222 | 47.821 | 100 year +40% CC 600 minute winter | 24.472 | 9.797 |
| 100 year +40% CC 120 minute summer | 116.088 | 30.679 | 100 year +40% CC 720 minute summer | 31.983 | 8.572 |
| 100 year +40% CC 120 minute winter | 77.126 | 30.679 | 100 year +40% CC 720 minute winter | 21.495 | 8.572 |
| 100 year +40% CC 180 minute summer | 90.626 | 23.321 | 100 year +40% CC 960 minute summer | 26.337 | 6.935 |
| 100 year +40% CC 180 minute winter | 58.909 | 23.321 | 100 year +40% CC 960 minute winter | 17.446 | 6.935 |
| 100 year +40% CC 240 minute summer | 72.104 | 19.055 | 100 year +40% CC 1440 minute summer | 19.151 | 5.133 |
| 100 year +40% CC 240 minute winter | 47.904 | 19.055 | 100 year +40% CC 1440 minute winter | 12.870 | 5.133 |

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**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.71%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW22.2 | 11 | 11.799 | 0.484 | 112.5 | 0.9577 | 0.0000 | SURCHARGED |
| 15 minute winter | SW22.1 | 11 | 12.647 | 1.072 | 89.3 | 3.8890 | 0.0000 | SURCHARGED |
| 15 minute winter | SW22.3 | 11 | 11.234 | 0.234 | 187.1 | 0.8329 | 0.0000 | OK |
| 15 minute winter | SW23.1 | 11 | 10.716 | 0.941 | 153.5 | 4.6866 | 0.0000 | SURCHARGED |
| 15 minute winter | SW22.4 | 11 | 10.525 | 1.369 | 355.6 | 3.9057 | 0.0000 | SURCHARGED |
| 15 minute winter | SW22.5 | 11 | 10.183 | 1.139 | 457.7 | 5.2503 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW22.6 OUT | 1410 | 9.990 | 1.440 | 30.6 | 2.5452 | 0.0000 | OK |
| 15 minute winter | SW24.1 | 10 | 10.208 | 1.269 | 117.5 | 5.0383 | 0.0000 | SURCHARGED |
| 15 minute winter | SW24.2 | 11 | 10.091 | 1.490 | 452.8 | 9.3187 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW24.3 OUT | 1440 | 9.990 | 1.448 | 27.0 | 1.6376 | 0.0000 | OK |
| 1440 minute winter | INF BASIN 3 | 1410 | 9.989 | 1.489 | 31.9 | 0.0000 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute winter | SW22.2 | 22.001 | SW22.3 | 111.1 | 1.587 | 1.348 | 2.9176 |
| 15 minute winter | SW22.1 | 22.000 | SW22.2 | 79.2 | 1.991 | 1.970 | 1.2231 |
| 15 minute winter | SW22.3 | 22.002 | SW22.4 | 180.3 | 2.103 | 0.546 | 5.7036 |
| 15 minute winter | SW23.1 | 23.000 | SW22.4 | 129.9 | 1.576 | 0.590 | 4.2740 |
| 15 minute winter | SW22.4 | 22.003 | SW22.5 | 340.9 | 1.578 | 1.570 | 11.9959 |
| 15 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 453.7 | 2.101 | 2.086 | 3.3878 |
| 1440 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 31.9 | 0.011 | 0.001 | 1438.7668 |
| 15 minute winter | SW24.1 | 24.000 | SW24.2 | 110.9 | 0.700 | 0.620 | 13.5124 |
| 15 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 417.2 | 1.931 | 1.927 | 6.3053 |
| 1440 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 31.9 | 0.011 | 0.001 | 1438.7668 |
| 1440 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 99.87%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | SW22.2 | 11 | 11.782 | 0.467 | 111.2 | 0.9235 | 0.0000 | SURCHARGED |
| 15 minute summer | SW22.1 | 11 | 12.601 | 1.026 | 89.3 | 3.7221 | 0.0000 | SURCHARGED |
| 15 minute summer | SW22.3 | 11 | 11.223 | 0.222 | 184.8 | 0.7936 | 0.0000 | OK |
| 15 minute summer | SW23.1 | 11 | 10.633 | 0.858 | 153.5 | 4.2719 | 0.0000 | SURCHARGED |
| 15 minute summer | SW22.4 | 11 | 10.452 | 1.296 | 351.6 | 3.6977 | 0.0000 | SURCHARGED |
| 15 minute summer | SW22.5 | 11 | 10.122 | 1.079 | 447.8 | 4.9702 | 0.0000 | SURCHARGED |
| 15 minute summer | SW22.6 OUT | 11 | 9.882 | 1.332 | 444.7 | 2.3532 | 0.0000 | OK |
| 15 minute summer | SW24.1 | 11 | 10.127 | 1.188 | 117.5 | 4.7168 | 0.0000 | SURCHARGED |
| 15 minute summer | SW24.2 | 11 | 10.037 | 1.436 | 425.7 | 8.9828 | 0.0000 | SURCHARGED |
| 15 minute summer | SW24.3 OUT | 11 | 9.746 | 1.204 | 414.4 | 1.3612 | 0.0000 | OK |
| 15 minute summer | INF BASIN 3 | 21 | 8.991 | 0.491 | 699.3 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute summer | SW22.2 | 22.001 | SW22.3 | 109.3 | 1.562 | 1.326 | 2.9097 |
| 15 minute summer | SW22.1 | 22.000 | SW22.2 | 77.9 | 1.958 | 1.937 | 1.2231 |
| 15 minute summer | SW22.3 | 22.002 | SW22.4 | 177.4 | 2.082 | 0.537 | 5.5779 |
| 15 minute summer | SW23.1 | 23.000 | SW22.4 | 127.0 | 1.599 | 0.577 | 4.2740 |
| 15 minute summer | SW22.4 | 22.003 | SW22.5 | 334.9 | 1.551 | 1.542 | 11.9959 |
| 15 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 444.7 | 2.059 | 2.044 | 3.3878 |
| 15 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 699.3 | 0.092 | 0.016 | 366.3806 |
| 15 minute summer | SW24.1 | 24.000 | SW24.2 | 110.6 | 0.698 | 0.619 | 13.5124 |
| 15 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 414.4 | 1.918 | 1.914 | 6.3053 |
| 15 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 699.3 | 0.092 | 0.016 | 366.3806 |
| 15 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 99.97%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | SW22.2 | 11 | 11.799 | 0.484 | 112.5 | 0.9577 | 0.0000 | SURCHARGED |
| 15 minute winter | SW22.1 | 11 | 12.647 | 1.072 | 89.3 | 3.8890 | 0.0000 | SURCHARGED |
| 15 minute winter | SW22.3 | 11 | 11.234 | 0.234 | 187.1 | 0.8329 | 0.0000 | OK |
| 15 minute winter | SW23.1 | 11 | 10.716 | 0.941 | 153.5 | 4.6866 | 0.0000 | SURCHARGED |
| 15 minute winter | SW22.4 | 11 | 10.525 | 1.369 | 355.6 | 3.9057 | 0.0000 | SURCHARGED |
| 15 minute winter | SW22.5 | 11 | 10.183 | 1.139 | 457.7 | 5.2503 | 0.0000 | SURCHARGED |
| 15 minute winter | SW22.6 OUT | 11 | 9.932 | 1.382 | 453.7 | 2.4425 | 0.0000 | OK |
| 15 minute winter | SW24.1 | 10 | 10.208 | 1.269 | 117.5 | 5.0383 | 0.0000 | SURCHARGED |
| 15 minute winter | SW24.2 | 11 | 10.091 | 1.490 | 452.8 | 9.3187 | 0.0000 | SURCHARGED |
| 15 minute winter | SW24.3 OUT | 11 | 9.788 | 1.246 | 417.2 | 1.4091 | 0.0000 | OK |
| 15 minute winter | INF BASIN 3 | 24 | 9.041 | 0.541 | 734.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 15 minute winter | SW22.2 | 22.001 | SW22.3 | 111.1 | 1.587 | 1.348 | 2.9176 |
| 15 minute winter | SW22.1 | 22.000 | SW22.2 | 79.2 | 1.991 | 1.970 | 1.2231 |
| 15 minute winter | SW22.3 | 22.002 | SW22.4 | 180.3 | 2.103 | 0.546 | 5.7036 |
| 15 minute winter | SW23.1 | 23.000 | SW22.4 | 129.9 | 1.576 | 0.590 | 4.2740 |
| 15 minute winter | SW22.4 | 22.003 | SW22.5 | 340.9 | 1.578 | 1.570 | 11.9959 |
| 15 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 453.7 | 2.101 | 2.086 | 3.3878 |
| 15 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 734.0 | 0.090 | 0.017 | 411.0843 |
| 15 minute winter | SW24.1 | 24.000 | SW24.2 | 110.9 | 0.700 | 0.620 | 13.5124 |
| 15 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 417.2 | 1.931 | 1.927 | 6.3053 |
| 15 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 734.0 | 0.090 | 0.017 | 411.0843 |
| 15 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 99.84%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute summer | SW22.2 | 18 | 11.728 | 0.413 | 104.5 | 0.8179 | 0.0000 | SURCHARGED |
| 30 minute summer | SW22.1 | 18 | 12.460 | 0.885 | 82.5 | 3.2121 | 0.0000 | SURCHARGED |
| 30 minute summer | SW22.3 | 18 | 11.201 | 0.201 | 172.4 | 0.7179 | 0.0000 | OK |
| 30 minute summer | SW23.1 | 19 | 10.472 | 0.697 | 141.6 | 3.4705 | 0.0000 | SURCHARGED |
| 30 minute summer | SW22.4 | 19 | 10.318 | 1.161 | 332.1 | 3.3144 | 0.0000 | SURCHARGED |
| 30 minute summer | SW22.5 | 19 | 10.024 | 0.980 | 432.2 | 4.5167 | 0.0000 | SURCHARGED |
| 30 minute summer | SW22.6 OUT | 19 | 9.813 | 1.263 | 420.7 | 2.2310 | 0.0000 | OK |
| 30 minute summer | SW24.1 | 18 | 10.032 | 1.093 | 108.4 | 4.3400 | 0.0000 | SURCHARGED |
| 30 minute summer | SW24.2 | 18 | 9.942 | 1.341 | 402.6 | 8.3857 | 0.0000 | SURCHARGED |
| 30 minute summer | SW24.3 OUT | 18 | 9.664 | 1.122 | 393.4 | 1.2686 | 0.0000 | OK |
| 30 minute summer | INF BASIN 3 | 37 | 9.142 | 0.642 | 541.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 30 minute summer | SW22.2 | 22.001 | SW22.3 | 102.4 | 1.471 | 1.242 | 2.8768 |
| 30 minute summer | SW22.1 | 22.000 | SW22.2 | 73.3 | 1.844 | 1.825 | 1.2231 |
| 30 minute summer | SW22.3 | 22.002 | SW22.4 | 169.5 | 2.084 | 0.513 | 5.3313 |
| 30 minute summer | SW23.1 | 23.000 | SW22.4 | 122.4 | 1.546 | 0.556 | 4.2740 |
| 30 minute summer | SW22.4 | 22.003 | SW22.5 | 319.5 | 1.479 | 1.471 | 11.9959 |
| 30 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 420.7 | 1.947 | 1.934 | 3.3878 |
| 30 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 541.0 | 0.067 | 0.012 | 503.1685 |
| 30 minute summer | SW24.1 | 24.000 | SW24.2 | 103.5 | 0.653 | 0.579 | 13.5124 |
| 30 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 393.4 | 1.821 | 1.817 | 6.3053 |
| 30 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 541.0 | 0.067 | 0.012 | 503.1685 |
| 30 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 99.83%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | SW22.2 | 18 | 11.651 | 0.336 | 94.3 | 0.6641 | 0.0000 | SURCHARGED |
| 30 minute winter | SW22.1 | 18 | 12.252 | 0.677 | 71.3 | 2.4585 | 0.0000 | SURCHARGED |
| 30 minute winter | SW22.3 | 18 | 11.178 | 0.178 | 155.2 | 0.6355 | 0.0000 | OK |
| 30 minute winter | SW23.1 | 19 | 10.267 | 0.492 | 122.6 | 2.4475 | 0.0000 | SURCHARGED |
| 30 minute winter | SW22.4 | 19 | 10.129 | 0.972 | 299.4 | 2.7754 | 0.0000 | SURCHARGED |
| 30 minute winter | SW22.5 | 19 | 9.883 | 0.840 | 389.9 | 3.8708 | 0.0000 | SURCHARGED |
| 30 minute winter | SW22.6 OUT | 19 | 9.703 | 1.153 | 386.6 | 2.0368 | 0.0000 | OK |
| 30 minute winter | SW24.1 | 18 | 9.812 | 0.873 | 93.8 | 3.4651 | 0.0000 | SURCHARGED |
| 30 minute winter | SW24.2 | 18 | 9.742 | 1.141 | 353.2 | 7.1379 | 0.0000 | SURCHARGED |
| 30 minute winter | SW24.3 OUT | 18 | 9.524 | 0.982 | 350.2 | 1.1105 | 0.0000 | OK |
| 30 minute winter | INF BASIN 3 | 36 | 9.207 | 0.707 | 467.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 30 minute winter | SW22.2 | 22.001 | SW22.3 | 93.2 | 1.361 | 1.131 | 2.8252 |
| 30 minute winter | SW22.1 | 22.000 | SW22.2 | 66.5 | 1.673 | 1.655 | 1.2231 |
| 30 minute winter | SW22.3 | 22.002 | SW22.4 | 155.1 | 2.097 | 0.470 | 5.0612 |
| 30 minute winter | SW23.1 | 23.000 | SW22.4 | 110.5 | 1.524 | 0.502 | 4.2740 |
| 30 minute winter | SW22.4 | 22.003 | SW22.5 | 291.4 | 1.349 | 1.342 | 11.9959 |
| 30 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 386.6 | 1.790 | 1.777 | 3.3878 |
| 30 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 467.2 | 0.065 | 0.011 | 564.5853 |
| 30 minute winter | SW24.1 | 24.000 | SW24.2 | 88.5 | 0.564 | 0.495 | 13.5124 |
| 30 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 350.2 | 1.621 | 1.618 | 6.3053 |
| 30 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 467.2 | 0.065 | 0.011 | 564.5853 |
| 30 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 99.71%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute summer | SW22.2 | 33 | 11.584 | 0.269 | 84.8 | 0.5322 | 0.0000 | OK |
| 60 minute summer | SW22.1 | 33 | 12.043 | 0.468 | 62.7 | 1.6969 | 0.0000 | SURCHARGED |
| 60 minute summer | SW22.3 | 33 | 11.167 | 0.167 | 138.3 | 0.5952 | 0.0000 | OK |
| 60 minute summer | SW23.1 | 34 | 9.992 | 0.217 | 107.7 | 1.0818 | 0.0000 | OK |
| 60 minute summer | SW22.4 | 34 | 9.926 | 0.770 | 275.8 | 2.1971 | 0.0000 | SURCHARGED |
| 60 minute summer | SW22.5 | 34 | 9.733 | 0.689 | 352.2 | 3.1756 | 0.0000 | SURCHARGED |
| 60 minute summer | SW22.6 OUT | 34 | 9.591 | 1.041 | 348.4 | 1.8392 | 0.0000 | OK |
| 60 minute summer | SW24.1 | 33 | 9.653 | 0.714 | 82.4 | 2.8327 | 0.0000 | SURCHARGED |
| 60 minute summer | SW24.2 | 33 | 9.586 | 0.985 | 317.8 | 6.1582 | 0.0000 | SURCHARGED |
| 60 minute summer | SW24.3 OUT | 34 | 9.427 | 0.885 | 303.8 | 1.0011 | 0.0000 | OK |
| 60 minute summer | INF BASIN 3 | 64 | 9.301 | 0.801 | 341.4 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 60 minute summer | SW22.2 | 22.001 | SW22.3 | 83.7 | 1.352 | 1.015 | 2.6781 |
| 60 minute summer | SW22.1 | 22.000 | SW22.2 | 60.4 | 1.521 | 1.503 | 1.1862 |
| 60 minute summer | SW22.3 | 22.002 | SW22.4 | 138.2 | 2.104 | 0.419 | 4.9294 |
| 60 minute summer | SW23.1 | 23.000 | SW22.4 | 107.1 | 1.502 | 0.486 | 3.4193 |
| 60 minute summer | SW22.4 | 22.003 | SW22.5 | 259.4 | 1.201 | 1.194 | 11.9959 |
| 60 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 348.4 | 1.613 | 1.602 | 3.3878 |
| 60 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 341.4 | 0.034 | 0.008 | 657.3996 |
| 60 minute summer | SW24.1 | 24.000 | SW24.2 | 78.1 | 0.580 | 0.437 | 13.5124 |
| 60 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 303.8 | 1.406 | 1.403 | 6.3053 |
| 60 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 341.4 | 0.034 | 0.008 | 657.3996 |
| 60 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 99.76%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute winter | SW22.2 | 33 | 11.533 | 0.218 | 68.3 | 0.4321 | 0.0000 | OK |
| 60 minute winter | SW22.1 | 33 | 11.869 | 0.294 | 49.2 | 1.0662 | 0.0000 | SURCHARGED |
| 60 minute winter | SW22.3 | 33 | 11.149 | 0.149 | 112.1 | 0.5298 | 0.0000 | OK |
| 60 minute winter | SW23.1 | 32 | 9.934 | 0.159 | 84.6 | 0.7898 | 0.0000 | OK |
| 60 minute winter | SW22.4 | 35 | 9.667 | 0.511 | 222.1 | 1.4575 | 0.0000 | OK |
| 60 minute winter | SW22.5 | 36 | 9.560 | 0.517 | 291.0 | 2.3807 | 0.0000 | OK |
| 60 minute winter | SW22.6 OUT | 37 | 9.467 | 0.917 | 287.6 | 1.6195 | 0.0000 | OK |
| 60 minute winter | SW24.1 | 34 | 9.463 | 0.524 | 64.8 | 2.0816 | 0.0000 | SURCHARGED |
| 60 minute winter | SW24.2 | 35 | 9.432 | 0.831 | 249.7 | 5.1965 | 0.0000 | SURCHARGED |
| 60 minute winter | SW24.3 OUT | 63 | 9.386 | 0.844 | 240.6 | 0.9543 | 0.0000 | OK |
| 60 minute winter | INF BASIN 3 | 63 | 9.381 | 0.881 | 268.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 60 minute winter | SW22.2 | 22.001 | SW22.3 | 68.2 | 1.288 | 0.827 | 2.2957 |
| 60 minute winter | SW22.1 | 22.000 | SW22.2 | 48.7 | 1.243 | 1.212 | 1.1458 |
| 60 minute winter | SW22.3 | 22.002 | SW22.4 | 112.0 | 2.102 | 0.339 | 4.6315 |
| 60 minute winter | SW23.1 | 23.000 | SW22.4 | 84.4 | 1.486 | 0.383 | 2.9290 |
| 60 minute winter | SW22.4 | 22.003 | SW22.5 | 216.4 | 1.047 | 0.996 | 11.9257 |
| 60 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 287.6 | 1.557 | 1.322 | 3.2463 |
| 60 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 268.8 | 0.037 | 0.006 | 738.3206 |
| 60 minute winter | SW24.1 | 24.000 | SW24.2 | 63.1 | 0.578 | 0.353 | 13.5124 |
| 60 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 240.6 | 1.114 | 1.111 | 6.3053 |
| 60 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 268.8 | 0.037 | 0.006 | 738.3206 |
| 60 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 99.78%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute summer | SW22.2 | 62 | 11.508 | 0.193 | 58.9 | 0.3823 | 0.0000 | OK |
| 120 minute summer | SW22.1 | 62 | 11.783 | 0.208 | 43.0 | 0.7564 | 0.0000 | OK |
| 120 minute summer | SW22.3 | 62 | 11.137 | 0.137 | 96.5 | 0.4872 | 0.0000 | OK |
| 120 minute summer | SW23.1 | 62 | 9.922 | 0.147 | 74.0 | 0.7320 | 0.0000 | OK |
| 120 minute summer | SW22.4 | 64 | 9.578 | 0.422 | 192.4 | 1.2044 | 0.0000 | OK |
| 120 minute summer | SW22.5 | 64 | 9.487 | 0.444 | 250.4 | 2.0458 | 0.0000 | OK |
| 120 minute summer | SW22.6 OUT | 122 | 9.464 | 0.914 | 245.9 | 1.6150 | 0.0000 | OK |
| 120 minute summer | SW24.1 | 122 | 9.464 | 0.525 | 56.6 | 2.0831 | 0.0000 | SURCHARGED |
| 120 minute summer | SW24.2 | 124 | 9.464 | 0.863 | 204.9 | 5.3988 | 0.0000 | SURCHARGED |
| 120 minute summer | SW24.3 OUT | 124 | 9.468 | 0.926 | 202.5 | 1.0469 | 0.0000 | OK |
| 120 minute summer | INF BASIN 3 | 124 | 9.464 | 0.964 | 228.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 120 minute summer | SW22.2 | 22.001 | SW22.3 | 58.2 | 1.253 | 0.706 | 2.0155 |
| 120 minute summer | SW22.1 | 22.000 | SW22.2 | 41.6 | 1.168 | 1.035 | 1.0885 |
| 120 minute summer | SW22.3 | 22.002 | SW22.4 | 95.9 | 2.102 | 0.290 | 3.7911 |
| 120 minute summer | SW23.1 | 23.000 | SW22.4 | 73.5 | 1.464 | 0.334 | 2.4048 |
| 120 minute summer | SW22.4 | 22.003 | SW22.5 | 186.1 | 0.999 | 0.857 | 10.5735 |
| 120 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 245.9 | 1.469 | 1.131 | 3.0072 |
| 120 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 228.9 | 0.026 | 0.005 | 824.7217 |
| 120 minute summer | SW24.1 | 24.000 | SW24.2 | 51.1 | 0.579 | 0.286 | 13.5124 |
| 120 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 202.5 | 0.938 | 0.936 | 6.3053 |
| 120 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 228.9 | 0.026 | 0.005 | 824.7217 |
| 120 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 120 minute winter. 360 minute analysis at 2 minute timestep. Mass balance: 99.85%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute winter | SW22.2 | 62 | 11.477 | 0.162 | 44.8 | 0.3212 | 0.0000 | OK |
| 120 minute winter | SW22.1 | 62 | 11.734 | 0.159 | 32.0 | 0.5754 | 0.0000 | OK |
| 120 minute winter | SW22.3 | 62 | 11.119 | 0.119 | 73.4 | 0.4230 | 0.0000 | OK |
| 120 minute winter | SW23.1 | 62 | 9.901 | 0.126 | 55.0 | 0.6267 | 0.0000 | OK |
| 120 minute winter | SW22.4 | 128 | 9.561 | 0.405 | 145.3 | 1.1554 | 0.0000 | OK |
| 120 minute winter | SW22.5 | 122 | 9.562 | 0.518 | 193.4 | 2.3883 | 0.0000 | OK |
| 120 minute winter | SW22.6 OUT | 124 | 9.563 | 1.013 | 192.5 | 1.7902 | 0.0000 | OK |
| 120 minute winter | SW24.1 | 126 | 9.561 | 0.622 | 42.1 | 2.4685 | 0.0000 | SURCHARGED |
| 120 minute winter | SW24.2 | 124 | 9.561 | 0.960 | 156.6 | 6.0025 | 0.0000 | SURCHARGED |
| 120 minute winter | SW24.3 OUT | 124 | 9.564 | 1.022 | 152.8 | 1.1558 | 0.0000 | OK |
| 120 minute winter | INF BASIN 3 | 122 | 9.561 | 1.061 | 176.0 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 120 minute winter | SW22.2 | 22.001 | SW22.3 | 44.6 | 1.180 | 0.541 | 1.6400 |
| 120 minute winter | SW22.1 | 22.000 | SW22.2 | 31.9 | 1.101 | 0.793 | 0.8896 |
| 120 minute winter | SW22.3 | 22.002 | SW22.4 | 73.3 | 2.097 | 0.222 | 2.6932 |
| 120 minute winter | SW23.1 | 23.000 | SW22.4 | 54.9 | 1.458 | 0.249 | 1.7138 |
| 120 minute winter | SW22.4 | 22.003 | SW22.5 | 144.9 | 0.940 | 0.667 | 10.9410 |
| 120 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 192.5 | 1.351 | 0.885 | 3.3833 |
| 120 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 176.0 | 0.029 | 0.004 | 930.3776 |
| 120 minute winter | SW24.1 | 24.000 | SW24.2 | 36.7 | 0.582 | 0.205 | 13.5124 |
| 120 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 152.8 | 0.707 | 0.706 | 6.3053 |
| 120 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 176.0 | 0.029 | 0.004 | 930.3776 |
| 120 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 99.79%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute summer | SW22.2 | 92 | 11.480 | 0.165 | 46.3 | 0.3261 | 0.0000 | OK |
| 180 minute summer | SW22.1 | 92 | 11.738 | 0.163 | 33.6 | 0.5914 | 0.0000 | OK |
| 180 minute summer | SW22.3 | 92 | 11.120 | 0.120 | 75.6 | 0.4286 | 0.0000 | OK |
| 180 minute summer | SW23.1 | 92 | 9.904 | 0.129 | 57.7 | 0.6430 | 0.0000 | OK |
| 180 minute summer | SW22.4 | 184 | 9.553 | 0.397 | 150.4 | 1.1327 | 0.0000 | OK |
| 180 minute summer | SW22.5 | 184 | 9.554 | 0.511 | 198.0 | 2.3532 | 0.0000 | OK |
| 180 minute summer | SW22.6 OUT | 184 | 9.555 | 1.005 | 194.5 | 1.7758 | 0.0000 | OK |
| 180 minute summer | SW24.1 | 184 | 9.554 | 0.615 | 44.2 | 2.4405 | 0.0000 | SURCHARGED |
| 180 minute summer | SW24.2 | 184 | 9.554 | 0.953 | 161.1 | 5.9579 | 0.0000 | SURCHARGED |
| 180 minute summer | SW24.3 OUT | 184 | 9.557 | 1.015 | 153.8 | 1.1479 | 0.0000 | OK |
| 180 minute summer | INF BASIN 3 | 184 | 9.553 | 1.053 | 177.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 180 minute summer | SW22.2 | 22.001 | SW22.3 | 45.4 | 1.182 | 0.551 | 1.6674 |
| 180 minute summer | SW22.1 | 22.000 | SW22.2 | 32.8 | 1.107 | 0.817 | 0.9119 |
| 180 minute summer | SW22.3 | 22.002 | SW22.4 | 75.1 | 2.067 | 0.228 | 2.7410 |
| 180 minute summer | SW23.1 | 23.000 | SW22.4 | 57.3 | 1.432 | 0.260 | 1.7675 |
| 180 minute summer | SW22.4 | 22.003 | SW22.5 | 146.6 | 0.943 | 0.675 | 10.8147 |
| 180 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 194.5 | 1.354 | 0.894 | 3.3747 |
| 180 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 177.9 | 0.023 | 0.004 | 921.9937 |
| 180 minute summer | SW24.1 | 24.000 | SW24.2 | 36.1 | 0.567 | 0.202 | 13.5124 |
| 180 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 153.8 | 0.712 | 0.710 | 6.3053 |
| 180 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 177.9 | 0.023 | 0.004 | 921.9937 |
| 180 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 180 minute winter. 420 minute analysis at 4 minute timestep. Mass balance: 99.83%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute winter | SW22.2 | 92 | 11.453 | 0.138 | 34.2 | 0.2730 | 0.0000 | OK |
| 180 minute winter | SW22.1 | 92 | 11.706 | 0.131 | 24.5 | 0.4762 | 0.0000 | OK |
| 180 minute winter | SW22.3 | 92 | 11.103 | 0.103 | 56.1 | 0.3683 | 0.0000 | OK |
| 180 minute winter | SW23.1 | 92 | 9.886 | 0.111 | 42.0 | 0.5519 | 0.0000 | OK |
| 180 minute winter | SW22.4 | 180 | 9.664 | 0.508 | 111.0 | 1.4496 | 0.0000 | OK |
| 180 minute winter | SW22.5 | 180 | 9.665 | 0.621 | 147.8 | 2.8636 | 0.0000 | SURCHARGED |
| 180 minute winter | SW22.6 OUT | 180 | 9.665 | 1.115 | 147.3 | 1.9703 | 0.0000 | OK |
| 180 minute winter | SW24.1 | 188 | 9.664 | 0.725 | 32.2 | 2.8765 | 0.0000 | SURCHARGED |
| 180 minute winter | SW24.2 | 184 | 9.664 | 1.063 | 120.1 | 6.6467 | 0.0000 | SURCHARGED |
| 180 minute winter | SW24.3 OUT | 184 | 9.667 | 1.125 | 116.4 | 1.2719 | 0.0000 | OK |
| 180 minute winter | INF BASIN 3 | 184 | 9.664 | 1.164 | 135.7 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 180 minute winter | SW22.2 | 22.001 | SW22.3 | 34.1 | 1.105 | 0.413 | 1.3373 |
| 180 minute winter | SW22.1 | 22.000 | SW22.2 | 24.4 | 1.045 | 0.607 | 0.7180 |
| 180 minute winter | SW22.3 | 22.002 | SW22.4 | 56.0 | 2.077 | 0.170 | 3.5616 |
| 180 minute winter | SW23.1 | 23.000 | SW22.4 | 41.9 | 1.457 | 0.190 | 2.2174 |
| 180 minute winter | SW22.4 | 22.003 | SW22.5 | 110.4 | 0.880 | 0.508 | 11.9372 |
| 180 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 147.3 | 1.238 | 0.677 | 3.3878 |
| 180 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 135.7 | 0.025 | 0.003 | 1045.8745 |
| 180 minute winter | SW24.1 | 24.000 | SW24.2 | 28.1 | 0.574 | 0.157 | 13.5124 |
| 180 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 116.4 | 0.637 | 0.538 | 6.3053 |
| 180 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 135.7 | 0.025 | 0.003 | 1045.8745 |
| 180 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 99.82%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute summer | SW22.2 | 124 | 11.461 | 0.146 | 37.4 | 0.2884 | 0.0000 | OK |
| 240 minute summer | SW22.1 | 124 | 11.714 | 0.139 | 26.7 | 0.5052 | 0.0000 | OK |
| 240 minute summer | SW22.3 | 124 | 11.108 | 0.108 | 61.5 | 0.3864 | 0.0000 | OK |
| 240 minute summer | SW23.1 | 120 | 9.891 | 0.116 | 45.9 | 0.5759 | 0.0000 | OK |
| 240 minute summer | SW22.4 | 248 | 9.614 | 0.458 | 121.7 | 1.3065 | 0.0000 | OK |
| 240 minute summer | SW22.5 | 244 | 9.615 | 0.571 | 162.7 | 2.6320 | 0.0000 | SURCHARGED |
| 240 minute summer | SW22.6 OUT | 244 | 9.615 | 1.065 | 160.4 | 1.8822 | 0.0000 | OK |
| 240 minute summer | SW24.1 | 244 | 9.616 | 0.677 | 35.2 | 2.6863 | 0.0000 | SURCHARGED |
| 240 minute summer | SW24.2 | 244 | 9.614 | 1.013 | 131.9 | 6.3380 | 0.0000 | SURCHARGED |
| 240 minute summer | SW24.3 OUT | 244 | 9.618 | 1.076 | 128.4 | 1.2169 | 0.0000 | OK |
| 240 minute summer | INF BASIN 3 | 244 | 9.614 | 1.114 | 148.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 240 minute summer | SW22.2 | 22.001 | SW22.3 | 37.4 | 1.131 | 0.454 | 1.4341 |
| 240 minute summer | SW22.1 | 22.000 | SW22.2 | 26.7 | 1.066 | 0.664 | 0.7703 |
| 240 minute summer | SW22.3 | 22.002 | SW22.4 | 61.5 | 2.093 | 0.186 | 3.1644 |
| 240 minute summer | SW23.1 | 23.000 | SW22.4 | 45.9 | 1.440 | 0.208 | 1.9731 |
| 240 minute summer | SW22.4 | 22.003 | SW22.5 | 121.8 | 0.900 | 0.561 | 11.5458 |
| 240 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 160.4 | 1.257 | 0.737 | 3.3878 |
| 240 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 148.2 | 0.020 | 0.003 | 989.3860 |
| 240 minute summer | SW24.1 | 24.000 | SW24.2 | 29.7 | 0.556 | 0.166 | 13.5124 |
| 240 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 128.4 | 0.598 | 0.593 | 6.3053 |
| 240 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 148.2 | 0.020 | 0.003 | 989.3860 |
| 240 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 240 minute winter. 480 minute analysis at 4 minute timestep. Mass balance: 99.84%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute winter | SW22.2 | 124 | 11.438 | 0.123 | 27.9 | 0.2434 | 0.0000 | OK |
| 240 minute winter | SW22.1 | 124 | 11.690 | 0.115 | 19.9 | 0.4188 | 0.0000 | OK |
| 240 minute winter | SW22.3 | 120 | 11.095 | 0.095 | 45.8 | 0.3375 | 0.0000 | OK |
| 240 minute winter | SW23.1 | 120 | 9.877 | 0.102 | 34.2 | 0.5073 | 0.0000 | OK |
| 240 minute winter | SW22.4 | 240 | 9.733 | 0.577 | 90.7 | 1.6470 | 0.0000 | SURCHARGED |
| 240 minute winter | SW22.5 | 240 | 9.734 | 0.690 | 120.3 | 3.1812 | 0.0000 | SURCHARGED |
| 240 minute winter | SW22.6 OUT | 244 | 9.735 | 1.185 | 119.3 | 2.0935 | 0.0000 | OK |
| 240 minute winter | SW24.1 | 240 | 9.733 | 0.794 | 26.2 | 3.1494 | 0.0000 | SURCHARGED |
| 240 minute winter | SW24.2 | 240 | 9.734 | 1.133 | 98.7 | 7.0855 | 0.0000 | SURCHARGED |
| 240 minute winter | SW24.3 OUT | 244 | 9.735 | 1.193 | 96.3 | 1.3497 | 0.0000 | OK |
| 240 minute winter | INF BASIN 3 | 240 | 9.733 | 1.233 | 110.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 240 minute winter | SW22.2 | 22.001 | SW22.3 | 27.9 | 1.050 | 0.338 | 1.1521 |
| 240 minute winter | SW22.1 | 22.000 | SW22.2 | 19.9 | 0.997 | 0.495 | 0.6139 |
| 240 minute winter | SW22.3 | 22.002 | SW22.4 | 45.9 | 2.092 | 0.139 | 3.6479 |
| 240 minute winter | SW23.1 | 23.000 | SW22.4 | 34.2 | 1.445 | 0.156 | 2.2701 |
| 240 minute winter | SW22.4 | 22.003 | SW22.5 | 89.9 | 0.838 | 0.414 | 11.9959 |
| 240 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 119.3 | 1.151 | 0.548 | 3.3878 |
| 240 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 110.5 | 0.023 | 0.003 | 1125.7910 |
| 240 minute winter | SW24.1 | 24.000 | SW24.2 | 23.4 | 0.568 | 0.131 | 13.5124 |
| 240 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 96.3 | 0.606 | 0.445 | 6.3053 |
| 240 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 110.5 | 0.023 | 0.003 | 1125.7910 |
| 240 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 99.82%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute summer | SW22.2 | 184 | 11.439 | 0.124 | 28.5 | 0.2452 | 0.0000 | OK |
| 360 minute summer | SW22.1 | 184 | 11.692 | 0.117 | 20.5 | 0.4243 | 0.0000 | OK |
| 360 minute summer | SW22.3 | 184 | 11.095 | 0.095 | 46.6 | 0.3401 | 0.0000 | OK |
| 360 minute summer | SW23.1 | 184 | 9.878 | 0.103 | 35.2 | 0.5140 | 0.0000 | OK |
| 360 minute summer | SW22.4 | 360 | 9.687 | 0.531 | 92.3 | 1.5141 | 0.0000 | SURCHARGED |
| 360 minute summer | SW22.5 | 368 | 9.687 | 0.644 | 122.4 | 2.9653 | 0.0000 | SURCHARGED |
| 360 minute summer | SW22.6 OUT | 368 | 9.687 | 1.137 | 121.0 | 2.0095 | 0.0000 | OK |
| 360 minute summer | SW24.1 | 360 | 9.686 | 0.747 | 26.9 | 2.9648 | 0.0000 | SURCHARGED |
| 360 minute summer | SW24.2 | 368 | 9.687 | 1.086 | 100.1 | 6.7893 | 0.0000 | SURCHARGED |
| 360 minute summer | SW24.3 OUT | 368 | 9.690 | 1.148 | 96.8 | 1.2984 | 0.0000 | OK |
| 360 minute summer | INF BASIN 3 | 368 | 9.687 | 1.187 | 112.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 360 minute summer | SW22.2 | 22.001 | SW22.3 | 28.2 | 1.052 | 0.342 | 1.1622 |
| 360 minute summer | SW22.1 | 22.000 | SW22.2 | 20.3 | 1.001 | 0.505 | 0.6235 |
| 360 minute summer | SW22.3 | 22.002 | SW22.4 | 46.5 | 2.078 | 0.141 | 3.5687 |
| 360 minute summer | SW23.1 | 23.000 | SW22.4 | 34.9 | 1.453 | 0.159 | 2.2168 |
| 360 minute summer | SW22.4 | 22.003 | SW22.5 | 91.1 | 0.841 | 0.419 | 11.9950 |
| 360 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 121.0 | 1.161 | 0.556 | 3.3878 |
| 360 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 112.5 | 0.018 | 0.003 | 1071.8403 |
| 360 minute summer | SW24.1 | 24.000 | SW24.2 | 21.8 | 0.510 | 0.122 | 13.5124 |
| 360 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 96.8 | 0.559 | 0.447 | 6.3053 |
| 360 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 112.5 | 0.018 | 0.003 | 1071.8403 |
| 360 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 99.78%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | SW22.2 | 184 | 11.420 | 0.105 | 20.9 | 0.2070 | 0.0000 | OK |
| 360 minute winter | SW22.1 | 184 | 11.672 | 0.097 | 14.9 | 0.3528 | 0.0000 | OK |
| 360 minute winter | SW22.3 | 184 | 11.082 | 0.082 | 34.2 | 0.2924 | 0.0000 | OK |
| 360 minute winter | SW23.1 | 184 | 9.863 | 0.088 | 25.6 | 0.4365 | 0.0000 | OK |
| 360 minute winter | SW22.4 | 360 | 9.818 | 0.662 | 67.7 | 1.8893 | 0.0000 | SURCHARGED |
| 360 minute winter | SW22.5 | 360 | 9.819 | 0.775 | 90.0 | 3.5725 | 0.0000 | SURCHARGED |
| 360 minute winter | SW22.6 OUT | 360 | 9.819 | 1.269 | 87.6 | 2.2426 | 0.0000 | OK |
| 360 minute winter | SW24.1 | 360 | 9.819 | 0.880 | 19.6 | 3.4927 | 0.0000 | SURCHARGED |
| 360 minute winter | SW24.2 | 360 | 9.818 | 1.217 | 73.9 | 7.6123 | 0.0000 | SURCHARGED |
| 360 minute winter | SW24.3 OUT | 360 | 9.819 | 1.277 | 72.4 | 1.4445 | 0.0000 | OK |
| 360 minute winter | INF BASIN 3 | 360 | 9.818 | 1.318 | 83.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 360 minute winter | SW22.2 | 22.001 | SW22.3 | 20.8 | 0.972 | 0.253 | 0.9292 |
| 360 minute winter | SW22.1 | 22.000 | SW22.2 | 14.9 | 0.927 | 0.370 | 0.4932 |
| 360 minute winter | SW22.3 | 22.002 | SW22.4 | 34.2 | 1.947 | 0.103 | 3.7389 |
| 360 minute winter | SW23.1 | 23.000 | SW22.4 | 25.6 | 1.334 | 0.116 | 2.3316 |
| 360 minute winter | SW22.4 | 22.003 | SW22.5 | 67.2 | 0.771 | 0.309 | 11.9959 |
| 360 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 87.6 | 1.038 | 0.403 | 3.3878 |
| 360 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 83.2 | 0.020 | 0.002 | 1226.7111 |
| 360 minute winter | SW24.1 | 24.000 | SW24.2 | 17.9 | 0.526 | 0.100 | 13.5124 |
| 360 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 72.4 | 0.559 | 0.335 | 6.3053 |
| 360 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 83.2 | 0.020 | 0.002 | 1226.7111 |
| 360 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 99.84%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute summer | SW22.2 | 248 | 11.425 | 0.110 | 22.7 | 0.2170 | 0.0000 | OK |
| 480 minute summer | SW22.1 | 248 | 11.677 | 0.102 | 16.2 | 0.3706 | 0.0000 | OK |
| 480 minute summer | SW22.3 | 248 | 11.086 | 0.086 | 37.3 | 0.3058 | 0.0000 | OK |
| 480 minute summer | SW23.1 | 248 | 9.867 | 0.092 | 27.8 | 0.4560 | 0.0000 | OK |
| 480 minute summer | SW22.4 | 480 | 9.736 | 0.580 | 73.8 | 1.6539 | 0.0000 | SURCHARGED |
| 480 minute summer | SW22.5 | 480 | 9.736 | 0.692 | 98.1 | 3.1905 | 0.0000 | SURCHARGED |
| 480 minute summer | SW22.6 OUT | 488 | 9.736 | 1.186 | 95.9 | 2.0956 | 0.0000 | OK |
| 480 minute summer | SW24.1 | 488 | 9.736 | 0.797 | 21.3 | 3.1624 | 0.0000 | SURCHARGED |
| 480 minute summer | SW24.2 | 488 | 9.736 | 1.135 | 80.3 | 7.1009 | 0.0000 | SURCHARGED |
| 480 minute summer | SW24.3 OUT | 488 | 9.739 | 1.197 | 78.4 | 1.3542 | 0.0000 | OK |
| 480 minute summer | INF BASIN 3 | 488 | 9.735 | 1.235 | 90.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 480 minute summer | SW22.2 | 22.001 | SW22.3 | 22.7 | 0.995 | 0.275 | 0.9896 |
| 480 minute summer | SW22.1 | 22.000 | SW22.2 | 16.2 | 0.948 | 0.403 | 0.5257 |
| 480 minute summer | SW22.3 | 22.002 | SW22.4 | 37.3 | 1.996 | 0.113 | 3.5791 |
| 480 minute summer | SW23.1 | 23.000 | SW22.4 | 27.8 | 1.366 | 0.126 | 2.2238 |
| 480 minute summer | SW22.4 | 22.003 | SW22.5 | 73.4 | 0.796 | 0.338 | 11.9959 |
| 480 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 95.9 | 1.086 | 0.441 | 3.3878 |
| 480 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 90.5 | 0.016 | 0.002 | 1128.4142 |
| 480 minute summer | SW24.1 | 24.000 | SW24.2 | 18.4 | 0.483 | 0.103 | 13.5124 |
| 480 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 78.4 | 0.538 | 0.362 | 6.3053 |
| 480 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 90.5 | 0.016 | 0.002 | 1128.4142 |
| 480 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 480 minute winter. 720 minute analysis at 8 minute timestep. Mass balance: 99.76%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute winter | SW22.2 | 248 | 11.408 | 0.093 | 16.8 | 0.1845 | 0.0000 | OK |
| 480 minute winter | SW22.1 | 248 | 11.661 | 0.086 | 12.0 | 0.3126 | 0.0000 | OK |
| 480 minute winter | SW22.3 | 248 | 11.074 | 0.074 | 27.6 | 0.2627 | 0.0000 | OK |
| 480 minute winter | SW23.1 | 480 | 9.875 | 0.100 | 20.7 | 0.4957 | 0.0000 | OK |
| 480 minute winter | SW22.4 | 480 | 9.875 | 0.719 | 54.7 | 2.0508 | 0.0000 | SURCHARGED |
| 480 minute winter | SW22.5 | 472 | 9.875 | 0.832 | 72.2 | 3.8332 | 0.0000 | SURCHARGED |
| 480 minute winter | SW22.6 OUT | 480 | 9.877 | 1.327 | 70.1 | 2.3452 | 0.0000 | OK |
| 480 minute winter | SW24.1 | 472 | 9.875 | 0.936 | 15.8 | 3.7141 | 0.0000 | SURCHARGED |
| 480 minute winter | SW24.2 | 480 | 9.876 | 1.275 | 60.6 | 7.9739 | 0.0000 | SURCHARGED |
| 480 minute winter | SW24.3 OUT | 480 | 9.880 | 1.338 | 59.7 | 1.5133 | 0.0000 | OK |
| 480 minute winter | INF BASIN 3 | 480 | 9.874 | 1.374 | 67.8 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 480 minute winter | SW22.2 | 22.001 | SW22.3 | 16.8 | 0.917 | 0.204 | 0.7944 |
| 480 minute winter | SW22.1 | 22.000 | SW22.2 | 12.0 | 0.877 | 0.299 | 0.4208 |
| 480 minute winter | SW22.3 | 22.002 | SW22.4 | 27.6 | 1.832 | 0.084 | 3.7606 |
| 480 minute winter | SW23.1 | 23.000 | SW22.4 | 20.7 | 1.258 | 0.094 | 2.5904 |
| 480 minute winter | SW22.4 | 22.003 | SW22.5 | 53.8 | 0.731 | 0.248 | 11.9959 |
| 480 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 70.1 | 0.983 | 0.322 | 3.3878 |
| 480 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 67.8 | 0.018 | 0.002 | 1295.2659 |
| 480 minute winter | SW24.1 | 24.000 | SW24.2 | 14.9 | 0.494 | 0.084 | 13.5124 |
| 480 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 59.7 | 0.524 | 0.276 | 6.3053 |
| 480 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 67.8 | 0.018 | 0.002 | 1295.2659 |
| 480 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 99.82%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute summer | SW22.2 | 315 | 11.413 | 0.098 | 18.6 | 0.1948 | 0.0000 | OK |
| 600 minute summer | SW22.1 | 315 | 11.666 | 0.091 | 13.3 | 0.3311 | 0.0000 | OK |
| 600 minute summer | SW22.3 | 315 | 11.078 | 0.078 | 30.6 | 0.2766 | 0.0000 | OK |
| 600 minute summer | SW23.1 | 315 | 9.858 | 0.083 | 22.8 | 0.4116 | 0.0000 | OK |
| 600 minute summer | SW22.4 | 615 | 9.766 | 0.609 | 60.5 | 1.7391 | 0.0000 | SURCHARGED |
| 600 minute summer | SW22.5 | 615 | 9.765 | 0.722 | 79.8 | 3.3268 | 0.0000 | SURCHARGED |
| 600 minute summer | SW22.6 OUT | 615 | 9.766 | 1.216 | 79.1 | 2.1494 | 0.0000 | OK |
| 600 minute summer | SW24.1 | 600 | 9.765 | 0.826 | 17.5 | 3.2774 | 0.0000 | SURCHARGED |
| 600 minute summer | SW24.2 | 600 | 9.765 | 1.164 | 66.3 | 7.2779 | 0.0000 | SURCHARGED |
| 600 minute summer | SW24.3 OUT | 615 | 9.766 | 1.224 | 65.0 | 1.3849 | 0.0000 | OK |
| 600 minute summer | INF BASIN 3 | 615 | 9.764 | 1.264 | 74.6 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 600 minute summer | SW22.2 | 22.001 | SW22.3 | 18.6 | 0.943 | 0.226 | 0.8557 |
| 600 minute summer | SW22.1 | 22.000 | SW22.2 | 13.3 | 0.901 | 0.331 | 0.4540 |
| 600 minute summer | SW22.3 | 22.002 | SW22.4 | 30.6 | 1.887 | 0.093 | 3.5877 |
| 600 minute summer | SW23.1 | 23.000 | SW22.4 | 22.8 | 1.293 | 0.104 | 2.2304 |
| 600 minute summer | SW22.4 | 22.003 | SW22.5 | 59.5 | 0.760 | 0.274 | 11.9959 |
| 600 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 79.1 | 1.027 | 0.363 | 3.3878 |
| 600 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 74.6 | 0.014 | 0.002 | 1162.4502 |
| 600 minute summer | SW24.1 | 24.000 | SW24.2 | 15.5 | 0.467 | 0.087 | 13.5124 |
| 600 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 65.0 | 0.496 | 0.300 | 6.3053 |
| 600 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 74.6 | 0.014 | 0.002 | 1162.4502 |
| 600 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 600 minute winter. 840 minute analysis at 15 minute timestep. Mass balance: 99.74%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | SW22.2 | 315 | 11.401 | 0.086 | 14.3 | 0.1695 | 0.0000 | OK |
| 600 minute winter | SW22.1 | 315 | 11.654 | 0.079 | 10.2 | 0.2860 | 0.0000 | OK |
| 600 minute winter | SW22.3 | 300 | 11.068 | 0.068 | 23.4 | 0.2416 | 0.0000 | OK |
| 600 minute winter | SW23.1 | 600 | 9.913 | 0.138 | 17.5 | 0.6873 | 0.0000 | OK |
| 600 minute winter | SW22.4 | 600 | 9.913 | 0.757 | 46.3 | 2.1607 | 0.0000 | SURCHARGED |
| 600 minute winter | SW22.5 | 600 | 9.913 | 0.870 | 60.9 | 4.0091 | 0.0000 | SURCHARGED |
| 600 minute winter | SW22.6 OUT | 600 | 9.915 | 1.365 | 58.9 | 2.4121 | 0.0000 | OK |
| 600 minute winter | SW24.1 | 600 | 9.913 | 0.974 | 13.4 | 3.8640 | 0.0000 | SURCHARGED |
| 600 minute winter | SW24.2 | 600 | 9.915 | 1.314 | 51.6 | 8.2159 | 0.0000 | SURCHARGED |
| 600 minute winter | SW24.3 OUT | 585 | 9.914 | 1.372 | 51.0 | 1.5516 | 0.0000 | OK |
| 600 minute winter | INF BASIN 3 | 600 | 9.913 | 1.413 | 57.6 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 600 minute winter | SW22.2 | 22.001 | SW22.3 | 14.3 | 0.878 | 0.173 | 0.7067 |
| 600 minute winter | SW22.1 | 22.000 | SW22.2 | 10.2 | 0.840 | 0.254 | 0.3736 |
| 600 minute winter | SW22.3 | 22.002 | SW22.4 | 23.4 | 1.743 | 0.071 | 3.7375 |
| 600 minute winter | SW23.1 | 23.000 | SW22.4 | 17.5 | 1.198 | 0.080 | 2.8497 |
| 600 minute winter | SW22.4 | 22.003 | SW22.5 | 45.3 | 0.690 | 0.209 | 11.9959 |
| 600 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 58.9 | 0.919 | 0.271 | 3.3878 |
| 600 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 57.6 | 0.017 | 0.001 | 1342.6017 |
| 600 minute winter | SW24.1 | 24.000 | SW24.2 | 12.7 | 0.476 | 0.071 | 13.5124 |
| 600 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 51.0 | 0.501 | 0.236 | 6.3053 |
| 600 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 57.6 | 0.017 | 0.001 | 1342.6017 |
| 600 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 99.82%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute summer | SW22.2 | 375 | 11.408 | 0.093 | 16.7 | 0.1839 | 0.0000 | OK |
| 720 minute summer | SW22.1 | 375 | 11.661 | 0.086 | 11.9 | 0.3112 | 0.0000 | OK |
| 720 minute summer | SW22.3 | 375 | 11.073 | 0.073 | 27.4 | 0.2617 | 0.0000 | OK |
| 720 minute summer | SW23.1 | 375 | 9.853 | 0.078 | 20.4 | 0.3888 | 0.0000 | OK |
| 720 minute summer | SW22.4 | 720 | 9.788 | 0.632 | 54.1 | 1.8027 | 0.0000 | SURCHARGED |
| 720 minute summer | SW22.5 | 720 | 9.788 | 0.744 | 71.4 | 3.4294 | 0.0000 | SURCHARGED |
| 720 minute summer | SW22.6 OUT | 735 | 9.788 | 1.238 | 69.7 | 2.1879 | 0.0000 | OK |
| 720 minute summer | SW24.1 | 720 | 9.788 | 0.849 | 15.6 | 3.3680 | 0.0000 | SURCHARGED |
| 720 minute summer | SW24.2 | 720 | 9.787 | 1.186 | 59.3 | 7.4181 | 0.0000 | SURCHARGED |
| 720 minute summer | SW24.3 OUT | 735 | 9.788 | 1.246 | 58.1 | 1.4097 | 0.0000 | OK |
| 720 minute summer | INF BASIN 3 | 720 | 9.787 | 1.287 | 66.7 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 720 minute summer | SW22.2 | 22.001 | SW22.3 | 16.7 | 0.916 | 0.203 | 0.7910 |
| 720 minute summer | SW22.1 | 22.000 | SW22.2 | 11.9 | 0.875 | 0.296 | 0.4182 |
| 720 minute summer | SW22.3 | 22.002 | SW22.4 | 27.4 | 1.828 | 0.083 | 3.6014 |
| 720 minute summer | SW23.1 | 23.000 | SW22.4 | 20.4 | 1.252 | 0.093 | 2.2391 |
| 720 minute summer | SW22.4 | 22.003 | SW22.5 | 53.3 | 0.721 | 0.245 | 11.9959 |
| 720 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 69.7 | 0.944 | 0.321 | 3.3878 |
| 720 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 66.7 | 0.014 | 0.002 | 1189.1221 |
| 720 minute summer | SW24.1 | 24.000 | SW24.2 | 13.9 | 0.447 | 0.078 | 13.5124 |
| 720 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 58.1 | 0.483 | 0.269 | 6.3053 |
| 720 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 66.7 | 0.014 | 0.002 | 1189.1221 |
| 720 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 720 minute winter. 960 minute analysis at 15 minute timestep. Mass balance: 99.73%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute winter | SW22.2 | 375 | 11.395 | 0.080 | 12.5 | 0.1580 | 0.0000 | OK |
| 720 minute winter | SW22.1 | 375 | 11.648 | 0.073 | 8.9 | 0.2658 | 0.0000 | OK |
| 720 minute winter | SW22.3 | 360 | 11.063 | 0.063 | 20.5 | 0.2263 | 0.0000 | OK |
| 720 minute winter | SW23.1 | 705 | 9.940 | 0.165 | 15.3 | 0.8237 | 0.0000 | OK |
| 720 minute winter | SW22.4 | 705 | 9.941 | 0.784 | 40.6 | 2.2383 | 0.0000 | SURCHARGED |
| 720 minute winter | SW22.5 | 705 | 9.941 | 0.897 | 53.1 | 4.1352 | 0.0000 | SURCHARGED |
| 720 minute winter | SW22.6 OUT | 720 | 9.942 | 1.392 | 51.2 | 2.4593 | 0.0000 | OK |
| 720 minute winter | SW24.1 | 705 | 9.940 | 1.001 | 11.7 | 3.9740 | 0.0000 | SURCHARGED |
| 720 minute winter | SW24.2 | 705 | 9.941 | 1.340 | 45.4 | 8.3791 | 0.0000 | SURCHARGED |
| 720 minute winter | SW24.3 OUT | 705 | 9.941 | 1.399 | 44.9 | 1.5818 | 0.0000 | OK |
| 720 minute winter | INF BASIN 3 | 720 | 9.940 | 1.440 | 51.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 720 minute winter | SW22.2 | 22.001 | SW22.3 | 12.5 | 0.845 | 0.152 | 0.6415 |
| 720 minute winter | SW22.1 | 22.000 | SW22.2 | 8.9 | 0.809 | 0.221 | 0.3382 |
| 720 minute winter | SW22.3 | 22.002 | SW22.4 | 20.5 | 1.678 | 0.062 | 3.7370 |
| 720 minute winter | SW23.1 | 23.000 | SW22.4 | 15.3 | 1.152 | 0.069 | 3.0446 |
| 720 minute winter | SW22.4 | 22.003 | SW22.5 | 39.4 | 0.674 | 0.182 | 11.9959 |
| 720 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 51.2 | 0.895 | 0.236 | 3.3878 |
| 720 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 51.2 | 0.015 | 0.001 | 1376.3102 |
| 720 minute winter | SW24.1 | 24.000 | SW24.2 | 11.2 | 0.461 | 0.063 | 13.5124 |
| 720 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 44.9 | 0.488 | 0.207 | 6.3053 |
| 720 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 51.2 | 0.015 | 0.001 | 1376.3102 |
| 720 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 99.81%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute summer | SW22.2 | 495 | 11.399 | 0.084 | 13.7 | 0.1657 | 0.0000 | OK |
| 960 minute summer | SW22.1 | 495 | 11.652 | 0.077 | 9.8 | 0.2799 | 0.0000 | OK |
| 960 minute summer | SW22.3 | 495 | 11.067 | 0.067 | 22.5 | 0.2375 | 0.0000 | OK |
| 960 minute summer | SW23.1 | 495 | 9.846 | 0.071 | 16.8 | 0.3526 | 0.0000 | OK |
| 960 minute summer | SW22.4 | 960 | 9.810 | 0.653 | 44.5 | 1.8650 | 0.0000 | SURCHARGED |
| 960 minute summer | SW22.5 | 960 | 9.810 | 0.766 | 58.9 | 3.5316 | 0.0000 | SURCHARGED |
| 960 minute summer | SW22.6 OUT | 960 | 9.810 | 1.260 | 57.5 | 2.2266 | 0.0000 | OK |
| 960 minute summer | SW24.1 | 960 | 9.810 | 0.871 | 12.8 | 3.4550 | 0.0000 | SURCHARGED |
| 960 minute summer | SW24.2 | 960 | 9.810 | 1.209 | 48.8 | 7.5642 | 0.0000 | SURCHARGED |
| 960 minute summer | SW24.3 OUT | 975 | 9.810 | 1.268 | 47.9 | 1.4338 | 0.0000 | OK |
| 960 minute summer | INF BASIN 3 | 960 | 9.809 | 1.309 | 55.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 960 minute summer | SW22.2 | 22.001 | SW22.3 | 13.7 | 0.867 | 0.166 | 0.6853 |
| 960 minute summer | SW22.1 | 22.000 | SW22.2 | 9.8 | 0.831 | 0.244 | 0.3628 |
| 960 minute summer | SW22.3 | 22.002 | SW22.4 | 22.5 | 1.726 | 0.068 | 3.6088 |
| 960 minute summer | SW23.1 | 23.000 | SW22.4 | 16.8 | 1.184 | 0.076 | 2.2461 |
| 960 minute summer | SW22.4 | 22.003 | SW22.5 | 44.0 | 0.685 | 0.203 | 11.9959 |
| 960 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 57.5 | 0.910 | 0.264 | 3.3878 |
| 960 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 55.5 | 0.013 | 0.001 | 1215.6119 |
| 960 minute summer | SW24.1 | 24.000 | SW24.2 | 11.4 | 0.435 | 0.064 | 13.5124 |
| 960 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 47.9 | 0.466 | 0.221 | 6.3053 |
| 960 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 55.5 | 0.013 | 0.001 | 1215.6119 |
| 960 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 960 minute winter. 1200 minute analysis at 15 minute timestep. Mass balance: 99.74%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | SW22.2 | 495 | 11.387 | 0.072 | 10.1 | 0.1416 | 0.0000 | OK |
| 960 minute winter | SW22.1 | 495 | 11.640 | 0.065 | 7.2 | 0.2376 | 0.0000 | OK |
| 960 minute winter | SW22.3 | 480 | 11.057 | 0.057 | 16.6 | 0.2041 | 0.0000 | OK |
| 960 minute winter | SW23.1 | 945 | 9.974 | 0.199 | 12.5 | 0.9918 | 0.0000 | OK |
| 960 minute winter | SW22.4 | 945 | 9.975 | 0.818 | 33.0 | 2.3352 | 0.0000 | SURCHARGED |
| 960 minute winter | SW22.5 | 945 | 9.975 | 0.931 | 43.0 | 4.2911 | 0.0000 | SURCHARGED |
| 960 minute winter | SW22.6 OUT | 945 | 9.975 | 1.425 | 41.5 | 2.5179 | 0.0000 | OK |
| 960 minute winter | SW24.1 | 945 | 9.976 | 1.037 | 9.5 | 4.1139 | 0.0000 | SURCHARGED |
| 960 minute winter | SW24.2 | 945 | 9.974 | 1.373 | 36.9 | 8.5898 | 0.0000 | SURCHARGED |
| 960 minute winter | SW24.3 OUT | 960 | 9.976 | 1.434 | 36.5 | 1.6220 | 0.0000 | OK |
| 960 minute winter | INF BASIN 3 | 945 | 9.974 | 1.474 | 42.2 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 960 minute winter | SW22.2 | 22.001 | SW22.3 | 10.1 | 0.796 | 0.123 | 0.5503 |
| 960 minute winter | SW22.1 | 22.000 | SW22.2 | 7.2 | 0.764 | 0.179 | 0.2899 |
| 960 minute winter | SW22.3 | 22.002 | SW22.4 | 16.6 | 1.580 | 0.050 | 3.7096 |
| 960 minute winter | SW23.1 | 23.000 | SW22.4 | 12.5 | 1.088 | 0.057 | 3.2891 |
| 960 minute winter | SW22.4 | 22.003 | SW22.5 | 31.9 | 0.630 | 0.147 | 11.9959 |
| 960 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 41.5 | 0.829 | 0.191 | 3.3878 |
| 960 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 42.2 | 0.014 | 0.001 | 1419.1869 |
| 960 minute winter | SW24.1 | 24.000 | SW24.2 | 9.2 | 0.447 | 0.052 | 13.5124 |
| 960 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 36.5 | 0.464 | 0.169 | 6.3053 |
| 960 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 42.2 | 0.014 | 0.001 | 1419.1869 |
| 960 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 99.84%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW22.2 | 750 | 11.386 | 0.071 | 10.0 | 0.1409 | 0.0000 | OK |
| 1440 minute summer | SW22.1 | 750 | 11.640 | 0.065 | 7.1 | 0.2358 | 0.0000 | OK |
| 1440 minute summer | SW22.3 | 750 | 11.057 | 0.057 | 16.4 | 0.2031 | 0.0000 | OK |
| 1440 minute summer | SW23.1 | 750 | 9.835 | 0.060 | 12.2 | 0.3006 | 0.0000 | OK |
| 1440 minute summer | SW22.4 | 1440 | 9.801 | 0.645 | 32.4 | 1.8406 | 0.0000 | SURCHARGED |
| 1440 minute summer | SW22.5 | 1440 | 9.801 | 0.758 | 43.0 | 3.4923 | 0.0000 | SURCHARGED |
| 1440 minute summer | SW22.6 OUT | 1440 | 9.802 | 1.252 | 42.1 | 2.2116 | 0.0000 | OK |
| 1440 minute summer | SW24.1 | 1410 | 9.802 | 0.863 | 9.3 | 3.4246 | 0.0000 | SURCHARGED |
| 1440 minute summer | SW24.2 | 1410 | 9.801 | 1.200 | 35.6 | 7.5067 | 0.0000 | SURCHARGED |
| 1440 minute summer | SW24.3 OUT | 1440 | 9.803 | 1.261 | 35.0 | 1.4258 | 0.0000 | OK |
| 1440 minute summer | INF BASIN 3 | 1440 | 9.801 | 1.301 | 41.5 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 1440 minute summer | SW22.2 | 22.001 | SW22.3 | 10.0 | 0.794 | 0.121 | 0.5464 |
| 1440 minute summer | SW22.1 | 22.000 | SW22.2 | 7.1 | 0.761 | 0.177 | 0.2870 |
| 1440 minute summer | SW22.3 | 22.002 | SW22.4 | 16.4 | 1.575 | 0.050 | 3.5871 |
| 1440 minute summer | SW23.1 | 23.000 | SW22.4 | 12.2 | 1.081 | 0.055 | 2.2315 |
| 1440 minute summer | SW22.4 | 22.003 | SW22.5 | 32.1 | 0.621 | 0.148 | 11.9959 |
| 1440 minute summer | SW22.5 | 22.004 | SW22.6 OUT | 42.1 | 0.821 | 0.194 | 3.3878 |
| 1440 minute summer | SW22.6 OUT | Flow through pond | INF BASIN 3 | 41.5 | 0.012 | 0.001 | 1205.7551 |
| 1440 minute summer | SW24.1 | 24.000 | SW24.2 | 8.4 | 0.426 | 0.047 | 13.5124 |
| 1440 minute summer | SW24.2 | 24.001 | SW24.3 OUT | 35.0 | 0.414 | 0.162 | 6.3053 |
| 1440 minute summer | SW24.3 OUT | Flow through pond | INF BASIN 3 | 41.5 | 0.012 | 0.001 | 1205.7551 |
| 1440 minute summer | INF BASIN 3 | Infiltration | | 6.9 | | | |

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**Results for 100 year +40% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 99.75%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW22.2 | 750 | 11.376 | 0.061 | 7.4 | 0.1209 | 0.0000 | OK |
| 1440 minute winter | SW22.1 | 750 | 11.631 | 0.056 | 5.3 | 0.2027 | 0.0000 | OK |
| 1440 minute winter | SW22.3 | 720 | 11.049 | 0.049 | 12.2 | 0.1758 | 0.0000 | OK |
| 1440 minute winter | SW23.1 | 1410 | 9.990 | 0.215 | 9.2 | 1.0692 | 0.0000 | OK |
| 1440 minute winter | SW22.4 | 1410 | 9.990 | 0.834 | 24.3 | 2.3795 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW22.5 | 1410 | 9.990 | 0.947 | 31.7 | 4.3620 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW22.6 OUT | 1410 | 9.990 | 1.440 | 30.6 | 2.5452 | 0.0000 | OK |
| 1440 minute winter | SW24.1 | 1350 | 9.990 | 1.051 | 7.0 | 4.1715 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW24.2 | 1410 | 9.991 | 1.390 | 27.3 | 8.6939 | 0.0000 | SURCHARGED |
| 1440 minute winter | SW24.3 OUT | 1440 | 9.990 | 1.448 | 27.0 | 1.6376 | 0.0000 | OK |
| 1440 minute winter | INF BASIN 3 | 1410 | 9.989 | 1.489 | 31.9 | 0.0000 | 0.0000 | OK |

| Link Event | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) |
|---|---|---|---|---|---|---|---|
| 1440 minute winter | SW22.2 | 22.001 | SW22.3 | 7.4 | 0.729 | 0.090 | 0.4404 |
| 1440 minute winter | SW22.1 | 22.000 | SW22.2 | 5.3 | 0.701 | 0.132 | 0.2325 |
| 1440 minute winter | SW22.3 | 22.002 | SW22.4 | 12.2 | 1.442 | 0.037 | 3.6653 |
| 1440 minute winter | SW23.1 | 23.000 | SW22.4 | 9.2 | 0.995 | 0.042 | 3.4012 |
| 1440 minute winter | SW22.4 | 22.003 | SW22.5 | 23.5 | 0.572 | 0.108 | 11.9959 |
| 1440 minute winter | SW22.5 | 22.004 | SW22.6 OUT | 30.6 | 0.760 | 0.141 | 3.3878 |
| 1440 minute winter | SW22.6 OUT | Flow through pond | INF BASIN 3 | 31.9 | 0.011 | 0.001 | 1438.7668 |
| 1440 minute winter | SW24.1 | 24.000 | SW24.2 | 6.8 | 0.422 | 0.038 | 13.5124 |
| 1440 minute winter | SW24.2 | 24.001 | SW24.3 OUT | 27.0 | 0.432 | 0.125 | 6.3053 |
| 1440 minute winter | SW24.3 OUT | Flow through pond | INF BASIN 3 | 31.9 | 0.011 | 0.001 | 1438.7668 |
| 1440 minute winter | INF BASIN 3 | Infiltration | | 6.9 | | | |

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## Design Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Maximum Time of Concentration (mins) | 30.00 |
| Return Period (years) | 2 | Maximum Rainfall (mm/hr) | 75.0 |
| Additional Flow (%) | 0 | Minimum Velocity (m/s) | 1.00 |
| FSR Region | England and Wales | Connection Type | Level Soffits |
| M5-60 (mm) | 17.000 | Minimum Backdrop Height (m) | 0.200 |
| Ratio-R | 0.300 | Preferred Cover Depth (m) | 1.200 |
| CV | 0.750 | Include Intermediate Ground | ✓ |
| Time of Entry (mins) | 4.00 | Enforce best practice design rules | ✓ |

## Nodes

| Name | Area (ha) | Cover Level (m) | Easting (m) | Northing (m) | Depth (m) |
|---|---|---|---|---|---|
| PERMEABLE PAVING | 1.328 | 10.000 | 282544.185 | 177170.684 | 0.430 |

## Simulation Settings

| | | | |
|---|---|---|---|
| Rainfall Methodology | FSR | Analysis Speed | Detailed |
| FSR Region | England and Wales | Skip Steady State | x |
| M5-60 (mm) | 17.000 | Drain Down Time (mins) | 240 |
| Ratio-R | 0.300 | Additional Storage (m³/ha) | 20.0 |
| Summer CV | 0.750 | Check Discharge Rate(s) | x |
| Winter CV | 0.840 | Check Discharge Volume | x |

### Storm Durations

| 15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440 |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|---|---|---|---|
| 100 | 40 | 0 | 0 |

## Node PERMEABLE PAVING Carpark Storage Structure

| | | | | | |
|---|---|---|---|---|---|
| Base Inf Coefficient (m/hr) | 2.21100 | Invert Level (m) | 9.570 | Slope (1:X) | 500.0 |
| Side Inf Coefficient (m/hr) | 0.00000 | Time to half empty (mins) | 5 | Depth (m) | 0.300 |
| Safety Factor | 10.0 | Width (m) | 40.000 | Inf Depth (m) | |
| Porosity | 0.30 | Length (m) | 68.000 | | |

## Rainfall

| Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) | Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) |
|---|---|---|---|---|---|
| 100 year +40% CC 15 minute summer | 368.854 | 104.373 | 100 year +40% CC 240 minute winter | 47.904 | 19.055 |
| 100 year +40% CC 15 minute winter | 258.845 | 104.373 | 100 year +40% CC 360 minute summer | 55.175 | 14.198 |
| 100 year +40% CC 30 minute summer | 255.101 | 72.185 | 100 year +40% CC 360 minute winter | 35.865 | 14.198 |
| 100 year +40% CC 30 minute winter | 179.018 | 72.185 | 100 year +40% CC 480 minute summer | 43.619 | 11.527 |
| 100 year +40% CC 60 minute summer | 180.954 | 47.821 | 100 year +40% CC 480 minute winter | 28.979 | 11.527 |
| 100 year +40% CC 60 minute winter | 120.222 | 47.821 | 100 year +40% CC 600 minute summer | 35.816 | 9.797 |
| 100 year +40% CC 120 minute summer | 116.088 | 30.679 | 100 year +40% CC 600 minute winter | 24.472 | 9.797 |
| 100 year +40% CC 120 minute winter | 77.126 | 30.679 | 100 year +40% CC 720 minute summer | 31.983 | 8.572 |
| 100 year +40% CC 180 minute summer | 90.626 | 23.321 | 100 year +40% CC 720 minute winter | 21.495 | 8.572 |
| 100 year +40% CC 180 minute winter | 58.909 | 23.321 | 100 year +40% CC 960 minute summer | 26.337 | 6.935 |
| 100 year +40% CC 240 minute summer | 72.104 | 19.055 | 100 year +40% CC 960 minute winter | 17.446 | 6.935 |

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## Rainfall

| Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) | Event | Peak Intensity (mm/hr) | Average Intensity (mm/hr) |
|---|---|---|---|---|---|
| 100 year +40% CC 1440 minute summer | 19.151 | 5.133 | 100 year +40% CC 1440 minute winter | 12.870 | 5.133 |

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**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | PERMEABLE PAVING | 24 | 9.861 | 0.291 | 532.0 | 199.6390 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 30 minute winter | PERMEABLE PAVING | Infiltration | 167.1 |

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**Results for 100 year +40% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute summer | PERMEABLE PAVING | 14 | 9.808 | 0.238 | 666.4 | 153.1587 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 15 minute summer | PERMEABLE PAVING | Infiltration | 167.1 |

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**Results for 100 year +40% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 15 minute winter | PERMEABLE PAVING | 14 | 9.835 | 0.265 | 666.6 | 177.4835 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 15 minute winter | PERMEABLE PAVING | Infiltration | 167.1 |

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**Results for 100 year +40% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute summer | PERMEABLE PAVING | 22 | 9.833 | 0.263 | 615.0 | 175.6712 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 30 minute summer | PERMEABLE PAVING | Infiltration | 167.1 |

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**Results for 100 year +40% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 30 minute winter | PERMEABLE PAVING | 24 | 9.861 | 0.291 | 532.0 | 199.6390 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 30 minute winter | PERMEABLE PAVING | Infiltration | 167.1 |

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**Results for 100 year +40% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute summer | PERMEABLE PAVING | 39 | 9.829 | 0.259 | 467.5 | 172.1595 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 60 minute summer | PERMEABLE PAVING | Infiltration | 167.1 |

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**Results for 100 year +40% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 60 minute winter | PERMEABLE PAVING | 42 | 9.841 | 0.271 | 367.5 | 182.5914 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 60 minute winter | PERMEABLE PAVING | Infiltration | 167.1 |

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**Results for 100 year +40% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute summer | PERMEABLE PAVING | 72 | 9.785 | 0.215 | 321.1 | 133.0787 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 120 minute summer | PERMEABLE PAVING | Infiltration | 167.1 |

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**Results for 100 year +40% CC 120 minute winter. 360 minute analysis at 2 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 120 minute winter | PERMEABLE PAVING | 74 | 9.763 | 0.193 | 239.0 | 113.6079 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 120 minute winter | PERMEABLE PAVING | Infiltration | 167.1 |

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**Results for 100 year +40% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute summer | PERMEABLE PAVING | 100 | 9.740 | 0.170 | 250.6 | 93.3866 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 180 minute summer | PERMEABLE PAVING | Infiltration | 167.1 |

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**Results for 100 year +40% CC 180 minute winter. 420 minute analysis at 4 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 180 minute winter | PERMEABLE PAVING | 100 | 9.706 | 0.136 | 182.5 | 63.8798 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 180 minute winter | PERMEABLE PAVING | Infiltration | 167.0 |

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**Results for 100 year +40% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute summer | PERMEABLE PAVING | 128 | 9.710 | 0.140 | 199.5 | 67.0592 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 240 minute summer | PERMEABLE PAVING | Infiltration | 167.1 |

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**Results for 100 year +40% CC 240 minute winter. 480 minute analysis at 4 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 240 minute winter | PERMEABLE PAVING | 128 | 9.685 | 0.115 | 148.4 | 46.9839 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 240 minute winter | PERMEABLE PAVING | Infiltration | 141.6 |

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**Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute summer | PERMEABLE PAVING | 192 | 9.681 | 0.111 | 152.7 | 43.8852 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 360 minute summer | PERMEABLE PAVING | Infiltration | 136.4 |

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**Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 360 minute winter | PERMEABLE PAVING | 192 | 9.658 | 0.088 | 111.1 | 28.8770 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 360 minute winter | PERMEABLE PAVING | Infiltration | 108.5 |

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**Results for 100 year +40% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute summer | PERMEABLE PAVING | 248 | 9.664 | 0.094 | 120.7 | 32.3415 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 480 minute summer | PERMEABLE PAVING | Infiltration | 115.5 |

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**Results for 100 year +40% CC 480 minute winter. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 480 minute winter | PERMEABLE PAVING | 248 | 9.643 | 0.073 | 89.8 | 20.2744 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 480 minute winter | PERMEABLE PAVING | Infiltration | 89.1 |

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**Results for 100 year +40% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute summer | PERMEABLE PAVING | 315 | 9.650 | 0.080 | 99.1 | 24.0751 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 600 minute summer | PERMEABLE PAVING | Infiltration | 98.1 |

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**Results for 100 year +40% CC 600 minute winter. 840 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 600 minute winter | PERMEABLE PAVING | 315 | 9.632 | 0.062 | 75.8 | 15.2016 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 600 minute winter | PERMEABLE PAVING | Infiltration | 75.7 |

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**Results for 100 year +40% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute summer | PERMEABLE PAVING | 375 | 9.642 | 0.072 | 88.5 | 19.7909 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 720 minute summer | PERMEABLE PAVING | Infiltration | 87.9 |

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**Results for 100 year +40% CC 720 minute winter. 960 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 720 minute winter | PERMEABLE PAVING | 375 | 9.624 | 0.054 | 66.6 | 12.1563 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 720 minute winter | PERMEABLE PAVING | Infiltration | 66.5 |

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**Results for 100 year +40% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute summer | PERMEABLE PAVING | 495 | 9.629 | 0.059 | 72.9 | 14.1653 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 960 minute summer | PERMEABLE PAVING | Infiltration | 72.7 |

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**Results for 100 year +40% CC 960 minute winter. 1200 minute analysis at 15 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 960 minute winter | PERMEABLE PAVING | 495 | 9.614 | 0.044 | 54.1 | 8.5401 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 960 minute winter | PERMEABLE PAVING | Infiltration | 54.1 |

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**Results for 100 year +40% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute summer | PERMEABLE PAVING | 750 | 9.613 | 0.043 | 53.0 | 8.2536 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 1440 minute summer | PERMEABLE PAVING | Infiltration | 53.0 |

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**Results for 100 year +40% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 100.00%**

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|---|---|---|---|---|---|---|---|---|
| 1440 minute winter | PERMEABLE PAVING | 750 | 9.602 | 0.032 | 39.9 | 5.1746 | 0.0000 | OK |

| Link Event | US Node | Link | Outflow (l/s) |
|---|---|---|---|
| 1440 minute winter | PERMEABLE PAVING | Infiltration | 39.9 |

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| | | | | |
|---|---|---|---|---|
| REDSTART | Project: Porthcawl Waterfront Regeneration | | | Job Ref: GC/3432 |
| | Section: Coney Beach Amusement Park - Existing peak foul flows | | | Sheet Number: 1 of 1 |
| | Drawing Ref: | Calculated by: RL | Checked by: DL | Date: 10/08/2020 |

**Calculation of Wastewater Flows for Drain Systems**
**BS EN 12056-2:2000**
**Gravity Drainage Systems Inside Buildings -**
**Part 2: Sanitary Pipework, Layout and Calculation**
**Foul Design Flow - Discharge Unit Method**

**FREQUENCY FACTOR**

| k | Type of Building |
|---|---|
| 0.5 | Dwelling, Guesthouse, Office (intermittent use) |
| > 0.7 | Hospital, School, Restaurant, Hotel (frequent use) < |
| 1 | Toilets and/or shower open to the public (congested use) |
| 1.2 | Laboratory buildings (special use) |

System III

| | No. | Appliance | DU | Total |
|---|---|---|---|---|
| | 107 | WCs | 2.0 | 214.0 |
| | 0 | Washbasin | 0.3 | 0.0 |
| | 0 | Shower without plug | 0.4 | 0.0 |
| | 0 | Urinal with cistern | 0.4 | 0.0 |
| | 0 | Slab Urinal | 0.2 | 0.0 |
| | 0 | Kitchen Sink | 1.3 | 0.0 |
| | 0 | Dishwasher | 0.2 | 0.0 |
| | 0 | Commercial Dishwasher | 2.5 | 0.0 |
| | 0 | Washing Machine up to 12kg load | 1.2 | 0.0 |
| From System I { | 0 | Dryer (Assumed DU = 0.8 l/s) | 0.8 | 0.0 |
| | 0 | Floor Drain DN50 | 0.8 | 0.0 |
| | 0 | Floor Drain DN70 | 1.5 | 0.0 |
| | 0 | Floor Drain DN100 | 2.0 | 0.0 |

**EQUATION 6.3.1 FOR DESIGN FLOW RATE**

| | | | | |
|---|---|---|---|---|
| $Q_{ww}$ | Wastewater Design Flow Rate | = | 10.24 | l/s |
| K | Frequency Factor | = | 0.7 | |
| ∑DU | Total Discharge Units | = | 214.0 | |

0.7 frequency factor used as not all toilets are open to the public

From Sewer for Adoption 7th Edition, peak foul flows from dwellings is based on 4,000 l/dw/day (approximately based on 4 persons per dwellins)

This gives a peak discharge rate per second of 0.046 l/s

Equivalent Dwellings = 221 dwellings

0m 282200m 282300m 282400m 282500m 282600m 28270

# Appendix D

# Geotechnical interpretative letter report and factual report

15 September 2020

Bridgend County Borough Council
Civic Offices Level 2
Angel Street,
Bridgend,
CF31 4WB

Dear Sirs,

**RE:**Letter report for Porthcawl Drainage Strategy CS/098811

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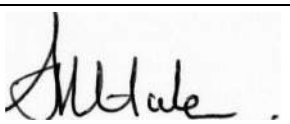
| | Name | Signature | Date |
|---|---|---|---|
| Author | Ian Leek<br>Geotechnical Team Leader<br>BSc (Hons) MSc CGeol CSci EurGeol FGS | | 15/09/20 |
| Checker and Approver | Andrew Hale<br>Technical Director - Geotechnics<br>BEng (Hons) CEng MICE |  | 15/09/20 |

# 1.0 Introduction

Bridgend County Borough Council (BCBC) propose to provide a drainage scheme within the area known as the Porthcawl Municipal Caravan Park.

Redstart have been appointed to provide an Interpretative Letter Report as part of the initial feasibility stage study for the proposed Porthcawl Drainage Scheme.

The proposed works are located on the site of the former Municipal Caravan Park located to the south of New Road, and immediately to the west of Trecco Bay Caravan Park, Porthcawl. The site is located at National Grid reference SS (2)82718 (1)77136.

The location of the proposed scheme is presented on Dwg. 98811-RED-75-XX-DR-C-7501 – Site Location Plan.

# 2.0 Site Description

The eastern part of the site comprises a generally flat, maintained grassed area divided by surfaced tracks. Towards the south-eastern corner of the site and along the southern boundary, the ground levels become more undulating, with unmaintained grass, shrubs and brambles present.

The southern area of the site possesses a recently laid asphalt and gravel series of caravan pitches. Centrally the site possesses a low area in the shape of a “bowl” this area is approximately 4 to 5m deep. A surfaced path is located within and around the circumference of this feature.

The western part of the site comprises a generally flat grassed area.

A large berm feature runs east to west within the northern part of the site. This is vegetated with grass and shrubs. To the north of this berm is a flat maintained grassed area.

A network of surfaced tracks is present across the site, with numerous lighting columns installed adjacent to the tracks.

# 3.0 Published Geology

The published geology has been obtained from the geological maps, memoirs and online viewer available for this area.

## 3.1 Made Ground

Made Ground was not indicated as being present on the geological map covering the site but was expected to be present due to the presence of recent infrastructure such as roadways and paths.

### 3.2 Natural Superficial Deposits

Wind blown sand is inferred as being present across the site which is likely to be as a result of the site being covered by coastal sand dunes.

### 3.3 Solid Geology

Beneath the site the solid geology maps indicate the geology to be mostly of Triassic age (Mercia Mudstone Group/Marginal Facies), with Carboniferous Limestone outcropping in the south west corner of the site. The Mercia Mudstone Group generally underlies the superficial materials. However, the geological map indicates that the Mercia Mudstone Group lies unconformably over Carboniferous Limestone beneath the site.

## 4.0 Site works

Quantum Geotechnic Ltd. carried out a ground investigation between 17 and 19 June 2020. The ground investigation was planned, procured and supervised by Redstart, with the purpose of providing further information for the overall design of the scheme. The investigation targeted the area of the former municipal caravan park and included general contamination testing in line with the previous developed Conceptual Site Model.

The locations of the exploratory holes are indicated on Figure 1 within Quantum Geotechnic Ltd's factual report (attached).

The fieldwork carried out comprised nine machine excavated trial pits, five infiltration tests to BRE Digest 365 within selected trial pits, TRL probes adjacent to each pit and samples for geotechnical and environmental testing.

Subsequent laboratory testing comprised:

- Moisture content determination.
- Atterberg limits determination.
- Particle size distribution analysis.
- pH value and sulphate content of soil/groundwater.
- Contamination testing.

A factual report for the ground investigation compiled by Quantum Geotechnic Ltd., Report No. Q0281/FR, Porthcawl Drainage Ground Investigation Factual Report July 2020, is included in Appendix A. The report includes exploratory hole engineering logs, TRL probe results, infiltration test results and

laboratory test results.

## 5.0 Ground Summary

The following provides an overview of the ground conditions encountered during the ground investigation undertaken as part of this scheme.

### 5.1 Made Ground

Made Ground was observed within four trial pits at various locations across the site. These locations were associated with hard standing areas. The Made Ground was described as a black grey slightly silty sandy gravel with frequent metal and glass in one location. This was generally about 0.5m thick.

In one trial pit (TP02) Made Ground was noted to 1.40m depth. In this exploratory hole the following sequence was noted

Table 1: Summary of Made Ground in TP02

| Strata Description | Strata depth (m) | Strata Thickness (m) |
|---|---|---|
| MADE GROUND - Grass over brown slightly gravelly sandy Silt with frequent rootlets | 0.2 | 0.2 |
| MADE GROUND - Light brown medium to fine Sand (re-worked natural ground) | 1.2 | 1.0 |
| MADE GROUND - Black grey slightly silty sandy Gravel. Gravel is fine to course sub-angular to sub rounded concrete and brick with frequent pieces of metal. | 1.4 | 0.2 |

### 5.2 Natural Superficial Deposits

Natural Superficial Deposits were encountered in all the excavated trial pits. They were generally described as “light brown medium to fine sand”. Their thickness was not proven as excavations generally went to 3.4m depth before the pits collapsed inwards.

### 5.3 Bedrock

No bedrock was encountered during excavation of the trial pits.

### 5.4 Groundwater

No groundwater was observed during the excavation of the trial pits. Groundwater conditions observed in the excavations are those appertaining to the period of investigation. It should be noted, however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions or other causes.

## 6.0 Material Properties

### 6.1 Particle Size Distribution

Particle size distribution tests were carried out on 9 samples obtained during the recent ground investigation. The results from the samples tested indicate that these soils are primarily fine to medium sands. This would confirm the BGS maps which infer the site is covered with wind-blown sand, which is generally fine to medium in size.

### 6.2 California Bearing Ratio

A Transport Research Laboratories (TRL) probe was used adjacent to the location of each trial pit excavated. The results from the probe were correlated to a CBR value. For the Made Ground at TP02 and TP03, in situ testing indicating an average correlated CBR value of 15%.

For the natural superficial materials (wind-blown sand), correlated CBR values ranged from 8% to 25%, with an average of 16%.

### 6.3 Infiltration Tests

A total of five infiltration tests were carried out in trial pits TP01, TP03, TP05, TP07 and TP09. These tests were carried out in accordance with BRE Digest 365. The test involved filling up pits of known dimensions and then measuring the water drop and time taken. An initial test was carried out within these trial pits and was then repeated a further two times.

The results indicated maximum and minimum infiltration rates of $1.48 \times 10^{-4}$ m/s and $9.9 \times 10^{-4}$ m/s across the site with an average infiltration rate of $4.54 \times 10^{-4}$ m/s.

### 6.4 Natural Chemistry

A total of 10 chemical tests (pH and sulphate) were undertaken on recovered samples.

On the basis of the guidance given in BRE Special Digest 1, Part 1 (2005), a Design Sulphate Class of DS-1 with a concrete classification of AC-1 for mobile groundwater has been calculated.

# 7.0 Contamination Assessment

## 7.1 Human health risk

In accordance with the procedures of CLR 11 (Ref. Model Procedures for the Management of land contamination CLR 11. DEFRA / Environment Agency 2004, and gov.uk website), this Generic Quantitative Risk Assessment (GQRA) compares the measured concentrations of contaminants within soils, as revealed by laboratory test results, with Generic Assessment Criteria (GAC) values appropriate to the proposed end-use.

The methodology for the derivation of the GAC values is presented in 'The LQM/CIEH S4ULs for Human Health Risk assessment' * (Ref The LQM/CIEH S4ULs for Human Health Risk Assessment. Paul Nathanial, Caroline McCaffrey, Andy Gilett, Richard Ogden and Judith Nathanial. 2015. Land Quality Press. Nottingham) with the exception of lead which in the absence of other authoritative guidance is that presented in SP1010 (Ref. SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report (Revision 2). Contaminated Land: Applications in Real Environments (CL:AIRE). 24th September 2014).

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## 7.2 Method of Analysis

GAC's are used for preliminary screening purposes only. If a concentration of a determinant is less than the corresponding S4UL/C4SL and the assumptions of the generic land-use are appropriate to the site conditions, it is reasonable to assume the concentration poses an 'acceptable' level of risk to human health, within the context of Part 2A. However, where a determinand's concentration exceeds the corresponding GAC value, it does not necessarily indicate an unacceptable risk; it indicates a need for further investigation/assessment and/or inclusion of appropriate mitigating measures during the design and construction phases of a development.

It should be noted that construction workers are not included in this GQRA as acute exposure conditions, such as those encountered during the construction process, are not considered when deriving the GAC. The contractor should read this environmental assessment in order to satisfy himself that suitable health and safety precautions are put in place for his employees and the public during the works period.

The proposed end use of the site is a public leisure facility. We have utilised GAC for the 'public open spaces near residential housing' (POS resi) generic land-use, as described in SR3 (Ref. Updated Technical background to the CLEA Model. Science Report: SC050021/SR3. Environment Agency. January 2009). This land use has a 3 to 9 year old child as the most sensitive receptor and considers tracking back of indoor dust.

The near surface soils are composed primarily of sand, therefore the GAC for organic contaminants are

those derived for 'Sand' with 1 % SOM, representing a worst-case scenario.

Laboratory test results have been analysed in the GQRA using the statistical methods outlined by CIEH (Ref. The Chartered Institute of Environmental Health. Guidance on Comparing Soil Contamination Data with a Critical Concentration. May 2008).

## 7.3 Analysis of Results

The results of the GQRA are summarised below and attached to this letter report.

### *7.3.1 Inorganic*

Ten samples of soil were tested for a suite of inorganic contaminants (based upon the LQM suite), with five of those samples only tested for selenium. No sample tested exceeded the relevant GAC for any of the inorganic determinands.

The 95 % Upper Confidence Limit (one sample t-test) did not exceed the corresponding GAC for any determinand.

### *7.3.2 Petroleum Hydrocarbons*

Eight soil samples were tested for a suite of organic contaminants (based upon the LQM suite) with all the sample concentrations lower than the corresponding GAC. It should be noted that statistically the 95 % Upper Confidence Limit (one sample t-test) did not exceed the corresponding GAC for any determinand.

### *7.3.3 VOC's and SVOC's*

A total of up to ten samples were tested for both VOC and SVOC's (based on the LQM suite). In the case of both the VOC's and SVOC's no concentrations exceeded the corresponding GAC, and the 95% Upper Confidence Limit (one sample t-test) did not exceed the corresponding GAC.

## 7.4 Discussion

The concentrations of contaminants are not considered to represent a significant risk to future workers.

The testing undertaken indicates that the soils at the site, for a public leisure facility development land use does not contain any significant contaminant sources.

## 7.5 Controlled Waters Risk Assessment

### *7.5.1 Assessment of Leachate Testing*

Soil leachate testing was undertaken on three samples obtained from the exploratory pits to provide an indication of whether the leachable concentrations of soil contaminants are sufficient to impact on relevant Controlled Water receptors. This is particularly relevant as the scheme may possibly utilise

infiltration drainage into the wind-blown sand stratum.

The leachate samples are reflective of the pore water quality at the potential source of the contamination and form a Tier 1 risk assessment. It should be noted that laboratory leachate tests are relatively aggressive, often over estimating contaminant concentrations and may not realistically represent actual conditions.

The test results were assessed against regulatory standards including EU Environmental Water Standards, Water Framework Directive standards and World Health Organisation Drinking Water Quality Standards.

### *7.5.2 Leachate Results*

All of the tests carried out for the metals were below the relevant generic assessment criteria (GAC). The VOC/SVOC test results were all below detection limits for the test, but the detection limits were above the GACs used.

However, it should be noted that the total PAH results (Sum of USEPA 16) were significantly below (<2µg/l) the chosen assessment criteria of 40µg/l indicating that the VOC/SVOC results are likely to be significantly below their detection limits and likely to be below the relevant GAC. In addition, the results in all VOC/SVOC's tested in the soil samples were also below their detection limits which was extremely low. It is unlikely that leaching of the covering superficial materials will be a risk to local groundwater.

## 7.6 Asbestos

The Health and Safety Executive (2012b) notes that "any asbestos product or material that is ready for disposal is defined as asbestos waste" and advises that "if in doubt, always treat waste as 'hazardous' or 'special'".

Coding and classification of hazardous wastes and the waste classification of Asbestos Containing Soils (ACS) and Made Ground is described in technical guidance by the Natural Resources Wales, Environment Agency, SEPA, NIEA.

Waste containing asbestos will be hazardous waste if it contains more than 0.1 per cent by weight of asbestos (refers to asbestos and non-asbestos containing materials), or if it contains less than 0.1 per cent by weight of asbestos but has been deliberately mixed to lower the bulk concentration of asbestos.

In the case of the samples tested from the Porthcawl Drainage Strategy investigation no asbestos was detected and based on the NRW/EA guidance are classified as non-hazardous with regard to asbestos content only.

# 8.0 Construction Considerations

## 8.1 Protection of Buried Concrete

The requirement for protecting concrete from aggressive ground is determined from BRE Special Digest 1: Concrete in Aggressive Ground, 2005 (Ref. 10). Based on the testing results of 10 samples, Aggressive Chemical Environment for Concrete (ACEC) classification of AC-1 and a Design Sulphate Class DS-1 class appears to be appropriate for this site.

## 8.2 Permeability

During the ground investigation, five soakaway tests were undertaken at the site in selected machine excavated trial pits. The results recorded indicated maximum and minimum infiltration rates of 1.48 x $10^{-4}$ m/s and 9.9 x $10^{-4}$ m/s across the site with an average infiltration rate of 4.54 x $10^{-4}$ m/s.

Copies of the infiltration tests are presented in Quantum Geotechnic Ltd. factual report.

## 8.3 Excavations

During the formation of the trial pits, instability was noted when the excavations reached depths of around 3m. These pits were excavated to dimensions of 0.6m wide and approximately 2.7m long. We would recommend that for all excavations some form of temporary support system is used to ensure the integrity of the pit sides.

## 8.4 Groundwater

No groundwater was observed during the time the investigation was carried out. Should any works encounter groundwater we recommend that groundwater control methods are employed to enable works to continue.

# Site Location Plan

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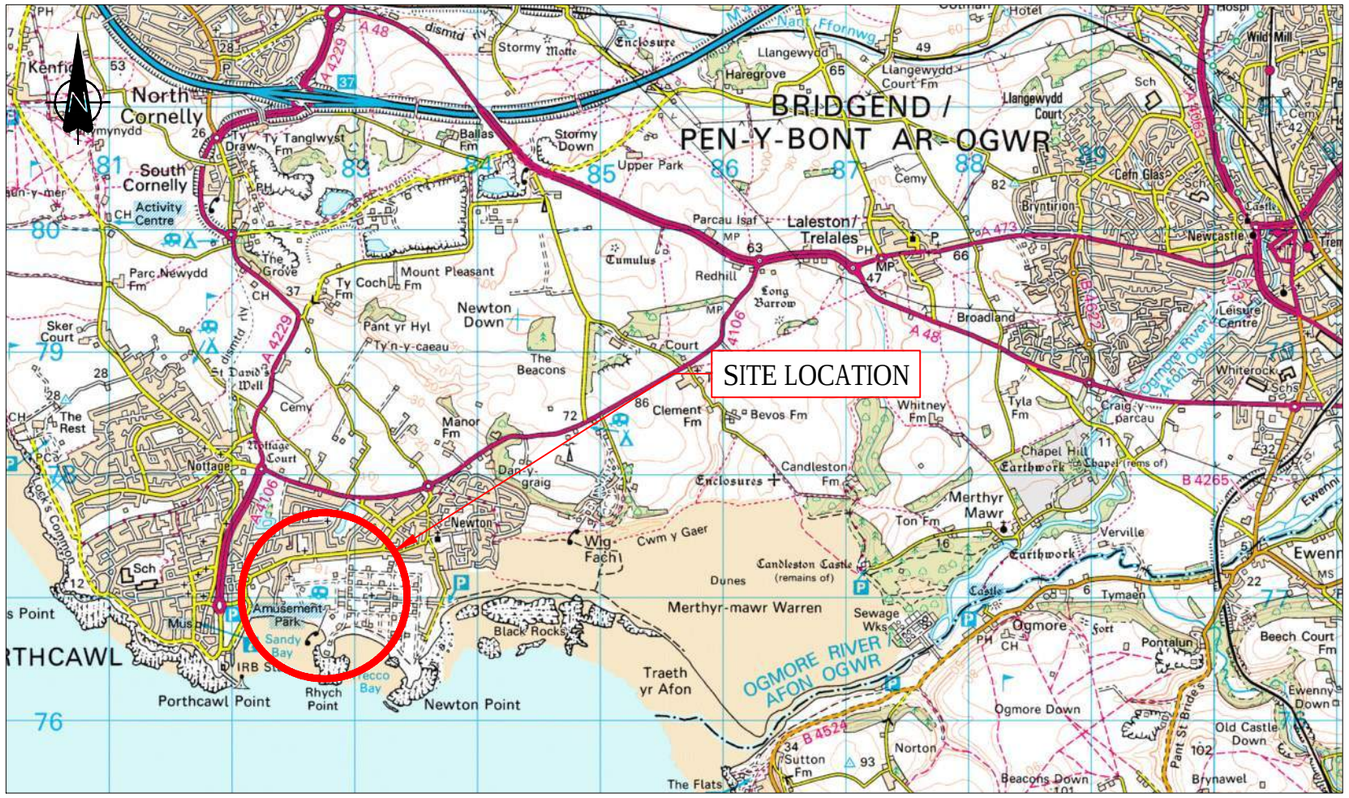


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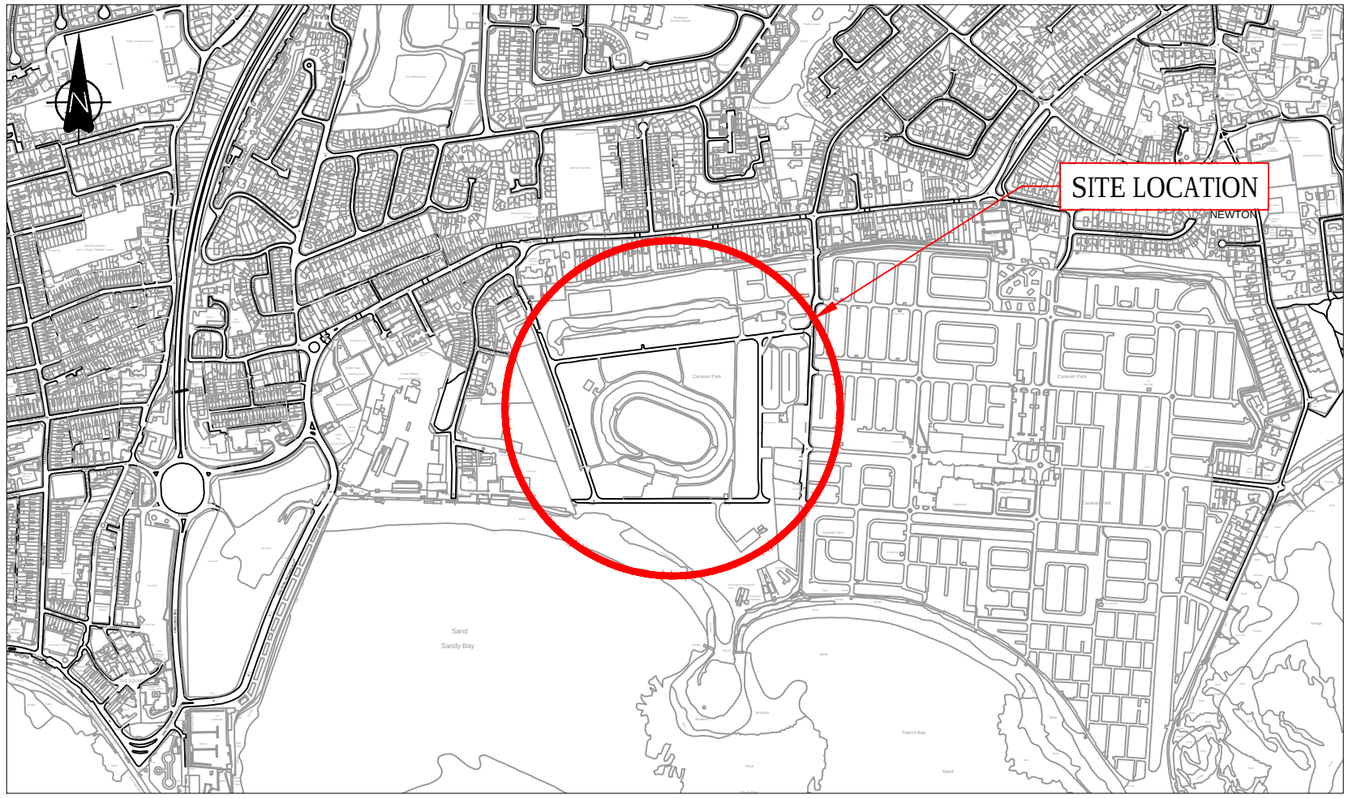


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| Rev | Dwn | Chk'd | App'd | Description | Date |
|---|---|---|---|---|---|
| P01 | LB | IL | AH | FIRST ISSUE. | 23/03/2020 |

Purpose of Issue
S2 - FIT FOR INFORMATION

Classification
COMMERCIAL IN CONFIDENCE

Client
BRIDGEND COUNTY BOROUGH COUNCIL

Project
PORTHCAWL DRAINAGE STRATEGY

Drawing
SITE LOCATION PLAN

| Scale @ A3 | Drawn | Checked | Approved |
|---|---|---|---|
| AS SHOWN | LB | IL | AH |

Project No.
CS098811

Date
23-MAR-2020

Drawing Identifier
Project - Originator - Zone - Level - File Type - Role - Number
98811-CAP-75-XX-DR-C-7501

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# GQRA Summary Sheets

## Key statistical symbols and terms

| | |
|---|---|
| GAC | Generic Assessment Criteria |
| Normality | Shapiro-Wilk test provides a reliable check on whether a test based on normailty (like the one-sample t-test) can be applied on the data set under scrutiny. Where the size of a data set is greater than n=50 a visual assessment of the normailty of the data is undertaken using a probabilty plot. |
| | **Normal**, deviation of the data set from normality is not significant. One-sample t-test can be used when testing the mean against a Critical concentration/GAC. |
| | **Not Normal**, deviation of the data set from normality has been identified as being significant. If normality of a relatively large data set appears to be normal through visual assessment but is indicated to be not normal by the Shapiro-Wilk test, then the One-side Chebychev Theorum has used when testing the mean against a Critical concentration/GAC. |
| No. exceeding GAC | Number of sample concentrations exceeding the defined GAC. |
| No. Outliers | Number of statistical Outliers determined using Grubbs Test for data sets n>2. Where the maximum value in a data set has been identified as an outlier, the test has been repeated on the second largest value (by removing the max value) and then the 3rd largest value... etc, until the maximum concetration is not reported as an Outlier. |
| Test | **t**, the one-sample t-test (for datasets n>1) |
| | **c**, the one-sided Chebychev Theorum or Chebychev Inequality (for data sets n>1) |
| | N.B. the tests for comparing the mean against a critical concentration can only be applied when n>1 and the sample population standard deviation>0 |
| UCL95% | 95% Upper Confidence Limit (of the true population mean) |
| Test Result | **FAIL**, the 95% UCL exceeds the defined GAC. |
| | **PASS**, the 95% UCL does not exceed the defined GAC |
| **Bold Red Type** | Used to highlight the "No. exceeding GAC", "no. Outliers" and "Test Result" on the Summary of Statistics Sheet. Where the test result is reported as "FAIL" the whole row for a particular contaminant is highlighted. |
| **Filled** | Used to highlight exceedances (individual sample concentrations exceeding the GAC) in the Summary of Concentrations sheets. |
| **Bold Underlined** | Used to highlight maximum value outliers (as determined using an iterative Grubbs Test) in the Summary of Concentrations sheets. Outliers may also be shown in filled cells (exceedances). |

## Summary of Statistics

Geology: **Superficial material**
Site End Use: **Public Open Space**
Soil Type: **Sand - 1% SOM**

Project Number: CS/098811
Client: Bridgend County Borough Council

| Compound | GAC (mg/kg) | No. Samples | Range of values (mg/kg) | No. exceeding GAC | Normality | No. Outliers | Test | $UCL_{95\%}$ (of the true population mean) | Test Result |
|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | |
| Arsenic | 79 | 10 | 11 - 19 | 0 | Normal | None | t | 18.0 | PASS |
| Cadmium | 120 | 10 | 0.1 - 0.32 | 0 | Normal | None | t | 0.2 | PASS |
| Chromium VI | 7.7 | 10 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| Copper | 12000 | 10 | 1.2 - 12 | 0 | Not Normal | None | c | 11.4 | PASS |
| Lead | 270 | 10 | 4.2 - 44 | 0 | Not Normal | None | c | 45.0 | PASS |
| Mercury | 120 | 10 | 0.1 - 0.11 | 0 | Not Normal | None | c | 0.1 | PASS |
| Nickel | 230 | 10 | 4.5 - 13 | 0 | Normal | None | t | 10.3 | PASS |
| Selenium | 1100 | 4 | 0.2 - 0.21 | 0 | Not Normal | 1 | c | 0.2 | PASS |
| Vanadium | 2000 | 10 | 10 - 26 | 0 | Normal | None | t | 20.7 | PASS |
| Zinc | 81000 | 10 | 14 - 82 | 0 | Normal | None | t | 61.4 | PASS |
| **Non-Metals** | | | | | | | | | |
| Inorganic Cyanide | 3000 | 10 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| **TPH** | | | | | | | | | |
| Aliphatic C16-35 | 250000 | 8 | 10 - 66 | 0 | Not Normal | 1 | c | 47.5 | PASS |
| **VOCs** | | | | | | | | | |
| Benzene | 72 | 10 | 1 - 1 | 0 | Not Normal | None | c | 1.0000 | PASS |
| Chloroethene | 3.5 | 8 | 1 - 1 | 0 | Not Normal | None | c | 1.0000 | PASS |
| 1,2-Dichloroethane | 29 | 8 | 2 - 2 | 0 | Not Normal | None | c | 0.0020 | PASS |
| Ethylbenzene | 24000 | 10 | 1 - 1 | 0 | Not Normal | None | c | 1.0000 | PASS |
| Naphthalene | 4900 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5000 | PASS |
| Tetrachloroethene | 1400 | 8 | 1 - 1 | 0 | Not Normal | None | c | 1.0000 | PASS |
| Tetrachloromethane | 890 | 8 | 1 - 1 | 0 | Not Normal | None | c | 1.0000 | PASS |
| Toluene | 56000 | 10 | 1 - 1 | 0 | Not Normal | None | c | 1.0000 | PASS |
| 1,1,1-Trichloroethane | 140000 | 8 | 1 - 1 | 0 | Not Normal | None | c | 1.0000 | PASS |
| Trichloroethene | 120 | 8 | 1 - 1 | 0 | Not Normal | None | c | 1.0000 | PASS |
| **SVOCs** | | | | | | | | | |
| Benz[a]anthracene | 29 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| Benzo[a]pyrene | 5.7 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| Benzo[b]fluoranthene | 7.1 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| Benzo[ghi]perylene | 640 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| Benzo[k]fluoranthene | 190 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| Chrysene | 57 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| Dibenz[ah]anthracene | 0.57 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| Fluoranthene | 3100 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| Indeno[123-cd]pyrene | 82 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| Naphthalene | 4900 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| Phenol | 440 | 8 | 0.3 - 0.3 | 0 | Not Normal | None | c | 0.3 | PASS |
| Pyrene | 7400 | 8 | 0.5 - 0.5 | 0 | Not Normal | None | c | 0.5 | PASS |
| **Other Contaminants** | | | | | | | | | |
| | | | | | | | | | |

## Summary of Concentrations

| | |
|---|---|
| Geology: | **Superficial material** |
| Site End Use: | **Public Open Space** |
| Soil Type: | **Sand - 1% SOM** |

Project Number: CS/098811

Client: Bridgend County Borough Council

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Compound** | **GAC** | TPTP01 0.20m | TPTP03 0.20m | TPTP04 0.50m | TPTP05 0.50m | TPTP06 0.50m | TPTP07 0.30m | TPTP09 0.50m | TPTP1 0.50m | TPTP6 0.50m | TPTP3 0.20m |
| **Metals** | | | | | | | | | | | |
| Arsenic | 79 | 15 | 19 | 18 | 17 | 18 | 19 | 17 | 15 | 11 | 17 |
| Boron | 21000 | - | - | - | - | - | - | - | - | - | - |
| Cadmium | 120 | 0.3 | 0.23 | 0.21 | 0.18 | 0.22 | 0.24 | 0.15 | 0.1 | 0.1 | 0.32 |
| Chromium VI | 7.7 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Copper | 12000 | 9.5 | 6.2 | 6.2 | 6.4 | 7.6 | 8.4 | 8.7 | 1.6 | 1.2 | 12 |
| Lead | 270 | 44 | 28 | 26 | 26 | 33 | 36 | 26 | 9.5 | 4.2 | 42 |
| Mercury | 120 | 0.1 | 0.11 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.11 |
| Nickel | 230 | 11 | 9.1 | 8.9 | 8.6 | 9.7 | 10 | 8 | 6.3 | 4.5 | 13 |
| Selenium | 1100 | - | 0.2 | 0.2 | - | - | - | 0.2 | - | - | **0.21** |
| Vanadium | 2000 | 26 | 19 | 18 | 18 | 18 | 22 | 16 | 14 | 10 | 21 |
| Zinc | 81000 | 68 | 43 | 41 | 40 | 47 | 51 | 82 | 21 | 14 | 78 |
| **Non-Metals** | | | | | | | | | | | |
| Inorganic Cyanide | 3000 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| **TPH** | | | | | | | | | | | |
| Aliphatic C16-35 | 250000 | **66** | 10 | - | 10.0 | 10.00 | 10 | - | 10 | 10 | 10 |
| **VOCs** | | | | | | | | | | | |
| Benzene | 72 | 1 | 1 | 1 | 1.00 | 1 | 1 | 1 | 1 | 1 | 1 |
| Chloroethene | 3.5 | 1 | 1 | - | 1.00 | 1 | 1 | - | 1 | 1 | 1 |
| 1,2-Dichloroethane | 29 | 2 | 2 | - | 2.00 | 2 | 2 | - | 2 | 2 | 2 |
| Ethylbenzene | 24000 | 1 | 1 | 1 | 1.00 | 1 | 1 | 1 | 1 | 1 | 1 |
| Naphthalene | 4900 | 0.5 | 0.5 | - | 0.50 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| Tetrachloroethene | 1400 | 1 | 1 | - | 1.00 | 1 | 1 | - | 1 | 1 | 1 |
| Tetrachloromethane | 890 | 1 | 1 | - | 1.00 | 1 | 1 | - | 1 | 1 | 1 |
| Toluene | 56000 | 1 | 1 | 1 | 1.00 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1,1,1-Trichloroethane | 140000 | 1 | 1 | - | 1.00 | 1 | 1 | - | 1 | 1 | 1 |
| Trichloroethene | 120 | 1 | 1 | - | 1.00 | 1 | 1 | - | 1 | 1 | 1 |
| **SVOCs** | | | | | | | | | | | |
| Benz[a]anthracene | 29 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| Benzo[a]pyrene | 5.7 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| Benzo[b]fluoranthene | 7.1 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| Benzo[ghi]perylene | 640 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| Benzo[k]fluoranthene | 190 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| Chrysene | 57 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| Dibenz[ah]anthracene | 0.57 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| Fluoranthene | 3100 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| Indeno[123-cd]pyrene | 82 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| Naphthalene | 4900 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| Phenol | 440 | 0.3 | 0.3 | 0.3 | 0.3 | - | 0.3 | 0.3 | 0.3 | - | 0.3 |
| Pyrene | 7400 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 | - | 0.5 | 0.5 | 0.5 |
| **Other Contaminants** | | | | | | | | | | | |
| | | - | - | - | - | - | - | - | - | - | - |
| | | - | - | - | - | - | - | - | - | - | - |
| | | - | - | - | - | - | - | - | - | - | - |
| | | - | - | - | - | - | - | - | - | - | - |

Sample concentrations in mg/kg

CAPITA

Leachate Screening Results

AC values chosen from minimum value of EU EWS, WFD 2015, and WHO DWQ standards

| | | | Sample ID | TP03 | TP04 | TP09 |
|---|---|---|---|---|---|---|
| | | | Sample Desc | 0.2 | 0.5 | 0.5 |
| | | | Date Sampled | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 |
| Analyte: | Method Code: | AC | Units: | | | |
| Arsenic as As (Dissolved) | ICPMSW | 0.0075 | mg/l | 0.0026 | 0.0011 | <0.001 |
| Cadmium as Cd (Dissolved) | ICPMSW | 0.003 | mg/l | <0.00008 | <0.00008 | <0.00008 |
| Chromium as Cr (Dissolved) | ICPMSW | 0.0375 | mg/l | <0.001 | <0.001 | <0.001 |
| Copper as Cu (Dissolved) | ICPMSW | 1.5 | mg/l | 0.00290 | 0.00150 | 0.00140 |
| Lead as Pb (Dissolved) | ICPMSW | 0.0075 | mg/l | 0.0025 | <0.001 | <0.001 |
| Mercury as Hg (Dissolved) | ICPMSW | 0.00075 | mg/l | <0.0005 | <0.0005 | <0.0005 |
| Nickel as Ni (Dissolved) | ICPMSW | 0.015 | mg/l | <0.001 | <0.001 | <0.001 |
| Selenium as Se (Dissolved) | ICPMSW | 0.0075 | mg/l | <0.001 | <0.001 | <0.001 |
| Zinc as Zn (Dissolved) | ICPMSW | | mg/l | <0.001 | <0.001 | <0.001 |
| Boron as B (Dissolved) a | ICPWATVAR | 0.75 | mg/l | <0.02 | 0.024 | 0.023 |
| | | | | | | |
| Acenaphthene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Acenaphthylene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Anthracene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Benzo(a)anthracene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Benzo(b)fluoranthene | PAHMSW | 0.075 | ug/l | I/S | <0.1 | <0.1 |
| Benzo(ghi)perylene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Benzo(k)fluoranthene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Benzo-a-Pyrene | PAHMSW | 0.0075 | ug/l | I/S | <0.1 | <0.1 |
| Chrysene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Dibenzo(a,h)anthracene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Fluoranthene | PAHMSW | 0.075 | ug/l | I/S | <0.1 | <0.1 |
| Fluorene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Indeno(1,2,3-cd)pyrene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Naphthalene | PAHMSW | 0.075 | ug/l | I/S | <0.1 | <0.1 |
| Phenanthrene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Pyrene | PAHMSW | | ug/l | I/S | <0.1 | <0.1 |
| Total PAH (Sum of USEPA 16) | PAHMSW | 40 | ug/l | I/S | <2 | <2 |
| | | | | | | |
| Phenol Index as C6H5OH | SFAPI | | mg/l | I/S | < 0.030 | < 0.030 |
| pH units w | WSLM3 | | pH units | 8.8 | 9.7 | 9.1 |

indicates below detection limit of test

We trust this report is to your satisfaction.

Yours Sincerely

**Senior Geotechnical Engineer**

Enc; Quantum Geotechnic Ltd Factual Report Q0281/FR

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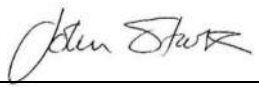
VAT Registration No. 618 1841 40

# Porthcawl Drainage Scheme

## GROUND INVESTIGATION FACTUAL REPORT

Report No. Q0281/FR July 2020

| DOCUMENT CONTROL | |
|---|---|
| **Contract Name:** | **PORTHCAWL DRAINAGE SCHEME** |
| **Contract Reference:** | **Q0281** |
| **Report Type:** | **Factual Ground Investigation Report** |
| **Report Reference:** | **Q0281/FR** |
| **Date of Report Production:** | **July 2020** |
| **Client** | **Bridgend Borough Council** |

| Version: | Date: | Prepared by: | Checked by: | Approved by: |
|---|---|---|---|---|
| 1.0 | 20/07/20 | S. Picton | P. Darby | J. Stark |
| | | | |  |
| | | Eng. Geologist B.Sc.(Hons). | Senior Eng. Geologist B.Sc.(Hons).,M.Sc., C.Geol., FGS | Technical Manager *B.Sc.(Hons)., C.Geol., FGS* |

Disclaimer: Quantum Geotechnic Limited has prepared this report in accordance with the instructions of the above named Client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

## CONTENTS


**0.0. FOREWORD ..... 1**

**1.0. INTRODUCTION ..... 2**
1.1 General ..... 2

**2.0. SITE DETAIL ..... 3**
2.1. Site Description ..... 3
2.2. Statutory Service Information ..... 3

**3.0. GEOLOGY & ENVIRONMENTAL SETTING ..... 4**
3.1. Published Geology ..... 4
3.2. Hydrology ..... 4

**4.0. FIELDWORK ..... 5**
4.1. General ..... 5
4.2. Exploratory Hole Locations ..... 5
4.3 Machine Excavated Trial Pits ..... 6
4.4 In-Situ Testing ..... 7
4.5. Sampling - General ..... 8

**5.0. LABORATORY TESTING ..... 9**
5.1 General ..... 9
5.2 Geotechnical Laboratory Testing ..... 9
5.3 Geoenvironmental Laboratory Testing ..... 9

**6.0. REFERENCES ..... 11**

**APPENDIX I – SITE PLANS ..... I**

**APPENDIX II – ENGINEERING GEOLOGIST'S TRIAL PIT LOGS ..... II**

**APPENDIX III – SOAKAWAY TEST RESULTS ..... III**

**APPENDIX IV – TRL DCP PROBE RESULTS ..... IV**

**APPENDIX V – GEOTECHNICAL LABORATORY TEST RESULTS ..... V**

**APPENDIX VI – GEOENVIRONMENTAL LABORATORY TEST RESULTS ..... VI**

## 0.0. FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

### 0.1. Ground Investigation

#### 0.1.1. General

Recommendations made and opinions expressed in the report are based on the strata observed in the boreholes and excavations, together with the results of site and laboratory tests. No responsibility can be held for conditions which have not been revealed by the Exploratory Holes or which occur between them. Whilst the report may suggest the likely configuration of strata, both between Exploratory Holes and below the maximum depth of investigation, this is only indicative and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

#### 0.1.2. Investigation Procedures

Trial Pitting techniques for ground investigation have been employed within the project. All Exploratory Hole operations, sampling and logging of soils, rocks and in-situ testing complies with the recommendations of the British Code of Practice BS 5930 (2015), 'Site Investigations', British Code of Practice BS 10175: 2011 +A1:2013 'Investigation of Potentially Contaminated Sites' and BS 1377: 1990, 'Methods of Test for Soils for Engineering Purposes'. Whilst these techniques allow the maximum data to be obtained in soft ground/ superficial deposits, some disturbance and variation of soft and layered soils is unavoidable. Attention is drawn to this condition whenever it is suspected.

#### 0.1.3. Routine Sampling

Representative disturbed and environmental soil samples of the different strata are taken following completion of logging. Soil samples obtained for testing are sampled and sealed in plastic tubs, borosilicate amber jars or in specialist vessels where required. All samples are returned from site to QG's laboratory for controlled storage within 24 hours of sampling to await test scheduling/requirements.

#### 0.1.4. In-Situ Testing

- TRL DCP Probes
- Soakaway tests

#### 0.1.5. Groundwater

Where possible, the depth of entry of any influx of groundwater is recorded during the course of excavation or boring operations. The rate of inflow into the excavation or borehole is monitored during the course of the excavation or during boring procedures. Upon encountering any water strikes, work is temporarily halted and the water levels monitored for a standard twenty-minute period recording the change in water level at the end of the twenty minutes.

Groundwater conditions observed in the excavations are those appertaining to the period of investigation. It should be noted, however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions or other causes.

#### 0.1.6. Retention of Samples

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded. Further to notifying the Engineer/ Client with one week's notice all soil and/or rock samples will be discarded 28 days after submission of the approved final report.

## 1.0. INTRODUCTION

### 1.1 General

Upon the instructions of Capita (Project Engineer), on behalf of Bridgend County Borough Council (Client), Quantum Geotechnic Ltd (QGL) has been commissioned to undertake a ground investigation on land located to the west of the Trecco Bay Caravan Park, Porthcawl for the proposed drainage scheme works for Porthcawl town. The purpose of this ground investigation is to determine the existing ground and groundwater conditions on the site to allow the design to proceed.

The approximate Ordnance Survey National Grid Reference of the site is 282673, 177018.

This report presents a factual account of the fieldwork carried out, the strata encountered, groundwater observations and details subsequent laboratory testing undertaken on samples obtained from the investigation.

Other available sources of information that have been consulted include the published geological maps for the area.

General notes on the techniques employed by QGL are described in the Foreword together with the limitations inherent in carrying out site investigation work.

## 2.0. SITE DETAIL

### 2.1. Site Description

The ground investigation was undertaken across the site as directed by the Project Engineer. This site is situated to the west of the Trecco Bay Caravan Park, Porthcawl. The site is currently unused rough ground but was formerly used as a municipal caravan park. Its western boundary is located to the east of Coney Beach Amusement Park, with Sandy Bay beach immediately south of the site. The site is mostly flat with a few man made wind break bunds approximately 1.5-2.0m in height, with a circular 'bowl' area in the middle of the site and is between 0 and 3.5mbgl below the level of the surrounding area.

A site location plan can be found as Figure 1 in Appendix I.

### 2.2. Statutory Service Information

All service information was held by the Project Engineer and was made available to QGL prior to commencement of the intrusive works. Standard QGL procedures for breaking ground were followed and all areas were CAT scanned for presence of buried services.

## 3.0. GEOLOGY & ENVIRONMENTAL SETTING

### 3.1. Published Geology

Details of the superficial and solid geology of the site are provided by the British Geological Survey, Sheet 262 '*Bridgend"* (superficial and bedrock edition) – 1:50,000 Scale

***Superficial Geology***

The geological sheet indicates the natural superficial deposits along the route to be wind blown sands. These are recent deposits located across the site, likely associated with the beach as coastal sand dunes.

No Made Ground deposits are mapped across the site. There is however a possibility Made Ground may be present relating to the road infrastructure across the site.

***Solid Geology***

The Geological map indicates the solid geology below the site to comprise of Triassic age (Mercia Mudstone Group/Marginal Facies), with Carboniferous Limestone outcropping in the south west corner of the site.

There are two unnamed faults located on/within 50m of the site.

### 3.2. Hydrology

Sandy Bay beach is located immediately south of the site.

## 4.0. FIELDWORK

### 4.1. General

The fieldwork was undertaken between the 17th and 19th June 2020. Full time on site supervision and attendance was provided by an Engineering Geologist from QGL.

All service plans were held onsite, with all site personnel inducted by QGL and briefed of the pertinent Risk Assessments and Method Statements relating to the tasks to be undertaken.

Each area of investigation was fully CAT ('Cable Avoidance Tool') scanned prior to breaking ground.

***Summary of Fieldworks***

The fieldworks comprised;

- 9 No. Machine Excavated Trial Pits
- Soakaway tests within selected Trial Pits
- TRL DCP Probes adjacent to each Trial Pit
- Sampling of soils for environmental and geotechnical testing

General notes on the techniques employed by Quantum Geotechnic are described in the Foreword together with the limitations inherent in carrying out ground investigation work.

### 4.2. Exploratory Hole Locations

The exploratory hole locations were set out by QGL in liaison with the Project Engineer. The exploratory hole locations were surveyed upon completion using a Leica dual frequency GPS Model 1250, accurate to 0.005m horizontal and 0.01m vertical.

A site location plan is presented as Figure 1 in Appendix I. The Exploratory Hole co-ordinates and levels are detailed within Table 1.

***Table 1:*** Exploratory Hole Co-Ordinates & Levels

| Exploratory Hole ID | Easting | Northing | Height (mAOD) |
|---|---|---|---|
| TP01 | 282526.465 | 177197.178 | 9.77 |
| TP02 | 282686.029 | 177213.246 | 9.07 |
| TP03 | 282894.295 | 177212.204 | 10.03 |
| TP04 | 282570.013 | 177060.519 | 14.38 |
| TP05 | 282674.490 | 177005.387 | 8.84 |
| TP06 | 282888.951 | 177053.310 | 11.98 |
| TP07 | 282570.652 | 176948.983 | 11.84 |
| TP08 | 282726.555 | 176882.041 | 13.25 |
| TP09 | 282854.505 | 176896.757 | 13.85 |

### 4.3 Machine Excavated Trial Pits

9 No. Trial Pits were excavated using a JCB 3CX wheeled excavator at the positions shown on the exploratory hole location plan in Appendix I.

This method of investigation allows direct sampling of the near surface deposits for identification purposes, as well as assessment of any salient features and Made Ground or disturbed ground. The trial pits were logged in accordance with BS5930:2015; BS EN ISO 14688-1:2002 and BS EN ISO 14688-2:2004, and supervised at all times by an Engineering Geologist from QGL.

All trial pits were backfilled with compacted layers of arisings upon completion with suitable reinstatement where required.

Geotechnical and Environmental samples were taken within the superficial deposits for laboratory testing purposes.

Details of the Trial Pits, including final depths in metres below ground level (mbgl) are provided in Table 2.

***Table 2:*** *Trial Pit Detail*

| Exploratory Hole ID | Exploratory Hole Type | Final Length (mbgl) | Reason for termination |
|---|---|---|---|
| TP01 | Machine Excavated Trial Pit | 3.00 | Soakaway test to be undertaken |
| TP02 | Machine Excavated Trial Pit | 3.20 | Significant instability |
| TP03 | Machine Excavated Trial Pit | 3.40 | Soakaway test to be undertaken |
| TP04 | Machine Excavated Trial Pit | 3.00 | Significant instability |
| TP05 | Machine Excavated Trial Pit | 3.20 | Soakaway test to be undertaken |
| TP06 | Machine Excavated Trial Pit | 3.30 | Significant instability |
| TP07 | Machine Excavated Trial Pit | 3.20 | Soakaway test to be undertaken |
| TP08 | Machine Excavated Trial Pit | 3.00 | Significant instability |
| TP09 | Machine Excavated Trial Pit | 3.20 | Soakaway test to be undertaken |

A complete set of Engineering Geologist's Test Hole logs are presented within Appendix II.

## 4.4 In-Situ Testing

### *4.4.1 TRL DCP Probes*

The TRL (Transport Research Laboratory) Dynamic Cone Penetrometer (DCP) tests were undertaken adjacent to each Trial Pit. The TRL DCP probe is used for rapid in-situ measurement of the structural properties of existing road pavement constructed with unbound materials. The unit incorporates an 8 kg weight with a drop of 575 mm, and a 20 mm diameter cone fitted to the end of the shaft, allowing measurements to be made down to a depth of approximately 900 mm.

The TRL DCP Probe results are presented in Appendix IV.

### *4.4.3 Soakaway Tests*

Soakaway tests were undertaken within Trial Pits TP01, TP03, TP05, TP07 and TP09 in accordance with BRE 365. The test involves filling a test pit with water and measuring the time taken for the water level to drop.

The Soakaway test results are presented in Appendix III.

## 4.5. Sampling - General

Sampling of soils was undertaken in accordance with the Specification for the Works as specified by the Engineer. Geotechnical bulk, large bulk and disturbed samples were taken where required within the superficial deposits for strata identification and laboratory testing purposes. In addition, environment samples were taken in amber jars for laboratory testing.

All geotechnical samples were returned from site to QGL's laboratory for controlled storage to await test scheduling/requirements. For specific details of laboratory testing see Section 5.0. Sample type and sample depth was recorded on the Engineering Geologist's Exploratory Hole Logs found within Appendix II.

## 5.0. LABORATORY TESTING

### 5.1 General

The laboratory testing was scheduled by the Engineer and comprised a number of geotechnical and environmental tests on selected soil and soil leachate samples obtained during the investigation.

### 5.2 Geotechnical Laboratory Testing

All the geotechnical soil testing work was carried out in accordance with the procedures stipulated in the various sections of BS 1377:1990 Parts 1 - 9 Methods of test for soils for civil engineering purposes. Table 3 details the tests undertaken.

***Table 3:*** **Geotechnical Tests Undertaken**

| Type of Test | No of Tests |
|---|---|
| Moisture Content | 5 |
| Liquid Limit, Plastic Limit & Plasticity Index | 5 |
| PSD Wet Sieve | 9 |
| Suite D BRE Suite (Pyrite present)(Soil) | 5 |

Results of the geotechnical testing undertaken are presented within Appendix V.

### 5.3 Geoenvironmental Laboratory Testing

Geoenvironmental testing was carried out on selected soil and soil leachate samples gained from the ground investigation. The purpose of the testing is to gain a holistic view of any raised levels of contaminants that may exist onsite. Table 4 details Geo-Environmental tests undertaken on selected soil samples.

***Table 4:*** **Geoenvironmental Tests Undertaken**

| Type of Test | No of Tests |
|---|---|
| Suite E (Soil) | 5 |
| Suite K (Soil) | 3 |
| Faecal Coliforms (microbiological analysis) | 5 |
| Clostridium Perfrigens (microbiological analysis) | 5 |

Results of the geotechnical testing undertaken are presented within Appendix VI.

## 6.0. REFERENCES

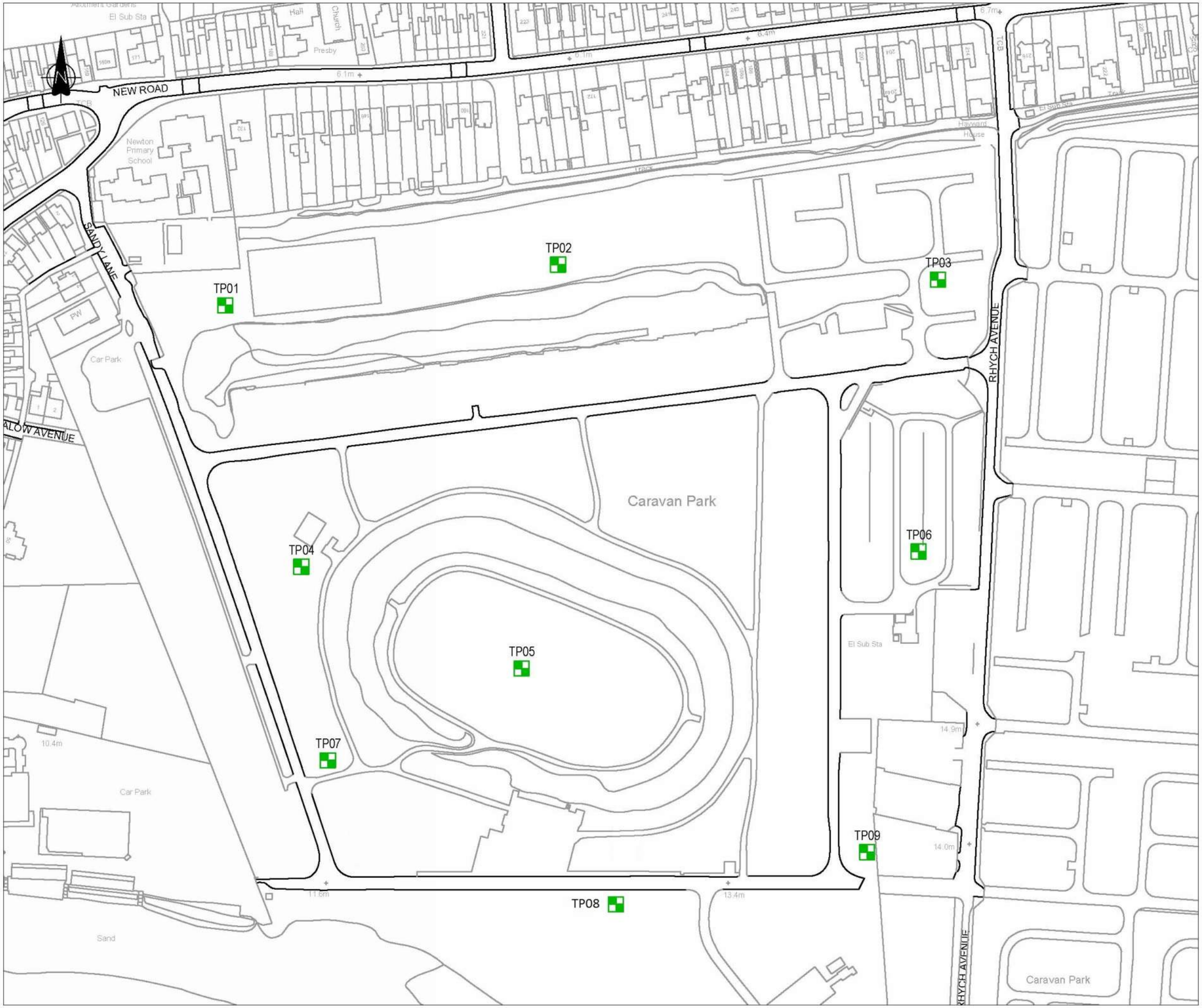

British Geological Survey: -

- Geological Survey, Sheet 262 '*Bridgend"* (superficial and bedrock edition) – 1:50,000 Scale

Specialist Publications;-

- British Code of Practice BS 5930: (2015) *'Code of Practice for Site Investigations'*
- British Code of Practice BS 1377: (1990) *'Methods of test for soils for civil engineering purposes'.*
- *British Code of Practice BS EN ISO 14688-1:2002+A2:2013 Geotechnical investigation and testing.*
- *British Code of Practice BS EN ISO 14688-2:2004+A2:2013 Geotechnical investigation and testing.*
- *Health and Safety Executive Guidance Note EH40/90*

## APPENDIX I – SITE PLANS




## KEY

TRIAL PIT

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| Rev | Drwn | Chk'd | App'd | Description | Date |
|---|---|---|---|---|---|
| P01 | LB | IL | | FIRST ISSUE. | 24/03/2020 |

Purpose of Issue
S2 - FIT FOR INFORMATION

Classification
COMMERCIAL IN CONFIDENCE

Client
BRIDGEND COUNTY BOROUGH COUNCIL

Project
PORTHCAWL DRAINAGE STRATEGY

Drawing
PROPOSED EXPLORATORY HOLE LOCATION PLAN

| Scale @ A3 | Drawn | Checked | Approved |
|---|---|---|---|
| 1:2,000 | LB | IL | |

| Project No. | Date |
|---|---|
| CS098811 | 24-MAR-2020 |

Drawing Identifier — BS1192 Compliant
Project - Originator - Zone - Level - File Type - Role - Number — rev
98811-CAP-75-XX-DR-C-7502 — P01

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P:\Schemes_CGC\GC003400-99\GC003432 - Porthcawl Salt Lake Car Park\2 - Drawings\2.2 - Preliminary & Pre-Tender\75 - Pre-construction Geotechnical\98811-CAP-75-XX-DR-C-7502 P01.dwg

Print Date:06/05/2020 10:22:25

## APPENDIX II – ENGINEERING GEOLOGIST'S TRIAL PIT LOGS

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Trial Pit No. TP01**

Dates : 17/6/20 - 17/6/20

Location : Within park area

Job Number : Q0281

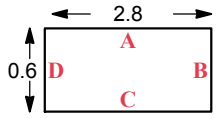
Engineer : Capita

Ground Level : 9.77 m A.O.D. *Level to Ordnance Datum*

Coordinates: 282526.47 E 177197.18 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | 0.10 - | ES1 | | | 0.20 | Grass over brown slightly gravelly sandy SILT with frequent rootlets. Gravel is fine to coarse sub-angular to sub-rounded Siltstone and Sandstone. | | | |
| | 0.20 - 0.50 | ES2 | | | 0.20 | Light brown medium to fine SAND | | 9.57 | |
| | 0.50 - 1.00 | B1 | | | | | | | |
| 1 | 1.00 - | ES3 | | | 2.80 | | | | |
| 2 | 2.00 - | B2 ES4 | | | | | | | |
| 3 | 3.00 - | B3 | | | 3.00 | TP terminated at 3.00mbgl sides collapsing, unable to progress | | 6.77 | |

**PLAN**




Groundwater: No ground water encountered

Stability: Unstable collapsing below 1.50m

Shoring: N/A

Remarks : TP marked out by QGL in liaison with Capita. Service plans checked and area CAT scanned. Soakaway test undertaken within pit at 1.70mbgl

Equipment Used: JCB 3CX wheeled excavator using a 2ft bucket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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| Garth Plant | S Picton | 1 Of 2 | 4 | | |

| Contract : Porthcawl Drainage Scheme<br>Client : Bridgend County Council | | Trial Pit No.<br>TP01 |
|---|---|---|
| Dates : 17/6/20 - 17/6/20<br>Location : Within park area | Job Number : Q0281<br>Engineer : Capita | Ground Level : 9.77 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 282526.47 E 177197.18 N *Co-ordinates to National Grid* |

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|---|---|---|---|---|
| Garth Plant | S Picton | 2 Of 2 | | All measurements in metres unless otherwise stated |

AGS

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Trial Pit No. TP02**

Dates : 17/6/20 - 17/6/20

Location : Within park area

Job Number : Q0281

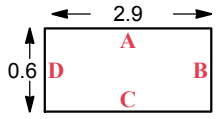
Engineer : Capita

Ground Level : 9.07 m A.O.D. *Level to Ordnance Datum*

Coordinates: 282686.03 E 177213.25 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.20 | MADE GROUND - Grass over brown slightly gravelly sandy SILT with frequent rootlets. Gravel is fine to coarse sub-angular to sub-rounded Siltstone and Sandstone. | | | |
| | 0.20 - | ES1 | | | 0.20 | MADE GROUND - Light brown medium to fine SAND (Re-worked natural ground) | | 8.87 | |
| | 0.50 - 1.00 | B1 | | | | | | | |
| | 0.50 - | ES2 | | | 1.00 | | | | |
| 1 | 1.00 - | ES3 | | | | | | | |
| | 1.20 - | B2 | | | 1.20 | MADE GROUND - Black grey slightly silty sandy GRAVEL. Gravel is fine to coarse sub-angular to sub-rounded concrete and brick with frequent pieces of metal | | 7.87 | |
| | | | | | 0.20 | | | | |
| | | | | | 1.40 | Light brown medium to fine SAND | | 7.67 | |
| 2 | 2.00 - | B3 | | | | | | | |
| | | ES4 | | | 1.80 | | | | |
| 3 | 3.00 - | B4 | | | | | | | |
| | | | | | 3.20 | TP terminated at 3.20mbgl sides collapsing, unable to progress | | 5.87 | |

**PLAN**




Groundwater: No ground water encountered

Stability: Unstable collapsing below 1.50m

Shoring: N/A

Remarks : TP marked out by QGL in liaison with Capita. Service plans checked and area CAT scanned

Equipment Used: JCB 3CX wheeled excavator using a 2ft bucket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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| Garth Plant | S Picton | 1 Of 2 | 4 | | |

| Contract : Porthcawl Drainage Scheme<br>Client : Bridgend County Council | | Trial Pit No.<br>TP02 |
|---|---|---|
| Dates : 17/6/20 - 17/6/20<br>Location : Within park area | Job Number : Q0281<br>Engineer : Capita | Ground Level : 9.07 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 282686.03 E 177213.25 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| Garth Plant | S Picton | 2 Of 2 | | All measurements in metres unless otherwise stated |

AGS

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Trial Pit No. TP03**

Dates : 17/6/20 - 17/6/20

Location : Within park area

Job Number : Q0281

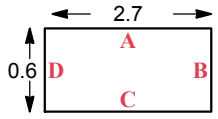
Engineer : Capita

Ground Level : 10.03 m A.O.D. *Level to Ordnance Datum*

Coordinates: 282894.30 E
177212.20 N
*Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.20 | MADE GROUND - Grass over brown slightly gravelly sandy SILT with frequent rootlets. Gravel is fine to coarse sub-angular to sub-rounded Siltstone and Sandstone. | | | |
| | 0.20 - | ES1 | | | 0.20 | MADE GROUND - Black grey slightly silty sandy GRAVEL with frequent sheets of metal and glass. Gravel is fine to coarse sub-angular to sub-rounded Siltstone, Limestone, Flint, concrete and brick. | | 9.83 | |
| | 0.50 - | B1 ES2 | | | 0.30 | | | | |
| 1 | 1.00 - | B2 ES3 | | | 0.50 | Light brown medium to fine SAND woth low boulder content. Boulders are rounded to sub-rounded Sandstone. | | 9.53 | |
| 2 | 2.00 - 3.00 2.00 - | B3 ES4 | | | 2.90 | | | | |
| 3 | | | | | | | | | |
| | | | | | 3.40 | TP terminated at 3.40mbgl sides collapsing, unable to progress | | 6.63 | |

**PLAN**




Groundwater: No ground water encountered

Stability: Unstable collapsing below 1.50m

Shoring: N/A

Remarks : TP marked out by QGL in liaison with Capita. Service plans checked and area CAT scanned. Soakaway test undertaken within pit at 1.50mbgl

Equipment Used: JCB 3CX wheeled excavator using a 2ft bucket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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| Garth Plant | S Picton | 1 Of 2 | 4 | | |

| Contract : Porthcawl Drainage Scheme<br>Client : Bridgend County Council | | Trial Pit No.<br>TP03 |
|---|---|---|
| Dates : 17/6/20 - 17/6/20<br>Location : Within park area | Job Number : Q0281<br>Engineer : Capita | Ground Level : 10.03 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 282894.30 E 177212.20 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| Garth Plant | S Picton | 2 Of 2 | | All measurements in metres unless otherwise stated |

AGS

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Trial Pit No. TP04**

Dates : 19/6/20 - 19/6/20

Location : Within park area

Job Number : Q0281

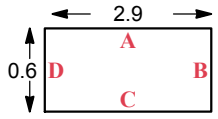
Engineer : Capita

Ground Level : 14.38 m A.O.D. *Level to Ordnance Datum*

Coordinates: 282570.01 E 177060.52 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | MADE GROUND - Grass over brown slightly gravelly sandy SILT with frequent rootlets. Gravel is fine to coarse sub-angular to sub-rounded Siltstone and Sandstone and rare bricks and pieces of tarmac. | | 14.28 | |
| | 0.20 - | ES1 | | | 0.10 | Light brown medium to fine SAND | | | |
| | 0.50 - 1.00 | B1 | | | | | | | |
| | 0.50 - | ES2 | | | | | | | |
| 1 | 1.00 - 2.00 | B2 | | | | | | | |
| | 1.00 - | ES3 | | | | | | | |
| | | | | | 2.90 | | | | |
| 2 | 2.00 - 3.00 | B3 | | | | | | | |
| | 2.00 - | ES4 | | | | | | | |
| 3 | | | | | 3.00 | TP terminated at 3.00mbgl sides collapsing, unable to progress | | 11.38 | |

**PLAN**




Groundwater: No ground water encountered

Stability: Unstable collapsing below 1.50m

Shoring: N/A

Remarks : TP marked out by QGL in liaison with Capita. Service plans checked and area CAT scanned

Equipment Used: JCB 3CX wheeled excavator using a 2ft bucket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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| Garth Plant | S Picton | 1 Of 2 | 4 | | |

| Contract : Porthcawl Drainage Scheme<br>Client : Bridgend County Council | | Trial Pit No.<br>TP04 |
|---|---|---|
| Dates : 19/6/20 - 19/6/20<br>Location : Within park area | Job Number : Q0281<br>Engineer : Capita | Ground Level : 14.38 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 282570.01 E 177060.52 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| Garth Plant | S Picton | 2 Of 2 | | All measurements in metres unless otherwise stated |

AGS

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Trial Pit No. TP05**

Dates : 18/6/20 - 18/6/20

Location : Within park area

Job Number : Q0281

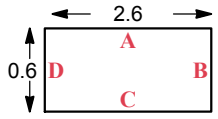
Engineer : Capita

Ground Level : 8.84 m A.O.D. *Level to Ordnance Datum*

Coordinates: 282674.49 E 177005.39 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.20 | Grass over brown slightly gravelly sandy SILT with frequent rootlets. Gravel is fine to coarse sub-angular to sub-rounded Siltstone and Sandstone. | | | |
| | 0.20 - | ES1 | | | 0.20 | Light brown medium to fine SAND | | 8.64 | |
| | 0.50 - 1.00 | B1 | | | | | | | |
| | 0.50 - | ES2 | | | | | | | |
| 1 | 1.00 - 2.00 | B2 | | | | | | | |
| | 1.00 - | ES3 | | | | | | | |
| | | | | | 3.00 | | | | |
| 2 | 2.00 - 3.00 | B3 | | | | | | | |
| | 2.00 - | ES4 | | | | | | | |
| 3 | | | | | | | | | |
| | | | | | 3.20 | TP terminated at 3.20mbgl sides collapsing, unable to progress | | 5.64 | |

**PLAN**




Groundwater: No ground water encountered

Stability: Unstable collapsing below 1.50m

Shoring: N/A

Remarks : TP marked out by QGL in liaison with Capita. Service plans checked and area CAT scanned. Soakaway test undertaken within pit at 1.60mbgl

Equipment Used: JCB 3CX wheeled excavator using a 2ft bucket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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| Garth Plant | S Picton | 1 Of 2 | 4 | | |

| Contract : Porthcawl Drainage Scheme<br>Client : Bridgend County Council | | Trial Pit No.<br>TP05 |
|---|---|---|
| Dates : 18/6/20 - 18/6/20<br>Location : Within park area | Job Number : Q0281<br>Engineer : Capita | Ground Level : 8.84 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 282674.49 E 177005.39 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| Garth Plant | S Picton | 2 Of 2 | | All measurements in metres unless otherwise stated |

AGS

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Trial Pit No. TP06**

Dates : 17/6/20 - 17/6/20

Location : Within park area

Job Number : Q0281

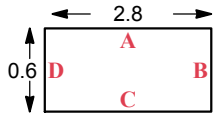
Engineer : Capita

Ground Level : 11.98 m A.O.D. *Level to Ordnance Datum*

Coordinates: 282888.95 E 177053.31 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.20 | Grass over brown slightly gravelly sandy SILT with frequent rootlets. Gravel is fine to coarse sub-angular to sub-rounded Siltstone and Sandstone. | | | |
| | 0.20 - | ES1 | | | 0.20 | Light brown medium to fine SAND | | 11.78 | |
| | 0.50 - 1.00 | B1 | | | | | | | |
| | 0.50 - | ES2 | | | | | | | |
| 1 | 1.00 - | ES3 | | | | | | | |
| | | | | | 3.10 | | | | |
| 2 | 2.00 - | B2 | | | | | | | |
| | | ES4 | | | | | | | |
| 3 | | | | | | | | | |
| | 3.30 - | B3 | | | 3.30 | TP terminated at 3.30mbgl sides collapsing, unable to progress | | 8.68 | |

**PLAN**




Groundwater: No ground water encountered

Stability: Unstable collapsing below 2.00m

Shoring: N/A

Remarks : TP marked out by QGL in liaison with Capita. Service plans checked and area CAT scanned

Equipment Used: JCB 3CX wheeled excavator using a 2ft bucket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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| Garth Plant | S Picton | 1 Of 2 | 4 | | |

| Contract : Porthcawl Drainage Scheme<br>Client : Bridgend County Council | | Trial Pit No.<br>TP06 |
|---|---|---|
| Dates : 17/6/20 - 17/6/20<br>Location : Within park area | Job Number : Q0281<br>Engineer : Capita | Ground Level : 11.98 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 282888.95 E 177053.31 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| Garth Plant | S Picton | 2 Of 2 | | All measurements in metres unless otherwise stated |

AGS

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Trial Pit No. TP07**

Dates : 18/6/20 - 18/6/20

Location : Within park area

Job Number : Q0281

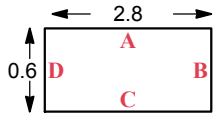
Engineer : Capita

Ground Level : 11.84 m A.O.D. *Level to Ordnance Datum*

Coordinates: 282570.65 E 176948.98 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | 0.10 - | ES1 | | | 0.05 | MADE GROUND - Grass over brown slightly gravelly sandy SILT with frequent rootlets. Gravel is fine to coarse sub-angular to sub-rounded Siltstone and Sandstone. | | 11.79 | |
| | | | | | 0.05 | | | | |
| | | | | | 0.25 | MADE GROUND - Light brown medium to fine SAND (Reworked natural ground) | | 11.54 | |
| | 0.30 - | ES2 | | | 0.30 | | | | |
| | | | | | 0.20 | MADE GROUND - Brown slightly silty sandy GRAVEL. Gravel is fine to coarse sub-angular to sub-rounded Siltstone, Limestone and Flint | | 11.34 | |
| | 0.50 - | B1 | | | 0.50 | Light brown medium to fine SAND | | | |
| 1 | 1.00 - 2.00 | B2 | | | | | | | |
| | 1.00 - | ES3 | | | | | | | |
| | | | | | 2.70 | | | | |
| 2 | 2.00 - 3.00 | B3 | | | | | | | |
| | 2.00 - | ES4 | | | | | | | |
| 3 | | | | | | | | | |
| | | | | | 3.20 | TP terminated at 3.20mbgl sides collapsing, unable to progress | | 8.64 | |

**PLAN**




Groundwater: No ground water encountered

Stability: Unstable collapsing below 1.50m

Shoring: N/A

Remarks : TP marked out by QGL in liaison with Capita. Service plans checked and area CAT scanned. Soakaway test undertaken within pit at 1.30mbgl

Equipment Used: JCB 3CX wheeled excavator using a 2ft bucket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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| Garth Plant | S Picton | 1 Of 2 | 4 | All measurements in metres unless otherwise stated |

AGS

| Contract : Porthcawl Drainage Scheme<br>Client : Bridgend County Council | | Trial Pit No.<br>TP07 |
|---|---|---|
| Dates : 18/6/20 - 18/6/20<br>Location : Within park area | Job Number : Q0281<br>Engineer : Capita | Ground Level : 11.84 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 282570.65 E 176948.98 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| Garth Plant | S Picton | 2 Of 2 | | All measurements in metres unless otherwise stated |

AGS

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Trial Pit No. TP08**

Dates : 18/6/20 - 18/6/20

Location : Within park area

Job Number : Q0281

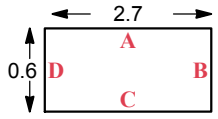
Engineer : Capita

Ground Level : 13.25 m A.O.D. *Level to Ordnance Datum*

Coordinates: 282726.56 E 176882.04 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.20 | MADE GROUND - Grass over brown slightly gravelly sandy SILT with frequent rootlets. Gravel is fine to coarse sub-angular to sub-rounded Siltstone and Sandstone. | | | |
| | 0.20 - | ES1 | | | 0.20 | | | 13.05 | |
| | | | | | 0.10 | MADE GROUND - Brown slightly silty sandy GRAVEL. Gravel is fine to coarse sub-angular to sub-rounded Siltstone, Limestone and Flint | | | |
| | | | | | 0.30 | | | 12.95 | |
| | 0.50 - 1.00 | B1 | | | | Light brown medium to fine SAND | | | |
| | 0.50 - | ES2 | | | | | | | |
| 1 | 1.00 - 2.00 | B2 | | | | | | | |
| | 1.00 - | ES3 | | | | | | | |
| | | | | | 2.70 | | | | |
| 2 | 2.00 - 3.00 | B3 | | | | | | | |
| | 2.00 - | ES4 | | | | | | | |
| 3 | | | | | 3.00 | TP terminated at 3.00mbgl sides collapsing, unable to progress | | 10.25 | |

**PLAN**




Groundwater: No ground water encountered

Stability: Unstable collapsing below 2.00m

Shoring: N/A

Remarks : TP marked out by QGL in liaison with Capita. Service plans checked and area CAT scanned

Equipment Used: JCB 3CX wheeled excavator using a 2ft bucket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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| Garth Plant | S Picton | 1 Of 2 | 4 | | |

| Contract : Porthcawl Drainage Scheme<br>Client : Bridgend County Council | | Trial Pit No.<br>TP08 |
|---|---|---|
| Dates : 18/6/20 - 18/6/20<br>Location : Within park area | Job Number : Q0281<br>Engineer : Capita | Ground Level : 13.25 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 282726.56 E 176882.04 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| Garth Plant | S Picton | 2 Of 2 | | All measurements in metres unless otherwise stated |

AGS

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Trial Pit No. TP09**

Dates : 18/6/20 - 18/6/20

Location : Within park area

Job Number : Q0281

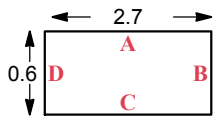
Engineer : Capita

Ground Level : 13.85 m A.O.D. *Level to Ordnance Datum*

Coordinates: 282854.51 E 176896.76 N *Co-ordinates to National Grid*

| m B.G.L. | Samples Depth | Samples Type No. | Tests Depth | Tests Test Results | Strata Depth (Thick-ness) | Strata Description | Strata Legend | Strata Red. Level A.O.D. | WATER |
|---|---|---|---|---|---|---|---|---|---|
| | 0.20 - | ES1 | | | | Grass over light brown medium to fine SAND | | | |
| | 0.50 - | B1 ES2 | | | | | | | |
| 1 | 1.00 - | B2 ES3 | | | | | | | |
| | | | | | 3.20 | | | | |
| 2 | 2.00 - | B3 ES4 | | | | | | | |
| 3 | 3.00 - | B4 | | | | | | | |
| | | | | | 3.20 | TP terminated at 3.20mbgl sides collapsing, unable to progress | | 10.65 | |

**PLAN**




Groundwater: No ground water encountered

Stability: Unstable collapsing below 2.00m

Shoring: N/A

Remarks : TP marked out by QGL in liaison with Capita. Service plans checked and area CAT scanned. Soakaway test undertaken within pit at 1.20mbgl

Equipment Used: JCB 3CX wheeled excavator using a 2ft bucket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| Operator: | Logged By. | Sheet No. | m Per Page | All measurements in metres unless otherwise stated | AGS |
|---|---|---|---|---|---|
| Garth Plant | S Picton | 1 Of 2 | 4 | | |

| Contract : Porthcawl Drainage Scheme<br>Client : Bridgend County Council | | Trial Pit No.<br>TP09 |
|---|---|---|
| Dates : 18/6/20 - 18/6/20<br>Location : Within park area | Job Number : Q0281<br>Engineer : Capita | Ground Level : 13.85 m A.O.D. *Level to Ordnance Datum*<br>Coordinates: 282854.51 E 176896.76 N *Co-ordinates to National Grid* |

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| Operator: | Logged By. | Sheet No. | m Per Page | |
|---|---|---|---|---|
| Garth Plant | S Picton | 2 Of 2 | | All measurements in metres unless otherwise stated |

AGS

## APPENDIX III – SOAKAWAY TEST RESULTS

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA01,1**

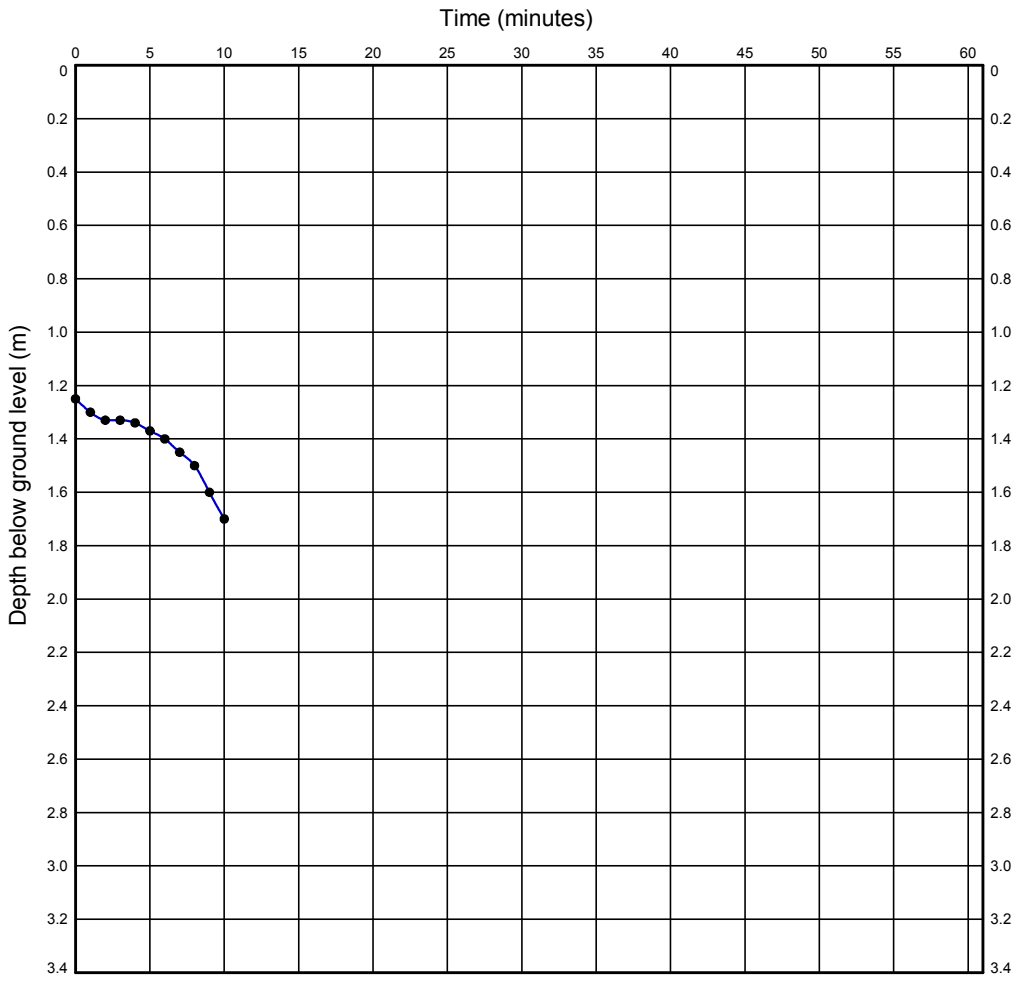
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 1.25 |
| 1.0 | 1.3 |
| 2.0 | 1.33 |
| 3.0 | 1.33 |
| 4.0 | 1.34 |
| 5.0 | 1.37 |
| 6.0 | 1.4 |
| 7.0 | 1.45 |
| 8.0 | 1.5 |
| 9.0 | 1.6 |
| 10.0 | 1.7 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 10 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.700 m | $V_{p75-25}$= | 0.378 $m^3$ |
| Trial Pit Length | 2.800 m | $a_{p50}$= | 3.210 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 4.000 minutes |
| Effective Depth | 0.450 m | | |
| Outflow Time | 4 mins from 75% to 25% full | | |

**f = 4.9065E-4 m/sec**


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Figure No. 1

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA01,2**

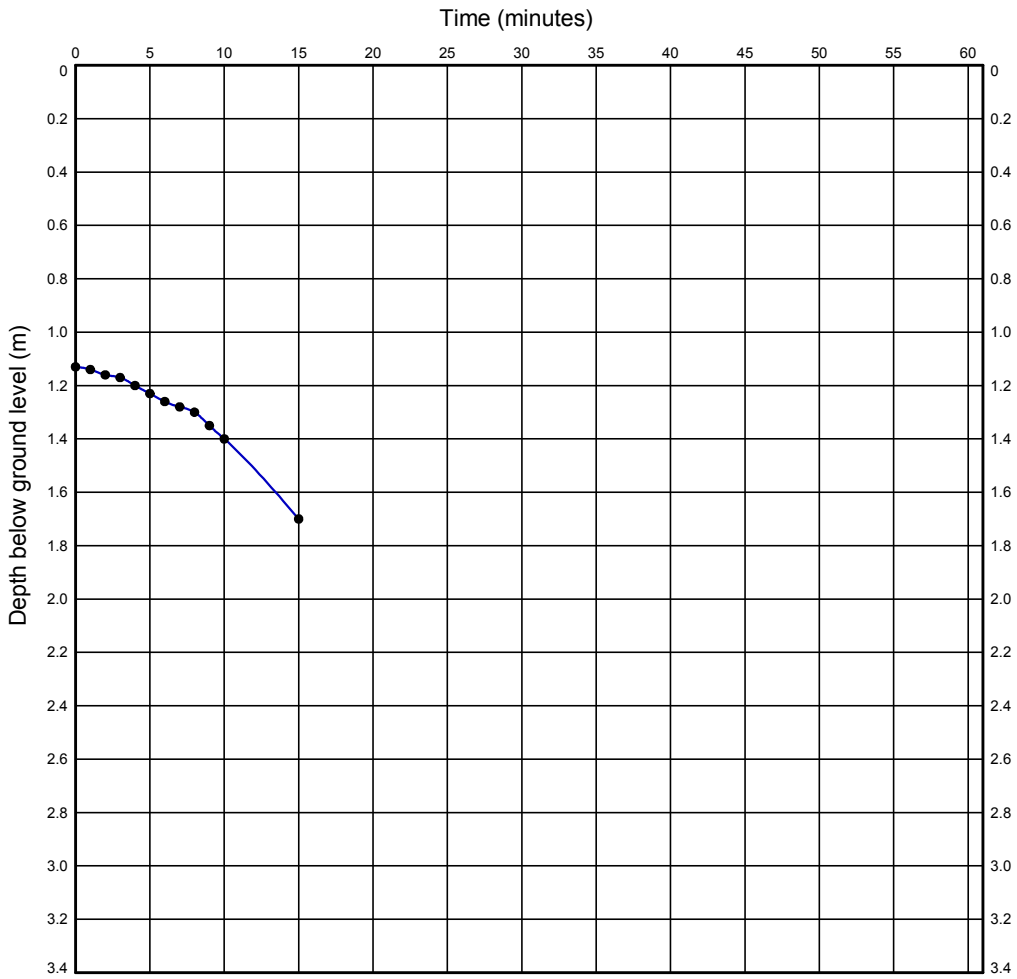
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 1.13 |
| 1.0 | 1.14 |
| 2.0 | 1.16 |
| 3.0 | 1.17 |
| 4.0 | 1.2 |
| 5.0 | 1.23 |
| 6.0 | 1.26 |
| 7.0 | 1.28 |
| 8.0 | 1.3 |
| 9.0 | 1.35 |
| 10.0 | 1.4 |
| 15.0 | 1.7 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 15 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.700 m | $V_{p75-25}$= | 0.479 $m^3$ |
| Trial Pit Length | 2.800 m | $a_{p50}$= | 3.618 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 5.000 minutes |
| Effective Depth | 0.570 m | | |
| Outflow Time | 5 mins from 75% to 25% full | | |

**f = 4.4113E-4 m/sec**


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Figure No. 2

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA01,3**

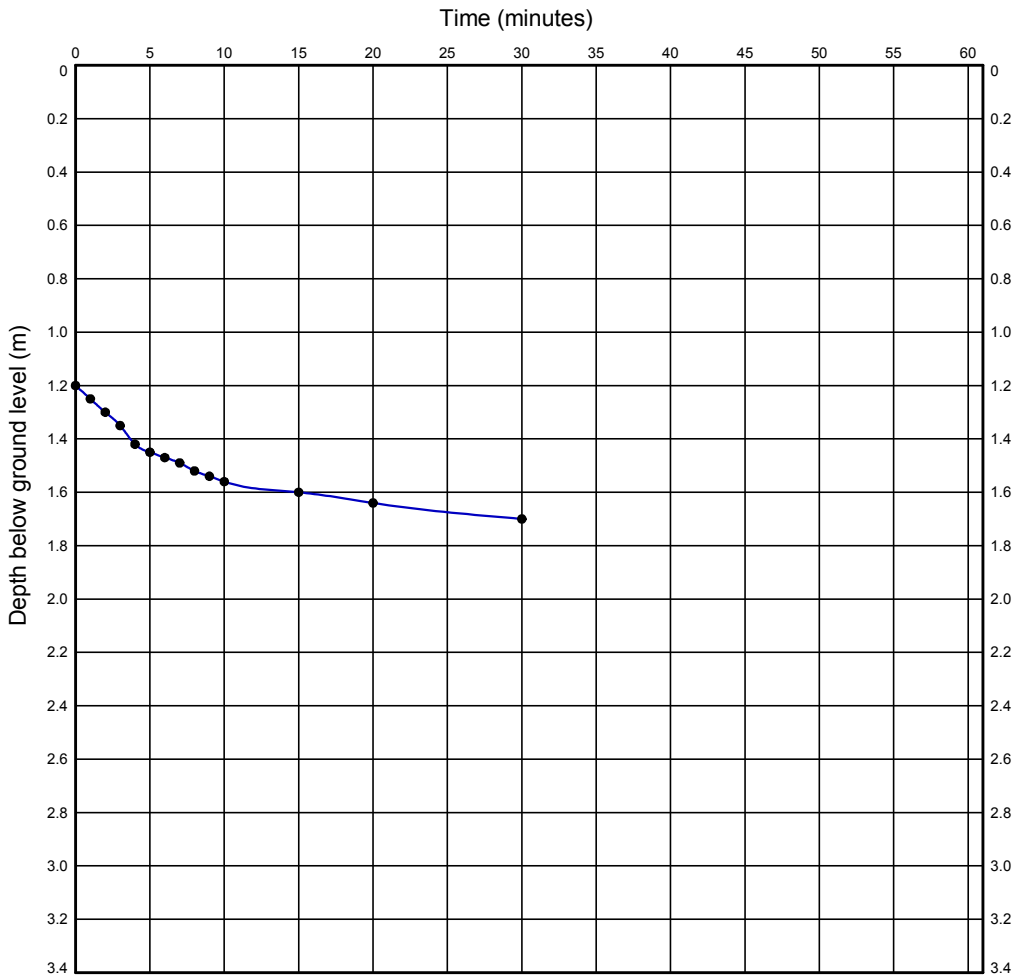
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 1.2 |
| 1.0 | 1.25 |
| 2.0 | 1.3 |
| 3.0 | 1.35 |
| 4.0 | 1.42 |
| 5.0 | 1.45 |
| 6.0 | 1.47 |
| 7.0 | 1.49 |
| 8.0 | 1.52 |
| 9.0 | 1.54 |
| 10.0 | 1.56 |
| 15.0 | 1.6 |
| 20.0 | 1.64 |
| 30.0 | 1.7 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 30 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.700 m | $V_{p75-25}$= | 0.420 $m^3$ |
| Trial Pit Length | 2.800 m | $a_{p50}$= | 3.380 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 9.500 minutes |
| Effective Depth | 0.500 m | | |
| Outflow Time | 9.5 mins from 75% to 25% full | | |

**f = 2.1800E-4 m/sec**


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Figure No. 3

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA03,1**

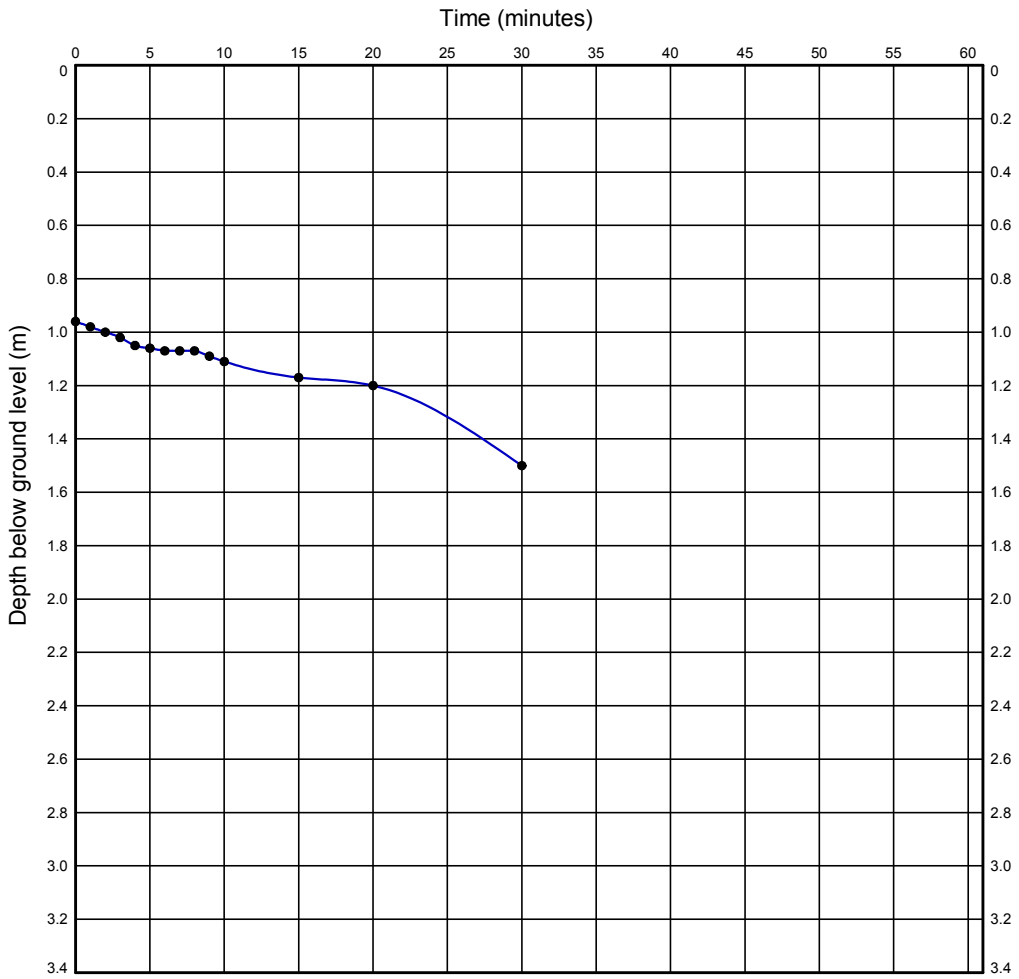
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 0.96 |
| 1.0 | 0.98 |
| 2.0 | 1 |
| 3.0 | 1.02 |
| 4.0 | 1.05 |
| 5.0 | 1.06 |
| 6.0 | 1.07 |
| 7.0 | 1.07 |
| 8.0 | 1.07 |
| 9.0 | 1.09 |
| 10.0 | 1.11 |
| 15.0 | 1.17 |
| 20.0 | 1.2 |
| 30.0 | 1.5 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 30 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.500 m | $V_{p75-25}$= | 0.437 $m^3$ |
| Trial Pit Length | 2.700 m | $a_{p50}$= | 3.402 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 15.500 minutes |
| Effective Depth | 0.540 m | | |
| Outflow Time | 15.5 mins from 75% to 25% full | | |

**f = 1.3825E-4 m/sec**


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Figure No. 4

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA03,2**

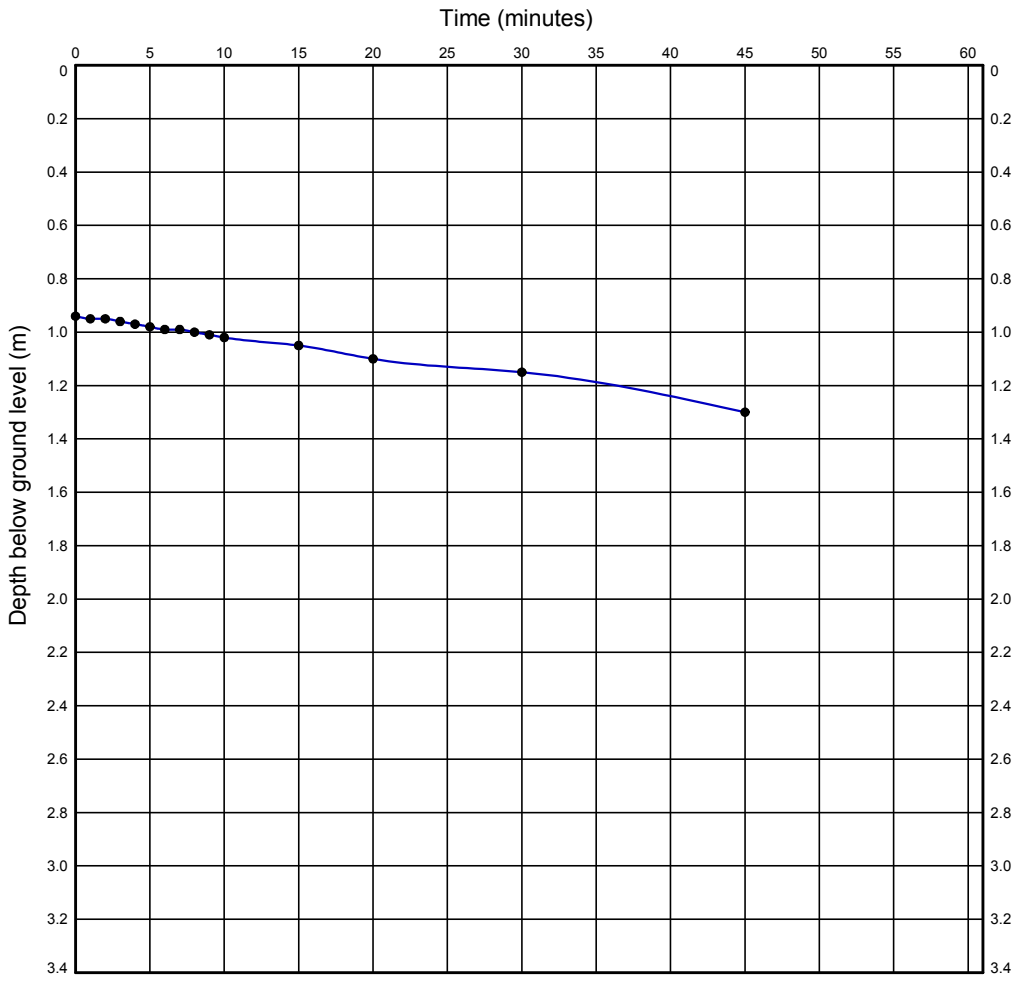
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 0.94 |
| 1.0 | 0.95 |
| 2.0 | 0.95 |
| 3.0 | 0.96 |
| 4.0 | 0.97 |
| 5.0 | 0.98 |
| 6.0 | 0.99 |
| 7.0 | 0.99 |
| 8.0 | 1 |
| 9.0 | 1.01 |
| 10.0 | 1.02 |
| 15.0 | 1.05 |
| 20.0 | 1.1 |
| 30.0 | 1.15 |
| 45.0 | 1.3 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 45 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.500 m | $V_{p75-25}$= | 0.292 $m^3$ |
| Trial Pit Length | 2.700 m | $a_{p50}$= | 2.808 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 25.000 minutes |
| Effective Depth | 0.360 m | | |
| Outflow Time | 25 mins from 75% to 25% full | | |

**f = 6.9231E-5 m/sec**


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Figure No. 5

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA03,3**

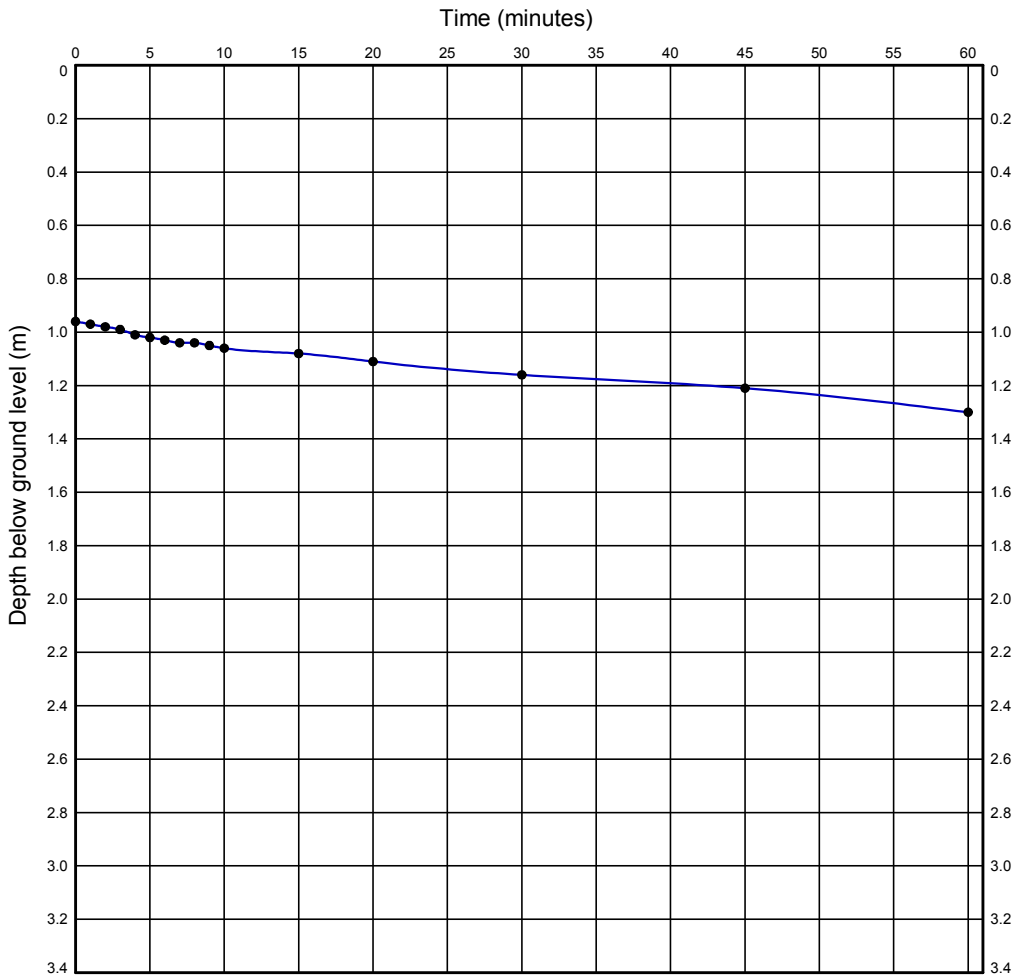
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 0.96 |
| 1.0 | 0.97 |
| 2.0 | 0.98 |
| 3.0 | 0.99 |
| 4.0 | 1.01 |
| 5.0 | 1.02 |
| 6.0 | 1.03 |
| 7.0 | 1.04 |
| 8.0 | 1.04 |
| 9.0 | 1.05 |
| 10.0 | 1.06 |
| 15.0 | 1.08 |
| 20.0 | 1.11 |
| 30.0 | 1.16 |
| 45.0 | 1.21 |
| 60.0 | 1.3 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 60 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.500 m | $V_{p75-25}$= | 0.292 $m^3$ |
| Trial Pit Length | 2.700 m | $a_{p50}$= | 2.808 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 36.000 minutes |
| Effective Depth | 0.360 m | | |
| Outflow Time | 36 mins from 75% to 25% full | | |

**f = 4.8077E-5 m/sec**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All measurements in metres unless otherwise stated

Project File: Q0281.GPJ

Figure No. 6

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA05,1**

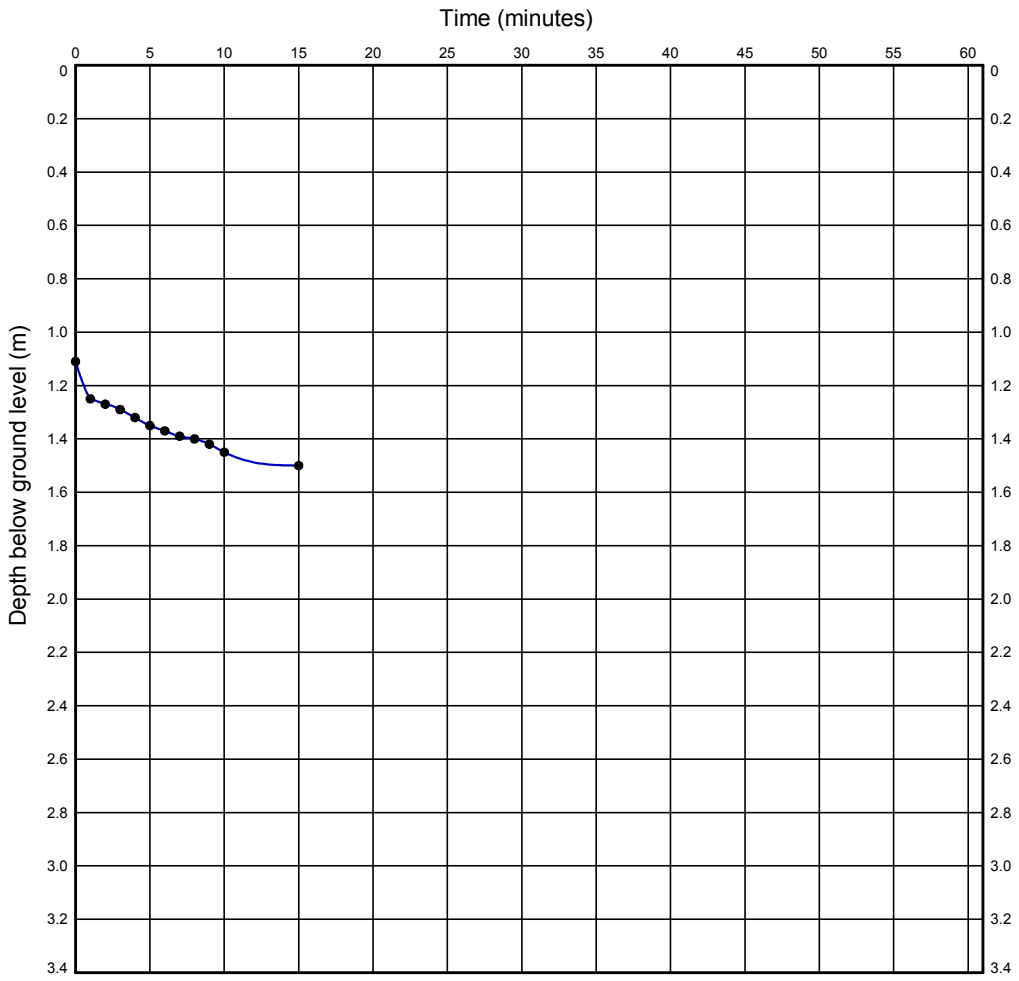
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 1.11 |
| 1.0 | 1.25 |
| 2.0 | 1.27 |
| 3.0 | 1.29 |
| 4.0 | 1.32 |
| 5.0 | 1.35 |
| 6.0 | 1.37 |
| 7.0 | 1.39 |
| 8.0 | 1.4 |
| 9.0 | 1.42 |
| 10.0 | 1.45 |
| 15.0 | 1.5 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 15 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.600 m | $V_{p75-25}$= | 0.304 $m^3$ |
| Trial Pit Length | 2.600 m | $a_{p50}$= | 2.808 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 7.700 minutes |
| Effective Depth | 0.390 m | | |
| Outflow Time | 7.7 mins from 75% to 25% full | | |

**f = 2.3449E-4 m/sec**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All measurements in metres unless otherwise stated

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Figure No. 7

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA05,2**

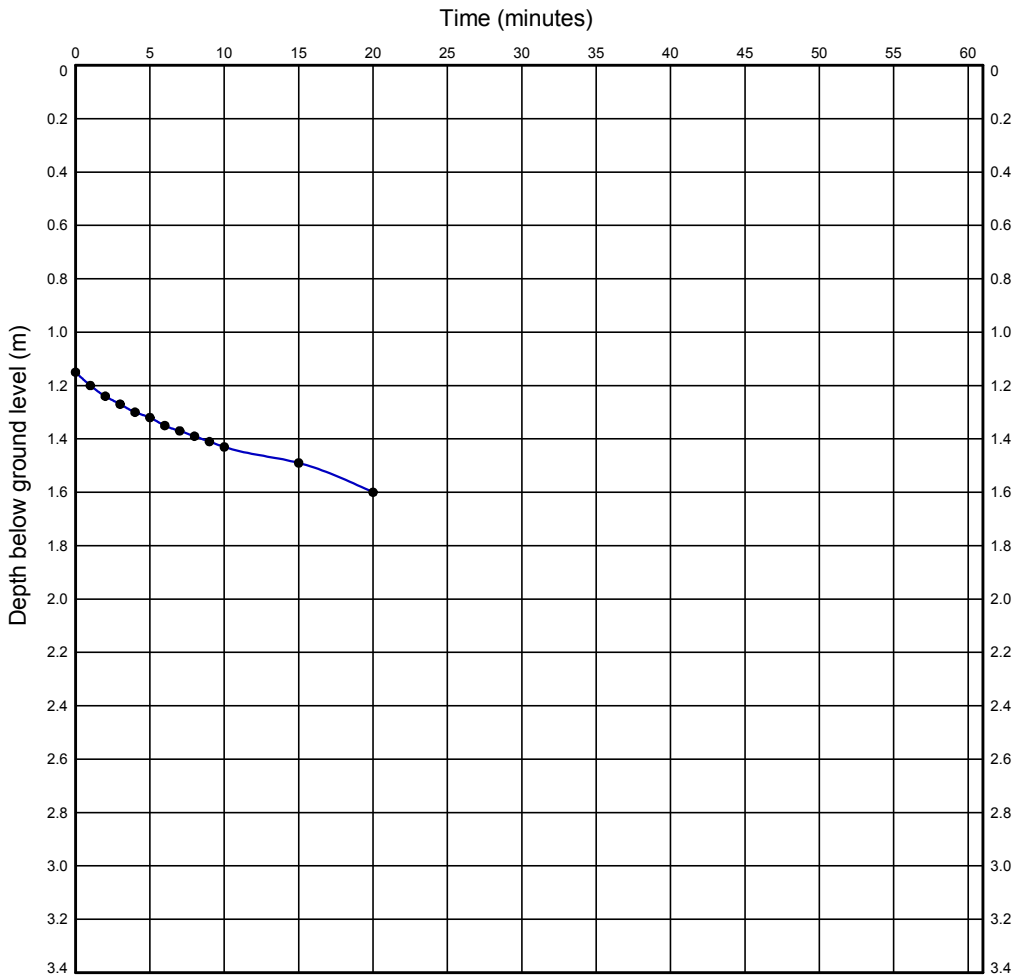
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 1.15 |
| 1.0 | 1.2 |
| 2.0 | 1.24 |
| 3.0 | 1.27 |
| 4.0 | 1.3 |
| 5.0 | 1.32 |
| 6.0 | 1.35 |
| 7.0 | 1.37 |
| 8.0 | 1.39 |
| 9.0 | 1.41 |
| 10.0 | 1.43 |
| 15.0 | 1.49 |
| 20.0 | 1.6 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 20 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.600 m | $V_{p75-25}$= | 0.351 $m^3$ |
| Trial Pit Length | 2.600 m | $a_{p50}$= | 3.000 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 12.000 minutes |
| Effective Depth | 0.450 m | | |
| Outflow Time | 12 mins from 75% to 25% full | | |

**f = 1.6250E-4 m/sec**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Date of Test: 18/06/2020

All measurements in metres unless otherwise stated

Project File: Q0281.GPJ

Figure No. 8

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA05,3**

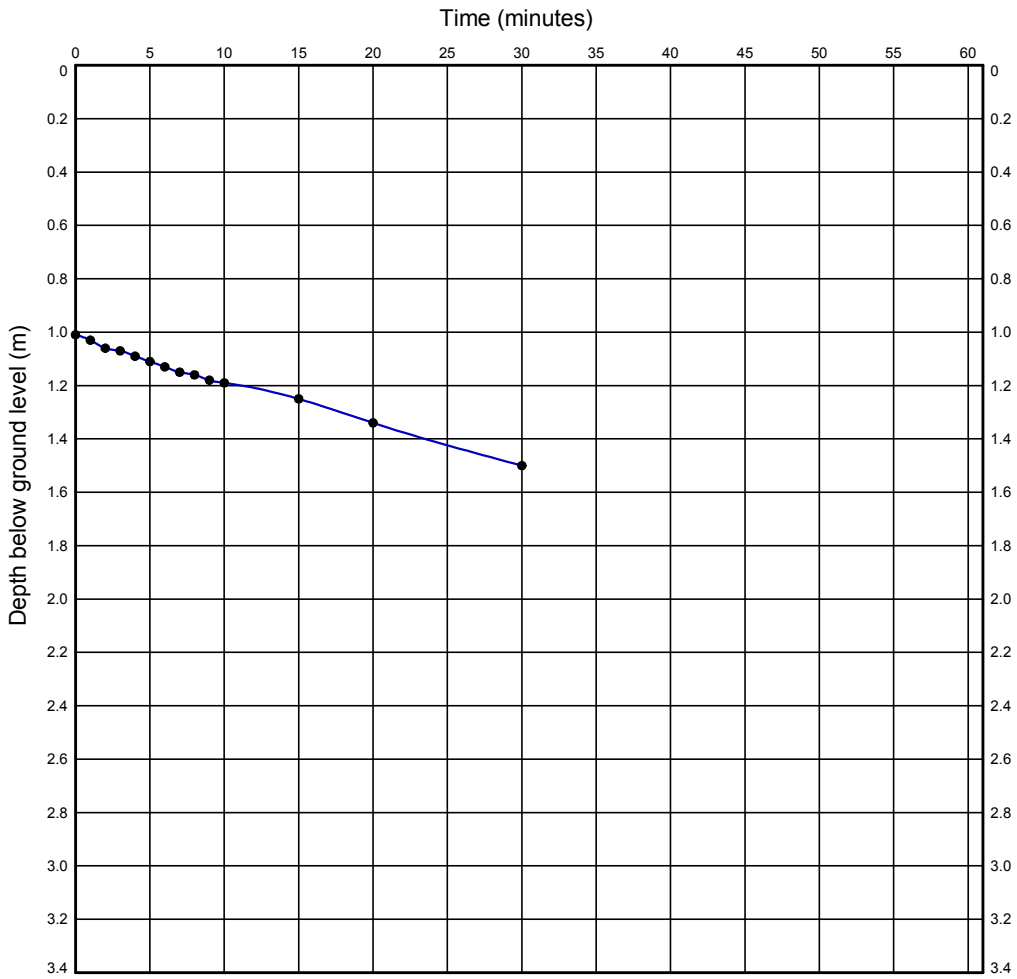
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 1.01 |
| 1.0 | 1.03 |
| 2.0 | 1.06 |
| 3.0 | 1.07 |
| 4.0 | 1.09 |
| 5.0 | 1.11 |
| 6.0 | 1.13 |
| 7.0 | 1.15 |
| 8.0 | 1.16 |
| 9.0 | 1.18 |
| 10.0 | 1.19 |
| 15.0 | 1.25 |
| 20.0 | 1.34 |
| 30.0 | 1.5 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 30 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.600 m | $V_{p75-25}$= | 0.382 $m^3$ |
| Trial Pit Length | 2.600 m | $a_{p50}$= | 3.128 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 16.000 minutes |
| Effective Depth | 0.490 m | | |
| Outflow Time | 16 mins from 75% to 25% full | | |

**f = 1.2728E-4 m/sec**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Date of Test: 18/06/2020

All measurements in metres unless otherwise stated

Project File: Q0281.GPJ

Figure No. 9

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA07,1**

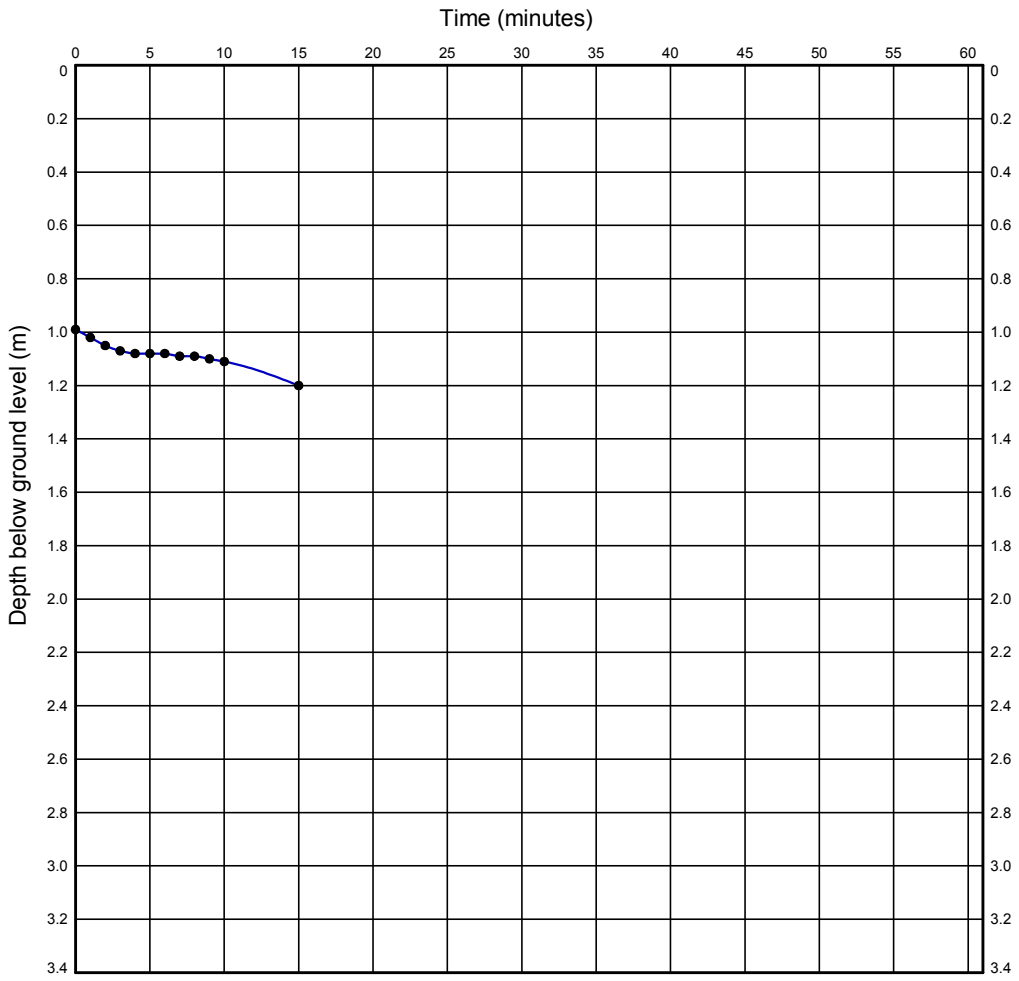
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 0.99 |
| 1.0 | 1.02 |
| 2.0 | 1.05 |
| 3.0 | 1.07 |
| 4.0 | 1.08 |
| 5.0 | 1.08 |
| 6.0 | 1.08 |
| 7.0 | 1.09 |
| 8.0 | 1.09 |
| 9.0 | 1.1 |
| 10.0 | 1.11 |
| 15.0 | 1.2 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 15 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.300 m | $V_{p75-25}$= | 0.176 $m^3$ |
| Trial Pit Length | 2.800 m | $a_{p50}$= | 2.394 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 10.000 minutes |
| Effective Depth | 0.210 m | | |
| Outflow Time | 10 mins from 75% to 25% full | | |

**f = 1.2281E-4 m/sec**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Date of Test: 18/06/2020

All measurements in metres unless otherwise stated

Project File: Q0281.GPJ

Figure No. 10

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA07,2**

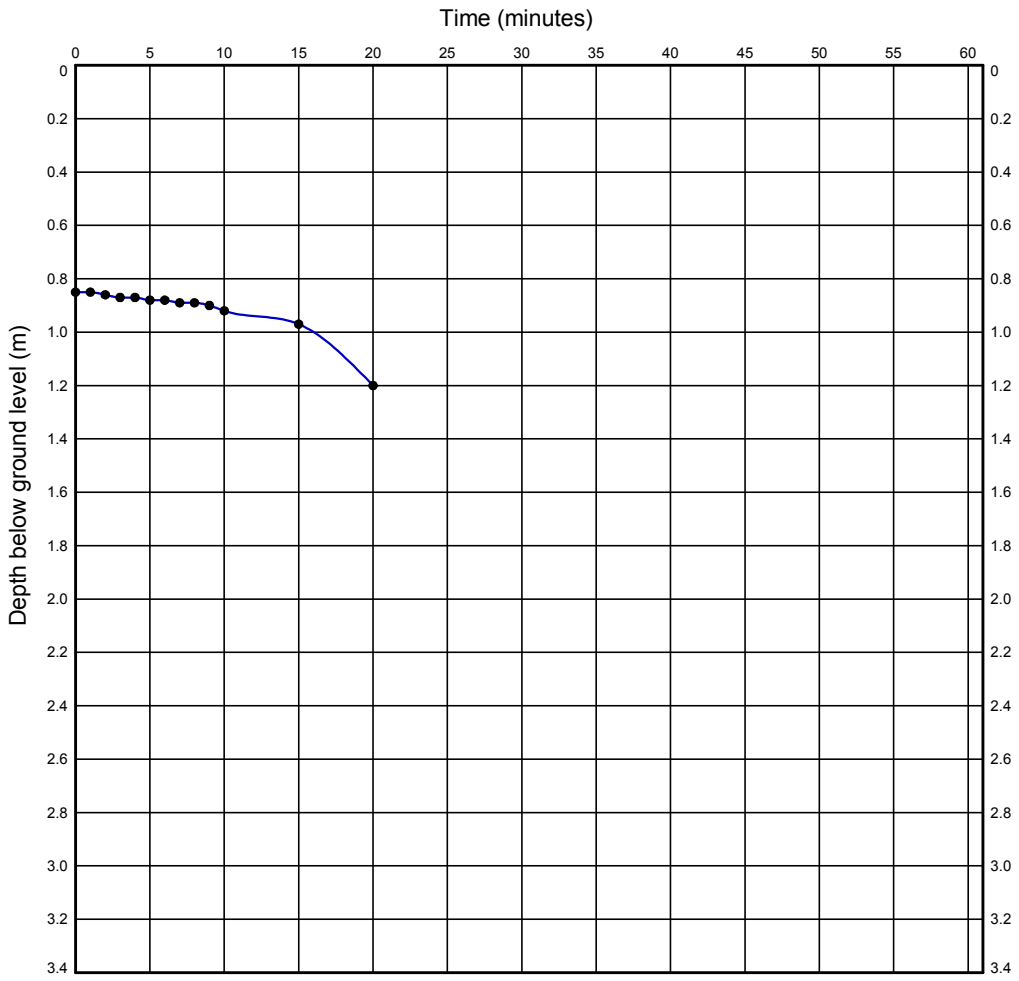
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 0.85 |
| 1.0 | 0.85 |
| 2.0 | 0.86 |
| 3.0 | 0.87 |
| 4.0 | 0.87 |
| 5.0 | 0.88 |
| 6.0 | 0.88 |
| 7.0 | 0.89 |
| 8.0 | 0.89 |
| 9.0 | 0.9 |
| 10.0 | 0.92 |
| 15.0 | 0.97 |
| 20.0 | 1.2 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 20 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.300 m | $V_{p75-25}$= | 0.294 $m^3$ |
| Trial Pit Length | 2.800 m | $a_{p50}$= | 2.870 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 8.000 minutes |
| Effective Depth | 0.350 m | | |
| Outflow Time | 8 mins from 75% to 25% full | | |

**f = 2.1341E-4 m/sec**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Date of Test: 18/06/2020

All measurements in metres unless otherwise stated

Project File: Q0281.GPJ

Figure No. 11

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA07,3**

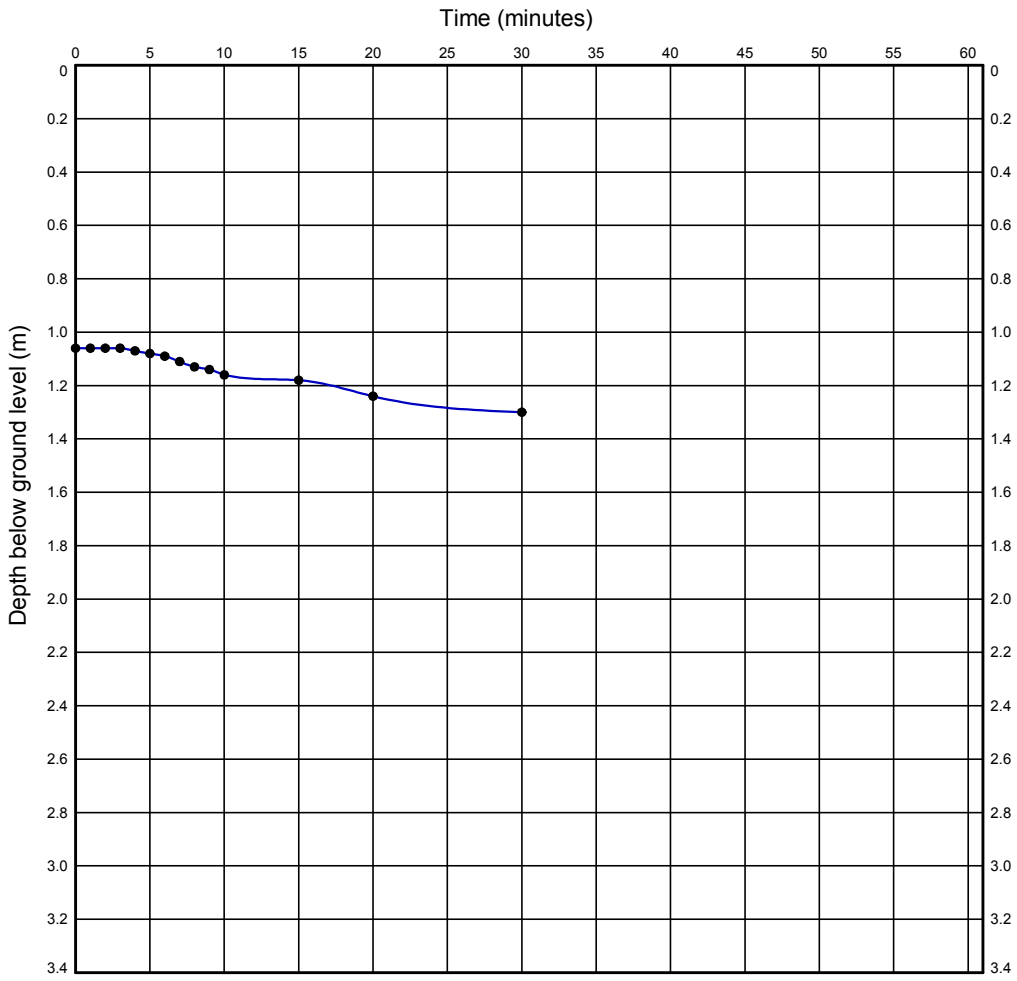
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 1.06 |
| 1.0 | 1.06 |
| 2.0 | 1.06 |
| 3.0 | 1.06 |
| 4.0 | 1.07 |
| 5.0 | 1.08 |
| 6.0 | 1.09 |
| 7.0 | 1.11 |
| 8.0 | 1.13 |
| 9.0 | 1.14 |
| 10.0 | 1.16 |
| 15.0 | 1.18 |
| 20.0 | 1.24 |
| 30.0 | 1.3 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 30 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.300 m | $V_{p75-25}$= | 0.202 $m^3$ |
| Trial Pit Length | 2.800 m | $a_{p50}$= | 2.496 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 12.500 minutes |
| Effective Depth | 0.240 m | | |
| Outflow Time | 12.5 mins from 75% to 25% full | | |

**f = 1.0769E-4 m/sec**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Date of Test: 18/06/2020

All measurements in metres unless otherwise stated

Project File: Q0281.GPJ

Figure No. 12

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA09,1**

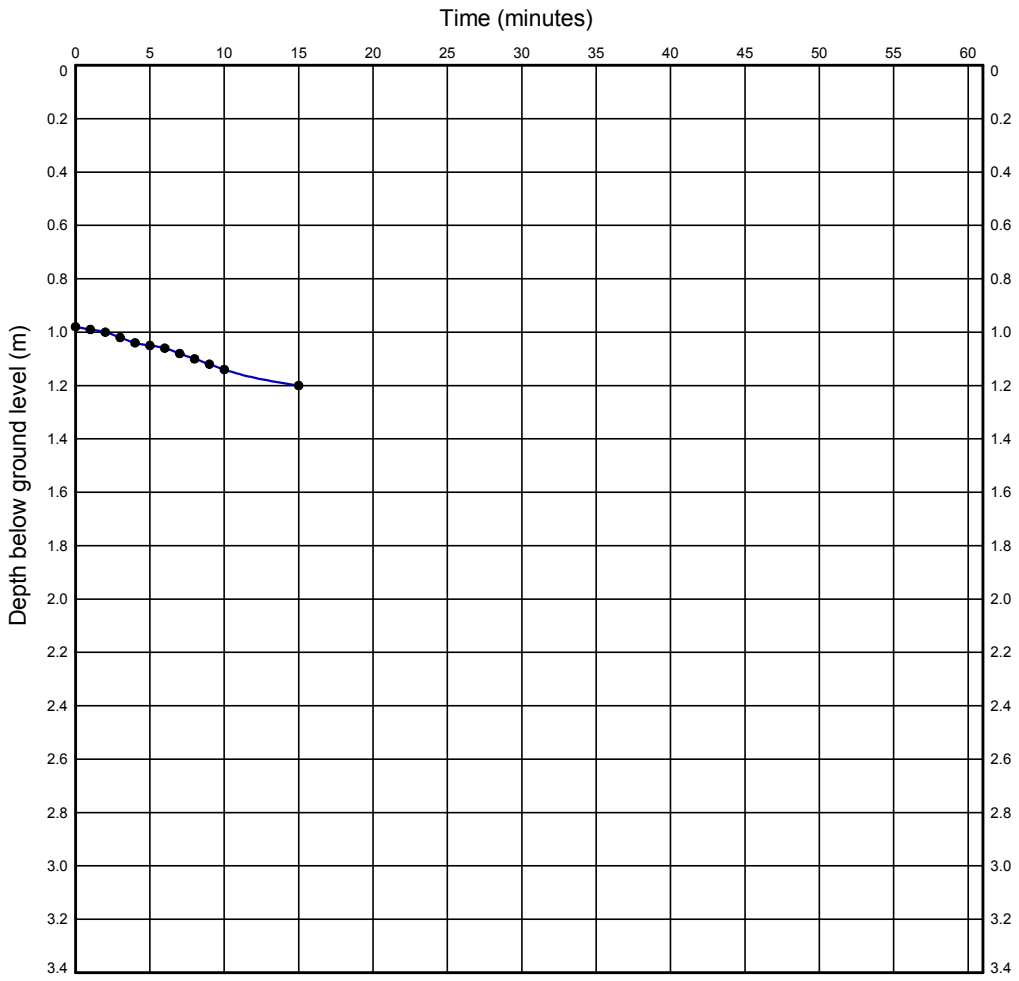
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 0.98 |
| 1.0 | 0.99 |
| 2.0 | 1 |
| 3.0 | 1.02 |
| 4.0 | 1.04 |
| 5.0 | 1.05 |
| 6.0 | 1.06 |
| 7.0 | 1.08 |
| 8.0 | 1.1 |
| 9.0 | 1.12 |
| 10.0 | 1.14 |
| 15.0 | 1.2 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 15 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.200 m | $V_{p75-25}$= | 0.178 $m^3$ |
| Trial Pit Length | 2.700 m | $a_{p50}$= | 2.346 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 6.000 minutes |
| Effective Depth | 0.220 m | | |
| Outflow Time | 6 mins from 75% to 25% full | | |

**f = 2.1100E-4 m/sec**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Date of Test: 18/06/2020

All measurements in metres unless otherwise stated

Project File: Q0281.GPJ

Figure No. 13

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA09,2**

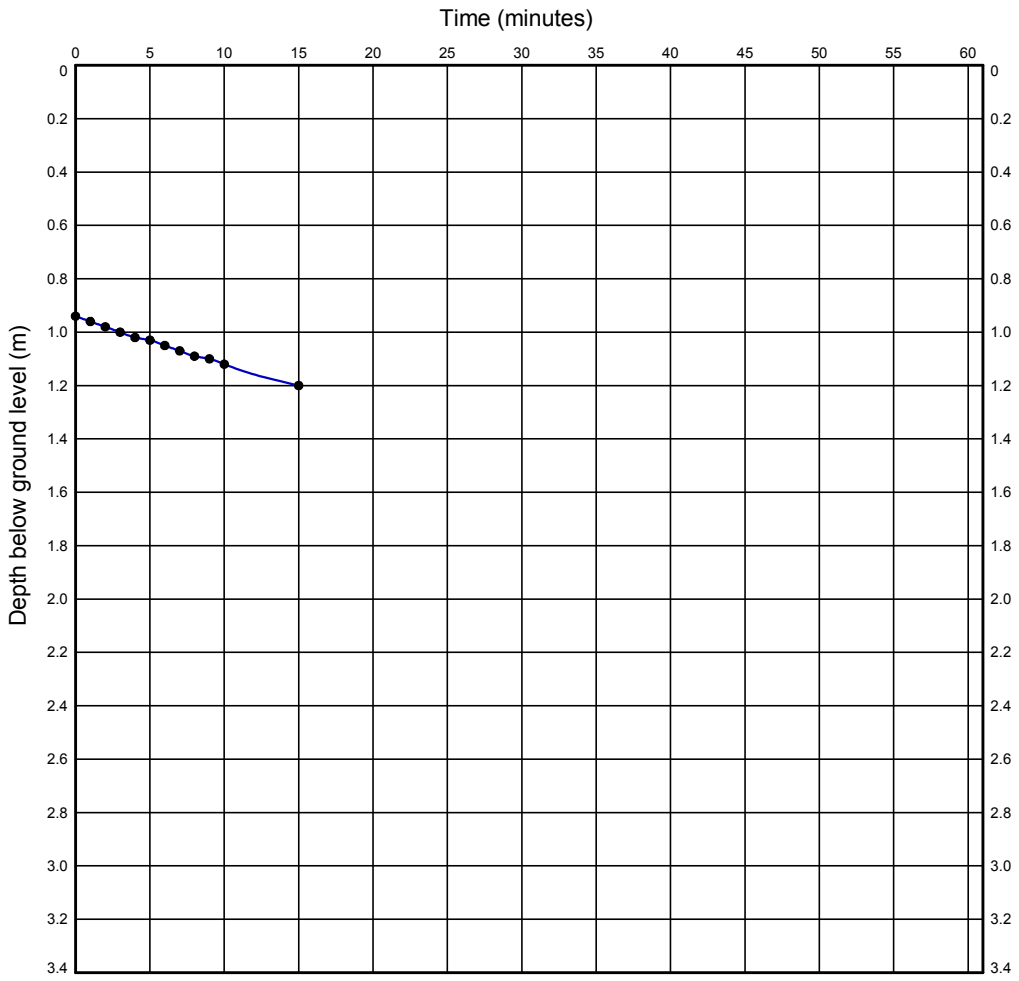
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 0.94 |
| 1.0 | 0.96 |
| 2.0 | 0.98 |
| 3.0 | 1 |
| 4.0 | 1.02 |
| 5.0 | 1.03 |
| 6.0 | 1.05 |
| 7.0 | 1.07 |
| 8.0 | 1.09 |
| 9.0 | 1.1 |
| 10.0 | 1.12 |
| 15.0 | 1.2 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 15 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.200 m | $V_{p75-25}$= | 0.211 $m^3$ |
| Trial Pit Length | 2.700 m | $a_{p50}$= | 2.478 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 8.000 minutes |
| Effective Depth | 0.260 m | | |
| Outflow Time | 8 mins from 75% to 25% full | | |

**f = 1.7706E-4 m/sec**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Date of Test: 18/06/2020

All measurements in metres unless otherwise stated

Project File: Q0281.GPJ

Figure No. 14

**Contract : Porthcawl Drainage Scheme**

**Client : Bridgend County Council**

**Point Plotted**
**SA09,3**

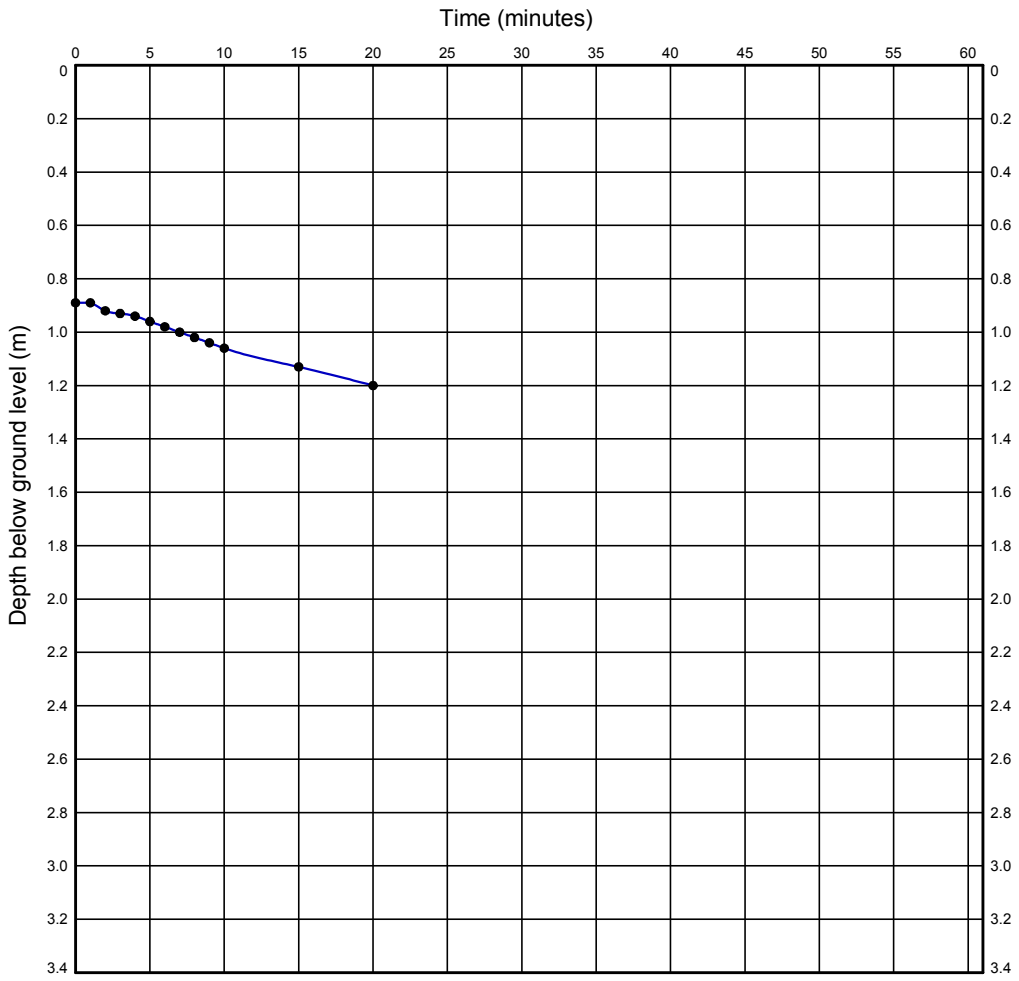
Job Number : Q0281

Engineer : Capita

# SOAKAWAY TEST CALCULATION SHEET

| Time (Minutes) | Depth of water from ground level (m) |
|---|---|
| 0.0 | 0.89 |
| 1.0 | 0.89 |
| 2.0 | 0.92 |
| 3.0 | 0.93 |
| 4.0 | 0.94 |
| 5.0 | 0.96 |
| 6.0 | 0.98 |
| 7.0 | 1 |
| 8.0 | 1.02 |
| 9.0 | 1.04 |
| 10.0 | 1.06 |
| 15.0 | 1.13 |
| 20.0 | 1.2 |

**Field Observations from soakaway trial pit**




Remarks: Fully drained at 20 minutes

Soakaway test for soil infiltration rate
design method based on BRE Digest 365

Permeability Test on Strata

| | | | |
|---|---|---|---|
| Trial Pit Depth | 1.200 m | $V_{p75-25}$= | 0.251 $m^3$ |
| Trial Pit Length | 2.700 m | $a_{p50}$= | 2.643 $m^2$ |
| Trial Pit Width | 0.600 m | $t_{p75-25}$= | 9.500 minutes |
| Effective Depth | 0.310 m | | |
| Outflow Time | 9.5 mins from 75% to 25% full | | |

**f = 1.6668E-4 m/sec**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Date of Test: 18/06/2020

All measurements in metres unless otherwise stated

Project File: Q0281.GPJ

Figure No. 15

## APPENDIX IV – TRL DCP PROBE RESULTS

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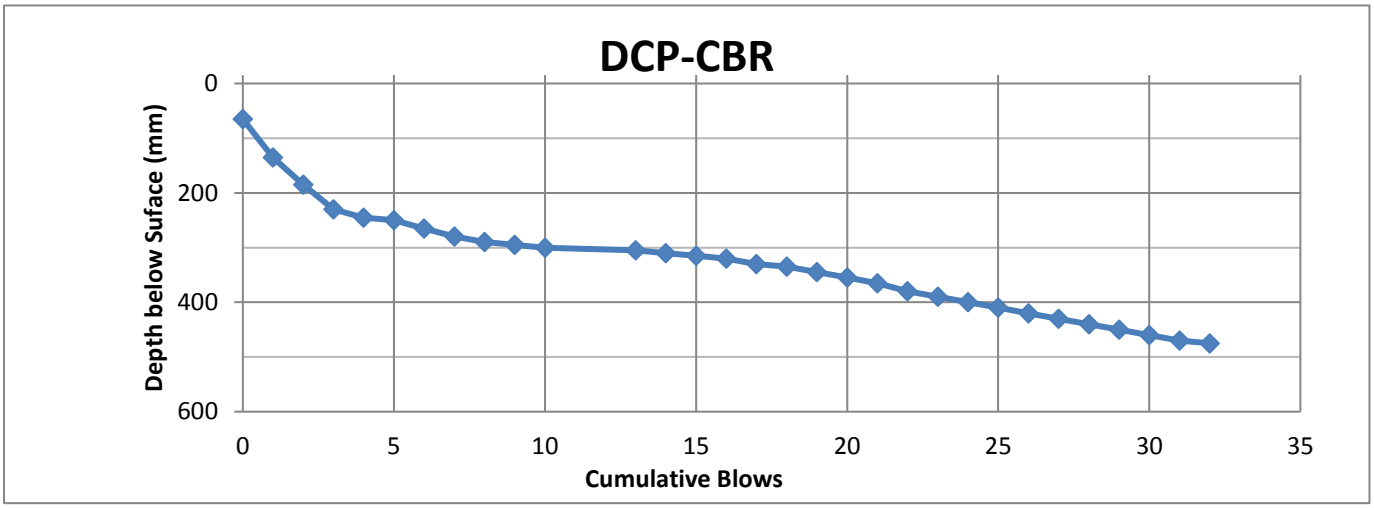
# Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP
## CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

| | | | |
|---|---|---|---|
| **Client Name:** | Redstart | | |
| **Client Address:** | St David's House, Pascal Cl, St. Mellons, Cardiff CF3 0LW | | |
| **Contract Name:** | Porthcawl Darinage Scheme | **Contract No.:** | Q0281 |

| | | | | | |
|---|---|---|---|---|---|
| Site Reference: | 1 | Lab. Reference: | 1 | Date Tested: | 19.06.20 |
| Sample Location: | CBR01 - TP01 | | | Date Received: | 19.06.20 |
| Material Description: | Brown silty gravelly SAND | | | | |
| Supplier: | In-Situ | | Source: | In-Situ | |
| Depth Start of Test (mm) | 65mm b.g.l. | | Tested By: | SP | |




CBR Relationship - TRL Equation $Log_{10}(CBR) = 2.48-1.057*Log_{10}(Peneration\ Rate)$

| Layer No. | Number of Blows | | Penetration (mm) | | Rate of Penetration (mm/blow) | Equilavent CBR (%) | Remarks |
|---|---|---|---|---|---|---|---|
| | Start | Finish | Start | Finish | | | |
| 1 | 0 | 39 | 65 | 475 | 10.51 | 25 | Refused |
| | | | | | | | |
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Signed: T.M.Burke
Position: Senior Technician
Dated: 19.06.20

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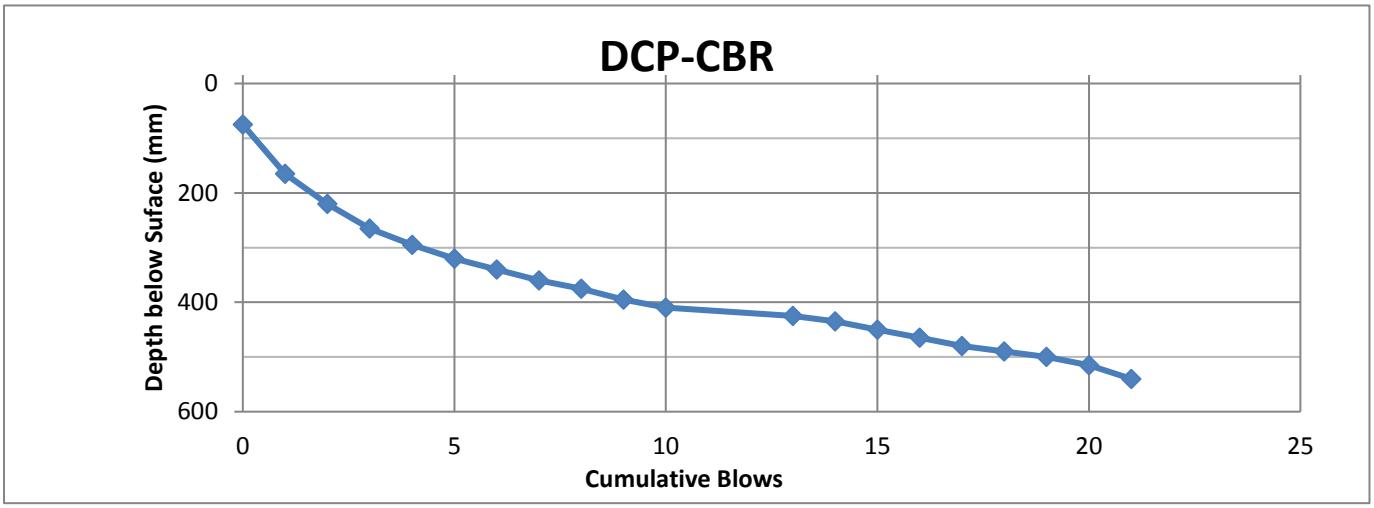
# Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP
## CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

| | | | |
|---|---|---|---|
| **Client Name:** | Redstart | | |
| **Client Address:** | St David's House, Pascal Cl, St. Mellons, Cardiff CF3 0LW | | |
| **Contract Name:** | Porthcawl Darinage Scheme | **Contract No.:** | Q0281 |

| | | | | | |
|---|---|---|---|---|---|
| Site Reference: | 1 | Lab. Reference: | 1 | Date Tested: | 19.06.20 |
| Sample Location: | CBR02 - TP02 | | | Date Received: | 19.06.20 |
| Material Description: | Brown silty gravelly SAND | | | | |
| Supplier: | In-Situ | Source: | In-Situ | | |
| Depth Start of Test (mm) | 75mm b.g.l. | Tested By: | SP | | |




CBR Relationship - TRL Equation $Log_{10}(CBR) = 2.48-1.057*Log_{10}(Peneration\ Rate)$

| Layer No. | Number of Blows | | Penetration (mm) | | Rate of Penetration (mm/blow) | Equilavent CBR (%) | Remarks |
|---|---|---|---|---|---|---|---|
| | Start | Finish | Start | Finish | | | |
| 1 | 0 | 28 | 75 | 540 | 16.61 | 15 | Refused |
| | | | | | | | |
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Signed: T.M.Burke
Position: Senior Technician
Dated: 19.06.20

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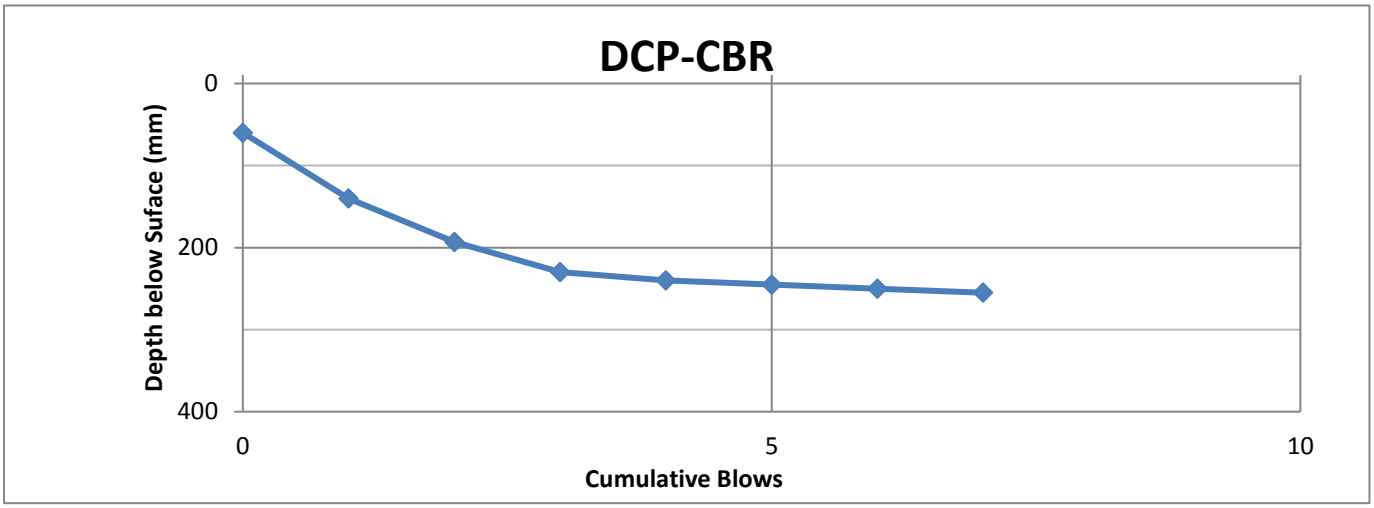
**Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP**
**CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12**

| | | | |
|---|---|---|---|
| **Client Name:** | Redstart | | |
| **Client Address:** | St David's House, Pascal Cl, St. Mellons, Cardiff CF3 0LW | | |
| **Contract Name:** | Porthcawl Darinage Scheme | **Contract No.:** | Q0281 |

| | | | | | |
|---|---|---|---|---|---|
| Site Reference: | 1 | Lab. Reference: | 1 | Date Tested: | 19.06.20 |
| Sample Location: | CBR03 - TP03 | | | Date Received: | 19.06.20 |
| Material Description: | Brown silty gravelly SAND | | | | |
| Supplier: | In-Situ | | Source: | In-Situ | |
| Depth Start of Test (mm) | 60mm b.g.l. | | Tested By: | SP | |




CBR Relationship - TRL Equation $Log_{10}(CBR) = 2.48-1.057*Log_{10}(Peneration\ Rate)$

| Layer No. | Number of Blows | | Penetration (mm) | | Rate of Penetration (mm/blow) | Equilavent CBR (%) | Remarks |
|---|---|---|---|---|---|---|---|
| | Start | Finish | Start | Finish | | | |
| 1 | 0 | 16 | 60 | 255 | 12.19 | 21 | Refused |
| | | | | | | | |
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Signed: T.M.Burke
Position: Senior Technician
Dated: 19.06.20

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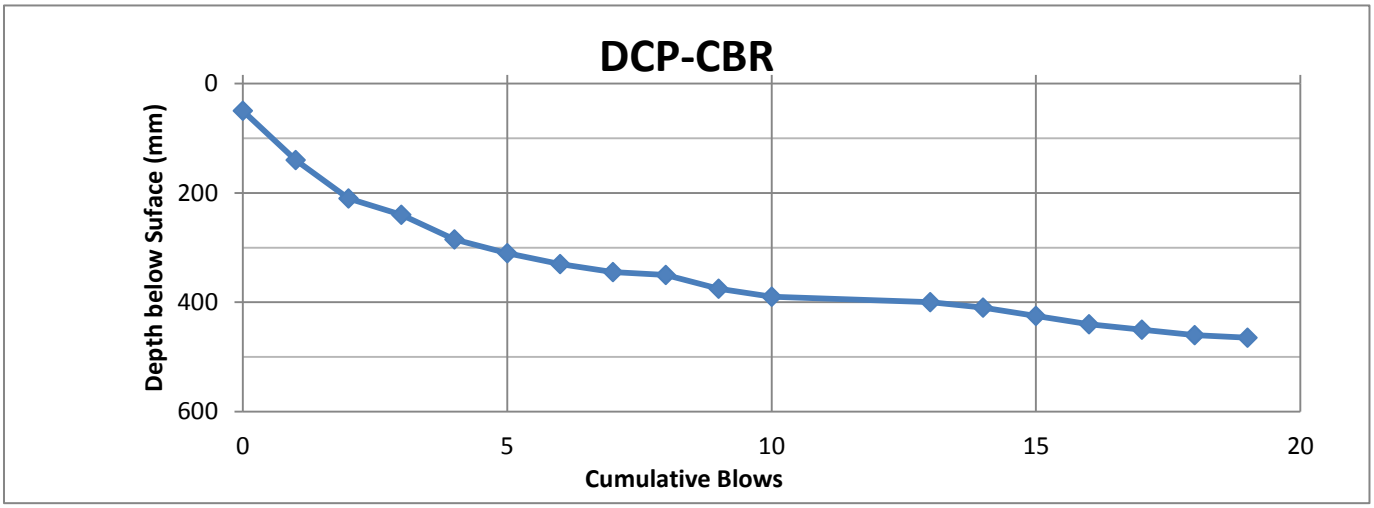
**Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP**
**CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12**

| | | | |
|---|---|---|---|
| **Client Name:** | Redstart | | |
| **Client Address:** | St David's House, Pascal Cl, St. Mellons, Cardiff CF3 0LW | | |
| **Contract Name:** | Porthcawl Darinage Scheme | **Contract No.:** | Q0281 |

| | | | | | |
|---|---|---|---|---|---|
| Site Reference: | 1 | Lab. Reference: | 1 | Date Tested: | 19.06.20 |
| Sample Location: | CBR04 - TP04 | | | Date Received: | 19.06.20 |
| Material Description: | Brown silty gravelly SAND | | | | |
| Supplier: | In-Situ | | Source: | In-Situ | |
| Depth Start of Test (mm) | 50mm b.g.l. | | Tested By: | SP | |




CBR Relationship - TRL Equation $Log_{10}(CBR) = 2.48-1.057*Log_{10}(Peneration\ Rate)$

| Layer No. | Number of Blows | | Penetration (mm) | | Rate of Penetration (mm/blow) | Equilavent CBR (%) | Remarks |
|---|---|---|---|---|---|---|---|
| | Start | Finish | Start | Finish | | | |
| 1 | 0 | 26 | 50 | 465 | 15.96 | 16 | Refused |
| | | | | | | | |
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Dated: 19.06.20

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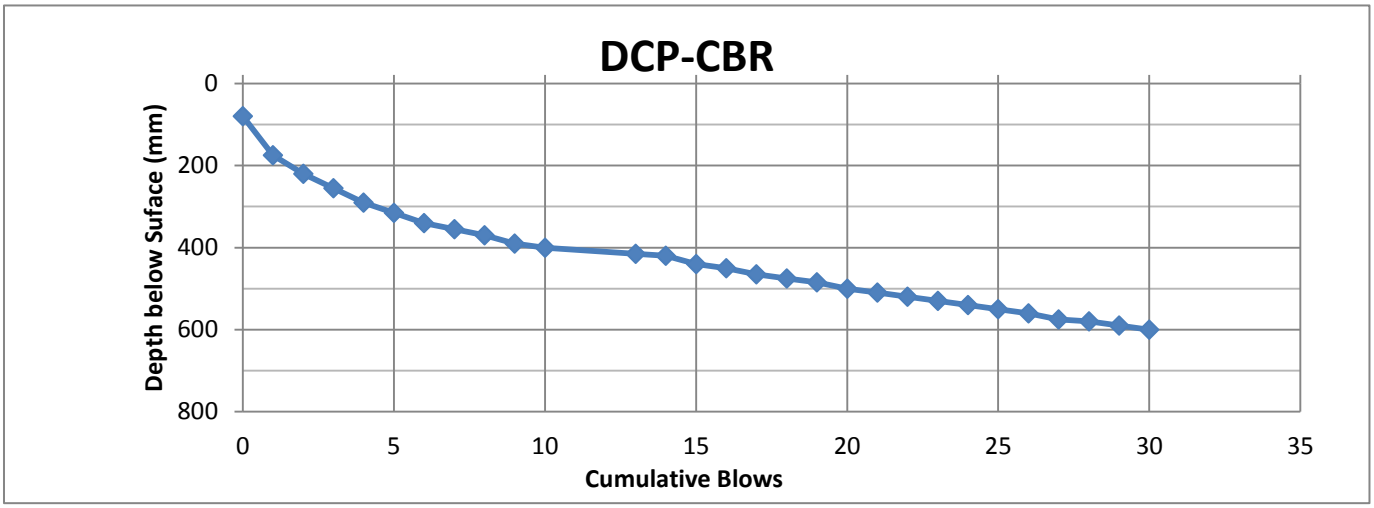
# Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP
## CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

| | | | |
|---|---|---|---|
| **Client Name:** | Redstart | | |
| **Client Address:** | St David's House, Pascal Cl, St. Mellons, Cardiff CF3 0LW | | |
| **Contract Name:** | Porthcawl Darinage Scheme | **Contract No.:** | Q0281 |

| | | | | | |
|---|---|---|---|---|---|
| Site Reference: | 1 | Lab. Reference: | 1 | Date Tested: | 19.06.20 |
| Sample Location: | CBR05 - TP05 | | | Date Received: | 19.06.20 |
| Material Description: | Brown silty gravelly SAND | | | | |
| Supplier: | In-Situ | | Source: | In-Situ | |
| Depth Start of Test (mm) | 80mm b.g.l. | | Tested By: | SP | |




CBR Relationship - TRL Equation $Log_{10}(CBR) = 2.48-1.057*Log_{10}(Peneration\ Rate)$

| Layer No. | Number of Blows | | Penetration (mm) | | Rate of Penetration (mm/blow) | Equilavent CBR (%) | Remarks |
|---|---|---|---|---|---|---|---|
| | Start | Finish | Start | Finish | | | |
| 1 | 0 | 37 | 80 | 600 | 14.05 | 18 | Refused |
| | | | | | | | |
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Signed: T.M.Burke
Position: Senior Technician
Dated: 19.06.20

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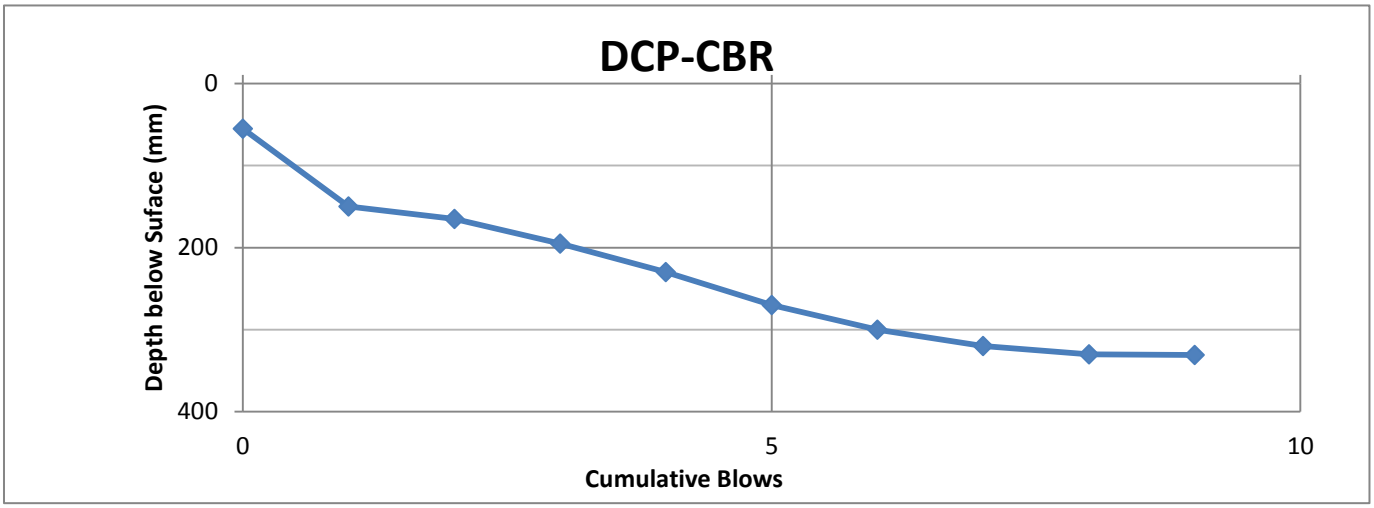
# Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP
## CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12

| | | | |
|---|---|---|---|
| **Client Name:** | Redstart | | |
| **Client Address:** | St David's House, Pascal Cl, St. Mellons, Cardiff CF3 0LW | | |
| **Contract Name:** | Porthcawl Darinage Scheme | **Contract No.:** | Q0281 |

| | | | | | |
|---|---|---|---|---|---|
| Site Reference: | 1 | Lab. Reference: | 1 | Date Tested: | 19.06.20 |
| Sample Location: | CBR06 - TP06 | | | Date Received: | 19.06.20 |
| Material Description: | Brown silty gravelly SAND | | | | |
| Supplier: | In-Situ | | Source: | In-Situ | |
| Depth Start of Test (mm) | 55mm b.g.l. | | Tested By: | SP | |




CBR Relationship - TRL Equation $Log_{10}(CBR) = 2.48-1.057*Log_{10}(Peneration\ Rate)$

| Layer No. | Number of Blows | | Penetration (mm) | | Rate of Penetration (mm/blow) | Equilavent CBR (%) | Remarks |
|---|---|---|---|---|---|---|---|
| | Start | Finish | Start | Finish | | | |
| 1 | 0 | 18 | 55 | 331 | 15.33 | 17 | Refused |
| | | | | | | | |
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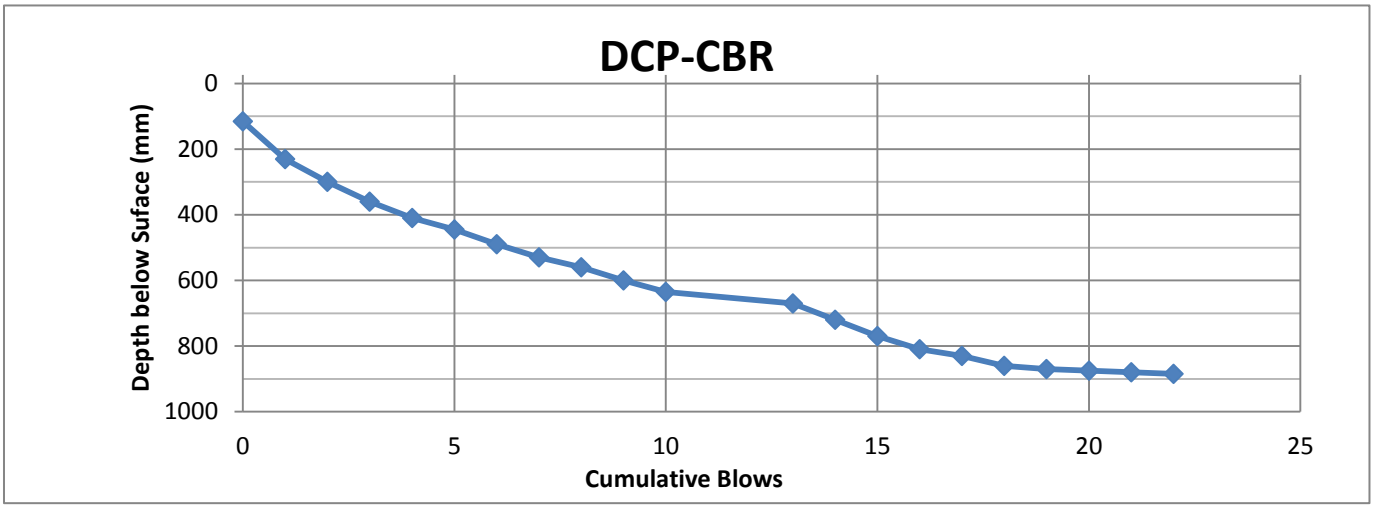
**Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP**
**CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12**

| | | | |
|---|---|---|---|
| **Client Name:** | Redstart | | |
| **Client Address:** | St David's House, Pascal Cl, St. Mellons, Cardiff CF3 0LW | | |
| **Contract Name:** | Porthcawl Darinage Scheme | **Contract No.:** | Q0281 |

| | | | | | |
|---|---|---|---|---|---|
| Site Reference: | 1 | Lab. Reference: | 1 | Date Tested: | 19.06.20 |
| Sample Location: | CBR07 - TP07 | | | Date Received: | 19.06.20 |
| Material Description: | Brown silty gravelly SAND | | | | |
| Supplier: | In-Situ | | Source: | In-Situ | |
| Depth Start of Test (mm) | 115mm b.g.l. | | Tested By: | SP | |




CBR Relationship - TRL Equation $Log_{10}(CBR) = 2.48-1.057*Log_{10}(Peneration\ Rate)$

| Layer No. | Number of Blows | | Penetration (mm) | | Rate of Penetration (mm/blow) | Equilavent CBR (%) | Remarks |
|---|---|---|---|---|---|---|---|
| | Start | Finish | Start | Finish | | | |
| 1 | 0 | 29 | 115 | 885 | 26.55 | 9 | Refused |
| | | | | | | | |
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Signed: T.M.Burke
Position: Senior Technician
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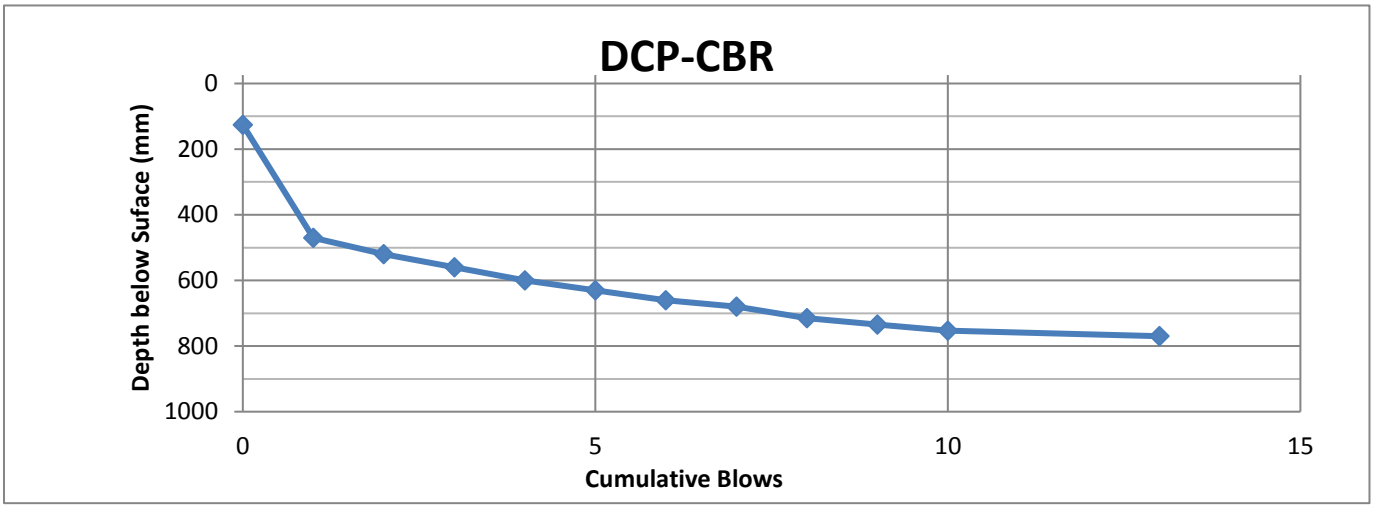
**Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP**
**CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12**

| | | | |
|---|---|---|---|
| **Client Name:** | Redstart | | |
| **Client Address:** | St David's House, Pascal Cl, St. Mellons, Cardiff CF3 0LW | | |
| **Contract Name:** | Porthcawl Darinage Scheme | **Contract No.:** | Q0281 |

| | | | | | |
|---|---|---|---|---|---|
| Site Reference: | 1 | Lab. Reference: | 1 | Date Tested: | 19.06.20 |
| Sample Location: | CBR08 - TP08 | | | Date Received: | 19.06.20 |
| Material Description: | Brown silty gravelly SAND | | | | |
| Supplier: | In-Situ | | Source: | In-Situ | |
| Depth Start of Test (mm) | 126mm b.g.l. | | Tested By: | SP | |




CBR Relationship - TRL Equation $Log_{10}(CBR) = 2.48-1.057*Log_{10}(Peneration\ Rate)$

| Layer No. | Number of Blows | | Penetration (mm) | | Rate of Penetration (mm/blow) | Equilavent CBR (%) | Remarks |
|---|---|---|---|---|---|---|---|
| | Start | Finish | Start | Finish | | | |
| 1 | 0 | 20 | 126 | 770 | 32.20 | 8 | Refused |
| | | | | | | | |
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Signed: T.M.Burke
Position: Senior Technician
Dated: 19.06.20

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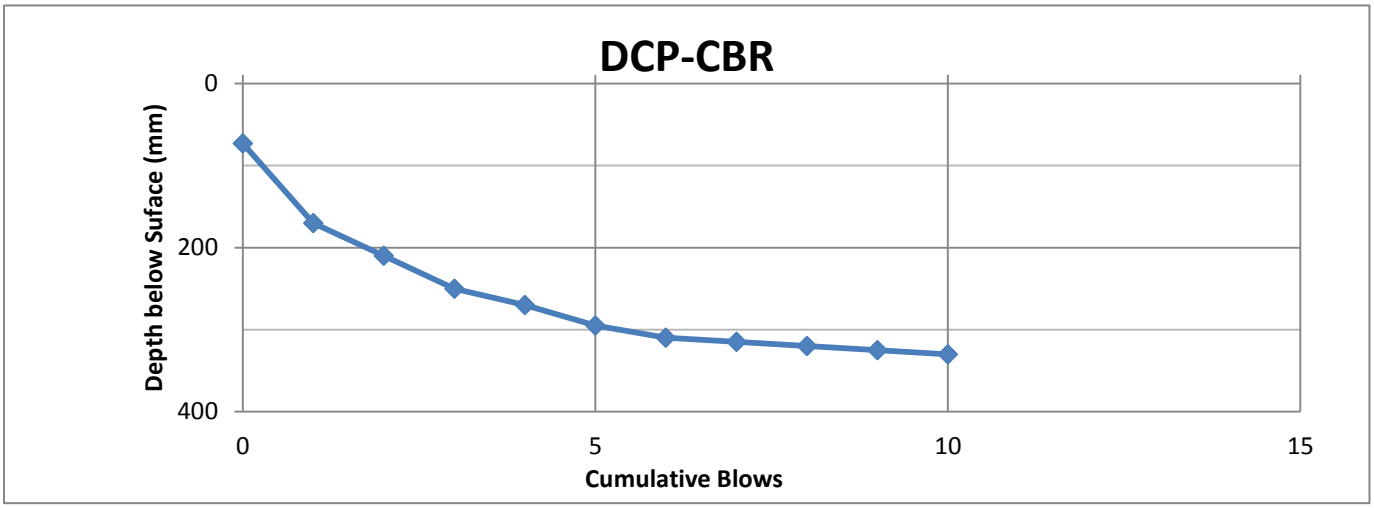
Tel.: 01554 744880

**Determination of Equivalent CBR using TRL Dynamic Cone Penetrometer DCP**
**CBR Relationship based on Kleyn & Van Heerden (60° Cone) - TRL, DMRB HD 29/08 & TP 12**

| | | | |
|---|---|---|---|
| **Client Name:** | Redstart | | |
| **Client Address:** | St David's House, Pascal Cl, St. Mellons, Cardiff CF3 0LW | | |
| **Contract Name:** | Porthcawl Darinage Scheme | **Contract No.:** | Q0281 |

| | | | | | |
|---|---|---|---|---|---|
| Site Reference: | 1 | Lab. Reference: | 1 | Date Tested: | 19.06.20 |
| Sample Location: | CBR09 - TP09 | | | Date Received: | 19.06.20 |
| Material Description: | Brown silty gravelly SAND | | | | |
| Supplier: | In-Situ | | Source: | In-Situ | |
| Depth Start of Test (mm) | 73mm b.g.l. | | Tested By: | SP | |




CBR Relationship - TRL Equation $Log_{10}(CBR) = 2.48-1.057*Log_{10}(Peneration\ Rate)$

| Layer No. | Number of Blows | | Penetration (mm) | | Rate of Penetration (mm/blow) | Equilavent CBR (%) | Remarks |
|---|---|---|---|---|---|---|---|
| | Start | Finish | Start | Finish | | | |
| 1 | 0 | 21 | 73 | 330 | 12.24 | 21 | Refused |
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Signed: T.M.Burke
Position: Senior Technician
Dated: 19.06.20

## APPENDIX V – GEOTECHNICAL LABORATORY TEST RESULTS

# Laboratory Report

2788

GEO Site & Testing Services Ltd

## Contract Number: 49141

Client Ref: **Q0281**
Client PO:

Report Date: **23-07-2020**

Client **Quantum Geotechnic Ltd**
**Ty Berwig**
**Bynea**
**Llanelli.**
**Carmarthenshire.**
**SA14 9ST**

Contract Title: **Porthcawl Drainage Scheme**
For the attention of: **Steffan Picton**

Date Received: **03-07-2020**
Date Completed: **23-07-2020**

| Test Description | Qty |
|---|---|
| **Moisture Content**<br>BS 1377:1990 - Part 2 : 3.2 - * UKAS | 5 |
| **4 Point Liquid & Plastic Limit**<br>BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS | 5 |
| **PSD Wet Sieve method**<br>BS 1377:1990 - Part 2 : 9.2 - * UKAS | 9 |
| **Disposal of samples for job** | 1 |

**Notes:** **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
**# - denotes test carried out by approved contractor**
**@ - denotes non accredited tests**

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

**Approved Signatories:**
Emma Sharp (Office Manager) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)

GEO Site & Testing Services Ltd
Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

| GSTL | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377 : Part 2 : 1990 Method 5 ) | |
|---|---|---|
| Contract Number | 49141 | |
| Site Name | Porthcawl Drainage Scheme | |
| Date Tested | 15/07/2020 | |
| | DESCRIPTIONS | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Descriptions |
|---|---|---|---|---|---|---|
| TP02 | 2 | B | 1.20 | - | | Brown slightly clayey/silty fine to coarse gravelly fine to coarse SAND |
| TP04 | 3 | B | 2.00 | - | 3.00 | Brown slightly clayey/silty fine to coarse SAND |
| TP05 | 2 | B | 1.00 | - | 2.00 | Brown slightly clayey/silty fine to coarse SAND |
| TP06 | 1 | B | 0.50 | - | 1.00 | Brown fine to coarse SAND |
| TP09 | 2 | B | 1.00 | - | | Brown slightly clayey/silty fine to medium SAND |
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| Operators | Checked | 23/07/2020 | Wayne Honey (Administrative/Quality Assistant) |
|---|---|---|---|
| Luke Williams | Approved | 23/07/2020 | Paul Evans (Quality/Technical Manager) |

UKAS TESTING 2788

| GSTL | NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377 : Part 2 : 1990 Method 5 ) | |
|---|---|---|
| Contract Number | **49141** | |
| Project Location | **Porthcawl Drainage Scheme** | |
| Date Tested | **15/07/2020** | |
| | | |

| Sample/Hole Reference | Sample Number | Sample Type | Depth (m) | | | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity index % | Passing 0.425mm % | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TP02 | 2 | B | 1.20 | - | | 9.0 | | NP | | 73 | |
| TP04 | 3 | B | 2.00 | - | 3.00 | 3.0 | | NP | | 99 | |
| TP05 | 2 | B | 1.00 | - | 2.00 | 4.0 | | NP | | 99 | |
| TP06 | 1 | B | 0.50 | - | 1.00 | 3.0 | | NP | | 99 | |
| TP09 | 2 | B | 1.00 | - | | 3.6 | | NP | | 99 | |
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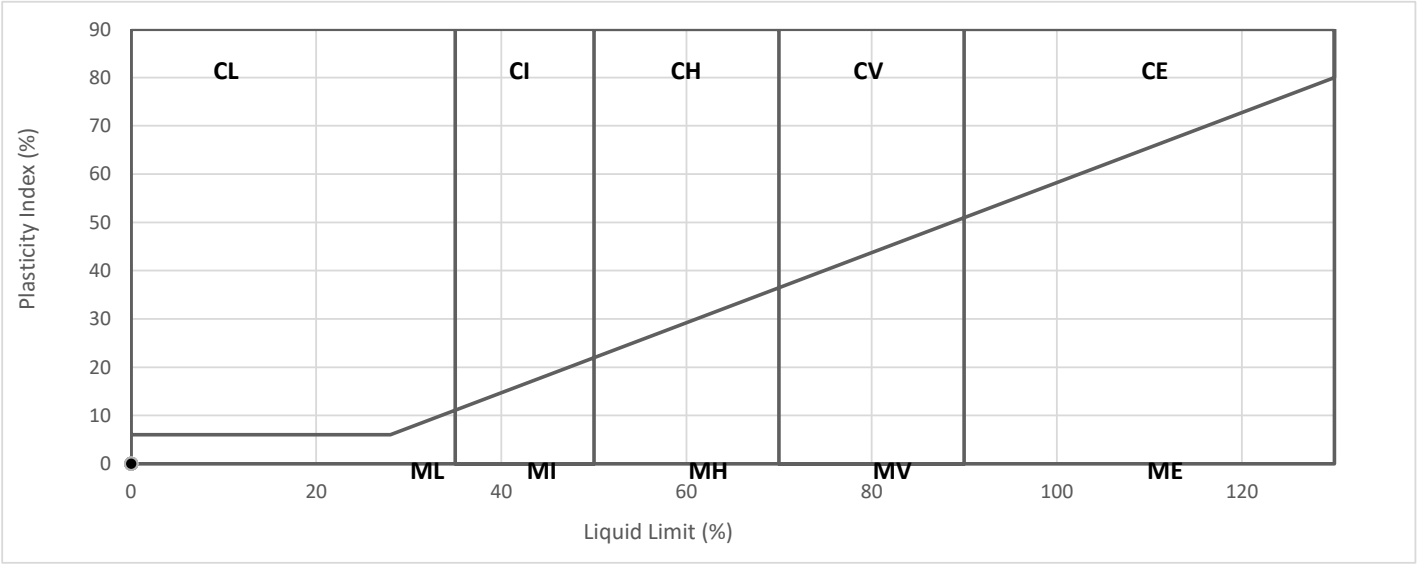
| | | | | - | | | | | | | |
| | | | | - | | | | | | | |

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

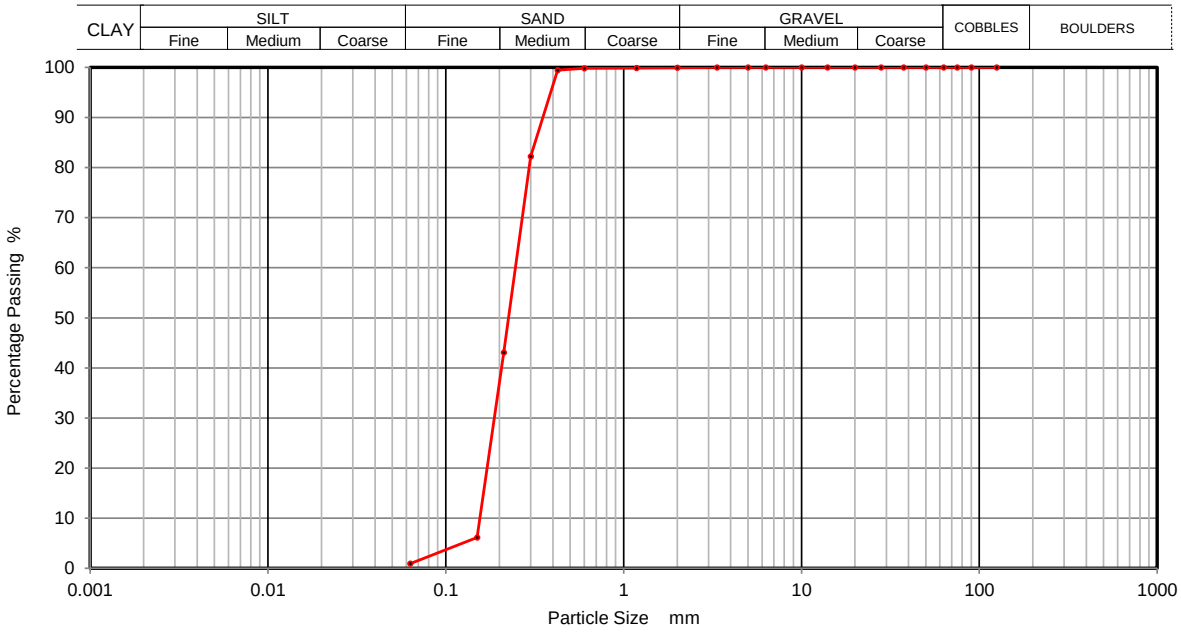
**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION**
**BS 5930:1999+A2:2010**




| Operators | Checked | 23/07/2020 | Wayne Honey (Administrative/Quality Assistant) |
|---|---|---|---|
| Luke Williams | Approved | 23/07/2020 | Paul Evans (Quality/Technical Manager) |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve, Clause 9.2 | Contract Number | 49141 |
|---|---|---|---|
| | | Borehole/Pit No. | TP01 |
| Site Name | Porthcawl Drainage Scheme | Sample No. | 2 |
| Soil Description | Brown slightly clayey/silty fine to medium GRAVEL | Depth Top | 2.00 |
| | | Depth Base | |
| Date Tested | 20/07/2020 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 100 | | |
| 0.425 | 99 | | |
| 0.3 | 82 | | |
| 0.212 | 43 | | |
| 0.15 | 6 | | |
| 0.063 | 1 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 99 |
| Silt and Clay | 1 |
| | |
| | |

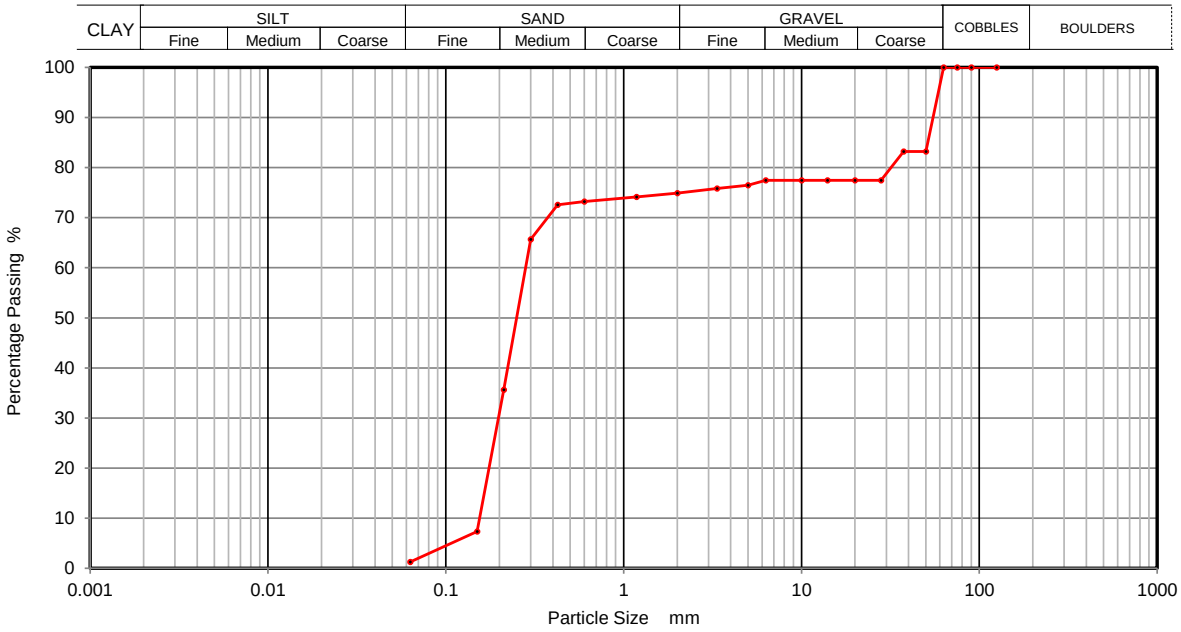
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operators | Checked | 22/07/2020 | Wayne Honey | W. Honey |
|---|---|---|---|---|
| RO/MH | Approved | 23/07/2020 | Paul Evans | D P Evans |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve, Clause 9.2 | Contract Number | 49141 |
|---|---|---|---|
| | | Borehole/Pit No. | TP02 |
| Site Name | Porthcawl Drainage Scheme | Sample No. | 2 |
| Soil Description | Brown slightly clayey/silty fine to coarse gravelly fine to coarse SAND | Depth Top | 1.20 |
| | | Depth Base | |
| Date Tested | 20/07/2020 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 83 | | |
| 37.5 | 83 | | |
| 28 | 77 | | |
| 20 | 77 | | |
| 14 | 77 | | |
| 10 | 77 | | |
| 6.3 | 77 | | |
| 5 | 76 | | |
| 3.35 | 76 | | |
| 2 | 75 | | |
| 1.18 | 74 | | |
| 0.6 | 73 | | |
| 0.425 | 73 | | |
| 0.3 | 66 | | |
| 0.212 | 36 | | |
| 0.15 | 7 | | |
| 0.063 | 1 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 25 |
| Sand | 74 |
| Silt and Clay | 1 |
| | |
| | |

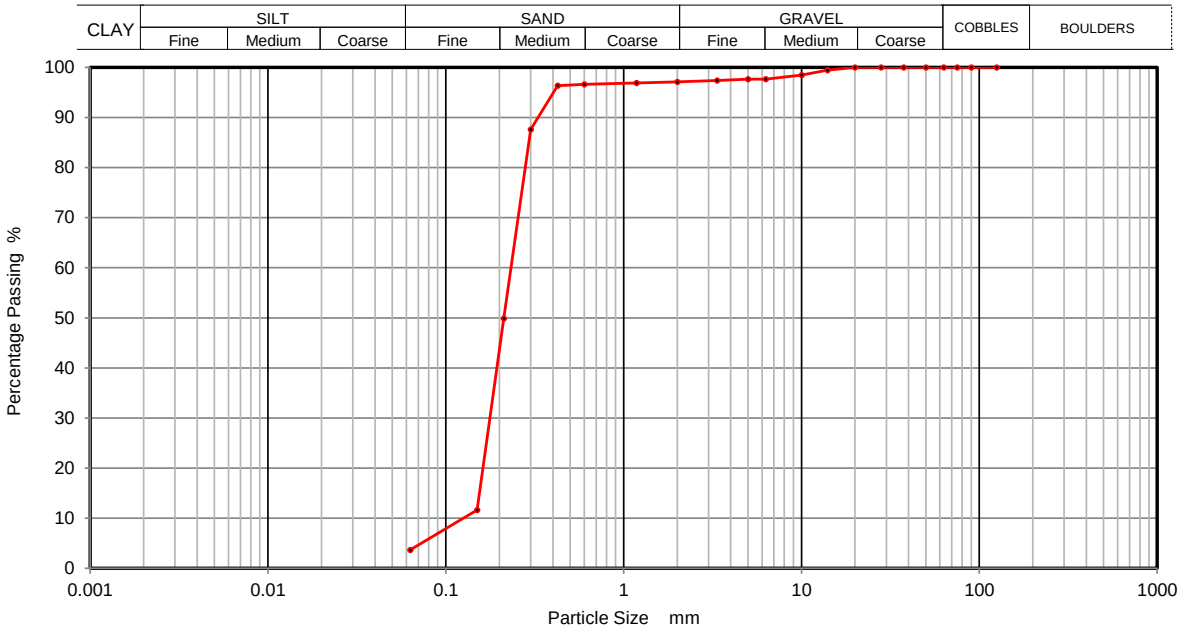
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operators | Checked | 22/07/2020 | Wayne Honey | W. Honey |
|---|---|---|---|---|
| RO/MH | Approved | 23/07/2020 | Paul Evans | D P Evans |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve, Clause 9.2 | Contract Number | 49141 |
|---|---|---|---|
| | | Borehole/Pit No. | TP03 |
| Site Name | Porthcawl Drainage Scheme | Sample No. | 2 |
| Soil Description | Brown slightly fine to medium gravelly slightly clayey/silty fine to coarse SAND | Depth Top | 1.00 |
| | | Depth Base | |
| Date Tested | 20/07/2020 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 99 | | |
| 10 | 98 | | |
| 6.3 | 98 | | |
| 5 | 98 | | |
| 3.35 | 97 | | |
| 2 | 97 | | |
| 1.18 | 97 | | |
| 0.6 | 97 | | |
| 0.425 | 96 | | |
| 0.3 | 88 | | |
| 0.212 | 50 | | |
| 0.15 | 12 | | |
| 0.063 | 4 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 3 |
| Sand | 93 |
| Silt and Clay | 4 |
| | |
| | |

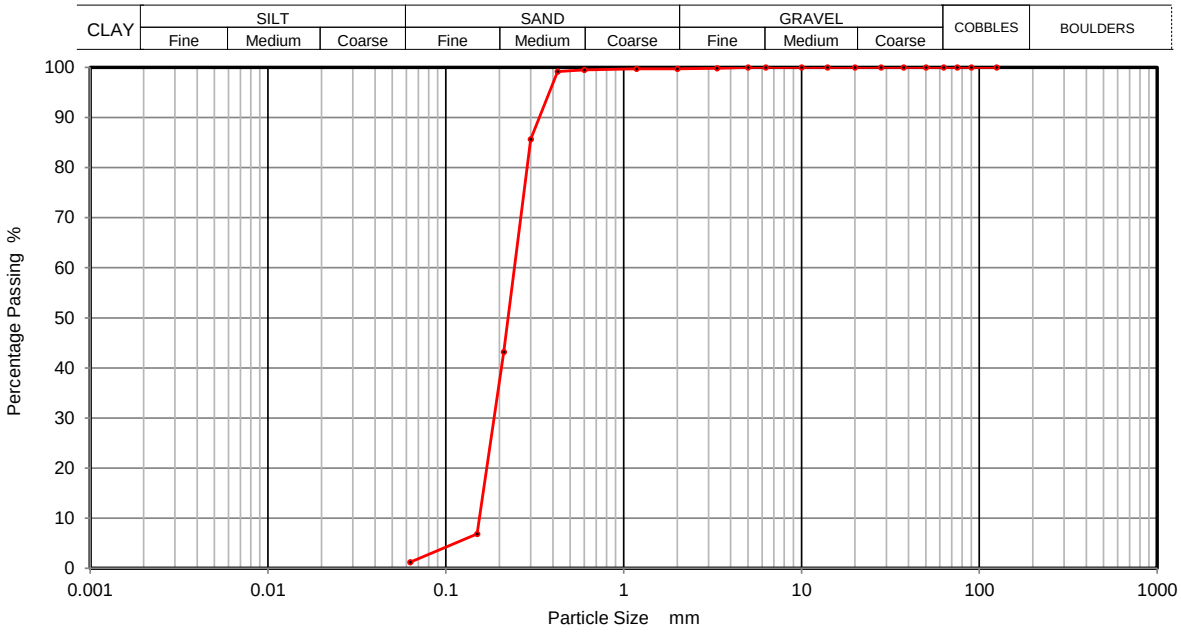
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operators | Checked | 22/07/2020 | Wayne Honey | W. Honey |
|---|---|---|---|---|
| RO/MH | Approved | 23/07/2020 | Paul Evans | P Evans |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve, Clause 9.2 | Contract Number | 49141 |
|---|---|---|---|
| | | Borehole/Pit No. | TP04 |
| Site Name | Porthcawl Drainage Scheme | Sample No. | 3 |
| Soil Description | Brown slightly clayey/silty fine to coarse SAND | Depth Top | 2.00 |
| | | Depth Base | 3.00 |
| Date Tested | 20/07/2020 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 100 | | |
| 0.425 | 99 | | |
| 0.3 | 86 | | |
| 0.212 | 43 | | |
| 0.15 | 7 | | |
| 0.063 | 1 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 99 |
| Silt and Clay | 1 |
| | |
| | |

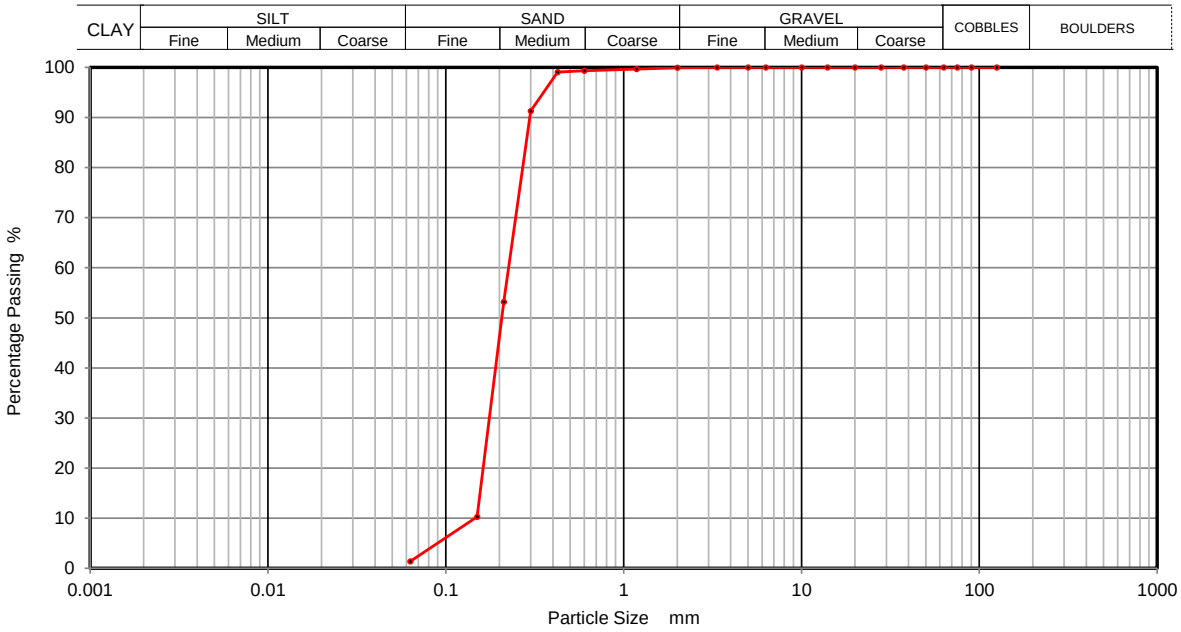
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operators | Checked | 22/07/2020 | Wayne Honey | W. Honey |
|---|---|---|---|---|
| RO/MH | Approved | 23/07/2020 | Paul Evans | D P Evans |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve, Clause 9.2 | Contract Number | 49141 |
|---|---|---|---|
| | | Borehole/Pit No. | TP05 |
| Site Name | Porthcawl Drainage Scheme | Sample No. | 2 |
| Soil Description | Brown slightly clayey/silty fine to coarse SAND | Depth Top | 1.00 |
| | | Depth Base | 2.00 |
| Date Tested | 21/07/2020 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 99 | | |
| 0.425 | 99 | | |
| 0.3 | 91 | | |
| 0.212 | 53 | | |
| 0.15 | 10 | | |
| 0.063 | 1 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 99 |
| Silt and Clay | 1 |
| | |
| | |

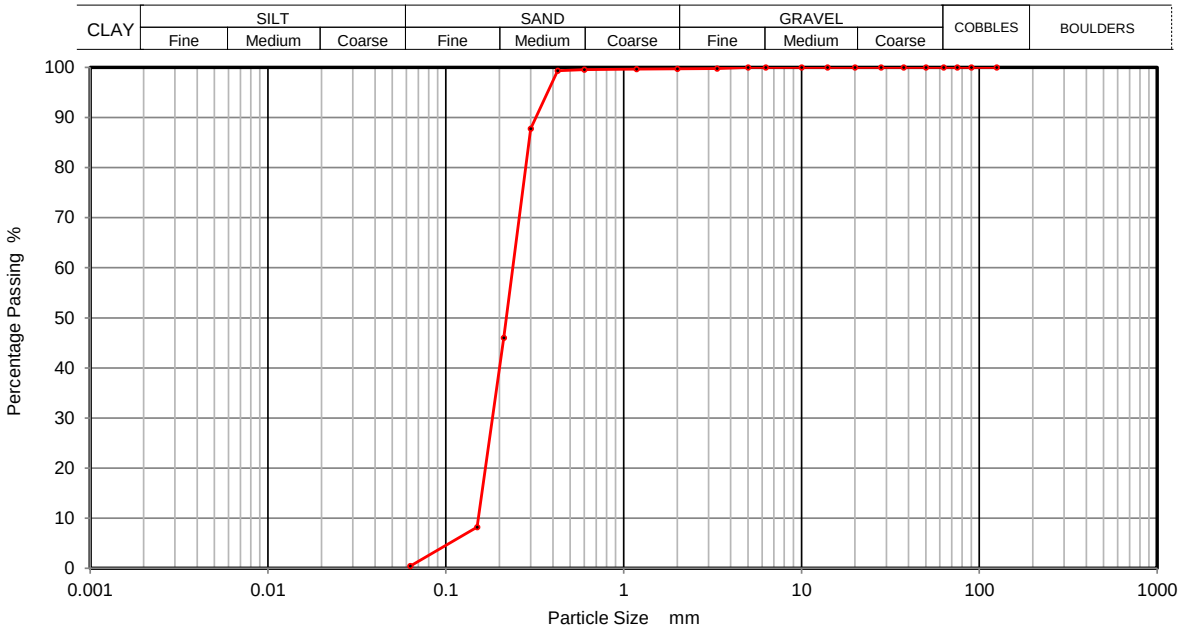
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operators | Checked | 22/07/2020 | Wayne Honey | W. Honey |
|---|---|---|---|---|
| RO/MH | Approved | 23/07/2020 | Paul Evans | D P Evans |

UKAS TESTING 2788

| | | | |
|---|---|---|---|
| GSTL | **PARTICLE SIZE DISTRIBUTION**<br>**BS 1377 Part 2:1990**<br>**Wet Sieve, Clause 9.2** | Contract Number | **49141** |
| | | Borehole/Pit No. | **TP06** |
| Site Name | **Porthcawl Drainage Scheme** | Sample No. | **1** |
| Soil Description | Brown fine to coarse SAND | Depth Top | **0.50** |
| | | Depth Base | **1.00** |
| Date Tested | 20/07/2020 | Sample Type | **B** |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 100 | | |
| 0.425 | 99 | | |
| 0.3 | 88 | | |
| 0.212 | 46 | | |
| 0.15 | 8 | | |
| 0.063 | 0 | | |

| **Sample Proportions** | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 100 |
| Silt and Clay | 0 |
| | |
| | |

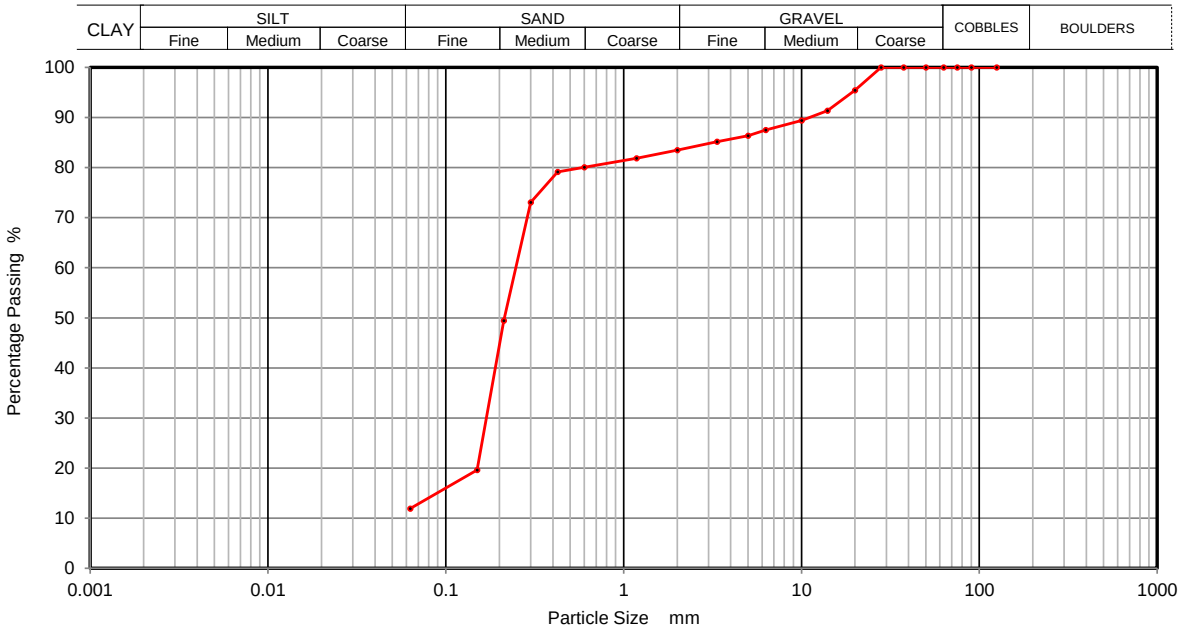
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| | | | | |
|---|---|---|---|---|
| Operators | Checked | 22/07/2020 | Wayne Honey | W. Honey |
| RO/MH | Approved | 23/07/2020 | Paul Evans | P Evans |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve, Clause 9.2 | Contract Number | 49141 |
|---|---|---|---|
| | | Borehole/Pit No. | TP07 |
| Site Name | Porthcawl Drainage Scheme | Sample No. | 1 |
| Soil Description | Brown clayey/silty fine to coarse gravelly fine to coarse SAND | Depth Top | 0.50 |
| | | Depth Base | |
| Date Tested | 20/07/2020 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 95 | | |
| 14 | 91 | | |
| 10 | 89 | | |
| 6.3 | 88 | | |
| 5 | 86 | | |
| 3.35 | 85 | | |
| 2 | 83 | | |
| 1.18 | 82 | | |
| 0.6 | 80 | | |
| 0.425 | 79 | | |
| 0.3 | 73 | | |
| 0.212 | 49 | | |
| 0.15 | 20 | | |
| 0.063 | 12 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 17 |
| Sand | 71 |
| Silt and Clay | 12 |
| | |
| | |

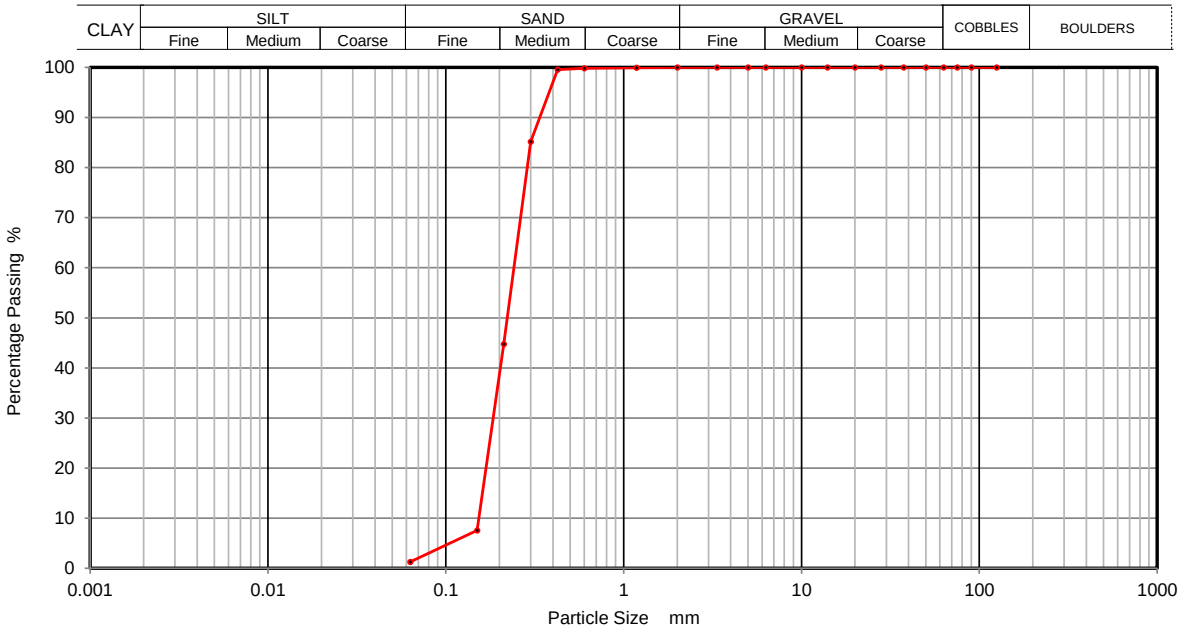
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operators | Checked | 22/07/2020 | Wayne Honey | W. Honey |
|---|---|---|---|---|
| RO/MH | Approved | 23/07/2020 | Paul Evans | D P Evans |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve, Clause 9.2 | Contract Number | 49141 |
|---|---|---|---|
| | | Borehole/Pit No. | TP08 |
| Site Name | Porthcawl Drainage Scheme | Sample No. | 2 |
| Soil Description | Brown slightly clayey/silty fine to coarse SAND | Depth Top | 1.00 |
| | | Depth Base | 2.00 |
| Date Tested | 20/07/2020 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 100 | | |
| 0.425 | 100 | | |
| 0.3 | 85 | | |
| 0.212 | 45 | | |
| 0.15 | 8 | | |
| 0.063 | 1 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 99 |
| Silt and Clay | 1 |
| | |
| | |

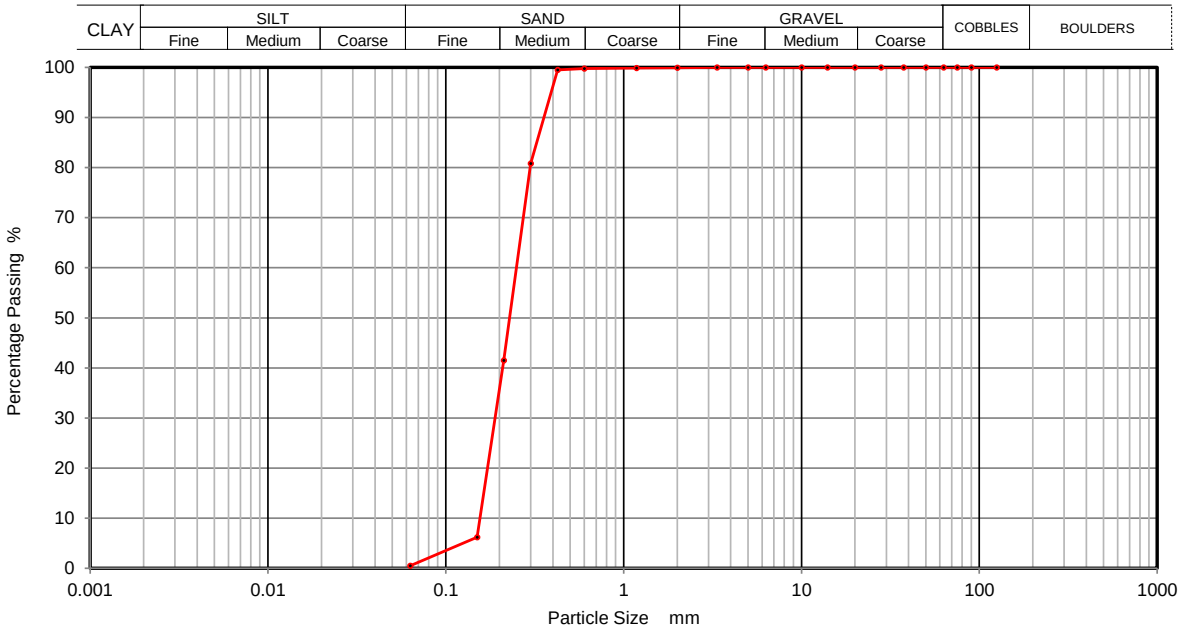
Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operators | Checked | 22/07/2020 | Wayne Honey | W. Honey |
|---|---|---|---|---|
| RO/MH | Approved | 23/07/2020 | Paul Evans | P Evans |

UKAS TESTING 2788

| GSTL | PARTICLE SIZE DISTRIBUTION<br>BS 1377 Part 2:1990<br>Wet Sieve, Clause 9.2 | Contract Number | 49141 |
|---|---|---|---|
| | | Borehole/Pit No. | TP09 |
| Site Name | Porthcawl Drainage Scheme | Sample No. | 2 |
| Soil Description | Brown slightly clayey/silty fine to medium SAND | Depth Top | 1.00 |
| | | Depth Base | |
| Date Tested | 20/07/2020 | Sample Type | B |




| Sieving | | Sedimentation | |
|---|---|---|---|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125 | 100 | | |
| 90 | 100 | | |
| 75 | 100 | | |
| 63 | 100 | | |
| 50 | 100 | | |
| 37.5 | 100 | | |
| 28 | 100 | | |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 100 | | |
| 2 | 100 | | |
| 1.18 | 100 | | |
| 0.6 | 100 | | |
| 0.425 | 99 | | |
| 0.3 | 81 | | |
| 0.212 | 41 | | |
| 0.15 | 6 | | |
| 0.063 | 1 | | |

| Sample Proportions | % dry mass |
|---|---|
| Cobbles | 0 |
| Gravel | 0 |
| Sand | 99 |
| Silt and Clay | 1 |
| | |
| | |

Remarks

Preparation and testing in accordance with BS1377 unless noted below

| Operators | Checked | 22/07/2020 | Wayne Honey | W. Honey |
|---|---|---|---|---|
| RO/MH | Approved | 23/07/2020 | Paul Evans | P Evans |

UKAS TESTING 2788

## APPENDIX VI – GEOENVIRONMENTAL LABORATORY TEST RESULTS

# BACTERIOLOGICAL TEST REPORT

Stansted Laboratories LTD

Unit 9-10, Riverside Industrial Estate
27 Thames Road
Barking, Essex
IG11 0ND

Tel: +44 (0)20 8594 5104
Fax: +44 (0)20 8591 8762
sales@stanstedlabs.co.uk
www.stanstedlabs.co.uk

Directors: B. Patel, K.Patel

**Client:** i2 Analytical LTD
**#Address:** 7 Woodshots Meadow
Croxley Green Business Park
Croxley Green
Hertfordshire
WD18 8YS
**#Site:** 20-17820
**#FAO:** Trevor Hill
**#Order No:** 12534,2017820

**Job Number:** M/182/79667
**Report No.:** 86919.1
**#Date Tak'n:** Wed, 17th Jun 2020 00:00
**Date Rec'd:** Wed, 8th Jul 2020

Items Marked ¤ are not included in the UKAS Schedule

| Sample ID | #Description & Temperatures | Analysis | Result | Tested | Notes / Species |
|---|---|---|---|---|---|
| **SL357128**<br>*Soil* | 1553366 (1020263)<br>**Init Temp ¤** **Temp > 1 Min ¤** **Temp > 2 Min ¤** | Coliforms ¤ | 0 MPN/g | 08/07/2020 | |
| | | E.Coli ¤ | 0 MPN/g | 08/07/2020 | |
| | | Clostridium perfringens ¤ | 4100 cfu/g | 08/07/2020 | |
| **SL357129**<br>*Soil* | 1553366 (1020271)<br>**Init Temp ¤** **Temp > 1 Min ¤** **Temp > 2 Min ¤** | Coliforms ¤ | 10300 MPN/g | 08/07/2020 | |
| | | E.Coli ¤ | 300 MPN/g | 08/07/2020 | |
| | | Clostridium perfringens ¤ | 900 cfu/g | 08/07/2020 | |
| **SL357130**<br>*Soil* | 1553368 (1020274)<br>**Init Temp ¤** **Temp > 1 Min ¤** **Temp > 2 Min ¤** | Coliforms ¤ | 100 MPN/g | 08/07/2020 | |
| | | E.Coli ¤ | 0 MPN/g | 08/07/2020 | |
| | | Clostridium perfringens ¤ | 2400 cfu/g | 08/07/2020 | |

Method Codes
SLM/B312/M - Coliforms and Escherichia coli
SLM/B316/M - Clostridium perfringens

Legend & Footnotes
cfu = Colony Forming Units
mpn = Most Probable Number
TNTC = Too Numerous to Count
#Information supplied by the customer and can affect the validity of results.
Sampling is not included in our UKAS Schedule.
All Samples Analysed as received.

Test report authorised by :
B.Patel

Director
Date: 13/07/2020 10:26:28

Test Report checked by : Theepa Supikaran
13/07/2020 09:28:21

Disclaimer
Results relate to water samples tested and should not be reproduced except in full, without the written approval of the laboratory. Interpretations and opinions are not included in our UKAS schedule.
00:00 means time not declared.

**-------- END OF REPORT --------**

Eurofins Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Interim Report

| | | | |
|---|---|---|---|
| **Report No.:** | 20-15657-0 | | |
| **Initial Date of Issue:** | | | |
| **Client** | Quantum Geotechnic Ltd | | |
| **Client Address:** | Plas Newydd<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ | | |
| **Contact(s):** | Steffan Picton | | |
| **Project** | Q0281 - Porthcawl Drainage Scheme | | |
| **Quotation No.:** | Q20-20173 | **Date Received:** | 22-Jun-2020 |
| **Order No.:** | | **Date Instructed:** | 03-Jul-2020 |
| **No. of Samples:** | 4 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 09-Jul-2020 |
| **Date Approved:** | | **Subcon Results Due:** | 24-Jul-2020 |
| **Approved By:** | | | |

**Details:**

**Please note that the interim data available has passed our Quality Control Criteria but has not been verified by an approved signatory and may be subject to amendment on approval. Chemtest cannot therefore be held responsible for decisions made on interim data sets but only for the data submitted on a final report containing an approval date and signature.**

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| ACM Type | U | 2192 | | N/A | - | | - | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | | No Asbestos Detected | No Asbestos Detected |
| ACM Detection Stage | U | 2192 | | N/A | - | | - | - |
| Moisture | N | 2030 | % | 0.020 | 3.0 | 4.5 | 3.1 | 14 |
| Soil Colour | N | 2040 | | N/A | | Brown | | Brown |
| Other Material | N | 2040 | | N/A | | None | | Roots |
| Soil Texture | N | 2040 | | N/A | | Sand | | Sand |
| Clostridium perfringens (Subcon) | SN | | cfu/g | N/A | To Follow | | To Follow | To Follow |
| E. coli (Subcon) | SN | | cfu/g | N/A | To Follow | | To Follow | To Follow |
| Total Coliforms (Subcon) | SN | | cfu/g | N/A | To Follow | | To Follow | To Follow |
| pH | U | 2010 | | 4.0 | 8.3 | | 8.5 | 8.1 |
| pH (2.5:1) | N | 2010 | | 4.0 | | 8.6 | | 8.2 |
| Boron (Hot Water Soluble) | U | 2120 | mg/kg | 0.40 | < 0.40 | | < 0.40 | 0.69 |
| Sulphate (2:1 Water Soluble) as SO4 | U | 2120 | g/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | 0.013 |
| Sulphate (2:1 Extract) | U | 2120 | mg/kg | 20 | | < 20 | | 26 |
| Total Sulphur | U | 2175 | % | 0.010 | 0.015 | 0.010 | 0.011 | 0.030 |
| Cyanide (Free) | U | 2300 | mg/kg | 0.50 | | | | [B] < 0.50 |
| Cyanide (Total) | U | 2300 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Thiocyanate | U | 2300 | mg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| Sulphide (Easily Liberatable) | N | 2325 | mg/kg | 0.50 | | | | 2.6 |
| Ammonium (Water Soluble) | U | 2120 | g/l | 0.01 | | | | < 0.01 |
| Iron (Total) | N | 2430 | mg/kg | 100 | 11000 | | 7400 | 13000 |
| Sulphate (Acid Soluble) | U | 2430 | % | 0.010 | | 0.016 | | 0.10 |
| Arsenic | U | 2450 | mg/kg | 1.0 | 15 | | 11 | 17 |
| Barium | U | 2450 | mg/kg | 10 | 40 | | 17 | 64 |
| Beryllium | U | 2450 | mg/kg | 1.0 | < 1.0 | | < 1.0 | < 1.0 |
| Cadmium | U | 2450 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.32 |
| Chromium | U | 2450 | mg/kg | 1.0 | 5.5 | | 3.6 | 14 |
| Copper | U | 2450 | mg/kg | 0.50 | 1.6 | | 1.2 | 12 |
| Mercury | U | 2450 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.11 |
| Nickel | U | 2450 | mg/kg | 0.50 | 6.3 | | 4.5 | 13 |
| Lead | U | 2450 | mg/kg | 0.50 | 9.5 | | 4.2 | 42 |
| Selenium | U | 2450 | mg/kg | 0.20 | | | | 0.21 |
| Vanadium | U | 2450 | mg/kg | 5.0 | 14 | | 10 | 21 |
| Zinc | U | 2450 | mg/kg | 0.50 | 21 | | 14 | 78 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | | < 0.50 | < 0.50 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| Organic Matter | U | 2625 | % | 0.40 | < 0.40 | | < 0.40 | 4.8 |
| Total TPH >C6-C40 | U | 2670 | mg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| Naphthalene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Acenaphthylene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Acenaphthene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Fluorene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Phenanthrene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Anthracene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Fluoranthene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.41 |
| Pyrene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.77 |
| Benzo[a]anthracene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Chrysene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Total Of 16 PAH's | U | 2700 | mg/kg | 2.0 | < 2.0 | | < 2.0 | < 2.0 |
| Dichlorodifluoromethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Chloromethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Vinyl Chloride | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromomethane | U | 2760 | µg/kg | 20 | [B] < 20 | | [B] < 20 | [B] < 20 |
| Chloroethane | U | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Trichlorofluoromethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1-Dichloroethene | U | 2760 | mg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Trans 1,2-Dichloroethene | U | 2760 | mg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1-Dichloroethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| cis 1,2-Dichloroethene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromochloromethane | U | 2760 | µg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| Trichloromethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1,1-Trichloroethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Tetrachloromethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1-Dichloropropene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Benzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2-Dichloroethane | U | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Trichloroethene | N | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| 1,2-Dichloropropane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Dibromomethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromodichloromethane | U | 2760 | µg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| cis-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| Toluene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Trans-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| 1,1,2-Trichloroethane | U | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| Tetrachloroethene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,3-Dichloropropane | U | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Dibromochloromethane | U | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| 1,2-Dibromoethane | U | 2760 | µg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| Chlorobenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1,1,2-Tetrachloroethane | U | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Ethylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| m & p-Xylene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| o-Xylene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Styrene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Tribromomethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Isopropylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromobenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2,3-Trichloropropane | N | 2760 | µg/kg | 50 | [B] < 50 | | [B] < 50 | [B] < 50 |
| N-Propylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 2-Chlorotoluene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,3,5-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 4-Chlorotoluene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Tert-Butylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2,4-Trimethylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Sec-Butylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,3-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 4-Isopropyltoluene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,4-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| N-Butylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2-Dichlorobenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2-Dibromo-3-Chloropropane | U | 2760 | µg/kg | 50 | [B] < 50 | | [B] < 50 | [B] < 50 |
| 1,2,4-Trichlorobenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Hexachlorobutadiene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2,3-Trichlorobenzene | U | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| Methyl Tert-Butyl Ether | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| N-Nitrosodimethylamine | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Phenol | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Chlorophenol | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis-(2-Chloroethyl)Ether | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,3-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,4-Dichlorobenzene | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,2-Dichlorobenzene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Methylphenol | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis(2-Chloroisopropyl)Ether | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachloroethane | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| N-Nitrosodi-n-propylamine | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Methylphenol | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Nitrobenzene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Isophorone | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Nitrophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4-Dimethylphenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis(2-Chloroethoxy)Methane | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4-Dichlorophenol | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,2,4-Trichlorobenzene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Naphthalene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Chloroaniline | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachlorobutadiene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Chloro-3-Methylphenol | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Methylnaphthalene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Nitrophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachlorocyclopentadiene | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4,6-Trichlorophenol | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4,5-Trichlorophenol | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Chloronaphthalene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Nitroaniline | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Acenaphthylene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Dimethylphthalate | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,6-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Acenaphthene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 3-Nitroaniline | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Dibenzofuran | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| 4-Chlorophenylphenylether | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4-Dinitrotoluene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Fluorene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Diethyl Phthalate | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Nitroaniline | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Methyl-4,6-Dinitrophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Azobenzene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Bromophenylphenyl Ether | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachlorobenzene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Pentachlorophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Phenanthrene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Anthracene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Carbazole | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Di-N-Butyl Phthalate | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Fluoranthene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Pyrene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Butylbenzyl Phthalate | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[a]anthracene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Chrysene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis(2-Ethylhexyl)Phthalate | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Di-N-Octyl Phthalate | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[b]fluoranthene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[k]fluoranthene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[a]pyrene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Indeno(1,2,3-c,d)Pyrene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Dibenz(a,h)Anthracene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[g,h,i]perylene | U | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Total Phenols | U | 2920 | mg/kg | 0.30 | < 0.30 | | < 0.30 | < 0.30 |

# Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Eurofins Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---|---|---|---|---|---|---|
| 1020263 | ES2 | 2 | TP1 | 17-Jun-2020 | B | Amber Glass 250ml |
| 1020263 | ES2 | 2 | TP1 | 17-Jun-2020 | B | Amber Glass 60ml |
| 1020263 | ES2 | 2 | TP1 | 17-Jun-2020 | B | Plastic Tub 500g |
| 1020271 | ES2 | 2 | TP6 | 17-Jun-2020 | B | Amber Glass 250ml |
| 1020271 | ES2 | 2 | TP6 | 17-Jun-2020 | B | Amber Glass 60ml |
| 1020271 | ES2 | 2 | TP6 | 17-Jun-2020 | B | Plastic Tub 500g |
| 1020274 | ES1 | 1 | TP3 | 17-Jun-2020 | B | Amber Glass 250ml |
| 1020274 | ES1 | 1 | TP3 | 17-Jun-2020 | B | Amber Glass 60ml |
| 1020274 | ES1 | 1 | TP3 | 17-Jun-2020 | B | Plastic Tub 500g |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2175 | Total Sulphur in Soils | Total Sulphur | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine. |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2790 | Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS | Semi-volatile organic compounds(cf. USEPA Method 8270) | Acetone/Hexane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |

## Report Information

**Key**

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | |
|---|---|
| **Report No.:** | 20-15657-1 |
| **Initial Date of Issue:** | 04-Aug-2020 |
| **Client** | Quantum Geotechnic Ltd |
| **Client Address:** | Plas Newydd<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ |
| **Contact(s):** | Steffan Picton |
| **Project** | Q0281 - Porthcawl Drainage Scheme |

| | | | |
|---|---|---|---|
| **Quotation No.:** | Q20-20173 | **Date Received:** | 22-Jun-2020 |
| **Order No.:** | | **Date Instructed:** | 03-Jul-2020 |
| **No. of Samples:** | 4 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 09-Jul-2020 |
| **Date Approved:** | 04-Aug-2020 | **Subcon Results Due:** | 24-Jul-2020 |

**Approved By:**

**Details:** Glynn Harvey, Technical Manager

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| ACM Type | U | 2192 | | N/A | - | | - | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | | No Asbestos Detected | No Asbestos Detected |
| ACM Detection Stage | U | 2192 | | N/A | - | | - | - |
| Moisture | N | 2030 | % | 0.020 | 3.0 | 4.5 | 3.1 | 14 |
| Soil Colour | N | 2040 | | N/A | | Brown | | Brown |
| Other Material | N | 2040 | | N/A | | None | | Roots |
| Soil Texture | N | 2040 | | N/A | | Sand | | Sand |
| Clostridium perfringens (Subcon) | SN | | cfu/g | N/A | See Attached | | See Attached | See Attached |
| E. coli (Subcon) | SN | | cfu/g | N/A | See Attached | | See Attached | See Attached |
| Total Coliforms (Subcon) | SN | | cfu/g | N/A | See Attached | | See Attached | See Attached |
| pH | M | 2010 | | 4.0 | 8.3 | | 8.5 | 8.1 |
| pH (2.5:1) | N | 2010 | | 4.0 | | 8.6 | | 8.2 |
| Boron (Hot Water Soluble) | M | 2120 | mg/kg | 0.40 | < 0.40 | | < 0.40 | 0.69 |
| Sulphate (2:1 Water Soluble) as SO4 | M | 2120 | g/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | 0.013 |
| Sulphate (2:1 Extract) | M | 2120 | mg/kg | 20 | | < 20 | | 26 |
| Total Sulphur | M | 2175 | % | 0.010 | 0.015 | 0.010 | 0.011 | 0.035 |
| Cyanide (Free) | M | 2300 | mg/kg | 0.50 | | | | [B] < 0.50 |
| Cyanide (Total) | M | 2300 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Thiocyanate | M | 2300 | mg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| Sulphide (Easily Liberatable) | N | 2325 | mg/kg | 0.50 | | | | 2.6 |
| Ammonium (Water Soluble) | M | 2120 | g/l | 0.01 | | | | < 0.01 |
| Iron (Total) | N | 2430 | mg/kg | 100 | 11000 | | 7400 | 13000 |
| Sulphate (Acid Soluble) | M | 2430 | % | 0.010 | | 0.016 | | 0.10 |
| Arsenic | M | 2450 | mg/kg | 1.0 | 15 | | 11 | 17 |
| Barium | M | 2450 | mg/kg | 10 | 40 | | 17 | 64 |
| Beryllium | U | 2450 | mg/kg | 1.0 | < 1.0 | | < 1.0 | < 1.0 |
| Cadmium | M | 2450 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.32 |
| Chromium | M | 2450 | mg/kg | 1.0 | 5.5 | | 3.6 | 14 |
| Copper | M | 2450 | mg/kg | 0.50 | 1.6 | | 1.2 | 12 |
| Mercury | M | 2450 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.11 |
| Nickel | M | 2450 | mg/kg | 0.50 | 6.3 | | 4.5 | 13 |
| Lead | M | 2450 | mg/kg | 0.50 | 9.5 | | 4.2 | 42 |
| Selenium | M | 2450 | mg/kg | 0.20 | | | | 0.21 |
| Vanadium | U | 2450 | mg/kg | 5.0 | 14 | | 10 | 21 |
| Zinc | M | 2450 | mg/kg | 0.50 | 21 | | 14 | 78 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | | < 0.50 | < 0.50 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| Organic Matter | M | 2625 | % | 0.40 | < 0.40 | | < 0.40 | 4.8 |
| Total TPH >C6-C40 | M | 2670 | mg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| Naphthalene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Acenaphthylene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Acenaphthene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Fluorene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Phenanthrene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Anthracene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Fluoranthene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.41 |
| Pyrene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.77 |
| Benzo[a]anthracene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Chrysene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[a]pyrene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Total Of 16 PAH's | M | 2700 | mg/kg | 2.0 | < 2.0 | | < 2.0 | < 2.0 |
| Dichlorodifluoromethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Chloromethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Vinyl Chloride | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromomethane | M | 2760 | µg/kg | 20 | [B] < 20 | | [B] < 20 | [B] < 20 |
| Chloroethane | U | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Trichlorofluoromethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1-Dichloroethene | M | 2760 | mg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Trans 1,2-Dichloroethene | M | 2760 | mg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1-Dichloroethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| cis 1,2-Dichloroethene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromochloromethane | U | 2760 | µg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| Trichloromethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1,1-Trichloroethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Tetrachloromethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1-Dichloropropene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Benzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2-Dichloroethane | M | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Trichloroethene | N | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| 1,2-Dichloropropane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Dibromomethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromodichloromethane | M | 2760 | µg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| cis-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| Toluene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Trans-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| 1,1,2-Trichloroethane | M | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| Tetrachloroethene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,3-Dichloropropane | U | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Dibromochloromethane | U | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| 1,2-Dibromoethane | M | 2760 | µg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| Chlorobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1,1,2-Tetrachloroethane | M | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Ethylbenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| m & p-Xylene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| o-Xylene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Styrene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Tribromomethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Isopropylbenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2,3-Trichloropropane | N | 2760 | µg/kg | 50 | [B] < 50 | | [B] < 50 | [B] < 50 |
| N-Propylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 2-Chlorotoluene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,3,5-Trimethylbenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 4-Chlorotoluene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Tert-Butylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2,4-Trimethylbenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Sec-Butylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,3-Dichlorobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 4-Isopropyltoluene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,4-Dichlorobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| N-Butylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2-Dichlorobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2-Dibromo-3-Chloropropane | U | 2760 | µg/kg | 50 | [B] < 50 | | [B] < 50 | [B] < 50 |
| 1,2,4-Trichlorobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Hexachlorobutadiene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2,3-Trichlorobenzene | U | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| Methyl Tert-Butyl Ether | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| N-Nitrosodimethylamine | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Phenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Chlorophenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis-(2-Chloroethyl)Ether | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,3-Dichlorobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,4-Dichlorobenzene | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,2-Dichlorobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Methylphenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis(2-Chloroisopropyl)Ether | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachloroethane | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| N-Nitrosodi-n-propylamine | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Methylphenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Nitrobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Isophorone | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Nitrophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4-Dimethylphenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis(2-Chloroethoxy)Methane | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4-Dichlorophenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,2,4-Trichlorobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Naphthalene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Chloroaniline | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachlorobutadiene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Chloro-3-Methylphenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Methylnaphthalene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Nitrophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachlorocyclopentadiene | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4,6-Trichlorophenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4,5-Trichlorophenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Chloronaphthalene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Nitroaniline | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Acenaphthylene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Dimethylphthalate | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,6-Dinitrotoluene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Acenaphthene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 3-Nitroaniline | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Dibenzofuran | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| 4-Chlorophenylphenylether | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4-Dinitrotoluene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Fluorene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Diethyl Phthalate | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Nitroaniline | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Methyl-4,6-Dinitrophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Azobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Bromophenylphenyl Ether | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachlorobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Pentachlorophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Phenanthrene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Anthracene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Carbazole | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Di-N-Butyl Phthalate | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Fluoranthene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Pyrene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Butylbenzyl Phthalate | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[a]anthracene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Chrysene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis(2-Ethylhexyl)Phthalate | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Di-N-Octyl Phthalate | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[b]fluoranthene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[k]fluoranthene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[a]pyrene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Indeno(1,2,3-c,d)Pyrene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Dibenz(a,h)Anthracene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[g,h,i]perylene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Total Phenols | M | 2920 | mg/kg | 0.30 | < 0.30 | | < 0.30 | < 0.30 |

# Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---|---|---|---|---|---|---|
| 1020263 | ES2 | 2 | TP1 | 17-Jun-2020 | B | Amber Glass 250ml |
| 1020263 | ES2 | 2 | TP1 | 17-Jun-2020 | B | Amber Glass 60ml |
| 1020263 | ES2 | 2 | TP1 | 17-Jun-2020 | B | Plastic Tub 500g |
| 1020271 | ES2 | 2 | TP6 | 17-Jun-2020 | B | Amber Glass 250ml |
| 1020271 | ES2 | 2 | TP6 | 17-Jun-2020 | B | Amber Glass 60ml |
| 1020271 | ES2 | 2 | TP6 | 17-Jun-2020 | B | Plastic Tub 500g |
| 1020274 | ES1 | 1 | TP3 | 17-Jun-2020 | B | Amber Glass 250ml |
| 1020274 | ES1 | 1 | TP3 | 17-Jun-2020 | B | Amber Glass 60ml |
| 1020274 | ES1 | 1 | TP3 | 17-Jun-2020 | B | Plastic Tub 500g |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2175 | Total Sulphur in Soils | Total Sulphur | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine. |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2790 | Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS | Semi-volatile organic compounds(cf. USEPA Method 8270) | Acetone/Hexane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |

## Report Information

**Key**

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Amended Report

| | | | |
|---|---|---|---|
| **Report No.:** | 20-15657-2 | | |
| **Initial Date of Issue:** | 04-Aug-2020 | **Date of Re-Issue:** | 04-Aug-2020 |
| **Client** | Quantum Geotechnic Ltd | | |
| **Client Address:** | Plas Newydd<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ | | |
| **Contact(s):** | Steffan Picton | | |
| **Project** | Q0281 - Porthcawl Drainage Scheme | | |
| **Quotation No.:** | Q20-20173 | **Date Received:** | 22-Jun-2020 |
| **Order No.:** | | **Date Instructed:** | 03-Jul-2020 |
| **No. of Samples:** | 4 | | |
| **Turnaround (Wkdays):** | 5 | **Results Due:** | 09-Jul-2020 |
| **Date Approved:** | 04-Aug-2020 | **Subcon Results Due:** | 24-Jul-2020 |

**Approved By:**

**Details:** Glynn Harvey, Technical Manager

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| ACM Type | U | 2192 | | N/A | - | | - | - |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | | No Asbestos Detected | No Asbestos Detected |
| ACM Detection Stage | U | 2192 | | N/A | - | | - | - |
| Moisture | N | 2030 | % | 0.020 | 3.0 | 4.5 | 3.1 | 14 |
| Soil Colour | N | 2040 | | N/A | | Brown | | Brown |
| Other Material | N | 2040 | | N/A | | None | | Roots |
| Soil Texture | N | 2040 | | N/A | | Sand | | Sand |
| Clostridium perfringens (Subcon) | SN | | cfu/g | N/A | See Attached | | See Attached | See Attached |
| E. coli (Subcon) | SN | | cfu/g | N/A | See Attached | | See Attached | See Attached |
| Total Coliforms (Subcon) | SN | | cfu/g | N/A | See Attached | | See Attached | See Attached |
| pH | M | 2010 | | 4.0 | 8.3 | | 8.5 | 8.1 |
| pH (2.5:1) | N | 2010 | | 4.0 | | 8.6 | | 8.2 |
| Boron (Hot Water Soluble) | M | 2120 | mg/kg | 0.40 | < 0.40 | | < 0.40 | 0.69 |
| Sulphate (2:1 Water Soluble) as SO4 | M | 2120 | g/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | 0.013 |
| Sulphate (2:1 Extract) | M | 2120 | mg/kg | 20 | | < 20 | | 26 |
| Total Sulphur | M | 2175 | % | 0.010 | 0.015 | 0.010 | 0.011 | 0.035 |
| Cyanide (Free) | M | 2300 | mg/kg | 0.50 | | | | [B] < 0.50 |
| Cyanide (Total) | M | 2300 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Thiocyanate | M | 2300 | mg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| Sulphide (Easily Liberatable) | N | 2325 | mg/kg | 0.50 | | | | 2.6 |
| Ammonium (Water Soluble) | M | 2120 | g/l | 0.01 | | | | < 0.01 |
| Iron (Total) | N | 2430 | mg/kg | 100 | 11000 | | 7400 | 13000 |
| Sulphate (Acid Soluble) | M | 2430 | % | 0.010 | | 0.016 | | 0.10 |
| Arsenic | M | 2450 | mg/kg | 1.0 | 15 | | 11 | 17 |
| Barium | M | 2450 | mg/kg | 10 | 40 | | 17 | 64 |
| Beryllium | U | 2450 | mg/kg | 1.0 | < 1.0 | | < 1.0 | < 1.0 |
| Cadmium | M | 2450 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.32 |
| Chromium | M | 2450 | mg/kg | 1.0 | 5.5 | | 3.6 | 14 |
| Copper | M | 2450 | mg/kg | 0.50 | 1.6 | | 1.2 | 12 |
| Mercury | M | 2450 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.11 |
| Nickel | M | 2450 | mg/kg | 0.50 | 6.3 | | 4.5 | 13 |
| Lead | M | 2450 | mg/kg | 0.50 | 9.5 | | 4.2 | 42 |
| Selenium | M | 2450 | mg/kg | 0.20 | | | | 0.21 |
| Vanadium | U | 2450 | mg/kg | 5.0 | 14 | | 10 | 21 |
| Zinc | M | 2450 | mg/kg | 0.50 | 21 | | 14 | 78 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | | < 0.50 | < 0.50 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| Organic Matter | M | 2625 | % | 0.40 | < 0.40 | | < 0.40 | 4.8 |
| Total TPH >C6-C40 | M | 2670 | mg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| Naphthalene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Acenaphthylene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Acenaphthene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Fluorene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Phenanthrene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Anthracene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Fluoranthene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.41 |
| Pyrene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | 0.77 |
| Benzo[a]anthracene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Chrysene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[a]pyrene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 |
| Total Of 16 PAH's | M | 2700 | mg/kg | 2.0 | < 2.0 | | < 2.0 | < 2.0 |
| Dichlorodifluoromethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Chloromethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Vinyl Chloride | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromomethane | M | 2760 | µg/kg | 20 | [B] < 20 | | [B] < 20 | [B] < 20 |
| Chloroethane | U | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Trichlorofluoromethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1-Dichloroethene | M | 2760 | mg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Trans 1,2-Dichloroethene | M | 2760 | mg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1-Dichloroethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| cis 1,2-Dichloroethene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromochloromethane | U | 2760 | µg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| Trichloromethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1,1-Trichloroethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Tetrachloromethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1-Dichloropropene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Benzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2-Dichloroethane | M | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Trichloroethene | N | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| 1,2-Dichloropropane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Dibromomethane | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromodichloromethane | M | 2760 | µg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| cis-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| Toluene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Trans-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| 1,1,2-Trichloroethane | M | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| Tetrachloroethene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,3-Dichloropropane | U | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Dibromochloromethane | U | 2760 | µg/kg | 10 | [B] < 10 | | [B] < 10 | [B] < 10 |
| 1,2-Dibromoethane | M | 2760 | µg/kg | 5.0 | [B] < 5.0 | | [B] < 5.0 | [B] < 5.0 |
| Chlorobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,1,1,2-Tetrachloroethane | M | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |
| Ethylbenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| m & p-Xylene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| o-Xylene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Styrene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Tribromomethane | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Isopropylbenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Bromobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2,3-Trichloropropane | N | 2760 | µg/kg | 50 | [B] < 50 | | [B] < 50 | [B] < 50 |
| N-Propylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 2-Chlorotoluene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,3,5-Trimethylbenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 4-Chlorotoluene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Tert-Butylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2,4-Trimethylbenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Sec-Butylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,3-Dichlorobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 4-Isopropyltoluene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,4-Dichlorobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| N-Butylbenzene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2-Dichlorobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2-Dibromo-3-Chloropropane | U | 2760 | µg/kg | 50 | [B] < 50 | | [B] < 50 | [B] < 50 |
| 1,2,4-Trichlorobenzene | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| Hexachlorobutadiene | U | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| 1,2,3-Trichlorobenzene | U | 2760 | µg/kg | 2.0 | [B] < 2.0 | | [B] < 2.0 | [B] < 2.0 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| Methyl Tert-Butyl Ether | M | 2760 | µg/kg | 1.0 | [B] < 1.0 | | [B] < 1.0 | [B] < 1.0 |
| N-Nitrosodimethylamine | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Phenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Chlorophenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis-(2-Chloroethyl)Ether | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,3-Dichlorobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,4-Dichlorobenzene | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,2-Dichlorobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Methylphenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis(2-Chloroisopropyl)Ether | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachloroethane | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| N-Nitrosodi-n-propylamine | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Methylphenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Nitrobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Isophorone | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Nitrophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4-Dimethylphenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis(2-Chloroethoxy)Methane | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4-Dichlorophenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 1,2,4-Trichlorobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Naphthalene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Chloroaniline | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachlorobutadiene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Chloro-3-Methylphenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Methylnaphthalene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Nitrophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachlorocyclopentadiene | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4,6-Trichlorophenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4,5-Trichlorophenol | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Chloronaphthalene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Nitroaniline | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Acenaphthylene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Dimethylphthalate | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,6-Dinitrotoluene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Acenaphthene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 3-Nitroaniline | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Dibenzofuran | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |

# Results - Soil

**Project: Q0281 - Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-15657 | 20-15657 | 20-15657 | 20-15657 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1020263 | 1020267 | 1020271 | 1020274 |
| Order No.: | | | Client Sample Ref.: | | ES2 | ES2 | ES2 | ES1 |
| | | | Client Sample ID.: | | 2 | 2 | 2 | 1 |
| | | | Sample Location: | | TP1 | TP2 | TP6 | TP3 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.5 | 0.5 | 0.5 | 0.2 |
| | | | Date Sampled: | | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 | 17-Jun-2020 |
| | | | Asbestos Lab: | | COVENTRY | | COVENTRY | COVENTRY |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | |
| 4-Chlorophenylphenylether | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2,4-Dinitrotoluene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Fluorene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Diethyl Phthalate | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Nitroaniline | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 2-Methyl-4,6-Dinitrophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Azobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| 4-Bromophenylphenyl Ether | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Hexachlorobenzene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Pentachlorophenol | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Phenanthrene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Anthracene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Carbazole | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Di-N-Butyl Phthalate | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Fluoranthene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Pyrene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Butylbenzyl Phthalate | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[a]anthracene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Chrysene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Bis(2-Ethylhexyl)Phthalate | N | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Di-N-Octyl Phthalate | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[b]fluoranthene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[k]fluoranthene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[a]pyrene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Indeno(1,2,3-c,d)Pyrene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Dibenz(a,h)Anthracene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Benzo[g,h,i]perylene | M | 2790 | mg/kg | 0.50 | [B] < 0.50 | | [B] < 0.50 | [B] < 0.50 |
| Total Phenols | M | 2920 | mg/kg | 0.30 | < 0.30 | | < 0.30 | < 0.30 |

# Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---|---|---|---|---|---|---|
| 1020263 | ES2 | 2 | TP1 | 17-Jun-2020 | B | Amber Glass 250ml |
| 1020263 | ES2 | 2 | TP1 | 17-Jun-2020 | B | Amber Glass 60ml |
| 1020263 | ES2 | 2 | TP1 | 17-Jun-2020 | B | Plastic Tub 500g |
| 1020271 | ES2 | 2 | TP6 | 17-Jun-2020 | B | Amber Glass 250ml |
| 1020271 | ES2 | 2 | TP6 | 17-Jun-2020 | B | Amber Glass 60ml |
| 1020271 | ES2 | 2 | TP6 | 17-Jun-2020 | B | Plastic Tub 500g |
| 1020274 | ES1 | 1 | TP3 | 17-Jun-2020 | B | Amber Glass 250ml |
| 1020274 | ES1 | 1 | TP3 | 17-Jun-2020 | B | Amber Glass 60ml |
| 1020274 | ES1 | 1 | TP3 | 17-Jun-2020 | B | Plastic Tub 500g |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2175 | Total Sulphur in Soils | Total Sulphur | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine. |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2790 | Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS | Semi-volatile organic compounds(cf. USEPA Method 8270) | Acetone/Hexane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |

## Report Information

**Key**

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Amended Report

| | | | |
|---|---|---|---|
| **Report No.:** | 20-17839-3 | | |
| **Initial Date of Issue:** | 17-Jul-2020 | **Date of Re-Issue:** | 04-Sep-2020 |
| **Client** | Quantum Geotechnic Ltd | | |
| **Client Address:** | Plas Newydd<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ | | |
| **Contact(s):** | Steffan Picton | | |
| **Project** | Q0281 Porthcawl Drainage Scheme | | |
| **Quotation No.:** | Q20-20173 | **Date Received:** | 06-Jul-2020 |
| **Order No.:** | | **Date Instructed:** | 13-Jul-2020 |
| **No. of Samples:** | 9 | | |
| **Turnaround (Wkdays):** | 39 | **Results Due:** | 04-Sep-2020 |
| **Date Approved:** | 04-Sep-2020 | **Subcon Results Due:** | 03-Aug-2020 |

**Approved By:**

**Details:** Glynn Harvey, Technical Manager

# Results - Leachate

**Project: Q0281 Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 20-17839 | 20-17839 | 20-17839 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | | **Chemtest Sample ID.:** | | 1030440 | 1030441 | 1030446 |
| | | | | Client Sample ID.: | | 1 | 2 | 2 |
| | | | | Sample Location: | | TP03 | TP04 | TP09 |
| | | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.2 | 0.5 | 0.5 |
| | | | | Date Sampled: | | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | | |
| pH | U | 1010 | 10:1 | | N/A | 8.8 | 9.7 | 9.1 |
| Ammonium | U | 1220 | 10:1 | mg/l | 0.050 | 0.11 | < 0.050 | < 0.050 |
| Sulphate | U | 1220 | 10:1 | mg/l | 1.0 | I/S | 2.2 | < 1.0 |
| Cyanide (Total) | U | 1300 | 10:1 | mg/l | 0.050 | I/S | < 0.050 | < 0.050 |
| Cyanide (Free) | U | 1300 | 10:1 | mg/l | 0.050 | I/S | < 0.050 | < 0.050 |
| Sulphide | U | 1325 | 10:1 | mg/l | 0.050 | I/S | < 0.050 | < 0.050 |
| Arsenic (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | 2.6 | 1.1 | < 1.0 |
| Boron (Dissolved) | U | 1450 | 10:1 | µg/l | 20 | < 20 | 24 | 23 |
| Cadmium (Dissolved) | U | 1450 | 10:1 | µg/l | 0.080 | < 0.080 | < 0.080 | < 0.080 |
| Chromium (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Copper (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | 2.9 | 1.5 | 1.4 |
| Mercury (Dissolved) | U | 1450 | 10:1 | µg/l | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Nickel (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Lead (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | 2.5 | < 1.0 | < 1.0 |
| Selenium (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vanadium (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | 2.1 | < 1.0 | < 1.0 |
| Zinc (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chromium (Hexavalent) | U | 1490 | 10:1 | µg/l | 20 | [B] I/S | [B] < 20 | [B] < 20 |
| Total TPH >C10-C40 | U | 1670 | 10:1 | µg/l | 10 | < 10 | < 10 | < 10 |
| Naphthalene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Acenaphthylene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Acenaphthene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Fluorene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Phenanthrene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Anthracene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Fluoranthene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Pyrene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Chrysene | N | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 1700 | 10:1 | µg/l | 0.10 | I/S | < 0.10 | < 0.10 |
| Total Of 16 PAH's | N | 1700 | 10:1 | µg/l | 2.0 | I/S | < 2.0 | < 2.0 |
| Benzene | U | 1760 | 10:1 | µg/l | 1.0 | I/S | < 1.0 | < 1.0 |
| Toluene | U | 1760 | 10:1 | µg/l | 1.0 | I/S | < 1.0 | < 1.0 |
| Ethylbenzene | U | 1760 | 10:1 | µg/l | 1.0 | I/S | < 1.0 | < 1.0 |

# Results - Leachate

**Project: Q0281 Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 20-17839 | 20-17839 | 20-17839 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | | **Chemtest Sample ID.:** | | 1030440 | 1030441 | 1030446 |
| | | | | Client Sample ID.: | | 1 | 2 | 2 |
| | | | | Sample Location: | | TP03 | TP04 | TP09 |
| | | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.2 | 0.5 | 0.5 |
| | | | | Date Sampled: | | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | | |
| m & p-Xylene | U | 1760 | 10:1 | µg/l | 1.0 | I/S | < 1.0 | < 1.0 |
| o-Xylene | U | 1760 | 10:1 | µg/l | 1.0 | I/S | < 1.0 | < 1.0 |
| Total Phenols | U | 1920 | 10:1 | mg/l | 0.030 | I/S | < 0.030 | < 0.030 |

# Results - Soil

**Project: Q0281 Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1030438 | 1030439 | 1030440 | 1030441 | 1030442 | 1030443 | 1030444 | 1030445 | 1030446 |
| | | | Client Sample ID.: | | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 3 | 2 |
| | | | Sample Location: | | TP01 | TP02 | TP03 | TP04 | TP05 | TP06 | TP07 | TP07 | TP09 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.2 | 0.5 | 0.2 | 0.5 | 0.5 | 0.5 | 0.3 | 1.0 | 0.5 |
| | | | Bottom Depth (m): | | 0.5 | | | | | | | | |
| | | | Date Sampled: | | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 |
| | | | Asbestos Lab: | | DURHAM | | DURHAM | | DURHAM | DURHAM | DURHAM | | |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| ACM Type | U | 2192 | | N/A | - | | - | | - | - | - | | |
| Asbestos Identification | U | 2192 | % | 0.001 | No Asbestos Detected | | No Asbestos Detected | | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | | |
| ACM Detection Stage | U | 2192 | | N/A | - | | - | | - | - | - | | |
| Moisture | N | 2030 | % | 0.020 | 14 | 5.1 | 16 | 16 | 19 | 19 | 16 | 5.9 | 18 |
| Soil Colour | N | 2040 | | N/A | | Brown | Brown | Brown | | | | Brown | Brown |
| Other Material | N | 2040 | | N/A | | Stones | None | None | | | | None | Stones |
| Soil Texture | N | 2040 | | N/A | | Sand | Sand | Sand | | | | Sand | Sand |
| Clostridium perfringens (Subcon) | SN | | cfu/g | N/A | >15.000 | | >15.000 | | >15.000 | >15.000 | >15.000 | | |
| Total Coliforms (Subcon) | SN | | cfu/g | N/A | >1.500 | | 640 | | 20 | 370 | 720 | | |
| pH | M | 2010 | | 4.0 | 8.5 | | 8.5 | 8.5 | 8.4 | 8.5 | 8.4 | | 8.3 |
| pH (2.5:1) | N | 2010 | | 4.0 | | 8.6 | 8.5 | 8.5 | | | | 8.6 | 8.3 |
| Boron (Hot Water Soluble) | M | 2120 | mg/kg | 0.40 | 0.66 | | 0.50 | < 0.40 | 0.54 | 0.53 | 0.55 | | 0.40 |
| Sulphate (2:1 Water Soluble) as SO4 | M | 2120 | g/l | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Sulphate (2:1 Extract) | M | 2120 | mg/kg | 20 | | < 20 | < 20 | < 20 | | | | < 20 | < 20 |
| Total Sulphur | M | 2175 | % | 0.010 | 0.021 | 0.016 | 0.016 | 0.015 | 0.018 | 0.019 | 0.020 | 0.014 | 0.019 |
| Cyanide (Free) | M | 2300 | mg/kg | 0.50 | | | < 0.50 | < 0.50 | | | | | < 0.50 |
| Cyanide (Total) | M | 2300 | mg/kg | 0.50 | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | | < 0.50 |
| Thiocyanate | M | 2300 | mg/kg | 5.0 | < 5.0 | | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | | |
| Sulphide (Easily Liberatable) | N | 2325 | mg/kg | 0.50 | | | 1.3 | 2.2 | | | | | 1.3 |
| Ammonium (Water Soluble) | M | 2120 | g/l | 0.01 | | | < 0.01 | < 0.01 | | | | | < 0.01 |
| Iron (Total) | N | 2430 | mg/kg | 100 | 15000 | | 13000 | | 12000 | 13000 | 14000 | | |
| Sulphate (Acid Soluble) | M | 2430 | % | 0.010 | | 0.039 | 0.046 | 0.043 | | | | 0.024 | 0.031 |
| Arsenic | M | 2450 | mg/kg | 1.0 | 15 | | 19 | 18 | 17 | 18 | 19 | | 17 |
| Barium | M | 2450 | mg/kg | 10 | 75 | | 46 | | 44 | 51 | 55 | | |
| Beryllium | U | 2450 | mg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Cadmium | M | 2450 | mg/kg | 0.10 | 0.30 | | 0.23 | 0.21 | 0.18 | 0.22 | 0.24 | | 0.15 |
| Chromium | M | 2450 | mg/kg | 1.0 | 22 | | 9.7 | 9.2 | 8.6 | 9.6 | 11 | | 7.8 |
| Copper | M | 2450 | mg/kg | 0.50 | 9.5 | | 6.2 | 6.2 | 6.4 | 7.6 | 8.4 | | 8.7 |
| Mercury | M | 2450 | mg/kg | 0.10 | < 0.10 | | 0.11 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Nickel | M | 2450 | mg/kg | 0.50 | 11 | | 9.1 | 8.9 | 8.6 | 9.7 | 10 | | 8.0 |
| Lead | M | 2450 | mg/kg | 0.50 | 44 | | 28 | 26 | 26 | 33 | 36 | | 26 |
| Selenium | M | 2450 | mg/kg | 0.20 | | | < 0.20 | < 0.20 | | | | | < 0.20 |
| Vanadium | U | 2450 | mg/kg | 5.0 | 26 | | 19 | 18 | 18 | 18 | 22 | | 16 |
| Zinc | M | 2450 | mg/kg | 0.50 | 68 | | 43 | 41 | 40 | 47 | 51 | | 82 |
| Chromium (Hexavalent) | N | 2490 | mg/kg | 0.50 | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | | < 0.50 |
| Organic Matter | M | 2625 | % | 0.40 | 2.2 | | 1.1 | | 1.3 | 1.2 | 1.9 | | |

# Results - Soil

**Project: Q0281 Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1030438 | 1030439 | 1030440 | 1030441 | 1030442 | 1030443 | 1030444 | 1030445 | 1030446 |
| | | | Client Sample ID.: | | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 3 | 2 |
| | | | Sample Location: | | TP01 | TP02 | TP03 | TP04 | TP05 | TP06 | TP07 | TP07 | TP09 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.2 | 0.5 | 0.2 | 0.5 | 0.5 | 0.5 | 0.3 | 1.0 | 0.5 |
| | | | Bottom Depth (m): | | 0.5 | | | | | | | | |
| | | | Date Sampled: | | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 |
| | | | Asbestos Lab: | | DURHAM | | DURHAM | | DURHAM | DURHAM | DURHAM | | |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| Total TPH >C6-C40 | M | 2670 | mg/kg | 10 | 66 | | < 10 | | < 10 | < 10 | < 10 | | |
| Naphthalene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Acenaphthylene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Acenaphthene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Fluorene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Phenanthrene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Anthracene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Fluoranthene | M | 2700 | mg/kg | 0.10 | 0.71 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Pyrene | M | 2700 | mg/kg | 0.10 | 0.97 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Benzo[a]anthracene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Chrysene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Benzo[b]fluoranthene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Benzo[k]fluoranthene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Benzo[a]pyrene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Dibenz(a,h)Anthracene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Benzo[g,h,i]perylene | M | 2700 | mg/kg | 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 |
| Total Of 16 PAH's | M | 2700 | mg/kg | 2.0 | < 2.0 | | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | | < 2.0 |
| Dichlorodifluoromethane | U | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Chloromethane | M | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Vinyl Chloride | M | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Bromomethane | M | 2760 | µg/kg | 20 | < 20 | | < 20 | | < 20 | < 20 | < 20 | | |
| Chloroethane | U | 2760 | µg/kg | 2.0 | < 2.0 | | < 2.0 | | < 2.0 | < 2.0 | < 2.0 | | |
| Trichlorofluoromethane | M | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,1-Dichloroethene | M | 2760 | mg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Trans 1,2-Dichloroethene | M | 2760 | mg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,1-Dichloroethane | M | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| cis 1,2-Dichloroethene | M | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Bromochloromethane | U | 2760 | µg/kg | 5.0 | < 5.0 | | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | | |
| Trichloromethane | M | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,1,1-Trichloroethane | M | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Tetrachloromethane | M | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,1-Dichloropropene | U | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Benzene | M | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | < 1.0 |
| 1,2-Dichloroethane | M | 2760 | µg/kg | 2.0 | < 2.0 | | < 2.0 | | < 2.0 | < 2.0 | < 2.0 | | |
| Trichloroethene | N | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,2-Dichloropropane | M | 2760 | µg/kg | 1.0 | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |

# Results - Soil

**Project: Q0281 Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | | | **Chemtest Job No.:** | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | | | **Chemtest Sample ID.:** | 1030438 | 1030439 | 1030440 | 1030441 | 1030442 | 1030443 | 1030444 | 1030445 | 1030446 |
| | | | | | Client Sample ID.: | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 3 | 2 |
| | | | | | Sample Location: | TP01 | TP02 | TP03 | TP04 | TP05 | TP06 | TP07 | TP07 | TP09 |
| | | | | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | | Top Depth (m): | 0.2 | 0.5 | 0.2 | 0.5 | 0.5 | 0.5 | 0.3 | 1.0 | 0.5 |
| | | | | | Bottom Depth (m): | 0.5 | | | | | | | | |
| | | | | | Date Sampled: | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 |
| | | | | | Asbestos Lab: | DURHAM | | DURHAM | | DURHAM | DURHAM | DURHAM | | |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | | |
| Dibromomethane | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Bromodichloromethane | M | 2760 | µg/kg | 5.0 | | < 5.0 | | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | | |
| cis-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | | < 10 | | < 10 | | < 10 | < 10 | < 10 | | |
| Toluene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | < 1.0 |
| Trans-1,3-Dichloropropene | N | 2760 | µg/kg | 10 | | < 10 | | < 10 | | < 10 | < 10 | < 10 | | |
| 1,1,2-Trichloroethane | M | 2760 | µg/kg | 10 | | < 10 | | < 10 | | < 10 | < 10 | < 10 | | |
| Tetrachloroethene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,3-Dichloropropane | U | 2760 | µg/kg | 2.0 | | < 2.0 | | < 2.0 | | < 2.0 | < 2.0 | < 2.0 | | |
| Dibromochloromethane | U | 2760 | µg/kg | 10 | | < 10 | | < 10 | | < 10 | < 10 | < 10 | | |
| 1,2-Dibromoethane | M | 2760 | µg/kg | 5.0 | | < 5.0 | | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | | |
| Chlorobenzene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,1,1,2-Tetrachloroethane | M | 2760 | µg/kg | 2.0 | | < 2.0 | | < 2.0 | | < 2.0 | < 2.0 | < 2.0 | | |
| Ethylbenzene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | < 1.0 |
| m & p-Xylene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | < 1.0 |
| o-Xylene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | < 1.0 |
| Styrene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Tribromomethane | U | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Isopropylbenzene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Bromobenzene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,2,3-Trichloropropane | N | 2760 | µg/kg | 50 | | < 50 | | < 50 | | < 50 | < 50 | < 50 | | |
| N-Propylbenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 2-Chlorotoluene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,3,5-Trimethylbenzene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 4-Chlorotoluene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Tert-Butylbenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,2,4-Trimethylbenzene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Sec-Butylbenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,3-Dichlorobenzene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 4-Isopropyltoluene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,4-Dichlorobenzene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| N-Butylbenzene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,2-Dichlorobenzene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,2-Dibromo-3-Chloropropane | U | 2760 | µg/kg | 50 | | < 50 | | < 50 | | < 50 | < 50 | < 50 | | |
| 1,2,4-Trichlorobenzene | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| Hexachlorobutadiene | U | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |
| 1,2,3-Trichlorobenzene | U | 2760 | µg/kg | 2.0 | | < 2.0 | | < 2.0 | | < 2.0 | < 2.0 | < 2.0 | | |
| Methyl Tert-Butyl Ether | M | 2760 | µg/kg | 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | | |

# Results - Soil

**Project: Q0281 Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | | | **Chemtest Job No.:** | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | | | **Chemtest Sample ID.:** | 1030438 | 1030439 | 1030440 | 1030441 | 1030442 | 1030443 | 1030444 | 1030445 | 1030446 |
| | | | | | Client Sample ID.: | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 3 | 2 |
| | | | | | Sample Location: | TP01 | TP02 | TP03 | TP04 | TP05 | TP06 | TP07 | TP07 | TP09 |
| | | | | | Sample Type: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | | Top Depth (m): | 0.2 | 0.5 | 0.2 | 0.5 | 0.5 | 0.5 | 0.3 | 1.0 | 0.5 |
| | | | | | Bottom Depth (m): | 0.5 | | | | | | | | |
| | | | | | Date Sampled: | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 |
| | | | | | Asbestos Lab: | DURHAM | | DURHAM | | DURHAM | DURHAM | DURHAM | | |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | | |
| N-Nitrosodimethylamine | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Phenol | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2-Chlorophenol | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Bis-(2-Chloroethyl)Ether | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 1,3-Dichlorobenzene | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 1,4-Dichlorobenzene | N | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 1,2-Dichlorobenzene | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2-Methylphenol | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Bis(2-Chloroisopropyl)Ether | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Hexachloroethane | N | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| N-Nitrosodi-n-propylamine | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 4-Methylphenol | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Nitrobenzene | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Isophorone | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2-Nitrophenol | N | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2,4-Dimethylphenol | N | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Bis(2-Chloroethoxy)Methane | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2,4-Dichlorophenol | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 1,2,4-Trichlorobenzene | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Naphthalene | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 4-Chloroaniline | N | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Hexachlorobutadiene | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 4-Chloro-3-Methylphenol | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2-Methylnaphthalene | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 4-Nitrophenol | N | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Hexachlorocyclopentadiene | N | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2,4,6-Trichlorophenol | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2,4,5-Trichlorophenol | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2-Chloronaphthalene | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2-Nitroaniline | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Acenaphthylene | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Dimethylphthalate | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2,6-Dinitrotoluene | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Acenaphthene | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 3-Nitroaniline | N | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Dibenzofuran | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 4-Chlorophenylphenylether | M | 2790 | mg/kg | 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |

# Results - Soil

**Project: Q0281 Porthcawl Drainage Scheme**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 | 20-17839 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-20173 | | | **Chemtest Sample ID.:** | | 1030438 | 1030439 | 1030440 | 1030441 | 1030442 | 1030443 | 1030444 | 1030445 | 1030446 |
| | | | Client Sample ID.: | | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 3 | 2 |
| | | | Sample Location: | | TP01 | TP02 | TP03 | TP04 | TP05 | TP06 | TP07 | TP07 | TP09 |
| | | | Sample Type: | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | 0.2 | 0.5 | 0.2 | 0.5 | 0.5 | 0.5 | 0.3 | 1.0 | 0.5 |
| | | | Bottom Depth (m): | | 0.5 | | | | | | | | |
| | | | Date Sampled: | | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 | 08-Jul-2020 |
| | | | Asbestos Lab: | | DURHAM | | DURHAM | | DURHAM | DURHAM | DURHAM | | |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | | | |
| 2,4-Dinitrotoluene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Fluorene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Diethyl Phthalate | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 4-Nitroaniline | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 2-Methyl-4,6-Dinitrophenol | N | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Azobenzene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| 4-Bromophenylphenyl Ether | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Hexachlorobenzene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Pentachlorophenol | N | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Phenanthrene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Anthracene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Carbazole | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Di-N-Butyl Phthalate | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Fluoranthene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Pyrene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Butylbenzyl Phthalate | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Benzo[a]anthracene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Chrysene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Bis(2-Ethylhexyl)Phthalate | N | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Di-N-Octyl Phthalate | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Benzo[b]fluoranthene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Benzo[k]fluoranthene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Benzo[a]pyrene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Indeno(1,2,3-c,d)Pyrene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Dibenz(a,h)Anthracene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Benzo[g,h,i]perylene | M | 2790 | mg/kg | 0.50 | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | | |
| Total Phenols | M | 2920 | mg/kg | 0.30 | < 0.30 | | < 0.30 | | < 0.30 | < 0.30 | < 0.30 | | |

# Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

| Sample: | Sample Ref: | Sample ID: | Sample Location: | Sampled Date: | Deviation Code(s): | Containers Received: |
|---|---|---|---|---|---|---|
| 1030440 | | 1 | TP03 | 08-Jul-2020 | B | Amber Glass 250ml |
| 1030440 | | 1 | TP03 | 08-Jul-2020 | B | Amber Glass 60ml |
| 1030440 | | 1 | TP03 | 08-Jul-2020 | B | Plastic Tub 500g |
| 1030441 | | 2 | TP04 | 08-Jul-2020 | B | Amber Glass 250ml |
| 1030441 | | 2 | TP04 | 08-Jul-2020 | B | Amber Glass 60ml |
| 1030441 | | 2 | TP04 | 08-Jul-2020 | B | Plastic Tub 500g |
| 1030446 | | 2 | TP09 | 08-Jul-2020 | B | Amber Glass 250ml |
| 1030446 | | 2 | TP09 | 08-Jul-2020 | B | Plastic Tub 500g |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. |
| 1325 | Sulphide in Waters | Sulphides | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine. |
| 1450 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1490 | Hexavalent Chromium in Waters | Chromium [VI] | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 1670 | Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO | Pentane extraction / GC FID detection |
| 1700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 1760 | Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260) | Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds. |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2010 | pH Value of Soils | pH | pH Meter |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium | Boron; Sulphate; Magnesium; Chromium | Aqueous extraction / ICP-OES |
| 2175 | Total Sulphur in Soils | Total Sulphur | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2192 | Asbestos | Asbestos | Polarised light microscopy / Gravimetry |
| 2300 | Cyanides & Thiocyanate in Soils | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser. |
| 2325 | Sulphide in Soils | Sulphide | Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine. |
| 2430 | Total Sulphate in soils | Total Sulphate | Acid digestion followed by determination of sulphate in extract by ICP-OES. |
| 2450 | Acid Soluble Metals in Soils | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc | Acid digestion followed by determination of metals in extract by ICP-MS. |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 2490 | Hexavalent Chromium in Soils | Chromium [VI] | Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 2625 | Total Organic Carbon in Soils | Total organic Carbon (TOC) | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser. |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40 | Dichloromethane extraction / GC-FID |
| 2700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2790 | Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS | Semi-volatile organic compounds(cf. USEPA Method 8270) | Acetone/Hexane extraction / GC-MS |
| 2920 | Phenols in Soils by HPLC | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection. |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |

## Report Information

**Key**

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

# Final Report

| | |
|---|---|
| **Report No.:** | 20-22999-1 |
| **Initial Date of Issue:** | 04-Sep-2020 |
| **Client** | Quantum Geotechnic Ltd |
| **Client Address:** | Plas Newydd<br>Llanedi<br>Pontarddulais<br>Swansea<br>SA4 0FQ |
| **Contact(s):** | Steffan Picton |
| **Project** | Q0281 |
| **Quotation No.:** | |
| **Order No.:** | |
| **No. of Samples:** | 3 |
| **Turnaround (Wkdays):** | 5 |
| **Date Approved:** | 04-Sep-2020 |
| **Approved By:** | |
| **Details:** | Glynn Harvey, Technical Manager |

| | |
|---|---|
| **Date Received:** | 28-Aug-2020 |
| **Date Instructed:** | 28-Aug-2020 |
| **Results Due:** | 04-Sep-2020 |

# Results - Leachate

**Project: Q0281**

| **Client: Quantum Geotechnic Ltd** | | | | **Chemtest Job No.:** | | 20-22999 | 20-22999 | 20-22999 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: | | | | **Chemtest Sample ID.:** | | 1056040 | 1056041 | 1056042 |
| Order No.: | | | | Client Sample Ref.: | | 1 | 2 | 2 |
| | | | | Client Sample ID.: | | ES1 | ES2 | ES2 |
| | | | | Sample Location: | | TP03 | TP04 | TP09 |
| | | | | Sample Type: | | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | | 0.2 | 0.5 | 0.5 |
| | | | | Date Sampled: | | 26-Aug-2020 | 26-Aug-2020 | 26-Aug-2020 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | | |
| pH | U | 1010 | 10:1 | | N/A | 8.3 | 9.0 | 9.3 |
| Ammonium | U | 1220 | 10:1 | mg/l | 0.050 | 0.39 | 0.088 | < 0.050 |
| Sulphate | U | 1220 | 10:1 | mg/l | 1.0 | 1.3 | < 1.0 | < 1.0 |
| Cyanide (Total) | U | 1300 | 10:1 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cyanide (Free) | U | 1300 | 10:1 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Sulphide | U | 1325 | 10:1 | mg/l | 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Arsenic (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | 3.0 | 4.1 | 2.2 |
| Boron (Dissolved) | U | 1450 | 10:1 | µg/l | 20 | < 20 | < 20 | < 20 |
| Cadmium (Dissolved) | U | 1450 | 10:1 | µg/l | 0.080 | < 0.080 | < 0.080 | < 0.080 |
| Chromium (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Copper (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | 1.9 | 1.5 | < 1.0 |
| Mercury (Dissolved) | U | 1450 | 10:1 | µg/l | 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Nickel (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Lead (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | 1.8 | < 1.0 | < 1.0 |
| Selenium (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vanadium (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | 2.2 | 2.6 | 1.4 |
| Zinc (Dissolved) | U | 1450 | 10:1 | µg/l | 1.0 | 3.7 | 2.5 | < 1.0 |
| Chromium (Hexavalent) | U | 1490 | 10:1 | µg/l | 20 | < 20 | < 20 | < 20 |
| Total TPH >C10-C40 | U | 1670 | 10:1 | µg/l | 10 | < 10 | < 10 | < 10 |
| Naphthalene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Anthracene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Pyrene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Chrysene | N | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Indeno(1,2,3-c,d)Pyrene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 1700 | 10:1 | µg/l | 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 16 PAH's | N | 1700 | 10:1 | µg/l | 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Benzene | U | 1760 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | U | 1760 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |

# Results - Leachate

**Project: Q0281**

| **Client: Quantum Geotechnic Ltd** | | | **Chemtest Job No.:** | | | 20-22999 | 20-22999 | 20-22999 |
|---|---|---|---|---|---|---|---|---|
| Quotation No.: | | | **Chemtest Sample ID.:** | | | 1056040 | 1056041 | 1056042 |
| Order No.: | | | Client Sample Ref.: | | | 1 | 2 | 2 |
| | | | Client Sample ID.: | | | ES1 | ES2 | ES2 |
| | | | Sample Location: | | | TP03 | TP04 | TP09 |
| | | | Sample Type: | | | SOIL | SOIL | SOIL |
| | | | Top Depth (m): | | | 0.2 | 0.5 | 0.5 |
| | | | Date Sampled: | | | 26-Aug-2020 | 26-Aug-2020 | 26-Aug-2020 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | | | |
| Ethylbenzene | U | 1760 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| m & p-Xylene | U | 1760 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | U | 1760 | 10:1 | µg/l | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Phenols | U | 1920 | 10:1 | mg/l | 0.030 | < 0.030 | < 0.030 | < 0.030 |

# Test Methods

| SOP | Title | Parameters included | Method summary |
|---|---|---|---|
| 1010 | pH Value of Waters | pH | pH Meter |
| 1220 | Anions, Alkalinity & Ammonium in Waters | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser. |
| 1300 | Cyanides & Thiocyanate in Waters | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate | Continuous Flow Analysis. |
| 1325 | Sulphide in Waters | Sulphides | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine. |
| 1450 | Metals in Waters by ICP-MS | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS). |
| 1490 | Hexavalent Chromium in Waters | Chromium [VI] | Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide. |
| 1670 | Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO | Pentane extraction / GC FID detection |
| 1700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |
| 1760 | Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260) | Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds. |
| 1920 | Phenols in Waters by HPLC | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded. | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection. |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS) | Moisture content | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C. |
| 2040 | Soil Description(Requirement of MCERTS) | Soil description | As received soil is described based upon BS5930 |
| 640 | Characterisation of Waste (Leaching C10) | Waste material including soil, sludges and granular waste | ComplianceTest for Leaching of Granular Waste Material and Sludge |

## Report Information

**Key**

| | |
|---|---|
| U | UKAS accredited |
| M | MCERTS and UKAS accredited |
| N | Unaccredited |
| S | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis |
| SN | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T | This analysis has been subcontracted to an unaccredited laboratory |
| I/S | Insufficient Sample |
| U/S | Unsuitable Sample |
| N/E | not evaluated |
| < | "less than" |
| > | "greater than" |

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

**Sample Deviation Codes**

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

**Sample Retention and Disposal**

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

# Appendix E

# Outline Costing

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **New Drainage - Salt Lake and Coney** | | | | |
| | **CARRIER DRAINS** | | | | |
| | 150mm internal diameter in Type S bedding, not exceeding 2m depth | m | 50 | 50.00 | 2,487.40 |
| | 150mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 50 | 80.00 | 3,979.84 |
| | 225mm internal diameter in Type S bedding, not exceeding 2m depth | m | 29 | 60.00 | 1,719.15 |
| | 225mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 43 | 90.00 | 3,884.36 |
| | 300mm internal diameter in Type S bedding, not exceeding 2m depth | m | 67 | 65.00 | 4,337.87 |
| | 300mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 37 | 100.00 | 3,695.75 |
| | 375mm internal diameter in Type S bedding, not exceeding 2m depth | m | 109 | 70.00 | 7,608.02 |
| | 375mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 16 | 110.00 | 1,752.41 |
| | 450mm internal diameter in Type S bedding, not exceeding 2m depth | m | 177 | 75.00 | 13,307.66 |
| | 450mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 138 | 115.00 | 15,876.04 |
| | 525mm internal diameter in Type S bedding, not exceeding 2m depth | m | 158 | 85.00 | 13,428.26 |
| | 525mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 43 | 130.00 | 5,611.91 |
| | 900mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 41 | 160.00 | 6,615.68 |
| | 900mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 60 | 240.00 | 14,318.40 |
| | 1050mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 417 | 280.00 | 116,800.88 |
| | **CHAMBERS AND GULLIES** | | | | |
| | PCC Type B not exceeding 2m | no | 8 | 1,200.00 | 9,600.00 |
| | PCC Type B not exceeding 3m | no | 7 | 1,500.00 | 10,500.00 |
| | PCC Type A not exceeding 5m | no | 10 | 4,000.00 | 40,000.00 |
| | PCC Type A not exceeding 6m | no | 1 | 5,500.00 | 5,500.00 |
| | Outfall Works plus flap valve | no | 1 | 6,000.00 | 6,000.00 |
| | Page : 1 | | To Summary | | 287,023.62 |

| | | | | | |
|---|---|---|---|---|---|
| | **SUMMARY**<br>Page 1 | | | | 287,023.62 |
| | | | | Sub-total | 287,023.62 |
| | | | | 30% allowance for Contingency and Risk | 86,107.09 |
| | | | | **Total** | **373,130.71** |

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **New Drainage - Sandy Bay North** | | | | |
| | **CARRIER DRAINS** | | | | |
| | 225mm internal diameter in Type S bedding, not exceeding 2m depth | m | 129 | 60.00 | 7,712.52 |
| | 300mm internal diameter in Type S bedding, not exceeding 2m depth | m | 64 | 65.00 | 4,171.38 |
| | 375mm internal diameter in Type S bedding, not exceeding 2m depth | m | 58 | 70.00 | 4,081.63 |
| | 450mm internal diameter in Type S bedding, not exceeding 2m depth | m | 241 | 75.00 | 18,042.23 |
| | 525mm internal diameter in Type S bedding, not exceeding 2m depth | m | 80 | 85.00 | 6,812.50 |
| | 600mm internal diameter in Type S bedding, not exceeding 2m depth | m | 12 | 105.00 | 1,268.45 |
| | 600mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 12 | 165.00 | 1,993.28 |
| | 675mm internal diameter in Type S bedding, not exceeding 2m depth | m | 11 | 110.00 | 1,245.09 |
| | 750mm internal diameter in Type S bedding, not exceeding 2m depth | m | 23 | 115.00 | 2,588.54 |
| | **CHAMBERS AND GULLIES** | | | | |
| | PCC Type B not exceeding 2m | no | 11 | 1,200.00 | 13,200.00 |
| | PCC Type B not exceeding 3m | no | 2 | 1,500.00 | 3,000.00 |
| | Headwalls | no | 3 | 2,500.00 | 7,500.00 |
| |  | | To Summary | | 71,615.61 |

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **Infiltration Basin 1** | | | | |
| | **Excavation** | | | | |
| | Excavation of acceptable material excluding Class 5A in cutting and other excavation (subgrade excavation to formation level) | $m^3$ | 3,616 | 10.00 | 36,161.00 |
| | **Disposal of Material** | | | | |
| | Disposal of acceptable material excluding Class 5A. | $m^3$ | 3,616 | 50.00 | 180,805.00 |
| | **Imported Fill** | | | | |
| | Imported topsoil Class 5B | $m^3$ | 701.1 | 24.00 | 16,826.40 |
| | **Topsoiling** | | | | |
| | Topsoiling 300mm thick to surfaces sloping at more than 10deg to the horizontal. Plus compaction | $m^2$ | 1,058 | 5.00 | 5,289.50 |
| | Topsoiling 300mm thick to surfaces sloping at 10deg or less to the horizontal. Plus compaction | $m^2$ | 1,279 | 6.00 | 7,674.60 |
| | Seeding | $m^2$ | 2,337 | 1.00 | 2,337.00 |
| |  | | To Summary | | 249,093.50 |

| | | | | | |
|---|---|---|---|---|---|
| | **SUMMARY** | | | | |
| | Page 1 | | | | 71,615.61 |
| | Page 2 | | | | 249,093.50 |
| | | | | Sub-total | 320,709.11 |
| | | | | 30% allowance for Contingency and Risk | 96,212.73 |
| | | | | **Total** | **416,921.84** |

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **New Drainage - Sandy Bay South** | | | | |
| | **CARRIER DRAINS** | | | | |
| | 225mm internal diameter in Type S bedding, not exceeding 2m depth | m | 25 | 60.00 | 1,498.86 |
| | 300mm internal diameter in Type S bedding, not exceeding 2m depth | m | 45 | 65.00 | 2,944.34 |
| | 300mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 45 | 100.00 | 4,529.75 |
| | 375mm internal diameter in Type S bedding, not exceeding 2m depth | m | 39 | 70.00 | 2,761.64 |
| | 450mm internal diameter in Type S bedding, not exceeding 2m depth | m | 95 | 75.00 | 7,140.68 |
| | 525mm internal diameter in Type S bedding, not exceeding 2m depth | m | 179 | 85.00 | 15,254.27 |
| | 600mm internal diameter in Type S bedding, not exceeding 2m depth | m | 218 | 105.00 | 22,933.68 |
| | **CHAMBERS AND GULLIES** | | | | |
| | PCC Type B not exceeding 2m | no | 6 | 1,200.00 | 7,200.00 |
| | PCC Type B not exceeding 3m | no | 4 | 1,500.00 | 6,000.00 |
| | PCC Type A not exceeding 5m | no | 1 | 4,000.00 | 4,000.00 |
| | Headwalls | no | 2 | 2,500.00 | 5,000.00 |
| | Page : 1 | | To Summary | | 79,263.21 |

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **Infiltration Basin 2** | | | | |
| | **Excavation** | | | | |
| | Excavation of acceptable material excluding Class 5A in cutting and other excavation (subgrade excavation to formation level) | $m^3$ | 2,326 | 10.00 | 23,263.50 |
| | **Disposal of Material** | | | | |
| | Disposal of acceptable material excluding Class 5A. | $m^3$ | 2,326 | 50.00 | 116,317.50 |
| | **Imported Fill** | | | | |
| | Imported topsoil Class 5B | $m^3$ | 600.2 | 24.00 | 14,405.76 |
| | **Topsoiling** | | | | |
| | Topsoiling 300mm thick to surfaces sloping at more than 10deg to the horizontal. Plus compaction | $m^2$ | 900 | 5.00 | 4,499.00 |
| | Topsoiling 300mm thick to surfaces sloping at 10deg or less to the horizontal. Plus compaction | $m^2$ | 1,101 | 6.00 | 6,606.00 |
| | Seeding | $m^2$ | 2,001 | 1.00 | 2,000.80 |
| | Page : 2 | | To Summary | | 167,092.56 |

| | | | | | |
|---|---|---|---|---|---|
| | **SUMMARY** | | | | |
| | Page 1 | | | | 79,263.21 |
| | Page 2 | | | | 167,092.56 |
| | | | | Sub-total | 246,355.77 |
| | | | | 30% allowance for Contingency and Risk | 73,906.73 |
| | | | | **Total** | **320,262.50** |

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **New Drainage - Sandy Bay West** | | | | |
| | **CARRIER DRAINS** | | | | |
| | 225mm internal diameter in Type S bedding, not exceeding 2m depth | m | 31 | 60.00 | 1,845.24 |
| | 300mm internal diameter in Type S bedding, not exceeding 2m depth | m | 43 | 65.00 | 2,819.18 |
| | 375mm internal diameter in Type S bedding, not exceeding 2m depth | m | 101 | 70.00 | 7,089.81 |
| | 450mm internal diameter in Type S bedding, not exceeding 2m depth | m | 85 | 75.00 | 6,396.15 |
| | 525mm internal diameter in Type S bedding, not exceeding 2m depth | m | 63 | 85.00 | 5,386.37 |
| | 525mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 37 | 130.00 | 4,813.64 |
| | **CHAMBERS AND GULLIES** | | | | |
| | PCC Type B not exceeding 2m | no | 7 | 1,200.00 | 8,400.00 |
| | PCC Type B not exceeding 3m | no | 1 | 1,500.00 | 1,500.00 |
| | Headwalls | no | 2 | 2,500.00 | 5,000.00 |
| | Page : 1 | | To Summary | | 43,250.39 |

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **Infiltration Basin 3** | | | | |
| | **Excavation** | | | | |
| | Excavation of acceptable material excluding Class 5A in cutting and other excavation (subgrade excavation to formation level) | $m^3$ | 1,959 | 10.00 | 19,591.50 |
| | **Disposal of Material** | | | | |
| | Disposal of acceptable material excluding Class 5A. | $m^3$ | 1,959 | 20.00 | 39,183.00 |
| | **Imported Fill** | | | | |
| | Imported topsoil Class 5B | $m^3$ | 427.5 | 24.00 | 10,259.28 |
| | **Topsoiling** | | | | |
| | Topsoiling 300mm thick to surfaces sloping at more than 10deg to the horizontal. Plus compaction | $m^2$ | 732 | 5.00 | 3,659.00 |
| | Topsoiling 300mm thick to surfaces sloping at 10deg or less to the horizontal. Plus compaction | $m^2$ | 693 | 6.00 | 4,158.60 |
| | Seeding | $m^2$ | 1,425 | 1.00 | 1,424.90 |
| | Page : 2 | | To Summary | | 78,276.28 |

| | | | | | |
|---|---|---|---|---|---|
| | **SUMMARY** | | | | |
| | Page 1 | | | | 43,250.39 |
| | Page 2 | | | | 78,276.28 |
| | | | | Sub-total | 121,526.67 |
| | | | | 30% allowance for Contingency and Risk | 36,458.00 |
| | | | | **Total** | **157,984.66** |

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **New Drainage - Sandy Bay South West** | | | | |
| | **CARRIER DRAINS** | | | | |
| | 300mm internal diameter in Type S bedding, not exceeding 2m depth | m | 64 | 65.00 | 4,132.57 |
| | 375mm internal diameter in Type S bedding, not exceeding 2m depth | m | 120 | 70.00 | 8,367.03 |
| | **CHAMBERS AND GULLIES** | | | | |
| | PCC Type B not exceeding 2m | no | 5 | 1,200.00 | 6,000.00 |
| | Headwalls | no | 1 | 2,500.00 | 2,500.00 |
| | Page : 1 | | To Summary | | 20,999.60 |

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **Infiltration Basin 4** | | | | |
| | **Excavation** | | | | |
| | Excavation of acceptable material excluding Class 5A in cutting and other excavation (subgrade excavation to formation level) | $m^3$ | 890 | 10.00 | 8,901.20 |
| | **Disposal of Material** | | | | |
| | Disposal of acceptable material excluding Class 5A. | $m^3$ | 890 | 20.00 | 17,802.40 |
| | **Imported Fill** | | | | |
| | Imported topsoil Class 5B | $m^3$ | 228.2 | 24.00 | 5,477.76 |
| | **Topsoiling** | | | | |
| | Topsoiling 300mm thick to surfaces sloping at more than 10deg to the horizontal. Plus compaction | $m^2$ | 474 | 5.00 | 2,372.00 |
| | Topsoiling 300mm thick to surfaces sloping at 10deg or less to the horizontal. Plus compaction | $m^2$ | 286 | 6.00 | 1,718.40 |
| | Seeding | $m^2$ | 761 | 1.00 | 760.80 |
| | Page : 2 | | To Summary | | 37,032.56 |

| | | | | | |
|---|---|---|---|---|---|
| | **SUMMARY** | | | | |
| | Page 1 | | | | 20,999.60 |
| | Page 2 | | | | 37,032.56 |
| | | | | Sub-total | 58,032.16 |
| | | | | 30% allowance for Contingency and Risk | 17,409.65 |
| | | | | **Total** | **75,441.81** |

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **School - Permeable Pavement** | | | | |
| | AC10 open surface course 100/150, 25mm thick | $m^2$ | 2,720 | 15.00 | 40,800.00 |
| | AC32 open binder 40/90, 90mm thick | $m^2$ | 2,720 | 25.00 | 68,000.00 |
| | Type 3 sub-base | $m^3$ | 816 | 30.00 | 24,480.00 |
| | Geotextile | $m^2$ | 2,752 | 2.00 | 5,504.80 |
| | **Excavation** | | | | |
| | Excavation of acceptable material excluding Class 5A in cutting and other excavation (subgrade excavation to formation level) | $m^3$ | 1,129 | 10.00 | 11,288.00 |
| | **Disposal of Material** | | | | |
| | Disposal of acceptable material excluding Class 5A. | $m^3$ | 1,129 | 20.00 | 22,576.00 |
| | Page : 1 | | To Summary | | 172,648.80 |
| | **SUMMARY** | | | | |
| | Page 1 | | | | 172,648.80 |
| | | | | Sub-total | 172,648.80 |
| | | | | 30% allowance for Contingency and Risk | 51,794.64 |
| | | | | **Total** | **224,443.44** |

**Summary**

| Catchment | Total Cost of Designed Surface Water Drainage and SuDS | Extra for connection drainage and SuDS (+120%) | Total Cost per Catchment |
|---|---|---|---|
| Salt Lake and Coney | 373,130.71 | 447,756.85 | 820,887.55 |
| Sandy Bay North | 416,921.84 | 500,306.20 | 917,228.04 |
| Sandy Bay South | 320,262.50 | 384,315.01 | 704,577.51 |
| Sandy Bay West | 157,984.66 | 189,581.60 | 347,566.26 |
| Sandy Bay South West | 75,441.81 | 90,530.17 | 165,971.98 |
| School | 224,443.44 | 269,332.13 | 493,775.57 |
| **Total** | **1,568,184.96** | **1,881,821.95** | **3,450,006.91** |

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **Public Surface Water Sewer Diversion** | | | | |
| | **CARRIER DRAINS** | | | | |
| | 225mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 49 | 90.00 | 4,420.89 |
| | 225mm internal diameter in Type S bedding, exceeding 4m depth but not 6m | m | 145 | 200.00 | 28,912.20 |
| | 1200mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | | 350.00 | 0.00 |
| | 1200mm internal diameter in Type S bedding, exceeding 4m depth but not 6m | m | | 500.00 | 0.00 |
| | **CHAMBERS AND GULLIES** | | | | |
| | PCC Type A not exceeding 5m | no | 1 | 4,000.00 | 4,000.00 |
| | PCC Type A not exceeding 6m | no | 1 | 5,500.00 | 5,500.00 |
| | Page : 1 | | To Summary | | 42,833.09 |

| | | | | | |
|---|---|---|---|---|---|
| | **SUMMARY**<br>Page 1 | | | | 42,833.09 |
| | | | | Sub-total | 42,833.09 |
| | | | | 30% allowance for Contingency and Risk | 12,849.93 |
| | | | | 30% allowance for DCWW costs | 12,849.93 |
| | | | | **Total** | **68,532.94** |

| Ref | Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|---|
| | **Wilderness Drain Diversion** | | | | |
| | **CARRIER DRAINS** | | | | |
| | 225mm internal diameter in Type S bedding, not exceeding 2m depth | m | 25 | 60.00 | 1,481.70 |
| | 225mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 25 | 90.00 | 2,222.55 |
| | 1200mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 34 | 350.00 | 11,855.90 |
| | 1200mm internal diameter in Type S bedding, exceeding 4m depth but not 6m | m | 478 | 500.00 | 239,194.50 |
| | **CHAMBERS AND GULLIES** | | | | |
| | PCC Type A not exceeding 5m | no | 2 | 4,000.00 | 8,000.00 |
| | PCC Type A not exceeding 6m | no | 7 | 5,500.00 | 38,500.00 |
| | Outfall Works plus flap valve | no | 1 | 7,000.00 | 7,000.00 |
| | Page : 1 | | To Summary | | 308,254.65 |

| | | | | | |
|---|---|---|---|---|---|
| | **SUMMARY**<br><br>Page 1 | | | | 308,254.65 |
| | | | | Sub-total | 308,254.65 |
| | | | | 30% allowance for Contingency and Risk | 92,476.40 |
| | | | | **Total** | **400,731.05** |

| Description | Unit | Qty | Rate | Amount |
|---|---|---|---|---|
| **600mm Ø' Drain Diversion** | | | | |
| **CARRIER DRAINS** | | | | |
| 600mm internal diameter in Type S bedding, exceeding 2m depth but not 4m | m | 31 | 165.00 | 5,122.92 |
| 600mm internal diameter in Type S bedding, exceeding 4m depth but not 6m | m | 389 | 300.00 | 116,719.20 |
| **CHAMBERS AND GULLIES** | | | | |
| PCC Type A not exceeding 5m | no | 3 | 4,000.00 | 12,000.00 |
| PCC Type A not exceeding 6m | no | 2 | 5,500.00 | 11,000.00 |
| Outfall Works plus flap valve | no | 1 | 5,000.00 | 5,000.00 |
| Page : 1 | | To Summary | | 149,842.12 |

| | | | | |
|---|---|---|---|---|
| **SUMMARY**<br><br>Page 1 | | | | 149,842.12 |
| | | | Sub-total | 149,842.12 |
| | | | 30% allowance for Contingency and Risk | 44,952.64 |
| | | | **Total** | **194,794.76** |

**Summary**

| Catchment | Total Cost of Diversions |
|---|---|
| Public surface water sewer diversion | 68,532.94 |
| The Wilderness drain diversion | 400,731.05 |
| 600mm Ø drain diversion | 194,794.76 |
| **Total** | **664,058.75** |

# Appendix F

# Procedure of Health and Safety in Design

# Porthcawl Drainage Strategy Procedure for health and safety in design

| Revision | Author | Checked by | Technical Review | Approved by | Date approved | Reason for revision |
|---|---|---|---|---|---|---|
| 1 | Richard Delaney | Stuart Christer | | Stuart Christer | 23.10.20 | Initial Issue |
| | | | | | | |

# Contents


1 Purpose 2
2 Scope 2
3 Definitions and abbreviations 2
3.1 Definitions 2
4 Responsibilities 3
4.1 Designer 3
4.2 Principal Designer 4
5 Requirements on design organisations 4
5.1 Coordination and co-operation by designers 4
5.2 Design review 5
5.3 Application of the Workplace (Health, Safety and Welfare) Regulations 1992 6
5.4 Final design submission 6
5.5 Design risk register 6
5.6 Design and pre-construction information 7
5.7 RAG lists 8
5.8 Flow of design information 9
5.9 Relationship between the project risk registers and the design risk registers 9
5.10 Hazard workshop and studies 9
5.11 Safety, Health and Environmental (SHE) boxes on drawings 9
6 References 10
Appendix A –Design risk register template 11
Appendix B – Typical SHE box on drawings 19

# 1 Purpose

The purpose of this procedure is to provide for a consistent approach to design risk management activities to support the projects compliance with the Construction (Design and Management) Regulations 2015.

# 2 Scope

The scope of works includes the provision of a drainage strategy and general arrangements for the feasibility of disposing and discharging foul and surface water flows from the proposed masterplan to points either within the site or within close proximity to the site using both piped and Sustainable Drainage Systems (SuDS). This document includes the general arrangements to be implemented for:

a) The production, management and maintenance of the Design Risk Registers (DRR) by all design organisations;
b) Co-operation and co-ordination between designers; and
c) The management of health and safety information generated by designers and its incorporation into the pre-construction information.

This procedure applies to all design work related to the implementation of the works that will be undertaken on behalf of the Client Bridgend County Borough Council and Funfair Sites Limited.

**COVID 19 restrictions impact during the compilation of this document it should be noted that face to face meetings have not been possible, however electronic communications including TEAMS and Zoom methods have been used.**

# 3 Definitions and abbreviations

The abbreviations, descriptions and project terminology used within this document can be found in the Project Dictionary.

## 3.1 Definitions

| Term | Definition |
|---|---|
| Guidance | For the purposes of this document the guidance referred to is: HSE L153 - Managing Health and Safety in Construction. |
| Principal Designer (PD) | Defined in the Construction (Design and Management) Regulations 2015 (CDM) as "the designer appointed under regulation 5(1)(a) to perform specified duties in regulations 11 and 12". |
| Design | Defined in the CDM Regulation 2 as "including drawings, design details, specifications and bills of quantities (including specifications of articles or substances) relating to a structure and calculations prepared for the purposes of design". |

| | |
|---|---|
| Designer | Defined under CDM Regulation 2 "as any person (including a client, contractor or other person referred to in these Regulations) in the furtherance of a business who prepares or modifies a design or arranges for or instructs any person under his control to do so". |

# 4 Responsibilities

## 4.1 Designer

Designers shall:

a) Fully comply with their obligations under Construction (Design & Management) Regulations 2015 (CDM);

b) Ensure that designs they prepare are correctly checked and peer reviewed, consider hazards and associated risks;

c) Apply suitable and sufficient control to ensure that health and safety risk is evaluated, eliminated, reduced and controlled so far as is reasonably practicable, considering construction, maintenance and use under normal, abnormal, degraded and emergency conditions;

d) Undertake design risk assessments appropriate for individual work packages, for which they are responsible and record the significant findings, mitigations or actions in the risk register;

e) Continually develop, regularly review, amend and update the design risk register;

f) Highlight significant risk on the relevant drawing (only required for drawings to be issued to Contractors) by the use of Safety, Health and Environment (SHE) boxes or (see Appendix B) or to added to into their design risk assessment;

g) Pro-actively co-operate with other designers;

h) Input into initial Pre-Construction Information Pack (PCIP) as an output of their design to provide information required of them under CDM Regulation 9 (4);

i) Develop suitable Red, Amber and Green (RAG) lists(see 5.7);

j) Plan, implement and formally record design review meetings with , the Principal Designer and other appointed designers as identified of each of the individual Discipline Leads ;

k) Support the assurance activities (including audit, checking, monitoring etc) required by the Principal Designer

l) Nominate or appoint a suitable, person as their design lead coordinator who shall:

   I. Lead on all aspects of design risk and coordination;

## 4.2 Principal Designer

The Principal Designer shall

a) Discharge all Principal Designer Duties as set out in CDM including:

I. Compile, plan, manage and monitor the pre-construction phase and coordinate matters relating to health and safety during the pre-construction phase, particularly when design, technical and organisational aspects are being decided in order to plan the various items or stages of work.

II. Identify and eliminate or control, so far as is reasonably practicable, foreseeable health or safety risk to any person likely to be affected by construction work; maintenance/cleaning of the structure; or its use as a workplace 'taking into account the general principles of prevention with regards to managing identified risks

III. Estimate the period of time required to complete work or work stages. As it has been deemed within each of the PCF stages as per the collaboration of the RIBA scales. This will make sure that appropriate resource in place.

IV. Ensure all designers comply with their duties; and that all persons working in relation to the pre-construction phase cooperate with the Client (Bridgend County Borough Council and Funfair Sites Limited), the Principal Designer and each other. This will make sure that risks are identified throughout the design phase.

V. Assist the client in the provision of the pre-construction information and provide it promptly and in a convenient form, to every designer and contractor appointed, or being considered for appointment, to the project.

VI. Liaise with the principal contractor and share information relevant to the planning, management and monitoring of the construction phase and the coordination of health and safety matters during the construction phase.

b) Support the assurance activities (including audit, checking, monitoring etc) required by Bridgend County Borough Council and Funfair Sites Limited as necessary to be assured that they are meeting their duty.

# 5 Requirements on design organisations

## 5.1 Coordination and co-operation by designers

Designers shall have in place arrangements to facilitate internal (within their organisation) and external cooperation and coordination.

Internal coordination and cooperation shall be fostered through:

- Regular meetings of all members of the design team;
- Regular internal design and constructability reviews of developing designs; these internal reviews are to be documented and recorded;
- Formal design review meetings to assess health and safety aspects of design proposals and design risk register information.

External coordination and cooperation shall be fostered through:

a) Interface design reviews (including the exchange of hazard and risk information) see 5.2 below;
b) The sharing of information with Highways England and other designers (including their Discipline Leads) or contractors that the designer believes would be useful to them in meeting their objectives or necessary for health and safety;
c) Raising issues with the Principal Designer where the designer believes commonality of design approach or proposed construction method would benefit the design;
d) Developing and designing common standards and solutions collaboratively with all designers;
e) Cooperating with others in a timely way where requests are made.

## 5.2 Design review

Designers shall undertake internal design reviews as per the consultant/contractors management arrangements as part of the ongoing design process. The designer shall also hold external design reviews, the Principal Designer and, where applicable, interfacing designers and contractors or any other parties affected by the design.

All design reviews shall include the identification of health and safety hazards and the evaluation of risk.

Designers shall ensure that such reviews shall be chaired by a person with sufficient training, skills and experience, and for the purposes of consistency, generally by the same person throughout the life of design.

Within the designer's project documentation, the competency requirements of the chairperson shall be defined and evidence that these requirements have been met shall be recorded and maintained.

A record shall be maintained of the external design review and the record shall include:

Risk identified from the CDM Risk Register that should transfer to the Project Risk Register. In such cases this will require raising a Request for Information.

The hazard identification and risk evaluation shall consider the whole life cycle of the proposed drainage including any proposed materials, methods of design and the sequence of construction.

Specific consideration shall be given to occupational health issues for contractors, operators and maintainers of the structures and systems.

The principles of prevention as detailed in Appendix 1 of the Managing Health and Safety in Construction Guidance (L153) shall be applied to the identified risks.

## 5.3 Application of the Workplace (Health, Safety and Welfare) Regulations 1992

Designers shall determine criteria for the identification of workplaces; CDM Regulation 9(2)(c)

As part of the design submissions there shall be clear identification of workplaces (e.g. Station, depot, etc.) and the designer shall confirm that appropriate provisions required by The Workplace (Health, Safety and Welfare) Regulations 1992 have been taken into account.

## 5.4 Final design submission

The review of the final design submission shall be agreed with the Principal Designer and shall include:

a) Complete development of the project brief and preparation of proposals.
b) The relevant standards applied to the design in respect to ergonomics.
c) That safety factors have been considered within each stage of the process.
d) How human factors have been considered within the design.
e) How health factors will be considered within each phase of design.
f) The design has considered operability and maintainability and other elements of the life cycle such as decommissioning.
g) How the design will affect the overall safety performance of the drainage system.
h) That all risks have been considered along with control measures.
i) Consideration has been given to all foreseeable operating conditions including normal, abnormal, degraded and emergencies.
j) Provision of maintenance vehicular access in order to access key assets along the route.
k) That environmental considerations have been taken into account within the whole lifecycle of the overall design.
l) Provision of access for emergency services should the need arise.

## 5.5 Design risk register

The designer shall maintain a design risk register to identify hazards, prioritise risk and document mitigation measures or controlling actions taken.

The risk register and the evaluation of risk shall contain as a minimum the information detailed in the template provided in Appendix a (design risk register template).

The purpose of risk ranking / evaluation within the design risk register is to prioritise the designer's action to eliminate, reduce, mitigate and control risk; however the designer should apply the 'Principles of Prevention' to all hazards irrespective of their ranking.

The aim of ranking residual risk is to alert the project or the risk owner of the priority of the residual risk for further action. This will make sure that all of the high risk items are made aware to all of the design team, and that control measures are put in place to either remove the risk or reduce the exposure to far as reasonably practicable.

Closure of an entry in the risk register should indicate that the risk has been eliminated.

Closure of items in the risk register shall be confirmed and recorded at the external design review (see section 5.2).

The main aims of the design risk registers are to:

a) Identify all reasonably foreseeable hazards and associated risks arising from a given design and to apply appropriate control and / or mitigation measures specifically directed at those hazards and risks where these cannot be eliminated;
b) Record which entity has ownership of each risk;
c) Record what actions are to be taken (or have been taken), by whom and when, in design in respect of removing the risk or controlling the risk;
d) Assess whether any residual risks remain in relation to the hazard and whom it is envisaged should own the residual risk;
e) Indicate where the risk should be communicated, e.g. on a drawing, in the pre-construction information (for risk to be consider at the next design stage or construction risks) or health and safety file;
f) Provide an auditable record for each hazard and risk identified and the control measures to be adopted.

To achieve the above there will need to be an auditable trail from the design and any assumptions made and the design risk register concurrent with it.

Risk may be transferred from one designer to another; in making this transfer all parties to the transfer must have evidence in the form of a formal transmittal that the receiving party has accepted the risk transfer.

The design risk register is a live document and data entries shall be required justifying why a particular risk has been modified / closed and who made the change.

The Design risk register shall be treated as a controlled document and managed in accordance with the overall project. This will be evaluated at each of the stage gate reviews in line with the overall PCF stages, and the close out of each of the products.

The Design risk register is to be produced and maintained in electronic format using the template detailed in appendix A.

Designers will have suitable arrangements in place to prevent corruption or other data loss.

Each designer organisation's design risk register shall be kept up-to-date and shall reflect the progress of the design. Each of these will be owned by each of the discipline leads and then overviewed by the Principal Designer, to make sure that all of the risks are captured.

Ownership of particular risk shall be assigned to the designer in the first instance.

Reassignment of risk shall be proposed by the designer in the submission of the design risk register to the Principal Designer.

## 5.6 Design and pre-construction information

In order to assist the appointed Principal Designer to comply with their respective duties to provide information, the designer shall prepare the following relevant to their design;

- A PCIP (appropriate for either the next stage of design or for any contractor appointed to implement their design) containing the available health and safety information needed to identify hazards and risks associated with the proposed design and construction work;
- Provide any information in their possession necessary for any stage of the works to enable Bridgend County Borough Council and Funfair Sites Limited to undertake their work safely; this includes design team and Project Management team going out to sites to gather further information about the site (e.g. intrusive surveys, ,

transport assessment, geotechnical work, etc.) necessary for the designer to progress their work or close out an assumption including any relevant information already produced by the Client.

- The PCIP and any other necessary information identified shall first to be submitted to the Principal Designer, for review and so the Principal Designer can provide any supplementary information or disseminate the information to other parties that are require to plan and carry out design/construction activities. This will allow the Principal Designer to compile the overall PCIP for this project.

The PCIP shall (where applicable) include all relevant survey and other information necessary including any health and safety files which exist for any enabling or other previous works as may be relevant.

The design team is responsible for completing the preparation of the design documentation in accordance with the Guidance and the submission of the documentation to the Principal Designer for review and acceptance.

The Principal Designer, shall make sure that PCIP information that may be necessary for the next stage of procurement is included in procurement documentation or arrange for the issue of such parts of the information that is relevant to contractors or designers. This will allow the PCIP to be updated as we move through each stage of the PCF Lifecycle.

Ground investigation surveys have been carried out by Quantum Geotechnic Limited during 2020 the results of which are available and have been considered during the production of the LDP Drainage Strategy Report.

A Health and Safety Pre Construction Information document was produced in April 2020 for the Ground investigation survey works which is available and should be referred to when any further PCIP are being compiled for any future construction activities on the site.

## 5.7 RAG lists

Designers are required to develop suitable RAG lists to provide teams on what to eliminate or avoid and what to encourage in the design. These RAG lists shall be submitted to the Principal Designer for agreement, so as to aid the Principal Designer in delivering his duty of ensuring consistency of control measures.

Based on the Health and Safety Executive (HSE) guidance, industry best practice, the design team shall identify design elements, materials and processes which are either to be avoided because they are judged to represent significant risk to construction personnel, facility users and / or the environment or to be preferred because they represent a reduction in such risks.

Examples of red list items and processes include hazardous elements, materials or processes, which are effectively prohibited and shall be eliminated from the Project excepting only where no alternative can be found.

If any red list item is to be employed, it requires formal justification within the design documentation.

Examples of amber list items and processes include hazardous elements, materials and processes which are to be employed in a careful and sparing way because they represent significant risks (although they may be justified on a risk-management basis).

If any item on the amber list is to be employed, it requires information within the design documentation on its minimisation and shall require advice and guidance to be provided as part of the design for the safe execution of that design.

Examples of green list items and processes include elements, materials and processes which are preferred because they represent significant risk reduction. This will be indicated within the overall Design Risk Register for the principal of the project.

Designers shall coordinate their RAG lists with other designers to ensure consistency.

## 5.8 Flow of design information

The designer should ensure that adequate arrangements and systems are in place to ensure that design information is being adequately communicated to the Principal Designer and other designers / contractors.

The designer shall ensure that all relevant design risk information and health and safety documentation, drawings, reports etc. are entered in a timely manner on the client's electronic data management system or equivalent for review by the Principal Designer.

## 5.9 Relationship between the project risk registers and the design risk registers

The project risk registers and the design risk registers shall be reviewed on a monthly basis with the relevant Risk Manager, to identify risks which may need to be elevated into the project risk registers.

## 5.10 Hazard workshop and studies

The designer shall, where appropriate, facilitate and carry out hazard identification workshops and studies.

Hazard workshops are group meetings arranged to facilitate the identification and management of health and safety risks.

The purpose of the workshop is to draw knowledge and experience from each group member in order to achieve a better understanding of the issues.

The design team organising such workshops should include the Principal Designer and relevant discipline engineer(s) from the relevant directorate.

## 5.11 Safety, Health and Environmental (SHE) boxes on drawings

Where the designer considers the design to have a residual risk that a competent contractor may not be familiar with, this risk shall be highlighted on the drawing by the use of the SHE box system (note: only required for the release of drawings that are to be issued to Contractors).

An example of the SHE box is shown in Appendix B.

Where there is no SHE box shown on a drawing, the designers shall be deemed to have reviewed the relevant risks and considers that "there are no significant or unusual, location specific risks which would be unfamiliar to a competent contractor or other designers or likely to be difficult to manage effectively".

# 6 References

| Title | Reference |
|---|---|
| Managing Health and Safety in Construction | HSE L153 |
| Construction (Design and Management) Regulations 2015 | 2015 No. 51 |
| The Workplace (Health, Safety and Welfare) Regulations 1992 | 1992 No. 3004 |
| GG 104 requirements for safety risk assessments | |

# Appendix A –Design risk register Porthcawl Drainage Strategy

| **Document Number:** PC DS RA 1 | **Revision No. 1** | **Date of revision September 2020** |
|---|---|---|
| **Name:** Porthcawl Drainage Strategy | **Design description:** LDP Drainage Strategy | |

| Ref no. {unique identifier} | Description | Classification | Hazard description | Risk description | Current risk impact {risk matrix} | | | Design mitigation action | Risk owner | Residual risk {risk matrix} | | | Comments / actions | Status | Residual risk owner | Design document number and revision |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Likelihood | Impact | Priority | | | Likelihood | Impact | Priority | | | | |
| | COVID 19 restrictions impact during the compilation of this document | C | Covid 19 Virus | Becoming infected | | | | Include in Tender Documentation and PCI | P C | | | | | | | |
| GROUND INVESTIGATION FACTUAL REPORT Report No. Q0281/FR July 2020 | Results from GI Survey – identify very unstable ground when excavating trial pits | C | Sandy soil and made up very unstable ground | Collapse of excavations . | | | | Ensure any information regarding unstable ground conditions are passed on to anyone carrying out excavation works on the site | Designer Client & PC | | | | | | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GC3432-RED-73-XX-RP-D-0001 | Location of proposed drainage system | O<br>M<br>C<br>D | Impact on residents | Injury | | | | Routing | Designer and Client | | | | | | |
| GC3432-RED-73-XX-RP-D-0001 | Land uses including several car parks, an area of open space, an Amusement park fun fair and a former municipal caravan/ camping park | C | Residual materials on site | Infection , cuts, contamination | | | | Ground Surveys | Client and PC | | | | | | |
| GC3432-RED-73-XX-RP-D-0001 | Coney Beach Amusement Park, Sandy Bay Caravan Park, Newton Primary School and Griffin Park | C | Construction activities | Injury to public – in particular school children | | | | Competent Contractors, high level H&S Management | Client and PC | | | | | | |
| GC3432-RED-73-XX-RP-D-0001 | Area bound between 'The Portway' and 'Eastern Promenade' was a dry dock that was filled in the 1960's. underlain with material that is contaminated | C | Contaminated ground | Skin absorption , inhalation of contaminant vapours | | | | Material sampling safe working practice | PC | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GC3432-RED-73-XX-RP-D-0001 | Proposed phasing plan | C | Prolonged construction period | Additional time third parties exposed to potential construction activities | | | | Coherent phasing | Designers and Client | | | | | | | |
| GC3432-RED-73-XX-RP-D-0001 | Surface water discharges | C | Flooding | Personal injury | | | | Adequate drainage capacity | Designer | | | | | | | |
| GC3432-RED-73-XX-RP-D-0001 | Masterplan mixed use development consisting of residential, commercial, leisure, car parking, new highway and pedestrian links and public open space | C | Incompatible activities / uses | Personal injury | | | | Consider suitable location interaction | Designer | | | | | | | |
| GC3432-RED-73-XX-RP-D-0001 | Land Use<br>Residential<br>Commercial<br>Leisure<br>Car Parking<br>Education<br>Highway/ pedestrian link<br>Public open space | C | Incompatible activities / uses | Personal injury | | | | Consider suitable location interaction | Designer | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GC3432-RED-73-XX-RP-D-0001 | Existing drainage including Public foul sewers Public foul rising main Public surface water sewers Highway drainage The Wilderness' drain 600mm Ø' drain | C | None identified | None identified | | | | N/A | N/A | | | | | | | |
| GC3432-RED-73-XX-RP-D-0001 | Drainage assets under private ownership Sandy Bay Caravan Park Coney Beach Amusement Park | C | Unidentified below ground utilities | Personal injury | | | | Ground surveys | Client and PC | | | | | | | |
| GC3432-RED-73-XX-RP-D-0001 | Foul drainage Connections 2 to 8 | C | Failure of connection | Personal injury and property damage | | | | Suitable connection processes | Designer and PC | | | | | | | |
| GC3432-RED-73-XX-RP-D-0001 | DCWW hydraulic modelling assessment (HMA) will be required to be undertaken on the existing public sewerage | C | None identified | None identified | | | | N/A | N/A | | | | | | | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GC3432-RED-73-XX-RP-D-0001 | Calculation outputs | O | Incorrect calculations | Failure of drainage system | | | | Ensure calculations are adequately verfied | Designer | | | | | | | |
| PRE-CONSTRUCTION INFORMATION FOR PORTHCAWL DRAINAGE PROJECT GROUND INVESTIGATIONS | Unexploded munitions | C | Unexploded munitions being discovered / disturbed | Explosion | | | | Surveys and records | Designer PC | | | | | | | |
| PRE-CONSTRUCTION INFORMATION FOR PORTHCAWL DRAINAGE PROJECT GROUND INVESTIGATIONS | Existing underground services | C | Located in close proximity to proposed drainage pipework | Damage to existing undergroun d services Injury to condstructi on personnel | | | | Obtain records of underground services and carry out safe digging practice | Designer PC | | | | | | | |

**Design Document number and revision** - document to which the risk relates, its document number and revision

**Classification as follows:**

O – operational, a risk to the operation or operatives of the future drainage system

M – Maintenance, a risk to the future maintainer or maintainer's operatives

C – Construction, a risk to a contractor/ principal contractor

D - Demoltion, the risk to any contractor whilst the demolition of the structure is being undertaken

**Hazard description** - brief description of the hazard

**Risk description** should include a description of how the hazard could be caused and its consequence

**Risk owner** – the risk owner shall always be the designer (or a designer the risk has been transferred to) until such time as it is agreed that no further design mitigation is possible. The risk can then be assigned to those that will need to manage it.

**Comments /actions** – this is a free field for further comments

**Status** – Eliminated or open.

**Interface description** - this field should be used to identify if the risk has been passed to another interfacing design to manage or a risk that must be managed collectively by designers. Where necessary, it should provide evidence that the interfacing designers have acknowledged the risk interface or risk transfer; and in the case of risk which needs to be managed across design boundaries, evidenced of the designer's cooperation and coordination with other designers to arrive at a solution.

The Risk Matrix is a tool to enable the ranking of risks so that the project team can prioritise actions, irrespective of the ranking or score the requirement to reduce risk to a level that is both tolerable and as low as reasonable practicable remains.

| Likelihood Rating | | | | | | |
|---|---|---|---|---|---|---|
| | Very High | MEDIUM | HIGH | HIGH | HIGH | HIGH |
| | High | MEDIUM | MEDIUM | HIGH | HIGH | HIGH |
| | Medium | LOW | MEDIUM | MEDIUM | HIGH | HIGH |
| | Low | LOW | LOW | MEDIUM | MEDIUM | HIGH |
| | Very Low | LOW | LOW | LOW | MEDIUM | MEDIUM |
| | | Very Low | Low | Medium | High | Very High |
| Impact Rating | | | | | | |

Guide to impact and likelihood ratings

## Guide to impact rating (severity of impact)

| Descriptor | Description |
|---|---|
| Very Low | Minor Injuries / ill health – non-first aid |
| Low | Injuries-requiring first aid but no lost time |
| Medium | Injury or illness incurred at work with 3 or more days lost time from work |
| High | Major injury / single fatality potential or illness with long term health effects, long absence from work |
| Very High | Multiple fatality potential |

## Guide to likelihood rating (probability or chance that event will occur)

| Descriptor | Description |
|---|---|
| Very Low | Improbable, highly unlikely to occur |
| Low | Remote, unlikely to happen but could |
| Medium | Occasional, increased chance or probability, event could happen or occur |
| High | Probable, more likely to happen than not |
| Very High | Frequent, highly likely to happen, almost certain. |

# Appendix B – Typical SHE box on drawings

1.1.1 The SHE box shall be included (only drawings to be issued to Contractors) where the designer has identified risks that may not be apparent to other designers or competent contractors, or are likely to be difficult to manage effectively.

1.1.2 The style of numbering shall allow ease of cross referencing to the Design risk register.

1.1.3 Future dismantling information, and other post construction risks, shall be identified in the future part of the SHE box.

| **Safety, Health and Environment Information** |
|---|
| Notes below are additional to hazards / risks normally associated with this type of work: |
| **Construction**<br>**Ci.**<br>**Cii.**<br>**Ciii.** |
| **Operations**<br>**Oi.**<br>**Oii.**<br>**Oiii.** |
| **Maintenance**<br>**Mi.**<br>**Mii.**<br>**Miii.** |
| **Dismantling / Demolition (Future)**<br>**Fi.**<br>**Fii.**<br>**Fiii.** |
| |

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