

**PROPOSED NEW DEVELOPMENT TO LAND  
SOUTH OF AUTUMN GATE,  
HOOK LANE  
ALDINGBOURNE  
WEST SUSSEX  
PO20 3TE**

## **DRAINAGE DESIGN REPORT**

For:

**RANDMERE LIMITED**

Cowan Consultancy Ltd  
3 Turnberry House  
4400 Parkway  
Whiteley  
Fareham  
Hampshire  
PO15 7FJ

[www.cowanconsult.co.uk](http://www.cowanconsult.co.uk)

Landguard Manor  
Landguard Manor Road  
Shanklin  
Isle of Wight  
PO37 7JB

**TB/435050/eg  
25 September 2025**

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## **1.0 INTRODUCTION**

- 1.1 This report has been prepared by Cowan Consultancy Limited (CCL) for Randmere Limited.
- 1.2 This drainage design report is required, to form part of a Discharge of Condition planning application related to the drainage of the subject site. The report is to demonstrate that the surface water and foul water can be adequately disposed of.

## **2.0 GEOLOGY OF THE AREA**

- 2.1.1 The site lies on OS grid reference (Eastings) 493545 (Northings) 104528 and Site GPS Coordinates 50.832735, -0.67303222.
- 2.1.2 By reference to the British Geological Maps, the site would be expected to lie within a bedrock of the London Clay Formation. Overlain by superficial deposits of River Terrace Deposits – Sand, silt and clay.
- 2.1.3 Borehole logs, which were undertaken for the drainage design at the adjacent Autumn Gate development, confirm that the site is underlain with River Terrace Deposits but did not encounter the London Clay within the borehole depths of 3m. These logs can be seen in Appendix D

## **3.0 SITE DESCRIPTION**

- 3.1.1 The site for the proposed development consists of approximately 0.3219 ha and is considered to be a greenfield development site.
- 3.1.2 The site consists mainly of unkept shrubs and grass with some trees / hedges to the site boundaries.
- 3.1.3 The site is adjoined to the north by the recently built Autumn Gate (Springfields) development with the Westergate development beyond this. To the south, west & east of the site is existing residential properties.
- 3.1.4 The site is relatively flat but with a gradual slope from north west to south east.
- 3.1.5 The proposed access to the site is via the existing Autumn Gate development.

- 3.1.6 The proposed site development consists of a mixture of 2, 3 & 4 bed detached & semi-detached houses, together with associated landscaping, amenity space and parking.

#### **4.0 SURFACE WATER DRAINAGE STRATEGY**

##### **4.1 Pre-Development**

- 4.2 The site is currently undeveloped land and its previous use is unknown at this stage. It is assumed not to have the benefit of any formal drainage serving the area.

- 4.3 The site slopes generally from north west to south east. Any rainfall which does not naturally permeate into the ground will ultimately discharge off site.

- 4.4 Southern Water sewer record plans indicate that there are no public surface water or combined sewers in the vicinity of the site.

##### **4.5 Post-Development**

- 4.6 The site is currently undeveloped and therefore any proposed development will increase the impermeable area, thus increasing surface water runoff rates and volumes of water.

- 4.7 Referencing the infiltration testing and groundwater monitoring data from the adjacent Autumn Gate development site, see Appendix D, it shows that disposing of the surface water via infiltration on site is not feasible. Infiltration testing showed negligible infiltration over the test period and groundwater monitoring showed the highest recorded groundwater level to be 0.22m bgl.

- 4.8 Following the SuDS hierarchy for method of discharge (see below) the appropriate methods applicable to this site are 1 & 4. Rainwater reuse is utilised by the proposed provision of water butts to each property.

1. Rainwater reuse where possible
2. Complete discharge into the ground (infiltration)
3. Hybrid infiltration and restricted discharge to an appropriate water body or surface water sewer
4. Restricted discharge to an appropriate water body
5. Restricted discharge to a surface water sewer
6. Restricted discharge to a combined sewer

- 4.9 There are no surface water bodies directly adjacent to any of the site boundaries, but there is a ditch to the north of the Autumn Gate development.

- 4.10 The development of Autumn Gate which is located to the north of the subject site, utilises a shallow attenuation system for the surface water drainage, which conveys the surface water flows to the north-eastern boundary of the site, where it discharges into a ditch. Via the ditch, the surface water enters the Westergate development surface water drainage system. This was agreed with the Management Company of the Westergate Development and approved by Arun DC as part of the Discharge of Conditions for the Autumn Gate development.
- 4.11 Cowan Consultancy Ltd carried out the drainage design for the Autumn Gate development and, as such, we have been able to use the Flow model to determine that there is additional capacity within the existing system to accommodate the additional flows, whilst negating the need to increase the discharge rate into the ditch. Please see Appendix C for updated Flow calculations that shows that the existing Autumn Gate drainage system can adequately take the additional flow from the new site.
- 4.12 The new site flow calculations in Appendix C show that an additional flow of 0.4l/s is required to be applied to the existing Autumn Gate development
- 4.13 The current day climate change allowances have been applied to the new site flow calculations (45% climate change allowance to the 1-in-100 year storm event).
- 4.14 The existing Autumn Gate surface water drainage calculations have had the climate change allowances kept the same as what was the requirement at the time of the design, which is 40% climate change allowance to the 1-in-100 year storm event.
- 4.15 The discharge rate for the existing Autumn Gate development is set at 1.2 l/s, of which was agreed at the time when this was designed. It is proposed to keep this discharge rate unaltered, meaning that the agreement with the Westergate development Management Company will not be affected, neither will the Ordinary Watercourse Consent approval.
- 4.16 Greenfield Run-off calculations (pre-development) can be seen on page 6 of the flow model calculations in Appendix C. These are based upon a soil index of 2 and show a QBAR rate of 0.5 l/s for the combined Autumn Gate site and the proposed site.
- 4.17 Infiltration testing on site showed there to be negligible infiltration achieved on the site, thus a soil index of 2 is not really appropriate to be applied to this site,

as it assumes a far greater volume of surface water infiltrates instead of run-off. Therefore, HR Wallingford Greenfield Run-off calculations can be seen in Appendix B, which shows the QBAR for the site with a more realistic soil index 4 applied. The QBAR for the combined impermeable areas of the Autumn Gate site and the new site, is 1.4 l/s. This is higher than the discharge rate that has been set, but for the reasons mentioned above the current discharge rate shall not be increased. This means that the proposed design is not increasing discharge from the pre-development run-off rate.

- 4.18 The impermeable surfaces of the new site can be seen in Appendix C, these equate to 0.0763 ha. The impermeable surfaces of the existing Autumn Gate site equate to 0.2003 ha. This gives a total impermeable surface area applied to the HR Wallingford Greenfield Run-off calculations of 0.2766 ha.
- 4.19 It is proposed that the subject site surface water is piped into the Autumn Gate development surface water system. Additional attenuation has been provided within the new development, this has been located at shallow depths underneath the property driveways, with controlled discharge into the Autumn Gate system.
- 4.20 The topography allows for a gravity system to be effective, as shallow attenuation features have been utilised.
- 4.21 A 400mm depth sub-base underneath permeable driveway areas has been designed to attenuate and convey the surface water. Water from roofs is drained to the permeable sub-base via pipework and diffuser units, with a silt trap proceeding each connection into the sub-base. The permeable driveway sub-bases are piped into the Autumn Gate access road permeavoid attenuation tank via a contraflow orifice control chamber.
- 4.22 As mentioned above, the new site drainage scheme has included a climate change allowance of 45% and a 10% urban creep has been applied to all impermeable areas except the access road.
- 4.23 Percolation testing to BRE 365 and groundwater monitoring data already obtained for the Autumn Gate site will suffice to accompany this drainage design for the new site, see Appendix D
- 4.24 The proposed Drainage Design can be seen in Appendix A

## **5.0 SUSTAINABLE URBAN DRAINAGE SYSTEMS**

- 5.1 SuDS have been incorporated into the design to intercept rainfall and convey the water to the ditch outfall to the north-east of the site.
- 5.2 As well as providing storm water storage, the SuDS features are within the design to ensure the water quality entering the surface water body is acceptable.
- 5.3 In accordance with section 26.3 of CIRIA C753 recommends the use of simple index approach for assessing the minimum water quality management requirements and this method has been used to assess the suitability of above proposals as follows:
- (i) From table 26.2, residential roads runoff is considered low pollution hazard
  - (ii) From table 26.2 the following hazard indices are applicable;  
Total suspended solids – 0.5  
Metals – 0.4  
Hydrocarbons – 0.4
  - (iii) From table 26.3, the indicative SuDS mitigation indices for permeable paving is as follows;  
Total suspended solids – 0.7  
Metals – 0.6  
Hydrocarbons – 0.7
- 5.4 From the above it can be seen that the provision of permeable paving exceeds the pollution mitigation requirements.

## **6.0 FOUL DRAINAGE STRATEGY**

### **6.1 Pre-Development**

- 6.2 The site is currently undeveloped land and therefore it is unlikely that there will not be any foul drainage system serving the area.

- 6.3 Southern Water sewer record plans indicate that there is an existing 150mm diameter public foul sewer in Hook Lane. This flows from south to north.

### **6.4 Post-Development**

- 6.5 The site will require a new foul drainage network.
- 6.6 The proposed site consists of 5 residential dwellings. Using the recommendations within Sewers for Adoption 7<sup>th</sup> Edition for an allowance of 4000 litres per unit per day, this will result in a peak flow of 0.23 l/s from the proposed development.
- 6.7 It is proposed that the new development is connected into the Autumn Gate development foul drainage network. However, It will be necessary to confirm with Southern Water that there is sufficient capacity within the system to accommodate the additional flow.
- 6.8 Due to the topography of the site, there is a requirement for Plot 5 to be pumped. This will be a private package pumping station.
- 6.9 The rest of the site can then discharge via a gravity system into the Autumn Gate foul manhole FWMH 9.

Signature.....



**TIM BUTTON**

***For and on behalf of Cowan Consultancy Limited***

## **APPENDIX A**

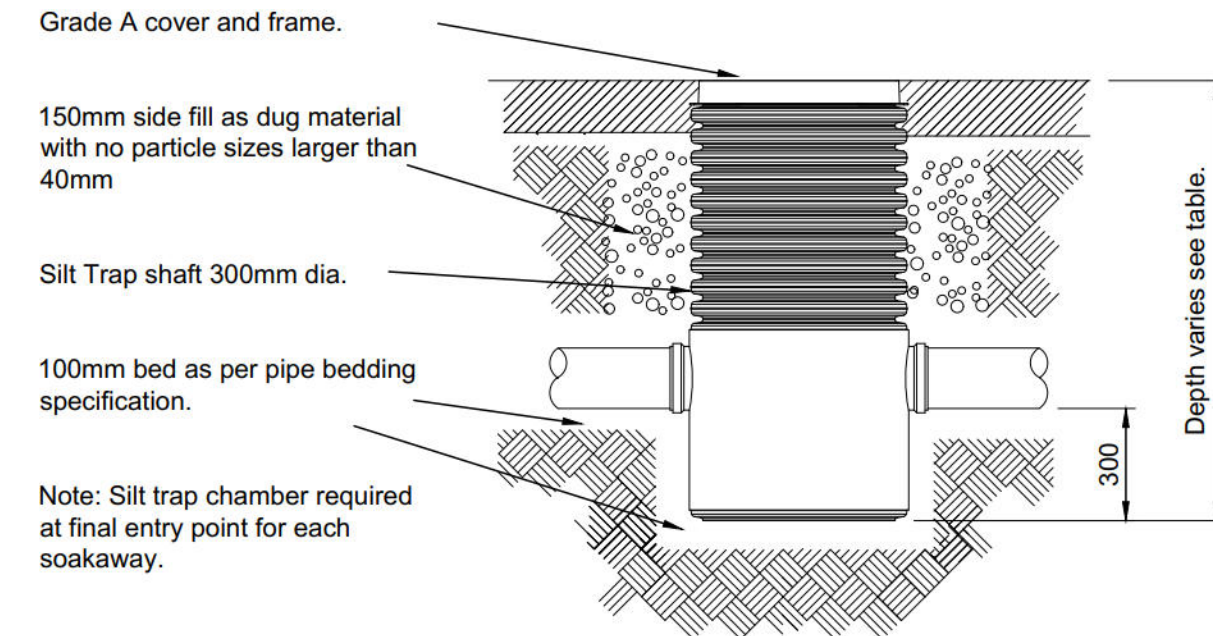
### **DRAINAGE STRATEGY DRAWING**

In preparing the designs illustrated by this drawing we have fulfilled our duties in the role of Designer as defined in the Construction Design and Management Regulations 2015. We have undertaken a full Hazard Identification and Risk Analysis and have designed out any special risks associated with the work, so that as far as possible there are no residual risks.

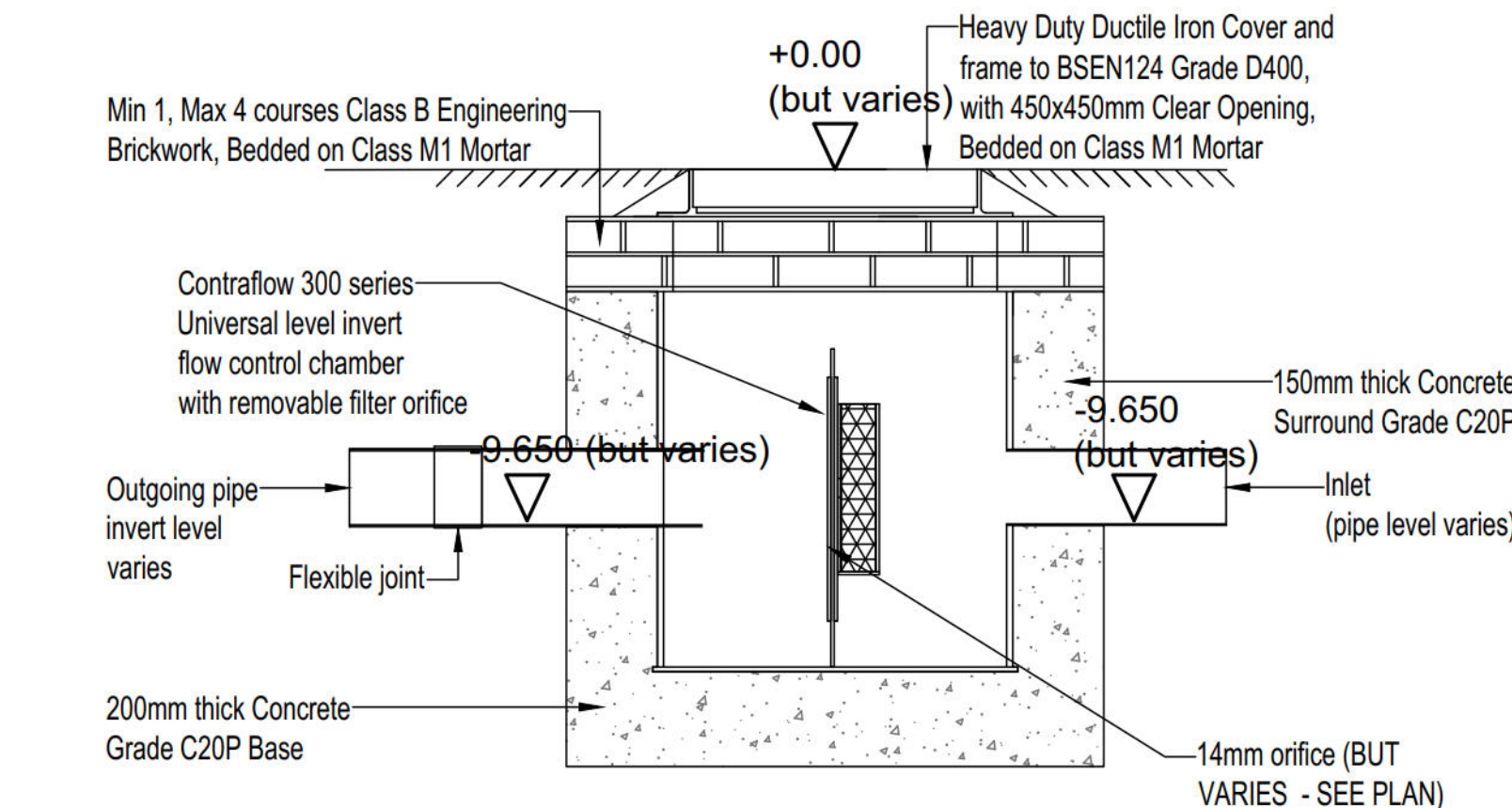
Where hazards have been identified, the risks from which it has not been possible to eliminate during the design process, these are indicated on the drawing. It will be the responsibility of the Principal Contractor to develop Safe Systems of Work and/or Method Statements to minimise any risks associated with such hazards.

1. This drawing has been prepared using a Topographical Survey Drawing supplied by the client in AutoCAD format.
2. This drawing is to be read in conjunction with all relevant Engineers' and Architects' drawings and specifications.
3. All dimensions are in millimetres unless noted otherwise. All levels are in metres.
4. The contractor is responsible for setting out and for checking dimensions.
5. In accordance with The Construction (Design and Management) Regulations 2015 (CDM 2015) the Principle Designer and Contractor are to:
  - Notify HSE of works.
  - Comply with the requirements of Health and Safety Plan (if applicable)
  - Provide risk assessments and method statements for all potential hazards relevant to this project.
6. The main contractor shall be responsible for the setting out and accuracy of all dimensions. The contractor shall be satisfied that the information given is correct and any discrepancies should be noted to the Engineer immediately.
7. The Contractor is responsible for specifying product and codes and ordering of drainage materials.
8. New adoptable pipework to be vitrified clay type and to be constructed to the following specifications. Systems that are resistant to a jetting pressure of 4000psi. Systems that minimise the number of joints in the system, by using 3metre pipe length. Systems that do not have lip seal joints, hence preventing root ingress.
9. All non-uPVC (adoptable) pipe connection to manholes shall be provided with a 'rocker pipe' of 600mm effective length in accordance with CI E6.6 of 'Sewers for Adoption'.
10. Precast concrete manhole units shall comply with the relevant provisions of BS EN 1917 and BS 5911-3.
11. Cover grades are in accordance with BS497 Pt 1
  - Cover Grades : D400 - carriageways.
  - B125 - carriageways for slow traffic.
  - A15 - inaccessible to vehicles
12. All drainage pipes within development site to be 100mm dia unless shown otherwise.
13. All uPVC drainage to be installed to BS5955 Pt6 and in strict accordance with the manufacturers instructions.
14. All uPVC drainage products to conform to BS EN1401 & Kite mark certified in accordance with specification.
15. All adoptable drainage and associated works to comply with the latest Part E - Civil Engineering Specification of 'Sewer for Adoption'.
16. DO NOT SCALE. If discrepancy or query arises on dimensions consult Engineer.

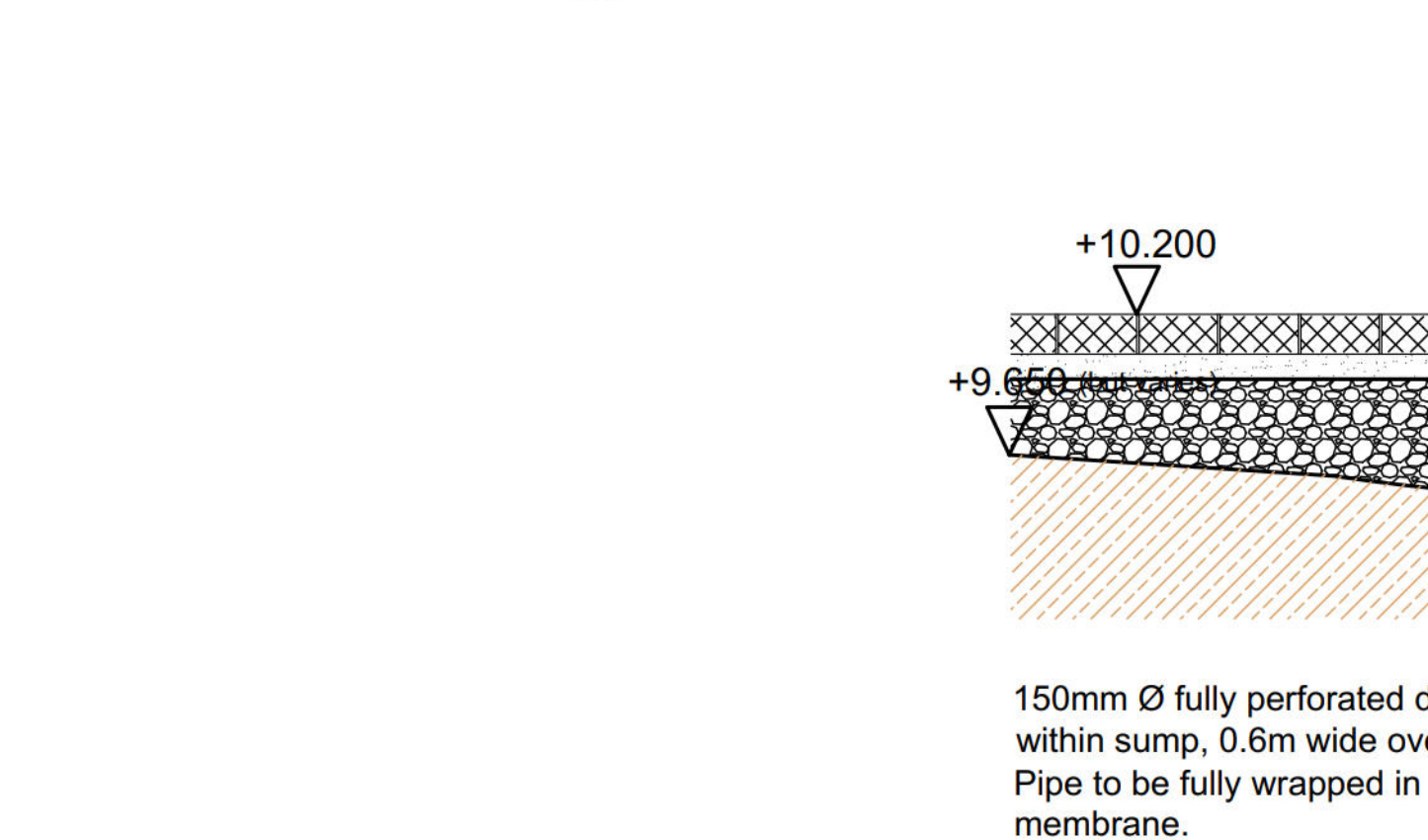
|                                                                                                                                                              |          |                                                                                                    |               |      |          |             |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------|---------------|------|----------|-------------|----|
| 25.09.25                                                                                                                                                     | TB       | Updates following ADC comments                                                                     |               |      |          |             | P1 |
| Date                                                                                                                                                         | By       | Revision                                                                                           |               | QA'D | Chk'd    | Ref         |    |
| Status                                                                                                                                                       |          | PRELIMINARY                                                                                        |               |      |          |             |    |
|  <b>Cowan Consultancy</b><br>STRUCTURAL, CIVIL AND BUILDING CONSULTANTS |          | Also at:<br>Landguard Manor<br>Landguard Manor Road<br>Shanklin<br>Isle of Wight<br>PO37 7JB       |               |      |          |             |    |
| 3 Turnberry House<br>4400 Parkway<br>Whiteley<br>Fareham<br>Hampshire<br>PO15 7FJ                                                                            |          | Tel: 01489 577488<br>Fax: 01489 579873<br>consultants@cowanconsult.co.uk<br>www.cowanconsult.co.uk |               |      |          |             |    |
| Client                                                                                                                                                       |          | RANDMERE LIMITED                                                                                   |               |      |          |             |    |
| Project                                                                                                                                                      |          | KARENZA (SITE SOUTH OF AUTUMN GATE)<br>HOOK LANE, ALDINGBOURNE, WEST SUSSEX, PO20 3TE              |               |      |          |             |    |
| Title                                                                                                                                                        |          | DRAINAGE LAYOUT GA                                                                                 |               |      |          |             |    |
| Date                                                                                                                                                         | JUN 2025 | Scale                                                                                              | AS SHOWN @ A1 |      | Drg. No. |             |    |
| Drawn                                                                                                                                                        | TB       | Chk'd                                                                                              | EG            | QA'D | EG       | 435050-221P |    |



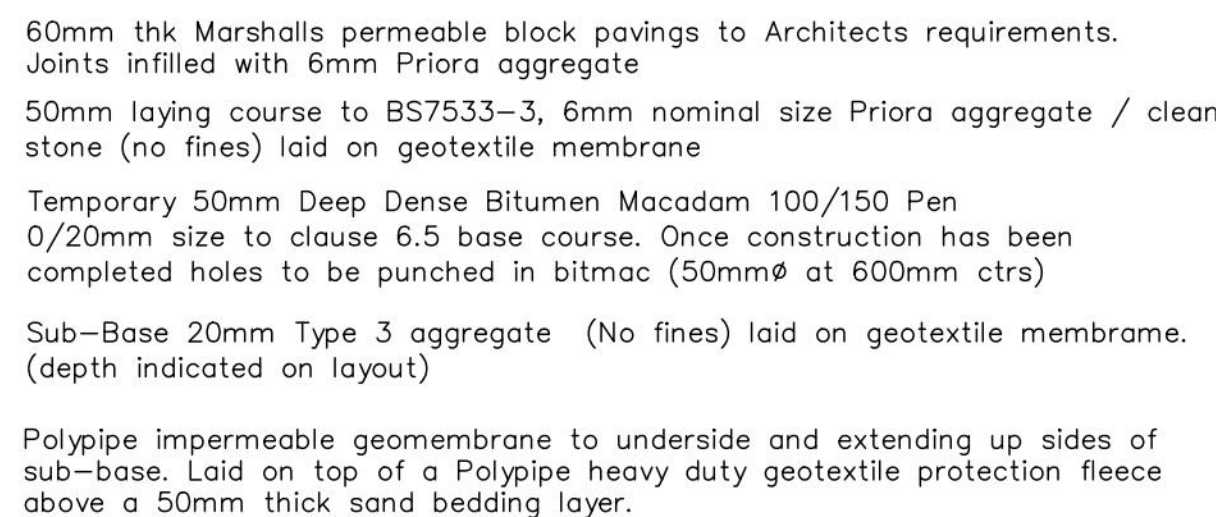
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SCALE 1:15



SCALE 1: 15

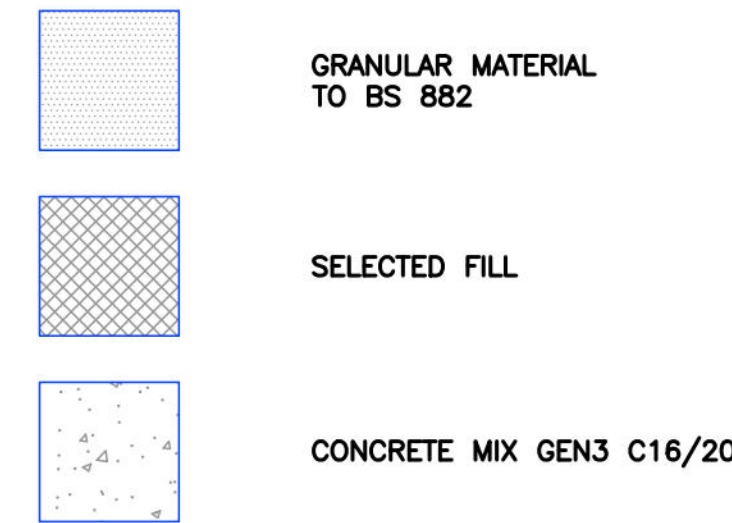


SCALE 1: 20

SCALE 1: 20



## LEGEND



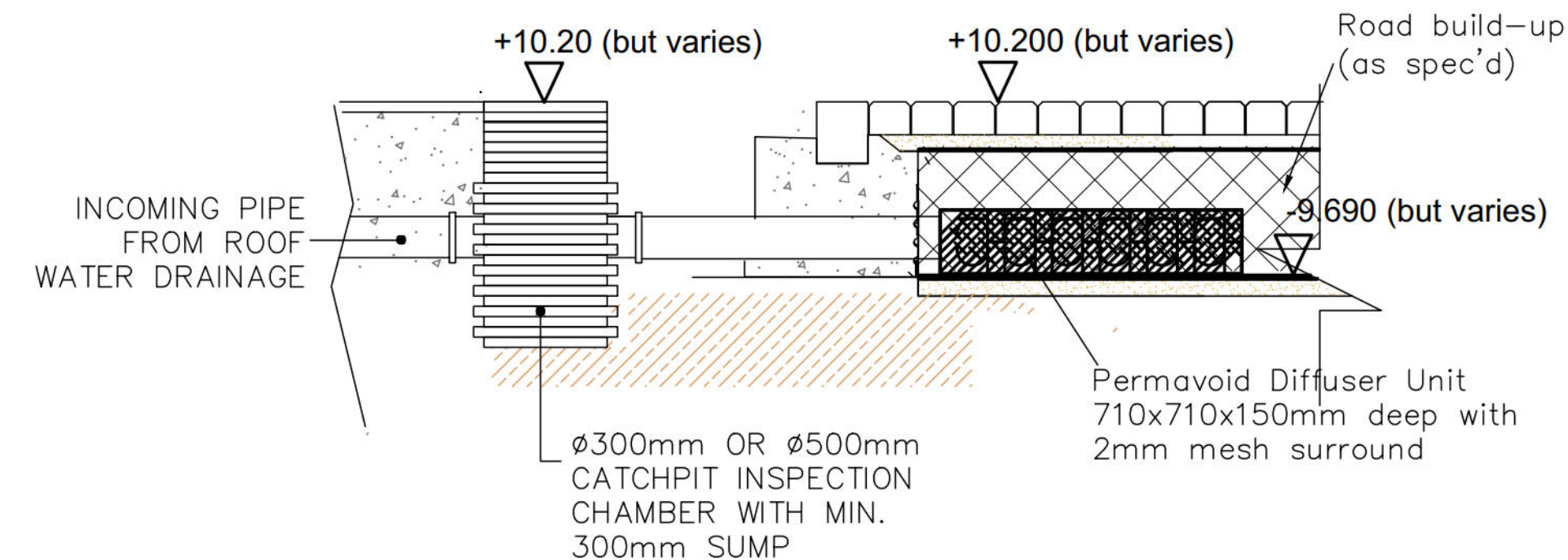
**SELECTED FILL:**  
Fill free from vegetable matter, rubbish, frozen soil and material retained on a 40 mm sieve.  
Compacted by hand in 100 mm layers.



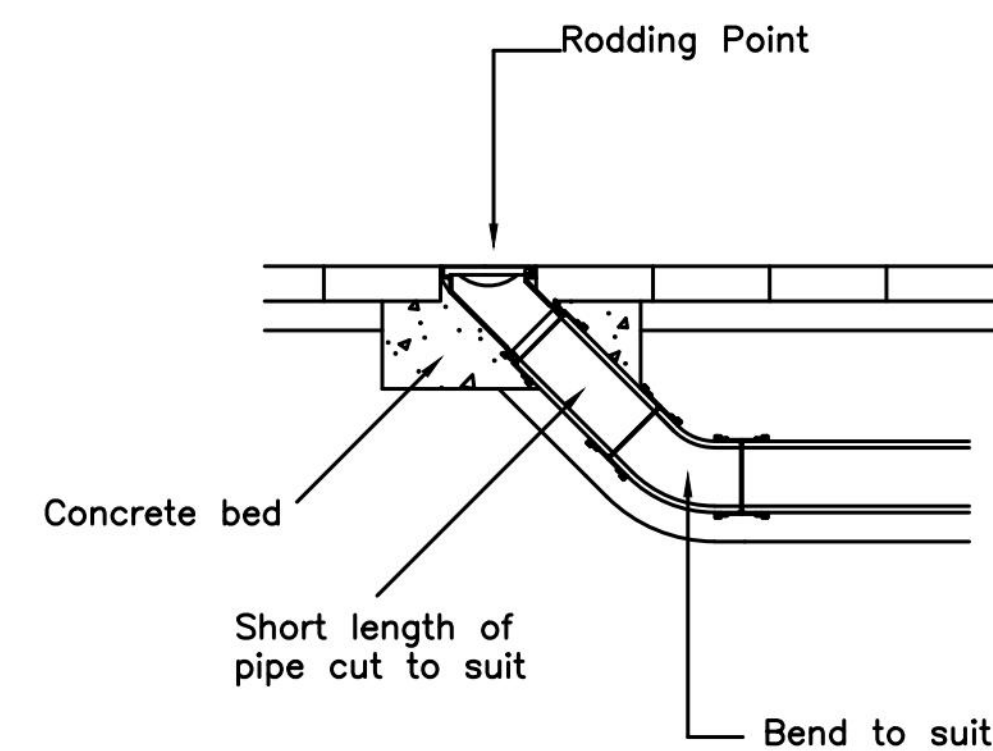
## CLASS S (RIGID PIPES)

Cover 0.6m - 6.0m pedestrian and vehicular areas

## PIPE BEDDING DETAILS



SCALE 1:15



## RODDING EYE

**! CDM 2015 - RESIDUAL RISKS !**

In preparing the designs illustrated by this drawing we have fulfilled our duties in the role of Designer as defined in the Construction Design and Management Regulations 2015. We have undertaken a full Hazard Identification and Risk Analysis and have designed out any special risks associated with the work, so that as far as possible there are no residual risks.

**NOTE:** Residual risks are defined as those risks arising from identified hazards which cannot be designed-out, and which a competent and experienced building contractor is unlikely to encounter during normal construction activities. Ordinary risks arising from normal construction operations have not been included.

Where hazards have been identified, the risks from which it has not been possible to eliminate during the design process, these are indicated on the drawing. It will be the responsibility of the Principal Contractor to develop Safe Systems of Work and/or Method Statements to minimise any risks associated with such hazards.

## NOTES

1. This drawing has been prepared using a Topographical Survey Drawing supplied by the client in AutoCAD format.
2. This drawing is to be read in conjunction with all relevant Engineers' and Architects' drawings and specifications.
3. All dimensions are in millimetres unless noted otherwise. All levels are in metres.
4. The contractor is responsible for setting out and for checking dimensions.
5. In accordance with The Construction (Design and Management) Regulations 2015 (CDM 2015) the Principle Designer and Contractor are to:
  - Notify HSE of works.
  - Comply with the requirements of Health and Safety Plan (if applicable)
  - Provide risk assessments and method statements for all potential hazards relevant to this project.
6. The main contractor shall be responsible for the setting out and accuracy of all dimensions. The contractor shall be satisfied that the information given is correct and any discrepancies should be noted to the Engineer immediately.
7. Contractor to ensure that the existing sewers remain in service until the diversion works are completed.
8. The Contractor is responsible for specifying product and codes and ordering of drainage materials.
9. Contractor to ensure that new sewers are laid and installed in like to like basis.
10. New adoptable pipework to be vitrified clay type and to be constructed to the following specifications. Systems that are resistant to a jetting pressure of 4000psi. Systems that minimise the number of joints in the system, by using 3metre pipe length. Systems that do not have lip seal joints, hence preventing root ingress.
11. All non-uPVC (adoptable) pipe connection to manholes shall be provided with a 'rocker pipe' of 600mm effective length in accordance with Cl E6.6 of 'Sewers for Adoption'.
12. Precast concrete manhole units shall comply with the relevant provisions of BS EN 1917 and BS 5911-3.
13. The diameter of the pipes to be diverted are 300mm for storm and 150mm for foul. The new pipes are to be 300mm and 150mm for foul diameter respectively. Any abandoned pipes or manholes are to be grubbed out or sealed up.
14. Cover grades are in accordance with BS497 Pt 1  
Cover Grades : D400 - carriageways.  
                  B125 - carriageways for slow traffic.  
                  A15 - inaccessible to vehicles
15. All drainage pipes within development site to be 100mm dia unless shown otherwise.
16. All uPVC drainage to be installed to BS5955 P16 and in strict accordance with the manufacturers instructions.
17. All uPVC drainage products to conform to BS EN1401 & Kite mark certified in accordance with specification.
18. All adoptable drainage and associated works to comply with the latest Part E - Civil Engineering Specification of 'Sewer for Adoption'.
19. DO NOT SCALE. If discrepancy or query arises on dimensions consult Engineer.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                       |          |                     |    |      |    |             |  |      |       |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------|---------------------|----|------|----|-------------|--|------|-------|-----|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                       |          |                     |    |      |    |             |  |      |       |     |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | By                                                                                    | Revision |                     |    |      |    |             |  | QA'D | Chk'd | Ref |
| Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | PRELIMINARY                                                                           |          |                     |    |      |    |             |  |      |       |     |
| <div><div><b>Cowan Consultancy</b><br/>STRUCTURAL, CIVIL AND BUILDING CONSULTANTS</div></div> <div><div>3 Turnberry House<br/>4400 Parkway<br/>Whiteley<br/>Fareham<br/>Hampshire<br/>PO15 7FJ</div><div>Tel: 01489 577488<br/>Fax: 01489 579873<br/>consultants@cowanconsult.co.uk<br/>www.cowanconsult.co.uk</div></div> <div>Landguard Manor<br/>Landguard Manor Road<br/>Shanklin<br/>Isle of Wight<br/>PO37 7JB</div> |                                                                                       |          |                     |    |      |    |             |  |      |       |     |
| Client                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | RANDMERE LIMITED                                                                      |          |                     |    |      |    |             |  |      |       |     |
| Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | KARENZA (SITE SOUTH OF AUTUMN GATE)<br>HOOK LANE, ALDINGBOURNE, WEST SUSSEX, PO20 3TE |          |                     |    |      |    |             |  |      |       |     |
| Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | DRAINAGE DETAILS                                                                      |          |                     |    |      |    |             |  |      |       |     |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | JUN 2025                                                                              |          | Scale AS SHOWN @ A1 |    |      |    | Drg. No.    |  |      |       |     |
| Drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TB                                                                                    |          | Chk'd               | EG | QA'D | EG | 435050-222P |  |      |       |     |

DO NOT SCALE THIS DRAWING

## **APPENDIX B**

### **GREENFIELD RUN-OFF RATE CALCULATIONS**

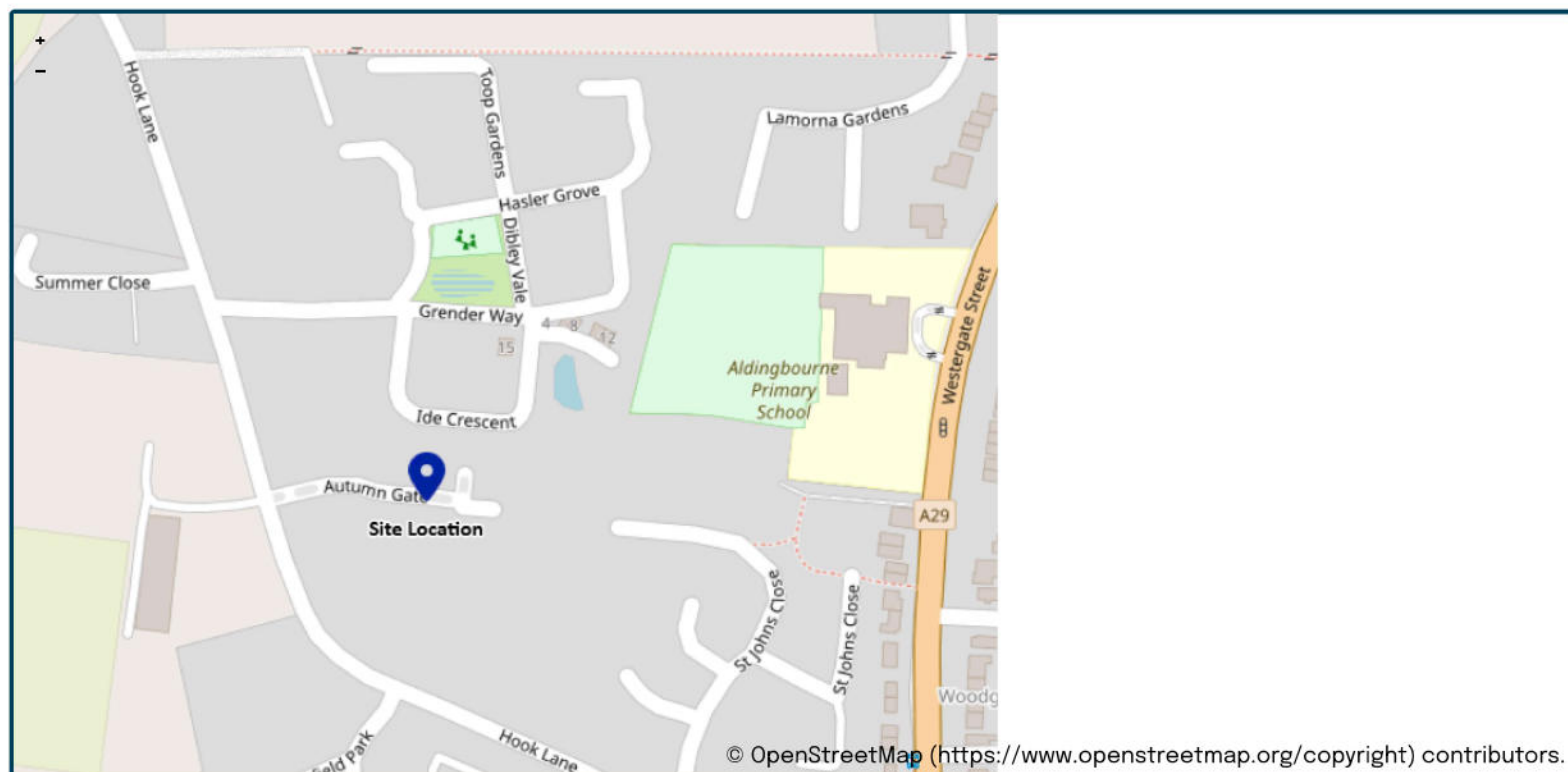
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

## Project details

|               |                                         |
|---------------|-----------------------------------------|
| Date          | <input type="text" value="18/06/2025"/> |
| Calculated by | <input type="text" value="Tim Button"/> |
| Reference     | <input type="text" value="Karenza"/>    |
| Model version | <input type="text" value="2.0.1"/>      |

## Location

|               |                                           |
|---------------|-------------------------------------------|
| Site name     | <input type="text" value="Karenza"/>      |
| Site location | <input type="text" value="Aldingbourne"/> |



|               |                                     |
|---------------|-------------------------------------|
| Site easting  | <input type="text" value="493546"/> |
| Site northing | <input type="text" value="104533"/> |

## Site details

|                      |                                     |    |
|----------------------|-------------------------------------|----|
| Total site area (ha) | <input type="text" value="0.2766"/> | ha |
|----------------------|-------------------------------------|----|

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# Greenfield runoff

## Method

|                            |                                             |                       |                                  |
|----------------------------|---------------------------------------------|-----------------------|----------------------------------|
| Method                     | IH124                                       |                       |                                  |
| IH124                      |                                             |                       |                                  |
|                            | <u>My value</u>                             | <input type="radio"/> | <u>Map value</u>                 |
| SAAR (mm)                  | <input type="text" value="749"/>            | mm                    | <input type="text" value="749"/> |
| How should SPR be derived? | <input type="text" value="WRAP soil type"/> |                       |                                  |
| WRAP soil type             | <input type="text" value="4"/>              | <input type="radio"/> | <input type="text" value="2"/>   |
| SPR                        | <input type="text" value="0.47"/>           |                       |                                  |
| QBar (IH124) (l/s)         | <input type="text" value="1.4"/>            | l/s                   |                                  |

## Growth curve factors

|                        |                                   |                       |                                |
|------------------------|-----------------------------------|-----------------------|--------------------------------|
|                        | <u>My value</u>                   | <input type="radio"/> | <u>Map value</u>               |
| Hydrological region    | <input type="text" value="7"/>    |                       | <input type="text" value="7"/> |
| 1 year growth factor   | <input type="text" value="0.85"/> |                       |                                |
| 2 year growth factor   | <input type="text" value="0.88"/> |                       |                                |
| 10 year growth factor  | <input type="text" value="1.62"/> |                       |                                |
| 30 year growth factor  | <input type="text" value="2.3"/>  |                       |                                |
| 100 year growth factor | <input type="text" value="3.19"/> |                       |                                |
| 200 year growth factor | <input type="text" value="3.74"/> |                       |                                |

## Results

|                           |                                  |     |
|---------------------------|----------------------------------|-----|
| Method                    | IH124                            |     |
| Flow rate 1 year (l/s)    | <input type="text" value="1.2"/> | l/s |
| Flow rate 2 year (l/s)    | <input type="text" value="1.3"/> | l/s |
| Flow rate 10 years (l/s)  | <input type="text" value="2.3"/> | l/s |
| Flow rate 30 years (l/s)  | <input type="text" value="3.3"/> | l/s |
| Flow rate 100 years (l/s) | <input type="text" value="4.6"/> | l/s |
| Flow rate 200 years (l/s) | <input type="text" value="5.4"/> | l/s |

### Disclaimer

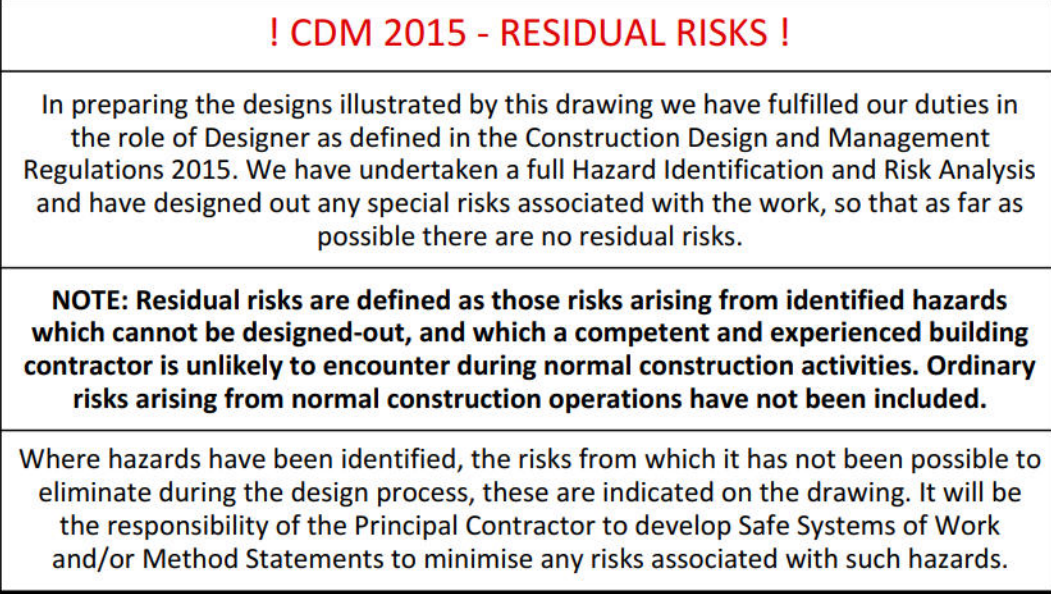
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## **APPENDIX C**

### **DRAINAGE NETWORK CALCULATIONS**





### Design Settings

|                       |        |                                      |               |                                    |       |
|-----------------------|--------|--------------------------------------|---------------|------------------------------------|-------|
| Rainfall Methodology  | FEH-22 | Maximum Time of Concentration (mins) | 30.00         | Preferred Cover Depth (m)          | 0.400 |
| Return Period (years) | 2      | Maximum Rainfall (mm/hr)             | 50.0          | Include Intermediate Ground        | ✓     |
| Additional Flow (%)   | 6      | Minimum Velocity (m/s)               | 1.00          | Enforce best practice design rules | ✓     |
| CV                    | 1.000  | Connection Type                      | Level Inverts |                                    |       |
| Time of Entry (mins)  | 5.00   | Minimum Backdrop Height (m)          | 0.200         |                                    |       |

### Nodes

| Name  | Area<br>(ha) | T of E<br>(mins) | Add<br>Inflow<br>(l/s) | Cover<br>Level<br>(m) | Diameter<br>(mm) | Width<br>(mm) | Easting<br>(m) | Northing<br>(m) | Depth<br>(m) |
|-------|--------------|------------------|------------------------|-----------------------|------------------|---------------|----------------|-----------------|--------------|
| 53    |              | 5.00             |                        | 10.400                |                  |               | 161026.272     | 49304.739       | 0.640        |
| 52    |              |                  |                        | 10.297                |                  |               | 161029.884     | 49290.595       | 0.569        |
| 51    |              | 5.00             |                        | 10.300                |                  |               | 161034.070     | 49296.038       | 0.400        |
| 50    |              | 5.00             |                        | 10.400                |                  |               | 161030.248     | 49304.407       | 0.350        |
| SW-01 |              |                  |                        | 10.300                | 450              |               | 161032.013     | 49294.619       | 0.780        |
| 48    | 0.013        | 5.00             |                        | 10.276                |                  |               | 161039.342     | 49293.075       | 0.569        |
| 47    |              | 5.00             |                        | 10.460                |                  |               | 161041.870     | 49307.455       | 0.460        |
| 46    |              | 5.00             |                        | 10.300                |                  |               | 161042.428     | 49298.230       | 0.350        |
| SW-02 |              |                  |                        | 10.270                | 450              |               | 161045.631     | 49299.665       | 0.753        |
| 44    |              |                  |                        | 10.255                |                  |               | 161048.544     | 49295.488       | 0.569        |
| 43    |              | 5.00             |                        | 10.270                |                  |               | 161059.309     | 49309.432       | 0.575        |
| 42    |              |                  |                        | 10.235                |                  |               | 161057.553     | 49296.345       | 0.569        |
| 41    |              | 5.00             |                        | 10.216                |                  |               | 161067.220     | 49298.691       | 0.555        |
| 40    | 0.017        | 5.00             |                        | 10.214                |                  |               | 161066.110     | 49290.649       | 0.570        |
| 39    |              | 5.00             |                        | 10.230                |                  |               | 161071.986     | 49310.482       | 0.250        |
| SW-04 |              |                  |                        | 10.216                | 450              |               | 161069.847     | 49297.610       | 0.722        |
| 37    |              |                  |                        | 10.205                |                  |               | 161069.553     | 49290.105       | 0.569        |
| 36    |              | 5.00             |                        | 10.230                |                  |               | 161074.227     | 49311.417       | 0.250        |
| 35    |              | 5.00             |                        | 10.194                |                  |               | 161073.315     | 49301.052       | 0.300        |
| SW-05 |              |                  |                        | 10.216                | 450              |               | 161071.911     | 49297.381       | 0.722        |
| 33    |              |                  |                        | 10.201                |                  |               | 161071.569     | 49290.040       | 0.569        |
| 32    |              | 5.00             |                        | 10.194                |                  |               | 161075.785     | 49298.697       | 0.550        |
| 31    |              |                  |                        | 10.194                |                  |               | 161074.752     | 49289.912       | 0.569        |
| 30    |              | 5.00             |                        | 10.183                |                  |               | 161081.820     | 49297.865       | 0.553        |

**Nodes**

| Name           | Area<br>(ha) | T of E<br>(mins) | Add<br>Inflow<br>(l/s) | Cover<br>Level<br>(m) | Diameter<br>(mm) | Width<br>(mm) | Easting<br>(m) | Northing<br>(m) | Depth<br>(m) |
|----------------|--------------|------------------|------------------------|-----------------------|------------------|---------------|----------------|-----------------|--------------|
| 29             |              |                  |                        | 10.181                |                  |               | 161080.817     | 49289.651       | 0.569        |
| 28             |              | 5.00             |                        | 10.180                |                  |               | 161084.968     | 49299.402       | 0.300        |
| 27             |              | 5.00             |                        | 10.160                |                  |               | 161086.911     | 49309.428       | 0.200        |
| SW-06          |              |                  |                        | 10.180                | 450              |               | 161085.376     | 49295.907       | 0.743        |
| 25             |              |                  |                        | 10.171                |                  |               | 161085.159     | 49289.476       | 0.566        |
| 24             |              | 5.00             |                        | 10.160                |                  |               | 161089.206     | 49311.922       | 0.200        |
| SW-07          |              |                  |                        | 10.180                | 450              |               | 161087.060     | 49295.823       | 0.743        |
| 21             | 0.015        | 5.00             |                        | 10.167                |                  |               | 161087.209     | 49289.463       | 0.569        |
| 20             |              | 5.00             |                        | 10.130                |                  |               | 161096.381     | 49303.591       | 0.515        |
| 19             |              |                  |                        | 10.123                |                  |               | 161094.252     | 49288.763       | 0.540        |
| 18             |              | 5.00             |                        | 10.110                |                  |               | 161100.338     | 49310.425       | 0.200        |
| 17             |              | 5.00             |                        | 10.130                |                  |               | 161096.637     | 49310.914       | 0.200        |
| SW-08          |              |                  |                        | 10.150                | 450              |               | 161098.181     | 49294.483       | 0.737        |
| 15             |              |                  |                        | 10.112                |                  |               | 161099.183     | 49288.072       | 0.540        |
| 14             |              | 5.00             |                        | 10.125                |                  |               | 161107.337     | 49301.900       | 0.533        |
| 13             | 0.023        | 5.00             |                        | 10.125                |                  |               | 161105.198     | 49286.789       | 0.567        |
| 12             |              | 5.00             |                        | 10.115                |                  |               | 161126.912     | 49285.201       | 0.265        |
| SW-09          |              |                  |                        | 10.115                | 450              |               | 161116.529     | 49286.837       | 0.838        |
| 10             | 0.008        | 5.00             |                        | 10.110                |                  |               | 161111.313     | 49289.247       | 0.573        |
| 9              |              | 5.00             |                        | 9.950                 |                  |               | 161129.855     | 49310.410       | 0.200        |
| SW-13          |              |                  |                        | 10.050                | 450              |               | 161120.470     | 49311.513       | 0.767        |
| 7              |              | 5.00             |                        | 10.125                |                  |               | 161106.203     | 49300.505       | 0.300        |
| 6              |              | 5.00             |                        | 10.065                |                  |               | 161107.404     | 49309.111       | 0.300        |
| SW-12          |              |                  |                        | 10.065                | 450              |               | 161109.040     | 49306.931       | 0.775        |
| 4              | 0.008        | 5.00             |                        | 10.065                |                  |               | 161113.813     | 49307.083       | 0.567        |
| SW-14 (HYDRO)  |              |                  |                        | 10.000                | 1200             |               | 161115.601     | 49312.745       | 0.806        |
| SW-15          |              |                  |                        | 9.950                 | 1200             |               | 161128.995     | 49311.404       | 0.540        |
| DITCH HEADWALL |              |                  |                        | 9.960                 | 225              | 225           | 161131.491     | 49318.685       | 0.607        |
| 54             |              |                  |                        | 10.230                |                  |               | 161059.533     | 49294.998       | 0.569        |
| SW-03          |              |                  |                        | 10.234                | 450              |               | 161059.914     | 49298.254       | 0.780        |
| 56             |              |                  |                        | 10.270                |                  |               | 161060.228     | 49312.027       | 0.300        |
| 57             |              | 5.00             |                        | 10.270                |                  |               | 161061.692     | 49311.725       | 0.270        |

### Nodes

| Name                 | Area<br>(ha) | T of E<br>(mins) | Add<br>Inflow<br>(l/s) | Cover<br>Level<br>(m) | Diameter<br>(mm) | Width<br>(mm) | Easting<br>(m) | Northing<br>(m) | Depth<br>(m) |
|----------------------|--------------|------------------|------------------------|-----------------------|------------------|---------------|----------------|-----------------|--------------|
| 58                   |              | 5.00             |                        | 10.240                |                  |               | 161060.312     | 49301.831       | 0.350        |
| 59                   |              |                  |                        | 10.080                |                  |               | 161113.241     | 49302.960       | 0.573        |
| SW-11                |              |                  |                        | 10.085                | 450              |               | 161118.411     | 49302.118       | 0.781        |
| 61                   |              | 5.00             |                        | 10.100                |                  |               | 161126.865     | 49300.847       | 0.300        |
| 62                   |              |                  |                        | 10.088                |                  |               | 161112.736     | 49299.376       | 0.573        |
| 63                   |              | 5.00             |                        | 10.100                |                  |               | 161126.272     | 49297.681       | 0.548        |
| 64                   |              |                  |                        | 10.094                |                  |               | 161112.303     | 49296.248       | 0.572        |
| SW-10                |              |                  |                        | 10.090                | 450              |               | 161116.164     | 49295.776       | 0.775        |
| 66                   |              | 5.00             |                        | 10.100                |                  |               | 161125.552     | 49295.671       | 0.300        |
| PLOT 1               | 0.016        | 5.00             | 0.0                    | 10.200                |                  |               | 161074.160     | 49281.446       | 0.510        |
| PLOT 2               | 0.019        | 5.00             | 0.0                    | 10.200                |                  |               | 161079.872     | 49277.038       | 0.480        |
| PLOT 3               | 0.011        | 5.00             | 0.0                    | 10.150                |                  |               | 161093.066     | 49272.831       | 0.480        |
| PLOT 4&5             | 0.032        | 5.00             |                        | 10.200                |                  |               | 161108.039     | 49270.388       | 0.530        |
| SW11                 |              |                  |                        | 10.200                | 500              |               | 161074.672     | 49287.476       | 0.550        |
| SW12                 |              |                  |                        | 10.200                | 500              |               | 161080.702     | 49287.192       | 0.560        |
| SW13                 |              |                  |                        | 10.150                | 500              |               | 161094.182     | 49286.331       | 0.550        |
| SW14                 |              |                  |                        | 10.200                | 500              |               | 161108.707     | 49282.662       | 0.590        |
| Access Road Widening | 0.005        | 5.00             |                        | 10.150                |                  |               | 161104.591     | 49283.582       | 0.580        |

### Links (Results)

| Name   | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) | US<br>Depth<br>(m) | DS<br>Depth<br>(m) | Σ Area<br>(ha) | Σ Add<br>Inflow<br>(l/s) | Pro<br>Depth<br>(mm) | Pro<br>Velocity<br>(m/s) |
|--------|--------------|--------------|---------------|--------------------|--------------------|----------------|--------------------------|----------------------|--------------------------|
| 1.022  | 1.351        | 95.5         | 45.8          | 0.240              | 0.307              | 0.309          | 0.0                      | 146                  | 1.337                    |
| 1.021  | 1.239        | 87.6         | 46.1          | 0.206              | 0.240              | 0.309          | 0.0                      | 154                  | 1.254                    |
| 1.020  | 0.515        | 51.5         | 46.6          | 0.367              | 0.306              | 0.309          | 0.0                      | 186                  | 0.501                    |
| 1.019  | 0.836        | 62.7         | 43.4          | 0.423              | 0.417              | 0.284          | 0.0                      | 116                  | 0.750                    |
| 27.001 | 0.759        | 6.0          | 1.9           | 0.367              | 0.460              | 0.010          | 0.0                      | 39                   | 0.673                    |
| 28.001 | 1.029        | 8.1          | 1.3           | 0.375              | 0.460              | 0.007          | 0.0                      | 28                   | 0.764                    |

Links (Results)

| Name   | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) | US<br>Depth<br>(m) | DS<br>Depth<br>(m) | Σ Area<br>(ha) | Σ Add<br>Inflow<br>(l/s) | Pro<br>Depth<br>(mm) | Pro<br>Velocity<br>(m/s) |
|--------|--------------|--------------|---------------|--------------------|--------------------|----------------|--------------------------|----------------------|--------------------------|
| 28.000 | 1.416        | 11.1         | 0.4           | 0.200              | 0.375              | 0.002          | 0.0                      | 13                   | 0.656                    |
| 29.000 | 1.967        | 15.4         | 1.0           | 0.200              | 0.375              | 0.005          | 0.0                      | 17                   | 1.083                    |
| 27.000 | 1.026        | 8.1          | 1.9           | 0.100              | 0.367              | 0.010          | 0.0                      | 33                   | 0.841                    |
| 1.018  | 0.845        | 63.4         | 43.3          | 0.423              | 0.423              | 0.282          | 0.0                      | 115                  | 0.755                    |
| 26.001 | 1.003        | 7.9          | 0.4           | 0.381              | 0.465              | 0.002          | 0.0                      | 16                   | 0.533                    |
| 26.000 | 1.170        | 9.2          | 0.4           | 0.200              | 0.381              | 0.002          | 0.0                      | 14                   | 0.583                    |
| 1.017  | 0.846        | 63.5         | 42.6          | 0.422              | 0.423              | 0.276          | 0.0                      | 113                  | 0.752                    |
| 25.000 | 0.348        | 2.7          | 1.2           | 0.448              | 0.465              | 0.006          | 0.0                      | 46                   | 0.334                    |
| 1.016  | 0.828        | 62.1         | 41.9          | 0.423              | 0.422              | 0.271          | 0.0                      | 114                  | 0.737                    |
| 24.002 | 1.142        | 9.0          | 1.0           | 0.375              | 0.464              | 0.005          | 0.0                      | 23                   | 0.761                    |
| 24.001 | 1.084        | 8.5          | 1.0           | 0.200              | 0.375              | 0.005          | 0.0                      | 23                   | 0.722                    |
| 1.015  | 0.855        | 42.7         | 40.1          | 0.467              | 0.473              | 0.257          | 0.0                      | 96                   | 0.838                    |
| 23.001 | 0.570        | 4.5          | 1.2           | 0.438              | 0.465              | 0.006          | 0.0                      | 36                   | 0.484                    |
| 23.000 | 1.245        | 9.8          | 1.2           | 0.165              | 0.438              | 0.006          | 0.0                      | 24                   | 0.847                    |
| 1.014  | 0.721        | 36.0         | 30.1          | 0.440              | 0.467              | 0.191          | 0.0                      | 89                   | 0.681                    |
| 22.000 | 0.357        | 2.8          | 1.1           | 0.433              | 0.467              | 0.006          | 0.0                      | 43                   | 0.334                    |
| 1.013  | 0.710        | 35.5         | 28.6          | 0.440              | 0.440              | 0.180          | 0.0                      | 86                   | 0.662                    |
| 20.001 | 1.139        | 8.9          | 2.1           | 0.337              | 0.440              | 0.011          | 0.0                      | 33                   | 0.934                    |
| 21.000 | 0.852        | 6.7          | 0.8           | 0.100              | 0.337              | 0.004          | 0.0                      | 23                   | 0.567                    |
| 20.000 | 0.883        | 6.9          | 1.3           | 0.100              | 0.337              | 0.007          | 0.0                      | 30                   | 0.685                    |
| 1.012  | 0.695        | 34.7         | 26.1          | 0.469              | 0.440              | 0.163          | 0.0                      | 82                   | 0.634                    |
| 19.000 | 0.349        | 2.7          | 1.1           | 0.415              | 0.440              | 0.006          | 0.0                      | 44                   | 0.330                    |
| 1.011  | 0.885        | 44.3         | 23.2          | 0.466              | 0.469              | 0.143          | 0.0                      | 65                   | 0.719                    |
| 17.000 | 0.903        | 7.1          | 0.8           | 0.100              | 0.343              | 0.004          | 0.0                      | 23                   | 0.601                    |
| 18.000 | 1.142        | 9.0          | 0.8           | 0.343              | 0.469              | 0.004          | 0.0                      | 21                   | 0.713                    |
| 1.010  | 0.604        | 30.2         | 21.7          | 0.469              | 0.466              | 0.133          | 0.0                      | 80                   | 0.544                    |
| 15.001 | 1.106        | 8.7          | 1.9           | 0.343              | 0.466              | 0.010          | 0.0                      | 32                   | 0.883                    |
| 16.000 | 1.561        | 12.3         | 0.8           | 0.200              | 0.343              | 0.004          | 0.0                      | 17                   | 0.858                    |
| 15.000 | 0.987        | 7.8          | 1.1           | 0.100              | 0.343              | 0.006          | 0.0                      | 26                   | 0.708                    |
| 1.009  | 0.699        | 34.9         | 18.3          | 0.469              | 0.469              | 0.112          | 0.0                      | 64                   | 0.563                    |
| 14.000 | 0.352        | 2.8          | 0.5           | 0.453              | 0.469              | 0.003          | 0.0                      | 29                   | 0.268                    |
| 1.008  | 0.708        | 35.4         | 15.3          | 0.469              | 0.469              | 0.093          | 0.0                      | 57                   | 0.537                    |

Links (Results)

| Name     | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) | US<br>Depth<br>(m) | DS<br>Depth<br>(m) | Σ Area<br>(ha) | Σ Add<br>Inflow<br>(l/s) | Pro<br>Depth<br>(mm) | Pro<br>Velocity<br>(m/s) |
|----------|--------------|--------------|---------------|--------------------|--------------------|----------------|--------------------------|----------------------|--------------------------|
| 13.000   | 0.350        | 2.7          | 0.6           | 0.450              | 0.469              | 0.003          | 0.0                      | 31                   | 0.274                    |
| 1.007    | 0.672        | 33.6         | 13.8          | 0.469              | 0.469              | 0.083          | 0.0                      | 55                   | 0.498                    |
| 11.001   | 1.147        | 9.0          | 1.9           | 0.322              | 0.469              | 0.010          | 0.0                      | 32                   | 0.916                    |
| 11.000   | 0.881        | 6.9          | 1.1           | 0.150              | 0.322              | 0.006          | 0.0                      | 28                   | 0.653                    |
| 12.000   | 1.231        | 9.7          | 0.8           | 0.200              | 0.322              | 0.004          | 0.0                      | 19                   | 0.733                    |
| 1.006    | 0.724        | 36.2         | 12.3          | 0.470              | 0.469              | 0.074          | 0.0                      | 49                   | 0.503                    |
| 10.001   | 1.120        | 8.8          | 1.7           | 0.322              | 0.469              | 0.009          | 0.0                      | 30                   | 0.870                    |
| 10.000   | 0.920        | 7.2          | 1.7           | 0.150              | 0.322              | 0.009          | 0.0                      | 33                   | 0.754                    |
| 1.005    | 0.701        | 35.0         | 9.1           | 0.469              | 0.470              | 0.054          | 0.0                      | 41                   | 0.441                    |
| 9.000    | 0.346        | 2.7          | 0.5           | 0.455              | 0.470              | 0.003          | 0.0                      | 30                   | 0.267                    |
| 1.004    | 0.453        | 8.0          | 7.0           | 0.419              | 0.419              | 0.041          | 0.0                      | 109                  | 0.510                    |
| 7.002    | 1.303        | 10.2         | 2.5           | 0.380              | 0.469              | 0.013          | 0.0                      | 33                   | 1.069                    |
| 8.000    | 1.506        | 11.8         | 0.6           | 0.250              | 0.380              | 0.003          | 0.0                      | 15                   | 0.778                    |
| 7.001    | 0.966        | 7.6          | 1.9           | 0.200              | 0.380              | 0.010          | 0.0                      | 34                   | 0.801                    |
| 7.000    | 1.073        | 8.4          | 0.9           | 0.170              | 0.200              | 0.005          | 0.0                      | 22                   | 0.700                    |
| 1.003    | 0.466        | 8.2          | 6.4           | 0.419              | 0.419              | 0.038          | 0.0                      | 100                  | 0.515                    |
| 6.000    | 0.354        | 2.8          | 0.7           | 0.475              | 0.469              | 0.004          | 0.0                      | 34                   | 0.293                    |
| 1.002    | 0.466        | 8.2          | 5.0           | 0.419              | 0.419              | 0.029          | 0.0                      | 85                   | 0.489                    |
| 4.001    | 1.240        | 9.7          | 1.7           | 0.353              | 0.469              | 0.009          | 0.0                      | 29                   | 0.935                    |
| 4.000    | 1.124        | 8.8          | 1.3           | 0.360              | 0.353              | 0.007          | 0.0                      | 26                   | 0.806                    |
| 5.000    | 1.508        | 11.8         | 0.4           | 0.250              | 0.353              | 0.002          | 0.0                      | 12                   | 0.671                    |
| 1.001    | 0.350        | 2.7          | 1.9           | 0.469              | 0.469              | 0.010          | 0.0                      | 61                   | 0.377                    |
| 2.001    | 0.947        | 7.4          | 1.0           | 0.380              | 0.469              | 0.005          | 0.0                      | 25                   | 0.667                    |
| 3.000    | 1.385        | 10.9         | 0.4           | 0.300              | 0.380              | 0.002          | 0.0                      | 14                   | 0.667                    |
| 2.000    | 1.175        | 9.2          | 0.6           | 0.250              | 0.380              | 0.003          | 0.0                      | 17                   | 0.645                    |
| 1.000    | 0.354        | 2.8          | 2.0           | 0.540              | 0.469              | 0.010          | 0.0                      | 62                   | 0.384                    |
| 14.000_1 | 0.814        | 14.4         | 3.1           | 0.360              | 0.400              | 0.016          | 0.0                      | 47                   | 0.650                    |
| 14.001   | 0.779        | 6.1          | 3.1           | 0.450              | 0.469              | 0.016          | 0.0                      | 50                   | 0.781                    |
| 15.000_1 | 0.889        | 15.7         | 3.6           | 0.330              | 0.410              | 0.019          | 0.0                      | 49                   | 0.723                    |
| 15.001_1 | 0.821        | 6.4          | 3.6           | 0.460              | 0.469              | 0.019          | 0.0                      | 54                   | 0.844                    |

### Links (Results)

| Name     | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) | US<br>Depth<br>(m) | DS<br>Depth<br>(m) | Σ Area<br>(ha) | Σ Add<br>Inflow<br>(l/s) | Pro<br>Depth<br>(mm) | Pro<br>Velocity<br>(m/s) |
|----------|--------------|--------------|---------------|--------------------|--------------------|----------------|--------------------------|----------------------|--------------------------|
| 20.000_1 | 0.719        | 12.7         | 2.1           | 0.330              | 0.400              | 0.011          | 0.0                      | 41                   | 0.533                    |
| 20.001_1 | 0.641        | 5.0          | 2.1           | 0.450              | 0.440              | 0.011          | 0.0                      | 45                   | 0.611                    |
| 24.000   | 0.698        | 12.3         | 6.1           | 0.380              | 0.440              | 0.032          | 0.0                      | 75                   | 0.697                    |
| 24.001_1 | 0.984        | 17.4         | 6.1           | 0.440              | 0.417              | 0.032          | 0.0                      | 61                   | 0.898                    |
| 26.000_1 | 0.461        | 3.6          | 1.0           | 0.480              | 0.467              | 0.005          | 0.0                      | 35                   | 0.387                    |

### Simulation Settings

|                      |          |                            |      |                |     |                               |    |
|----------------------|----------|----------------------------|------|----------------|-----|-------------------------------|----|
| Rainfall Methodology | FEH-22   | Skip Steady State          | ✓    | 2 year (l/s)   | 0.5 | Check Discharge Volume        | ✓  |
| Summer CV            | 1.000    | Drain Down Time (mins)     | 1440 | 10 year (l/s)  | 0.8 | 100 year +40% 360 minute (m³) | 89 |
| Winter CV            | 1.000    | Additional Storage (m³/ha) | 0.0  | 30 year (l/s)  | 1.2 |                               |    |
| Analysis Speed       | Detailed | Check Discharge Rate(s)    | ✓    | 100 year (l/s) | 1.6 |                               |    |

### Storm Durations

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

| Return Period<br>(years) | Climate Change<br>(CC %) | Additional Area<br>(A %) | Additional Flow<br>(Q %) | Return Period<br>(years) | Climate Change<br>(CC %) | Additional Area<br>(A %) | Additional Flow<br>(Q %) |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 2                        | 10                       | 0                        | 0                        | 30                       | 40                       | 0                        | 0                        |
| 10                       | 40                       | 0                        | 0                        | 100                      | 45                       | 0                        | 0                        |

### Pre-development Discharge Rate

|                              |            |                       |      |                        |      |                  |     |
|------------------------------|------------|-----------------------|------|------------------------|------|------------------|-----|
| Site Makeup                  | Greenfield | SPR                   | 0.30 | Growth Factor 100 year | 3.19 | Q 30 year (l/s)  | 1.2 |
| Greenfield Method            | IH124      | Region                | 7    | Betterment (%)         | 6    | Q 100 year (l/s) | 1.6 |
| Positively Drained Area (ha) | 0.277      | Growth Factor 2 year  | 0.88 | QBar                   | 0.5  |                  |     |
| SAAR (mm)                    | 749        | Growth Factor 10 year | 1.62 | Q 2 year (l/s)         | 0.5  |                  |     |
| Soil Index                   | 2          | Growth Factor 30 year | 2.40 | Q 10 year (l/s)        | 0.8  |                  |     |

### Pre-development Discharge Volume

|                              |            |            |         |                       |     |                                 |       |
|------------------------------|------------|------------|---------|-----------------------|-----|---------------------------------|-------|
| Site Makeup                  | Greenfield | Soil Index | 2       | Return Period (years) | 100 | Betterment (%)                  | 6     |
| Greenfield Method            | FSR/FEH    | SPR        | 0.30    | Climate Change (%)    | 40  | PR                              | 0.346 |
| Positively Drained Area (ha) | 0.277      | CWI        | 112.444 | Storm Duration (mins) | 360 | Runoff Volume (m <sup>3</sup> ) | 89    |

### Node DITCH HEADWALL Surcharged Outfall

|                                    |   |                                           |   |                              |   |
|------------------------------------|---|-------------------------------------------|---|------------------------------|---|
| Overrides Design Area              | x | Depression Storage Area (m <sup>2</sup> ) | 0 | Evapo-transpiration (mm/day) | 0 |
| Overrides Design Additional Inflow | x | Depression Storage Depth (mm)             | 0 |                              |   |
| Applies to All storms              |   |                                           |   |                              |   |

| Time (mins) | Depth (m) | Time (mins) | Depth (m) |
|-------------|-----------|-------------|-----------|
| 0           | 0.521     | 1440        | 0.521     |

### Node SW-14 (HYDRO) Online Hydro-Brake® Control

|                          |       |                   |                             |                         |       |
|--------------------------|-------|-------------------|-----------------------------|-------------------------|-------|
| Flap Valve               | x     | Design Flow (l/s) | 1.2                         | Min Outlet Diameter (m) | 0.075 |
| Replaces Downstream Link | ✓     | Objective         | (FP) Future proof           | Min Node Diameter (mm)  | 1200  |
| Invert Level (m)         | 9.494 | Sump Available    | ✓                           |                         |       |
| Design Depth (m)         | 0.400 | Product Number    | CTL-SFP-0058-1200-0400-1200 |                         |       |

### Node SW11 Online Orifice Control

|                          |   |                  |       |                   |       |                       |       |
|--------------------------|---|------------------|-------|-------------------|-------|-----------------------|-------|
| Flap Valve               | x | Invert Level (m) | 9.650 | Design Flow (l/s) | 2.9   | Discharge Coefficient | 0.600 |
| Replaces Downstream Link | ✓ | Design Depth (m) | 0.380 | Diameter (m)      | 0.050 |                       |       |

### Node SW12 Online Orifice Control

|                          |   |                  |       |                   |       |                       |       |
|--------------------------|---|------------------|-------|-------------------|-------|-----------------------|-------|
| Flap Valve               | x | Invert Level (m) | 9.640 | Design Flow (l/s) | 2.5   | Discharge Coefficient | 0.600 |
| Replaces Downstream Link | ✓ | Design Depth (m) | 0.350 | Diameter (m)      | 0.050 |                       |       |

### Node SW13 Online Orifice Control

|                          |   |                  |       |                   |       |                       |       |
|--------------------------|---|------------------|-------|-------------------|-------|-----------------------|-------|
| Flap Valve               | x | Invert Level (m) | 9.600 | Design Flow (l/s) | 1.2   | Discharge Coefficient | 0.600 |
| Replaces Downstream Link | ✓ | Design Depth (m) | 0.350 | Diameter (m)      | 0.050 |                       |       |

#### Node SW14 Online Orifice Control

|                          |   |                  |       |                   |       |                       |       |
|--------------------------|---|------------------|-------|-------------------|-------|-----------------------|-------|
| Flap Valve               | x | Invert Level (m) | 9.610 | Design Flow (l/s) | 2.9   | Discharge Coefficient | 0.600 |
| Replaces Downstream Link | ✓ | Design Depth (m) | 0.400 | Diameter (m)      | 0.050 |                       |       |

#### Node 48 Carpark Storage Structure

|                             |         |                           |       |             |        |               |       |
|-----------------------------|---------|---------------------------|-------|-------------|--------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity                  | 0.95  | Width (m)   | 11.400 | Depth (m)     | 0.300 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 9.707 | Length (m)  | 11.400 | Inf Depth (m) | 0.300 |
| Safety Factor               | 3.0     | Time to half empty (mins) | 0     | Slope (1:X) | 460.0  |               |       |

#### Node 21 Carpark Storage Structure

|                             |         |                           |       |             |        |               |       |
|-----------------------------|---------|---------------------------|-------|-------------|--------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity                  | 0.95  | Width (m)   | 12.250 | Depth (m)     | 0.300 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 9.598 | Length (m)  | 12.250 | Inf Depth (m) | 0.300 |
| Safety Factor               | 3.0     | Time to half empty (mins) |       | Slope (1:X) | 460.0  |               |       |

#### Node 40 Carpark Storage Structure

|                             |         |                           |       |             |        |               |       |
|-----------------------------|---------|---------------------------|-------|-------------|--------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity                  | 0.95  | Width (m)   | 10.490 | Depth (m)     | 0.300 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 9.644 | Length (m)  | 10.490 | Inf Depth (m) | 0.300 |
| Safety Factor               | 3.0     | Time to half empty (mins) |       | Slope (1:X) | 460.0  |               |       |

#### Node 13 Carpark Storage Structure

|                             |         |                           |       |             |        |               |       |
|-----------------------------|---------|---------------------------|-------|-------------|--------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity                  | 0.95  | Width (m)   | 15.090 | Depth (m)     | 0.300 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 9.558 | Length (m)  | 15.090 | Inf Depth (m) | 0.300 |
| Safety Factor               | 3.0     | Time to half empty (mins) |       | Slope (1:X) | 460.0  |               |       |

#### Node 10 Carpark Storage Structure

|                             |         |                           |       |             |       |               |       |
|-----------------------------|---------|---------------------------|-------|-------------|-------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity                  | 0.95  | Width (m)   | 8.940 | Depth (m)     | 0.300 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 9.537 | Length (m)  | 8.940 | Inf Depth (m) | 0.300 |
| Safety Factor               | 3.0     | Time to half empty (mins) |       | Slope (1:X) | 460.0 |               |       |

#### Node 4 Carpark Storage Structure

|                             |         |                           |       |             |       |               |       |
|-----------------------------|---------|---------------------------|-------|-------------|-------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity                  | 0.95  | Width (m)   | 8.940 | Depth (m)     | 0.300 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 9.498 | Length (m)  | 8.940 | Inf Depth (m) | 0.300 |
| Safety Factor               | 3.0     | Time to half empty (mins) |       | Slope (1:X) | 460.0 |               |       |

#### Node PLOT 1 Carpark Storage Structure

|                             |         |                           |       |             |        |               |       |
|-----------------------------|---------|---------------------------|-------|-------------|--------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity                  | 0.30  | Width (m)   | 6.630  | Depth (m)     | 0.380 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 9.690 | Length (m)  | 6.630  | Inf Depth (m) |       |
| Safety Factor               | 2.0     | Time to half empty (mins) | 7     | Slope (1:X) | 1000.0 |               |       |

#### Node PLOT 4&5 Carpark Storage Structure

|                             |         |                           |       |             |        |               |       |
|-----------------------------|---------|---------------------------|-------|-------------|--------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity                  | 0.30  | Width (m)   | 11.091 | Depth (m)     | 0.400 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 9.670 | Length (m)  | 11.091 | Inf Depth (m) |       |
| Safety Factor               | 2.0     | Time to half empty (mins) | 26    | Slope (1:X) | 1000.0 |               |       |

#### Node Access Road Widening Carpark Storage Structure

|                             |         |                           |       |             |        |               |       |
|-----------------------------|---------|---------------------------|-------|-------------|--------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity                  | 0.30  | Width (m)   | 7.211  | Depth (m)     | 0.400 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 9.570 | Length (m)  | 7.211  | Inf Depth (m) |       |
| Safety Factor               | 2.0     | Time to half empty (mins) |       | Slope (1:X) | 1000.0 |               |       |

#### Node PLOT 2 Carpark Storage Structure

|                             |         |                           |       |             |        |               |       |
|-----------------------------|---------|---------------------------|-------|-------------|--------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity                  | 0.30  | Width (m)   | 8.124  | Depth (m)     | 0.350 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 9.720 | Length (m)  | 8.124  | Inf Depth (m) |       |
| Safety Factor               | 2.0     | Time to half empty (mins) | 6     | Slope (1:X) | 1000.0 |               |       |

#### Node PLOT 3 Carpark Storage Structure

|                             |         |                           |       |             |        |               |       |
|-----------------------------|---------|---------------------------|-------|-------------|--------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Porosity                  | 0.30  | Width (m)   | 6.325  | Depth (m)     | 0.350 |
| Side Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 9.670 | Length (m)  | 6.325  | Inf Depth (m) |       |
| Safety Factor               | 2.0     | Time to half empty (mins) |       | Slope (1:X) | 1000.0 |               |       |

### Approval Settings

|                         |         |                                     |       |                               |       |
|-------------------------|---------|-------------------------------------|-------|-------------------------------|-------|
| Node Size               | ✓       | Backdrops                           | ✓     | Maximum Surcharged Depth (m)  | 0.100 |
| Node Losses             | ✓       | Minimum Backdrop Height (m)         | 0.000 | Flooding                      | ✓     |
| Link Size               | ✓       | Maximum Backdrop Height (m)         | 1.500 | Return Period (years)         | 100   |
| Minimum Diameter (mm)   | 100     | Full Bore Velocity                  | ✓     | Time to Half Empty            | ✓     |
| Link Length             | ✓       | Minimum Full Bore Velocity (m/s)    | 0.200 | Return Period (years)         | 10    |
| Maximum Length (m)      | 100.000 | Maximum Full Bore Velocity (m/s)    | 3.000 | Discharge Rates               | ✓     |
| Coordinates             | ✓       | Proportional Velocity               | ✓     | 2 year (l/s)                  | 0.0   |
| Accuracy (m)            | 1.000   | Return Period (years)               | 2     | 10 year (l/s)                 | 0.6   |
| Crossings               | ✓       | Minimum Proportional Velocity (m/s) | 0.200 | 30 year (l/s)                 | 0.9   |
| Cover Depth             | ✓       | Maximum Proportional Velocity (m/s) | 3.000 | 100 year (l/s)                | 1.2   |
| Minimum Cover Depth (m) | 0.100   | Surcharged Depth                    | ✓     | Discharge Volume              | ✓     |
| Maximum Cover Depth (m) | 3.000   | Return Period (years)               | 2     | 100 year +45% 360 minute (m³) | 60    |

### Approval Results

The network has been designed using IDF rainfall  
It contains 74 nodes (1 outfall) and 73 links  
The total impermeable area is 0.309 ha  
A surcharged outfall has been defined  
5 online controls have been defined  
11 structures have been defined, providing 243m³ of storage below the flood risk level  
Infiltration has not been utilised  
Simulations have been completed using FEH-22 summer and winter storms from 15 to 1440 minute duration

19 manholes are smaller than that required by the library

| Node  | Required<br>Dia (mm) | Required<br>Width (mm) | Actual<br>Dia (mm) | Actual<br>Width (mm) |
|-------|----------------------|------------------------|--------------------|----------------------|
| SW-01 | 700                  |                        | 450                |                      |
| SW-02 | 700                  |                        | 450                |                      |
| SW-04 | 700                  |                        | 450                |                      |
| SW-05 | 700                  |                        | 450                |                      |
| SW-06 | 700                  |                        | 450                |                      |
| SW-07 | 700                  |                        | 450                |                      |

| Node           | Required<br>Dia (mm) | Required<br>Width (mm) | Actual<br>Dia (mm) | Actual<br>Width (mm) |
|----------------|----------------------|------------------------|--------------------|----------------------|
| SW-08          | 700                  |                        | 450                |                      |
| SW-09          | 700                  |                        | 450                |                      |
| SW-13          | 700                  |                        | 450                |                      |
| SW-12          | 700                  |                        | 450                |                      |
| SW-14 (HYDRO)  | 1500                 |                        | 1200               |                      |
| DITCH HEADWALL | 2000                 | 1000                   | 225                | 225                  |
| SW-03          | 700                  |                        | 450                |                      |
| SW-11          | 700                  |                        | 450                |                      |
| SW-10          | 700                  |                        | 450                |                      |
| SW11           | 1200                 |                        | 500                |                      |
| SW12           | 1200                 |                        | 500                |                      |
| SW13           | 1200                 |                        | 500                |                      |
| SW14           | 1200                 |                        | 500                |                      |

No connections have combined exit and entry losses less than the recommended total

No circular links have diameters < 100mm

No links have lengths > 100.000m

No links have lengths that differ from their coordinated length by more than 1.000m

No links cross one or more other links

No links have cover depth outside the range 0.100-3.000m

No nodes have backdrops outside the range 0.000-1.500m

No links have full bore velocity outside the range 0.200-3.000m/s

4 links have peak proportional velocity outside the range 0.200-3.000m/s during the 2 year return period

| US Node | DS Node       | Link   | Velocity<br>(m/s) | Event                            |
|---------|---------------|--------|-------------------|----------------------------------|
| 4       | SW-14 (HYDRO) | 1.020  | 0.085             | 2 year +10% CC 15 minute winter  |
| 63      | 62            | 25.000 | 0.025             | 2 year +10% CC 720 minute summer |
| 43      | 42            | 6.000  | 0.012             | 2 year +10% CC 960 minute summer |
| 53      | 52            | 1.000  | 0.035             | 2 year +10% CC 600 minute winter |

No links have a surcharged depth greater than 0.100m during the 2 year return period

No nodes flood during the 100 year return period

No infiltrating structures failed to half empty in 1440 minutes during the 10 year return period

No outfalls have a discharge rate greater than 0.0l/s during the 2 year return period

No outfalls have a discharge rate greater than 0.6l/s during the 10 year return period

No outfalls have a discharge rate greater than 0.9l/s during the 30 year return period

No outfalls have a discharge rate greater than 1.2l/s during the 100 year return period

1 outfall has a discharge volume greater than 60m<sup>3</sup> during the 100 year 360 minute storm

| US Node | DS Node        | Link  | Discharge<br>Volume (m <sup>3</sup> ) | Event                              |
|---------|----------------|-------|---------------------------------------|------------------------------------|
| SW-15   | DITCH HEADWALL | 1.022 | 62.7                                  | 100 year +45% CC 360 minute summer |

#### Rainfall

| Event                           | Peak<br>Intensity<br>(mm/hr) | Average<br>Intensity<br>(mm/hr) | Event                            | Peak<br>Intensity<br>(mm/hr) | Average<br>Intensity<br>(mm/hr) |
|---------------------------------|------------------------------|---------------------------------|----------------------------------|------------------------------|---------------------------------|
| 2 year +10% CC 15 minute summer | 112.801                      | 31.919                          | 2 year +10% CC 60 minute winter  | 32.782                       | 13.040                          |
| 2 year +10% CC 15 minute winter | 79.159                       | 31.919                          | 2 year +10% CC 120 minute summer | 35.561                       | 9.398                           |
| 2 year +10% CC 30 minute summer | 73.505                       | 20.799                          | 2 year +10% CC 120 minute winter | 23.626                       | 9.398                           |
| 2 year +10% CC 30 minute winter | 51.583                       | 20.799                          | 2 year +10% CC 180 minute summer | 29.001                       | 7.463                           |
| 2 year +10% CC 60 minute summer | 49.342                       | 13.040                          | 2 year +10% CC 180 minute winter | 18.851                       | 7.463                           |

**Rainfall**

| Event                             | Peak<br>Intensity<br>(mm/hr) | Average<br>Intensity<br>(mm/hr) | Event                              | Peak<br>Intensity<br>(mm/hr) | Average<br>Intensity<br>(mm/hr) |
|-----------------------------------|------------------------------|---------------------------------|------------------------------------|------------------------------|---------------------------------|
| 2 year +10% CC 240 minute summer  | 23.623                       | 6.243                           | 10 year +40% CC 720 minute summer  | 22.297                       | 5.976                           |
| 2 year +10% CC 240 minute winter  | 15.694                       | 6.243                           | 10 year +40% CC 720 minute winter  | 14.985                       | 5.976                           |
| 2 year +10% CC 360 minute summer  | 18.479                       | 4.755                           | 10 year +40% CC 960 minute summer  | 17.912                       | 4.717                           |
| 2 year +10% CC 360 minute winter  | 12.012                       | 4.755                           | 10 year +40% CC 960 minute winter  | 11.865                       | 4.717                           |
| 2 year +10% CC 480 minute summer  | 14.638                       | 3.868                           | 10 year +40% CC 1440 minute summer | 12.606                       | 3.379                           |
| 2 year +10% CC 480 minute winter  | 9.725                        | 3.868                           | 10 year +40% CC 1440 minute winter | 8.472                        | 3.379                           |
| 2 year +10% CC 600 minute summer  | 11.991                       | 3.280                           | 30 year +40% CC 15 minute summer   | 429.907                      | 121.649                         |
| 2 year +10% CC 600 minute winter  | 8.193                        | 3.280                           | 30 year +40% CC 15 minute winter   | 301.689                      | 121.649                         |
| 2 year +10% CC 720 minute summer  | 10.667                       | 2.859                           | 30 year +40% CC 30 minute summer   | 283.638                      | 80.260                          |
| 2 year +10% CC 720 minute winter  | 7.169                        | 2.859                           | 30 year +40% CC 30 minute winter   | 199.044                      | 80.260                          |
| 2 year +10% CC 960 minute summer  | 8.714                        | 2.295                           | 30 year +40% CC 60 minute summer   | 190.809                      | 50.425                          |
| 2 year +10% CC 960 minute winter  | 5.772                        | 2.295                           | 30 year +40% CC 60 minute winter   | 126.769                      | 50.425                          |
| 2 year +10% CC 1440 minute summer | 6.274                        | 1.682                           | 30 year +40% CC 120 minute summer  | 116.003                      | 30.656                          |
| 2 year +10% CC 1440 minute winter | 4.217                        | 1.682                           | 30 year +40% CC 120 minute winter  | 77.070                       | 30.656                          |
| 10 year +40% CC 15 minute summer  | 319.333                      | 90.360                          | 30 year +40% CC 180 minute summer  | 88.009                       | 22.648                          |
| 10 year +40% CC 15 minute winter  | 224.093                      | 90.360                          | 30 year +40% CC 180 minute winter  | 57.208                       | 22.648                          |
| 10 year +40% CC 30 minute summer  | 207.936                      | 58.839                          | 30 year +40% CC 240 minute summer  | 68.712                       | 18.159                          |
| 10 year +40% CC 30 minute winter  | 145.920                      | 58.839                          | 30 year +40% CC 240 minute winter  | 45.651                       | 18.159                          |
| 10 year +40% CC 60 minute summer  | 139.400                      | 36.839                          | 30 year +40% CC 360 minute summer  | 51.173                       | 13.168                          |
| 10 year +40% CC 60 minute winter  | 92.614                       | 36.839                          | 30 year +40% CC 360 minute winter  | 33.264                       | 13.168                          |
| 10 year +40% CC 120 minute summer | 88.073                       | 23.275                          | 30 year +40% CC 480 minute summer  | 39.432                       | 10.421                          |
| 10 year +40% CC 120 minute winter | 58.514                       | 23.275                          | 30 year +40% CC 480 minute winter  | 26.198                       | 10.421                          |
| 10 year +40% CC 180 minute summer | 67.942                       | 17.484                          | 30 year +40% CC 600 minute summer  | 31.695                       | 8.669                           |
| 10 year +40% CC 180 minute winter | 44.164                       | 17.484                          | 30 year +40% CC 600 minute winter  | 21.656                       | 8.669                           |
| 10 year +40% CC 240 minute summer | 53.592                       | 14.163                          | 30 year +40% CC 720 minute summer  | 27.795                       | 7.449                           |
| 10 year +40% CC 240 minute winter | 35.605                       | 14.163                          | 30 year +40% CC 720 minute winter  | 18.680                       | 7.449                           |
| 10 year +40% CC 360 minute summer | 40.438                       | 10.406                          | 30 year +40% CC 960 minute summer  | 22.231                       | 5.854                           |
| 10 year +40% CC 360 minute winter | 26.286                       | 10.406                          | 30 year +40% CC 960 minute winter  | 14.726                       | 5.854                           |
| 10 year +40% CC 480 minute summer | 31.381                       | 8.293                           | 30 year +40% CC 1440 minute summer | 15.511                       | 4.157                           |
| 10 year +40% CC 480 minute winter | 20.849                       | 8.293                           | 30 year +40% CC 1440 minute winter | 10.424                       | 4.157                           |
| 10 year +40% CC 600 minute summer | 25.340                       | 6.931                           | 100 year +45% CC 15 minute summer  | 572.156                      | 161.900                         |
| 10 year +40% CC 600 minute winter | 17.314                       | 6.931                           | 100 year +45% CC 15 minute winter  | 401.513                      | 161.900                         |

**Rainfall**

| <b>Event</b>                       | <b>Peak<br/>Intensity<br/>(mm/hr)</b> | <b>Average<br/>Intensity<br/>(mm/hr)</b> | <b>Event</b>                        | <b>Peak<br/>Intensity<br/>(mm/hr)</b> | <b>Average<br/>Intensity<br/>(mm/hr)</b> |
|------------------------------------|---------------------------------------|------------------------------------------|-------------------------------------|---------------------------------------|------------------------------------------|
| 100 year +45% CC 30 minute summer  | 379.523                               | 107.392                                  | 100 year +45% CC 360 minute winter  | 42.904                                | 16.985                                   |
| 100 year +45% CC 30 minute winter  | 266.332                               | 107.392                                  | 100 year +45% CC 480 minute summer  | 50.678                                | 13.393                                   |
| 100 year +45% CC 60 minute summer  | 258.482                               | 68.309                                   | 100 year +45% CC 480 minute winter  | 33.669                                | 13.393                                   |
| 100 year +45% CC 60 minute winter  | 171.729                               | 68.309                                   | 100 year +45% CC 600 minute summer  | 40.618                                | 11.110                                   |
| 100 year +45% CC 120 minute summer | 153.020                               | 40.439                                   | 100 year +45% CC 600 minute winter  | 27.753                                | 11.110                                   |
| 100 year +45% CC 120 minute winter | 101.663                               | 40.439                                   | 100 year +45% CC 720 minute summer  | 35.535                                | 9.524                                    |
| 100 year +45% CC 180 minute summer | 114.761                               | 29.532                                   | 100 year +45% CC 720 minute winter  | 23.881                                | 9.524                                    |
| 100 year +45% CC 180 minute winter | 74.597                                | 29.532                                   | 100 year +45% CC 960 minute summer  | 28.311                                | 7.455                                    |
| 100 year +45% CC 240 minute summer | 89.062                                | 23.537                                   | 100 year +45% CC 960 minute winter  | 18.754                                | 7.455                                    |
| 100 year +45% CC 240 minute winter | 59.171                                | 23.537                                   | 100 year +45% CC 1440 minute summer | 19.617                                | 5.258                                    |
| 100 year +45% CC 360 minute summer | 66.004                                | 16.985                                   | 100 year +45% CC 1440 minute winter | 13.184                                | 5.258                                    |

**Results for 2 year +10% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node   | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|-------------------|-----------|-------------|-----------|-----------|--------------|---------------|------------|--------|
| 15 minute summer  | 53        | 12          | 9.797     | 0.037     | 0.3          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 1.000:50% | 12          | 9.797     | 0.053     | 1.9          | 0.1150        | 0.0000     | OK     |
| 15 minute summer  | 52        | 12          | 9.776     | 0.048     | 1.6          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 51        | 1           | 9.900     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 3.000:50% | 11          | 9.873     | 0.013     | 0.4          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 50        | 1           | 10.050    | 0.000     | 0.0          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 2.000:50% | 10          | 9.952     | 0.017     | 0.6          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | SW-01     | 10          | 9.845     | 0.025     | 1.0          | 0.0040        | 0.0000     | OK     |
| 180 minute summer | 48        | 112         | 9.742     | 0.035     | 2.2          | 2.7742        | 0.0000     | OK     |
| 15 minute summer  | 47        | 1           | 10.000    | 0.000     | 0.0          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 4.000:50% | 10          | 9.935     | 0.026     | 1.3          | 0.0373        | 0.0000     | OK     |
| 15 minute summer  | 46        | 1           | 9.950     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 5.000:50% | 11          | 9.896     | 0.013     | 0.4          | 0.0099        | 0.0000     | OK     |
| 15 minute summer  | SW-02     | 11          | 9.845     | 0.028     | 1.6          | 0.0044        | 0.0000     | OK     |
| 30 minute summer  | 44        | 20          | 9.730     | 0.044     | 1.6          | 0.0000        | 0.0000     | OK     |

| Link Event<br>(Upstream Depth) | US Node | Link  | DS Node   | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|-------|-----------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer               | 53      | 1.000 | 1.000:50% | -0.3          | -0.134         | -0.092   | 0.0248        |                    |
| 15 minute summer               | 53      | 1.000 | 52        | 1.6           | 0.408          | 0.578    | 0.0289        |                    |
| 15 minute summer               | 52      | 1.001 | 48        | 1.6           | 0.644          | 0.582    | 0.0251        |                    |
| 15 minute summer               | 51      | 3.000 | 3.000:50% | 0.0           | 0.000          | 0.000    | 0.0004        |                    |
| 15 minute summer               | 51      | 3.000 | SW-01     | 0.4           | 0.395          | 0.037    | 0.0013        |                    |
| 15 minute summer               | 50      | 2.000 | 2.000:50% | 0.0           | 0.000          | 0.000    | 0.0022        |                    |
| 15 minute summer               | 50      | 2.000 | SW-01     | 0.6           | 0.506          | 0.061    | 0.0060        |                    |
| 15 minute summer               | SW-01   | 2.001 | 48        | 1.0           | 0.759          | 0.130    | 0.0102        |                    |
| 180 minute summer              | 48      | 1.002 | 44        | 1.0           | 0.301          | 0.121    | 0.0337        |                    |
| 15 minute summer               | 47      | 4.000 | 4.000:50% | 0.0           | 0.000          | 0.000    | 0.0035        |                    |
| 15 minute summer               | 47      | 4.000 | SW-02     | 1.2           | 0.732          | 0.141    | 0.0074        |                    |
| 15 minute summer               | 46      | 5.000 | 5.000:50% | 0.0           | 0.000          | 0.000    | 0.0005        |                    |
| 15 minute summer               | 46      | 5.000 | SW-02     | 0.4           | 0.357          | 0.034    | 0.0021        |                    |
| 15 minute summer               | SW-02   | 4.001 | 44        | 1.6           | 0.679          | 0.169    | 0.0126        |                    |
| 30 minute summer               | 44      | 1.003 | 42        | 1.6           | 0.366          | 0.194    | 0.0395        |                    |

**Results for 2 year +10% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|--------|
| 15 minute summer  | 43         | 12          | 9.714     | 0.019     | 0.1          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 6.000:50%  | 12          | 9.712     | 0.032     | 0.7          | 0.0000        | 0.0000     | OK     |
| 30 minute summer  | 42         | 20          | 9.711     | 0.045     | 2.0          | 0.0000        | 0.0000     | OK     |
| 720 minute winter | 41         | 720         | 9.708     | 0.047     | 0.0          | 0.0000        | 0.0000     | OK     |
| 720 minute winter | 9.000:50%  | 720         | 9.707     | 0.055     | 0.1          | 0.0000        | 0.0000     | OK     |
| 720 minute winter | 40         | 720         | 9.708     | 0.064     | 1.4          | 5.4563        | 0.0000     | OK     |
| 15 minute summer  | 39         | 1           | 9.980     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 10.000:50% | 10          | 9.922     | 0.035     | 1.7          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | SW-04      | 10          | 9.825     | 0.031     | 1.7          | 0.0049        | 0.0000     | OK     |
| 720 minute winter | 37         | 720         | 9.708     | 0.072     | 1.6          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 36         | 1           | 9.980     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 11.000:50% | 11          | 9.914     | 0.027     | 1.1          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | 35         | 1           | 9.894     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK     |
| 30 minute summer  | 12.000:50% | 18          | 9.863     | 0.019     | 0.7          | 0.0000        | 0.0000     | OK     |
| 15 minute summer  | SW-05      | 10          | 9.826     | 0.032     | 1.8          | 0.0051        | 0.0000     | OK     |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer               | 43      | 6.000  | 6.000:50%  | -0.1          | -0.109         | -0.043   | 0.0104        |                    |
| 15 minute summer               | 43      | 6.000  | 42         | 0.5           | 0.258          | 0.175    | 0.0180        |                    |
| 30 minute summer               | 42      | 1.004  | 54         | 2.0           | 0.761          | 0.256    | 0.0074        |                    |
| 720 minute winter              | 41      | 9.000  | 9.000:50%  | 0.0           | -0.042         | 0.010    | 0.0162        |                    |
| 720 minute winter              | 41      | 9.000  | 40         | 0.1           | 0.178          | 0.037    | 0.0196        |                    |
| 720 minute winter              | 40      | 1.006  | 37         | 1.4           | 0.203          | 0.037    | 0.1180        |                    |
| 15 minute summer               | 39      | 10.000 | 10.000:50% | 0.0           | 0.000          | 0.000    | 0.0079        |                    |
| 15 minute summer               | 39      | 10.000 | SW-04      | 1.7           | 0.745          | 0.231    | 0.0146        |                    |
| 15 minute summer               | SW-04   | 10.001 | 37         | 1.7           | 0.893          | 0.189    | 0.0148        |                    |
| 720 minute winter              | 37      | 1.007  | 33         | 1.5           | 0.214          | 0.046    | 0.0743        |                    |
| 15 minute summer               | 36      | 11.000 | 11.000:50% | 0.0           | 0.000          | 0.000    | 0.0062        |                    |
| 15 minute summer               | 36      | 11.000 | SW-05      | 1.1           | 0.571          | 0.159    | 0.0138        |                    |
| 15 minute summer               | 35      | 12.000 | 12.000:50% | 0.0           | 0.000          | 0.000    | 0.0010        |                    |
| 15 minute summer               | 35      | 12.000 | SW-05      | 0.7           | 0.462          | 0.072    | 0.0031        |                    |
| 15 minute summer               | SW-05   | 11.001 | 33         | 1.8           | 0.908          | 0.201    | 0.0159        |                    |

**Results for 2 year +10% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 720 minute winter | 33         | 720         | 9.708     | 0.076     | 1.7          | 0.0000        | 0.0000     | OK         |
| 720 minute winter | 32         | 720         | 9.708     | 0.064     | 0.0          | 0.0000        | 0.0000     | OK         |
| 720 minute winter | 13.000:50% | 720         | 9.707     | 0.073     | 0.1          | 0.2295        | 0.0000     | OK         |
| 720 minute winter | 31         | 720         | 9.708     | 0.083     | 2.1          | 0.0000        | 0.0000     | OK         |
| 720 minute winter | 30         | 705         | 9.708     | 0.078     | 0.0          | 0.0000        | 0.0000     | OK         |
| 720 minute winter | 14.000:50% | 705         | 9.708     | 0.087     | 0.1          | 0.0000        | 0.0000     | OK         |
| 720 minute winter | 29         | 720         | 9.708     | 0.096     | 2.6          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 28         | 1           | 9.880     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 16.000:50% | 11          | 9.825     | 0.016     | 0.7          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 27         | 1           | 9.960     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 15.000:50% | 11          | 9.874     | 0.025     | 1.1          | 0.0458        | 0.0000     | OK         |
| 15 minute summer  | SW-06      | 11          | 9.768     | 0.031     | 1.8          | 0.0050        | 0.0000     | OK         |
| 720 minute winter | 25         | 720         | 9.708     | 0.103     | 2.7          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer  | 24         | 1           | 9.960     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 17.000:50% | 11          | 9.872     | 0.023     | 0.8          | 0.0387        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 720 minute winter              | 33      | 1.008  | 31         | 1.7           | 0.219          | 0.049    | 0.1261        |                    |
| 720 minute winter              | 32      | 13.000 | 13.000:50% | 0.0           | -0.035         | -0.010   | 0.0251        |                    |
| 720 minute winter              | 32      | 13.000 | 31         | 0.1           | 0.146          | 0.036    | 0.0288        |                    |
| 720 minute winter              | 31      | 1.009  | 29         | 2.1           | 0.224          | 0.060    | 0.2707        |                    |
| 720 minute winter              | 30      | 14.000 | 14.000:50% | 0.0           | -0.028         | -0.009   | 0.0284        |                    |
| 720 minute winter              | 30      | 14.000 | 29         | 0.1           | 0.097          | 0.030    | 0.0309        |                    |
| 720 minute winter              | 29      | 1.010  | 25         | 2.5           | 0.246          | 0.084    | 0.2155        |                    |
| 15 minute summer               | 28      | 16.000 | 16.000:50% | 0.0           | 0.000          | 0.000    | 0.0007        |                    |
| 15 minute summer               | 28      | 16.000 | SW-06      | 0.7           | 0.542          | 0.057    | 0.0026        |                    |
| 15 minute summer               | 27      | 15.000 | 15.000:50% | 0.0           | 0.000          | 0.000    | 0.0053        |                    |
| 15 minute summer               | 27      | 15.000 | SW-06      | 1.1           | 0.594          | 0.139    | 0.0124        |                    |
| 15 minute summer               | SW-06   | 15.001 | 25         | 1.8           | 0.842          | 0.205    | 0.0152        |                    |
| 720 minute winter              | 25      | 1.011  | 21         | 2.7           | 0.256          | 0.061    | 0.1089        |                    |
| 15 minute summer               | 24      | 17.000 | 17.000:50% | 0.0           | 0.000          | 0.000    | 0.0056        |                    |
| 15 minute summer               | 24      | 17.000 | SW-07      | 0.8           | 0.628          | 0.109    | 0.0100        |                    |

**Results for 2 year +10% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute summer  | SW-07      | 11          | 9.757     | 0.020     | 0.8          | 0.0031        | 0.0000     | OK         |
| 720 minute winter | 21         | 720         | 9.708     | 0.110     | 3.1          | 13.7146       | 0.0000     | SURCHARGED |
| 720 minute winter | 20         | 720         | 9.708     | 0.093     | 0.0          | 0.0000        | 0.0000     | OK         |
| 720 minute winter | 19.000:50% | 720         | 9.708     | 0.109     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 720 minute winter | 19         | 720         | 9.708     | 0.125     | 2.6          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer  | 18         | 1           | 9.910     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 21.000:50% | 11          | 9.833     | 0.022     | 0.7          | 0.0332        | 0.0000     | OK         |
| 15 minute summer  | 17         | 1           | 9.930     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 20.000:50% | 11          | 9.850     | 0.028     | 1.3          | 0.0593        | 0.0000     | OK         |
| 15 minute summer  | SW-08      | 11          | 9.745     | 0.032     | 1.9          | 0.0052        | 0.0000     | OK         |
| 720 minute winter | 15         | 720         | 9.708     | 0.136     | 2.7          | 0.0000        | 0.0000     | SURCHARGED |
| 720 minute winter | 14         | 720         | 9.708     | 0.116     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 720 minute winter | 22.000:50% | 720         | 9.708     | 0.133     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 720 minute winter | 13         | 720         | 9.708     | 0.150     | 3.6          | 28.8119       | 0.0000     | SURCHARGED |
| 15 minute summer  | 12         | 1           | 9.850     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer               | SW-07   | 18.000 | 21         | 0.8           | 0.617          | 0.085    | 0.0103        |                    |
| 720 minute winter              | 21      | 1.012  | 19         | 2.3           | 0.234          | 0.065    | 0.4148        |                    |
| 720 minute winter              | 20      | 19.000 | 19.000:50% | 0.0           | -0.023         | 0.007    | 0.0577        |                    |
| 720 minute winter              | 20      | 19.000 | 19         | 0.1           | 0.175          | 0.037    | 0.0586        |                    |
| 720 minute winter              | 19      | 1.013  | 15         | 2.5           | 0.226          | 0.071    | 0.3242        |                    |
| 15 minute summer               | 18      | 21.000 | 21.000:50% | 0.0           | 0.000          | 0.000    | 0.0050        |                    |
| 15 minute summer               | 18      | 21.000 | SW-08      | 0.7           | 0.401          | 0.102    | 0.0138        |                    |
| 15 minute summer               | 17      | 20.000 | 20.000:50% | 0.0           | 0.000          | 0.000    | 0.0076        |                    |
| 15 minute summer               | 17      | 20.000 | SW-08      | 1.2           | 0.603          | 0.175    | 0.0166        |                    |
| 15 minute summer               | SW-08   | 20.001 | 15         | 1.9           | 0.897          | 0.211    | 0.0148        |                    |
| 720 minute winter              | 15      | 1.014  | 13         | 2.7           | 0.191          | 0.074    | 0.4388        |                    |
| 720 minute winter              | 14      | 22.000 | 22.000:50% | 0.0           | -0.019         | -0.009   | 0.0597        |                    |
| 720 minute winter              | 14      | 22.000 | 13         | 0.1           | 0.166          | 0.036    | 0.0597        |                    |
| 720 minute winter              | 13      | 1.015  | 10         | 1.1           | 0.168          | 0.025    | 0.5280        |                    |
| 15 minute summer               | 12      | 23.000 | 23.000:50% | 0.0           | 0.000          | 0.000    | 0.0035        |                    |

**Results for 2 year +10% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node        | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|----------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute summer  | 23.000:50%     | 11          | 9.736     | 0.023     | 1.1          | 0.0320        | 0.0000     | OK         |
| 720 minute winter | SW-09          | 720         | 9.708     | 0.131     | 0.1          | 0.0208        | 0.0000     | SURCHARGED |
| 720 minute winter | 10             | 720         | 9.708     | 0.171     | 1.3          | 12.0372       | 0.0000     | SURCHARGED |
| 15 minute summer  | 9              | 1           | 9.750     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 720 minute winter | 27.000:50%     | 705         | 9.707     | 0.041     | 0.2          | 0.1237        | 0.0000     | OK         |
| 720 minute winter | SW-13          | 720         | 9.708     | 0.125     | 0.2          | 0.0198        | 0.0000     | SURCHARGED |
| 15 minute summer  | 7              | 1           | 9.825     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 28.000:50%     | 11          | 9.721     | 0.013     | 0.4          | 0.0109        | 0.0000     | OK         |
| 15 minute summer  | 6              | 1           | 9.765     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 720 minute winter | 29.000:50%     | 720         | 9.707     | 0.030     | 0.1          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | SW-12          | 945         | 9.708     | 0.118     | 0.2          | 0.0187        | 0.0000     | SURCHARGED |
| 720 minute winter | 4              | 720         | 9.708     | 0.210     | 1.1          | 14.9737       | 0.0000     | SURCHARGED |
| 720 minute winter | SW-14 (HYDRO)  | 720         | 9.708     | 0.214     | 0.2          | 0.2417        | 0.0000     | OK         |
| 720 minute winter | SW-15          | 720         | 9.708     | 0.298     | 0.1          | 0.3366        | 0.0000     | OK         |
| 15 minute summer  | DITCH HEADWALL | 1           | 9.874     | 0.521     | 0.0          | 0.0000        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US Node       | Link         | DS Node        | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------------|--------------|----------------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer               | 12            | 23.000       | SW-09          | 1.1           | 0.605          | 0.112    | 0.0099        |                    |
| 720 minute winter              | SW-09         | 23.001       | 10             | 0.1           | 0.099          | 0.033    | 0.0450        |                    |
| 720 minute winter              | 10            | 1.016        | 64             | 1.1           | 0.158          | 0.018    | 0.6301        |                    |
| 15 minute summer               | 9             | 27.000       | 27.000:50%     | 0.0           | 0.000          | 0.000    | 0.0053        |                    |
| 15 minute summer               | 9             | 27.000       | SW-13          | 1.7           | 0.695          | 0.213    | 0.0117        |                    |
| 720 minute winter              | SW-13         | 27.001       | 4              | 0.2           | 0.051          | 0.033    | 0.0626        |                    |
| 15 minute summer               | 7             | 28.000       | 28.000:50%     | 0.0           | 0.000          | 0.000    | 0.0010        |                    |
| 15 minute summer               | 7             | 28.000       | SW-12          | 0.4           | 0.355          | 0.036    | 0.0041        |                    |
| 15 minute summer               | 6             | 29.000       | 29.000:50%     | 0.0           | 0.000          | 0.000    | 0.0006        |                    |
| 15 minute summer               | 6             | 29.000       | SW-12          | 0.9           | 0.737          | 0.058    | 0.0018        |                    |
| 960 minute winter              | SW-12         | 28.001       | 4              | 0.2           | 0.027          | 0.020    | 0.0374        |                    |
| 720 minute winter              | 4             | 1.020        | SW-14 (HYDRO)  | 0.2           | 0.017          | 0.004    | 0.6287        |                    |
| 720 minute winter              | SW-14 (HYDRO) | Hydro-Brake® | SW-15          | 0.1           |                |          |               |                    |
| 720 minute winter              | SW-15         | 1.022        | DITCH HEADWALL | 0.0           | 0.000          | 0.000    | 0.5417        | 0.0                |

**Results for 2 year +10% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event                     | US Node    | Peak (mins) | Level (m)  | Depth (m)     | Inflow (l/s)   | Node Vol (m³) | Flood (m³)    | Status             |
|--------------------------------|------------|-------------|------------|---------------|----------------|---------------|---------------|--------------------|
| 720 minute winter              | 54         | 720         | 9.708      | 0.047         | 1.0            | 0.0000        | 0.0000        | OK                 |
| 15 minute summer               | SW-03      | 11          | 9.790      | 0.036         | 2.3            | 0.0057        | 0.0000        | OK                 |
| 15 minute summer               | 56         | 11          | 9.992      | 0.022         | 0.8            | 0.0000        | 0.0000        | OK                 |
| 15 minute summer               | 7.001:50%  | 11          | 9.896      | 0.034         | 1.7            | 0.0000        | 0.0000        | OK                 |
| 15 minute summer               | 57         | 11          | 10.006     | 0.006         | 0.0            | 0.0000        | 0.0000        | OK                 |
| 15 minute summer               | 7.000:50%  | 10          | 10.006     | 0.021         | 0.9            | 0.0000        | 0.0000        | OK                 |
| 15 minute summer               | 58         | 1           | 9.890      | 0.000         | 0.0            | 0.0000        | 0.0000        | OK                 |
| 15 minute summer               | 8.000:50%  | 10          | 9.837      | 0.015         | 0.6            | 0.0000        | 0.0000        | OK                 |
| 720 minute winter              | 59         | 720         | 9.708      | 0.201         | 0.7            | 0.0000        | 0.0000        | SURCHARGED         |
| 720 minute winter              | SW-11      | 720         | 9.708      | 0.104         | 0.1            | 0.0165        | 0.0000        | SURCHARGED         |
| 720 minute winter              | 26.001:50% | 720         | 9.707      | 0.148         | 0.2            | 0.0000        | 0.0000        | SURCHARGED         |
| 15 minute summer               | 61         | 1           | 9.800      | 0.000         | 0.0            | 0.0000        | 0.0000        | OK                 |
| 15 minute summer               | 26.000:50% | 11          | 9.716      | 0.014         | 0.4            | 0.0130        | 0.0000        | OK                 |
| 720 minute winter              | 62         | 720         | 9.708      | 0.193         | 1.2            | 0.0000        | 0.0000        | SURCHARGED         |
| 720 minute winter              | 63         | 705         | 9.708      | 0.156         | 0.1            | 0.0000        | 0.0000        | SURCHARGED         |
| Link Event<br>(Upstream Depth) | US Node    | Link        | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap      | Link Vol (m³) | Discharge Vol (m³) |
| 720 minute winter              | 54         | 1.005       | 40         | 1.0           | 0.174          | 0.028         | 0.2176        |                    |
| 15 minute summer               | SW-03      | 7.002       | 54         | 2.3           | 1.146          | 0.222         | 0.0066        |                    |
| 15 minute summer               | 56         | 7.001       | 7.001:50%  | 0.8           | 0.463          | 0.110         | 0.0125        |                    |
| 15 minute summer               | 56         | 7.001       | SW-03      | 1.7           | 0.719          | 0.228         | 0.0166        |                    |
| 15 minute summer               | 57         | 7.000       | 7.000:50%  | 0.0           | -0.086         | 0.005         | 0.0006        |                    |
| 15 minute summer               | 57         | 7.000       | 56         | 0.8           | 0.667          | 0.099         | 0.0010        |                    |
| 15 minute summer               | 58         | 8.000       | 8.000:50%  | 0.0           | 0.000          | 0.000         | 0.0007        |                    |
| 15 minute summer               | 58         | 8.000       | SW-03      | 0.6           | 0.404          | 0.049         | 0.0029        |                    |
| 720 minute winter              | 59         | 1.019       | 4          | 0.7           | 0.092          | 0.012         | 0.4271        |                    |
| 720 minute winter              | SW-11      | 26.001      | 26.001:50% | -0.1          | -0.040         | -0.013        | 0.0206        |                    |
| 720 minute winter              | SW-11      | 26.001      | 59         | 0.5           | 0.095          | 0.063         | 0.0206        |                    |
| 15 minute summer               | 61         | 26.000      | 26.000:50% | 0.0           | 0.000          | 0.000         | 0.0015        |                    |
| 15 minute summer               | 61         | 26.000      | SW-11      | 0.4           | 0.552          | 0.043         | 0.0031        |                    |
| 720 minute winter              | 62         | 1.018       | 59         | 0.7           | 0.148          | 0.011         | 0.3560        |                    |
| 720 minute winter              | 63         | 25.000      | 25.000:50% | -0.1          | -0.031         | -0.051        | 0.0534        |                    |

**Results for 2 year +10% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 960 minute winter | 25.000:50% | 945         | 9.707     | 0.170     | 0.3          | 0.0000        | 0.0000     | SURCHARGED |
| 720 minute winter | 64         | 720         | 9.708     | 0.186     | 1.9          | 0.0000        | 0.0000     | SURCHARGED |
| 720 minute winter | SW-10      | 720         | 9.708     | 0.093     | 0.5          | 0.0148        | 0.0000     | OK         |
| 720 minute winter | 24.002:50% | 720         | 9.707     | 0.135     | 0.6          | 0.8719        | 0.0000     | SURCHARGED |
| 15 minute summer  | 66         | 1           | 9.800     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 24.001:50% | 11          | 9.730     | 0.022     | 0.9          | 0.0315        | 0.0000     | OK         |
| 30 minute summer  | PLOT 1     | 21          | 9.739     | 0.049     | 2.6          | 0.5985        | 0.0000     | OK         |
| 30 minute summer  | PLOT 2     | 22          | 9.761     | 0.041     | 3.1          | 0.7279        | 0.0000     | OK         |
| 720 minute winter | PLOT 3     | 720         | 9.708     | 0.038     | 0.2          | 0.3960        | 0.0000     | OK         |
| 120 minute summer | PLOT 4&5   | 74          | 9.726     | 0.056     | 3.0          | 1.8670        | 0.0000     | OK         |
| 30 minute summer  | SW11       | 22          | 9.753     | 0.103     | 2.8          | 0.0202        | 0.0000     | SURCHARGED |
| 30 minute summer  | SW12       | 21          | 9.770     | 0.130     | 2.6          | 0.0256        | 0.0000     | SURCHARGED |
| 720 minute winter | SW13       | 720         | 9.708     | 0.108     | 0.2          | 0.0211        | 0.0000     | SURCHARGED |

| Link Event<br>(Upstream Depth) | US Node  | Link     | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|----------|----------|------------|---------------|----------------|----------|---------------|--------------------|
| 720 minute winter              | 63       | 25.000   | 62         | 0.2           | 0.036          | 0.077    | 0.0534        |                    |
| 720 minute winter              | 64       | 1.017    | 62         | 0.7           | 0.158          | 0.011    | 0.2988        |                    |
| 720 minute winter              | SW-10    | 24.002   | 24.002:50% | -0.4          | 0.370          | -0.041   | 0.0150        |                    |
| 720 minute winter              | SW-10    | 24.002   | 64         | 1.2           | 0.307          | 0.131    | 0.0152        |                    |
| 15 minute summer               | 66       | 24.001   | 24.001:50% | 0.0           | 0.000          | 0.000    | 0.0030        |                    |
| 15 minute summer               | 66       | 24.001   | SW-10      | 0.9           | 0.709          | 0.105    | 0.0059        |                    |
| 30 minute summer               | PLOT 1   | 14.000_1 | SW11       | 2.8           | 0.383          | 0.191    | 0.0536        |                    |
| 30 minute summer               | PLOT 2   | 15.000_1 | SW12       | 2.6           | 0.328          | 0.167    | 0.1029        |                    |
| 720 minute winter              | PLOT 3   | 20.000_1 | SW13       | 0.2           | 0.194          | 0.016    | 0.1151        |                    |
| 120 minute summer              | PLOT 4&5 | 24.000   | SW14       | 1.7           | 0.256          | 0.138    | 0.1270        |                    |
| 30 minute summer               | SW11     | Orifice  | 31         | 1.5           |                |          |               |                    |
| 30 minute summer               | SW12     | Orifice  | 29         | 1.7           |                |          |               |                    |
| 720 minute winter              | SW13     | Orifice  | 19         | 0.2           |                |          |               |                    |

**Results for 2 year +10% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node              | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|----------------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 30 minute summer  | SW14                 | 22          | 9.728     | 0.118     | 2.2          | 0.0232        | 0.0000     | OK         |
| 720 minute winter | Access Road Widening | 720         | 9.708     | 0.138     | 0.2          | 2.0424        | 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) |
|-----------------------------|----------------------|----------|---------|---------------|----------------|----------|---------------|--------------------|
| 30 minute summer            | SW14                 | Orifice  | 13      | 1.6           |                |          |               |                    |
| 720 minute winter           | Access Road Widening | 26.000_1 | 13      | -0.1          | -0.035         | -0.017   | 0.0255        |                    |

**Results for 10 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node   | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|-----------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute summer   | 53        | 12          | 9.847     | 0.087     | 0.4          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 1.000:50% | 12          | 9.847     | 0.103     | 5.5          | 0.4383        | 0.0000     | SURCHARGED |
| 1440 minute winter | 52        | 1440        | 9.839     | 0.111     | 0.2          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer   | 51        | 1           | 9.900     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 3.000:50% | 10          | 9.884     | 0.024     | 1.2          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 50        | 1           | 10.050    | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 2.000:50% | 10          | 9.963     | 0.028     | 1.6          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | SW-01     | 10          | 9.863     | 0.043     | 2.8          | 0.0069        | 0.0000     | OK         |
| 1440 minute winter | 48        | 1440        | 9.839     | 0.132     | 0.9          | 14.7094       | 0.0000     | OK         |
| 15 minute summer   | 47        | 1           | 10.000    | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 4.000:50% | 11          | 9.956     | 0.047     | 3.7          | 0.1225        | 0.0000     | OK         |
| 15 minute summer   | 46        | 1           | 9.950     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 5.000:50% | 11          | 9.903     | 0.020     | 1.0          | 0.0241        | 0.0000     | OK         |
| 15 minute summer   | SW-02     | 11          | 9.869     | 0.052     | 4.6          | 0.0082        | 0.0000     | OK         |
| 1440 minute winter | 44        | 1440        | 9.839     | 0.153     | 0.8          | 0.0000        | 0.0000     | SURCHARGED |

| Link Event<br>(Upstream Depth) | US Node | Link  | DS Node   | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|-------|-----------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer               | 53      | 1.000 | 1.000:50% | -0.4          | -0.136         | -0.149   | 0.0550        |                    |
| 15 minute summer               | 53      | 1.000 | 52        | 4.3           | 0.561          | 1.538    | 0.0545        |                    |
| 1440 minute winter             | 52      | 1.001 | 48        | 0.2           | 0.189          | 0.073    | 0.0765        |                    |
| 15 minute summer               | 51      | 3.000 | 3.000:50% | 0.0           | 0.000          | 0.000    | 0.0009        |                    |
| 15 minute summer               | 51      | 3.000 | SW-01     | 1.2           | 0.514          | 0.108    | 0.0029        |                    |
| 15 minute summer               | 50      | 2.000 | 2.000:50% | 0.0           | 0.000          | 0.000    | 0.0045        |                    |
| 15 minute summer               | 50      | 2.000 | SW-01     | 1.6           | 0.632          | 0.171    | 0.0125        |                    |
| 15 minute summer               | SW-01   | 2.001 | 48        | 2.7           | 1.032          | 0.366    | 0.0239        |                    |
| 1440 minute winter             | 48      | 1.002 | 44        | 0.6           | 0.248          | 0.077    | 0.1616        |                    |
| 15 minute summer               | 47      | 4.000 | 4.000:50% | 0.0           | 0.000          | 0.000    | 0.0079        |                    |
| 15 minute summer               | 47      | 4.000 | SW-02     | 3.6           | 0.921          | 0.404    | 0.0167        |                    |
| 15 minute summer               | 46      | 5.000 | 5.000:50% | 0.0           | 0.000          | 0.000    | 0.0010        |                    |
| 15 minute summer               | 46      | 5.000 | SW-02     | 1.0           | 0.416          | 0.084    | 0.0045        |                    |
| 15 minute summer               | SW-02   | 4.001 | 44        | 4.6           | 0.943          | 0.469    | 0.0248        |                    |
| 1440 minute winter             | 44      | 1.003 | 42        | 0.8           | 0.282          | 0.100    | 0.1593        |                    |

**Results for 10 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | 43         | 1410        | 9.838     | 0.143     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 6.000:50%  | 1410        | 9.838     | 0.158     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 42         | 1440        | 9.839     | 0.173     | 0.9          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 41         | 1410        | 9.839     | 0.178     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 9.000:50%  | 1440        | 9.838     | 0.186     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 40         | 1440        | 9.839     | 0.195     | 1.6          | 19.1464       | 0.0000     | SURCHARGED |
| 15 minute summer   | 39         | 1           | 9.980     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 10.000:50% | 10          | 9.952     | 0.065     | 4.7          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | SW-04      | 10          | 9.850     | 0.056     | 4.6          | 0.0089        | 0.0000     | OK         |
| 1440 minute winter | 37         | 1440        | 9.839     | 0.203     | 1.1          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer   | 36         | 1           | 9.980     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 11.000:50% | 10          | 9.936     | 0.049     | 3.1          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 35         | 1           | 9.894     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 12.000:50% | 10          | 9.880     | 0.036     | 2.1          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | SW-05      | 10          | 9.853     | 0.059     | 5.1          | 0.0093        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter             | 43      | 6.000  | 6.000:50%  | 0.0           | -0.010         | -0.010   | 0.0517        |                    |
| 1440 minute winter             | 43      | 6.000  | 42         | 0.1           | 0.115          | 0.036    | 0.0517        |                    |
| 1440 minute winter             | 42      | 1.004  | 54         | 0.9           | 0.573          | 0.110    | 0.0422        |                    |
| 1440 minute winter             | 41      | 9.000  | 9.000:50%  | 0.0           | -0.010         | -0.011   | 0.0318        |                    |
| 1440 minute winter             | 41      | 9.000  | 40         | 0.1           | 0.049          | 0.033    | 0.0318        |                    |
| 1440 minute winter             | 40      | 1.006  | 37         | 1.0           | 0.172          | 0.027    | 0.3463        |                    |
| 15 minute summer               | 39      | 10.000 | 10.000:50% | 0.0           | 0.000          | 0.000    | 0.0175        |                    |
| 15 minute summer               | 39      | 10.000 | SW-04      | 4.6           | 0.944          | 0.643    | 0.0321        |                    |
| 15 minute summer               | SW-04   | 10.001 | 37         | 4.6           | 1.164          | 0.524    | 0.0352        |                    |
| 1440 minute winter             | 37      | 1.007  | 33         | 1.1           | 0.175          | 0.031    | 0.2064        |                    |
| 15 minute summer               | 36      | 11.000 | 11.000:50% | 0.0           | 0.000          | 0.000    | 0.0137        |                    |
| 15 minute summer               | 36      | 11.000 | SW-05      | 3.1           | 0.711          | 0.444    | 0.0307        |                    |
| 15 minute summer               | 35      | 12.000 | 12.000:50% | 0.0           | 0.000          | 0.000    | 0.0025        |                    |
| 15 minute summer               | 35      | 12.000 | SW-05      | 2.1           | 0.570          | 0.215    | 0.0072        |                    |
| 15 minute summer               | SW-05   | 11.001 | 33         | 5.1           | 1.188          | 0.568    | 0.0364        |                    |

**Results for 10 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | 33         | 1440        | 9.839     | 0.207     | 1.3          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 32         | 1440        | 9.839     | 0.195     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 13.000:50% | 1440        | 9.838     | 0.204     | 0.1          | 1.8349        | 0.0000     | SURCHARGED |
| 1440 minute winter | 31         | 1440        | 9.839     | 0.214     | 1.5          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 30         | 1440        | 9.839     | 0.209     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 14.000:50% | 1440        | 9.839     | 0.218     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 29         | 1440        | 9.839     | 0.227     | 1.8          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer   | 28         | 1           | 9.880     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 16.000:50% | 10          | 9.838     | 0.030     | 2.1          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 27         | 1           | 9.960     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 15.000:50% | 11          | 9.892     | 0.044     | 3.1          | 0.1428        | 0.0000     | OK         |
| 1440 minute winter | SW-06      | 1440        | 9.838     | 0.101     | 0.2          | 0.0161        | 0.0000     | SURCHARGED |
| 1440 minute winter | 25         | 1440        | 9.839     | 0.234     | 2.0          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer   | 24         | 1           | 9.960     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 17.000:50% | 11          | 9.888     | 0.040     | 2.3          | 0.1183        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter             | 33      | 1.008  | 31         | 1.2           | 0.193          | 0.035    | 0.3348        |                    |
| 1440 minute winter             | 32      | 13.000 | 13.000:50% | 0.0           | -0.035         | -0.008   | 0.0346        |                    |
| 1440 minute winter             | 32      | 13.000 | 31         | 0.1           | 0.035          | 0.026    | 0.0346        |                    |
| 1440 minute winter             | 31      | 1.009  | 29         | 1.5           | 0.177          | 0.042    | 0.6683        |                    |
| 1440 minute winter             | 30      | 14.000 | 14.000:50% | 0.0           | -0.030         | 0.013    | 0.0324        |                    |
| 1440 minute winter             | 30      | 14.000 | 29         | 0.1           | -0.019         | 0.032    | 0.0324        |                    |
| 1440 minute winter             | 29      | 1.010  | 25         | 1.8           | 0.200          | 0.060    | 0.5001        |                    |
| 15 minute summer               | 28      | 16.000 | 16.000:50% | 0.0           | 0.000          | 0.000    | 0.0017        |                    |
| 15 minute summer               | 28      | 16.000 | SW-06      | 2.1           | 0.657          | 0.170    | 0.0058        |                    |
| 15 minute summer               | 27      | 15.000 | 15.000:50% | 0.0           | 0.000          | 0.000    | 0.0112        |                    |
| 15 minute summer               | 27      | 15.000 | SW-06      | 3.0           | 0.743          | 0.381    | 0.0273        |                    |
| 1440 minute winter             | SW-06   | 15.001 | 25         | 0.2           | 0.324          | 0.023    | 0.0504        |                    |
| 1440 minute winter             | 25      | 1.011  | 21         | 2.0           | 0.206          | 0.045    | 0.2431        |                    |
| 15 minute summer               | 24      | 17.000 | 17.000:50% | 0.0           | 0.000          | 0.000    | 0.0119        |                    |
| 15 minute summer               | 24      | 17.000 | SW-07      | 2.2           | 0.829          | 0.305    | 0.0212        |                    |

**Results for 10 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | SW-07      | 1440        | 9.839     | 0.102     | 0.1          | 0.0161        | 0.0000     | SURCHARGED |
| 1440 minute winter | 21         | 1440        | 9.839     | 0.241     | 2.4          | 32.3806       | 0.0000     | SURCHARGED |
| 1440 minute winter | 20         | 1440        | 9.839     | 0.224     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 19.000:50% | 1440        | 9.839     | 0.240     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 19         | 1440        | 9.839     | 0.256     | 1.5          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer   | 18         | 1           | 9.910     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 21.000:50% | 11          | 9.849     | 0.037     | 2.1          | 0.1026        | 0.0000     | OK         |
| 15 minute summer   | 17         | 1           | 9.930     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 20.000:50% | 11          | 9.873     | 0.051     | 3.7          | 0.1996        | 0.0000     | OK         |
| 1440 minute winter | SW-08      | 1440        | 9.839     | 0.126     | 0.3          | 0.0200        | 0.0000     | SURCHARGED |
| 1440 minute winter | 15         | 1440        | 9.839     | 0.267     | 1.7          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 14         | 1440        | 9.839     | 0.247     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 22.000:50% | 1440        | 9.839     | 0.264     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 13         | 1440        | 9.839     | 0.281     | 2.7          | 57.1435       | 0.0000     | SURCHARGED |
| 15 minute summer   | 12         | 1           | 9.850     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter             | SW-07   | 18.000 | 21         | 0.1           | 0.122          | 0.011    | 0.0498        |                    |
| 1440 minute winter             | 21      | 1.012  | 19         | 1.2           | 0.157          | 0.035    | 0.8783        |                    |
| 1440 minute winter             | 20      | 19.000 | 19.000:50% | 0.0           | -0.011         | 0.009    | 0.0586        |                    |
| 1440 minute winter             | 20      | 19.000 | 19         | 0.1           | 0.130          | 0.035    | 0.0586        |                    |
| 1440 minute winter             | 19      | 1.013  | 15         | 1.4           | 0.155          | 0.040    | 0.6502        |                    |
| 15 minute summer               | 18      | 21.000 | 21.000:50% | 0.0           | 0.000          | 0.000    | 0.0106        |                    |
| 15 minute summer               | 18      | 21.000 | SW-08      | 2.0           | 0.524          | 0.295    | 0.0303        |                    |
| 15 minute summer               | 17      | 20.000 | 20.000:50% | 0.0           | 0.000          | 0.000    | 0.0167        |                    |
| 15 minute summer               | 17      | 20.000 | SW-08      | 3.4           | 0.763          | 0.492    | 0.0369        |                    |
| 1440 minute winter             | SW-08   | 20.001 | 15         | 0.3           | 0.150          | 0.034    | 0.0508        |                    |
| 1440 minute winter             | 15      | 1.014  | 13         | 1.7           | 0.141          | 0.047    | 0.8416        |                    |
| 1440 minute winter             | 14      | 22.000 | 22.000:50% | 0.0           | -0.009         | 0.010    | 0.0597        |                    |
| 1440 minute winter             | 14      | 22.000 | 13         | 0.1           | 0.038          | 0.034    | 0.0597        |                    |
| 1440 minute winter             | 13      | 1.015  | 10         | 0.8           | 0.171          | 0.020    | 0.9596        |                    |
| 15 minute summer               | 12      | 23.000 | 23.000:50% | 0.0           | 0.000          | 0.000    | 0.0075        |                    |

**Results for 10 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node        | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|----------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | 23.000:50%     | 1440        | 9.838     | 0.125     | 0.1          | 0.9700        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW-09          | 1440        | 9.839     | 0.262     | 0.1          | 0.0416        | 0.0000     | SURCHARGED |
| 1440 minute winter | 10             | 1440        | 9.839     | 0.302     | 1.1          | 21.8413       | 0.0000     | SURCHARGED |
| 1440 minute winter | 9              | 1440        | 9.839     | 0.089     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 27.000:50%     | 1440        | 9.838     | 0.172     | 0.2          | 2.2064        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW-13          | 1440        | 9.839     | 0.256     | 0.2          | 0.0407        | 0.0000     | SURCHARGED |
| 1440 minute winter | 7              | 1440        | 9.839     | 0.014     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 28.000:50%     | 1440        | 9.838     | 0.131     | 0.1          | 1.1027        | 0.0000     | SURCHARGED |
| 1440 minute winter | 6              | 1410        | 9.839     | 0.074     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 29.000:50%     | 1440        | 9.838     | 0.161     | 0.3          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW-12          | 1440        | 9.839     | 0.249     | 0.7          | 0.0395        | 0.0000     | SURCHARGED |
| 1440 minute winter | 4              | 1440        | 9.839     | 0.341     | 0.8          | 21.8413       | 0.0000     | SURCHARGED |
| 1440 minute winter | SW-14 (HYDRO)  | 1440        | 9.839     | 0.345     | 0.5          | 0.3898        | 0.0000     | FLOOD RISK |
| 1440 minute winter | SW-15          | 1440        | 9.839     | 0.429     | 0.1          | 0.4848        | 0.0000     | FLOOD RISK |
| 15 minute summer   | DITCH HEADWALL | 1           | 9.874     | 0.521     | 0.0          | 0.0000        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US Node       | Link         | DS Node        | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------------|--------------|----------------|---------------|----------------|----------|---------------|--------------------|
| 15 minute summer               | 12            | 23.000       | SW-09          | 3.1           | 0.764          | 0.320    | 0.0219        |                    |
| 1440 minute winter             | SW-09         | 23.001       | 10             | 0.1           | 0.032          | 0.021    | 0.0450        |                    |
| 1440 minute winter             | 10            | 1.016        | 64             | 0.6           | 0.153          | 0.010    | 1.0932        |                    |
| 1440 minute winter             | 9             | 27.000       | 27.000:50%     | 0.0           | -0.002         | -0.002   | 0.0358        |                    |
| 1440 minute winter             | 9             | 27.000       | SW-13          | 0.2           | 0.318          | 0.025    | 0.0370        |                    |
| 1440 minute winter             | SW-13         | 27.001       | 4              | 0.2           | 0.030          | 0.032    | 0.0626        |                    |
| 1440 minute winter             | 7             | 28.000       | 28.000:50%     | 0.0           | -0.007         | -0.003   | 0.0149        |                    |
| 1440 minute winter             | 7             | 28.000       | SW-12          | 0.1           | 0.019          | 0.008    | 0.0275        |                    |
| 1440 minute winter             | 6             | 29.000       | 29.000:50%     | 0.0           | 0.005          | 0.002    | 0.0095        |                    |
| 1440 minute winter             | 6             | 29.000       | SW-12          | 0.5           | 0.165          | 0.035    | 0.0107        |                    |
| 1440 minute winter             | SW-12         | 28.001       | 4              | 0.2           | 0.024          | 0.024    | 0.0374        |                    |
| 1440 minute winter             | 4             | 1.020        | SW-14 (HYDRO)  | 0.5           | 0.032          | 0.010    | 1.0175        |                    |
| 1440 minute winter             | SW-14 (HYDRO) | Hydro-Brake® | SW-15          | 0.1           |                |          |               |                    |
| 1440 minute winter             | SW-15         | 1.022        | DITCH HEADWALL | 0.0           | 0.000          | 0.000    | 0.5420        | 0.0                |

**Results for 10 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | 54         | 1440        | 9.839     | 0.178     | 1.2          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW-03      | 1440        | 9.838     | 0.084     | 0.3          | 0.0134        | 0.0000     | OK         |
| 15 minute summer   | 56         | 11          | 10.009    | 0.039     | 2.5          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 7.001:50%  | 10          | 9.927     | 0.065     | 5.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 57         | 10          | 10.023    | 0.023     | 0.2          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 7.000:50%  | 10          | 10.023    | 0.038     | 2.5          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 58         | 1           | 9.890     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 8.000:50%  | 10          | 9.847     | 0.025     | 1.6          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 59         | 1440        | 9.839     | 0.332     | 0.6          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW-11      | 1440        | 9.839     | 0.235     | 0.1          | 0.0373        | 0.0000     | SURCHARGED |
| 1440 minute winter | 26.001:50% | 1440        | 9.838     | 0.279     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 61         | 1440        | 9.839     | 0.039     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 26.000:50% | 1440        | 9.839     | 0.137     | 0.1          | 1.1934        | 0.0000     | SURCHARGED |
| 1440 minute winter | 62         | 1440        | 9.839     | 0.324     | 0.6          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 63         | 1440        | 9.839     | 0.287     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter             | 54      | 1.005  | 40         | 1.2           | 0.153          | 0.033    | 0.7339        |                    |
| 1440 minute winter             | SW-03   | 7.002  | 54         | 0.3           | 0.644          | 0.029    | 0.0244        |                    |
| 15 minute summer               | 56      | 7.001  | 7.001:50%  | 2.4           | 0.595          | 0.322    | 0.0282        |                    |
| 15 minute summer               | 56      | 7.001  | SW-03      | 5.0           | 0.906          | 0.657    | 0.0379        |                    |
| 15 minute summer               | 57      | 7.000  | 7.000:50%  | 0.2           | 0.173          | 0.025    | 0.0016        |                    |
| 15 minute summer               | 57      | 7.000  | 56         | 2.5           | 0.892          | 0.292    | 0.0021        |                    |
| 15 minute summer               | 58      | 8.000  | 8.000:50%  | 0.0           | 0.000          | 0.000    | 0.0014        |                    |
| 15 minute summer               | 58      | 8.000  | SW-03      | 1.6           | 0.496          | 0.134    | 0.0064        |                    |
| 1440 minute winter             | 59      | 1.019  | 4          | 0.5           | 0.073          | 0.009    | 0.6997        |                    |
| 1440 minute winter             | SW-11   | 26.001 | 26.001:50% | -0.1          | 0.010          | -0.008   | 0.0206        |                    |
| 1440 minute winter             | SW-11   | 26.001 | 59         | -0.1          | -0.008         | -0.008   | 0.0206        |                    |
| 1440 minute winter             | 61      | 26.000 | 26.000:50% | 0.0           | 0.005          | 0.003    | 0.0227        |                    |
| 1440 minute winter             | 61      | 26.000 | SW-11      | -0.1          | -0.007         | -0.006   | 0.0334        |                    |
| 1440 minute winter             | 62      | 1.018  | 59         | 0.6           | 0.123          | 0.009    | 0.5930        |                    |
| 1440 minute winter             | 63      | 25.000 | 25.000:50% | 0.0           | -0.008         | -0.015   | 0.0534        |                    |

**Results for 10 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | 25.000:50% | 1440        | 9.838     | 0.301     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 64         | 1440        | 9.839     | 0.317     | 0.6          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW-10      | 1440        | 9.839     | 0.224     | 0.3          | 0.0356        | 0.0000     | SURCHARGED |
| 1440 minute winter | 24.002:50% | 1440        | 9.838     | 0.266     | 0.1          | 3.3923        | 0.0000     | SURCHARGED |
| 1440 minute winter | 66         | 1440        | 9.839     | 0.039     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 24.001:50% | 1440        | 9.838     | 0.131     | 0.1          | 1.1019        | 0.0000     | SURCHARGED |
| 30 minute summer   | PLOT 1     | 23          | 9.870     | 0.180     | 7.5          | 2.3317        | 0.0000     | SURCHARGED |
| 30 minute summer   | PLOT 2     | 24          | 9.875     | 0.155     | 8.9          | 2.9467        | 0.0000     | SURCHARGED |
| 1440 minute winter | PLOT 3     | 1440        | 9.839     | 0.169     | 0.3          | 1.9100        | 0.0000     | SURCHARGED |
| 120 minute summer  | PLOT 4&5   | 82          | 9.860     | 0.190     | 7.5          | 6.7823        | 0.0000     | SURCHARGED |
| 30 minute summer   | SW11       | 23          | 9.869     | 0.219     | 3.4          | 0.0430        | 0.0000     | SURCHARGED |
| 30 minute summer   | SW12       | 24          | 9.873     | 0.233     | 2.5          | 0.0456        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW13       | 1440        | 9.839     | 0.239     | 0.2          | 0.0468        | 0.0000     | SURCHARGED |

| Link Event<br>(Upstream Depth) | US Node  | Link     | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|----------|----------|------------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter             | 63       | 25.000   | 62         | 0.1           | -0.022         | 0.035    | 0.0534        |                    |
| 1440 minute winter             | 64       | 1.017    | 62         | 0.6           | 0.154          | 0.009    | 0.5056        |                    |
| 1440 minute winter             | SW-10    | 24.002   | 24.002:50% | -0.2          | 0.073          | -0.022   | 0.0152        |                    |
| 1440 minute winter             | SW-10    | 24.002   | 64         | 0.2           | 0.040          | 0.026    | 0.0152        |                    |
| 1440 minute winter             | 66       | 24.001   | 24.001:50% | 0.0           | -0.005         | -0.003   | 0.0249        |                    |
| 1440 minute winter             | 66       | 24.001   | SW-10      | 0.1           | 0.369          | 0.012    | 0.0367        |                    |
| 30 minute summer               | PLOT 1   | 14.000_1 | SW11       | 3.4           | 0.335          | 0.238    | 0.1065        |                    |
| 30 minute summer               | PLOT 2   | 15.000_1 | SW12       | 2.5           | 0.349          | 0.159    | 0.1794        |                    |
| 1440 minute winter             | PLOT 3   | 20.000_1 | SW13       | 0.2           | 0.181          | 0.016    | 0.2385        |                    |
| 120 minute summer              | PLOT 4&5 | 24.000   | SW14       | 2.1           | 0.254          | 0.167    | 0.2164        |                    |
| 30 minute summer               | SW11     | Orifice  | 31         | 2.2           |                |          |               |                    |
| 30 minute summer               | SW12     | Orifice  | 29         | 2.2           |                |          |               |                    |
| 1440 minute winter             | SW13     | Orifice  | 19         | 0.2           |                |          |               |                    |

**Results for 10 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node              | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|----------------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 120 minute summer  | SW14                 | 82          | 9.859     | 0.249     | 2.1          | 0.0488        | 0.0000     | SURCHARGED |
| 1440 minute winter | Access Road Widening | 1440        | 9.839     | 0.269     | 0.1          | 4.0560        | 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) |
|-----------------------------|----------------------|----------|---------|---------------|----------------|----------|---------------|--------------------|
| 120 minute summer           | SW14                 | Orifice  | 13      | 2.0           |                |          |               |                    |
| 1440 minute winter          | Access Road Widening | 26.000_1 | 13      | -0.1          | -0.066         | -0.023   | 0.0255        |                    |

**Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node   | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|-----------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | 53        | 1410        | 9.909     | 0.149     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 1.000:50% | 1410        | 9.909     | 0.165     | 0.3          | 1.1296        | 0.0000     | SURCHARGED |
| 1440 minute winter | 52        | 1410        | 9.909     | 0.181     | 0.3          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 51        | 1380        | 9.909     | 0.009     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 3.000:50% | 1380        | 9.909     | 0.049     | 0.1          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 50        | 1           | 10.050    | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 2.000:50% | 10          | 9.967     | 0.032     | 2.1          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | SW-01     | 1380        | 9.909     | 0.089     | 0.2          | 0.0142        | 0.0000     | OK         |
| 1440 minute winter | 48        | 1410        | 9.909     | 0.202     | 1.2          | 23.4377       | 0.0000     | SURCHARGED |
| 15 minute summer   | 47        | 1           | 10.000    | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 4.000:50% | 11          | 9.965     | 0.057     | 4.9          | 0.1772        | 0.0000     | OK         |
| 15 minute summer   | 46        | 1           | 9.950     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 5.000:50% | 1410        | 9.909     | 0.026     | 0.1          | 0.0408        | 0.0000     | OK         |
| 1440 minute winter | SW-02     | 1410        | 9.910     | 0.093     | 0.3          | 0.0147        | 0.0000     | OK         |
| 1440 minute winter | 44        | 1410        | 9.909     | 0.223     | 1.0          | 0.0000        | 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) |
|-----------------------------|---------|-------|-----------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter          | 53      | 1.000 | 1.000:50% | 0.0           | -0.009         | 0.008    | 0.0571        |                    |
| 1440 minute winter          | 53      | 1.000 | 52        | 0.3           | 0.235          | 0.108    | 0.0571        |                    |
| 1440 minute winter          | 52      | 1.001 | 48        | 0.3           | 0.198          | 0.109    | 0.0765        |                    |
| 1440 minute winter          | 51      | 3.000 | 3.000:50% | 0.0           | -0.016         | -0.002   | 0.0026        |                    |
| 1440 minute winter          | 51      | 3.000 | SW-01     | 0.1           | 0.284          | 0.009    | 0.0070        |                    |
| 15 minute summer            | 50      | 2.000 | 2.000:50% | 0.0           | 0.000          | 0.000    | 0.0054        |                    |
| 15 minute summer            | 50      | 2.000 | SW-01     | 2.1           | 0.679          | 0.225    | 0.0153        |                    |
| 1440 minute winter          | SW-01   | 2.001 | 48        | 0.2           | 0.190          | 0.027    | 0.0569        |                    |
| 1440 minute winter          | 48      | 1.002 | 44        | 0.7           | 0.245          | 0.083    | 0.1675        |                    |
| 15 minute summer            | 47      | 4.000 | 4.000:50% | 0.0           | 0.000          | 0.000    | 0.0099        |                    |
| 15 minute summer            | 47      | 4.000 | SW-02     | 4.7           | 0.962          | 0.535    | 0.0212        |                    |
| 15 minute summer            | 46      | 5.000 | 5.000:50% | 0.0           | 0.000          | 0.000    | 0.0012        |                    |
| 15 minute summer            | 46      | 5.000 | SW-02     | 1.4           | 0.436          | 0.114    | 0.0057        |                    |
| 1440 minute winter          | SW-02   | 4.001 | 44        | 0.3           | 0.199          | 0.031    | 0.0392        |                    |
| 1440 minute winter          | 44      | 1.003 | 42        | 1.0           | 0.288          | 0.117    | 0.1593        |                    |

**Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | 43         | 1410        | 9.909     | 0.214     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 6.000:50%  | 1410        | 9.909     | 0.228     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 42         | 1410        | 9.909     | 0.243     | 1.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 41         | 1380        | 9.909     | 0.248     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 9.000:50%  | 1410        | 9.909     | 0.256     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 40         | 1410        | 9.909     | 0.265     | 1.8          | 26.5389       | 0.0000     | SURCHARGED |
| 15 minute summer   | 39         | 1           | 9.980     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 10.000:50% | 10          | 9.968     | 0.081     | 6.3          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | SW-04      | 1410        | 9.909     | 0.115     | 0.3          | 0.0183        | 0.0000     | SURCHARGED |
| 1440 minute winter | 37         | 1410        | 9.909     | 0.273     | 1.0          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer   | 36         | 1           | 9.980     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 11.000:50% | 10          | 9.948     | 0.061     | 4.2          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 35         | 1380        | 9.909     | 0.015     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 12.000:50% | 1380        | 9.909     | 0.065     | 0.5          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | SW-05      | 1380        | 9.909     | 0.115     | 0.5          | 0.0183        | 0.0000     | SURCHARGED |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter             | 43      | 6.000  | 6.000:50%  | 0.0           | -0.012         | -0.016   | 0.0517        |                    |
| 1440 minute winter             | 43      | 6.000  | 42         | 0.1           | 0.112          | 0.036    | 0.0517        |                    |
| 1440 minute winter             | 42      | 1.004  | 54         | 1.0           | 0.578          | 0.127    | 0.0422        |                    |
| 1440 minute winter             | 41      | 9.000  | 9.000:50%  | 0.0           | -0.014         | 0.017    | 0.0318        |                    |
| 1440 minute winter             | 41      | 9.000  | 40         | 0.1           | 0.064          | 0.032    | 0.0318        |                    |
| 1440 minute winter             | 40      | 1.006  | 37         | 0.9           | 0.177          | 0.026    | 0.4695        |                    |
| 15 minute summer               | 39      | 10.000 | 10.000:50% | 0.0           | 0.000          | 0.000    | 0.0223        |                    |
| 15 minute summer               | 39      | 10.000 | SW-04      | 6.2           | 0.992          | 0.859    | 0.0406        |                    |
| 1440 minute winter             | SW-04   | 10.001 | 37         | 0.3           | 0.421          | 0.034    | 0.0588        |                    |
| 1440 minute winter             | 37      | 1.007  | 33         | 1.0           | 0.169          | 0.030    | 0.2777        |                    |
| 15 minute summer               | 36      | 11.000 | 11.000:50% | 0.0           | 0.000          | 0.000    | 0.0177        |                    |
| 15 minute summer               | 36      | 11.000 | SW-05      | 4.1           | 0.748          | 0.599    | 0.0393        |                    |
| 1440 minute winter             | 35      | 12.000 | 12.000:50% | 0.0           | -0.015         | -0.003   | 0.0061        |                    |
| 1440 minute winter             | 35      | 12.000 | SW-05      | -0.4          | 0.299          | -0.041   | 0.0131        |                    |
| 1440 minute winter             | SW-05   | 11.001 | 33         | 0.3           | 0.460          | 0.034    | 0.0575        |                    |

**Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | 33         | 1410        | 9.909     | 0.277     | 1.2          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 32         | 1410        | 9.909     | 0.265     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 13.000:50% | 1410        | 9.909     | 0.274     | 0.1          | 3.3404        | 0.0000     | SURCHARGED |
| 1440 minute winter | 31         | 1410        | 9.909     | 0.284     | 1.5          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 30         | 1410        | 9.910     | 0.280     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 14.000:50% | 1410        | 9.909     | 0.288     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 29         | 1410        | 9.909     | 0.297     | 1.9          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 28         | 1410        | 9.910     | 0.030     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 16.000:50% | 1410        | 9.909     | 0.100     | 0.5          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer   | 27         | 1           | 9.960     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 15.000:50% | 1410        | 9.909     | 0.060     | 0.2          | 0.2751        | 0.0000     | OK         |
| 1440 minute winter | SW-06      | 1410        | 9.909     | 0.172     | 0.3          | 0.0274        | 0.0000     | SURCHARGED |
| 1440 minute winter | 25         | 1410        | 9.909     | 0.304     | 2.1          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer   | 24         | 1           | 9.960     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 17.000:50% | 1410        | 9.909     | 0.060     | 0.1          | 0.2732        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter             | 33      | 1.008  | 31         | 1.2           | 0.184          | 0.034    | 0.4474        |                    |
| 1440 minute winter             | 32      | 13.000 | 13.000:50% | 0.0           | -0.010         | 0.010    | 0.0346        |                    |
| 1440 minute winter             | 32      | 13.000 | 31         | -0.1          | 0.046          | -0.045   | 0.0346        |                    |
| 1440 minute winter             | 31      | 1.009  | 29         | 1.5           | 0.176          | 0.042    | 0.8830        |                    |
| 1440 minute winter             | 30      | 14.000 | 14.000:50% | 0.0           | -0.020         | 0.012    | 0.0324        |                    |
| 1440 minute winter             | 30      | 14.000 | 29         | 0.1           | 0.019          | 0.036    | 0.0324        |                    |
| 1440 minute winter             | 29      | 1.010  | 25         | 1.9           | 0.185          | 0.062    | 0.6538        |                    |
| 1440 minute winter             | 28      | 16.000 | 16.000:50% | 0.0           | -0.010         | 0.003    | 0.0086        |                    |
| 1440 minute winter             | 28      | 16.000 | SW-06      | -0.4          | 0.313          | -0.035   | 0.0138        |                    |
| 15 minute summer               | 27      | 15.000 | 15.000:50% | 0.0           | 0.000          | 0.000    | 0.0142        |                    |
| 15 minute summer               | 27      | 15.000 | SW-06      | 3.9           | 0.770          | 0.505    | 0.0347        |                    |
| 1440 minute winter             | SW-06   | 15.001 | 25         | 0.3           | 0.310          | 0.036    | 0.0504        |                    |
| 1440 minute winter             | 25      | 1.011  | 21         | 2.1           | 0.195          | 0.048    | 0.3156        |                    |
| 15 minute summer               | 24      | 17.000 | 17.000:50% | 0.0           | 0.000          | 0.000    | 0.0146        |                    |
| 15 minute summer               | 24      | 17.000 | SW-07      | 2.9           | 0.885          | 0.404    | 0.0263        |                    |

**Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | SW-07      | 1410        | 9.909     | 0.172     | 0.1          | 0.0274        | 0.0000     | SURCHARGED |
| 1440 minute winter | 21         | 1410        | 9.909     | 0.311     | 2.6          | 40.9158       | 0.0000     | SURCHARGED |
| 1440 minute winter | 20         | 1380        | 9.909     | 0.294     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 19.000:50% | 1380        | 9.909     | 0.310     | 0.2          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 19         | 1410        | 9.909     | 0.326     | 1.5          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer   | 18         | 1           | 9.910     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 21.000:50% | 1410        | 9.909     | 0.097     | 0.1          | 0.7299        | 0.0000     | OK         |
| 15 minute summer   | 17         | 1           | 9.930     | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 20.000:50% | 1410        | 9.909     | 0.087     | 0.2          | 0.5866        | 0.0000     | OK         |
| 1440 minute winter | SW-08      | 1410        | 9.909     | 0.196     | 0.3          | 0.0312        | 0.0000     | SURCHARGED |
| 1440 minute winter | 15         | 1410        | 9.909     | 0.337     | 1.8          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 14         | 1410        | 9.910     | 0.318     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 22.000:50% | 1410        | 9.909     | 0.334     | 0.2          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 13         | 1410        | 9.909     | 0.351     | 2.9          | 61.4374       | 0.0000     | SURCHARGED |
| 1440 minute winter | 12         | 1410        | 9.910     | 0.060     | 0.0          | 0.0000        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter             | SW-07   | 18.000 | 21         | 0.1           | 0.087          | 0.011    | 0.0498        |                    |
| 1440 minute winter             | 21      | 1.012  | 19         | 1.2           | 0.158          | 0.036    | 1.1285        |                    |
| 1440 minute winter             | 20      | 19.000 | 19.000:50% | 0.0           | -0.013         | -0.015   | 0.0586        |                    |
| 1440 minute winter             | 20      | 19.000 | 19         | 0.2           | 0.090          | 0.067    | 0.0586        |                    |
| 1440 minute winter             | 19      | 1.013  | 15         | 1.5           | 0.169          | 0.041    | 0.8262        |                    |
| 15 minute summer               | 18      | 21.000 | 21.000:50% | 0.0           | 0.000          | 0.000    | 0.0132        |                    |
| 15 minute summer               | 18      | 21.000 | SW-08      | 2.6           | 0.561          | 0.395    | 0.0378        |                    |
| 15 minute summer               | 17      | 20.000 | 20.000:50% | 0.0           | 0.000          | 0.000    | 0.0209        |                    |
| 15 minute summer               | 17      | 20.000 | SW-08      | 4.5           | 0.795          | 0.642    | 0.0462        |                    |
| 1440 minute winter             | SW-08   | 20.001 | 15         | 0.3           | 0.098          | 0.034    | 0.0508        |                    |
| 1440 minute winter             | 15      | 1.014  | 13         | 1.7           | 0.157          | 0.048    | 1.0590        |                    |
| 1440 minute winter             | 14      | 22.000 | 22.000:50% | 0.0           | -0.010         | 0.013    | 0.0597        |                    |
| 1440 minute winter             | 14      | 22.000 | 13         | 0.2           | 0.027          | 0.067    | 0.0597        |                    |
| 1440 minute winter             | 13      | 1.015  | 10         | 0.9           | 0.192          | 0.022    | 1.1926        |                    |
| 1440 minute winter             | 12      | 23.000 | 23.000:50% | 0.0           | -0.005         | -0.003   | 0.0334        |                    |

**Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node        | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|----------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | 23.000:50%     | 1410        | 9.909     | 0.195     | 0.2          | 2.3801        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW-09          | 1410        | 9.909     | 0.332     | 0.2          | 0.0529        | 0.0000     | SURCHARGED |
| 1440 minute winter | 10             | 1410        | 9.909     | 0.372     | 1.1          | 21.8413       | 0.0000     | SURCHARGED |
| 1440 minute winter | 9              | 1380        | 9.909     | 0.159     | 0.0          | 0.0000        | 0.0000     | FLOOD RISK |
| 1440 minute winter | 27.000:50%     | 1410        | 9.909     | 0.242     | 0.3          | 4.3950        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW-13          | 1410        | 9.909     | 0.326     | 0.2          | 0.0519        | 0.0000     | FLOOD RISK |
| 1440 minute winter | 7              | 1410        | 9.909     | 0.084     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 28.000:50%     | 1410        | 9.909     | 0.201     | 0.1          | 2.6196        | 0.0000     | SURCHARGED |
| 1440 minute winter | 6              | 1380        | 9.909     | 0.144     | 0.0          | 0.0000        | 0.0000     | FLOOD RISK |
| 1440 minute winter | 29.000:50%     | 1380        | 9.909     | 0.231     | 0.9          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW-12          | 1380        | 9.909     | 0.319     | 0.5          | 0.0508        | 0.0000     | FLOOD RISK |
| 1440 minute winter | 4              | 1410        | 9.909     | 0.411     | 1.1          | 21.8413       | 0.0000     | FLOOD RISK |
| 1440 minute winter | SW-14 (HYDRO)  | 1410        | 9.909     | 0.415     | 0.5          | 0.4698        | 0.0000     | FLOOD RISK |
| 1440 minute winter | SW-15          | 1440        | 9.874     | 0.464     | 0.5          | 0.5248        | 0.0000     | FLOOD RISK |
| 15 minute summer   | DITCH HEADWALL | 1           | 9.874     | 0.521     | 0.0          | 0.0000        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US Node       | Link         | DS Node        | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------------|--------------|----------------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter             | 12            | 23.000       | SW-09          | 0.2           | 0.091          | 0.020    | 0.0412        |                    |
| 1440 minute winter             | SW-09         | 23.001       | 10             | 0.2           | 0.024          | 0.041    | 0.0450        |                    |
| 1440 minute winter             | 10            | 1.016        | 64             | 0.8           | 0.161          | 0.013    | 1.3431        |                    |
| 1440 minute winter             | 9             | 27.000       | 27.000:50%     | 0.0           | 0.003          | 0.003    | 0.0370        |                    |
| 1440 minute winter             | 9             | 27.000       | SW-13          | 0.2           | 0.318          | 0.027    | 0.0370        |                    |
| 1440 minute winter             | SW-13         | 27.001       | 4              | 0.2           | 0.056          | 0.035    | 0.0626        |                    |
| 1440 minute winter             | 7             | 28.000       | 28.000:50%     | 0.0           | -0.004         | -0.003   | 0.0261        |                    |
| 1440 minute winter             | 7             | 28.000       | SW-12          | 0.1           | 0.024          | 0.012    | 0.0275        |                    |
| 1440 minute winter             | 6             | 29.000       | 29.000:50%     | 0.0           | -0.004         | -0.002   | 0.0107        |                    |
| 1440 minute winter             | 6             | 29.000       | SW-12          | -0.8          | -0.149         | -0.050   | 0.0107        |                    |
| 1440 minute winter             | SW-12         | 28.001       | 4              | 0.3           | 0.035          | 0.034    | 0.0374        |                    |
| 1440 minute winter             | 4             | 1.020        | SW-14 (HYDRO)  | 0.5           | 0.032          | 0.009    | 1.2274        |                    |
| 1440 minute winter             | SW-14 (HYDRO) | Hydro-Brake® | SW-15          | 0.5           |                |          |               |                    |
| 1440 minute winter             | SW-15         | 1.022        | DITCH HEADWALL | 0.5           | 0.006          | 0.005    | 0.5420        | 23.2               |

**Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | 54         | 1410        | 9.909     | 0.248     | 1.3          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW-03      | 1410        | 9.909     | 0.155     | 0.6          | 0.0247        | 0.0000     | SURCHARGED |
| 15 minute summer   | 56         | 10          | 10.016    | 0.046     | 3.3          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 7.001:50%  | 11          | 9.946     | 0.084     | 6.8          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 57         | 10          | 10.030    | 0.030     | 0.2          | 0.0000        | 0.0000     | OK         |
| 15 minute summer   | 7.000:50%  | 10          | 10.030    | 0.045     | 3.4          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 58         | 1410        | 9.909     | 0.019     | 0.0          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 8.000:50%  | 1380        | 9.909     | 0.087     | 0.1          | 0.0000        | 0.0000     | OK         |
| 1440 minute winter | 59         | 1410        | 9.909     | 0.402     | 0.8          | 0.0000        | 0.0000     | FLOOD RISK |
| 1440 minute winter | SW-11      | 1410        | 9.909     | 0.305     | 0.1          | 0.0485        | 0.0000     | FLOOD RISK |
| 1440 minute winter | 26.001:50% | 1410        | 9.909     | 0.349     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 61         | 1380        | 9.909     | 0.109     | 0.0          | 0.0000        | 0.0000     | FLOOD RISK |
| 1440 minute winter | 26.000:50% | 1410        | 9.909     | 0.207     | 0.1          | 2.7476        | 0.0000     | SURCHARGED |
| 1440 minute winter | 62         | 1410        | 9.909     | 0.394     | 0.8          | 0.0000        | 0.0000     | FLOOD RISK |
| 1440 minute winter | 63         | 1410        | 9.909     | 0.357     | 0.0          | 0.0000        | 0.0000     | FLOOD RISK |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter             | 54      | 1.005  | 40         | 1.3           | 0.151          | 0.037    | 1.0128        |                    |
| 1440 minute winter             | SW-03   | 7.002  | 54         | 0.3           | 0.646          | 0.029    | 0.0256        |                    |
| 15 minute summer               | 56      | 7.001  | 7.001:50%  | 3.3           | 0.614          | 0.434    | 0.0363        |                    |
| 15 minute summer               | 56      | 7.001  | SW-03      | 6.7           | 0.946          | 0.881    | 0.0488        |                    |
| 15 minute summer               | 57      | 7.000  | 7.000:50%  | 0.2           | -0.127         | 0.023    | 0.0021        |                    |
| 15 minute summer               | 57      | 7.000  | 56         | 3.3           | 0.965          | 0.396    | 0.0027        |                    |
| 1440 minute winter             | 58      | 8.000  | 8.000:50%  | 0.0           | -0.015         | -0.004   | 0.0075        |                    |
| 1440 minute winter             | 58      | 8.000  | SW-03      | 0.4           | 0.278          | 0.032    | 0.0136        |                    |
| 1440 minute winter             | 59      | 1.019  | 4          | 0.7           | 0.082          | 0.012    | 0.8467        |                    |
| 1440 minute winter             | SW-11   | 26.001 | 26.001:50% | -0.1          | -0.018         | -0.017   | 0.0206        |                    |
| 1440 minute winter             | SW-11   | 26.001 | 59         | -0.1          | -0.018         | -0.018   | 0.0206        |                    |
| 1440 minute winter             | 61      | 26.000 | 26.000:50% | 0.0           | 0.004          | 0.004    | 0.0334        |                    |
| 1440 minute winter             | 61      | 26.000 | SW-11      | -0.1          | 0.020          | -0.014   | 0.0334        |                    |
| 1440 minute winter             | 62      | 1.018  | 59         | 0.8           | 0.126          | 0.012    | 0.7209        |                    |
| 1440 minute winter             | 63      | 25.000 | 25.000:50% | 0.0           | -0.009         | 0.015    | 0.0534        |                    |

**Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 1440 minute winter | 25.000:50% | 1410        | 9.909     | 0.372     | 0.2          | 0.0000        | 0.0000     | SURCHARGED |
| 1440 minute winter | 64         | 1410        | 9.909     | 0.387     | 0.8          | 0.0000        | 0.0000     | FLOOD RISK |
| 1440 minute winter | SW-10      | 1410        | 9.909     | 0.294     | 0.5          | 0.0468        | 0.0000     | FLOOD RISK |
| 1440 minute winter | 24.002:50% | 1410        | 9.909     | 0.336     | 0.5          | 5.4388        | 0.0000     | SURCHARGED |
| 1440 minute winter | 66         | 1410        | 9.909     | 0.109     | 0.0          | 0.0000        | 0.0000     | FLOOD RISK |
| 1440 minute winter | 24.001:50% | 1410        | 9.909     | 0.201     | 0.1          | 2.6179        | 0.0000     | SURCHARGED |
| 30 minute summer   | PLOT 1     | 24          | 9.955     | 0.265     | 10.2         | 3.4449        | 0.0000     | SURCHARGED |
| 30 minute summer   | PLOT 2     | 25          | 9.947     | 0.227     | 12.1         | 4.3623        | 0.0000     | SURCHARGED |
| 1440 minute winter | PLOT 3     | 1410        | 9.909     | 0.239     | 0.3          | 2.7407        | 0.0000     | SURCHARGED |
| 60 minute summer   | PLOT 4&5   | 48          | 9.945     | 0.275     | 15.2         | 9.8836        | 0.0000     | SURCHARGED |
| 30 minute summer   | SW11       | 24          | 9.953     | 0.303     | 3.0          | 0.0594        | 0.0000     | SURCHARGED |
| 60 minute summer   | SW12       | 42          | 9.944     | 0.304     | 3.4          | 0.0597        | 0.0000     | SURCHARGED |
| 1440 minute winter | SW13       | 1410        | 9.909     | 0.309     | 0.2          | 0.0606        | 0.0000     | SURCHARGED |

| Link Event<br>(Upstream Depth) | US Node  | Link     | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|----------|----------|------------|---------------|----------------|----------|---------------|--------------------|
| 1440 minute winter             | 63       | 25.000   | 62         | 0.2           | 0.023          | 0.067    | 0.0534        |                    |
| 1440 minute winter             | 64       | 1.017    | 62         | 0.8           | 0.162          | 0.012    | 0.6172        |                    |
| 1440 minute winter             | SW-10    | 24.002   | 24.002:50% | -0.4          | 0.159          | -0.046   | 0.0152        |                    |
| 1440 minute winter             | SW-10    | 24.002   | 64         | -0.2          | -0.029         | -0.025   | 0.0152        |                    |
| 1440 minute winter             | 66       | 24.001   | 24.001:50% | 0.0           | 0.004          | 0.004    | 0.0367        |                    |
| 1440 minute winter             | 66       | 24.001   | SW-10      | 0.1           | 0.369          | 0.012    | 0.0367        |                    |
| 30 minute summer               | PLOT 1   | 14.000_1 | SW11       | 3.0           | 0.358          | 0.209    | 0.1065        |                    |
| 30 minute summer               | PLOT 2   | 15.000_1 | SW12       | 3.2           | 0.371          | 0.203    | 0.1794        |                    |
| 1440 minute winter             | PLOT 3   | 20.000_1 | SW13       | 0.2           | 0.181          | 0.017    | 0.2385        |                    |
| 60 minute summer               | PLOT 4&5 | 24.000   | SW14       | 2.7           | 0.293          | 0.215    | 0.2164        |                    |
| 30 minute summer               | SW11     | Orifice  | 31         | 2.6           |                |          |               |                    |
| 60 minute summer               | SW12     | Orifice  | 29         | 2.5           |                |          |               |                    |
| 1440 minute winter             | SW13     | Orifice  | 19         | 0.2           |                |          |               |                    |

**Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event         | US Node              | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|--------------------|----------------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 60 minute summer   | SW14                 | 48          | 9.942     | 0.332     | 2.7          | 0.0651        | 0.0000     | SURCHARGED |
| 1440 minute winter | Access Road Widening | 1410        | 9.909     | 0.339     | 0.2          | 5.1503        | 0.0000     | SURCHARGED |

| Link Event (Upstream Depth) | US Node              | Link     | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|-----------------------------|----------------------|----------|---------|---------------|----------------|----------|---------------|--------------------|
| 60 minute summer            | SW14                 | Orifice  | 13      | 2.4           |                |          |               |                    |
| 1440 minute winter          | Access Road Widening | 26.000_1 | 13      | -0.1          | -0.065         | -0.022   | 0.0255        |                    |

**Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node   | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|-----------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 960 minute winter | 53        | 930         | 9.993     | 0.233     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 1.000:50% | 930         | 9.993     | 0.249     | 0.5          | 2.5662        | 0.0000     | SURCHARGED |
| 960 minute winter | 52        | 930         | 9.993     | 0.265     | 0.5          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 51        | 930         | 9.993     | 0.093     | 0.9          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | 3.000:50% | 930         | 9.993     | 0.133     | 0.9          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer  | 50        | 1           | 10.050    | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | 2.000:50% | 930         | 9.993     | 0.058     | 0.2          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | SW-01     | 930         | 9.993     | 0.173     | 0.8          | 0.0275        | 0.0000     | SURCHARGED |
| 960 minute winter | 48        | 930         | 9.993     | 0.286     | 2.2          | 33.7869       | 0.0000     | SURCHARGED |
| 15 minute summer  | 47        | 1           | 10.000    | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | 4.000:50% | 930         | 9.993     | 0.084     | 0.4          | 0.3872        | 0.0000     | OK         |
| 960 minute winter | 46        | 930         | 9.993     | 0.043     | 0.0          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | 5.000:50% | 930         | 9.993     | 0.109     | 0.3          | 0.7423        | 0.0000     | SURCHARGED |
| 960 minute winter | SW-02     | 930         | 9.993     | 0.176     | 0.5          | 0.0280        | 0.0000     | SURCHARGED |
| 960 minute winter | 44        | 930         | 9.993     | 0.307     | 1.3          | 0.0000        | 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) |
|-----------------------------|---------|-------|-----------|---------------|----------------|----------|---------------|--------------------|
| 960 minute winter           | 53      | 1.000 | 1.000:50% | 0.0           | -0.015         | -0.008   | 0.0571        |                    |
| 960 minute winter           | 53      | 1.000 | 52        | 0.5           | 0.272          | 0.180    | 0.0571        |                    |
| 960 minute winter           | 52      | 1.001 | 48        | 0.5           | 0.225          | 0.182    | 0.0765        |                    |
| 960 minute winter           | 51      | 3.000 | 3.000:50% | -0.9          | -0.212         | -0.086   | 0.0096        |                    |
| 960 minute winter           | 51      | 3.000 | SW-01     | 0.7           | 0.284          | 0.067    | 0.0098        |                    |
| 15 minute summer            | 50      | 2.000 | 2.000:50% | 0.0           | 0.000          | 0.000    | 0.0069        |                    |
| 15 minute summer            | 50      | 2.000 | SW-01     | 2.9           | 0.745          | 0.310    | 0.0191        |                    |
| 960 minute winter           | SW-01   | 2.001 | 48        | 0.4           | 0.202          | 0.053    | 0.0586        |                    |
| 960 minute winter           | 48      | 1.002 | 44        | -1.1          | 0.266          | -0.138   | 0.1675        |                    |
| 15 minute summer            | 47      | 4.000 | 4.000:50% | 0.0           | 0.000          | 0.000    | 0.0126        |                    |
| 15 minute summer            | 47      | 4.000 | SW-02     | 6.1           | 0.981          | 0.695    | 0.0270        |                    |
| 960 minute winter           | 46      | 5.000 | 5.000:50% | 0.0           | -0.010         | -0.003   | 0.0097        |                    |
| 960 minute winter           | 46      | 5.000 | SW-02     | -0.2          | 0.272          | -0.014   | 0.0137        |                    |
| 960 minute winter           | SW-02   | 4.001 | 44        | 0.5           | 0.240          | 0.051    | 0.0399        |                    |
| 960 minute winter           | 44      | 1.003 | 42        | 1.3           | 0.341          | 0.159    | 0.1593        |                    |

**Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 960 minute winter | 43         | 930         | 9.993     | 0.298     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 6.000:50%  | 930         | 9.993     | 0.312     | 0.2          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 42         | 930         | 9.993     | 0.327     | 1.4          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 41         | 930         | 9.993     | 0.332     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 9.000:50%  | 930         | 9.993     | 0.340     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 40         | 930         | 9.993     | 0.349     | 2.5          | 30.2126       | 0.0000     | SURCHARGED |
| 15 minute summer  | 39         | 11          | 10.023    | 0.043     | 0.5          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 10.000:50% | 11          | 10.023    | 0.136     | 8.4          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | SW-04      | 930         | 9.993     | 0.199     | 0.5          | 0.0317        | 0.0000     | SURCHARGED |
| 960 minute winter | 37         | 930         | 9.993     | 0.357     | 1.6          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 36         | 930         | 9.993     | 0.013     | 0.0          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | 11.000:50% | 930         | 9.993     | 0.106     | 0.3          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 35         | 930         | 9.993     | 0.099     | 0.0          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | 12.000:50% | 930         | 9.993     | 0.149     | 0.2          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | SW-05      | 930         | 9.993     | 0.199     | 0.8          | 0.0317        | 0.0000     | SURCHARGED |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 960 minute winter              | 43      | 6.000  | 6.000:50%  | 0.0           | -0.012         | -0.013   | 0.0517        |                    |
| 960 minute winter              | 43      | 6.000  | 42         | 0.2           | 0.118          | 0.066    | 0.0517        |                    |
| 960 minute winter              | 42      | 1.004  | 54         | 1.3           | 0.678          | 0.167    | 0.0422        |                    |
| 960 minute winter              | 41      | 9.000  | 9.000:50%  | 0.0           | -0.042         | -0.016   | 0.0318        |                    |
| 960 minute winter              | 41      | 9.000  | 40         | 0.1           | 0.163          | 0.037    | 0.0318        |                    |
| 960 minute winter              | 40      | 1.006  | 37         | -1.6          | 0.184          | -0.043   | 0.6156        |                    |
| 15 minute summer               | 39      | 10.000 | 10.000:50% | -0.5          | -0.105         | -0.064   | 0.0361        |                    |
| 15 minute summer               | 39      | 10.000 | SW-04      | 7.8           | 1.012          | 1.086    | 0.0484        |                    |
| 960 minute winter              | SW-04   | 10.001 | 37         | 0.5           | 0.477          | 0.057    | 0.0588        |                    |
| 960 minute winter              | 37      | 1.007  | 33         | 1.4           | 0.193          | 0.041    | 0.3623        |                    |
| 960 minute winter              | 36      | 11.000 | 11.000:50% | 0.0           | 0.006          | 0.004    | 0.0301        |                    |
| 960 minute winter              | 36      | 11.000 | SW-05      | 0.3           | 0.404          | 0.043    | 0.0557        |                    |
| 960 minute winter              | 35      | 12.000 | 12.000:50% | 0.0           | 0.015          | -0.004   | 0.0154        |                    |
| 960 minute winter              | 35      | 12.000 | SW-05      | 0.5           | 0.368          | 0.054    | 0.0154        |                    |
| 960 minute winter              | SW-05   | 11.001 | 33         | 0.5           | 0.446          | 0.056    | 0.0575        |                    |

**Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 960 minute winter | 33         | 930         | 9.993     | 0.361     | 1.7          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 32         | 930         | 9.993     | 0.349     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 13.000:50% | 930         | 9.993     | 0.358     | 0.4          | 5.7025        | 0.0000     | SURCHARGED |
| 960 minute winter | 31         | 930         | 9.993     | 0.368     | 2.1          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 30         | 930         | 9.993     | 0.363     | 0.1          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 14.000:50% | 930         | 9.993     | 0.372     | 0.1          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 29         | 930         | 9.993     | 0.381     | 2.8          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 28         | 930         | 9.993     | 0.113     | 0.1          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 16.000:50% | 930         | 9.993     | 0.184     | 0.6          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 27         | 930         | 9.993     | 0.033     | 0.0          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | 15.000:50% | 930         | 9.993     | 0.144     | 0.3          | 1.5950        | 0.0000     | SURCHARGED |
| 960 minute winter | SW-06      | 930         | 9.993     | 0.256     | 1.2          | 0.0407        | 0.0000     | FLOOD RISK |
| 960 minute winter | 25         | 930         | 9.993     | 0.388     | 3.1          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 24         | 930         | 9.993     | 0.033     | 0.0          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | 17.000:50% | 930         | 9.993     | 0.144     | 0.2          | 1.5943        | 0.0000     | SURCHARGED |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 960 minute winter              | 33      | 1.008  | 31         | 1.7           | 0.200          | 0.048    | 0.5810        |                    |
| 960 minute winter              | 32      | 13.000 | 13.000:50% | 0.0           | -0.036         | -0.013   | 0.0346        |                    |
| 960 minute winter              | 32      | 13.000 | 31         | -0.3          | 0.121          | -0.103   | 0.0346        |                    |
| 960 minute winter              | 31      | 1.009  | 29         | 2.0           | 0.181          | 0.058    | 1.1374        |                    |
| 960 minute winter              | 30      | 14.000 | 14.000:50% | -0.1          | -0.033         | -0.039   | 0.0324        |                    |
| 960 minute winter              | 30      | 14.000 | 29         | 0.1           | 0.036          | 0.044    | 0.0324        |                    |
| 960 minute winter              | 29      | 1.010  | 25         | 2.7           | 0.204          | 0.091    | 0.8360        |                    |
| 960 minute winter              | 28      | 16.000 | 16.000:50% | -0.1          | -0.012         | -0.005   | 0.0138        |                    |
| 960 minute winter              | 28      | 16.000 | SW-06      | 0.9           | 0.387          | 0.072    | 0.0138        |                    |
| 960 minute winter              | 27      | 15.000 | 15.000:50% | 0.0           | 0.005          | 0.004    | 0.0343        |                    |
| 960 minute winter              | 27      | 15.000 | SW-06      | 0.3           | 0.413          | 0.039    | 0.0532        |                    |
| 960 minute winter              | SW-06   | 15.001 | 25         | 0.6           | 0.322          | 0.072    | 0.0504        |                    |
| 960 minute winter              | 25      | 1.011  | 21         | 3.1           | 0.216          | 0.070    | 0.4015        |                    |
| 960 minute winter              | 24      | 17.000 | 17.000:50% | 0.0           | 0.006          | 0.004    | 0.0409        |                    |
| 960 minute winter              | 24      | 17.000 | SW-07      | 0.2           | 0.421          | 0.028    | 0.0635        |                    |

**Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 960 minute winter | SW-07      | 930         | 9.993     | 0.256     | 0.2          | 0.0407        | 0.0000     | FLOOD RISK |
| 960 minute winter | 21         | 930         | 9.993     | 0.395     | 4.0          | 40.9158       | 0.0000     | FLOOD RISK |
| 960 minute winter | 20         | 945         | 9.993     | 0.378     | 0.1          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 19.000:50% | 945         | 9.993     | 0.394     | 0.3          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 19         | 930         | 9.993     | 0.410     | 2.3          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 18         | 930         | 9.993     | 0.083     | 0.0          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | 21.000:50% | 930         | 9.993     | 0.181     | 0.2          | 2.5498        | 0.0000     | SURCHARGED |
| 960 minute winter | 17         | 915         | 9.993     | 0.063     | 0.0          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | 20.000:50% | 930         | 9.993     | 0.171     | 0.4          | 2.2757        | 0.0000     | SURCHARGED |
| 960 minute winter | SW-08      | 930         | 9.993     | 0.280     | 0.6          | 0.0445        | 0.0000     | FLOOD RISK |
| 960 minute winter | 15         | 930         | 9.993     | 0.421     | 2.7          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 14         | 930         | 9.993     | 0.401     | 0.1          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 22.000:50% | 915         | 9.993     | 0.418     | 0.3          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 13         | 930         | 9.993     | 0.435     | 4.8          | 61.4374       | 0.0000     | FLOOD RISK |
| 960 minute winter | 12         | 930         | 9.993     | 0.143     | 0.0          | 0.0000        | 0.0000     | FLOOD RISK |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 960 minute winter              | SW-07   | 18.000 | 21         | 0.2           | 0.124          | 0.022    | 0.0498        |                    |
| 960 minute winter              | 21      | 1.012  | 19         | 1.7           | 0.197          | 0.050    | 1.4252        |                    |
| 960 minute winter              | 20      | 19.000 | 19.000:50% | -0.1          | -0.013         | -0.031   | 0.0586        |                    |
| 960 minute winter              | 20      | 19.000 | 19         | 0.3           | 0.174          | 0.119    | 0.0586        |                    |
| 960 minute winter              | 19      | 1.013  | 15         | 2.2           | 0.217          | 0.062    | 1.0349        |                    |
| 960 minute winter              | 18      | 21.000 | 21.000:50% | 0.0           | 0.004          | -0.004   | 0.0594        |                    |
| 960 minute winter              | 18      | 21.000 | SW-08      | 0.2           | 0.301          | 0.030    | 0.0629        |                    |
| 960 minute winter              | 17      | 20.000 | 20.000:50% | 0.0           | -0.005         | -0.004   | 0.0538        |                    |
| 960 minute winter              | 17      | 20.000 | SW-08      | 0.4           | 0.403          | 0.058    | 0.0646        |                    |
| 960 minute winter              | SW-08   | 20.001 | 15         | 0.6           | 0.332          | 0.065    | 0.0508        |                    |
| 960 minute winter              | 15      | 1.014  | 13         | 2.6           | 0.216          | 0.073    | 1.3167        |                    |
| 960 minute winter              | 14      | 22.000 | 22.000:50% | -0.1          | -0.012         | -0.023   | 0.0597        |                    |
| 960 minute winter              | 14      | 22.000 | 13         | 0.4           | 0.166          | 0.139    | 0.0597        |                    |
| 960 minute winter              | 13      | 1.015  | 10         | 2.0           | 0.234          | 0.047    | 1.4688        |                    |
| 960 minute winter              | 12      | 23.000 | 23.000:50% | 0.0           | -0.005         | 0.003    | 0.0412        |                    |

**Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node        | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|----------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 960 minute winter | 23.000:50%     | 930         | 9.993     | 0.279     | 0.5          | 4.8571        | 0.0000     | SURCHARGED |
| 960 minute winter | SW-09          | 930         | 9.993     | 0.416     | 0.3          | 0.0662        | 0.0000     | FLOOD RISK |
| 960 minute winter | 10             | 930         | 9.993     | 0.456     | 2.2          | 21.8413       | 0.0000     | FLOOD RISK |
| 360 minute summer | 9              | 360         | 9.950     | 0.200     | 0.1          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 27.000:50%     | 930         | 9.993     | 0.326     | 0.6          | 7.9626        | 0.0000     | SURCHARGED |
| 960 minute winter | SW-13          | 930         | 9.993     | 0.410     | 0.3          | 0.0652        | 0.0000     | FLOOD RISK |
| 960 minute winter | 7              | 930         | 9.993     | 0.168     | 0.0          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 28.000:50%     | 930         | 9.993     | 0.285     | 0.5          | 5.2523        | 0.0000     | SURCHARGED |
| 960 minute winter | 6              | 930         | 9.993     | 0.228     | 0.0          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 29.000:50%     | 930         | 9.992     | 0.315     | 1.3          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | SW-12          | 930         | 9.993     | 0.403     | 1.2          | 0.0641        | 0.0000     | FLOOD RISK |
| 960 minute winter | 4              | 930         | 9.993     | 0.495     | 1.8          | 21.8413       | 0.0000     | FLOOD RISK |
| 960 minute winter | SW-14 (HYDRO)  | 930         | 9.993     | 0.499     | 1.2          | 0.5646        | 0.0000     | FLOOD RISK |
| 480 minute winter | SW-15          | 328         | 9.874     | 0.464     | 1.2          | 0.5249        | 0.0000     | FLOOD RISK |
| 15 minute summer  | DITCH HEADWALL | 1           | 9.874     | 0.521     | 0.0          | 0.0000        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US Node       | Link         | DS Node        | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------------|--------------|----------------|---------------|----------------|----------|---------------|--------------------|
| 960 minute winter              | 12            | 23.000       | SW-09          | 0.3           | 0.302          | 0.030    | 0.0412        |                    |
| 960 minute winter              | SW-09         | 23.001       | 10             | 0.3           | 0.242          | 0.063    | 0.0450        |                    |
| 960 minute winter              | 10            | 1.016        | 64             | 2.0           | 0.208          | 0.033    | 1.6394        |                    |
| 360 minute summer              | 9             | 27.000       | 27.000:50%     | -0.1          | -0.013         | -0.008   | 0.0370        |                    |
| 360 minute summer              | 9             | 27.000       | SW-13          | 1.0           | 0.390          | 0.120    | 0.0370        |                    |
| 960 minute winter              | SW-13         | 27.001       | 4              | -0.3          | 0.283          | -0.052   | 0.0626        |                    |
| 960 minute winter              | 7             | 28.000       | 28.000:50%     | 0.0           | -0.006         | 0.003    | 0.0275        |                    |
| 960 minute winter              | 7             | 28.000       | SW-12          | -0.4          | -0.051         | -0.036   | 0.0275        |                    |
| 960 minute winter              | 6             | 29.000       | 29.000:50%     | 0.0           | 0.006          | 0.003    | 0.0107        |                    |
| 960 minute winter              | 6             | 29.000       | SW-12          | -1.1          | 0.185          | -0.070   | 0.0107        |                    |
| 960 minute winter              | SW-12         | 28.001       | 4              | 0.5           | 0.058          | 0.056    | 0.0374        |                    |
| 960 minute winter              | 4             | 1.020        | SW-14 (HYDRO)  | 1.2           | 0.021          | 0.024    | 1.4763        |                    |
| 960 minute winter              | SW-14 (HYDRO) | Hydro-Brake® | SW-15          | 1.2           |                |          |               |                    |
| 480 minute winter              | SW-15         | 1.022        | DITCH HEADWALL | 1.2           | 0.017          | 0.013    | 0.5420        | 63.1               |

**Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node    | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 960 minute winter | 54         | 930         | 9.993     | 0.332     | 1.8          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | SW-03      | 945         | 9.993     | 0.239     | 0.7          | 0.0380        | 0.0000     | SURCHARGED |
| 15 minute summer  | 56         | 12          | 10.063    | 0.093     | 4.1          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 7.001:50%  | 11          | 10.039    | 0.177     | 8.4          | 0.0000        | 0.0000     | SURCHARGED |
| 15 minute summer  | 57         | 12          | 10.062    | 0.062     | 0.3          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | 7.000:50%  | 12          | 10.062    | 0.077     | 4.5          | 0.0000        | 0.0000     | OK         |
| 960 minute winter | 58         | 945         | 9.993     | 0.103     | 0.0          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 8.000:50%  | 915         | 9.993     | 0.171     | 0.2          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 59         | 930         | 9.993     | 0.486     | 1.7          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | SW-11      | 930         | 9.993     | 0.389     | 0.4          | 0.0619        | 0.0000     | FLOOD RISK |
| 960 minute winter | 26.001:50% | 930         | 9.993     | 0.433     | 0.5          | 0.0000        | 0.0000     | SURCHARGED |
| 960 minute winter | 61         | 930         | 9.993     | 0.193     | 0.0          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 26.000:50% | 930         | 9.993     | 0.291     | 0.4          | 5.4196        | 0.0000     | SURCHARGED |
| 960 minute winter | 62         | 930         | 9.993     | 0.478     | 1.7          | 0.0000        | 0.0000     | FLOOD RISK |
| 960 minute winter | 63         | 945         | 9.993     | 0.441     | 0.1          | 0.0000        | 0.0000     | FLOOD RISK |

| Link Event<br>(Upstream Depth) | US Node | Link   | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|--------|------------|---------------|----------------|----------|---------------|--------------------|
| 960 minute winter              | 54      | 1.005  | 40         | 1.8           | 0.167          | 0.051    | 1.3431        |                    |
| 960 minute winter              | SW-03   | 7.002  | 54         | 0.7           | 0.655          | 0.066    | 0.0256        |                    |
| 15 minute summer               | 56      | 7.001  | 7.001:50%  | 4.4           | 0.599          | 0.574    | 0.0531        |                    |
| 15 minute summer               | 56      | 7.001  | SW-03      | 7.8           | 0.991          | 1.023    | 0.0539        |                    |
| 15 minute summer               | 57      | 7.000  | 7.000:50%  | 0.5           | 0.284          | 0.062    | 0.0045        |                    |
| 15 minute summer               | 57      | 7.000  | 56         | 4.1           | 1.026          | 0.484    | 0.0054        |                    |
| 960 minute winter              | 58      | 8.000  | 8.000:50%  | 0.0           | 0.016          | 0.004    | 0.0141        |                    |
| 960 minute winter              | 58      | 8.000  | SW-03      | 0.2           | 0.278          | 0.020    | 0.0141        |                    |
| 960 minute winter              | 59      | 1.019  | 4          | 1.4           | 0.113          | 0.023    | 1.0212        |                    |
| 960 minute winter              | SW-11   | 26.001 | 26.001:50% | -0.4          | -0.053         | -0.053   | 0.0206        |                    |
| 960 minute winter              | SW-11   | 26.001 | 59         | -0.5          | -0.060         | -0.059   | 0.0206        |                    |
| 960 minute winter              | 61      | 26.000 | 26.000:50% | 0.0           | -0.005         | 0.004    | 0.0334        |                    |
| 960 minute winter              | 61      | 26.000 | SW-11      | -0.3          | 0.040          | -0.033   | 0.0334        |                    |
| 960 minute winter              | 62      | 1.018  | 59         | 1.7           | 0.170          | 0.026    | 0.8725        |                    |
| 960 minute winter              | 63      | 25.000 | 25.000:50% | -0.1          | -0.037         | -0.040   | 0.0534        |                    |

**Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event                     | US Node    | Peak (mins) | Level (m)  | Depth (m)     | Inflow (l/s)   | Node Vol (m³) | Flood (m³)    | Status             |
|--------------------------------|------------|-------------|------------|---------------|----------------|---------------|---------------|--------------------|
| 960 minute winter              | 25.000:50% | 915         | 9.993      | 0.455         | 0.4            | 0.0000        | 0.0000        | SURCHARGED         |
| 960 minute winter              | 64         | 930         | 9.993      | 0.471         | 2.0            | 0.0000        | 0.0000        | FLOOD RISK         |
| 960 minute winter              | SW-10      | 930         | 9.993      | 0.378         | 0.4            | 0.0601        | 0.0000        | FLOOD RISK         |
| 960 minute winter              | 24.002:50% | 930         | 9.993      | 0.420         | 0.7            | 8.4848        | 0.0000        | SURCHARGED         |
| 960 minute winter              | 66         | 930         | 9.993      | 0.193         | 0.0            | 0.0000        | 0.0000        | FLOOD RISK         |
| 960 minute winter              | 24.001:50% | 930         | 9.993      | 0.285         | 0.5            | 5.2515        | 0.0000        | SURCHARGED         |
| 60 minute summer               | PLOT 1     | 42          | 10.089     | 0.399         | 10.3           | 4.9718        | 0.0000        | FLOOD RISK         |
| 60 minute summer               | PLOT 2     | 43          | 10.056     | 0.336         | 12.2           | 6.5271        | 0.0000        | FLOOD RISK         |
| 960 minute winter              | PLOT 3     | 930         | 9.993      | 0.323         | 0.6            | 3.7401        | 0.0000        | FLOOD RISK         |
| 60 minute winter               | PLOT 4&5   | 55          | 10.066     | 0.396         | 14.9           | 14.3395       | 0.0000        | FLOOD RISK         |
| 60 minute summer               | SW11       | 42          | 10.087     | 0.437         | 4.5            | 0.0856        | 0.0000        | FLOOD RISK         |
| 60 minute summer               | SW12       | 43          | 10.054     | 0.414         | 3.0            | 0.0811        | 0.0000        | FLOOD RISK         |
| 960 minute winter              | SW13       | 930         | 9.993      | 0.393         | 0.4            | 0.0771        | 0.0000        | FLOOD RISK         |
| Link Event<br>(Upstream Depth) | US Node    | Link        | DS Node    | Outflow (l/s) | Velocity (m/s) | Flow/Cap      | Link Vol (m³) | Discharge Vol (m³) |
| 960 minute winter              | 63         | 25.000      | 62         | 0.4           | 0.184          | 0.150         | 0.0534        |                    |
| 960 minute winter              | 64         | 1.017       | 62         | 1.6           | 0.193          | 0.025         | 0.7495        |                    |
| 960 minute winter              | SW-10      | 24.002      | 24.002:50% | 0.6           | 0.134          | 0.064         | 0.0152        |                    |
| 960 minute winter              | SW-10      | 24.002      | 64         | -0.7          | -0.095         | -0.083        | 0.0152        |                    |
| 960 minute winter              | 66         | 24.001      | 24.001:50% | 0.0           | -0.007         | 0.004         | 0.0367        |                    |
| 960 minute winter              | 66         | 24.001      | SW-10      | -0.3          | 0.369          | -0.034        | 0.0367        |                    |
| 60 minute summer               | PLOT 1     | 14.000_1    | SW11       | 4.5           | 0.342          | 0.315         | 0.1065        |                    |
| 60 minute summer               | PLOT 2     | 15.000_1    | SW12       | 3.0           | 0.354          | 0.192         | 0.1794        |                    |
| 960 minute winter              | PLOT 3     | 20.000_1    | SW13       | 0.4           | 0.186          | 0.032         | 0.2385        |                    |
| 60 minute winter               | PLOT 4&5   | 24.000      | SW14       | 2.9           | 0.320          | 0.233         | 0.2164        |                    |
| 60 minute summer               | SW11       | Orifice     | 31         | 3.0           |                |               |               |                    |
| 60 minute summer               | SW12       | Orifice     | 29         | 2.8           |                |               |               |                    |
| 960 minute winter              | SW13       | Orifice     | 19         | 0.4           |                |               |               |                    |

**Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 95.31%**

| Node Event        | US Node              | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|----------------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 60 minute winter  | SW14                 | 56          | 10.062    | 0.452     | 2.9          | 0.0887        | 0.0000     | FLOOD RISK |
| 960 minute winter | Access Road Widening | 930         | 9.993     | 0.423     | 0.3          | 6.1028        | 0.0000     | FLOOD RISK |

| Link Event (Upstream Depth) | US Node              | Link     | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|-----------------------------|----------------------|----------|---------|---------------|----------------|----------|---------------|--------------------|
| 60 minute winter            | SW14                 | Orifice  | 13      | 2.8           |                |          |               |                    |
| 960 minute winter           | Access Road Widening | 26.000_1 | 13      | -0.1          | -0.128         | -0.039   | 0.0255        |                    |

## **APPENDIX D**

### **INFILTRATION & GROUNDWATER MONITORING**

**Figure 2. Trial Hole Location Plan**



## Soakaway Calculations

|                   |                 |
|-------------------|-----------------|
| Soakaway Test No. | TPSK1B (test 1) |
| Contract:         | Hook Lane       |
| Contract No.      | 17894           |

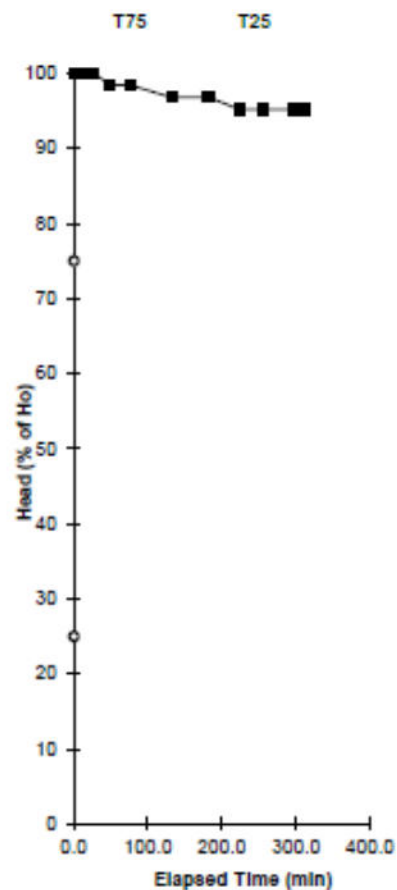
### Field Test

Trial Pit Log (include details of groundwater):  
See trial Pit record

|                     |                       |
|---------------------|-----------------------|
| Depth of Pit        | 1.39 m                |
| Width of Pit        | 0.60 m                |
| Length of Pit       | 0.90 m                |
| Depth of Pit Soaked | 0.62 m                |
| ap50                | 1.47 m <sup>2</sup>   |
| Vp75-25             | 0.1674 m <sup>3</sup> |
| t75-25              | 0.0 min               |
| water used          | 0.3348 m <sup>3</sup> |
| f                   | N/A m/sec.            |

### Field Data

| Depth to<br>Water<br>(m) | Elapsed<br>Time<br>(min) | Head of<br>Water<br>(% of Ho) | Head of<br>Water<br>(m) |
|--------------------------|--------------------------|-------------------------------|-------------------------|
| 0.77                     | 0                        | 100                           | 0.62                    |
| 0.77                     | 1.1                      | 100                           | 0.62                    |
| 0.77                     | 2.6                      | 100                           | 0.62                    |
| 0.77                     | 9.9                      | 100                           | 0.62                    |
| 0.77                     | 21.3                     | 100                           | 0.62                    |
| 0.77                     | 27.1                     | 100                           | 0.62                    |
| 0.78                     | 49.3                     | 98                            | 0.61                    |
| 0.78                     | 76.0                     | 98                            | 0.61                    |
| 0.79                     | 132.2                    | 97                            | 0.60                    |
| 0.79                     | 181.8                    | 97                            | 0.60                    |
| 0.8                      | 224.6                    | 95                            | 0.59                    |
| 0.80                     | 256.7                    | 95                            | 0.59                    |
| 0.8                      | 296.7                    | 95                            | 0.59                    |
| 0.80                     | 311.9                    | 95                            | 0.59                    |



|        |       |                       |
|--------|-------|-----------------------|
| T75    | 0.000 | 75                    |
| T25    | 0.000 | 25                    |
| T75-25 | 0.000 | Derived from Best Fit |

### Comments

Negligible infiltration over the test period of 312 minutes.

### SOILS LIMITED

Newton House, Cross Road, Tadworth  
Surrey, KT20 6BR

Telephone:  
Facsimile:

## Soakaway Calculations

|                   |                 |
|-------------------|-----------------|
| Soakaway Test No. | TPSK1B (test 1) |
| Contract:         | Hook Lane       |
| Contract No.      | 17894           |

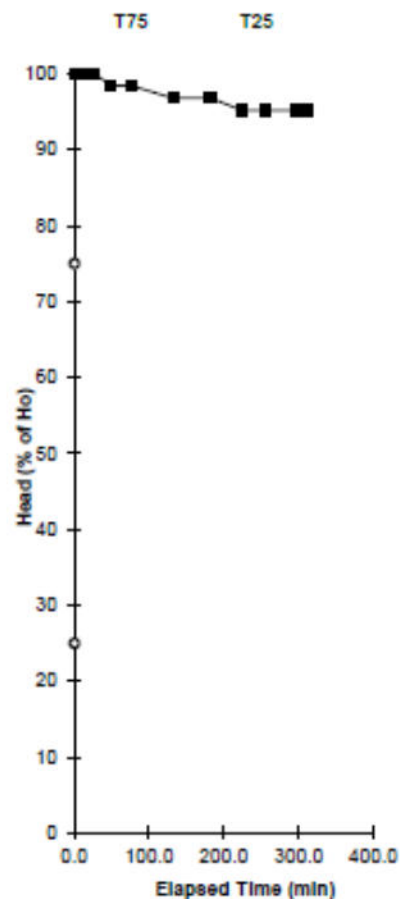
### Field Test

Trial Pit Log (include details of groundwater):  
See trial Pit record

|                     |                       |
|---------------------|-----------------------|
| Depth of Pit        | 1.39 m                |
| Width of Pit        | 0.60 m                |
| Length of Pit       | 0.90 m                |
| Depth of Pit Soaked | 0.62 m                |
| ap50                | 1.47 m <sup>2</sup>   |
| Vp75-25             | 0.1674 m <sup>3</sup> |
| t75-25              | 0.0 min               |
| water used          | 0.3348 m <sup>3</sup> |
| f                   | N/A m/sec.            |

### Field Data

| Depth to<br>Water<br>(m) | Elapsed<br>Time<br>(min) | Head of<br>Water<br>(% of Ho) | Head of<br>Water<br>(m) |
|--------------------------|--------------------------|-------------------------------|-------------------------|
| 0.77                     | 0                        | 100                           | 0.62                    |
| 0.77                     | 1.1                      | 100                           | 0.62                    |
| 0.77                     | 2.6                      | 100                           | 0.62                    |
| 0.77                     | 9.9                      | 100                           | 0.62                    |
| 0.77                     | 21.3                     | 100                           | 0.62                    |
| 0.77                     | 27.1                     | 100                           | 0.62                    |
| 0.78                     | 49.3                     | 98                            | 0.61                    |
| 0.78                     | 76.0                     | 98                            | 0.61                    |
| 0.79                     | 132.2                    | 97                            | 0.60                    |
| 0.79                     | 181.8                    | 97                            | 0.60                    |
| 0.8                      | 224.6                    | 95                            | 0.59                    |
| 0.80                     | 256.7                    | 95                            | 0.59                    |
| 0.8                      | 296.7                    | 95                            | 0.59                    |
| 0.80                     | 311.9                    | 95                            | 0.59                    |



|        |       |                       |
|--------|-------|-----------------------|
| T75    | 0.000 | 75                    |
| T25    | 0.000 | 25                    |
| T75-25 | 0.000 | Derived from Best Fit |

### Comments

Negligible infiltration over the test period of 312 minutes.

### SOILS LIMITED

Newton House, Cross Road, Tadworth  
Surrey, KT20 6JR

Telephone: [REDACTED]  
Facsimile: [REDACTED]

## Groundwater Monitoring Letter Report

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CLIENT</b>                  | Imperial Homes Southern                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>SITE ADDRESS</b>            | Springfield, Hook Avenue, Aldingbourne PO20 3TE                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>REPORT REFERENCE</b>        | GWPR4064                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>ENGINEER</b>                | Emily Murray, Ground and Water Limited.                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>INVESTIGATION LOCATIONS</b> | Site works were undertaken on 21 <sup>st</sup> January 2021 and comprised the drilling of 3No. Windowless Sampler Boreholes to 3.00m bgl. 3No. combined Groundwater and Ground-gas monitoring standpipes were installed to depths of between 1.50 – 2.00m bgl. Prior to installation and due to the stability of the well, the boreholes collapsed to between 1.50 – 2.00m bgl, therefore this was the maximum depth of installation. |

| Combined Ground-gas and Groundwater Monitoring Well Construction |                               |                                                         |                                                   |                               |
|------------------------------------------------------------------|-------------------------------|---------------------------------------------------------|---------------------------------------------------|-------------------------------|
| Trial Hole                                                       | Depth of Installation (m bgl) | Thickness of slotted piping with gravel filter pack (m) | Depth of plain piping with bentonite seal (m bgl) | Piping internal diameter (mm) |
| WS1                                                              | 2.00                          | 1.00                                                    | 1.00                                              | 50                            |
| WS2                                                              | 1.80                          | 0.80                                                    | 1.00                                              | 50                            |
| WS3                                                              | 1.50                          | 0.50                                                    | 1.00                                              | 50                            |

A trial hole location plan can be viewed within Figure 1.

### GROUND CONDITIONS ENCOUNTERED

| Summary of Strata Encountered                                                                                                                                                                                                                 |                   |                    |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|---------------|
| Strata                                                                                                                                                                                                                                        | Depth Top (m bgl) | Depth Base (m bgl) | Thickness (m) |
| <b>TOPSOIL (WS1 and WS3):</b> Brown clayey fine to medium SAND.                                                                                                                                                                               | GL                | 0.20               | 0.20          |
| <b>MADE GROUND (ALL TRIAL HOLES):</b> Light brown to brown slightly gravelly sandy CLAY. Sand was fine to coarse. Gravel was sub-angular to sub-rounded, fine to medium, flint, chalk and brick.                                              | GL – 0.20         | 0.50 – 1.00        | 0.30 – 1.00   |
| <b>RIVER TERRACE DEPOSITS – UNDIFFERENTIATED) (ALL TRIAL HOLES) (COHESIVE):</b> Generally comprised of a brown and orangish brown slightly gravelly sandy silty CLAY. Sand was fine to coarse. Gravel was sub-angular, fine to medium, flint. | 0.60 - 1.00       | 1.80 – 2.00        | 1.00 – 1.20   |
| <b>RIVER TERRACE DEPOSITS – UNDIFFERENTIATED) (ALL TRIAL HOLES) (GRANULAR):</b> Generally comprised a brown clayey fine to medium SAND to a fine SAND.                                                                                        | 0.50 – 2.00       | 0.60 – 3.00        | >0.10 – >1.00 |

Full trial hole logs can be viewed within Appendix B.

### ROOTS

A tabulated summary of the roots noted can be seen below:

| Depth of Root Penetrated Soils Observed Within Trial Holes (m bgl) |             |                        |
|--------------------------------------------------------------------|-------------|------------------------|
| Trial Hole                                                         | Fresh Roots | Rootlets/Decayed roots |
| WS1                                                                | 1.00        | -                      |
| WS2                                                                | 1.50        | -                      |
| WS3                                                                | 0.50        | 0.80                   |

It must be noted that the chance of determining actual depth of root penetration through a narrow diameter borehole is low. It should be noted that roots may be found to greater depths at other locations on the site, particularly close to trees and/or trees that have been removed both within the site and its close environs.

## GROUNDWATER

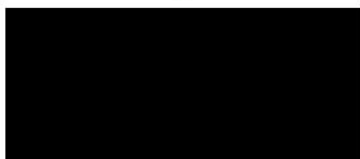
Groundwater strikes were encountered at 1.50m bgl within WS1 and WS3 and at 2.00m within WS2. It should be noted that groundwater strikes may have been obstructed by the drilling process.

4No. return groundwater monitoring visits were undertaken in January – March 2021. A tabulated summary can be seen tabulated below:

| Depth of Groundwater Strikes/Standing Groundwater Within Trial Holes |            |                              |                            |
|----------------------------------------------------------------------|------------|------------------------------|----------------------------|
| Trial Hole                                                           | Date       | Depth of Groundwater (m bgl) | Depth of Standpipe (m bgl) |
| WS1                                                                  | 30/01/2021 | 0.24                         | 1.97                       |
|                                                                      | 13/02/2021 | 1.00                         | 1.78 (silted base)         |
|                                                                      | 27/02/2021 | 1.15                         | 1.76 (silted base)         |
|                                                                      | 13/03/2021 | 0.89                         | 1.73 (silted base)         |
| WS2                                                                  | 30/01/2021 | 0.22                         | 1.80                       |
|                                                                      | 13/02/2021 | 0.78                         | 1.52 (silted base)         |
|                                                                      | 27/02/2021 | 0.96                         | 1.52 (silted base)         |
|                                                                      | 13/03/2021 | 1.03                         | 1.54 (silted base)         |
| WS3                                                                  | 30/01/2021 | 0.24                         | 1.45                       |
|                                                                      | 13/02/2021 | 0.65                         | 1.40 (silted base)         |
|                                                                      | 27/02/2021 | 0.82                         | 1.41 (silted base)         |
|                                                                      | 13/03/2021 | 0.74                         | 1.40 (silted base)         |

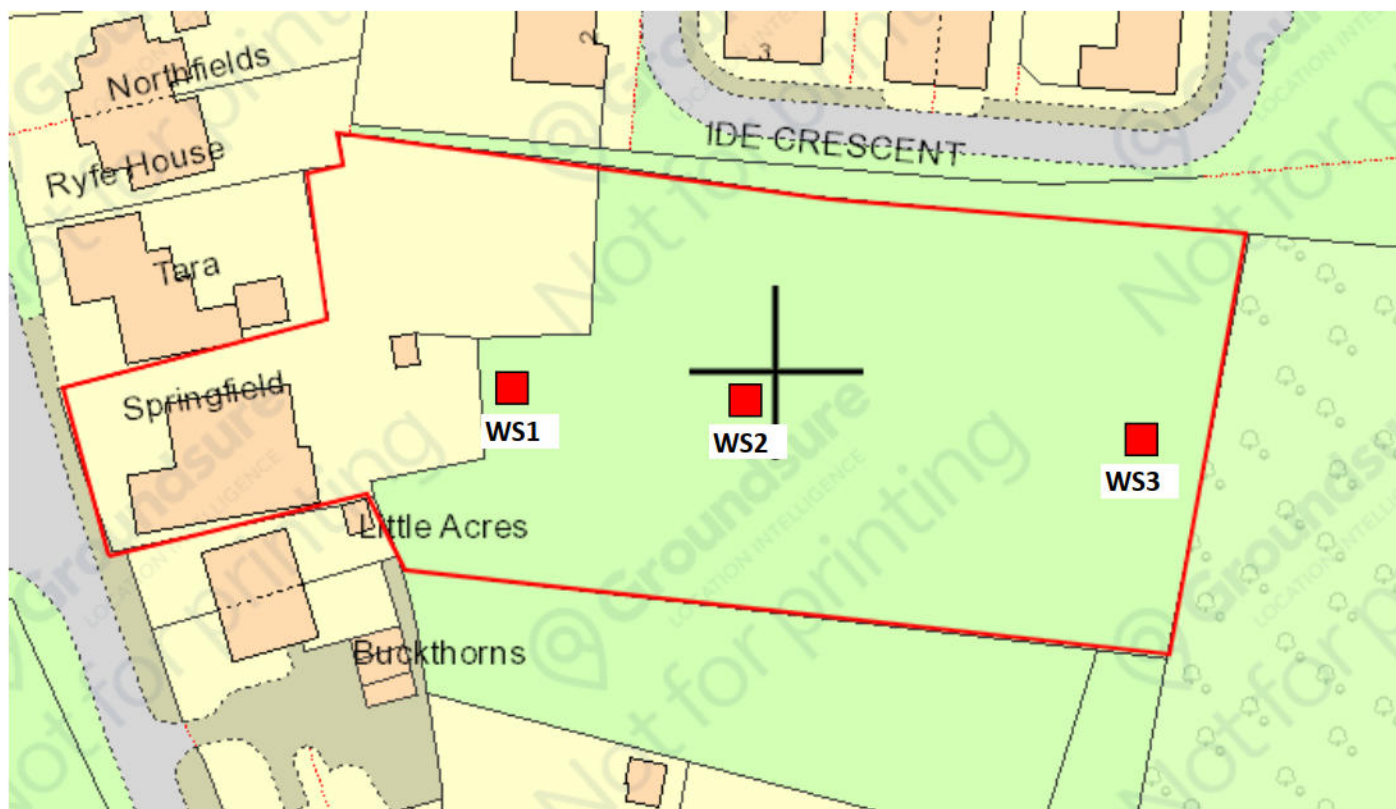
Please feel free to contact us should you have any queries regarding the information enclosed within this letter report.

Yours sincerely,



Emily Murray MSc.,  
Geotechnical and Geo-environmental Engineer  
For and on behalf of Ground and Water Limited

Figure 1 Trial Hole Location Plan  
Appendix A Conditions and Limitations  
Appendix B Trial Hole Logs



Not To Scale

Project:

Springfields, Hook Avenue, Aldingbourne PO20 3TE

Client:

Imperial Homes Southern

Date:

March 2021

Trial Hole Location Plan

Ref:

GWPR4064

Figure 1



## **APPENDIX E**

### **EXCEEDANCE FLOW & OVERLAND FLOW ROUTES LAYOUT**

CDM 2015 - RESIDUAL RISKS I

In preparing the designs illustrated by this drawing we have fulfilled our duties in the role of Designer as defined in the Construction Design and Management Regulations 2015. We have undertaken a full Hazard Identification and Risk Analysis and have designed out any special risks associated with the work, so that as far as possible there are no residual risks.

**NOTE: Residual risks are defined as those risks arising from identified hazards which cannot be designed-out, and which a competent and experienced building contractor is unlikely to encounter during normal construction activities. Ordinary risks arising from normal construction operations have not been included.**

Where hazards have been identified, the risks from which it has not been possible to eliminate during the design process, these are indicated on the drawing. It will be the responsibility of the Principal Contractor to develop Safe Systems of Work and/or Method Statements to minimise any risks associated with such hazards.

NOTES

- This drawing has been prepared using a Topographical Survey Drawing supplied by the client in AutoCAD format.
- This drawing is to be read in conjunction with all relevant Engineers' and Architects' drawings and specifications.
- All dimensions are in millimetres unless noted otherwise. All levels are in metres.
- The contractor is responsible for setting out and for checking dimensions.
- In accordance with The Construction (Design and Management) Regulations 2015 (CDM 2015) the Principle Designer and Contractor are to:
  - Notify HSE of works.
  - Comply with the requirements of Health and Safety Plan (if applicable)
  - Provide risk assessments and method statements for all potential hazards relevant to this project.
- The main contractor shall be responsible for the setting out and accuracy of all dimensions. The contractor shall be satisfied that the information given is correct and any discrepancies should be noted to the Engineer immediately.
- The Contractor is responsible for specifying product and codes and ordering of drainage materials.
- New adoptable pipework to be vitrified clay type and to be constructed to the following specifications. Systems that are resistant to a jetting pressure of 4000psi. Systems that minimise the number of joints in the system, by using 3metre pipe length. Systems that do not have lip seal joints, hence preventing root ingress.
- All non-uPVC (adoptable) pipe connection to manholes shall be provided with a 'rocker pipe' of 600mm effective length in accordance with CI E6.6 of 'Sewers for Adoption'.
- Precast concrete manhole units shall comply with the relevant provisions of BS EN 1917 and BS 5911-3.
- Cover grades are in accordance with BS497 Pt 1
  - Cover Grades : D400 - carriageways.
  - B125 - carriageways for slow traffic.
  - A15 - inaccessible to vehicles
- All drainage pipes within development site to be 100mm dia unless shown otherwise.
- All uPVC drainage to be installed to BS5955 P16 and in strict accordance with the manufacturers instructions.
- All uPVC drainage products to conform to BS EN1401 & Kite mark certified in accordance with specification.
- All adoptable drainage and associated works to comply with the latest Part E - Civil Engineering Specification of 'Sewer for Adoption'.
- DO NOT SCALE. If discrepancy or query arises on dimensions consult Engineer.

KEY

-   
EXISTING OVERLAND FLOW ROUTES
-   
EXCEEDANCE FLOW ROUTES

EXCEEDANCE FLOW AND OVERLAND FLOW ROUTES LAYOUT

1:125

|                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |          |             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|-------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          |          |             |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                           | By       | Revision | QA'd     | Chk'd    | Ref         |
| Status PRELIMINARY                                                                                                                                                                                                                                                                                                                                                                                                                             |          |          |          |          |             |
| <div><div><div><div>Cowan Consultancy</div><div>STRUCTURAL, CIVIL AND BUILDING CONSULTANTS</div></div></div><div><div>Also at:<br/>Landguard Manor<br/>Landguard Manor Road<br/>Shanklin<br/>Isle of Wight<br/>PO37 7JB</div><div>Tel: 01489 577488<br/>Fax: 01489 579873<br/>consultants@cowanconsult.co.uk<br/>www.cowanconsult.co.uk</div></div></div> |          |          |          |          |             |
| Client RANDMERE LIMITED                                                                                                                                                                                                                                                                                                                                                                                                                        |          |          |          |          |             |
| Project KARENZA (SITE SOUTH OF AUTUMN GATE)<br>HOOK LANE, ALDINGBOURNE, WEST SUSSEX, PO20 3TE                                                                                                                                                                                                                                                                                                                                                  |          |          |          |          |             |
| Title EXCEEDANCE FLOW & OVERLAND FLOW ROUTES                                                                                                                                                                                                                                                                                                                                                                                                   |          |          |          |          |             |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                           | JUN 2025 | Scale    | AS SHOWN | ©        | A1          |
| Drawn                                                                                                                                                                                                                                                                                                                                                                                                                                          | TB       | Chk'd    | EG       | QA'd     | EG          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |          |          | Drg. No. | 435050-230P |