



AQUA TERRA | CONSULTING

# **Church Farm: Flood Risk Assessment and Outline Drainage Strategy**

**P25083\_R3\_Rev2  
February 2026**



## Document Control

### Title

Church Farm: Flood Risk Assessment and Outline Drainage Strategy

### Client

Fairfax Acquisitions Ltd,  
Buncton Barn,  
Buncton Lane,  
Bolney,  
West Sussex,  
RH17 5RE

### Reference

P25083\_R3\_Rev2

### Status

Final

| Document reference | Issue date    | Comments                           | Written by | Approved by |
|--------------------|---------------|------------------------------------|------------|-------------|
| P25083_R3          | November 2025 | Final draft for comment            | MJF        | JEM         |
| P25083_R3          | December 2025 | Final                              | MJF        | JEM         |
| P25083_R3_Rev1     | December 2025 | Updated Site boundary              | RLW        | JEM         |
| P25083_R3_Rev2     | February 2026 | Updated responding to LPA comments | MJF        | JEM         |

# Table of Contents

|        |                                                                     |    |
|--------|---------------------------------------------------------------------|----|
| 1.     | Introduction .....                                                  | 6  |
| 1.1.   | Background .....                                                    | 6  |
| 1.2.   | Scope .....                                                         | 6  |
| 1.3.   | Data sources .....                                                  | 6  |
| 1.4.   | Limitations .....                                                   | 6  |
| 2.     | Site setting .....                                                  | 7  |
| 2.1.   | Site location and description .....                                 | 7  |
| 2.2.   | Topography and current drainage arrangements .....                  | 7  |
| 2.3.   | Geology and hydrogeology .....                                      | 8  |
| 2.3.1. | Published soils and geology .....                                   | 8  |
| 2.3.2. | Hydrogeology .....                                                  | 10 |
| 2.4.   | Hydrology .....                                                     | 10 |
| 3.     | Proposed Development .....                                          | 11 |
| 4.     | Flood risk to the proposed development .....                        | 12 |
| 4.1.   | Fluvial and tidal .....                                             | 12 |
| 4.2.   | Surface water .....                                                 | 14 |
| 4.3.   | Groundwater .....                                                   | 15 |
| 4.4.   | Sewer flooding .....                                                | 16 |
| 4.5.   | Catastrophic failures .....                                         | 17 |
| 4.6.   | Historical flooding .....                                           | 17 |
| 5.     | Flood Risk Mitigation Measures .....                                | 18 |
| 5.1.   | Remain safe in times of flooding .....                              | 18 |
| 5.2.   | No net loss of floodplain storage or impediment to flow paths ..... | 19 |
| 5.3.   | No increase in volume and rate of surface water runoff .....        | 19 |
| 6.     | Drainage Strategy .....                                             | 21 |
| 6.1.   | Proposed Drainage Design .....                                      | 21 |
| 6.1.1. | Assessment of catchment areas .....                                 | 21 |
| 6.1.2. | Proposed storage and control elements .....                         | 22 |
| 6.1.3. | Performance calculation parameters .....                            | 23 |
| 6.2.   | Standard 1: Runoff Destinations .....                               | 23 |
| 6.2.1. | Water re-use .....                                                  | 24 |
| 6.2.2. | Infiltration to ground .....                                        | 24 |
| 6.2.3. | Discharge to surface water body .....                               | 24 |
| 6.2.4. | Discharge to surface water drains and/or combined drain .....       | 26 |

|        |                                                                                                                        |    |
|--------|------------------------------------------------------------------------------------------------------------------------|----|
| 6.3.   | Standard 2: Management of everyday rainfall.....                                                                       | 26 |
| 6.4.   | Standard 3: Management of extreme rainfall and flooding .....                                                          | 27 |
| 6.4.1. | Greenfield runoff rates and volumes .....                                                                              | 27 |
| 6.5.   | Performance assessment.....                                                                                            | 28 |
| 6.5.1. | Exceedance flow paths.....                                                                                             | 28 |
| 6.6.   | Standard 4: Water Quality .....                                                                                        | 29 |
| 6.7.   | Standard 5 & 6: Amenity and Biodiversity .....                                                                         | 31 |
| 6.8.   | Standard 7: Design of drainage for construction, operation, maintenance, decommissioning and structural integrity..... | 31 |
| 6.8.1. | Maintenance Schedules .....                                                                                            | 31 |
| 6.9.   | Further SuDS considerations .....                                                                                      | 34 |
| 7.     | Foul Drainage .....                                                                                                    | 35 |
| 7.1.   | Maintenance Regime – Private Pumped Foul System .....                                                                  | 35 |
| 8.     | Conclusions.....                                                                                                       | 36 |
| 9.     | References.....                                                                                                        | 37 |

## List of Tables

|            |                                                                   |    |
|------------|-------------------------------------------------------------------|----|
| Table 2-1  | Hydrological point descriptors.....                               | 10 |
| Table 4-1  | EA Modelled flood levels .....                                    | 12 |
| Table 6-1  | Catchment area analysis .....                                     | 21 |
| Table 6-2  | Management of everyday rainfall .....                             | 26 |
| Table 6-3  | Summary of 1 in 30 year + 40% climate change model results .....  | 28 |
| Table 6-4  | Summary of 1 in 100 year + 45% climate change model results ..... | 28 |
| Table 6-5  | Water quality hazard ratings (CIRIA, 2015) .....                  | 30 |
| Table 6-6  | Mitigation indices for SuDS components.....                       | 30 |
| Table 6-7  | Maintenance for pipes and manholes .....                          | 32 |
| Table 6-8  | Maintenance for pervious pavements .....                          | 32 |
| Table 6-9  | Maintenance for swales .....                                      | 33 |
| Table 6-10 | Maintenance for control devices .....                             | 34 |
| Table 7-1  | Maintenance for private pumped foul system .....                  | 35 |



## List of Figures

|            |                                                                                         |    |
|------------|-----------------------------------------------------------------------------------------|----|
| Figure 2-1 | Site location.....                                                                      | 7  |
| Figure 2-2 | Existing ground elevations from LiDAR data.....                                         | 8  |
| Figure 2-3 | Superficial deposits .....                                                              | 9  |
| Figure 2-4 | Bedrock Geology .....                                                                   | 9  |
| Figure 3-1 | Illustrative masterplan .....                                                           | 11 |
| Figure 4-1 | Risk of Flooding from Rivers and Sea (present day) .....                                | 13 |
| Figure 4-2 | Risk of Flooding from Rivers and Sea (0.1% AEP with 37% Climate Change allowance) ..... | 14 |
| Figure 4-3 | Risk of Flooding from Surface Water.....                                                | 15 |
| Figure 4-4 | Flood Risk from Groundwater .....                                                       | 16 |
| Figure 4-5 | Flood Risk from Reservoir Failure .....                                                 | 17 |
| Figure 5-1 | Surface water flood risk mitigation measures .....                                      | 19 |
| Figure 6-1 | Impermeable Surfaces .....                                                              | 22 |
| Figure 6-2 | Properties of key SuDS features .....                                                   | 23 |
| Figure 6-3 | Photo of drain on eastern boundary of land ownership .....                              | 25 |
| Figure 6-4 | Cross-section profile through swale.....                                                | 25 |
| Figure 6-5 | Greenfield Runoff Rates .....                                                           | 27 |
| Figure 6-6 | Greenfield Runoff Volume .....                                                          | 27 |
| Figure 6-7 | Exceedance flow routes .....                                                            | 29 |

## List of Appendices

|            |                                                     |
|------------|-----------------------------------------------------|
| Appendix A | Report conditions                                   |
| Appendix B | Proposed Development Plans                          |
| Appendix C | EA Flood Data                                       |
| Appendix D | Proposed Drainage Plan                              |
| Appendix E | Causeway Flow Report                                |
| Appendix F | Causeway Flow Report (Surcharged)                   |
| Appendix G | Hydrobrake installation and maintenance information |
| Appendix H | Southern Water Correspondence                       |

# 1. Introduction

Aqua Terra Consultants Ltd (Aqua Terra) was instructed by Fairfax Acquisitions Ltd (the Client) to provide a Flood Risk Assessment (FRA) and Drainage Strategy (DS) to support a residential led development on a parcel of land at Church Farm, Upper Beeding (the Site).

## 1.1. Background

The FRA is to support a planning application for the erection of 4No. dwellings with access from Church Farm Walk, Upper Beeding.

## 1.2. Scope

The scope of the FRA and DS is as follows:

- Preparation of a FRA, written in line with the National Planning Policy Framework (NPPF) and supporting Planning Practice Guidance (PPG), to satisfy the Environment Agency (EA) and the Lead Local Flood Authority (LLFA, East Sussex County Council) that potential flood risks from all sources to and from the proposed development have been considered and that the proposed development is appropriate, as defined in the NPPF;
- Acquisition and review of modelled flood extents and levels for current and future climate scenarios from the EA;
- Where required, consideration of appropriate site-specific flood risk mitigation measures and provision of recommendations for a strategy for managing and mitigating potential flood risk posed on the Site;
- Review national, regional and local guidance and policies on surface water management;
- Estimate surface water runoff and preliminary attenuation storage requirements;
- Assessment of potential surface water runoff destinations;
- An appraisal of potentially feasible SuDS features for the Site; and,
- Provide a SuDS strategy for managing surface water runoff from the proposed development

## 1.3. Data sources

The main sources of data utilised in this assessment are summarised below:

- The proposed development plans as provided by the Client;
- LiDAR Digital Terrain Model (DTM) data obtained through data.gov.uk;
- EA flood risk data (Environment Agency, 2025);
- Soilsclapes soil mapping (Cranfield Soil and AgriFood Institute, 2025);
- British Geological Survey (BGS) mapping (British Geological Society, 2025);
- Horsham District council – Strategic Flood Risk Assessment, Level 1 (AECOM, 2024)
- West Sussex County Council – Sustainable Drainage System Design Guide (online); and,
- Water. People. Places. A guide for master planning sustainable drainage into developments. Prepared by the Lead Local Flood Authorities of the South East of England (AECOM - 2013).

## 1.4. Limitations

This report is written strictly for the benefit of the Client and bound by the conditions presented in Appendix A.

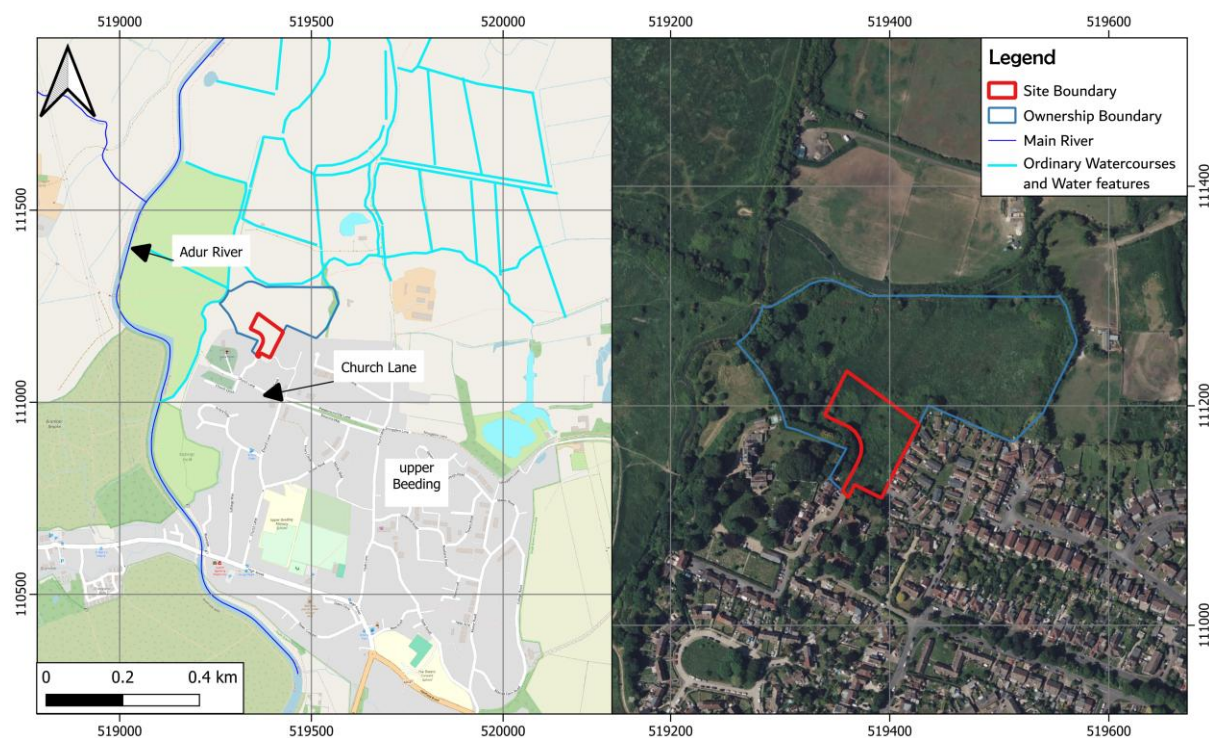
## 2. Site setting

### 2.1. Site location and description

The Site is located on the outskirts of Upper Beeding as shown in Figure 2-1, to the north of Church Lane. The Ordnance Survey Grid Reference for the approximate centre of the Site is TQ19400, 11177.

The Site currently comprises a greenfield Site with some scrub and young trees across the Site. The Site borders an existing residential area of Upper Beeding to the south. The Adur River (a Main River) lies to the west of the Site, and a detailed network of land drains drain land northwards of the Site. The overall area proposed to be developed is approximately 0.5Ha.

Figure 2-1 Site location



Contains Open Street Map data © OpenStreetMap and Bing Aerial imagery © Microsoft

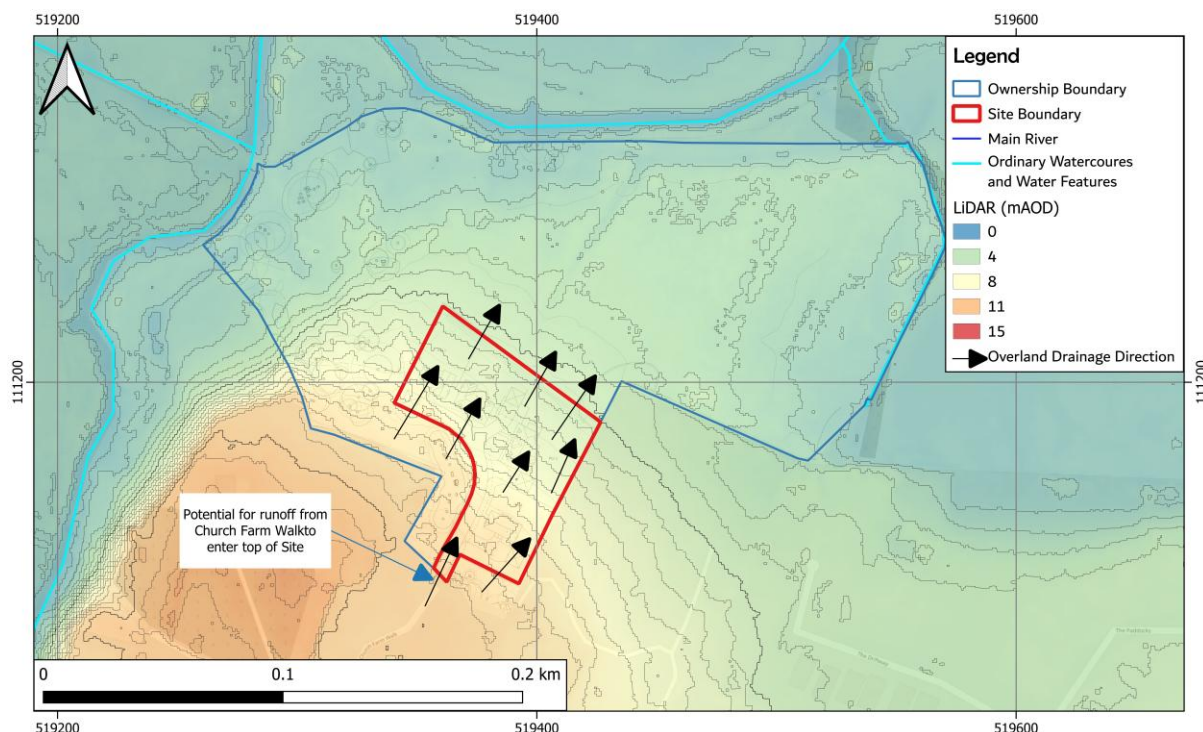
### 2.2. Topography and current drainage arrangements

Figure 2-2 presents LiDAR topographical data. Ground elevations in the area around the Site slope generally north-eastwards. The ground elevation at the Site falls from approximately 9.5m above Ordnance Datum (m aOD) in the south to 6.08m aOD where the lowest dwellings are proposed, to a minimum of 2.5m aOD along the northern boundary of the ownership extent.

At present, the Site does not have a formal drainage system and the surface water flood map shows no risk of surface water flooding on the Site. Surface water could enter the Site from the south-west, in particular along Church Farm Walk if runoff exceeds the highway drainage capacity. Due to the raised hill upon which the Church to the south-west is located, the catchment which could cause runoff onto the Site is limited. At most this catchment extends 75m upslope of the Site to Church Lane which forms a topographical divide, with land to the south of Church Lane draining southwards away from the Site. Once on the Site, runoff would flow in a north-easterly direction across and off the Site to the low-lying area to the north west. A network of land drains is located to the north and west

of the Site where the Gault Formation (Mudstone) outcrops and may be where groundwater is emerging. Likely overland flow routes onto, through and off the Site are shown in Figure 2-2.

Figure 2-2 Existing ground elevations from LiDAR data



## 2.3. Geology and hydrogeology

### 2.3.1. Published soils and geology

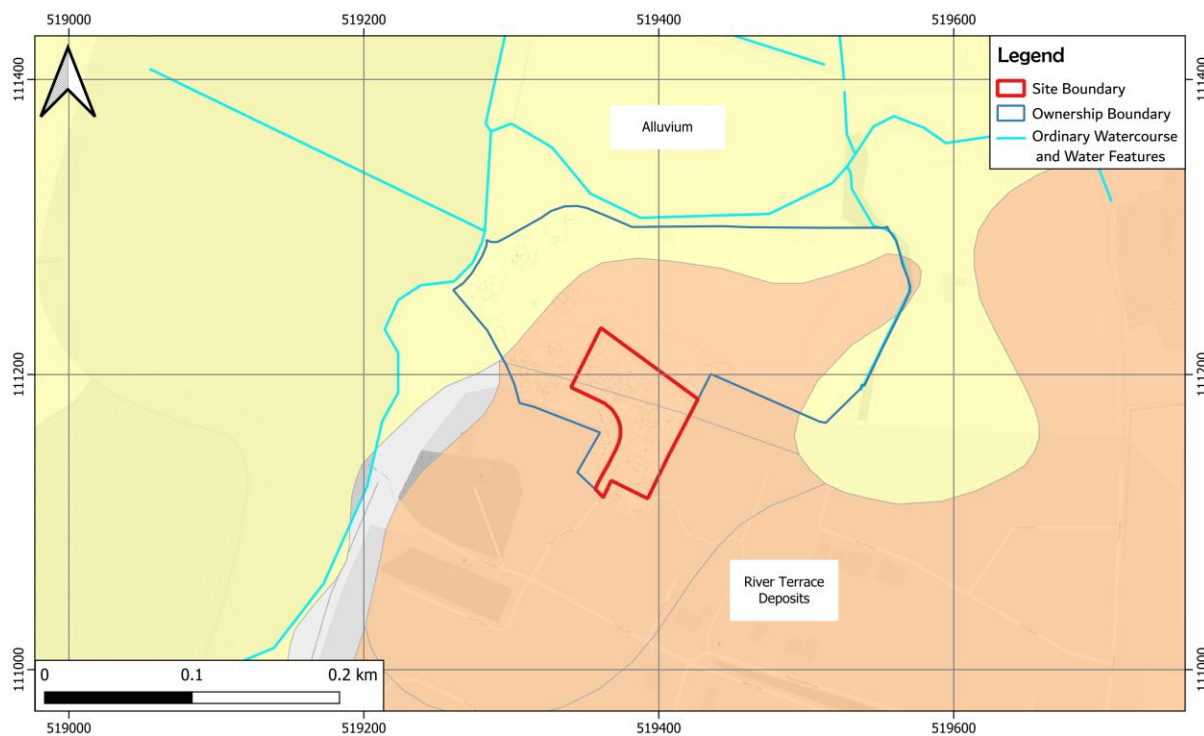
A review of Soilscape and British Geological Survey (BGS) 1:50,000 scale mapping indicates the geological sequence underlying the Site is as follows:

- Soils: Freely draining, lime-rich loamy soils
- Superficial geology (see Figure 2-3): River Terrace Deposits (sand and gravel) over majority over southern portion with Alluvium in the north.
- Solid geology (see Figure 2-4): West Melbury Marly Chalk Formation (White Chalk). A band of Upper Greensand Formation outcrops across the northern boundary of the land ownership, followed by Gault Formation Mudstone. A significant number of land drains are present over the Gault Formation indicating reduced natural infiltration.

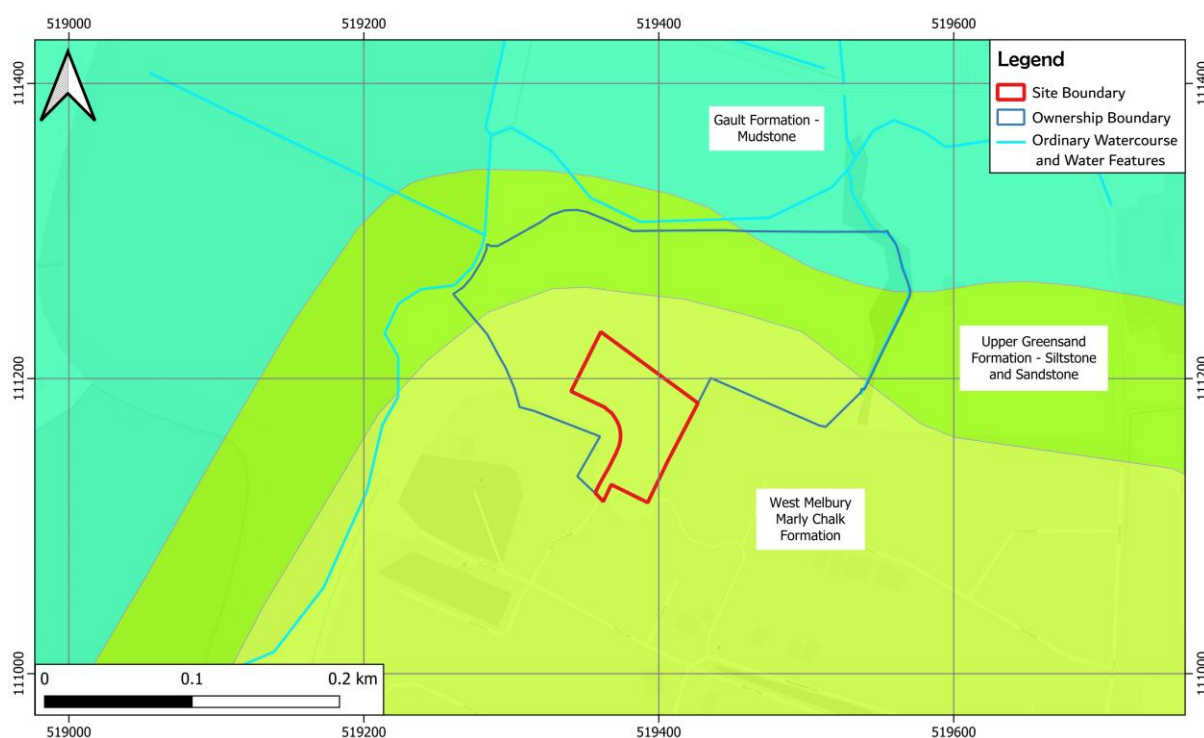
The nearest borehole is shallow (2.53m depth) and located 412m south of the Site. Detail on the borehole scan is limited, though it describes the strata as 'Drift' underlain by 'L.Ck' (White Chalk).



**Figure 2-3 Superficial deposits**



**Figure 2-4 Bedrock Geology**





### 2.3.2. Hydrogeology

The White Chalk is classified by the Environment Agency (EA) as a Principal Aquifer and the River Terrace Deposits are classified as a Secondary Undifferentiated aquifer. Principal and secondary aquifers provide significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands.

Groundwater vulnerability on Site is classed as high, and the Site is not within a source protection zone (SPZ).

The Water Framework Directive (WFD) classifies the Brighton Chalk Block groundwater body as having an overall, chemical and quantitative rating of poor.

## 2.4. Hydrology

Hydrological descriptors for the Site are provided in Table 2-1.

*Table 2-1 Hydrological point descriptors*

| Descriptor | Value          |
|------------|----------------|
| NGR        | TQ 19353 11157 |
| BFIHOST19  | 0.797          |
| PROPWET    | 0.34           |
| SAAR6190   | 848 mm         |

The nearest key surface water feature is the River Adur which lies 220m west of the Site. However, several surface water drains and streams feeding the River Adur are present surrounding the Site including immediately north, 105m east and 120m west of the land ownership boundary. The drains located to the north of the site are indicative of the change in bedrock from a highly permeable chalk to a more impermeable mudstone.

The Site does not lie within a specific WFD surface water body catchment, but does lie within the Adur Upper Operational Catchment.

### 3. Proposed Development

The Proposed Development comprises the erection of 4No. dwellings, with access from Church Farm Walk. An illustrative masterplan of the proposed development has been supplied to Aqua Terra and is presented in Figure 3-1. More detailed plans are provided in Appendix B.

*Figure 3-1 Illustrative masterplan*



Source: Paul Hewett (December 2025)

## 4. Flood risk to the proposed development

### 4.1. Fluvial and tidal

The EA's Flood Map for Planning (see Figure 4-1) indicates that the River Adur floodplain extends to the west and north of the Site, however not over the Site, and the Site is within Flood Zone 1. The flood zones including an assessment of Climate change (see Figure 4-2) indicate that the proposed area for development remains outside of the defended flood zones, with the undefended flood zone extending over the proposed swale along the northern boundary of the Site.

Flood defences along the River Adur are substantial, and raised above the surrounding land. Adjacent to the Site, the defences have a crest level of 4.47m aOD, approximately 3m above the floodplain ground levels, and a 100 year standard of protection.

Product 4 Flood Risk Data has been received from the EA for the Site (see Appendix C) and provides modelled flood levels for a range of scenarios. The flood levels have been summarised in Table 4-1 based on Node 3 provided by the EA as the closest node to areas that are proposed to be developed, that is within the flood extents for most events. Due to the extensive floodplain, levels are reasonably consistent, and it considered acceptable to use this point to provide indicative levels at the Site.

Table 4-1 EA Modelled flood levels

| Scenario           | Fluvial Flood level (m aOD) |               |               |                | Tidal Flood level (m aOD) |             |             |
|--------------------|-----------------------------|---------------|---------------|----------------|---------------------------|-------------|-------------|
|                    | 1%                          | 1% + CC (37%) | 1% + CC (55%) | 1% + CC (107%) | 0.5%                      | 0.5% (2067) | 0.5% (2117) |
| Fluvial Undefended | 3.96                        | 4.62          | 4.87          | 5.51           |                           |             |             |
| Fluvial Defended   | -                           | 4.76          | 5.07          | 5.72           |                           |             |             |
| Tidal Undefended   |                             |               |               |                | -                         | 3.74        | 4.17        |
| Tidal Defended     |                             |               |               |                | -                         | -           | -           |

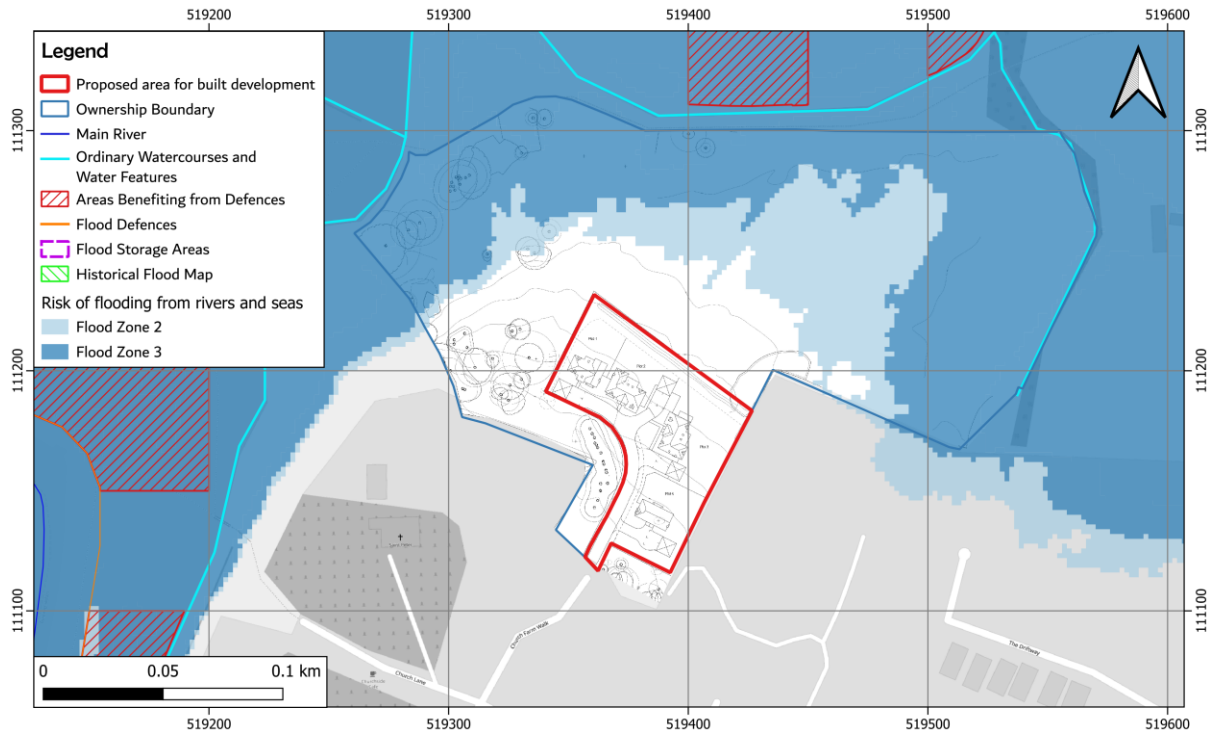
The modelled flood levels indicate that the fluvial defended scenario provides the worst-case, however the flood map, including an allowance for climate change (see Figure 4-2) which is based on the 0.1% AEP extents, suggests that the undefended scenario is worst-case. The difference is likely to be due to how during smaller events, a defended scenario when only some defences are overtopped can lead to higher water levels where those defence are overtopped, than if flood waters were allowed to spill over the full floodplain (as in the undefended scenario). For larger events more defences are overtopped, and therefore that difference diminishes, and the more typical scenario of the undefended extents being larger is observed.

Minimum ground levels for all residential built elements (including access road and gardens, excluding SuDS features) is 5.37m aOD, and the minimum for all built development (including SuDS features) is 5.04m aOD, and therefore based on the EA modelled data, and the Flood Zones incorporating climate change, all residential built elements are free from flooding up to the 1% + 55% CC, and during the 0.1% AEP with climate change (Central estimate for 2080s – 37%). The SuDS features are free from flooding up to the 1% + 37% CC scenario (both defended and undefended), and during the 0.1% with climate change defended scenario. The SuDS features are however at risk of flooding during the 0.1% with climate change undefended scenario based on the EA Flood Zone data. This scenario represents an unlikely case whereby all defences along the River Adur are removed.

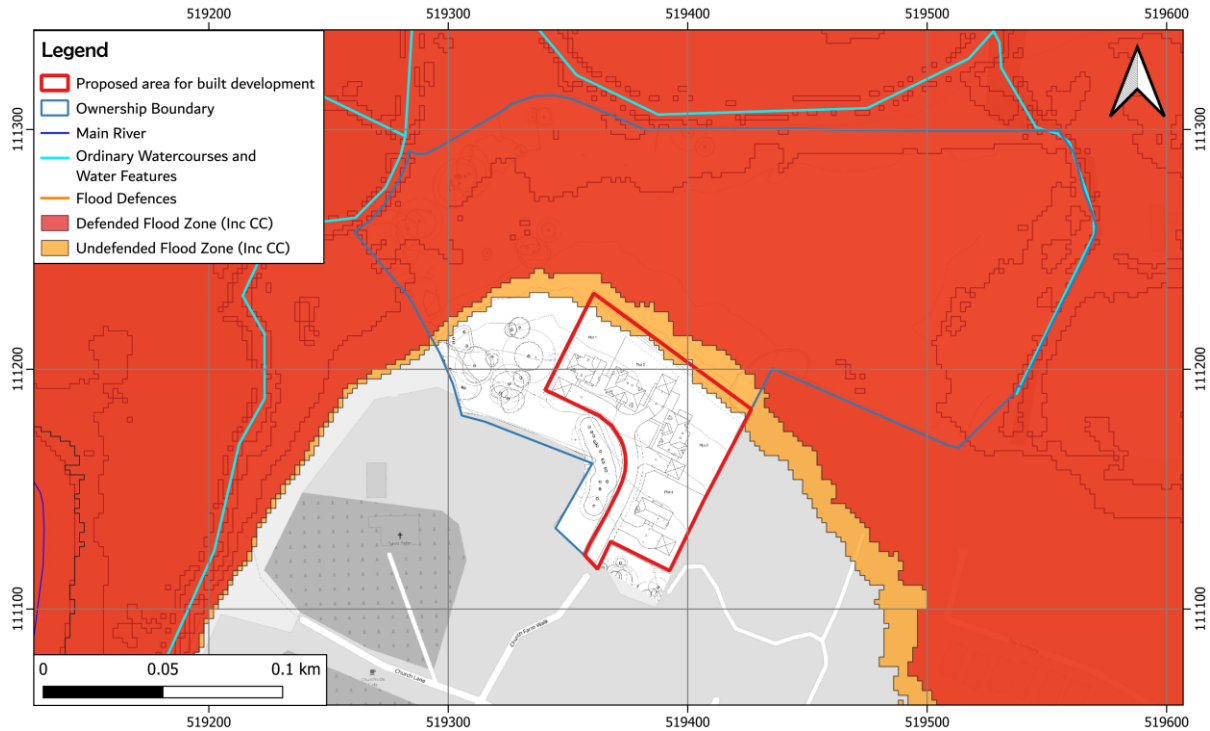
The proposed built development may be at risk of flooding during the 1% + 107% CC scenario which relates to the upper end climate change allowance for the 2080s.

The Flood risk assessment climate change allowance guidance indicates that for 'more vulnerable' development the central allowance should be used (37% increase). It is therefore considered that the proposed residential built areas are within Flood Zone 1 and at very low risk of fluvial and tidal flooding. Notwithstanding the above, the minimum ground elevation at proposed dwellings is 6.00m aOD, and therefore all dwellings will remain flood free in even the most extreme scenario modelled (1% + 107% CC).

*Figure 4-1 Risk of Flooding from Rivers and Sea (present day)*



*Figure 4-2 Risk of Flooding from Rivers and Sea (0.1% AEP with 37% Climate Change allowance)*



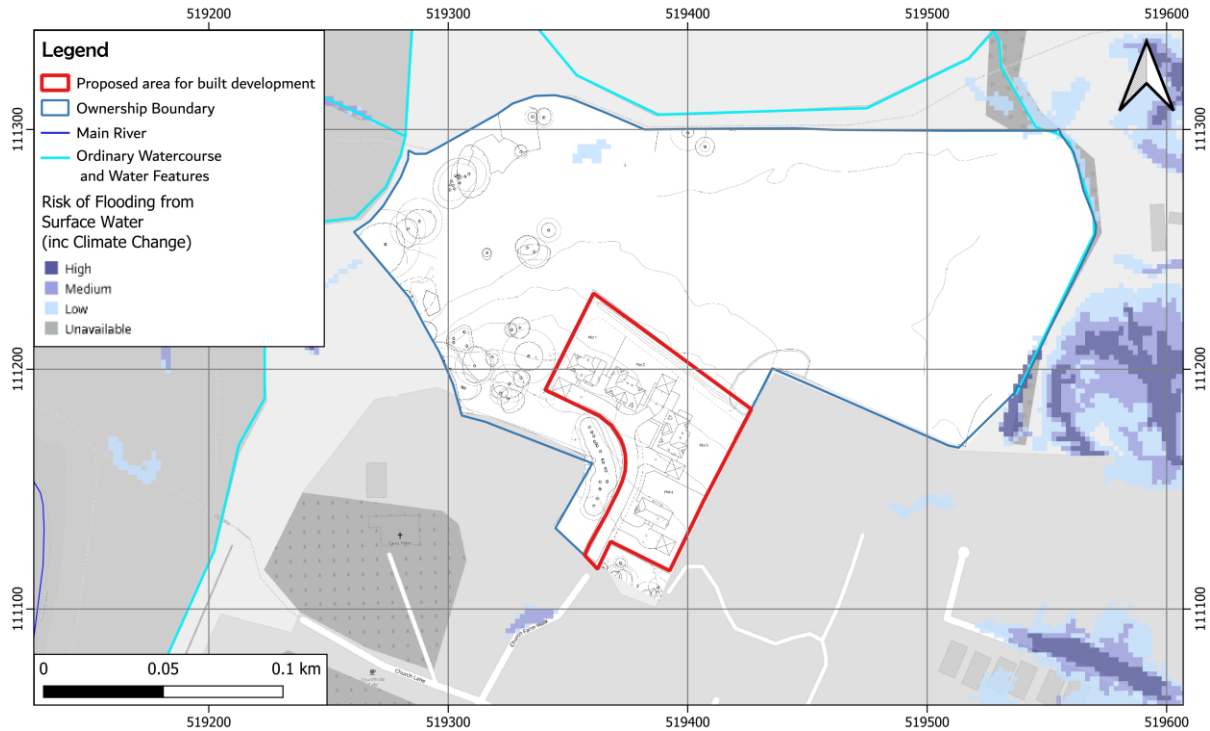
## 4.2. Surface water

Surface water (pluvial) flooding is usually associated with extreme rainfall events but may also occur when rain falls on land that is already saturated or has a low permeability. Rainfall that is unable to infiltrate into the ground generates overland flow which can lead to flooding or 'ponding' in localised topographical depressions before the runoff is able to enter local drainage systems and watercourses.

The EA's Risk of Flooding from Surface Water (RoFSW) flood map, updated in February 2025 to account for climate change, is shown in Figure 4-3. No Surface water flood risk is present within the area proposed for development, and there are some very small isolated 'Low' risk areas within the north of the Ownership extent. The Site is considered to be at very low risk of surface water flooding.



*Figure 4-3 Risk of Flooding from Surface Water*

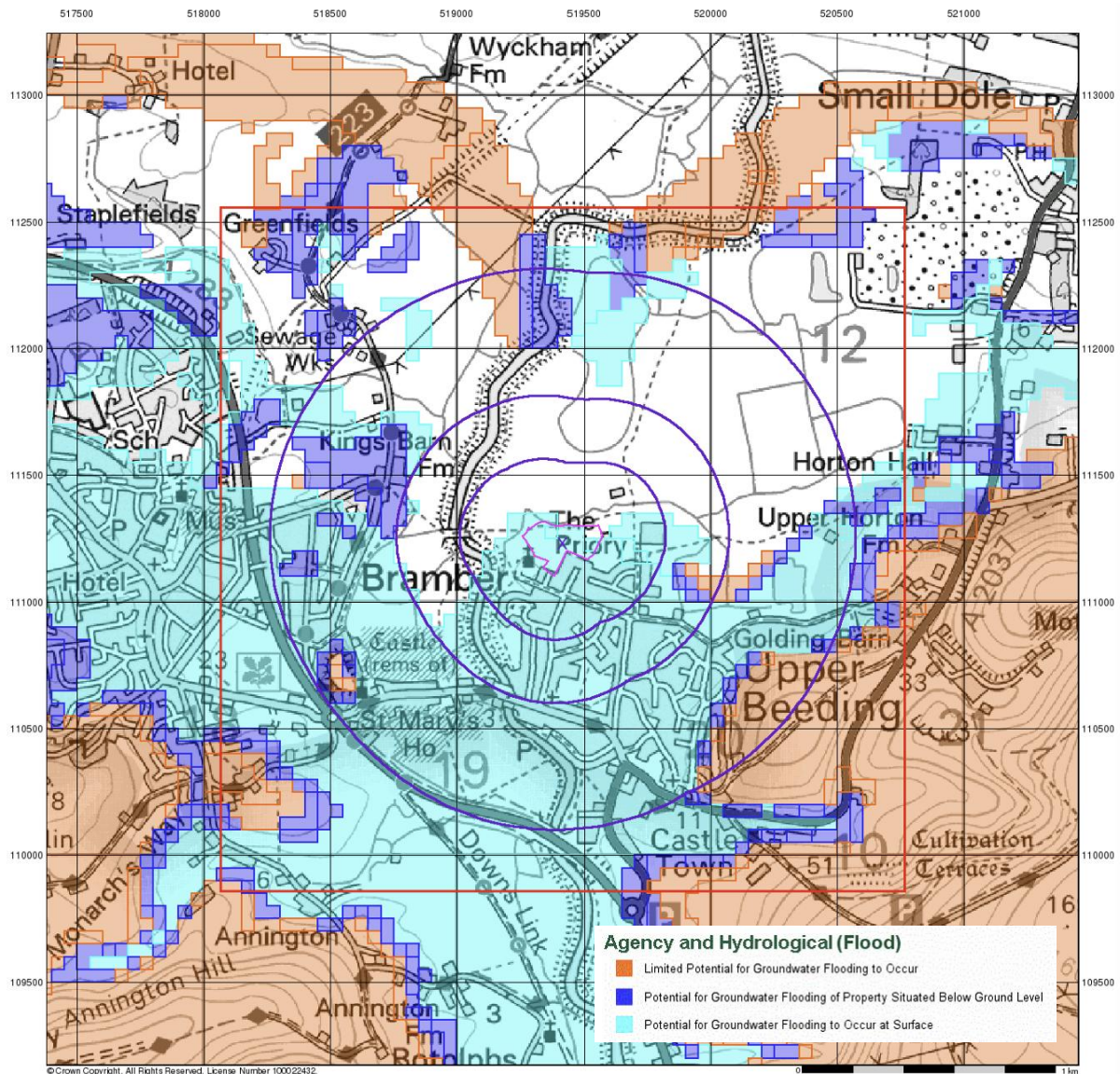


### 4.3. Groundwater

Groundwater flooding occurs when the water table rises above the surface elevation (or the floor of sub-surface structures).

The Horsham Strategic Flood Risk Assessment (AECOM, 2020) indicates that the area is on a transition between an area of High groundwater flood risk to the south, and an area of low risk to the north. Envirocheck assessment (see Figure 4-4 - sourced from BGS Flood GFS Data) also confirms that the Site is within an area where there is potential for groundwater flooding to occur at the surface.

Figure 4-4 Flood Risk from Groundwater



Source: Envirocheck

#### 4.4. Sewer flooding

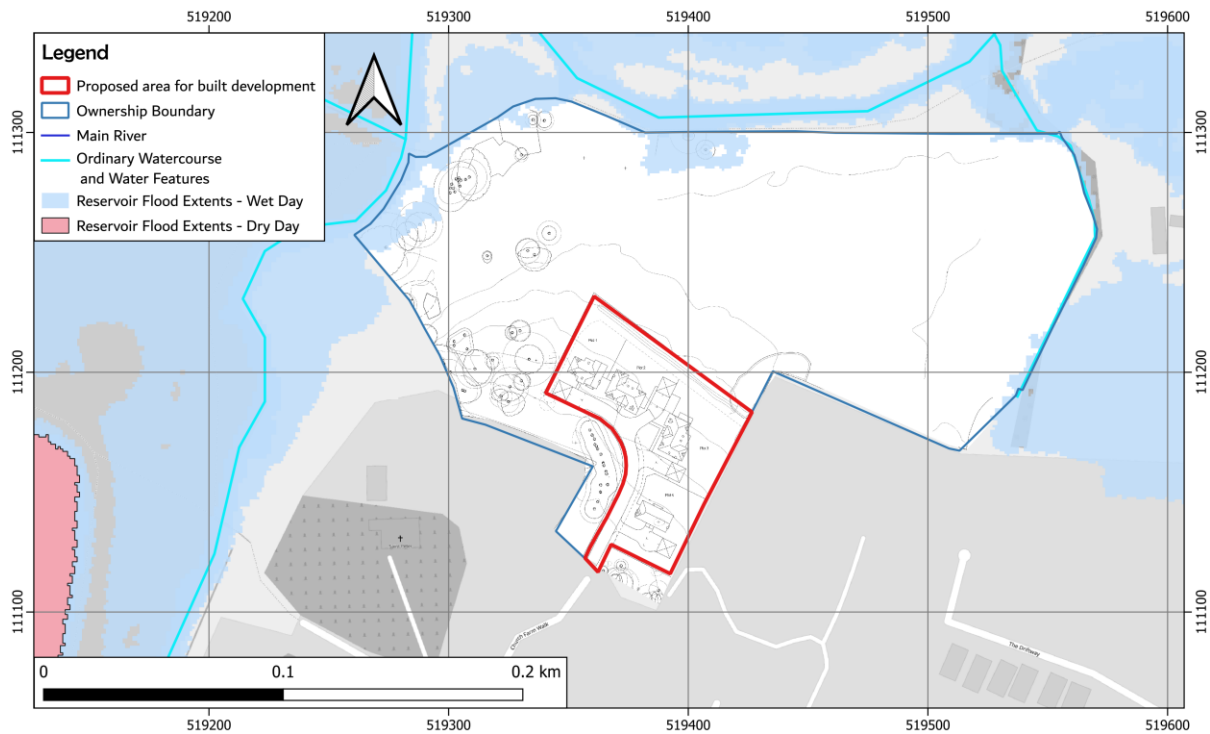
Sewer flooding can occur during periods of intense rainfall and /or if a sewer becomes blocked with debris. Whilst the Site is crossed by a sewer there is currently no connection on the Site to this network.

It has not been possible to obtain detailed sewer flooding records for the area, however the Horsham District Council SFRA Level 1 report suggests there were between 21 and 30 sewer flooding incidents recorded between 2014 and 2024 within postcode area BN44, which includes the urban areas of Steyning, and Upper Beeding in addition to several other smaller villages.

## 4.5. Catastrophic failures

This section considers catastrophic failures of water bearing infrastructure in the area of interest. The data.gov.uk datasets suggest no risk of catastrophic flooding from reservoir failure within the proposed area for development, however some risk within the Adur floodplain in the far reaches of the ownership extent (see Figure 4-5).

*Figure 4-5 Flood Risk from Reservoir Failure*



## 4.6. Historical flooding

There are no recorded flood outlines for the area, and the EA have stated that they do not have past flooding data for this location.

## 5. Flood Risk Mitigation Measures

The NPPF states that:

*The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk).*

The proposed area for built development lies entirely within Flood Zone 1 (low probability) now and in the future, and outside of any areas of surface water flood risk now and in the future. The proposed swale is partially located within the undefended 0.1% AEP with climate change extents. However, as this is protected by off-Site defences which are legally required to be maintained, this may be considered to be a residual risk from defence failure only. No land raising is proposed in this area, and this scenario is not considered to be representative of likely risk of flooding now or in the future. Therefore in accordance with the NPPF, the Sequential Test is not required.

To meet the PPG requirements, the proposed development will be considered appropriate in this location provided the following conditions are met:

- Remains safe in times of flooding whilst taking climate change into account;
- Does not result in a net loss of floodplain storage;
- Does not impede existing water flow pathways; and,
- Does not increase the volume and rate of surface water runoff leaving a site over its intended design lifetime.

### 5.1. Remain safe in times of flooding

The primary potential risk of flooding to the Site is from groundwater. It is recommended that floor levels are raised a minimum of 150mm above external levels. Due to the steady topographic slope, and negligible potential for ponding adjacent to the properties, 150 mm increase should be sufficient to ensure that any groundwater emerging at the surface will flow downslope without accumulating and flooding the interior of properties. The properties are also sufficiently elevated (approximately 2m) above the low floodplain to the north to ensure that any accumulation to the north will not result in flooding. There is potential to increase the 150 mm to 300 mm if considered necessary.

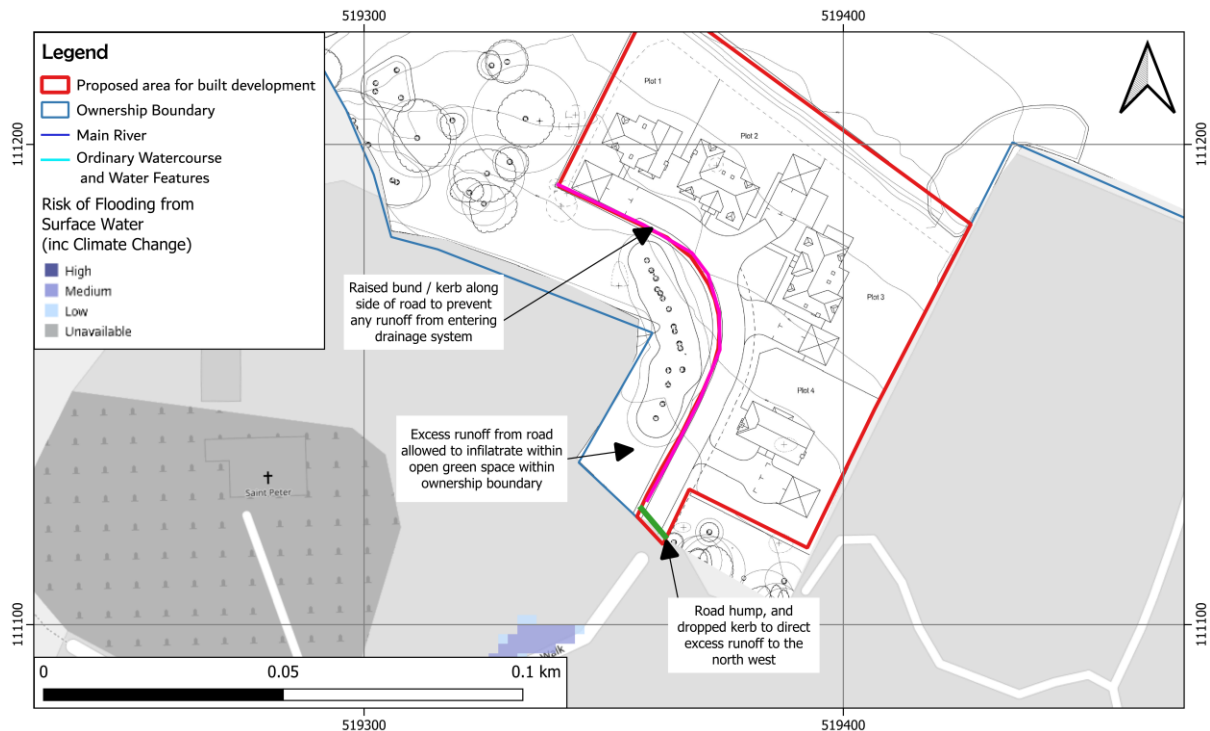
Additional mitigation measures relating to the groundwater flood risk include:

- Impermeable membrane / solid concrete slabs under buildings.
- Appropriate foundation design for potentially high water tables.

There is also a small risk that whilst the surface water flood risk mapping shows no flood risk to the Site, runoff from Church Farm Walk may enter the Site and fill areas of permeable paving identified for attenuation of on-Site runoff. It is proposed that a small road hump is included at the Site entrance directing runoff on the road to the open green space to the west (within the ownership boundary). Runoff would be allowed to passively infiltrate to ground, and a small raised bund / kerb along the side of the road would prevent any further potential for the runoff to enter the proposed drainage network. Due to the small upslope catchment and permeable ground conditions, it is not considered that the excess runoff would be significant. This is supported by the lack of any surface water flood risk being identified within the surface water flood risk mapping in this area, although some is indicated adjacent to Church Farm Walk within a localised depression. The proposed mitigation measures are indicated in Figure 5-1.



**Figure 5-1 Surface water flood risk mitigation measures**



## 5.2. No net loss of floodplain storage or impediment to flow paths

The proposed development will not result in a net loss of floodplain storage, or impede existing water flow pathways based on the very low risk from fluvial, tidal and surface water flooding.

The proposed swale within the undefended 0.1% AEP with climate change extents will not require land raising although some minor levelling may be required to maintain a consistent crest level along the length of the swale. This will be minimised through contouring the swale along the line of the existing ground levels. The PPG states that “*Loss of floodplain storage is less likely to be a concern in areas benefitting from appropriate flood risk management infrastructure or where the source of flood risk is solely tidal*”. It is therefore considered that as the only flood risk to the swale is during the undefended scenario this minor levelling is acceptable.

## 5.3. No increase in volume and rate of surface water runoff

The following stipulations are provided in the EA guidance for managing rainfall runoff:

- Stormwater runoff rates and volumes discharged from urban developments should approximate to the Site greenfield response over a range of storm frequencies of occurrence (return periods).
- Runoff for extreme events should be managed on-Site. This requires:
  - The peak rate of stormwater run-off to be limited.
  - The volume of run-off to be limited.
- The pollution load to receiving waters from stormwater runoff to be minimised.
- The assessment of overland flows and temporary flood storage across the Site.

Section 6 describes the drainage strategy for the Site, which is designed in such a way as to prevent an increase in runoff rates from the Site under a range of design storm scenarios. This includes suitable allowances for future increases in rainfall intensity caused by climate change.



Due to the likelihood of high groundwater levels it has not been possible to limit the volume of run-off to greenfield volumes, however in line with the National standards for sustainable drainage systems (SuDS) runoff rates will be limited to the 50% AEP greenfield runoff rate (or 3 l/s/ha, whichever is greater) for all events up to and including the design event (1% AEP with 45% Climate change).

The Drainage Strategy also assesses measures for ensuring pollution load to receiving water courses from stormwater runoff are minimised and an assessment of overland flows and temporary flood storage across the Site.

## 6. Drainage Strategy

The NPPF stipulates that all new developments must be “safe, without increasing flood risk elsewhere”. The National Standards for Sustainable Drainage Systems (HM Government, 2025) expand on these principles by setting a clear hierarchy for runoff destinations and defining seven technical standards covering runoff control, management of everyday and extreme rainfall, water quality, amenity, biodiversity and consideration of structural design, construction and long-term maintenance.

The proposed drainage design is described under Section 6.1 with subsequent sections covering each of the 7 standards that are required to be demonstrated for all SuDS schemes. Appendix D provides a plan of the proposed drainage scheme.

### 6.1. Proposed Drainage Design

A SuDS Strategy has been drafted and includes at source controls through porous paving acting as attenuation storage along the access road, leading to a swale running along the back of the proposed dwellings, before discharging to a surface drain at a controlled rate which will drain to the River Adur.

It is proposed at detailed design stage to undertake infiltration testing and groundwater monitoring to determine if discharge via infiltration is likely to be feasible (further discussed in Section 6.2.2) however due to concerns relating to (shallow) depth to groundwater a scheme has been developed that does not rely on infiltration, which is described below. If infiltration is found to be possible at detailed design stage (in particular for the dwellings in the south of the Site) reductions in swale sizes could be achieved and a reduction in discharge to surface water bodies.

#### 6.1.1. Assessment of catchment areas

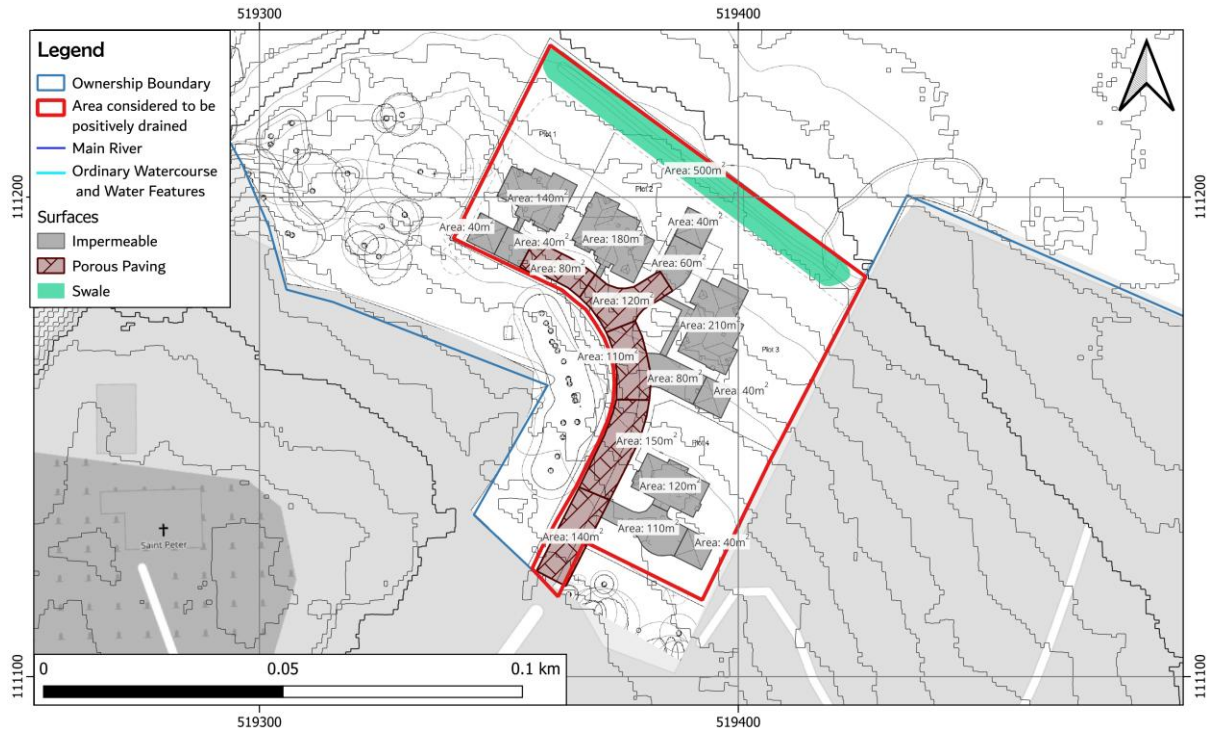
Due to the proposed design incorporating a swale along the northern boundary of the Site, it is likely that the swale will intercept all runoff, including that from permeable surfaces from the Site. The assessment has therefore considered the full area from the access road to the swale (as indicated on Figure 6-1) to be positively drained – this is an area of 0.53 ha.

GIS has been used to define the impermeable areas of Site, and a 10% urban creep allowance applied. The remaining greenfield areas have been calculated and a ReFH 2 hydrograph will be applied to the swale to represent the runoff from these areas. The swale itself has been treated as an impermeable surface with no urban creep allowance. Calculations are provided in Table 6-1, and the impermeable surfaces in Figure 6-1.

Table 6-1 Catchment area analysis

| Description                                       | Area (ha) |
|---------------------------------------------------|-----------|
| Impermeable developed areas                       | 0.184     |
| Urban creep at 10% on above areas                 | 0.018     |
| Swale footprint*                                  | 0.050     |
| Total impermeable area                            | 0.243     |
| Total positively drained area                     | 0.530     |
| Remaining greenfield areas (for ReFH2 hydrograph) | 0.288     |

Figure 6-1 Impermeable Surfaces



### 6.1.2. Proposed storage and control elements

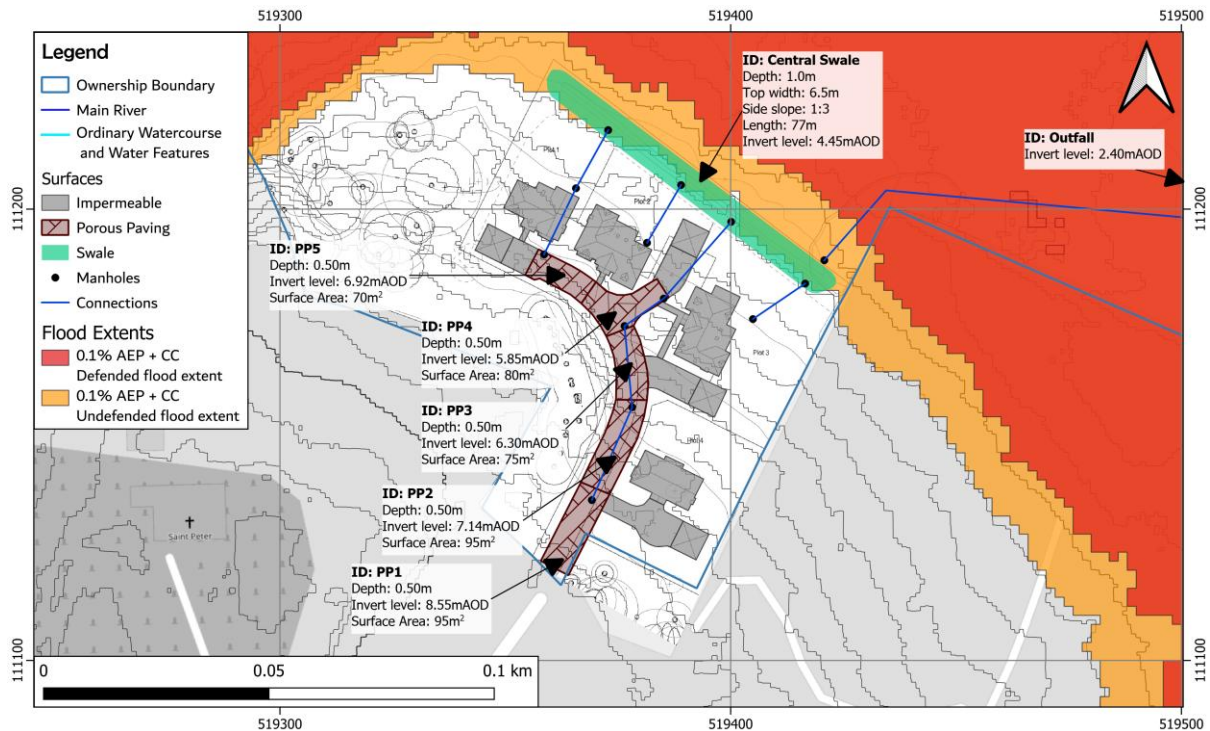
Porous paving has been proposed for low traffic roads (as indicated in Figure 6-1). Areas of porous paving have been assumed to have a 35% porosity and a depth of 0.50m. Orifices have been used as flow controls on the porous paving areas to limit flow rates passing onto downstream detention basins. Orifice dimensions are small (minimum of 20 mm) and therefore will need to be robustly protected from blockage risk as per the National SuDS Standards. As these orifices are located within the porous paving, the paving will already provide a measure of filtration. Further measures will be provided at detailed design.

A swale is proposed along the northern boundary. The swale is proposed to be 1m in depth, with a 0.4m base and 6.4m top width (1:3 slopes). The swale has a length of 77m. Discharge from the swale is controlled via hydrobrake.

As the layout plans for the Site progress, the required storage could be distributed over additional features such as rain gardens or tree pits adjacent to the larger roads to comprise a "SuDS train" within the Site.

Figure 6-2 details the location and key properties of SuDS features. Details of the modelled scheme in the form of a Causeway Flow report are provided in Appendix E.

Figure 6-2 Properties of key SuDS features



### 6.1.3. Performance calculation parameters

Causeway Flow has been used to model the proposed drainage design using a source control approach – therefore not all details have been provided but rather the model has been used to confirm that the overall storage provision on Site is sufficient.

Key model parameters are as follows:

- Model run for the 50%, 3.3% and 100% AEP events with a 40% and 45% allowance for climate change for the 3.3% and 100% AEP events respectively, representing the upper end peak rainfall climate change allowance for the Adur and Ouse Management Catchment.
- FEH22 rainfall profiles used, with full range of storm durations from 15 minutes to 1,440 minutes.
- Volumetric runoff coefficient set to 1 for both winter and summer storms to represent capture of all runoff from impermeable surfaces.
- No infiltration has been assumed for any of the SuDS features.
- ReFH2 hydrograph has been applied to the swale to represent runoff from permeable surfaces such as gardens.

The results from the modelling are presented under the relevant standards, with a detailed output report from Causeway Flow presented in Appendix E.

## 6.2. Standard 1: Runoff Destinations

Surface water runoff must be disposed of according to a hierarchy of destinations as follows:

- Priority 1: collected for non-potable use
- Priority 2: Infiltrated to ground
- Priority 3: Discharged to an above ground surface water body

- Priority 4: Discharged to a surface water sewer, or another piped surface water drainage system
- Priority 5: Discharged to a combined sewer

The suitability of each of these options is discussed below.

### 6.2.1. Water re-use

Water re-use (i.e. the use of water butts or more sophisticated tank systems to capture rainwater for re-use) could be implemented at the Site. These sites collect water from clean surfaces (such as rooftops) for (generally non-potable) use on Site.

Rainwater harvesting is particularly useful at Sites with a low infiltration potential and limited space for attenuation features. It also has wider sustainability benefits with regards to lowering the water supply demand. It is anticipated that water re-use will be incorporated as part of the detailed drainage design however they have not been included in the SuDS strategy to ensure the system has sufficient capacity.

### 6.2.2. Infiltration to ground

The Site is underlain by the White Chalk, and therefore infiltration rates may be above the recommended minimum of  $1 \times 10^{-6}$  m/s for relying on infiltration as a means of discharge. However due to the proximity of the Mudstone to the north of the Site, and low-lying floodplain it is likely that groundwater levels are close to surface. There is also a risk of groundwater flooding identified at the Site (see Section 4.3). Whilst it may be possible to incorporate infiltration to ground, particularly for Plot 4 which is located in the south of the Site and at a higher elevation, the drainage strategy has conservatively assumed that this will not be possible, and infiltration rates have been set to 0.

It is recommended that at detailed design infiltration testing and groundwater monitoring over a winter period is undertaken across the Site to determine if infiltration, particularly in the south of the Site, is possible. If infiltration is found to be feasible then the porous paving in the south could be unlined, and a plot soakaway provided for all plots where infiltration will be feasible. This will not change the overall design of the scheme, but may allow the size of the swale, and discharge to surface water body to be reduced.

### 6.2.3. Discharge to surface water body

Discharge of runoff at restricted rates to the drain (see Figure 6-3) located to the north-east of the Site, and onto the River Adur is a feasible destination for surface runoff from the Site. The drain runs along the eastern boundary of the land ownership and is 140m away from the Site boundary. It is recommended that the open drain is extended to the Site to allow for a surface discharge option, rather than relying on a piped discharge across the field. A condition survey of the drain should be undertaken to confirm that water can freely flow within the drain without obstruction.

Figure 6-4 shows a cross-section profiles through the swale and towards the outfall drain (which has an invert of 2.4m aOD). This demonstrates that the proposed elevations for the swale will allow discharge to the drain. There is potential for the outfall to become surcharged due to fluvial flooding of the land to the north of the Site. An additional model run has been undertaken with a surcharged outfall at a level of 4.76m aOD which corresponds to the fluvial flood level for the 1% AEP with 35% CC (Central estimate). This run (see Appendix F) demonstrates that the surcharged outfall scenario results in flooding from the swale of 33.3m<sup>3</sup>. Flooding from the swale would spill into the field to the north, which would already be inundated due to the fluvial event. The additional volume spilling from the basin would be offset by a reduction in flow out of the outfall (which would otherwise also be contributing to the same hydrologically linked area of flooding). Conservatively assuming that the additional flood water (with no offset for a reduction in flow through the outflow) would spread out

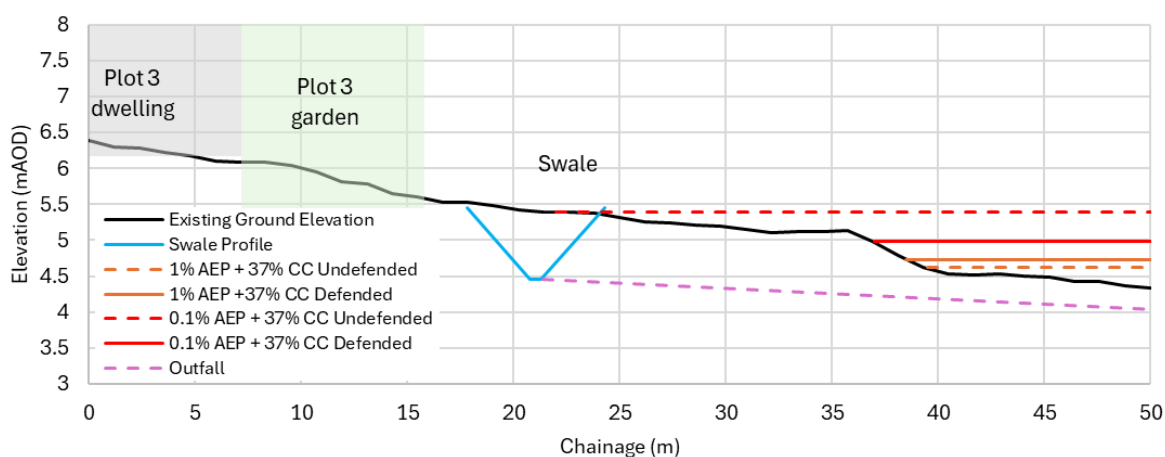


over only the extent of flood zone 2 that is within the land ownership boundary (approximately 1.5 ha), this results in a less than 2mm increase in flood depths.

Figure 6-3 Photo of drain on eastern boundary of land ownership



Figure 6-4 Cross-section profile through swale



#### 6.2.4. Discharge to surface water drains and/or combined drain

Given the likely feasibility of discharging to a surface water body, this option would unlikely be used in this instance.

### 6.3. Standard 2: Management of everyday rainfall

Drainage schemes should ensure that at least the first 5mm of rainfall for the majority of rainfall events does not result in runoff from the site to surface waters or piped drainage systems. Runoff from positively drained surfaces, for at least 5mm of rainfall must either be collected for use, infiltrated into the ground, or else captured, conveyed and stored within SuDS features where these features will naturally absorb or retain runoff and therefore not discharge off the Site.

If infiltration is feasible at the Site then the management of everyday rainfall will be readily achieved via infiltration from the areas of porous paving, and infiltration from the swale.

If however infiltration across the Site is not possible, or the swale in the lower portion of the Site is required to be lined to prevent groundwater ingress then managing the first 5mm of rainfall through infiltration alone will not be possible.

Table 6-2 details the potential scenarios relating to infiltration feasibility, and how everyday rainfall will be managed in each scenario based on the interception measures provided in the National SuDS standards.

The base area of the swale is relatively small (38.5m<sup>2</sup>) in order to maximise the storage volume, and therefore, particularly if lined will provide limited compliance (192m<sup>2</sup>). It is therefore likely that unless infiltration is possible across the whole Site, then rainwater harvesting measures, compliant to BS EN 16941, will be required.

Table 6-2 Management of everyday rainfall

| Scenario                                                                                                  | Measures for ensuring management of everyday rainfall                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Infiltration possible across the Site. No lining of features required                                     | <p>Infiltration from porous paving areas will provide compliance for up to 5 times the permeable surface area.</p> <p>Swale will provide interception for impermeable surfaces up to 25 times the base area</p> <p>Outfall from swale will be raised above invert of swale to ensure compliance for impermeable areas draining within 5 m from the swale outlet, and any residual non-compliant surfaces</p> |
| Infiltration possible in south of Site, however swale required to be lined to prevent groundwater ingress | <p>Infiltration from porous paving areas in south of Site will provide compliance for up to 5 times the permeable surface area.</p> <p>Swale to provide compliance for up to 5 times the base area.</p> <p>Rainwater harvesting measures required for residential runoff from plots 1, 2 and 3 (Plot 4 drained entirely via porous paving)</p>                                                               |
| No infiltration possible across the Site and all features lined                                           | <p>Porous paving areas will not provide any compliance as they receive runoff from contributing impermeable areas.</p> <p>Swale to provide compliance for up to 5 times the base area.</p> <p>Rainwater harvesting measures required for residential runoff from plots 1, 2, 3 and 4</p>                                                                                                                     |

## 6.4. Standard 3: Management of extreme rainfall and flooding

### 6.4.1. Greenfield runoff rates and volumes

The total positively drained area for the Site is 0.53ha. The ReFH2 method (Using FEH22 rainfall model) has been utilised to estimate the greenfield runoff rates for the Site (see Figure 6-5).

Figure 6-5 Greenfield Runoff Rates

**Pre-development discharge**

Site Makeup: Greenfield

Greenfield Method: ReFH2

FEH filename: Data\FEH Descriptors\FEH

Region: England, Wales, NI

Include Baseflow: ☐

Positively Drained Area (ha): 0.530

Betterment (%): 0

| Return Period (years) | Q (l/s) |
|-----------------------|---------|
| 2                     | 0.7     |
| 30                    | 1.8     |
| 100                   | 2.3     |

**Note:** FEH point descriptors can be downloaded from [fehweb.ceh.ac.uk](http://fehweb.ceh.ac.uk)  
Only XML file format can be used  
FEH-22 is the current FEH data and this should be used for new development  
**ReFH2 legacy** – Doesn't contain the new BFIHOST19 descriptor  
**ReFH2** – Contains the new BFIHOST19 descriptor

Due to infiltration potentially not being feasible at the Site, the volume of runoff discharged from the proposed development for the 1% AEP, 6 hour rainfall event will be greater than the volume of greenfield runoff for the same rainfall event. Therefore the peak allowable discharge rate from the development for all events up to and including the 1% AEP with Climate change is the 50% AEP greenfield runoff rate (0.7l/s) based on the National Standards for SuDS, or 3 l/s/ha whichever is greatest. In this case 3 l/s/ha is 1.6 l/s and is the greater of the two and has been used as the discharge limit.

The Greenfield runoff volume for the Site for the 1% AEP, 6 hour storm duration event has also been calculated and is presented in Figure 6-6.

Figure 6-6 Greenfield Runoff Volume

**Pre-development discharge**

Site Makeup: Greenfield

Greenfield Method: ReFH2

FEH filename: Data\FEH Descriptors\FEH

Region: England, Wales, NI

Include Baseflow: ☐

Positively Drained Area (ha): 0.530

Return Period (years): 100

Storm Duration (mins): 360

Betterment (%): 0

Runoff Volume (m³): 28

**Note:** FEH point descriptors can be downloaded from [fehweb.ceh.ac.uk](http://fehweb.ceh.ac.uk)  
Only XML file format can be used  
FEH-22 is the current FEH data and this should be used for new development  
**ReFH2 legacy** – Doesn't contain the new BFIHOST19 descriptor  
**ReFH2** – Contains the new BFIHOST19 descriptor

## 6.5. Performance assessment

The principal SuDS features have been modelled using Causeway Flow software to ensure there is sufficient storage volume within the system and discharge rates can be limited to the 50% AEP greenfield runoff rates.

Table 6-3 and Table 6-4 summarise the model results at the SuDS features for the 3.3% AEP +40% and 1% AEP + 45% scenarios. This confirms that, based on the parameters described above, the proposed drainage scheme will be able to attenuate and discharge runoff to greenfield runoff rates for both events.

Detailed model outputs are provided in Appendix E.

Table 6-3 Summary of 1 in 30 year + 40% climate change model results

| Feature name           | Critical storm  | Peak water depth <sup>1</sup><br>(m aOD) | Peak outflow<br>(l/s) | Flood Risk Status |
|------------------------|-----------------|------------------------------------------|-----------------------|-------------------|
| PP1                    | 60 Min: Winter  | 0.316                                    | 2.5                   | OK                |
| PP2                    | 60 Min: Summer  | 0.274                                    | 3.0                   | OK                |
| PP3                    | 60 Min: Winter  | 0.324                                    | 1.7                   | OK                |
| PP4                    | 120 Min: Summer | 0.199                                    | 0.7                   | OK                |
| PP5                    | 120 Min: Summer | 0.215                                    | 1.0                   | OK                |
| Swale                  | 720 Min: Winter | 0.831                                    | 1.5                   | FLOOD RISK        |
| <b>Total Discharge</b> |                 |                                          | <b>1.5</b>            |                   |

Table 6-4 Summary of 1 in 100 year + 45% climate change model results

| Feature name           | Critical storm  | Peak water depth<br>(m aOD) | Peak outflow<br>(l/s) | Flood Risk Status |
|------------------------|-----------------|-----------------------------|-----------------------|-------------------|
| PP1                    | 60 Min: Winter  | 0.443                       | 2.6                   | OK                |
| PP2                    | 60 Min: Summer  | 0.384                       | 3.1                   | OK                |
| PP3                    | 60 Min: Winter  | 0.459                       | 1.9                   | FLOOD RISK        |
| PP4                    | 120 Min: Summer | 0.267                       | 0.7                   | OK                |
| PP5                    | 120 Min: Summer | 0.321                       | 1.0                   | OK                |
| Swale                  | 960 Min: Summer | 0.995                       | 1.6                   | FLOOD RISK        |
| <b>Total Discharge</b> |                 |                             | <b>1.6</b>            |                   |

### 6.5.1. Exceedance flow paths

Whilst the strategy has aimed to ensure no flooding during the extreme 1 in 100 year + 45% climate change scenario, there is always a residual risk that flooding may occur for example due to more extreme events or blockage of structures. Under these conditions, exceedance flows will be designed to follow the existing preferential surface water flow paths towards the north of the Site, via the road network. Raised kerbs or bunds will be created along roads to direct flows where required. Flow will

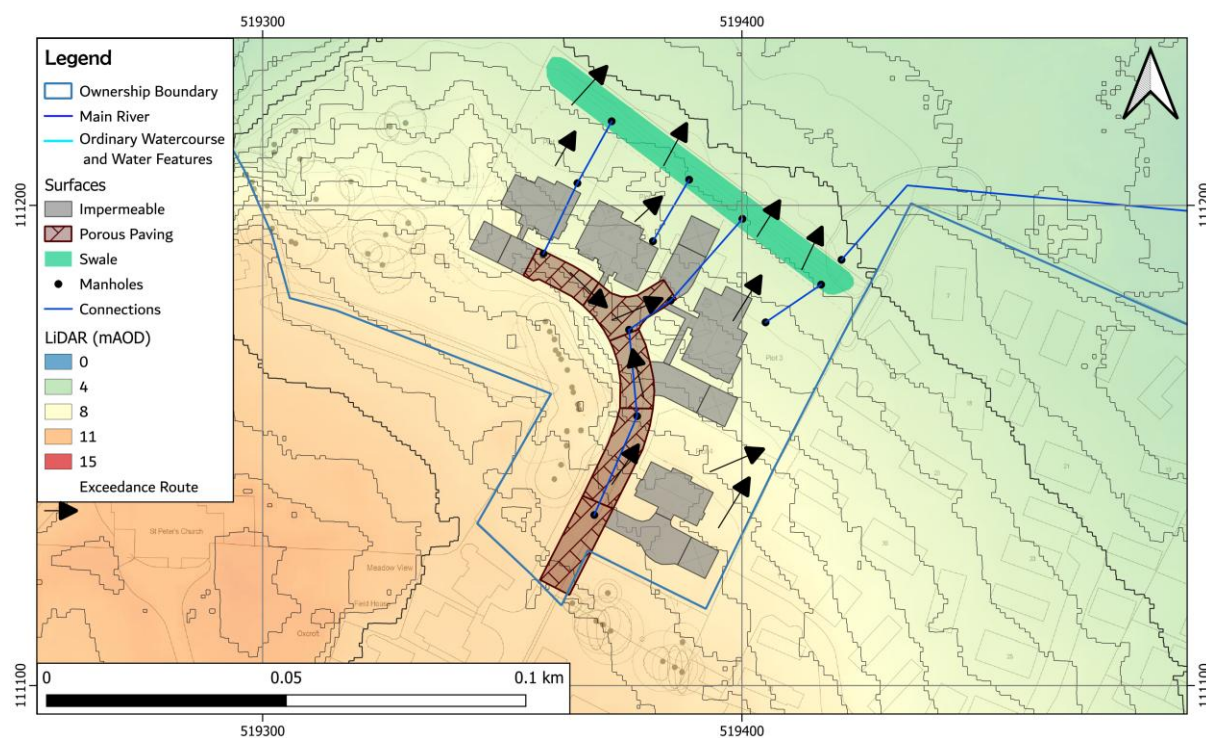
<sup>1</sup> Calculated as peak level – feature invert level. Note this is different to the depth reported in Causeway which uses the invert of the manhole not the storage feature.



be directed towards the swale where any remaining capacity can be utilised, before spilling to the open fields to the north of the swale.

Very high level exceedance flow directions are illustrated in Figure 6-7 based on topographic data. A more detailed analysis of exceedance flows will be undertaken during as part of the detailed drainage strategy.

*Figure 6-7 Exceedance flow routes*



## 6.6. Standard 4: Water Quality

SuDS techniques can be used to effectively manage the quality of surface water flowing across a site. Different methods can be used to intercept pollutants and allow them to degrade or be stored in-situ without impacting the quality of water further downstream. Frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals and various organic and inorganic contaminants). Therefore, the first 5mm to 10mm of rainfall (i.e. the 'first flush') should be adequately treated using SuDS.

The proposed development will primarily consist of residential dwellings, low traffic roads and driveways. The CIRIA SuDS manual categorises runoff from residential dwellings as presenting a very low water quality hazard and runoff from low usage roads and residential driveways as presenting a low hazard rating (see Table 6-5).



*Table 6-5 Water quality hazard ratings (CIRIA, 2015)*

| Land use                                                                                                                                                                                                                                                                 | Hazard level |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Residential roof drainage                                                                                                                                                                                                                                                | Very low     |
| Residential, amenity uses including low usage car parking spaces and roads, other roof drainage . Non-residential car parking with infrequent change (<e.g. schools, offices, i.e. < 300 traffic movements/day)                                                          | Low          |
| Commercial uses including car parking spaces and roads (e.g. hospitals, retail, excluding low usage roads, trunk roads and motorways)                                                                                                                                    | Medium       |
| Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemical and fuels (other than domestic fuel oil) are delivered, handled, stored used or manufactured, industrial sites | High         |
| Trunk roads and motorways                                                                                                                                                                                                                                                | High         |

The CIRIA SuDS manual (CIRIA, 2015) advocates a qualitative approach to designing a SuDS scheme for a site with a low hazard rating. This should provide adequate controls on pollutants contained in runoff water.

As the proposed development is predominantly residential in nature with a low hazard rating, hazard indices of 0.5 for Total Suspended Solids (TSS), 0.4 for Metals and 0.4 for Hydrocarbons are considered applicable.

The measures detailed in Table 6-6 are examples which are suitable for inclusion in a drainage strategy for a residential development to mitigate a potential increase in pollutant load within on-site and off-site runoff – note text in bold are measures included in this SuDS Strategy. Removal indices are included for each feature type relative to the specific pollutant.

*Table 6-6 Mitigation indices for SuDS components*

| Component type          | TSS        | Metals     | Hydrocarbons |
|-------------------------|------------|------------|--------------|
| Filter drain            | 0.4        | 0.4        | 0.4          |
| <b>Swale</b>            | <b>0.5</b> | <b>0.6</b> | <b>0.6</b>   |
| <b>Permeable paving</b> | <b>0.7</b> | <b>0.6</b> | <b>0.7</b>   |
| Detention basin         | 0.5        | 0.5        | 0.6          |
| Pond                    | 0.7        | 0.7        | 0.5          |

The inclusion of detention basins within the SuDS strategy for the Site will provide adequate treatment to mitigate the low hazard associated with runoff from the development provided all runoff flows through at least one of these components (as per the SuDS strategy), and most passing through both permeable paving and detention basins. Causeway Fow has been used to model the water quality indices, and demonstrates that at the outfall sufficient mitigation has been provided (Appendix E).

Sediment traps (i.e. sumps within the inspection chambers of the final manhole upstream of each feature) will be used to facilitate the maintenance of these SuDS features and reduce the build-up of potentially polluted material.

## 6.7. Standard 5 & 6: Amenity and Biodiversity

SuDS schemes present opportunities to enhance habitat for wildlife on-site and this often improves the biodiversity of the surrounding areas. Ponds, constructed wetlands and other surface water features are landscape assets that have amenity value and improve the aesthetics of a site more than conventional drainage systems.

The use of the swale along the northern boundary of the Site will provide opportunity for native planting within the swale and thereby both provide additional habitat potential and increase the visual impact of the features. The swale will be maintained by a management company ensuring that they remain in good condition. Further details of the planting will be provided in the detailed drainage strategy and landscape reports.

## 6.8. Standard 7: Design of drainage for construction, operation, maintenance, decommissioning and structural integrity

The Construction (Design and Management) Regulations 2015 include requirements for designers to take account of the health and safety risks associated with the construction, operation and maintenance and decommissioning of the drainage system to minimise these risk as far as reasonably practicable.

SuDS features should be built and operated in accordance with guidance outlined in the CIRIA SuDS Manual.

The drainage design can be delivered as a gravity fed system which reduces the reliance on mechanical systems and the cost of operation. Access for maintenance of the swale will be possible from the north due to the extensive land ownership to the north of the Site .

### 6.8.1. Maintenance Schedules

Inspection and long-term maintenance of SuDS components ensure efficient operation and prevents failure. Management of the surface water drainage system will be undertaken by a Management Company.

This section outlines the maintenance and management schedules for the proposed drainage system. The schedules have been formulated in line with guidelines contained within the CIRIA SuDS Manual (CIRIA, 2015). There are three categories of maintenance activities referred to in this report, although not all are required for each SuDS feature:

- **Regular maintenance** – tasks which are required to be undertaken on a weekly or monthly basis, or as required.
- **Occasional maintenance** – tasks which are required to be undertaken periodically, typically at intervals of three months or more.
- **Remedial maintenance** – tasks which are not required on a regular basis but are done when necessary.

This section is intended to give an overview of the operation and maintenance for the range of drainage features included within the surface water drainage strategy and in relation to typical/ standard details only.

Maintenance schedules for the proposed SuDS components are provided in the following tables. These schedules are not exhaustive and should be reassessed at regular intervals to determine if any additional maintenance requirements are required to preserve the performance and condition of the drainage system.

In addition the maintenance and installation information provided by Hydrobrake are provided in Appendix G. Requirements are expected to be similar if an alternative provider of a vortex control device is chosen as part of detailed design.

*Table 6-7 Maintenance for pipes and manholes*

| Maintenance schedule   | Required action                                                                                                     | Frequency                                         |
|------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| Regular maintenance    | Remove any accumulation of silt, sediment, leaves and debris etc                                                    | Monthly, or as required                           |
|                        | Inspect for evidence of poor operation                                                                              | Monthly (during the first year), then half yearly |
| Occasional maintenance | High pressure water jet removal of silt build-up and avoid blockages, particularly at bends or changes in direction | Six monthly, or as required                       |
|                        | Remove or control tree roots where they are encroaching pipe runs, using recommended methods                        | As required                                       |
| Remedial actions       | Clear pipework and gully grates of blockages                                                                        | As required                                       |
|                        | Replace any damaged or failed pipes, gullies or manholes                                                            | As required                                       |

*Table 6-8 Maintenance for pervious pavements*

| Maintenance schedule   | Required action                                                                                                                            | Frequency                                                                                                                                                                                                                                                                                                               |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Regular maintenance    | Brushing and vacuuming (standard cosmetic sweep over whole surface)                                                                        | Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment. |
| Occasional maintenance | Stabilise and mow contributing and adjacent areas                                                                                          | As required                                                                                                                                                                                                                                                                                                             |
|                        | Removal of weeds or management using glyphosphate applied directly into the weeds by an applicator rather than spraying                    | As required – once per year on less frequently used pavements                                                                                                                                                                                                                                                           |
| Remedial actions       | Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving   | As required                                                                                                                                                                                                                                                                                                             |
|                        | Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to | As required                                                                                                                                                                                                                                                                                                             |

| Maintenance schedule | Required action                                                                               | Frequency                                                                                                |
|----------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Monitoring           | users, and replace lost jointing material                                                     |                                                                                                          |
|                      | Rehabilitation of surface and upper substructure by remedial sweeping                         | Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging) |
|                      | Initial inspection                                                                            | Monthly for three months after installation                                                              |
|                      | Inspect for evidence of poor operation and/or weed growth – if required, take remedial action | Three-monthly, 48 h after large storms in first six months                                               |
| Monitoring           | Inspect silt accumulation rates and establish appropriate brushing frequencies                | Annually                                                                                                 |
|                      | Monitor inspection chambers                                                                   | Annually                                                                                                 |

Table 6-9 Maintenance for swales

| Maintenance schedule   | Required action                                                                                                              | Frequency                                                                           |
|------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Regular maintenance    | Remove litter and debris                                                                                                     | Monthly (or as required)                                                            |
|                        | Cut grass – to retain grass height within specified design range                                                             | Monthly (during growing season), or as required                                     |
|                        | Manage other vegetation and remove nuisance plants                                                                           | Monthly at start, then as required                                                  |
|                        | Inspect inlets, outlets and overflows for blockages, and clear if required                                                   | Monthly                                                                             |
|                        | Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours | Monthly (or as required)                                                            |
|                        | Inspect vegetation coverage                                                                                                  | Monthly for 6 months, quarterly for 2 years, then half yearly                       |
|                        | Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies                    | Half yearly                                                                         |
| Occasional maintenance | Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required                             | As required or if bare soil is exposed over 10% or more of the swale treatment area |
| Remedial actions       | Repair erosion or other damage by re-turfing or reseed                                                                       | As required                                                                         |
|                        | Relevel uneven surfaces and reinstate design levels                                                                          | As required                                                                         |

| Maintenance schedule | Required action                                                                                                                        | Frequency   |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------|
|                      | Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface | As required |
|                      | Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter stripe                                        | As required |
|                      | Remove and dispose of oils or petrol residues using safe standard practices                                                            | As required |

Table 6-10 Maintenance for control devices

| Maintenance schedule   | Required action                                                                                       | Frequency                   |
|------------------------|-------------------------------------------------------------------------------------------------------|-----------------------------|
| Regular maintenance    | Inspect/check pipework to ensure that the flow control is in good condition and operating as designed | Monthly                     |
|                        | Inspect for evidence of poor operation                                                                | Monthly, or as required     |
| Occasional maintenance | High pressure water jet removal of silt build-up                                                      | Six monthly, or as required |
| Remedial actions       | Clear pipework of blockages                                                                           | As required                 |
|                        | Replace the flow control if it becomes damaged                                                        | As required                 |

## 6.9. Further SuDS considerations

The detailed design strategy should include:

- Infiltration testing and groundwater monitoring across the Site to determine if infiltration is possible.
- Means of ensuring that small orifices (<0.05m diameter) are robustly protected from blockage.
- Consideration of rainwater harvesting calculations to support interception of the first 5mm of rainfall, particularly if infiltration is not feasible within the northern portion of the Site.
- Planting proposals for the swale to enhance biodiversity and amenity.



## 7. Foul Drainage

Due to site levels, it is anticipated that foul flows from the Site will discharge via a private pumped system to the existing public sewer. A capacity check with Southern Water has been undertaken, and they have confirmed that there is sufficient capacity available for 3.3 m<sup>3</sup>/day at manhole reference TQ19113002 (519328, 111092) (correspondence provided in Appendix H along with sewer network plan). The flow rate of 3.3m<sup>3</sup>/day has been calculated based on 4 properties, each containing 4 bedrooms using the Environment Agencies 'Daily discharge calculator for domestic properties' as per Southern Water's recommendations. The foul drainage network will comprise gravity laterals draining to a shared below-ground packaged pumping station, from which flows will be conveyed via a rising main to the agreed point of connection.

The pumping station and associated private pipework will not be offered for adoption and will remain under private ownership. The management company will take responsibility for the operation, inspection, maintenance, and repair of all private foul infrastructure, including the pumping station, rising main, control panel, and alarm system.

The pumping station will be designed in accordance with current legislation and industry best practice and will incorporate twin pumps operating on a duty/ standby arrangement, high-level alarms, non-return valves, and sufficient emergency storage to accommodate flows in the event of pump failure. An alarm system with telemetry or auto-dial capability will notify the appointed maintenance contractor of any malfunction.

A formal S106 application will be required to be completed and approved by Southern Water prior to a connection being made. No surface water will be discharged into the foul sewer network, and the surface and foul drainage networks would be independent of each other.

### 7.1. Maintenance Regime – Private Pumped Foul System

Table 7-1 provides the maintenance requirements and responsibilities for the proposed system:

*Table 7-1 Maintenance for private pumped foul system*

| Asset                    | Activity                                    | Frequency                        | Responsibility                |
|--------------------------|---------------------------------------------|----------------------------------|-------------------------------|
| Packaged pumping station | Service inspection by specialist contractor | Twice yearly                     | Management Company            |
| Pumps                    | Mechanical and electrical inspection        | Twice yearly                     | Management Company            |
| Level controls & alarms  | Functional test                             | Twice yearly                     | Management Company            |
| Rising main              | Visual inspection of accessible sections    | Annually                         | Management Company            |
| Emergency call-out       | 24-hour reactive response                   | As required                      | Management Company contractor |
| Desludging of wet well   | Remove accumulated solids                   | As required (typically annually) | Management Company            |

## 8. Conclusions

The Proposed Development for 4No. dwellings on a parcel of land at Church Farm, Upper Beeding, lies within an area of overall low flood risk. Flood zones associated with the River Adur extend onto the northern edge of the Site during the extreme (0.1% AEP event) during the undefended scenario when climate change is considered, however the proposed area to be developed is not at risk during the design (1% AEP event with climate change), and within the defended Flood Zone 1 (including climate change). There is no surface water flood risk at the Site within areas that are proposed to be developed. Groundwater poses the only source of flood risk, and it is proposed that finished floor levels are raised 150 mm above surrounding ground levels to ensure that any groundwater emerging at the surface flows around dwellings.

The proposed development is classified as 'More Vulnerable' with regards to flood risk, and all development will be within Flood Zone 1.

The Site will remain safe from flooding through the raising of floor levels above potential groundwater emergence, and through the implementation of SuDS to ensure no increase in runoff rates from the Site.

A drainage strategy has been prepared for the Site which given the risk of groundwater flooding does not rely on infiltration to ground and instead proposed a discharge to a drain to the north-east of the Site, which is linked to the River Adur. Attenuation is provided on Site via porous paving on low traffic roads, and through a swale along the northern boundary of the Site. Discharge at a rate of 3 l/s/ha is proposed for all events up to the design 1% AEP with climate change event.

There is potential that infiltration, particularly in the southern portion of the Site which is at a higher elevation may be possible. It is recommended that the infiltration testing and groundwater monitoring is undertaken to determine this feasibility. If infiltration is possible, then the size of the swale may be able to be reduced. The drainage strategy has conservatively assumed no infiltration to ensure sufficient capacity is available on Site if SuDS features are required to be lined to prevent groundwater ingress.

Performance calculations to assess the storage requirements have demonstrated that the design can limit discharge to the 3 l/s/ha flow rate for both the 3.33% and 1% AEP events with climate change. the Site is not expected to require significant land raising / lowering to accommodate a gravity driven drainage system as there is a suitable gradient over the Site.

The detailed design must consider the use of rain water harvesting to ensure compliance with the national SuDS standards regarding management of everyday rainfall, and the proposed planting of the swale to enhance amenity and biodiversity.

A foul drainage capacity check has been completed with Southern Water confirming adequate capacity and it is likely that any sewer connection will need to be pumped.

## 9. References

- AECOM. (2024). *Horsham Strategic Flood Risk Assessment*.
- British Geological Society. (2025). *BGS Geology Viewer*. Retrieved from <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/>
- CIRIA. (2015). *The SuDS Manual v2 C753*.
- Cranfield Soil and AgriFood Institute. (2025). Retrieved from <http://www.landis.org.uk/soilscapes/>.
- Environment Agency. (2025). *Check the long term flood risk for an area in England*. Retrieved from <https://www.gov.uk/check-long-term-flood-risk>
- HM Government. (2025). *National Standards for Sustainable Drainage Systems*.



## Report Conditions

This report has been prepared by Aqua Terra Consultants Ltd. (Aqua Terra) in its professional capacity as soil and groundwater specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client and is provided by Aqua Terra solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report, taking account of the terms of reference agreed with the client. The findings are based on the information made available to Aqua Terra at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology, and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

Where necessary and appropriate, the report represents and relies on published information from third party, publicly and commercially available sources which is used in good faith of its accuracy and efficacy. Aqua Terra cannot accept responsibility for the work of others.

Site investigation results necessarily rely on tests and observations within exploratory holes only. The inherent variation in ground conditions mean that the results may not be representative of ground conditions between exploratory holes. Aqua Terra take no responsibility for variation in ground conditions between exploratory positions.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, Aqua Terra may, by prior written agreement, agree to such release, if it is acknowledged that Aqua Terra accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. Aqua Terra accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual, or otherwise, against Aqua Terra except as expressly agreed with Aqua Terra in writing. Aqua Terra reserves the right to withhold and/ or negotiate the transference of reliance on this report, subject to legal and commercial review.









*Fairfax*

**project:**  
Development at:  
**CHURCH FARM  
CHURCH FARM WALK  
UPPER BEEDING**

**title:**  
**BLOCK PLAN - B&W**

**date:** Dec '25 **scale:** 1 : 500 @ A1

|                                      |                  |
|--------------------------------------|------------------|
| <b>drawing number:</b><br>2517/PL.03 | <b>Rev.</b><br>F |
|--------------------------------------|------------------|

|                                                               |                                                                                                                                                                                      |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Paul Hewett R.I.B.A.</b><br><br><b>CHARTERED ARCHITECT</b> | Paul Hewett BA(Hons) DipArch(Hons) R.I.B.A.<br>CHARTERED ARCHITECT<br>51 Foxdale Drive : Angmering : West Sussex<br>BN16 4HF<br>Tel: 01903 778701<br>email: hewett439@btinternet.com |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Copyright: Paul Hewett RIBA Chartered Architect - All Rights Reserved





# Flood risk assessment data



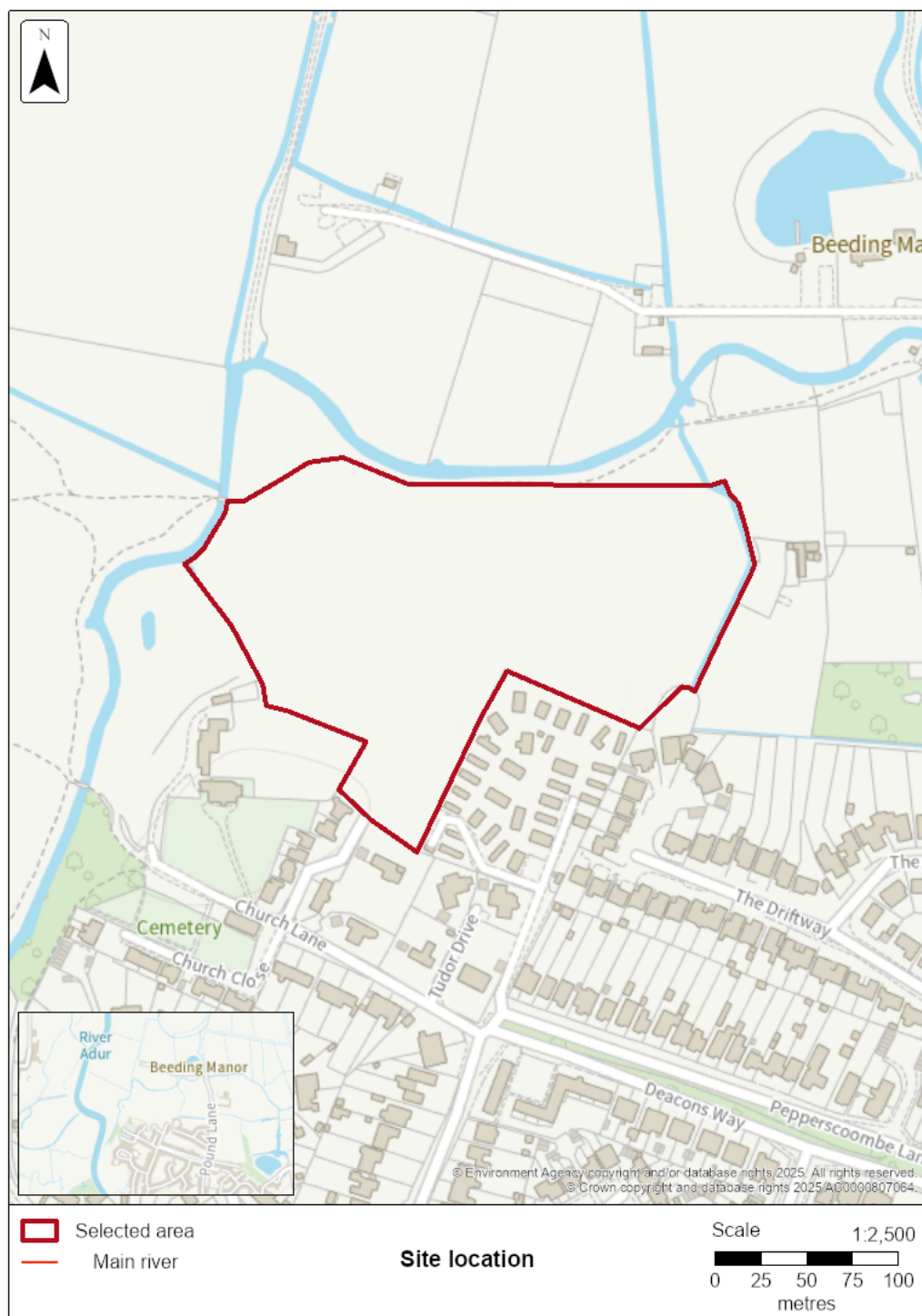
**Location of site:** Land off Church Farm, Upper Beeding

**Document created on:** 25 September 2025

**This information was previously known as a product 4.**

**Customer reference number:** EIR2025/28432

Map showing the location that flood risk assessment data has been requested for.



## How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

**We recommend that you work with a flood risk consultant to get your flood risk assessment.**

## Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- flood defences and attributes
- information to help you assess if there is a reduced flood risk from rivers and the sea because of defences
- modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

## Information that's unavailable

This document **does not** contain:

- past floods

We do not have past flooding data for this location.

Please note that:

- flooding may have occurred that we do not have records for
- flooding can come from a range of different sources
- we can only supply flood risk data relating to flooding from rivers or the sea

You can contact your Lead Local Flood Authority or Internal Drainage Board to see if they have other relevant local flood information. Please note that some areas do not have an Internal Drainage Board.



## Surface water and other sources of flooding

When using the surface water map on the [check your long term flood risk service](#) the following considerations apply:

- surface water extents are suitable for use in planning
- surface water climate change scenarios may help to inform risk assessments, but the available data fall short of what is required to assess planned development
- surface water depth information should not be used for planning purposes

To find out about other factors that might affect the flood risk of this location, you should also check:

- [reservoir flood risk](#)
- groundwater flood risk - you could use the [British Geological Survey groundwater flooding data](#), [groundwater: current status and flood risk](#) and the guide on [mining and groundwater constraints for development](#) - further information may be available from the lead local flood authority (LLFA)
- your local planning authority's SFRA, which includes future flood risk

Your Lead Local Flood Authority is West Sussex County.

For information about sewer flooding, contact the relevant water company for the area.

## About the models used

Model name: River Adur Intertidal Model Updates

Scenario(s): Defended fluvial, Undefined fluvial, Defended tidal, Undefined tidal

Date: 2022

This model contains the most relevant data for your area of interest.

## Terminology used

### Annual exceedance probability (AEP)

This refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which is calculated to have a 1% chance of occurring in any one year, is described as 1% AEP.

### Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

## **Flood map for planning (rivers and the sea)**

Your selected location is in flood zone 3.

Flood zone 3 shows the area at risk of flooding for an undefended flood event with a:

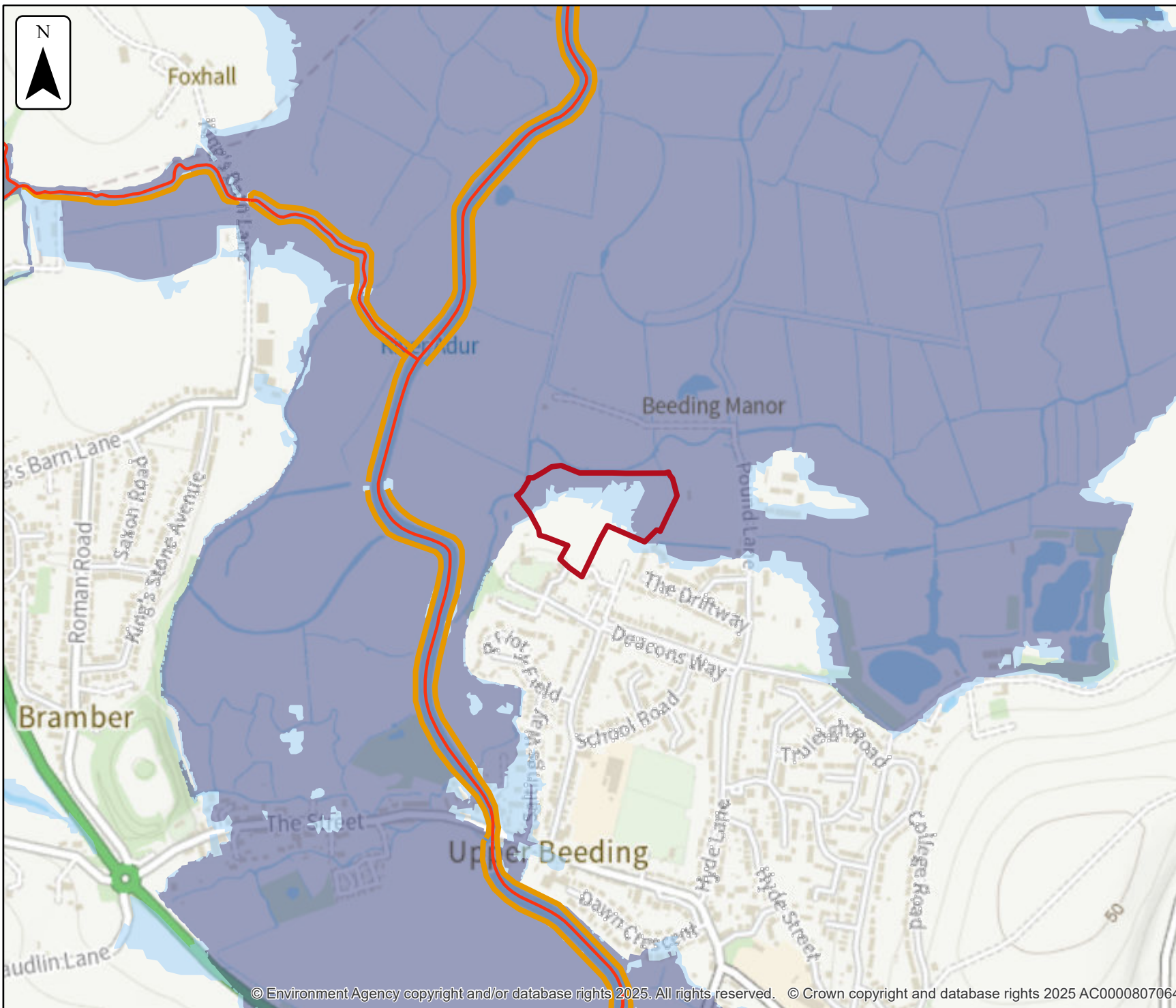
- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- between a 0.1% and 0.5% probability of occurring in any year for flooding from the sea
- between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding

It's important to remember that the flood zones on this map:

- refer to the land at risk of flooding and do not refer to individual properties
- refer to the probability of river and sea flooding, ignoring the presence of defences
- do not take into account potential impacts of climate change



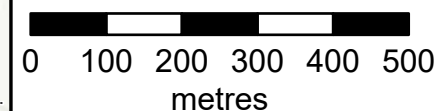
## Flood map for planning

Location (easting/northing)  
**519414/111233**

Scale  
**1:10,000**

Created  
**25 Sep 2025**

-  Selected area
-  Main river
-  Flood defence
-  Flood Zone 3
-  Flood Zone 2



## Flood defences and attributes

The flood defences map shows the location of the flood defences present.

The flood defences data table shows the type of defences, their condition and the standard of protection. It shows the height above sea level of the top of the flood defence (crest level). The height is in mAOD which is the metres above the mean sea level at Newlyn, Cornwall.

It's important to remember that flood defence data may not be updated on a regular basis. The information here is based on the best available data.

Use this information:

- to help you assess if there is a reduced flood risk for this location because of defences
- with any information in the modelled data section to find out the impact of defences on flood risk





## Flood defences

Location (easting/northing)  
**519414/111233**

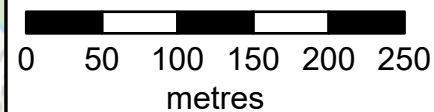
Scale

**1:5,000**

Created

**25 Sep 2025**

-  Selected area
-  Main river
-  Flood defence



## Flood defences data

| Label | Asset ID | Asset Type | Standard of protection (years) | Current condition | Downstream actual crest level (mAOD) | Upstream actual crest level (mAOD) | Effective crest level (mAOD) |
|-------|----------|------------|--------------------------------|-------------------|--------------------------------------|------------------------------------|------------------------------|
| 1     | 21564    | Embankment | 60                             |                   | 4.27                                 | 4.29                               |                              |
| 2     | 87586    | Embankment | 60                             |                   | 4.25                                 | 4.29                               |                              |
| 3     | 19939    | Embankment | 30                             |                   | 3.90                                 | 4.0                                |                              |
| 4     | 21562    | Embankment | 50                             |                   | 4.09                                 | 4.12                               |                              |
| 5     | 73571    | Embankment | 70                             |                   | 4.20                                 | 4.22                               |                              |
| 6     | 178163   | Embankment | 100                            |                   | 4.47                                 | 4.47                               |                              |
| 7     | 73570    | Embankment | 150                            |                   | 4.26                                 | 4.20                               |                              |
| 8     | 142299   | Embankment | 110                            |                   | 4.22                                 | 4.67                               |                              |
| 9     | 136618   | Embankment | 150                            |                   | 4.54                                 | 4.47                               |                              |
| 10    | 73821    | Embankment | 100                            |                   | 4.47                                 | 4.59                               |                              |

Any blank cells show where a particular value has not been recorded for an asset.

## Modelled data

This section provides details of different scenarios we have modelled and includes the following (where available):

- outline maps showing the area at risk from flooding in different modelled scenarios
- modelled node point map(s) showing the points used to get the data to model the scenarios and table(s) providing details of the flood risk for different return periods
- map(s) showing the approximate water levels for the return period with the largest flood extent for a scenario and table(s) of sample points providing details of the flood risk for different return periods

## Climate change

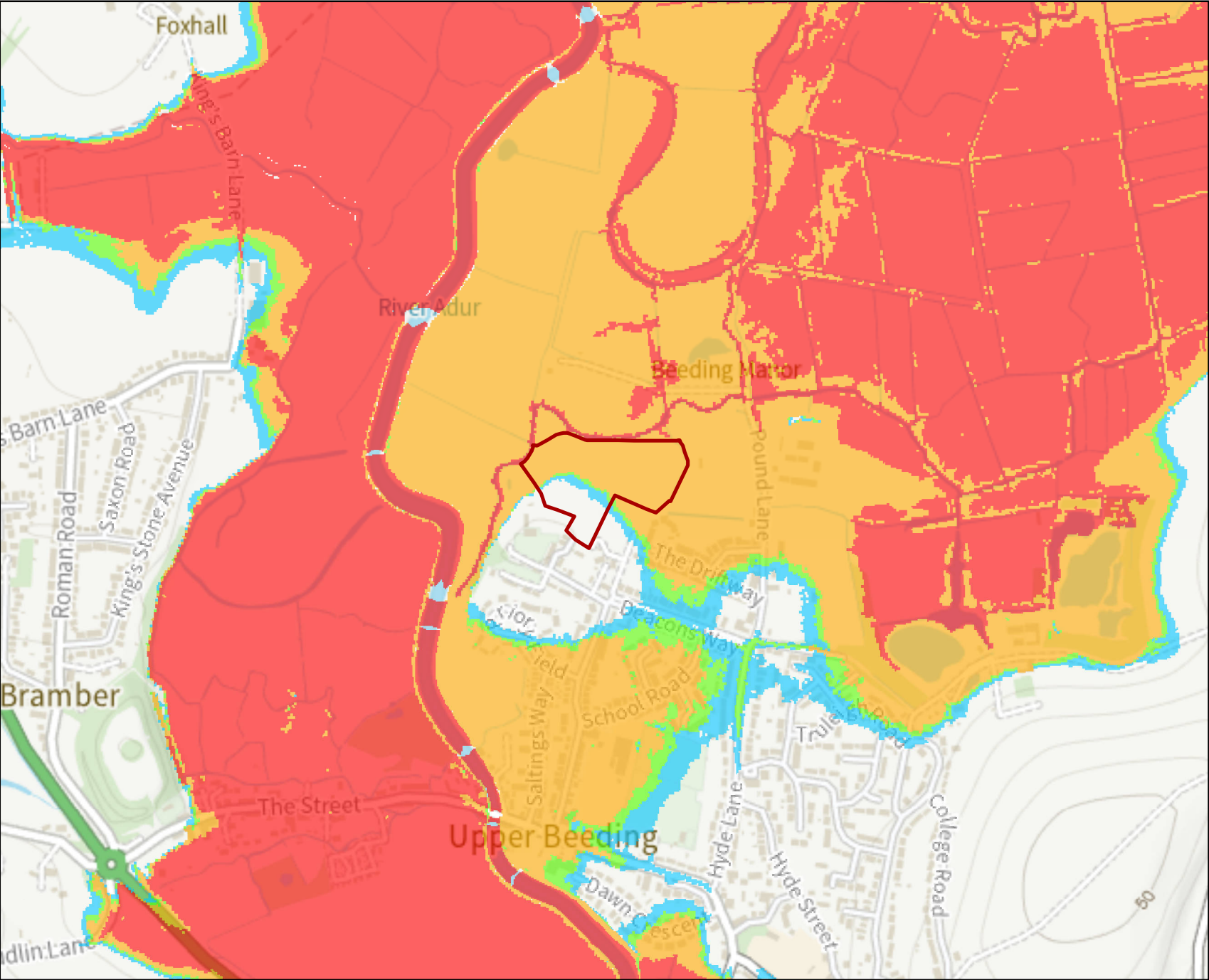
The climate change data included in the models may not include the latest [flood risk assessment climate change allowances](#). Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

The Environment Agency will incorporate the new allowances into future modelling studies. For now, it's your responsibility to demonstrate that new developments will be safe in flood risk terms for their lifetime.

## Modelled scenarios

The following scenarios are included:

- Defended modelled fluvial: risk of flooding from rivers where there are flood defences
- Defences removed modelled fluvial: risk of flooding from rivers where flood defences have been removed
- Defended modelled tidal: risk of flooding from the sea where there are flood defences
- Defences removed modelled tidal: risk of flooding from the sea where flood defences have been removed





Environment  
Agency

N



**Legend**

-  Site Boundary
-  1% AEP (Defended Fluvial)
-  1% AEP +CC 37% (Defended Fluvial)
-  1% AEP +CC 55% (Defended Fluvial)
-  1% AEP +CC 107% (Defended Fluvial)

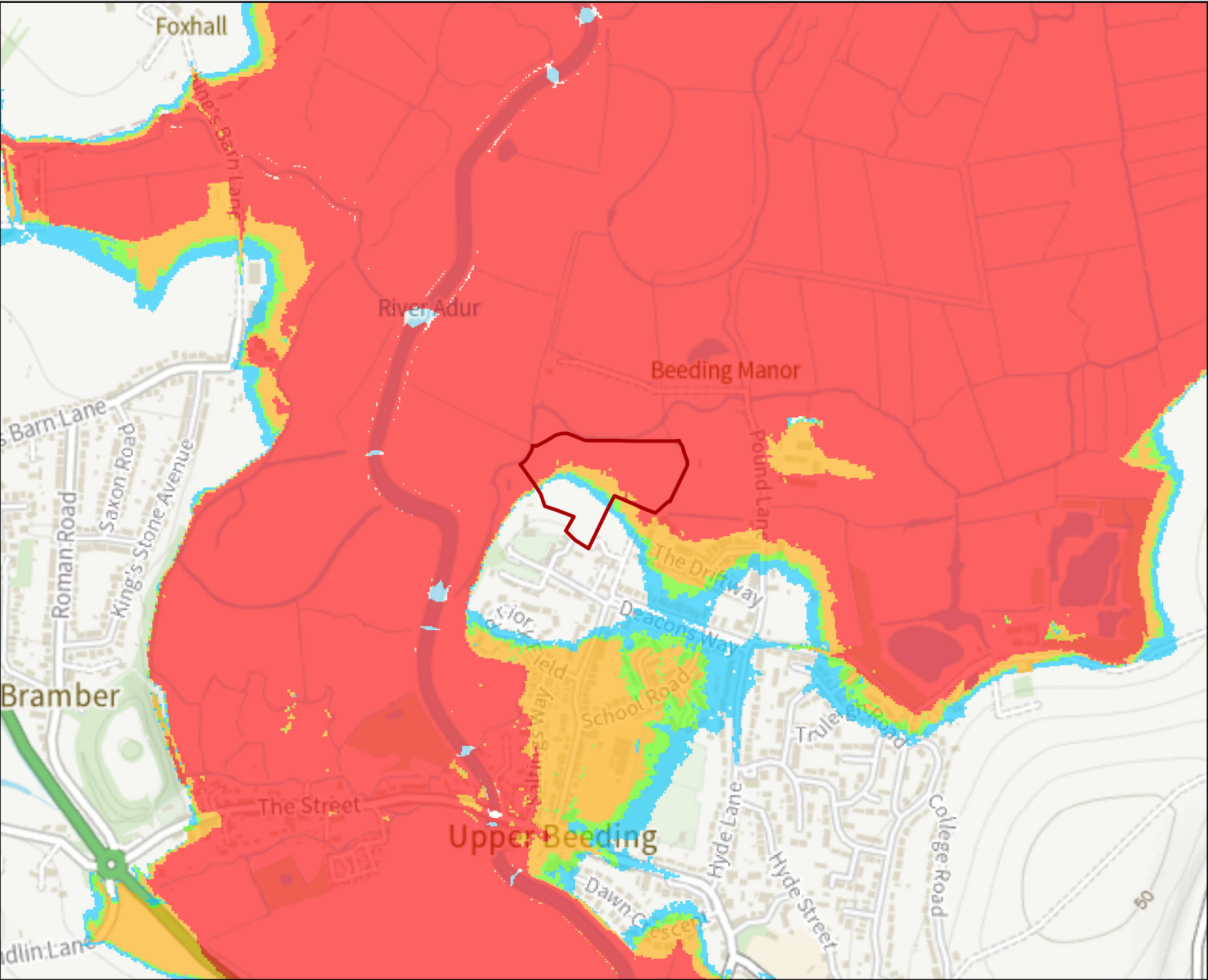
Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

**Scale: 1:10,000**



0 0.225 0.45  
Kilometers







Environment  
Agency

N  
▲

**Legend**

- Site Boundary
- 1% AEP (Undefended Fluvial)
- 1% AEP +CC 37% (Undefended Fluvial)
- 1% AEP +CC 55% (Undefended Fluvial)
- 1% AEP +CC 107% (Undefended Fluvial)

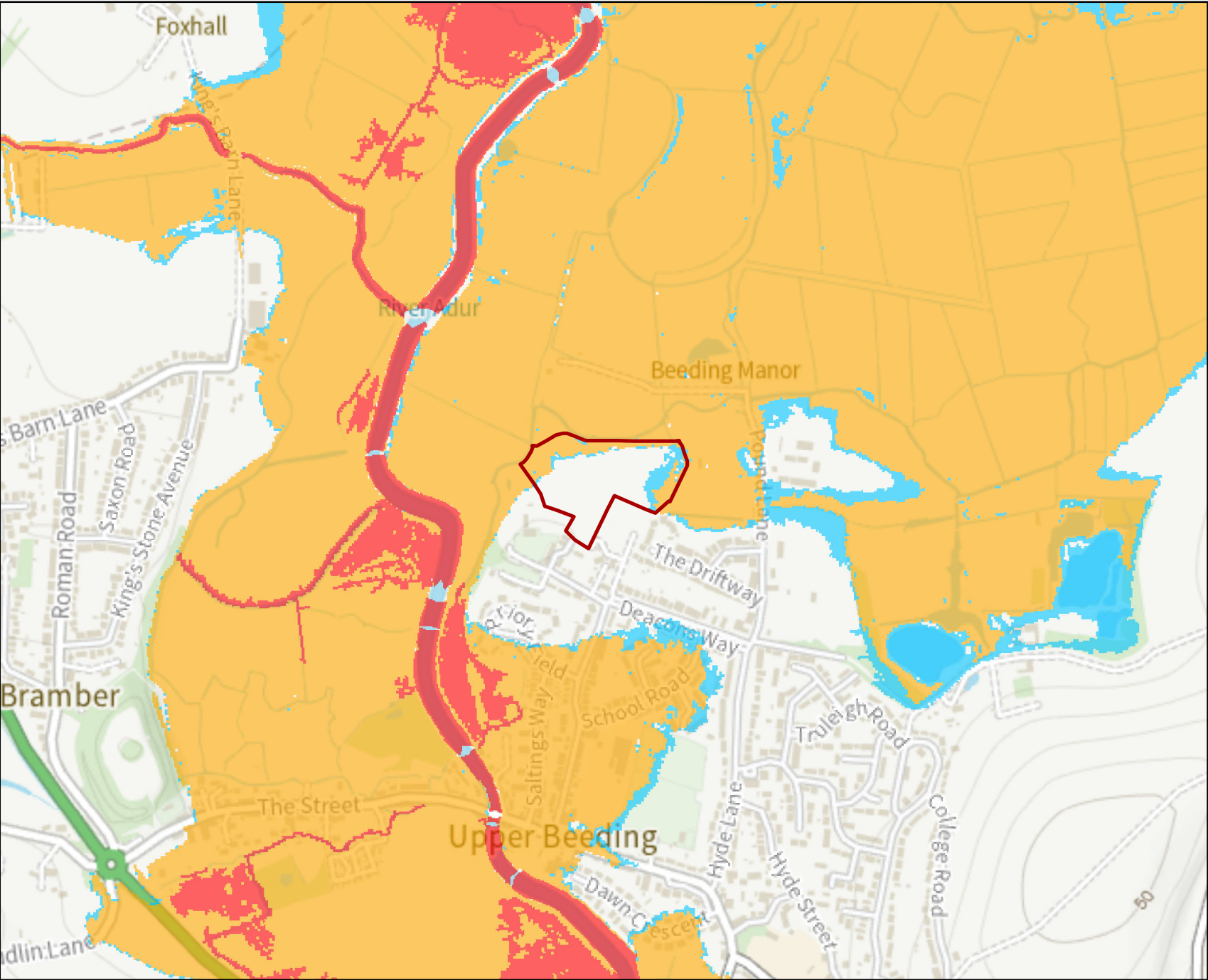
Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000

00.2250.45

Kilometers







Environment  
Agency

N



### Legend

 Site Boundary

 0.5% AEP (Defended Tidal)

 0.5% AEP (2067) (Defended Tidal)

 0.5% AEP (2117) (Defended Tidal)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

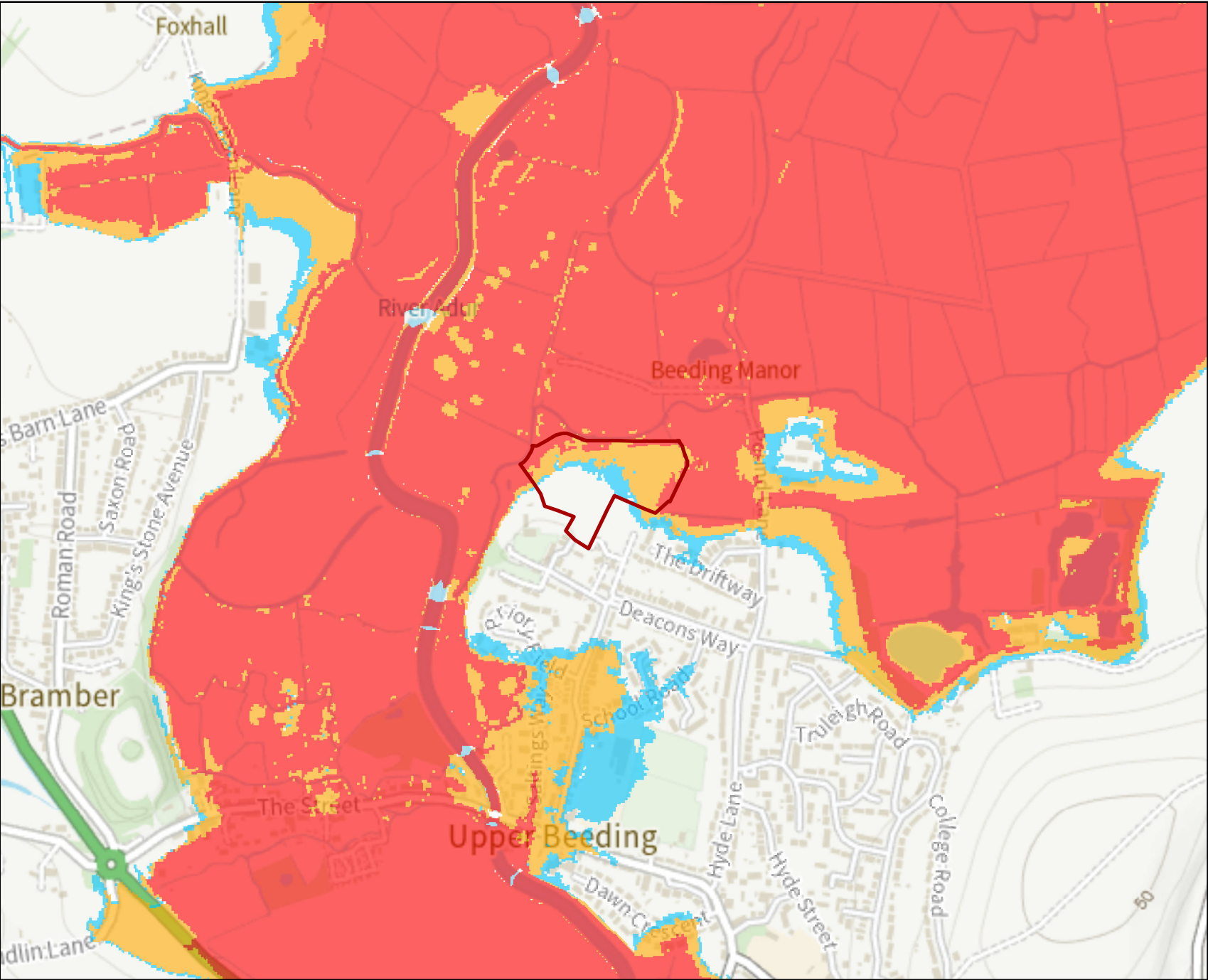
Scale: 1:10,000

0

0.225

0.45

Kilometers





Environment  
Agency

N  
▲

**Legend**

 Site Boundary

 0.5% AEP (Undefended Tidal)

 0.5% AEP (2067) (Undefended Tidal)

 0.5% AEP (2117) (Undefended Tidal)

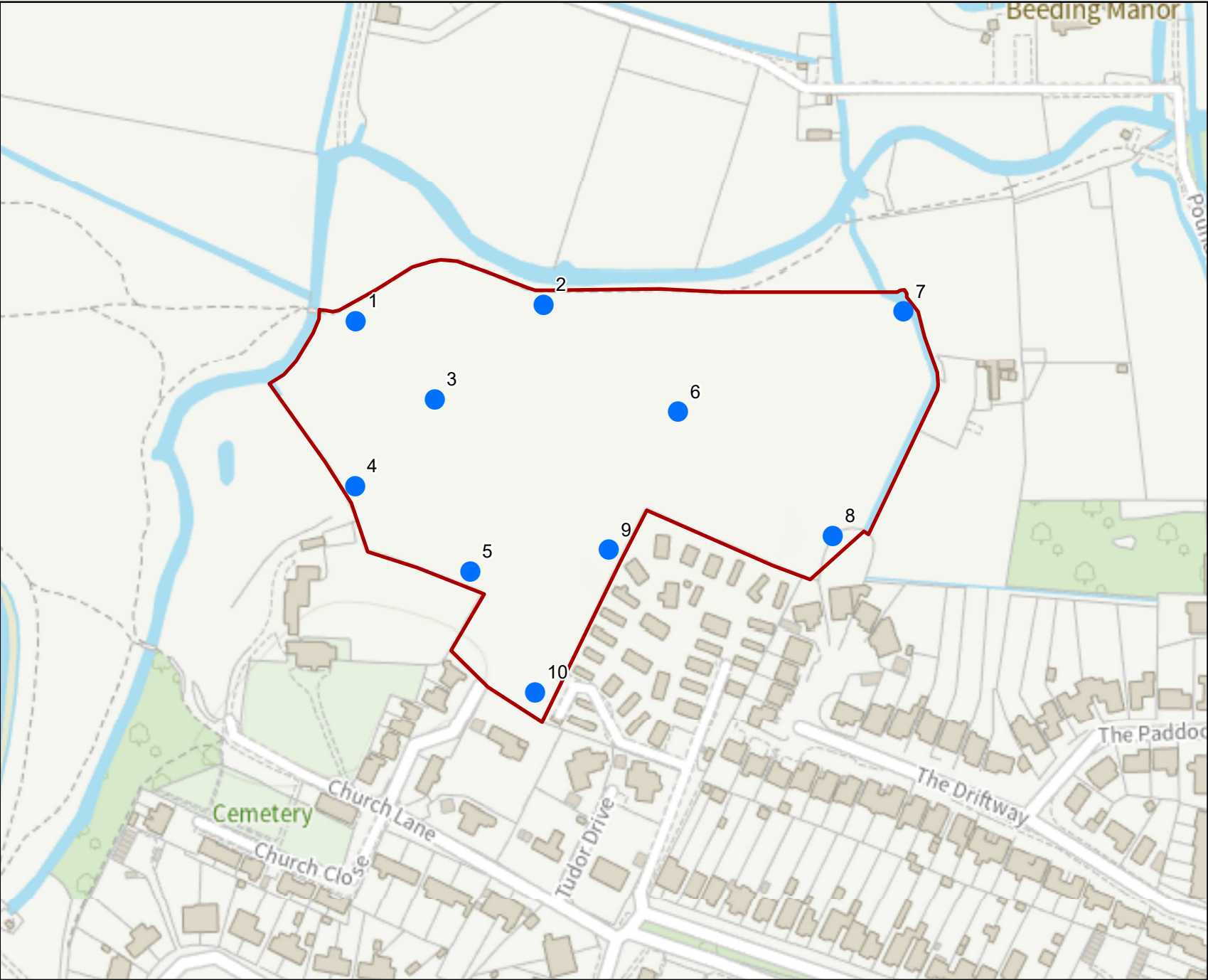
Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000



00.2250.45  
Kilometers

© Environment Agency Copyright and/or database rights 2022. All rights reserved. © Crown copyright and database rights 2022. All rights reserved. Ordnance Survey licence number 100026380.  
Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

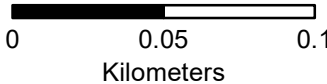


**Legend**

- Site Nodes
- Site Boundary

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:2,500





**Product 4 Flood Risk Data Requested by:** Aqua Terra Consultants

**Site:** Land off Church Farm, Upper Beeding

**Table 1:** Water Levels: Fluvial Undefended

| Node Ref | NGR      |           | Modelled Flood Levels in Metres AOD      |              |              |               |
|----------|----------|-----------|------------------------------------------|--------------|--------------|---------------|
|          | Eastings | Northings | Undefended Annual Exceedance Probability |              |              |               |
|          |          |           | 1%                                       | 1% +CC (37%) | 1% +CC (55%) | 1% +CC (107%) |
| 1        | 519300   | 111287    | 3.95                                     | 4.62         | 4.87         | 5.50          |
| 2        | 519388   | 111295    | 3.96                                     | 4.63         | 4.88         | 5.53          |
| 3        | 519337   | 111251    | 3.96                                     | 4.62         | 4.87         | 5.51          |
| 4        | 519300   | 111211    | -                                        | -            | -            | 5.49          |
| 5        | 519354   | 111171    | -                                        | -            | -            | -             |
| 6        | 519450   | 111245    | 3.96                                     | 4.64         | 4.89         | 5.54          |
| 7        | 519555   | 111291    | 3.96                                     | 4.64         | 4.89         | 5.54          |
| 8        | 519522   | 111187    | 3.97                                     | 4.64         | 4.89         | 5.54          |
| 9        | 519418   | 111121    | -                                        | -            | -            | 5.54          |
| 10       | 519384   | 111115    | -                                        | -            | -            | -             |

**Table 2:** Water Levels: Fluvial Defended

| Node Ref | NGR      |           | Modelled Flood Levels in Metres AOD    |              |              |               |
|----------|----------|-----------|----------------------------------------|--------------|--------------|---------------|
|          | Eastings | Northings | Defended Annual Exceedance Probability |              |              |               |
|          |          |           | 1%                                     | 1% +CC (37%) | 1% +CC (55%) | 1% +CC (107%) |
| 1        | 519300   | 111287    | -                                      | 4.76         | 5.07         | 5.72          |
| 2        | 519388   | 111295    | -                                      | 4.76         | 5.08         | 5.74          |
| 3        | 519337   | 111251    | -                                      | 4.76         | 5.07         | 5.72          |
| 4        | 519300   | 111211    | -                                      | -            | -            | 5.70          |
| 5        | 519354   | 111171    | -                                      | -            | -            | -             |
| 6        | 519450   | 111245    | -                                      | 4.76         | 5.08         | 5.74          |
| 7        | 519555   | 111291    | -                                      | 4.77         | 5.08         | 5.75          |
| 8        | 519522   | 111187    | -                                      | 4.77         | 5.08         | 5.75          |
| 9        | 519418   | 111121    | -                                      | -            | -            | 5.74          |
| 10       | 519384   | 111115    | -                                      | -            | -            | -             |

**Table 3: Water Levels: Tidal Undefended**

|          | NGR      |           | Modelled Flood Levels in Metres AOD      |              |              |
|----------|----------|-----------|------------------------------------------|--------------|--------------|
|          |          |           | Undefended Annual Exceedance Probability |              |              |
| Node Ref | Eastings | Northings | 0.5%                                     | 0.5% (2067)* | 0.5% (2117)* |
| 1        | 519300   | 111287    | 2.91                                     | 3.76         | 4.18         |
| 2        | 519388   | 111295    | 2.76                                     | 3.74         | 4.17         |
| 3        | 519337   | 111251    | -                                        | 3.74         | 4.17         |
| 4        | 519300   | 111211    | -                                        | -            | -            |
| 5        | 519354   | 111171    | -                                        | -            | -            |
| 6        | 519450   | 111245    | -                                        | 3.74         | 4.17         |
| 7        | 519555   | 111291    | -                                        | 3.74         | 4.17         |
| 8        | 519522   | 111187    | 2.76                                     | 3.74         | 4.17         |
| 9        | 519418   | 111121    | -                                        | -            | -            |
| 10       | 519384   | 111115    | -                                        | -            | -            |

**Table 4: Water Levels: Tidal Defended**

|          | NGR      |           | Modelled Flood Levels in Metres AOD    |              |              |
|----------|----------|-----------|----------------------------------------|--------------|--------------|
|          |          |           | Defended Annual Exceedance Probability |              |              |
| Node Ref | Eastings | Northings | 0.5%                                   | 0.5% (2067)* | 0.5% (2117)* |
| 1        | 519300   | 111287    | -                                      | 3.39         | 3.63         |
| 2        | 519388   | 111295    | -                                      | 3.04         | 3.26         |
| 3        | 519337   | 111251    | -                                      | -            | -            |
| 4        | 519300   | 111211    | -                                      | -            | -            |
| 5        | 519354   | 111171    | -                                      | -            | -            |
| 6        | 519450   | 111245    | -                                      | -            | -            |
| 7        | 519555   | 111291    | -                                      | 2.93         | 3.23         |
| 8        | 519522   | 111187    | -                                      | 2.91         | 3.23         |
| 9        | 519418   | 111121    | -                                      | -            | -            |
| 10       | 519384   | 111115    | -                                      | -            | -            |

**Table 5: Water Depths: Fluvial Undefended**

|          | NGR      |           | Modelled Flood Depths in Metres          |              |              |               |
|----------|----------|-----------|------------------------------------------|--------------|--------------|---------------|
|          |          |           | Undefended Annual Exceedance Probability |              |              |               |
| Node Ref | Eastings | Northings | 1%                                       | 1% +CC (37%) | 1% +CC (55%) | 1% +CC (107%) |
| 1        | 519300   | 111287    | 1.31                                     | 1.98         | 2.23         | 2.87          |
| 2        | 519388   | 111295    | 1.48                                     | 2.16         | 2.41         | 3.05          |
| 3        | 519337   | 111251    | 0.18                                     | 0.85         | 1.09         | 1.73          |
| 4        | 519300   | 111211    | -                                        | -            | -            | 0.03          |
| 5        | 519354   | 111171    | -                                        | -            | -            | -             |
| 6        | 519450   | 111245    | 0.25                                     | 0.93         | 1.18         | 1.83          |
| 7        | 519555   | 111291    | 0.96                                     | 1.64         | 1.89         | 2.54          |
| 8        | 519522   | 111187    | 1.31                                     | 1.99         | 2.34         | 2.89          |
| 9        | 519418   | 111121    | -                                        | -            | -            | 0.07          |
| 10       | 519384   | 111115    | -                                        | -            | -            | -             |



**Table 6:** Water Depths: Fluvial Defended

| Node Ref | NGR      |           | Modelled Flood Depths in Metres        |              |              |               |
|----------|----------|-----------|----------------------------------------|--------------|--------------|---------------|
|          |          |           | Defended Annual Exceedance Probability |              |              |               |
|          | Eastings | Northings | 1%                                     | 1% +CC (37%) | 1% +CC (55%) | 1% +CC (107%) |
| 1        | 519300   | 111287    | -                                      | 2.02         | 2.33         | 2.98          |
| 2        | 519388   | 111295    | -                                      | 2.31         | 2.63         | 3.28          |
| 3        | 519337   | 111251    | -                                      | 0.98         | 1.29         | 1.94          |
| 4        | 519300   | 111211    | -                                      | -            | -            | 0.06          |
| 5        | 519354   | 111171    | -                                      | -            | -            | -             |
| 6        | 519450   | 111245    | -                                      | 1.08         | 1.40         | 2.06          |
| 7        | 519555   | 111291    | -                                      | 1.76         | 2.08         | 2.74          |
| 8        | 519522   | 111187    | -                                      | 2.15         | 2.46         | 3.13          |
| 9        | 519418   | 111121    | -                                      | -            | -            | 0.24          |
| 10       | 519384   | 111115    | -                                      | -            | -            | -             |

**Table 7:** Water Depths: Tidal Undefined

| Node Ref | NGR      |           | Modelled Flood Depths in Metres         |              |              |
|----------|----------|-----------|-----------------------------------------|--------------|--------------|
|          |          |           | Undefined Annual Exceedance Probability |              |              |
|          | Eastings | Northings | 0.5%                                    | 0.5% (2067)* | 0.5% (2117)* |
| 1        | 519300   | 111287    | 0.20                                    | 1.05         | 1.47         |
| 2        | 519388   | 111295    | 0.28                                    | 1.26         | 1.69         |
| 3        | 519337   | 111251    | -                                       | 0.01         | 0.39         |
| 4        | 519300   | 111211    | -                                       | -            | -            |
| 5        | 519354   | 111171    | -                                       | -            | -            |
| 6        | 519450   | 111245    | -                                       | 0.06         | 0.48         |
| 7        | 519555   | 111291    | -                                       | 0.73         | 1.16         |
| 8        | 519522   | 111187    | 0.09                                    | 1.06         | 1.49         |
| 9        | 519418   | 111121    | -                                       | -            | -            |
| 10       | 519384   | 111115    | -                                       | -            | -            |

**Table 8:** Water Depths: Tidal Defended

| Node Ref | NGR      |           | Modelled Flood Depths in Metres        |              |              |
|----------|----------|-----------|----------------------------------------|--------------|--------------|
|          |          |           | Defended Annual Exceedance Probability |              |              |
|          | Eastings | Northings | 0.5%                                   | 0.5% (2067)* | 0.5% (2117)* |
| 1        | 519300   | 111287    | -                                      | 0.68         | 0.92         |
| 2        | 519388   | 111295    | -                                      | 0.59         | 0.81         |
| 3        | 519337   | 111251    | -                                      | -            | -            |
| 4        | 519300   | 111211    | -                                      | -            | -            |
| 5        | 519354   | 111171    | -                                      | -            | -            |
| 6        | 519450   | 111245    | -                                      | -            | -            |
| 7        | 519555   | 111291    | -                                      | 0.06         | 0.22         |
| 8        | 519522   | 111187    | -                                      | 0.25         | 0.58         |
| 9        | 519418   | 111121    | -                                      | -            | -            |
| 10       | 519384   | 111115    | -                                      | -            | -            |

All levels taken from: River Adur Intertidal Model Updates (2022)

Produced on: 25/09/2025

**\* The flood risk data provided is based on existing EA hydraulic models with an allowance for climate change. Please note the climate change allowances provided are not up to date. These were updated on 27 July 2021.**

**You should refer to ['Flood risk assessments: climate change allowances'](#) for the most up to date allowances. You will need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.**

**There is no additional information or health warnings for these levels/depths or the model from which they have been produced.**

## Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

Your Lead Local Flood Authority is West Sussex County.

## About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

## Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

[Find out more about flood risk activity permits](#)

## Help and advice

Contact the Solent and South Downs Environment Agency team at [ssdenquiries@environment-agency.gov.uk](mailto:ssdenquiries@environment-agency.gov.uk) for:

- [more information about getting a product 5, 6, 7 or 8](#)
- general help and advice about the site you're requesting data for









Design Settings

|                       |        |                                      |       |                             |               |                                    |   |
|-----------------------|--------|--------------------------------------|-------|-----------------------------|---------------|------------------------------------|---|
| Rainfall Methodology  | FEH-22 | Time of Entry (mins)                 | 5.00  | Connection Type             | Level Soffits | Enforce best practice design rules | ✓ |
| Return Period (years) | 30     | Maximum Time of Concentration (mins) | 30.00 | Minimum Backdrop Height (m) | 0.200         |                                    |   |
| Additional Flow (%)   | 0      | Maximum Rainfall (mm/hr)             | 50.0  | Preferred Cover Depth (m)   | 1.200         |                                    |   |
| CV                    | 1.000  | Minimum Velocity (m/s)               | 1.00  | Include Intermediate Ground | ✓             |                                    |   |

Adoptable Manhole Type

|                |               |                |               |                |               |                |               |
|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|
| Max Width (mm) | Diameter (mm) | Max Width (mm) | Diameter (mm) | Max Width (mm) | Diameter (mm) | Max Width (mm) | Diameter (mm) |
| 374            | 1200          | 499            | 1350          | 749            | 1500          | 900            | 1800          |

>900 Link+900 mm

|               |               |               |               |
|---------------|---------------|---------------|---------------|
| Max Depth (m) | Diameter (mm) | Max Depth (m) | Diameter (mm) |
| 1.500         | 1050          | 99.999        | 1200          |

Circular Link Type

TemplateFreeform CarrierShapeCircularBarrels1Auto Increment (mm)75Follow Groundx

Available Diameters (mm)

100150

Nodes

|   | Name          | Area (ha) | T of E (mins) | Cover Level (m) | Node Type | Manhole Type | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) | Invert Level (m) |
|---|---------------|-----------|---------------|-----------------|-----------|--------------|---------------|-------------|--------------|-----------|------------------|
| ✓ | Road 1        |           |               | 9.300           | Manhole   | Adoptable    | 1200          | 519369.210  | 111135.528   | 1.413     | 7.887            |
| ✓ | Road 2        |           |               | 7.890           | Manhole   | Adoptable    | 1200          | 519378.146  | 111156.108   | 1.468     | 6.422            |
| ✓ | Plot 3        | 0.021     | 5.00          | 6.180           | Manhole   | Adoptable    | 1200          | 519404.949  | 111175.646   | 0.855     | 5.325            |
| ✓ | Road 3        |           |               | 7.047           | Manhole   | Adoptable    | 1200          | 519376.462  | 111174.111   | 1.482     | 5.565            |
| ✓ | Road 4        |           |               | 6.597           | Manhole   | Adoptable    | 1200          | 519385.154  | 111180.191   | 1.416     | 5.181            |
| ✓ | Plot 1 US     |           |               | 7.670           | Manhole   | Adoptable    | 1200          | 519358.613  | 111189.965   | 2.100     | 5.570            |
| ✓ | Plot 3 DS     | 0.000     |               | 5.450           | Manhole   | Adoptable    | 1200          | 519414.811  | 111182.436   | 1.000     | 4.450            |
| ✓ | Plot 1        | 0.014     | 5.00          | 6.125           | Manhole   | Adoptable    | 1200          | 519365.686  | 111204.634   | 1.226     | 4.899            |
| ✓ | Plot 1 DS     |           |               | 5.450           | Manhole   | Adoptable    | 1200          | 519372.429  | 111214.356   | 1.000     | 4.450            |
| ✓ | Road 5        |           |               | 5.450           | Manhole   | Adoptable    | 1200          | 519398.253  | 111194.713   | 1.000     | 4.450            |
| ✓ | Plot 2        | 0.018     | 5.00          | 6.480           | Manhole   | Adoptable    | 1200          | 519381.454  | 111192.546   | 1.149     | 5.331            |
| ✓ | Plot 2 DS     | 0.010     |               | 5.450           | Manhole   | Adoptable    | 1200          | 519388.094  | 111202.106   | 1.000     | 4.450            |
| ✓ | Central Swale | 0.050     | 5.00          | 5.450           | Manhole   | Adoptable    | 1200          | 519423.500  | 111185.042   | 1.130     | 4.320            |
| ✓ | Outfall       |           |               | 2.300           | Manhole   | Adoptable    | 1200          | 519476.541  | 111217.478   | 1.300     | 1.000            |
| ✓ | PP3           | 0.023     | 5.00          | 7.047           | Junction  |              |               | 519375.966  | 111169.271   | 1.300     | 5.747            |
| ✓ | PP4           | 0.012     | 5.00          | 6.597           | Junction  |              |               | 519380.998  | 111180.334   | 1.246     | 5.351            |
| ✓ | PP2           | 0.027     | 5.00          | 7.890           | Junction  |              |               | 519374.526  | 111154.346   | 1.300     | 6.590            |
| ✓ | PP1           | 0.029     | 5.00          | 9.300           | Junction  |              |               | 519364.685  | 111130.624   | 1.300     | 8.000            |
| ✓ | PP5           | 0.016     | 5.00          | 7.670           | Junction  |              |               | 519360.455  | 111185.589   | 2.020     | 5.650            |

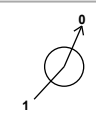
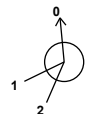
| Links |       |               |           |            |             |                   |              |              |                   |                   |             |                    |                |                    |                                                                                                         |
|-------|-------|---------------|-----------|------------|-------------|-------------------|--------------|--------------|-------------------|-------------------|-------------|--------------------|----------------|--------------------|---------------------------------------------------------------------------------------------------------|
|       | Name  | US Node       | DS Node   | Length (m) | ks (mm) / n | Velocity Equation | US IL (m)    | DS IL (m)    | Fall (m)          | Slope (1:X)       | Dia (mm)    | Link Type          | T of C (mins)  | Rain (mm/hr)       | Min DS IL (m)                                                                                           |
| ✓     | 1.001 | Road 1        | Road 2    | 22.436     | 0.600       | Colebrook-White   | 7.887        | 6.522        | 1.365             | 16.4              | 100         | Circular           | 5.31           | 50.0               |                                                                                                         |
| ✓     | 1.002 | Road 2        | Road 3    | 18.082     | 0.600       | Colebrook-White   | 6.422        | 5.565        | 0.857             | 21.1              | 200         | Circular           | 5.42           | 50.0               |                                                                                                         |
| ?     | 7.000 | Plot 3        | Plot 3 DS | 11.973     | 0.600       | Colebrook-White   | 5.325        | 4.700        | 0.625             | 19.2              | 100         | Circular           | 5.11           | 50.0               | 4.700                                                                                                   |
| ✓     | 1.003 | Road 3        | Road 4    | 10.607     | 0.600       | Colebrook-White   | 5.565        | 5.181        | 0.384             | 27.6              | 200         | Circular           | 5.50           | 50.0               |                                                                                                         |
| ?     | 1.004 | Road 4        | Road 5    | 19.557     | 0.600       | Colebrook-White   | 5.181        | 4.700        | 0.481             | 40.7              | 200         | Circular           | 5.67           | 50.0               | 4.700                                                                                                   |
| ?     | 6.001 | Plot 1 US     | Plot 1    | 16.285     | 0.600       | Colebrook-White   | 5.570        | 4.899        | 0.671             | 24.3              | 100         | Circular           | 5.25           | 50.0               |                                                                                                         |
| ?     | 6.002 | Plot 1        | Plot 1 DS | 11.832     | 0.600       | Colebrook-White   | 4.899        | 4.700        | 0.199             | 59.5              | 100         | Circular           | 5.45           | 50.0               | 4.700                                                                                                   |
| ?     | 8.000 | Plot 2        | Plot 2 DS | 11.640     | 0.600       | Colebrook-White   | 5.331        | 4.700        | 0.631             | 18.4              | 100         | Circular           | 5.11           | 50.0               | 4.700                                                                                                   |
| ?     | 5.000 | Central Swale | Outfall   | 62.173     | 0.600       | Colebrook-White   | 4.320        | 1.000        | 3.320             | 18.7              | 100         | Circular           | 5.58           | 50.0               |                                                                                                         |
| ✓     | 3.000 | PP3           | Road 3    | 4.865      | 0.600       | Colebrook-White   | 5.747        | 5.665        | 0.082             | 59.3              | 100         | Circular           | 5.08           | 50.0               |                                                                                                         |
| ?     | 4.000 | PP4           | Road 4    | 4.158      | 0.600       | Colebrook-White   | 5.351        | 5.281        | 0.070             | 59.4              | 100         | Circular           | 5.07           | 50.0               |                                                                                                         |
| ✓     | 2.000 | PP2           | Road 2    | 4.026      | 0.600       | Colebrook-White   | 6.590        | 6.522        | 0.068             | 59.2              | 100         | Circular           | 5.07           | 50.0               |                                                                                                         |
| ✓     | 1.000 | PP1           | Road 1    | 6.673      | 0.600       | Colebrook-White   | 8.000        | 7.887        | 0.113             | 59.1              | 100         | Circular           | 5.11           | 50.0               |                                                                                                         |
| ✓     | 6.000 | PP5           | Plot 1 US | 4.748      | 0.600       | Colebrook-White   | 5.650        | 5.570        | 0.080             | 59.3              | 100         | Circular           | 5.08           | 50.0               |                                                                                                         |
|       | Name  | US Node       | DS Node   | Vel (m/s)  | Cap (l/s)   | Flow (l/s)        | US Depth (m) | DS Depth (m) | Minimum Depth (m) | Maximum Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) | Notes                                                                                                   |
| ✓     | 1.001 | Road 1        | Road 2    | 1.914      | 15.0        | 5.2               | 1.313        | 1.268        | 1.268             | 1.313             | 0.029       | 0.0                | 41             | 1.750              | Fall increased to remove backdrop                                                                       |
| ✓     | 1.002 | Road 2        | Road 3    | 2.652      | 83.3        | 10.2              | 1.268        | 1.282        | 1.268             | 1.282             | 0.056       | 0.0                | 47             | 1.816              | Fall increased to remove backdrop                                                                       |
| ?     | 7.000 | Plot 3        | Plot 3 DS | 1.772      | 13.9        | 3.8               | 0.755        | 0.650        | 0.650             | 0.755             | 0.021       | 0.0                | 36             | 1.507              | Upstream Depth is less than the specified minimum   Downstream Depth is less than the specified minimum |
| ✓     | 1.003 | Road 3        | Road 4    | 2.316      | 72.8        | 14.4              | 1.282        | 1.216        | 1.216             | 1.282             | 0.080       | 0.0                | 60             | 1.807              | Fall increased to remove backdrop                                                                       |
| ?     | 1.004 | Road 4        | Road 5    | 1.907      | 59.9        | 16.5              | 1.216        | 0.550        | 0.550             | 1.216             | 0.092       | 0.0                | 71             | 1.633              | Downstream Depth is less than the specified minimum                                                     |
| ?     | 6.001 | Plot 1 US     | Plot 1    | 1.573      | 12.4        | 2.9               | 2.000        | 1.126        | 1.126             | 2.000             | 0.016       | 0.0                | 33             | 1.290              | Downstream Depth is less than the specified minimum                                                     |
| ?     | 6.002 | Plot 1        | Plot 1 DS | 1.001      | 7.9         | 5.5               | 1.126        | 0.650        | 0.650             | 1.126             | 0.031       | 0.0                | 62             | 1.085              | Upstream Depth is less than the specified minimum   Downstream Depth is less than the specified minimum |
| ?     | 8.000 | Plot 2        | Plot 2 DS | 1.806      | 14.2        | 3.2               | 1.049        | 0.650        | 0.650             | 1.049             | 0.018       | 0.0                | 32             | 1.463              | Upstream Depth is less than the specified minimum   Downstream Depth is less than the specified minimum |
| ?     | 5.000 | Central Swale | Outfall   | 1.793      | 14.1        | 9.0               | 1.030        | 1.200        | 1.030             | 1.200             | 0.050       | 0.0                | 58             | 1.901              | Upstream Depth is less than the specified minimum                                                       |
| ✓     | 3.000 | PP3           | Road 3    | 1.002      | 7.9         | 4.2               | 1.200        | 1.282        | 1.200             | 1.282             | 0.023       | 0.0                | 52             | 1.018              |                                                                                                         |
| ?     | 4.000 | PP4           | Road 4    | 1.001      | 7.9         | 2.2               | 1.146        | 1.216        | 1.146             | 1.216             | 0.012       | 0.0                | 36             | 0.850              | Upstream Depth is less than the specified minimum                                                       |
| ✓     | 2.000 | PP2           | Road 2    | 1.003      | 7.9         | 5.0               | 1.200        | 1.268        | 1.200             | 1.268             | 0.027       | 0.0                | 57             | 1.059              |                                                                                                         |
| ✓     | 1.000 | PP1           | Road 1    | 1.004      | 7.9         | 5.2               | 1.200        | 1.313        | 1.200             | 1.313             | 0.029       | 0.0                | 60             | 1.075              |                                                                                                         |
| ✓     | 6.000 | PP5           | Plot 1 US | 1.001      | 7.9         | 2.9               | 1.920        | 2.000        | 1.920             | 2.000             | 0.016       | 0.0                | 43             | 0.931              |                                                                                                         |

Pipeline Schedule

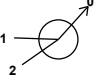
| Link  | Length<br>(m) | Slope<br>(1:X) | Dia<br>(mm) | Link<br>Type | US CL<br>(m) | US IL<br>(m) | US Depth<br>(m) | DS CL<br>(m) | DS IL<br>(m) | DS Depth<br>(m) |
|-------|---------------|----------------|-------------|--------------|--------------|--------------|-----------------|--------------|--------------|-----------------|
| 1.001 | 22.436        | 16.4           | 100         | Circular     | 9.300        | 7.887        | 1.313           | 7.890        | 6.522        | 1.268           |
| 1.002 | 18.082        | 21.1           | 200         | Circular     | 7.890        | 6.422        | 1.268           | 7.047        | 5.565        | 1.282           |
| 7.000 | 11.973        | 19.2           | 100         | Circular     | 6.180        | 5.325        | 0.755           | 5.450        | 4.700        | 0.650           |
| 1.003 | 10.607        | 27.6           | 200         | Circular     | 7.047        | 5.565        | 1.282           | 6.597        | 5.181        | 1.216           |
| 1.004 | 19.557        | 40.7           | 200         | Circular     | 6.597        | 5.181        | 1.216           | 5.450        | 4.700        | 0.550           |
| 6.001 | 16.285        | 24.3           | 100         | Circular     | 7.670        | 5.570        | 2.000           | 6.125        | 4.899        | 1.126           |
| 6.002 | 11.832        | 59.5           | 100         | Circular     | 6.125        | 4.899        | 1.126           | 5.450        | 4.700        | 0.650           |
| 8.000 | 11.640        | 18.4           | 100         | Circular     | 6.480        | 5.331        | 1.049           | 5.450        | 4.700        | 0.650           |
| 5.000 | 62.173        | 18.7           | 100         | Circular     | 5.450        | 4.320        | 1.030           | 2.300        | 1.000        | 1.200           |
| 3.000 | 4.865         | 59.3           | 100         | Circular     | 7.047        | 5.747        | 1.200           | 7.047        | 5.665        | 1.282           |
| 4.000 | 4.158         | 59.4           | 100         | Circular     | 6.597        | 5.351        | 1.146           | 6.597        | 5.281        | 1.216           |
| 2.000 | 4.026         | 59.2           | 100         | Circular     | 7.890        | 6.590        | 1.200           | 7.890        | 6.522        | 1.268           |
| 1.000 | 6.673         | 59.1           | 100         | Circular     | 9.300        | 8.000        | 1.200           | 9.300        | 7.887        | 1.313           |
| 6.000 | 4.748         | 59.3           | 100         | Circular     | 7.670        | 5.650        | 1.920           | 7.670        | 5.570        | 2.000           |

| Link  | US<br>Node    | Dia<br>(mm) | Node<br>Type | MH<br>Type | DS<br>Node | Dia<br>(mm) | Node<br>Type | MH<br>Type |
|-------|---------------|-------------|--------------|------------|------------|-------------|--------------|------------|
| 1.001 | Road 1        | 1200        | Manhole      | Adoptable  | Road 2     | 1200        | Manhole      | Adoptable  |
| 1.002 | Road 2        | 1200        | Manhole      | Adoptable  | Road 3     | 1200        | Manhole      | Adoptable  |
| 7.000 | Plot 3        | 1200        | Manhole      | Adoptable  | Plot 3 DS  | 1200        | Manhole      | Adoptable  |
| 1.003 | Road 3        | 1200        | Manhole      | Adoptable  | Road 4     | 1200        | Manhole      | Adoptable  |
| 1.004 | Road 4        | 1200        | Manhole      | Adoptable  | Road 5     | 1200        | Manhole      | Adoptable  |
| 6.001 | Plot 1 US     | 1200        | Manhole      | Adoptable  | Plot 1     | 1200        | Manhole      | Adoptable  |
| 6.002 | Plot 1        | 1200        | Manhole      | Adoptable  | Plot 1 DS  | 1200        | Manhole      | Adoptable  |
| 8.000 | Plot 2        | 1200        | Manhole      | Adoptable  | Plot 2 DS  | 1200        | Manhole      | Adoptable  |
| 5.000 | Central Swale | 1200        | Manhole      | Adoptable  | Outfall    | 1200        | Manhole      | Adoptable  |
| 3.000 | PP3           |             | Junction     |            | Road 3     | 1200        | Manhole      | Adoptable  |
| 4.000 | PP4           |             | Junction     |            | Road 4     | 1200        | Manhole      | Adoptable  |
| 2.000 | PP2           |             | Junction     |            | Road 2     | 1200        | Manhole      | Adoptable  |
| 1.000 | PP1           |             | Junction     |            | Road 1     | 1200        | Manhole      | Adoptable  |
| 6.000 | PP5           |             | Junction     |            | Plot 1 US  | 1200        | Manhole      | Adoptable  |

Manhole Schedule

| Node   | Easting<br>(m) | Northing<br>(m) | CL<br>(m) | Depth<br>(m) | Dia<br>(mm) | Node<br>Type | MH<br>Type | Connections                                                                           | Link | IL<br>(m) | Dia<br>(mm) | Link<br>Type |          |
|--------|----------------|-----------------|-----------|--------------|-------------|--------------|------------|---------------------------------------------------------------------------------------|------|-----------|-------------|--------------|----------|
| Road 1 | 519369.210     | 111135.528      | 9.300     | 1.413        | 1200        | Manhole      | Adoptable  |  | 1    | 1.000     | 7.887       | 100          | Circular |
|        |                |                 |           |              |             |              |            |                                                                                       | 0    | 1.001     | 7.887       | 100          | Circular |
| Road 2 | 519378.146     | 111156.108      | 7.890     | 1.468        | 1200        | Manhole      | Adoptable  |  | 1    | 2.000     | 6.522       | 100          | Circular |
|        |                |                 |           |              |             |              |            |                                                                                       | 2    | 1.001     | 6.522       | 100          | Circular |
|        |                |                 |           |              |             |              |            |                                                                                       | 0    | 1.002     | 6.422       | 200          | Circular |

Manhole Schedule

| Node          | Easting<br>(m) | Northing<br>(m) | CL<br>(m) | Depth<br>(m) | Dia<br>(mm) | Node<br>Type | MH<br>Type | Connections                                                                           | Link   | IL<br>(m)      | Dia<br>(mm)    | Link<br>Type |                      |
|---------------|----------------|-----------------|-----------|--------------|-------------|--------------|------------|---------------------------------------------------------------------------------------|--------|----------------|----------------|--------------|----------------------|
| Plot 3        | 519404.949     | 111175.646      | 6.180     | 0.855        | 1200        | Manhole      | Adoptable  |    | 0      | 7.000          | 5.325          | 100          | Circular             |
| Road 3        | 519376.462     | 111174.111      | 7.047     | 1.482        | 1200        | Manhole      | Adoptable  |    | 1<br>2 | 3.000<br>1.002 | 5.665<br>5.565 | 100<br>200   | Circular<br>Circular |
| Road 4        | 519385.154     | 111180.191      | 6.597     | 1.416        | 1200        | Manhole      | Adoptable  |    | 1<br>2 | 4.000<br>1.003 | 5.281<br>5.181 | 100<br>200   | Circular<br>Circular |
| Plot 1 US     | 519358.613     | 111189.965      | 7.670     | 2.100        | 1200        | Manhole      | Adoptable  |    | 1      | 6.000          | 5.570          | 100          | Circular             |
| Plot 3 DS     | 519414.811     | 111182.436      | 5.450     | 1.000        | 1200        | Manhole      | Adoptable  |    | 1      | 7.000          | 4.700          | 100          | Circular             |
| Plot 1        | 519365.686     | 111204.634      | 6.125     | 1.226        | 1200        | Manhole      | Adoptable  |   | 1      | 6.001          | 4.899          | 100          | Circular             |
| Plot 1 DS     | 519372.429     | 111214.356      | 5.450     | 1.000        | 1200        | Manhole      | Adoptable  |  | 1      | 6.002          | 4.700          | 100          | Circular             |
| Road 5        | 519398.253     | 111194.713      | 5.450     | 1.000        | 1200        | Manhole      | Adoptable  |  | 1      | 1.004          | 4.700          | 200          | Circular             |
| Plot 2        | 519381.454     | 111192.546      | 6.480     | 1.149        | 1200        | Manhole      | Adoptable  |  | 0      | 8.000          | 5.331          | 100          | Circular             |
| Plot 2 DS     | 519388.094     | 111202.106      | 5.450     | 1.000        | 1200        | Manhole      | Adoptable  |  | 1      | 8.000          | 4.700          | 100          | Circular             |
| Central Swale | 519423.500     | 111185.042      | 5.450     | 1.130        | 1200        | Manhole      | Adoptable  |  | 0      | 5.000          | 4.320          | 100          | Circular             |
| Outfall       | 519476.541     | 111217.478      | 2.300     | 1.300        | 1200        | Manhole      | Adoptable  |  | 1      | 5.000          | 1.000          | 100          | Circular             |
| PP3           | 519375.966     | 111169.271      | 7.047     | 1.300        |             | Junction     |            |  | 0      | 3.000          | 5.747          | 100          | Circular             |



| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Node Type | MH Type | Connections                                                                         | Link | IL (m) | Dia (mm) | Link Type |          |
|------|-------------|--------------|--------|-----------|----------|-----------|---------|-------------------------------------------------------------------------------------|------|--------|----------|-----------|----------|
| PP4  | 519380.998  | 111180.334   | 6.597  | 1.246     |          | Junction  |         |  | 0    | 4.000  | 5.351    | 100       | Circular |
| PP2  | 519374.526  | 111154.346   | 7.890  | 1.300     |          | Junction  |         |  | 0    | 2.000  | 6.590    | 100       | Circular |
| PP1  | 519364.685  | 111130.624   | 9.300  | 1.300     |          | Junction  |         |  | 0    | 1.000  | 8.000    | 100       | Circular |
| PP5  | 519360.455  | 111185.589   | 7.670  | 2.020     |          | Junction  |         |  | 0    | 6.000  | 5.650    | 100       | Circular |

|                      |          |                   |        |                            |      |                         |     |                          |     |
|----------------------|----------|-------------------|--------|----------------------------|------|-------------------------|-----|--------------------------|-----|
| Rainfall Methodology | FEH-22   | Winter CV         | 1.000  | Drain Down Time (mins)     | 240  | Check Discharge Rate(s) | ✓   | 100 year (l/s)           | 1.6 |
| Rainfall Events      | Singular | Analysis Speed    | Normal | Additional Storage (m³/ha) | 20.0 | 2 year (l/s)            | 1.6 | Check Discharge Volume   | ✓   |
| Summer CV            | 1.000    | Skip Steady State | x      | Starting Level (m)         |      | 30 year (l/s)           | 1.6 | 100 year 360 minute (m³) | 28  |

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

|                   |            |                  |                    |                              |       |                 |     |                  |     |
|-------------------|------------|------------------|--------------------|------------------------------|-------|-----------------|-----|------------------|-----|
| Site Makeup       | Greenfield | Region           | England, Wales, NI | Positively Drained Area (ha) | 0.530 | Q 2 year (l/s)  | 0.7 | Q 100 year (l/s) | 2.3 |
| Greenfield Method | ReFH2      | Include Baseflow | x                  | Betterment (%)               | 0     | Q 30 year (l/s) | 1.8 |                  |     |

|                   |            |                  |                    |                              |       |                       |     |                    |    |
|-------------------|------------|------------------|--------------------|------------------------------|-------|-----------------------|-----|--------------------|----|
| Site Makeup       | Greenfield | Region           | England, Wales, NI | Positively Drained Area (ha) | 0.530 | Storm Duration (mins) | 360 | Runoff Volume (m³) | 28 |
| Greenfield Method | ReFH2      | Include Baseflow | x                  | Return Period (years)        | 100   | Betterment (%)        | 0   |                    |    |

|                                    |   |                               |   |                              |       |                  |                    |
|------------------------------------|---|-------------------------------|---|------------------------------|-------|------------------|--------------------|
| Overrides Design Area              | x | Depression Storage Area (m²)  | 0 | Evapo-transpiration (mm/day) | 0     | Region           | England, Wales, NI |
| Overrides Design Additional Inflow | x | Depression Storage Depth (mm) | 0 | Area (ha)                    | 0.288 | Include Baseflow | x                  |
| Applies to All storms              |   |                               |   |                              |       |                  |                    |

|                          |       |                   |                             |                         |                             |                        |      |
|--------------------------|-------|-------------------|-----------------------------|-------------------------|-----------------------------|------------------------|------|
| Flap Valve               | x     | Design Depth (m)  | 1.000                       | Sump Available          | ✓                           | Min Node Diameter (mm) | 1200 |
| Replaces Downstream Link | x     | Design Flow (l/s) | 1.6                         | Product Number          | CTL-SCL-0057-1600-1000-1600 |                        |      |
| Invert Level (m)         | 4.450 | Objective         | (CL) Minimise blockage risk | Min Outlet Diameter (m) | 0.075                       |                        |      |



Other (defaults)

Entry Loss (manhole) 0.250 | Exit Loss (manhole) 0.250 | Entry Loss (junction) 0.000 | Exit Loss (junction) 0.000 | Apply Recommended Losses x | Flood Risk (m) 0.300

| Node Event        | US Node       | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|---------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 30 minute summer  | Road 1        | 23          | 7.912     | 0.025     | 2.1          | 0.0288        | 0.0000     | OK         |
| 15 minute summer  | Road 2        | 14          | 6.454     | 0.032     | 4.6          | 0.0361        | 0.0000     | OK         |
| 15 minute summer  | Plot 3        | 10          | 5.365     | 0.040     | 4.4          | 0.0665        | 0.0000     | OK         |
| 15 minute summer  | Road 3        | 14          | 5.604     | 0.039     | 6.0          | 0.0443        | 0.0000     | OK         |
| 30 minute summer  | Road 4        | 23          | 5.227     | 0.046     | 6.6          | 0.0520        | 0.0000     | OK         |
| 120 minute summer | Plot 1 US     | 74          | 5.588     | 0.018     | 0.9          | 0.0205        | 0.0000     | OK         |
| 480 minute winter | Plot 3 DS     | 448         | 4.832     | 0.382     | 1.1          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | Plot 1        | 11          | 4.948     | 0.049     | 3.6          | 0.0682        | 0.0000     | OK         |
| 480 minute winter | Plot 1 DS     | 448         | 4.832     | 0.382     | 1.1          | 0.0000        | 0.0000     | OK         |
| 480 minute winter | Road 5        | 440         | 4.833     | 0.383     | 2.9          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | Plot 2        | 10          | 5.367     | 0.036     | 3.7          | 0.0526        | 0.0000     | OK         |
| 480 minute winter | Plot 2 DS     | 448         | 4.832     | 0.382     | 1.1          | 0.0000        | 0.0000     | OK         |
| 480 minute winter | Central Swale | 448         | 4.831     | 0.511     | 3.5          | 51.3615       | 0.0000     | SURCHARGED |
| 60 minute summer  | Outfall       | 49          | 1.022     | 0.022     | 1.5          | 0.0000        | 0.0000     | OK         |
| 30 minute summer  | PP3           | 23          | 6.369     | 0.622     | 4.3          | 0.9332        | 0.0000     | SURCHARGED |
| 30 minute summer  | PP4           | 24          | 5.892     | 0.541     | 2.2          | 0.3818        | 0.0000     | SURCHARGED |
| 15 minute summer  | PP2           | 13          | 7.202     | 0.612     | 5.8          | 0.7951        | 0.0000     | SURCHARGED |
| 30 minute summer  | PP1           | 22          | 8.627     | 0.627     | 5.4          | 1.0946        | 0.0000     | SURCHARGED |
| 120 minute summer | PP5           | 74          | 6.779     | 1.129     | 1.8          | 0.1986        | 0.0000     | SURCHARGED |

Flow+ v16.0 Copyright © 1988-2025 Causeway Technologies Ltd

| Node Event        | US Node       | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|---------------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 60 minute summer  | Road 1        | 47          | 7.915     | 0.028     | 2.5          | 0.0314        | 0.0000     | OK         |
| 60 minute summer  | Road 2        | 46          | 6.457     | 0.035     | 5.4          | 0.0391        | 0.0000     | OK         |
| 15 minute summer  | Plot 3        | 11          | 5.551     | 0.226     | 15.8         | 0.3780        | 0.0000     | SURCHARGED |
| 60 minute summer  | Road 3        | 46          | 5.608     | 0.043     | 7.1          | 0.0485        | 0.0000     | OK         |
| 720 minute winter | Road 4        | 705         | 5.284     | 0.103     | 5.5          | 0.1160        | 0.0000     | OK         |
| 120 minute summer | Plot 1 US     | 88          | 5.589     | 0.019     | 1.0          | 0.0219        | 0.0000     | OK         |
| 720 minute winter | Plot 3 DS     | 720         | 5.281     | 0.831     | 2.5          | 0.0000        | 0.0000     | OK         |
| 720 minute winter | Plot 1        | 705         | 5.282     | 0.383     | 1.8          | 0.5330        | 0.0000     | SURCHARGED |
| 720 minute winter | Plot 1 DS     | 705         | 5.282     | 0.832     | 2.5          | 0.0000        | 0.0000     | OK         |
| 720 minute winter | Road 5        | 705         | 5.283     | 0.833     | 5.5          | 0.0000        | 0.0000     | OK         |
| 15 minute summer  | Plot 2        | 10          | 5.415     | 0.084     | 13.3         | 0.1238        | 0.0000     | OK         |
| 720 minute winter | Plot 2 DS     | 705         | 5.282     | 0.832     | 2.5          | 0.0000        | 0.0000     | OK         |
| 720 minute winter | Central Swale | 705         | 5.281     | 0.961     | 6.7          | 197.8895      | 0.0000     | FLOOD RISK |
| 360 minute winter | Outfall       | 120         | 1.022     | 0.022     | 1.5          | 0.0000        | 0.0000     | OK         |
| 60 minute winter  | PP3           | 51          | 6.621     | 0.874     | 8.7          | 7.5437        | 0.0000     | SURCHARGED |
| 120 minute summer | PP4           | 90          | 6.046     | 0.695     | 4.1          | 4.2140        | 0.0000     | SURCHARGED |
| 60 minute summer  | PP2           | 44          | 7.414     | 0.824     | 14.2         | 7.3989        | 0.0000     | SURCHARGED |
| 60 minute winter  | PP1           | 49          | 8.866     | 0.866     | 10.8         | 8.8249        | 0.0000     | SURCHARGED |
| 120 minute summer | PP5           | 88          | 7.135     | 1.485     | 5.6          | 5.0949        | 0.0000     | SURCHARGED |

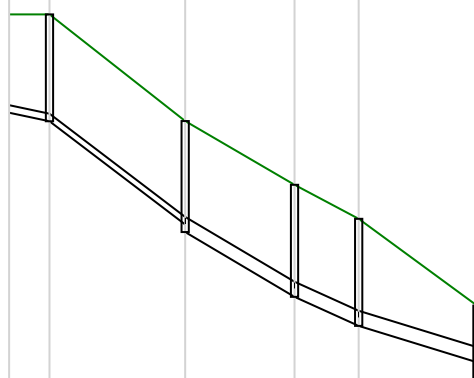
Flow+ v16.0 Copyright © 1988-2025 Causeway Technologies Ltd



|                                                                                                    |                            |                                                                         |             |           |               |                |               |               |                    |
|----------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------|-------------|-----------|---------------|----------------|---------------|---------------|--------------------|
| <div>Causeway</div> | Aqua Terra Consultants Ltd | File: Church Farm_v7.pfd<br>Network: Storm Network<br>MJF<br>08/12/2025 |             |           |               |                |               | Page 10       |                    |
| Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.70%           |                            |                                                                         |             |           |               |                |               |               |                    |
| Node Event                                                                                         |                            | US Node                                                                 | Peak (mins) | Level (m) | Depth (m)     | Inflow (l/s)   | Node Vol (m³) | Flood (m³)    | Status             |
| 60 minute winter                                                                                   |                            | Road 1                                                                  | 53          | 7.916     | 0.029         | 2.6            | 0.0326        | 0.0000        | OK                 |
| 60 minute winter                                                                                   |                            | Road 2                                                                  | 50          | 6.458     | 0.036         | 5.8            | 0.0404        | 0.0000        | OK                 |
| 15 minute summer                                                                                   |                            | Plot 3                                                                  | 12          | 5.908     | 0.583         | 20.5           | 0.9745        | 0.0000        | FLOOD RISK         |
| 60 minute winter                                                                                   |                            | Road 3                                                                  | 51          | 5.609     | 0.044         | 7.6            | 0.0503        | 0.0000        | OK                 |
| 960 minute summer                                                                                  |                            | Road 4                                                                  | 960         | 5.448     | 0.267         | 6.8            | 0.3015        | 0.0000        | SURCHARGED         |
| 120 minute summer                                                                                  |                            | Plot 1 US                                                               | 94          | 5.590     | 0.020         | 1.0            | 0.0223        | 0.0000        | OK                 |
| 960 minute summer                                                                                  |                            | Plot 3 DS                                                               | 960         | 5.446     | 0.996         | 3.6            | 0.0000        | 0.0000        | OK                 |
| 960 minute summer                                                                                  |                            | Plot 1                                                                  | 960         | 5.446     | 0.547         | 2.4            | 0.7609        | 0.0000        | SURCHARGED         |
| 960 minute summer                                                                                  |                            | Plot 1 DS                                                               | 960         | 5.446     | 0.996         | 3.6            | 0.0000        | 0.0000        | OK                 |
| 960 minute summer                                                                                  |                            | Road 5                                                                  | 960         | 5.448     | 0.998         | 6.8            | 0.0000        | 0.0000        | OK                 |
| 15 minute summer                                                                                   |                            | Plot 2                                                                  | 11          | 5.668     | 0.337         | 17.4           | 0.4960        | 0.0000        | SURCHARGED         |
| 960 minute summer                                                                                  |                            | Plot 2 DS                                                               | 960         | 5.446     | 0.996         | 3.6            | 0.0000        | 0.0000        | OK                 |
| 960 minute summer                                                                                  |                            | Central Swale                                                           | 960         | 5.445     | 1.125         | 8.8            | 274.6025      | 0.0000        | FLOOD RISK         |
| 960 minute summer                                                                                  |                            | Outfall                                                                 | 960         | 1.023     | 0.023         | 1.6            | 0.0000        | 0.0000        | OK                 |
| 60 minute winter                                                                                   |                            | PP3                                                                     | 58          | 6.756     | 1.009         | 11.5           | 11.1264       | 0.0000        | FLOOD RISK         |
| 120 minute summer                                                                                  |                            | PP4                                                                     | 96          | 6.114     | 0.763         | 5.3            | 6.1323        | 0.0000        | SURCHARGED         |
| 60 minute summer                                                                                   |                            | PP2                                                                     | 47          | 7.524     | 0.934         | 18.8           | 11.0883       | 0.0000        | SURCHARGED         |
| 60 minute winter                                                                                   |                            | PP1                                                                     | 53          | 8.993     | 0.993         | 14.3           | 13.0959       | 0.0000        | SURCHARGED         |
| 120 minute summer                                                                                  |                            | PP5                                                                     | 94          | 7.241     | 1.591         | 7.2            | 7.6988        | 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 winter                                                                                   |                            | Road 1                                                                  | 1.001       | Road 2    | 2.6           | 1.427          | 0.175         | 0.0415        |                    |
| 60 minute winter                                                                                   |                            | Road 2                                                                  | 1.002       | Road 3    | 5.8           | 1.298          | 0.069         | 0.0808        |                    |
| 15 minute summer                                                                                   |                            | Plot 3                                                                  | 7.000       | Plot 3 DS | 17.2          | 2.193          | 1.233         | 0.0937        |                    |
| 60 minute winter                                                                                   |                            | Road 3                                                                  | 1.003       | Road 4    | 7.6           | 1.348          | 0.105         | 0.0601        |                    |
| 960 minute summer                                                                                  |                            | Road 4                                                                  | 1.004       | Road 5    | 6.8           | 0.901          | 0.113         | 0.6121        |                    |
| 120 minute summer                                                                                  |                            | Plot 1 US                                                               | 6.001       | Plot 1    | 1.0           | 0.472          | 0.085         | 0.0726        |                    |
| 960 minute summer                                                                                  |                            | Plot 1                                                                  | 6.002       | Plot 1 DS | 2.3           | 0.592          | 0.288         | 0.0926        |                    |
| 15 minute summer                                                                                   |                            | Plot 2                                                                  | 8.000       | Plot 2 DS | 15.4          | 1.964          | 1.083         | 0.0911        |                    |
| 960 minute summer                                                                                  |                            | Central Swale                                                           | 5.000       | Outfall   | 1.6           | 1.186          | 0.113         | 0.0837        | 102.8              |
| 60 minute winter                                                                                   |                            | PP3                                                                     | 3.000       | Road 3    | 1.9           | 0.805          | 0.236         | 0.0112        |                    |
| 120 minute summer                                                                                  |                            | PP4                                                                     | 4.000       | Road 4    | 0.7           | 0.617          | 0.091         | 0.0048        |                    |
| 60 minute summer                                                                                   |                            | PP2                                                                     | 2.000       | Road 2    | 3.1           | 0.921          | 0.400         | 0.0138        |                    |
| 60 minute winter                                                                                   |                            | PP1                                                                     | 1.000       | Road 1    | 2.6           | 1.051          | 0.334         | 0.0168        |                    |
| 120 minute summer                                                                                  |                            | PP5                                                                     | 6.000       | Plot 1 US | 1.0           | 0.778          | 0.133         | 0.0064        |                    |
| Flow+ v16.0 Copyright © 1988-2025 Causeway Technologies Ltd                                        |                            |                                                                         |             |           |               |                |               |               |                    |

**Water Quality**

|   | Area<br>(ha) | Intended<br>Land Use | Entering via<br>Node or Link | Name          | SuDS Component    | Pollution<br>hazard indices |        |              | Pollution<br>mitigation indices |        |              | Cumulative pollution<br>hazard indices |              |              |
|---|--------------|----------------------|------------------------------|---------------|-------------------|-----------------------------|--------|--------------|---------------------------------|--------|--------------|----------------------------------------|--------------|--------------|
|   |              |                      |                              |               |                   | TSS                         | Metals | Hydrocarbons | TSS                             | Metals | Hydrocarbons | TSS                                    | Metals       | Hydrocarbons |
| ✓ | 0.021        | Residential roofing  | Node                         | Plot 3        |                   | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
| ✓ | 0.014        | Low traffic roads    | Node                         | PP1           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.011        | Individual driveway  | Node                         | PP1           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.004        | Residential roofing  | Node                         | PP1           | Permeable Surface | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
|   |              |                      | Node                         | PP1           |                   |                             |        |              | 0.7                             | 0.6    | 0.7          | 0                                      | 0            | 0            |
| ✓ | 0.015        | Low traffic roads    | Node                         | PP2           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.012        | Residential roofing  | Node                         | PP2           | Permeable Surface | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
|   |              |                      | Node                         | PP2           |                   |                             |        |              | 0.7                             | 0.6    | 0.7          | 0                                      | 0            | 0            |
| ✓ | 0.011        | Low traffic roads    | Node                         | PP3           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.008        | Individual driveway  | Node                         | PP3           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.004        | Residential roofing  | Node                         | PP3           | Permeable Surface | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
|   |              |                      | Node                         | PP3           |                   |                             |        |              | 0.7                             | 0.6    | 0.7          | 0                                      | 0            | 0            |
| ✓ | 0.012        | Low traffic roads    | Node                         | PP4           | Permeable Surface | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
|   |              |                      | Node                         | PP4           |                   |                             |        |              | 0.7                             | 0.6    | 0.7          | 0                                      | 0            | 0            |
| ✓ | 0.018        | Residential roofing  | Node                         | Plot 2        |                   | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
| ✓ | 0.004        | Residential roofing  | Node                         | Plot 2 DS     |                   | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
| ✓ | 0.006        | Individual driveway  | Node                         | Plot 2 DS     |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.008        | Low traffic roads    | Node                         | PP5           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.004        | Individual driveway  | Node                         | PP5           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.004        | Residential roofing  | Node                         | PP5           | Permeable Surface | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
|   |              |                      | Node                         | PP5           |                   |                             |        |              | 0.7                             | 0.6    | 0.7          | 0                                      | 0            | 0            |
| ✓ | 0.014        | Residential roofing  | Node                         | Plot 1        |                   | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
|   |              |                      | Node                         | Central Swale | Detention Basin   |                             |        |              | 0.25                            | 0.25   | 0.3          | 0.25                                   | 0.15         | 0.1          |
|   |              |                      | Node                         | Outfall       |                   |                             |        |              |                                 |        |              | 0.25                                   | 0.15         | 0.1          |
|   |              |                      |                              |               |                   |                             |        |              |                                 |        |              | Insufficient                           | Insufficient | Insufficient |

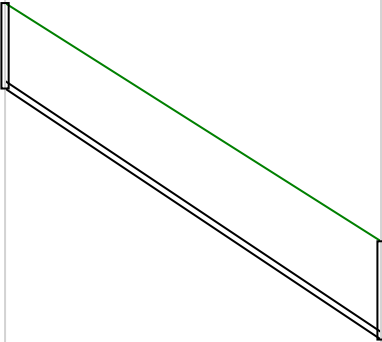
| Node Name                                                                                            | PP1Road 1Road 2Road 3Road 4Road 5                                                    |        |        |       |        |       |       |
|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------|--------|-------|--------|-------|-------|
| <div>A3 drawing</div> <div>Hor Scale 1250</div> <div>Ver Scale 100</div> <div>Datum (m) -3.000</div> |  |        |        |       |        |       |       |
|                                                                                                      | Link Name                                                                            | 1.000  | 1.001  | 1.002 | 1.003  | 1.004 |       |
|                                                                                                      | Section Type                                                                         | 100    | 100mm  | 200mm | 200m   | 200mm |       |
|                                                                                                      | Slope (1:X)                                                                          | 59.1   | 16.4   | 21.1  | 27.6   | 40.7  |       |
|                                                                                                      | Cover Level (m)                                                                      | 9.300  | 9.300  | 7.890 | 7.047  | 6.597 | 5.450 |
| Invert Level (m)                                                                                     | 8.889                                                                                | 7.887  | 6.522  | 6.422 | 5.565  | 5.181 | 4.700 |
| Length (m)                                                                                           | 6.61                                                                                 | 22.436 | 18.082 | 10.60 | 19.557 |       |       |

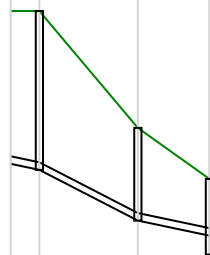
|                                                                                               |                  |                |
|-----------------------------------------------------------------------------------------------|------------------|----------------|
| Node Name                                                                                     | Road 2           |                |
| <div>A3 drawing</div> <div>Hor Scale 1250<br/>Ver Scale 100</div> <div>Datum (m) -3.000</div> |                  |                |
|                                                                                               | Link Name        | 2.0            |
|                                                                                               | Section Type     | 10             |
|                                                                                               | Slope (1:X)      | 59             |
|                                                                                               | Cover Level (m)  | 7.890<br>7.890 |
|                                                                                               | Invert Level (m) | 6.536<br>6.536 |
|                                                                                               | Length (m)       | 4.1            |

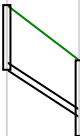
|                                                                                                      |            |  |
|------------------------------------------------------------------------------------------------------|------------|--|
| Node Name                                                                                            | PPRoad 3   |  |
| <div>A3 drawing</div> <div>Hor Scale 1250</div> <div>Ver Scale 100</div> <div>Datum (m) -4.000</div> |            |  |
|                                                                                                      |            |  |
|                                                                                                      |            |  |
|                                                                                                      |            |  |
|                                                                                                      |            |  |
|                                                                                                      |            |  |
|                                                                                                      |            |  |
| Link Name                                                                                            | 3.0        |  |
| Section Type                                                                                         | 10         |  |
| Slope (1:X)                                                                                          | 59         |  |
| Cover Level (m)                                                                                      | 7.0477.047 |  |
| Invert Level (m)                                                                                     | 5.6455.645 |  |
| Length (m)                                                                                           | 4.8        |  |

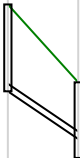


|                                                                                               |                  |                |
|-----------------------------------------------------------------------------------------------|------------------|----------------|
| Node Name                                                                                     | PPRoad 4         |                |
| <div>A3 drawing</div> <div>Hor Scale 1250<br/>Ver Scale 100</div> <div>Datum (m) -4.000</div> | Link Name        | 4.0            |
|                                                                                               | Section Type     | 10             |
|                                                                                               | Slope (1:X)      | 59             |
|                                                                                               | Cover Level (m)  | 6.597<br>6.597 |
|                                                                                               | Invert Level (m) | 5.381<br>5.381 |
|                                                                                               | Length (m)       | 4.0            |
|                                                                                               |                  |                |

| Node Name                                                                                     | Central Swale                                                                        |       | Outfall |
|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------|---------|
| <div>A3 drawing</div> <div>Hor Scale 1250<br/>Ver Scale 100</div> <div>Datum (m) -7.000</div> |  |       |         |
|                                                                                               | Link Name                                                                            |       | 5.000   |
|                                                                                               | Section Type                                                                         |       | 100mm   |
|                                                                                               | Slope (1:X)                                                                          |       | 18.7    |
|                                                                                               | Cover Level (m)                                                                      | 5.450 | 2.300   |
|                                                                                               | Invert Level (m)                                                                     | 4.320 | 1.000   |
|                                                                                               | Length (m)                                                                           |       | 62.173  |

| Node Name                                                                                     | Plot 1 USPlot 1 Plot 1 DS                                                            |       |        |        |       |
|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------|--------|--------|-------|
| <div>A3 drawing</div> <div>Hor Scale 1250<br/>Ver Scale 100</div> <div>Datum (m) -4.000</div> |  |       |        |        |       |
|                                                                                               | Link Name                                                                            | 6.0   | 6.001  | 6.002  |       |
|                                                                                               | Section Type                                                                         | 10    | 100mm  | 100mm  |       |
|                                                                                               | Slope (1:X)                                                                          | 59    | 24.3   | 59.5   |       |
|                                                                                               | Cover Level (m)                                                                      | 7.670 | 7.670  | 6.125  | 5.450 |
|                                                                                               | Invert Level (m)                                                                     | 5.570 | 4.899  | 4.899  | 4.700 |
|                                                                                               | Length (m)                                                                           | 4.7   | 16.285 | 11.832 |       |

| Node Name                                                                                            | Plot 3 Plot 3 DS                                                                    |             |
|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------|
| <div>A3 drawing</div> <div>Hor Scale 1250</div> <div>Ver Scale 100</div> <div>Datum (m) -5.000</div> |  |             |
|                                                                                                      | Link Name                                                                           | 7.000       |
|                                                                                                      | Section Type                                                                        | 100mm       |
|                                                                                                      | Slope (1:X)                                                                         | 19.2        |
|                                                                                                      | Cover Level (m)                                                                     | 6.180 5.450 |
|                                                                                                      | Invert Level (m)                                                                    | 5.325 4.700 |
|                                                                                                      | Length (m)                                                                          | 11.973      |

| Node Name                                                                                            | Plot 2 Plot 2 DS                                                                    |             |
|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------|
| <div>A3 drawing</div> <div>Hor Scale 1250</div> <div>Ver Scale 100</div> <div>Datum (m) -5.000</div> |  |             |
|                                                                                                      | Link Name                                                                           | 8.000       |
|                                                                                                      | Section Type                                                                        | 100mr       |
|                                                                                                      | Slope (1:X)                                                                         | 18.4        |
|                                                                                                      | Cover Level (m)                                                                     | 6.480 5.450 |
|                                                                                                      | Invert Level (m)                                                                    | 5.331 4.700 |
|                                                                                                      | Length (m)                                                                          | 11.640      |





Design Settings

|                       |        |                                      |       |                             |               |                                    |   |
|-----------------------|--------|--------------------------------------|-------|-----------------------------|---------------|------------------------------------|---|
| Rainfall Methodology  | FEH-22 | Time of Entry (mins)                 | 5.00  | Connection Type             | Level Soffits | Enforce best practice design rules | ✓ |
| Return Period (years) | 30     | Maximum Time of Concentration (mins) | 30.00 | Minimum Backdrop Height (m) | 0.200         |                                    |   |
| Additional Flow (%)   | 0      | Maximum Rainfall (mm/hr)             | 50.0  | Preferred Cover Depth (m)   | 1.200         |                                    |   |
| CV                    | 1.000  | Minimum Velocity (m/s)               | 1.00  | Include Intermediate Ground | ✓             |                                    |   |

Adoptable Manhole Type

|                |               |                |               |                |               |                |               |
|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|
| Max Width (mm) | Diameter (mm) | Max Width (mm) | Diameter (mm) | Max Width (mm) | Diameter (mm) | Max Width (mm) | Diameter (mm) |
| 374            | 1200          | 499            | 1350          | 749            | 1500          | 900            | 1800          |

>900 Link+900 mm

|               |               |               |               |
|---------------|---------------|---------------|---------------|
| Max Depth (m) | Diameter (mm) | Max Depth (m) | Diameter (mm) |
| 1.500         | 1050          | 99.999        | 1200          |

Circular Link Type

Template Freeform Carrier | Shape Circular | Barrels 1 | Auto Increment (mm) 75 | Follow Ground x

Available Diameters (mm)

100 | 150

Nodes

|   | Name          | Area (ha) | T of E (mins) | Cover Level (m) | Node Type | Manhole Type | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) | Invert Level (m) |
|---|---------------|-----------|---------------|-----------------|-----------|--------------|---------------|-------------|--------------|-----------|------------------|
| ✓ | Road 1        |           |               | 9.300           | Manhole   | Adoptable    | 1200          | 519369.210  | 111135.528   | 1.413     | 7.887            |
| ✓ | Road 2        |           |               | 7.890           | Manhole   | Adoptable    | 1200          | 519378.146  | 111156.108   | 1.468     | 6.422            |
| ✓ | Plot 3        | 0.021     | 5.00          | 6.180           | Manhole   | Adoptable    | 1200          | 519404.949  | 111175.646   | 0.855     | 5.325            |
| ✓ | Road 3        |           |               | 7.047           | Manhole   | Adoptable    | 1200          | 519376.462  | 111174.111   | 1.482     | 5.565            |
| ✓ | Road 4        |           |               | 6.597           | Manhole   | Adoptable    | 1200          | 519385.154  | 111180.191   | 1.416     | 5.181            |
| ✓ | Plot 1 US     |           |               | 7.670           | Manhole   | Adoptable    | 1200          | 519358.613  | 111189.965   | 2.100     | 5.570            |
| ✓ | Plot 3 DS     | 0.000     |               | 5.450           | Manhole   | Adoptable    | 1200          | 519414.811  | 111182.436   | 1.000     | 4.450            |
| ✓ | Plot 1        | 0.014     | 5.00          | 6.125           | Manhole   | Adoptable    | 1200          | 519365.686  | 111204.634   | 1.226     | 4.899            |
| ✓ | Plot 1 DS     |           |               | 5.450           | Manhole   | Adoptable    | 1200          | 519372.429  | 111214.356   | 1.000     | 4.450            |
| ✓ | Road 5        |           |               | 5.450           | Manhole   | Adoptable    | 1200          | 519398.253  | 111194.713   | 1.000     | 4.450            |
| ✓ | Plot 2        | 0.018     | 5.00          | 6.480           | Manhole   | Adoptable    | 1200          | 519381.454  | 111192.546   | 1.149     | 5.331            |
| ✓ | Plot 2 DS     | 0.010     |               | 5.450           | Manhole   | Adoptable    | 1200          | 519388.094  | 111202.106   | 1.000     | 4.450            |
| ✓ | Central Swale | 0.050     | 5.00          | 5.450           | Manhole   | Adoptable    | 1200          | 519423.500  | 111185.042   | 1.130     | 4.320            |
| ✓ | Outfall       |           |               | 2.300           | Manhole   | Adoptable    | 1200          | 519476.541  | 111217.478   | 1.300     | 1.000            |
| ✓ | PP3           | 0.023     | 5.00          | 7.047           | Junction  |              |               | 519375.966  | 111169.271   | 1.300     | 5.747            |
| ✓ | PP4           | 0.012     | 5.00          | 6.597           | Junction  |              |               | 519380.998  | 111180.334   | 1.246     | 5.351            |
| ✓ | PP2           | 0.027     | 5.00          | 7.890           | Junction  |              |               | 519374.526  | 111154.346   | 1.300     | 6.590            |
| ✓ | PP1           | 0.029     | 5.00          | 9.300           | Junction  |              |               | 519364.685  | 111130.624   | 1.300     | 8.000            |
| ✓ | PP5           | 0.016     | 5.00          | 7.670           | Junction  |              |               | 519360.455  | 111185.589   | 2.020     | 5.650            |

| Links |       |               |           |            |             |                   |              |              |                   |                   |             |                    |                |                    |                                                                                                         |
|-------|-------|---------------|-----------|------------|-------------|-------------------|--------------|--------------|-------------------|-------------------|-------------|--------------------|----------------|--------------------|---------------------------------------------------------------------------------------------------------|
|       | Name  | US Node       | DS Node   | Length (m) | ks (mm) / n | Velocity Equation | US IL (m)    | DS IL (m)    | Fall (m)          | Slope (1:X)       | Dia (mm)    | Link Type          | T of C (mins)  | Rain (mm/hr)       | Min DS IL (m)                                                                                           |
| ✓     | 1.001 | Road 1        | Road 2    | 22.436     | 0.600       | Colebrook-White   | 7.887        | 6.522        | 1.365             | 16.4              | 100         | Circular           | 5.31           | 50.0               |                                                                                                         |
| ✓     | 1.002 | Road 2        | Road 3    | 18.082     | 0.600       | Colebrook-White   | 6.422        | 5.565        | 0.857             | 21.1              | 200         | Circular           | 5.42           | 50.0               |                                                                                                         |
| ?     | 7.000 | Plot 3        | Plot 3 DS | 11.973     | 0.600       | Colebrook-White   | 5.325        | 4.700        | 0.625             | 19.2              | 100         | Circular           | 5.11           | 50.0               | 4.700                                                                                                   |
| ✓     | 1.003 | Road 3        | Road 4    | 10.607     | 0.600       | Colebrook-White   | 5.565        | 5.181        | 0.384             | 27.6              | 200         | Circular           | 5.50           | 50.0               |                                                                                                         |
| ?     | 1.004 | Road 4        | Road 5    | 19.557     | 0.600       | Colebrook-White   | 5.181        | 4.700        | 0.481             | 40.7              | 200         | Circular           | 5.67           | 50.0               | 4.700                                                                                                   |
| ?     | 6.001 | Plot 1 US     | Plot 1    | 16.285     | 0.600       | Colebrook-White   | 5.570        | 4.899        | 0.671             | 24.3              | 100         | Circular           | 5.25           | 50.0               |                                                                                                         |
| ?     | 6.002 | Plot 1        | Plot 1 DS | 11.832     | 0.600       | Colebrook-White   | 4.899        | 4.700        | 0.199             | 59.5              | 100         | Circular           | 5.45           | 50.0               | 4.700                                                                                                   |
| ?     | 8.000 | Plot 2        | Plot 2 DS | 11.640     | 0.600       | Colebrook-White   | 5.331        | 4.700        | 0.631             | 18.4              | 100         | Circular           | 5.11           | 50.0               | 4.700                                                                                                   |
| ?     | 5.000 | Central Swale | Outfall   | 62.173     | 0.600       | Colebrook-White   | 4.320        | 1.000        | 3.320             | 18.7              | 100         | Circular           | 5.58           | 50.0               |                                                                                                         |
| ✓     | 3.000 | PP3           | Road 3    | 4.865      | 0.600       | Colebrook-White   | 5.747        | 5.665        | 0.082             | 59.3              | 100         | Circular           | 5.08           | 50.0               |                                                                                                         |
| ?     | 4.000 | PP4           | Road 4    | 4.158      | 0.600       | Colebrook-White   | 5.351        | 5.281        | 0.070             | 59.4              | 100         | Circular           | 5.07           | 50.0               |                                                                                                         |
| ✓     | 2.000 | PP2           | Road 2    | 4.026      | 0.600       | Colebrook-White   | 6.590        | 6.522        | 0.068             | 59.2              | 100         | Circular           | 5.07           | 50.0               |                                                                                                         |
| ✓     | 1.000 | PP1           | Road 1    | 6.673      | 0.600       | Colebrook-White   | 8.000        | 7.887        | 0.113             | 59.1              | 100         | Circular           | 5.11           | 50.0               |                                                                                                         |
| ✓     | 6.000 | PP5           | Plot 1 US | 4.748      | 0.600       | Colebrook-White   | 5.650        | 5.570        | 0.080             | 59.3              | 100         | Circular           | 5.08           | 50.0               |                                                                                                         |
|       | Name  | US Node       | DS Node   | Vel (m/s)  | Cap (l/s)   | Flow (l/s)        | US Depth (m) | DS Depth (m) | Minimum Depth (m) | Maximum Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) | Notes                                                                                                   |
| ✓     | 1.001 | Road 1        | Road 2    | 1.914      | 15.0        | 5.2               | 1.313        | 1.268        | 1.268             | 1.313             | 0.029       | 0.0                | 41             | 1.750              | Fall increased to remove backdrop                                                                       |
| ✓     | 1.002 | Road 2        | Road 3    | 2.652      | 83.3        | 10.2              | 1.268        | 1.282        | 1.268             | 1.282             | 0.056       | 0.0                | 47             | 1.816              | Fall increased to remove backdrop                                                                       |
| ?     | 7.000 | Plot 3        | Plot 3 DS | 1.772      | 13.9        | 3.8               | 0.755        | 0.650        | 0.650             | 0.755             | 0.021       | 0.0                | 36             | 1.507              | Upstream Depth is less than the specified minimum   Downstream Depth is less than the specified minimum |
| ✓     | 1.003 | Road 3        | Road 4    | 2.316      | 72.8        | 14.4              | 1.282        | 1.216        | 1.216             | 1.282             | 0.080       | 0.0                | 60             | 1.807              | Fall increased to remove backdrop                                                                       |
| ?     | 1.004 | Road 4        | Road 5    | 1.907      | 59.9        | 16.5              | 1.216        | 0.550        | 0.550             | 1.216             | 0.092       | 0.0                | 71             | 1.633              | Downstream Depth is less than the specified minimum                                                     |
| ?     | 6.001 | Plot 1 US     | Plot 1    | 1.573      | 12.4        | 2.9               | 2.000        | 1.126        | 1.126             | 2.000             | 0.016       | 0.0                | 33             | 1.290              | Downstream Depth is less than the specified minimum                                                     |
| ?     | 6.002 | Plot 1        | Plot 1 DS | 1.001      | 7.9         | 5.5               | 1.126        | 0.650        | 0.650             | 1.126             | 0.031       | 0.0                | 62             | 1.085              | Upstream Depth is less than the specified minimum   Downstream Depth is less than the specified minimum |
| ?     | 8.000 | Plot 2        | Plot 2 DS | 1.806      | 14.2        | 3.2               | 1.049        | 0.650        | 0.650             | 1.049             | 0.018       | 0.0                | 32             | 1.463              | Upstream Depth is less than the specified minimum   Downstream Depth is less than the specified minimum |
| ?     | 5.000 | Central Swale | Outfall   | 1.793      | 14.1        | 9.0               | 1.030        | 1.200        | 1.030             | 1.200             | 0.050       | 0.0                | 58             | 1.901              | Upstream Depth is less than the specified minimum                                                       |
| ✓     | 3.000 | PP3           | Road 3    | 1.002      | 7.9         | 4.2               | 1.200        | 1.282        | 1.200             | 1.282             | 0.023       | 0.0                | 52             | 1.018              |                                                                                                         |
| ?     | 4.000 | PP4           | Road 4    | 1.001      | 7.9         | 2.2               | 1.146        | 1.216        | 1.146             | 1.216             | 0.012       | 0.0                | 36             | 0.850              | Upstream Depth is less than the specified minimum                                                       |
| ✓     | 2.000 | PP2           | Road 2    | 1.003      | 7.9         | 5.0               | 1.200        | 1.268        | 1.200             | 1.268             | 0.027       | 0.0                | 57             | 1.059              |                                                                                                         |
| ✓     | 1.000 | PP1           | Road 1    | 1.004      | 7.9         | 5.2               | 1.200        | 1.313        | 1.200             | 1.313             | 0.029       | 0.0                | 60             | 1.075              |                                                                                                         |
| ✓     | 6.000 | PP5           | Plot 1 US | 1.001      | 7.9         | 2.9               | 1.920        | 2.000        | 1.920             | 2.000             | 0.016       | 0.0                | 43             | 0.931              |                                                                                                         |

Pipeline Schedule

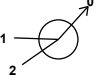
| Link  | Length<br>(m) | Slope<br>(1:X) | Dia<br>(mm) | Link<br>Type | US CL<br>(m) | US IL<br>(m) | US Depth<br>(m) | DS CL<br>(m) | DS IL<br>(m) | DS Depth<br>(m) |
|-------|---------------|----------------|-------------|--------------|--------------|--------------|-----------------|--------------|--------------|-----------------|
| 1.001 | 22.436        | 16.4           | 100         | Circular     | 9.300        | 7.887        | 1.313           | 7.890        | 6.522        | 1.268           |
| 1.002 | 18.082        | 21.1           | 200         | Circular     | 7.890        | 6.422        | 1.268           | 7.047        | 5.565        | 1.282           |
| 7.000 | 11.973        | 19.2           | 100         | Circular     | 6.180        | 5.325        | 0.755           | 5.450        | 4.700        | 0.650           |
| 1.003 | 10.607        | 27.6           | 200         | Circular     | 7.047        | 5.565        | 1.282           | 6.597        | 5.181        | 1.216           |
| 1.004 | 19.557        | 40.7           | 200         | Circular     | 6.597        | 5.181        | 1.216           | 5.450        | 4.700        | 0.550           |
| 6.001 | 16.285        | 24.3           | 100         | Circular     | 7.670        | 5.570        | 2.000           | 6.125        | 4.899        | 1.126           |
| 6.002 | 11.832        | 59.5           | 100         | Circular     | 6.125        | 4.899        | 1.126           | 5.450        | 4.700        | 0.650           |
| 8.000 | 11.640        | 18.4           | 100         | Circular     | 6.480        | 5.331        | 1.049           | 5.450        | 4.700        | 0.650           |
| 5.000 | 62.173        | 18.7           | 100         | Circular     | 5.450        | 4.320        | 1.030           | 2.300        | 1.000        | 1.200           |
| 3.000 | 4.865         | 59.3           | 100         | Circular     | 7.047        | 5.747        | 1.200           | 7.047        | 5.665        | 1.282           |
| 4.000 | 4.158         | 59.4           | 100         | Circular     | 6.597        | 5.351        | 1.146           | 6.597        | 5.281        | 1.216           |
| 2.000 | 4.026         | 59.2           | 100         | Circular     | 7.890        | 6.590        | 1.200           | 7.890        | 6.522        | 1.268           |
| 1.000 | 6.673         | 59.1           | 100         | Circular     | 9.300        | 8.000        | 1.200           | 9.300        | 7.887        | 1.313           |
| 6.000 | 4.748         | 59.3           | 100         | Circular     | 7.670        | 5.650        | 1.920           | 7.670        | 5.570        | 2.000           |

| Link  | US<br>Node    | Dia<br>(mm) | Node<br>Type | MH<br>Type | DS<br>Node | Dia<br>(mm) | Node<br>Type | MH<br>Type |
|-------|---------------|-------------|--------------|------------|------------|-------------|--------------|------------|
| 1.001 | Road 1        | 1200        | Manhole      | Adoptable  | Road 2     | 1200        | Manhole      | Adoptable  |
| 1.002 | Road 2        | 1200        | Manhole      | Adoptable  | Road 3     | 1200        | Manhole      | Adoptable  |
| 7.000 | Plot 3        | 1200        | Manhole      | Adoptable  | Plot 3 DS  | 1200        | Manhole      | Adoptable  |
| 1.003 | Road 3        | 1200        | Manhole      | Adoptable  | Road 4     | 1200        | Manhole      | Adoptable  |
| 1.004 | Road 4        | 1200        | Manhole      | Adoptable  | Road 5     | 1200        | Manhole      | Adoptable  |
| 6.001 | Plot 1 US     | 1200        | Manhole      | Adoptable  | Plot 1     | 1200        | Manhole      | Adoptable  |
| 6.002 | Plot 1        | 1200        | Manhole      | Adoptable  | Plot 1 DS  | 1200        | Manhole      | Adoptable  |
| 8.000 | Plot 2        | 1200        | Manhole      | Adoptable  | Plot 2 DS  | 1200        | Manhole      | Adoptable  |
| 5.000 | Central Swale | 1200        | Manhole      | Adoptable  | Outfall    | 1200        | Manhole      | Adoptable  |
| 3.000 | PP3           |             | Junction     |            | Road 3     | 1200        | Manhole      | Adoptable  |
| 4.000 | PP4           |             | Junction     |            | Road 4     | 1200        | Manhole      | Adoptable  |
| 2.000 | PP2           |             | Junction     |            | Road 2     | 1200        | Manhole      | Adoptable  |
| 1.000 | PP1           |             | Junction     |            | Road 1     | 1200        | Manhole      | Adoptable  |
| 6.000 | PP5           |             | Junction     |            | Plot 1 US  | 1200        | Manhole      | Adoptable  |

Manhole Schedule

| Node   | Easting<br>(m) | Northing<br>(m) | CL<br>(m) | Depth<br>(m) | Dia<br>(mm) | Node<br>Type | MH<br>Type | Connections                                                                           | Link | IL<br>(m) | Dia<br>(mm) | Link<br>Type |          |
|--------|----------------|-----------------|-----------|--------------|-------------|--------------|------------|---------------------------------------------------------------------------------------|------|-----------|-------------|--------------|----------|
| Road 1 | 519369.210     | 111135.528      | 9.300     | 1.413        | 1200        | Manhole      | Adoptable  |  | 1    | 1.000     | 7.887       | 100          | Circular |
|        |                |                 |           |              |             |              |            |                                                                                       | 0    | 1.001     | 7.887       | 100          | Circular |
| Road 2 | 519378.146     | 111156.108      | 7.890     | 1.468        | 1200        | Manhole      | Adoptable  |  | 1    | 2.000     | 6.522       | 100          | Circular |
|        |                |                 |           |              |             |              |            |                                                                                       | 2    | 1.001     | 6.522       | 100          | Circular |
|        |                |                 |           |              |             |              |            |                                                                                       | 0    | 1.002     | 6.422       | 200          | Circular |

Manhole Schedule

| Node          | Easting<br>(m) | Northing<br>(m) | CL<br>(m) | Depth<br>(m) | Dia<br>(mm) | Node<br>Type | MH<br>Type | Connections                                                                           | Link   | IL<br>(m)      | Dia<br>(mm)    | Link<br>Type |                      |
|---------------|----------------|-----------------|-----------|--------------|-------------|--------------|------------|---------------------------------------------------------------------------------------|--------|----------------|----------------|--------------|----------------------|
| Plot 3        | 519404.949     | 111175.646      | 6.180     | 0.855        | 1200        | Manhole      | Adoptable  |    | 0      | 7.000          | 5.325          | 100          | Circular             |
| Road 3        | 519376.462     | 111174.111      | 7.047     | 1.482        | 1200        | Manhole      | Adoptable  |    | 1<br>2 | 3.000<br>1.002 | 5.665<br>5.565 | 100<br>200   | Circular<br>Circular |
| Road 4        | 519385.154     | 111180.191      | 6.597     | 1.416        | 1200        | Manhole      | Adoptable  |    | 1<br>2 | 4.000<br>1.003 | 5.281<br>5.181 | 100<br>200   | Circular<br>Circular |
| Plot 1 US     | 519358.613     | 111189.965      | 7.670     | 2.100        | 1200        | Manhole      | Adoptable  |    | 1      | 6.000          | 5.570          | 100          | Circular             |
| Plot 3 DS     | 519414.811     | 111182.436      | 5.450     | 1.000        | 1200        | Manhole      | Adoptable  |    | 1      | 7.000          | 4.700          | 100          | Circular             |
| Plot 1        | 519365.686     | 111204.634      | 6.125     | 1.226        | 1200        | Manhole      | Adoptable  |   | 1      | 6.001          | 4.899          | 100          | Circular             |
| Plot 1 DS     | 519372.429     | 111214.356      | 5.450     | 1.000        | 1200        | Manhole      | Adoptable  |  | 1      | 6.002          | 4.700          | 100          | Circular             |
| Road 5        | 519398.253     | 111194.713      | 5.450     | 1.000        | 1200        | Manhole      | Adoptable  |  | 1      | 1.004          | 4.700          | 200          | Circular             |
| Plot 2        | 519381.454     | 111192.546      | 6.480     | 1.149        | 1200        | Manhole      | Adoptable  |  | 0      | 8.000          | 5.331          | 100          | Circular             |
| Plot 2 DS     | 519388.094     | 111202.106      | 5.450     | 1.000        | 1200        | Manhole      | Adoptable  |  | 1      | 8.000          | 4.700          | 100          | Circular             |
| Central Swale | 519423.500     | 111185.042      | 5.450     | 1.130        | 1200        | Manhole      | Adoptable  |  | 0      | 5.000          | 4.320          | 100          | Circular             |
| Outfall       | 519476.541     | 111217.478      | 2.300     | 1.300        | 1200        | Manhole      | Adoptable  |  | 1      | 5.000          | 1.000          | 100          | Circular             |
| PP3           | 519375.966     | 111169.271      | 7.047     | 1.300        |             | Junction     |            |  | 0      | 3.000          | 5.747          | 100          | Circular             |



| Time<br>(mins) | Level<br>(m) | Time<br>(mins) | Level<br>(m) |
|----------------|--------------|----------------|--------------|
| 0              | 4.760        | 1440           | 4.760        |

Node Central Swale Online Hydro-Brake® Control

|                          |       |                   |                             |                         |                             |                        |      |
|--------------------------|-------|-------------------|-----------------------------|-------------------------|-----------------------------|------------------------|------|
| Flap Valve               | x     | Design Depth (m)  | 1.000                       | Sump Available          | ✓                           | Min Node Diameter (mm) | 1200 |
| Replaces Downstream Link | x     | Design Flow (l/s) | 1.6                         | Product Number          | CTL-SCL-0057-1600-1000-1600 |                        |      |
| Invert Level (m)         | 4.450 | Objective         | (CL) Minimise blockage risk | Min Outlet Diameter (m) | 0.075                       |                        |      |

Node PP3 Online Orifice Control

|            |   |                          |   |                  |       |              |       |                       |       |
|------------|---|--------------------------|---|------------------|-------|--------------|-------|-----------------------|-------|
| Flap Valve | x | Replaces Downstream Link | x | Invert Level (m) | 5.747 | Diameter (m) | 0.030 | Discharge Coefficient | 0.600 |
|------------|---|--------------------------|---|------------------|-------|--------------|-------|-----------------------|-------|

Node PP4 Online Orifice Control

|            |   |                          |   |                  |       |              |       |                       |       |
|------------|---|--------------------------|---|------------------|-------|--------------|-------|-----------------------|-------|
| Flap Valve | x | Replaces Downstream Link | x | Invert Level (m) | 5.350 | Diameter (m) | 0.020 | Discharge Coefficient | 0.600 |
|------------|---|--------------------------|---|------------------|-------|--------------|-------|-----------------------|-------|

Node PP2 Online Orifice Control

|            |   |                          |   |                  |       |              |       |                       |       |
|------------|---|--------------------------|---|------------------|-------|--------------|-------|-----------------------|-------|
| Flap Valve | x | Replaces Downstream Link | x | Invert Level (m) | 6.590 | Diameter (m) | 0.040 | Discharge Coefficient | 0.600 |
|------------|---|--------------------------|---|------------------|-------|--------------|-------|-----------------------|-------|

Node PP1 Online Orifice Control

|            |   |                          |   |                  |       |              |       |                       |       |
|------------|---|--------------------------|---|------------------|-------|--------------|-------|-----------------------|-------|
| Flap Valve | x | Replaces Downstream Link | x | Invert Level (m) | 8.000 | Diameter (m) | 0.036 | Discharge Coefficient | 0.600 |
|------------|---|--------------------------|---|------------------|-------|--------------|-------|-----------------------|-------|

Node PP5 Online Orifice Control

|            |   |                          |   |                  |       |              |       |                       |       |
|------------|---|--------------------------|---|------------------|-------|--------------|-------|-----------------------|-------|
| Flap Valve | x | Replaces Downstream Link | x | Invert Level (m) | 5.650 | Diameter (m) | 0.020 | Discharge Coefficient | 0.600 |
|------------|---|--------------------------|---|------------------|-------|--------------|-------|-----------------------|-------|

Node Central Swale Pond Storage Structure

|                  |       |                           |  |                                |   |
|------------------|-------|---------------------------|--|--------------------------------|---|
| Invert Level (m) | 4.450 | Time to half empty (mins) |  | Analyse flow through structure | x |
|------------------|-------|---------------------------|--|--------------------------------|---|

| Inlets    |           |        |           |
|-----------|-----------|--------|-----------|
| Plot 1 DS | Plot 2 DS | Road 5 | Plot 3 DS |

| Depth<br>(m) | Area<br>(m²) | Depth<br>(m) | Area<br>(m²) |
|--------------|--------------|--------------|--------------|
| 0.000        | 38.5         | 1.000        | 500.5        |

Node PP3 Carpark Storage Structure

|                             |         |               |      |                           |       |            |        |             |       |               |
|-----------------------------|---------|---------------|------|---------------------------|-------|------------|--------|-------------|-------|---------------|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 2.0  | Invert Level (m)          | 6.297 | Width (m)  | 5.000  | Slope (1:X) | 150.0 | Inf Depth (m) |
| Side Inf Coefficient (m/hr) | 0.00000 | Porosity      | 0.35 | Time to half empty (mins) | 56    | Length (m) | 15.000 | Depth (m)   | 0.500 |               |

Node PP4 Carpark Storage Structure

|                             |         |               |      |                           |       |            |        |             |       |               |
|-----------------------------|---------|---------------|------|---------------------------|-------|------------|--------|-------------|-------|---------------|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 2.0  | Invert Level (m)          | 5.847 | Width (m)  | 5.000  | Slope (1:X) | 150.0 | Inf Depth (m) |
| Side Inf Coefficient (m/hr) | 0.00000 | Porosity      | 0.35 | Time to half empty (mins) | 32    | Length (m) | 16.000 | Depth (m)   | 0.500 |               |

Node PP2 Carpark Storage Structure

|                             |         |               |      |                           |       |            |        |             |       |               |
|-----------------------------|---------|---------------|------|---------------------------|-------|------------|--------|-------------|-------|---------------|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 2.0  | Invert Level (m)          | 7.140 | Width (m)  | 5.000  | Slope (1:X) | 150.0 | Inf Depth (m) |
| Side Inf Coefficient (m/hr) | 0.00000 | Porosity      | 0.35 | Time to half empty (mins) | 35    | Length (m) | 19.000 | Depth (m)   | 0.500 |               |



**Node PP1 Carpark Storage Structure**

|                             |         |               |      |                           |       |            |        |             |       |               |
|-----------------------------|---------|---------------|------|---------------------------|-------|------------|--------|-------------|-------|---------------|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 2.0  | Invert Level (m)          | 8.550 | Width (m)  | 5.000  | Slope (1:X) | 150.0 | Inf Depth (m) |
| Side Inf Coefficient (m/hr) | 0.00000 | Porosity      | 0.35 | Time to half empty (mins) | 50    | Length (m) | 19.000 | Depth (m)   | 0.500 |               |

**Node PP5 Carpark Storage Structure**

|                             |         |               |      |                           |       |            |        |             |       |               |
|-----------------------------|---------|---------------|------|---------------------------|-------|------------|--------|-------------|-------|---------------|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 2.0  | Invert Level (m)          | 6.920 | Width (m)  | 14.000 | Slope (1:X) | 150.0 | Inf Depth (m) |
| Side Inf Coefficient (m/hr) | 0.00000 | Porosity      | 0.35 | Time to half empty (mins) | 58    | Length (m) | 5.000  | Depth (m)   | 0.500 |               |

**Other (defaults)**

|                      |       |                     |       |                       |       |                      |       |                          |   |                |       |
|----------------------|-------|---------------------|-------|-----------------------|-------|----------------------|-------|--------------------------|---|----------------|-------|
| Entry Loss (manhole) | 0.250 | Exit Loss (manhole) | 0.250 | Entry Loss (junction) | 0.000 | Exit Loss (junction) | 0.000 | Apply Recommended Losses | x | Flood Risk (m) | 0.300 |
|----------------------|-------|---------------------|-------|-----------------------|-------|----------------------|-------|--------------------------|---|----------------|-------|

| Node Event        | US Node       | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status    |
|-------------------|---------------|-------------|-----------|-----------|--------------|---------------|------------|-----------|
| 30 minute summer  | Road 1        | 23          | 7.912     | 0.025     | 2.1          | 0.0288        | 0.0000     | OK        |
| 15 minute summer  | Road 2        | 14          | 6.454     | 0.032     | 4.6          | 0.0361        | 0.0000     | OK        |
| 15 minute summer  | Plot 3        | 10          | 5.365     | 0.040     | 4.4          | 0.0665        | 0.0000     | OK        |
| 15 minute summer  | Road 3        | 14          | 5.604     | 0.039     | 6.0          | 0.0443        | 0.0000     | OK        |
| 30 minute summer  | Road 4        | 23          | 5.227     | 0.046     | 6.6          | 0.0520        | 0.0000     | OK        |
| 120 minute summer | Plot 1 US     | 74          | 5.588     | 0.018     | 0.9          | 0.0205        | 0.0000     | OK        |
| 960 minute winter | Plot 3 DS     | 720         | 4.910     | 0.460     | 0.8          | 0.0000        | 0.0000     | OK        |
| 15 minute summer  | Plot 1        | 11          | 4.948     | 0.049     | 3.6          | 0.0682        | 0.0000     | OK        |
| 960 minute winter | Plot 1 DS     | 720         | 4.911     | 0.461     | 0.8          | 0.0000        | 0.0000     | OK        |
| 960 minute winter | Road 5        | 720         | 4.911     | 0.461     | 1.6          | 0.0000        | 0.0000     | OK        |
| 15 minute summer  | Plot 2        | 10          | 5.367     | 0.036     | 3.7          | 0.0526        | 0.0000     | OK        |
| 960 minute winter | Plot 2 DS     | 720         | 4.911     | 0.461     | 0.8          | 0.0000        | 0.0000     | OK        |
| 960 minute winter | Central Swale | 720         | 4.909     | 0.589     | 2.1          | 70.1095       | 0.0000     | SURCHARGE |
| 15 minute summer  | Outfall       | 1           | 4.760     | 3.760     | 0.0          | 0.0000        | 0.0000     | OK        |
| 30 minute summer  | PP3           | 23          | 6.369     | 0.622     | 4.3          | 0.9332        | 0.0000     | SURCHARGE |
| 30 minute summer  | PP4           | 24          | 5.892     | 0.541     | 2.2          | 0.3818        | 0.0000     | SURCHARGE |
| 15 minute summer  | PP2           | 13          | 7.202     | 0.612     | 5.8          | 0.7951        | 0.0000     | SURCHARGE |
| 30 minute summer  | PP1           | 22          | 8.627     | 0.627     | 5.4          | 1.0946        | 0.0000     | SURCHARGE |
| 120 minute summer | PP5           | 74          | 6.779     | 1.129     | 1.8          | 0.1986        | 0.0000     | SURCHARGE |

Flow+ v16.0 Copyright © 1988-2025 Causeway Technologies Ltd

Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.43%

| Node Event                  | US Node       | Peak (mins) | Level (m) | Depth (m)     | Inflow (l/s)   | Node Vol (m³) | Flood (m³)    | Status             |
|-----------------------------|---------------|-------------|-----------|---------------|----------------|---------------|---------------|--------------------|
| 60 minute summer            | Road 1        | 47          | 7.915     | 0.028         | 2.5            | 0.0314        | 0.0000        | OK                 |
| 60 minute summer            | Road 2        | 46          | 6.457     | 0.035         | 5.4            | 0.0391        | 0.0000        | OK                 |
| 15 minute summer            | Plot 3        | 11          | 5.551     | 0.226         | 15.8           | 0.3780        | 0.0000        | SURCHARGED         |
| 60 minute summer            | Road 3        | 46          | 5.608     | 0.043         | 7.1            | 0.0485        | 0.0000        | OK                 |
| 960 minute summer           | Road 4        | 960         | 5.339     | 0.158         | 6.0            | 0.1789        | 0.0000        | OK                 |
| 120 minute summer           | Plot 1 US     | 88          | 5.589     | 0.019         | 1.0            | 0.0219        | 0.0000        | OK                 |
| 960 minute summer           | Plot 3 DS     | 975         | 5.337     | 0.887         | 2.9            | 0.0000        | 0.0000        | OK                 |
| 960 minute summer           | Plot 1        | 960         | 5.338     | 0.439         | 2.0            | 0.6107        | 0.0000        | SURCHARGED         |
| 960 minute summer           | Plot 1 DS     | 960         | 5.338     | 0.888         | 2.9            | 0.0000        | 0.0000        | OK                 |
| 960 minute summer           | Road 5        | 960         | 5.339     | 0.889         | 6.0            | 0.0000        | 0.0000        | OK                 |
| 15 minute summer            | Plot 2        | 10          | 5.415     | 0.084         | 13.3           | 0.1238        | 0.0000        | OK                 |
| 960 minute summer           | Plot 2 DS     | 960         | 5.338     | 0.888         | 2.9            | 0.0000        | 0.0000        | OK                 |
| 960 minute summer           | Central Swale | 960         | 5.337     | 1.017         | 7.5            | 222.5625      | 0.0000        | FLOOD RISK         |
| 15 minute summer            | Outfall       | 1           | 4.760     | 3.760         | 1.4            | 0.0000        | 0.0000        | OK                 |
| 60 minute winter            | PP3           | 51          | 6.621     | 0.874         | 8.7            | 7.5437        | 0.0000        | SURCHARGED         |
| 120 minute summer           | PP4           | 90          | 6.046     | 0.695         | 4.1            | 4.2140        | 0.0000        | SURCHARGED         |
| 60 minute summer            | PP2           | 44          | 7.414     | 0.824         | 14.2           | 7.3989        | 0.0000        | SURCHARGED         |
| 60 minute winter            | PP1           | 49          | 8.866     | 0.866         | 10.8           | 8.8249        | 0.0000        | SURCHARGED         |
| 120 minute summer           | PP5           | 88          | 7.135     | 1.485         | 5.6            | 5.0949        | 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            | Road 1        | 1.001       | Road 2    | 2.5           | 1.399          | 0.163         | 0.0394        |                    |
| 60 minute summer            | Road 2        | 1.002       | Road 3    | 5.4           | 1.275          | 0.065         | 0.0769        |                    |
| 15 minute summer            | Plot 3        | 7.000       | Plot 3 DS | 14.0          | 1.876          | 1.005         | 0.0937        |                    |
| 60 minute summer            | Road 3        | 1.003       | Road 4    | 7.1           | 1.322          | 0.098         | 0.0572        |                    |
| 960 minute summer           | Road 4        | 1.004       | Road 5    | 6.0           | 0.711          | 0.101         | 0.5658        |                    |
| 120 minute summer           | Plot 1 US     | 6.001       | Plot 1    | 1.0           | 0.453          | 0.082         | 0.0724        |                    |
| 960 minute summer           | Plot 1        | 6.002       | Plot 1 DS | 2.0           | 0.522          | 0.250         | 0.0926        |                    |
| 15 minute summer            | Plot 2        | 8.000       | Plot 2 DS | 13.1          | 1.952          | 0.923         | 0.0781        |                    |
| 960 minute summer           | Central Swale | 5.000       | Outfall   | 1.5           | 0.193          | 0.107         | 0.4865        | 63.4               |
| 60 minute winter            | PP3           | 3.000       | Road 3    | 1.7           | 0.789          | 0.219         | 0.0106        |                    |
| 120 minute summer           | PP4           | 4.000       | Road 4    | 0.7           | 0.609          | 0.087         | 0.0047        |                    |
| 60 minute summer            | PP2           | 2.000       | Road 2    | 3.0           | 0.906          | 0.375         | 0.0131        |                    |
| 60 minute winter            | PP1           | 1.000       | Road 1    | 2.5           | 1.031          | 0.312         | 0.0160        |                    |
| 120 minute summer           | PP5           | 6.000       | Plot 1 US | 1.0           | 0.770          | 0.128         | 0.0063        |                    |

| <div>Causeway</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Aqua Terra Consultants Ltd | File: Church Farm_v7_Surcharged.pfd<br>Network: Storm Network<br>MJF<br>08/12/2025 |           |               |                |               |               | Page 10            |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------|-----------|---------------|----------------|---------------|---------------|--------------------|--|-----------------------------|---------|-------------|-----------|---------------|----------------|---------------|---------------|--------------------|------------------|--------|-------|--------|-------|-------|--------|--------|----|------------------|--------|-------|--------|-------|-------|--------|--------|----|------------------|--------|-------|-----------|-------|-------|--------|--------|------------|------------------|--------|-------|--------|-------|-------|--------|--------|----|-------------------|--------|-------|--------|-------|-------|--------|--------|------------|-------------------|-----------|-------|--------|-------|-------|--------|--------|----|--------------------|-----------|-------|-----------|-------|-------|--------|--------|-------|-------------------|--------|-------|-----------|-------|-------|--------|--------|------------|--------------------|---------------|-------|---------|-------|-------|--------|--------|-------|--------------------|--------|-------|--------|-------|-------|--------|---------|-------|-------------------|--------|-------|--------|-------|-------|--------|--------|------------|--------------------|-----------|-------|--------|-------|-------|--------|--------|-------|-------------------|---------------|-------|--------|-------|-------|----------|--------|-------|-------------------|---------|-------|-----------|-------|-------|--------|--------|----|------------------|-----|----|-------|-------|------|---------|--------|------------|-------------------|-----|----|-------|-------|-----|--------|--------|------------|------------------|-----|----|-------|-------|------|---------|--------|------------|------------------|-----|----|-------|-------|------|---------|--------|------------|-------------------|-----|----|-------|-------|-----|--------|--------|------------|
| Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.37%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                                                                                    |           |               |                |               |               |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| <table><tr><th>Node Event</th><th>US Node</th><th>Peak (mins)</th><th>Level (m)</th><th>Depth (m)</th><th>Inflow (l/s)</th><th>Node Vol (m³)</th><th>Flood (m³)</th><th>Status</th></tr><tr><td>60 minute winter</td><td>Road 1</td><td>53</td><td>7.916</td><td>0.029</td><td>2.6</td><td>0.0326</td><td>0.0000</td><td>OK</td></tr><tr><td>60 minute winter</td><td>Road 2</td><td>50</td><td>6.458</td><td>0.036</td><td>5.8</td><td>0.0404</td><td>0.0000</td><td>OK</td></tr><tr><td>15 minute summer</td><td>Plot 3</td><td>12</td><td>5.908</td><td>0.583</td><td>20.5</td><td>0.9745</td><td>0.0000</td><td>FLOOD RISK</td></tr><tr><td>60 minute winter</td><td>Road 3</td><td>51</td><td>5.609</td><td>0.044</td><td>7.6</td><td>0.0503</td><td>0.0000</td><td>OK</td></tr><tr><td>600 minute summer</td><td>Road 4</td><td>540</td><td>5.450</td><td>0.269</td><td>7.3</td><td>0.3048</td><td>0.0000</td><td>SURCHARGED</td></tr><tr><td>120 minute summer</td><td>Plot 1 US</td><td>94</td><td>5.590</td><td>0.020</td><td>1.0</td><td>0.0223</td><td>0.0000</td><td>OK</td></tr><tr><td>1440 minute summer</td><td>Plot 3 DS</td><td>990</td><td>5.450</td><td>1.000</td><td>2.8</td><td>0.0000</td><td>2.6945</td><td>FLOOD</td></tr><tr><td>600 minute summer</td><td>Plot 1</td><td>540</td><td>5.451</td><td>0.552</td><td>2.9</td><td>0.7683</td><td>0.0000</td><td>SURCHARGED</td></tr><tr><td>1440 minute summer</td><td>Plot 1 DS</td><td>990</td><td>5.450</td><td>1.000</td><td>2.8</td><td>0.0000</td><td>4.0854</td><td>FLOOD</td></tr><tr><td>1440 minute summer</td><td>Road 5</td><td>960</td><td>5.450</td><td>1.000</td><td>5.9</td><td>0.0000</td><td>21.7688</td><td>FLOOD</td></tr><tr><td>15 minute summer</td><td>Plot 2</td><td>11</td><td>5.668</td><td>0.337</td><td>17.4</td><td>0.4960</td><td>0.0000</td><td>SURCHARGED</td></tr><tr><td>1440 minute summer</td><td>Plot 2 DS</td><td>990</td><td>5.450</td><td>1.000</td><td>2.8</td><td>0.0000</td><td>3.5886</td><td>FLOOD</td></tr><tr><td>960 minute summer</td><td>Central Swale</td><td>720</td><td>5.450</td><td>1.130</td><td>8.8</td><td>276.6304</td><td>1.1999</td><td>FLOOD</td></tr><tr><td>15 minute summer</td><td>Outfall</td><td>1</td><td>4.760</td><td>3.760</td><td>1.5</td><td>0.0000</td><td>0.0000</td><td>OK</td></tr><tr><td>60 minute winter</td><td>PP3</td><td>58</td><td>6.756</td><td>1.009</td><td>11.5</td><td>11.1264</td><td>0.0000</td><td>FLOOD RISK</td></tr><tr><td>120 minute summer</td><td>PP4</td><td>96</td><td>6.114</td><td>0.763</td><td>5.3</td><td>6.1323</td><td>0.0000</td><td>SURCHARGED</td></tr><tr><td>60 minute summer</td><td>PP2</td><td>47</td><td>7.524</td><td>0.934</td><td>18.8</td><td>11.0881</td><td>0.0000</td><td>SURCHARGED</td></tr><tr><td>60 minute winter</td><td>PP1</td><td>53</td><td>8.993</td><td>0.993</td><td>14.3</td><td>13.0959</td><td>0.0000</td><td>SURCHARGED</td></tr><tr><td>120 minute summer</td><td>PP5</td><td>94</td><td>7.241</td><td>1.591</td><td>7.2</td><td>7.6988</td><td>0.0000</td><td>SURCHARGED</td></tr></table> |                            |                                                                                    |           |               |                |               |               |                    |  | Node Event                  | US Node | Peak (mins) | Level (m) | Depth (m)     | Inflow (l/s)   | Node Vol (m³) | Flood (m³)    | Status             | 60 minute winter | Road 1 | 53    | 7.916  | 0.029 | 2.6   | 0.0326 | 0.0000 | OK | 60 minute winter | Road 2 | 50    | 6.458  | 0.036 | 5.8   | 0.0404 | 0.0000 | OK | 15 minute summer | Plot 3 | 12    | 5.908     | 0.583 | 20.5  | 0.9745 | 0.0000 | FLOOD RISK | 60 minute winter | Road 3 | 51    | 5.609  | 0.044 | 7.6   | 0.0503 | 0.0000 | OK | 600 minute summer | Road 4 | 540   | 5.450  | 0.269 | 7.3   | 0.3048 | 0.0000 | SURCHARGED | 120 minute summer | Plot 1 US | 94    | 5.590  | 0.020 | 1.0   | 0.0223 | 0.0000 | OK | 1440 minute summer | Plot 3 DS | 990   | 5.450     | 1.000 | 2.8   | 0.0000 | 2.6945 | FLOOD | 600 minute summer | Plot 1 | 540   | 5.451     | 0.552 | 2.9   | 0.7683 | 0.0000 | SURCHARGED | 1440 minute summer | Plot 1 DS     | 990   | 5.450   | 1.000 | 2.8   | 0.0000 | 4.0854 | FLOOD | 1440 minute summer | Road 5 | 960   | 5.450  | 1.000 | 5.9   | 0.0000 | 21.7688 | FLOOD | 15 minute summer  | Plot 2 | 11    | 5.668  | 0.337 | 17.4  | 0.4960 | 0.0000 | SURCHARGED | 1440 minute summer | Plot 2 DS | 990   | 5.450  | 1.000 | 2.8   | 0.0000 | 3.5886 | FLOOD | 960 minute summer | Central Swale | 720   | 5.450  | 1.130 | 8.8   | 276.6304 | 1.1999 | FLOOD | 15 minute summer  | Outfall | 1     | 4.760     | 3.760 | 1.5   | 0.0000 | 0.0000 | OK | 60 minute winter | PP3 | 58 | 6.756 | 1.009 | 11.5 | 11.1264 | 0.0000 | FLOOD RISK | 120 minute summer | PP4 | 96 | 6.114 | 0.763 | 5.3 | 6.1323 | 0.0000 | SURCHARGED | 60 minute summer | PP2 | 47 | 7.524 | 0.934 | 18.8 | 11.0881 | 0.0000 | SURCHARGED | 60 minute winter | PP1 | 53 | 8.993 | 0.993 | 14.3 | 13.0959 | 0.0000 | SURCHARGED | 120 minute summer | PP5 | 94 | 7.241 | 1.591 | 7.2 | 7.6988 | 0.0000 | SURCHARGED |
| Node Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | US Node                    | Peak (mins)                                                                        | Level (m) | Depth (m)     | Inflow (l/s)   | Node Vol (m³) | Flood (m³)    | Status             |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 60 minute winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Road 1                     | 53                                                                                 | 7.916     | 0.029         | 2.6            | 0.0326        | 0.0000        | OK                 |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 60 minute winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Road 2                     | 50                                                                                 | 6.458     | 0.036         | 5.8            | 0.0404        | 0.0000        | OK                 |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 15 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Plot 3                     | 12                                                                                 | 5.908     | 0.583         | 20.5           | 0.9745        | 0.0000        | FLOOD RISK         |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 60 minute winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Road 3                     | 51                                                                                 | 5.609     | 0.044         | 7.6            | 0.0503        | 0.0000        | OK                 |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 600 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Road 4                     | 540                                                                                | 5.450     | 0.269         | 7.3            | 0.3048        | 0.0000        | SURCHARGED         |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 120 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Plot 1 US                  | 94                                                                                 | 5.590     | 0.020         | 1.0            | 0.0223        | 0.0000        | OK                 |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 1440 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Plot 3 DS                  | 990                                                                                | 5.450     | 1.000         | 2.8            | 0.0000        | 2.6945        | FLOOD              |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 600 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Plot 1                     | 540                                                                                | 5.451     | 0.552         | 2.9            | 0.7683        | 0.0000        | SURCHARGED         |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 1440 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Plot 1 DS                  | 990                                                                                | 5.450     | 1.000         | 2.8            | 0.0000        | 4.0854        | FLOOD              |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 1440 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Road 5                     | 960                                                                                | 5.450     | 1.000         | 5.9            | 0.0000        | 21.7688       | FLOOD              |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 15 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Plot 2                     | 11                                                                                 | 5.668     | 0.337         | 17.4           | 0.4960        | 0.0000        | SURCHARGED         |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 1440 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Plot 2 DS                  | 990                                                                                | 5.450     | 1.000         | 2.8            | 0.0000        | 3.5886        | FLOOD              |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 960 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Central Swale              | 720                                                                                | 5.450     | 1.130         | 8.8            | 276.6304      | 1.1999        | FLOOD              |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 15 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Outfall                    | 1                                                                                  | 4.760     | 3.760         | 1.5            | 0.0000        | 0.0000        | OK                 |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 60 minute winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PP3                        | 58                                                                                 | 6.756     | 1.009         | 11.5           | 11.1264       | 0.0000        | FLOOD RISK         |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 120 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PP4                        | 96                                                                                 | 6.114     | 0.763         | 5.3            | 6.1323        | 0.0000        | SURCHARGED         |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 60 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PP2                        | 47                                                                                 | 7.524     | 0.934         | 18.8           | 11.0881       | 0.0000        | SURCHARGED         |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 60 minute winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PP1                        | 53                                                                                 | 8.993     | 0.993         | 14.3           | 13.0959       | 0.0000        | SURCHARGED         |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 120 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PP5                        | 94                                                                                 | 7.241     | 1.591         | 7.2            | 7.6988        | 0.0000        | SURCHARGED         |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| <table><tr><th>Link Event (Upstream Depth)</th><th>US Node</th><th>Link</th><th>DS Node</th><th>Outflow (l/s)</th><th>Velocity (m/s)</th><th>Flow/Cap</th><th>Link Vol (m³)</th><th>Discharge Vol (m³)</th></tr><tr><td>60 minute winter</td><td>Road 1</td><td>1.001</td><td>Road 2</td><td>2.6</td><td>1.427</td><td>0.175</td><td>0.0415</td><td></td></tr><tr><td>60 minute winter</td><td>Road 2</td><td>1.002</td><td>Road 3</td><td>5.8</td><td>1.298</td><td>0.069</td><td>0.0808</td><td></td></tr><tr><td>15 minute summer</td><td>Plot 3</td><td>7.000</td><td>Plot 3 DS</td><td>17.2</td><td>2.193</td><td>1.233</td><td>0.0937</td><td></td></tr><tr><td>60 minute winter</td><td>Road 3</td><td>1.003</td><td>Road 4</td><td>7.6</td><td>1.348</td><td>0.105</td><td>0.0601</td><td></td></tr><tr><td>600 minute summer</td><td>Road 4</td><td>1.004</td><td>Road 5</td><td>7.3</td><td>0.854</td><td>0.121</td><td>0.6121</td><td></td></tr><tr><td>120 minute summer</td><td>Plot 1 US</td><td>6.001</td><td>Plot 1</td><td>1.0</td><td>0.472</td><td>0.085</td><td>0.0726</td><td></td></tr><tr><td>600 minute summer</td><td>Plot 1</td><td>6.002</td><td>Plot 1 DS</td><td>2.8</td><td>0.587</td><td>0.351</td><td>0.0926</td><td></td></tr><tr><td>15 minute summer</td><td>Plot 2</td><td>8.000</td><td>Plot 2 DS</td><td>15.4</td><td>1.964</td><td>1.083</td><td>0.0911</td><td></td></tr><tr><td>960 minute summer</td><td>Central Swale</td><td>5.000</td><td>Outfall</td><td>1.5</td><td>0.193</td><td>0.107</td><td>0.4865</td><td>69.7</td></tr><tr><td>60 minute winter</td><td>PP3</td><td>3.000</td><td>Road 3</td><td>1.9</td><td>0.805</td><td>0.236</td><td>0.0112</td><td></td></tr><tr><td>120 minute summer</td><td>PP4</td><td>4.000</td><td>Road 4</td><td>0.7</td><td>0.617</td><td>0.091</td><td>0.0048</td><td></td></tr><tr><td>60 minute summer</td><td>PP2</td><td>2.000</td><td>Road 2</td><td>3.1</td><td>0.921</td><td>0.400</td><td>0.0138</td><td></td></tr><tr><td>60 minute winter</td><td>PP1</td><td>1.000</td><td>Road 1</td><td>2.6</td><td>1.051</td><td>0.334</td><td>0.0168</td><td></td></tr><tr><td>120 minute summer</td><td>PP5</td><td>6.000</td><td>Plot 1 US</td><td>1.0</td><td>0.778</td><td>0.133</td><td>0.0064</td><td></td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                            |                                                                                    |           |               |                |               |               |                    |  | 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 | Road 1 | 1.001 | Road 2 | 2.6   | 1.427 | 0.175  | 0.0415 |    | 60 minute winter | Road 2 | 1.002 | Road 3 | 5.8   | 1.298 | 0.069  | 0.0808 |    | 15 minute summer | Plot 3 | 7.000 | Plot 3 DS | 17.2  | 2.193 | 1.233  | 0.0937 |            | 60 minute winter | Road 3 | 1.003 | Road 4 | 7.6   | 1.348 | 0.105  | 0.0601 |    | 600 minute summer | Road 4 | 1.004 | Road 5 | 7.3   | 0.854 | 0.121  | 0.6121 |            | 120 minute summer | Plot 1 US | 6.001 | Plot 1 | 1.0   | 0.472 | 0.085  | 0.0726 |    | 600 minute summer  | Plot 1    | 6.002 | Plot 1 DS | 2.8   | 0.587 | 0.351  | 0.0926 |       | 15 minute summer  | Plot 2 | 8.000 | Plot 2 DS | 15.4  | 1.964 | 1.083  | 0.0911 |            | 960 minute summer  | Central Swale | 5.000 | Outfall | 1.5   | 0.193 | 0.107  | 0.4865 | 69.7  | 60 minute winter   | PP3    | 3.000 | Road 3 | 1.9   | 0.805 | 0.236  | 0.0112  |       | 120 minute summer | PP4    | 4.000 | Road 4 | 0.7   | 0.617 | 0.091  | 0.0048 |            | 60 minute summer   | PP2       | 2.000 | Road 2 | 3.1   | 0.921 | 0.400  | 0.0138 |       | 60 minute winter  | PP1           | 1.000 | Road 1 | 2.6   | 1.051 | 0.334    | 0.0168 |       | 120 minute summer | PP5     | 6.000 | Plot 1 US | 1.0   | 0.778 | 0.133  | 0.0064 |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Road 1                     | 1.001                                                                              | Road 2    | 2.6           | 1.427          | 0.175         | 0.0415        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 60 minute winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Road 2                     | 1.002                                                                              | Road 3    | 5.8           | 1.298          | 0.069         | 0.0808        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 15 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Plot 3                     | 7.000                                                                              | Plot 3 DS | 17.2          | 2.193          | 1.233         | 0.0937        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 60 minute winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Road 3                     | 1.003                                                                              | Road 4    | 7.6           | 1.348          | 0.105         | 0.0601        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 600 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Road 4                     | 1.004                                                                              | Road 5    | 7.3           | 0.854          | 0.121         | 0.6121        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 120 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Plot 1 US                  | 6.001                                                                              | Plot 1    | 1.0           | 0.472          | 0.085         | 0.0726        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 600 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Plot 1                     | 6.002                                                                              | Plot 1 DS | 2.8           | 0.587          | 0.351         | 0.0926        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 15 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Plot 2                     | 8.000                                                                              | Plot 2 DS | 15.4          | 1.964          | 1.083         | 0.0911        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 960 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Central Swale              | 5.000                                                                              | Outfall   | 1.5           | 0.193          | 0.107         | 0.4865        | 69.7               |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 60 minute winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PP3                        | 3.000                                                                              | Road 3    | 1.9           | 0.805          | 0.236         | 0.0112        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 120 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PP4                        | 4.000                                                                              | Road 4    | 0.7           | 0.617          | 0.091         | 0.0048        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 60 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PP2                        | 2.000                                                                              | Road 2    | 3.1           | 0.921          | 0.400         | 0.0138        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 60 minute winter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PP1                        | 1.000                                                                              | Road 1    | 2.6           | 1.051          | 0.334         | 0.0168        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| 120 minute summer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PP5                        | 6.000                                                                              | Plot 1 US | 1.0           | 0.778          | 0.133         | 0.0064        |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |
| Flow+ v16.0 Copyright © 1988-2025 Causeway Technologies Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                            |                                                                                    |           |               |                |               |               |                    |  |                             |         |             |           |               |                |               |               |                    |                  |        |       |        |       |       |        |        |    |                  |        |       |        |       |       |        |        |    |                  |        |       |           |       |       |        |        |            |                  |        |       |        |       |       |        |        |    |                   |        |       |        |       |       |        |        |            |                   |           |       |        |       |       |        |        |    |                    |           |       |           |       |       |        |        |       |                   |        |       |           |       |       |        |        |            |                    |               |       |         |       |       |        |        |       |                    |        |       |        |       |       |        |         |       |                   |        |       |        |       |       |        |        |            |                    |           |       |        |       |       |        |        |       |                   |               |       |        |       |       |          |        |       |                   |         |       |           |       |       |        |        |    |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |                  |     |    |       |       |      |         |        |            |                  |     |    |       |       |      |         |        |            |                   |     |    |       |       |     |        |        |            |

**Water Quality**

|   | Area<br>(ha) | Intended<br>Land Use | Entering via<br>Node or Link | Name          | SuDS Component    | Pollution<br>hazard indices |        |              | Pollution<br>mitigation indices |        |              | Cumulative pollution<br>hazard indices |              |              |
|---|--------------|----------------------|------------------------------|---------------|-------------------|-----------------------------|--------|--------------|---------------------------------|--------|--------------|----------------------------------------|--------------|--------------|
|   |              |                      |                              |               |                   | TSS                         | Metals | Hydrocarbons | TSS                             | Metals | Hydrocarbons | TSS                                    | Metals       | Hydrocarbons |
| ✓ | 0.021        | Residential roofing  | Node                         | Plot 3        |                   | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
| ✓ | 0.014        | Low traffic roads    | Node                         | PP1           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.011        | Individual driveway  | Node                         | PP1           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.004        | Residential roofing  | Node                         | PP1           | Permeable Surface | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
|   |              |                      | Node                         | PP1           |                   |                             |        |              | 0.7                             | 0.6    | 0.7          | 0                                      | 0            | 0            |
| ✓ | 0.015        | Low traffic roads    | Node                         | PP2           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.012        | Residential roofing  | Node                         | PP2           | Permeable Surface | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
|   |              |                      | Node                         | PP2           |                   |                             |        |              | 0.7                             | 0.6    | 0.7          | 0                                      | 0            | 0            |
| ✓ | 0.011        | Low traffic roads    | Node                         | PP3           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.008        | Individual driveway  | Node                         | PP3           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.004        | Residential roofing  | Node                         | PP3           | Permeable Surface | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
|   |              |                      | Node                         | PP3           |                   |                             |        |              | 0.7                             | 0.6    | 0.7          | 0                                      | 0            | 0            |
| ✓ | 0.012        | Low traffic roads    | Node                         | PP4           | Permeable Surface | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
|   |              |                      | Node                         | PP4           |                   |                             |        |              | 0.7                             | 0.6    | 0.7          | 0                                      | 0            | 0            |
| ✓ | 0.018        | Residential roofing  | Node                         | Plot 2        |                   | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
| ✓ | 0.004        | Residential roofing  | Node                         | Plot 2 DS     |                   | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
| ✓ | 0.006        | Individual driveway  | Node                         | Plot 2 DS     |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.008        | Low traffic roads    | Node                         | PP5           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.004        | Individual driveway  | Node                         | PP5           |                   | 0.5                         | 0.4    | 0.4          |                                 |        |              | 0.5                                    | 0.4          | 0.4          |
| ✓ | 0.004        | Residential roofing  | Node                         | PP5           | Permeable Surface | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
|   |              |                      | Node                         | PP5           |                   |                             |        |              | 0.7                             | 0.6    | 0.7          | 0                                      | 0            | 0            |
| ✓ | 0.014        | Residential roofing  | Node                         | Plot 1        |                   | 0.2                         | 0.2    | 0.05         |                                 |        |              | 0.2                                    | 0.2          | 0.05         |
|   |              |                      | Node                         | Central Swale | Detention Basin   |                             |        |              | 0.25                            | 0.25   | 0.3          | 0.25                                   | 0.15         | 0.1          |
|   |              |                      | Node                         | Outfall       |                   |                             |        |              |                                 |        |              | 0.25                                   | 0.15         | 0.1          |
|   |              |                      |                              |               |                   |                             |        |              |                                 |        |              | Insufficient                           | Insufficient | Insufficient |





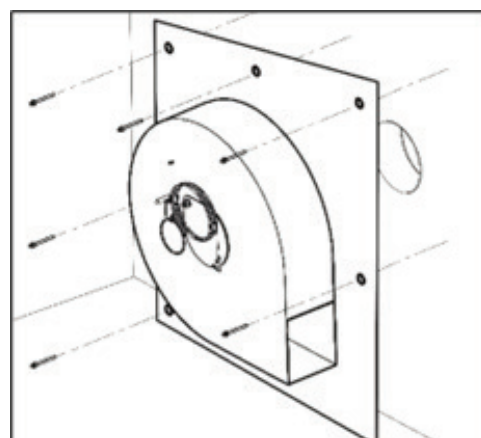
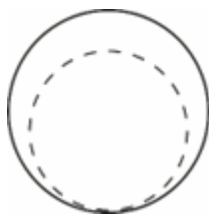
## Hydro-Brake® Optimum S Type with Lugs or Flat Plate mounting

Construct control chamber to drawing with flat concrete mounting surface cast on inside face of manhole wall at outlet pipe. Ensure that sump floor level is formed at the minimum value shown on the drawing. Form benching / standing area as indicated on installation drawing.

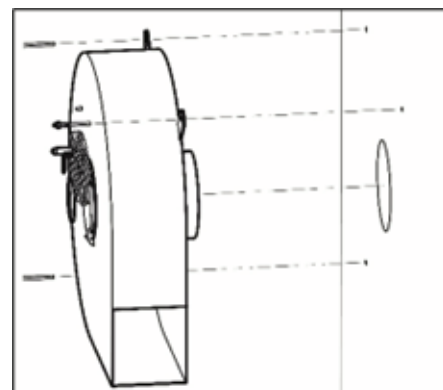
For the preparation of existing chambers, the following point must be considered:

- Storage and handling of pre-fitted Hydro-Brake® Optimum units must not be detrimental to the integrity of the unit.
- Ensure access opening is large enough to allow unit to be inserted or remove existing cover slab.
- If fitting to existing flat surface ensure brickwork/mortar is sound.
- If fitting to existing flat surface ensure face is flat to allow water seal between unit and chamber wall.
- If more than one Hydro-Brake® Optimum is to be installed check serial number is correct for each location.

Offer up Hydro-Brake® Optimum Flow Control to outlet hole invert to invert, as shown below, in correct orientation. Mark and drill the required holes through fixing lugs for masonry fixing bolts M10 x 75.

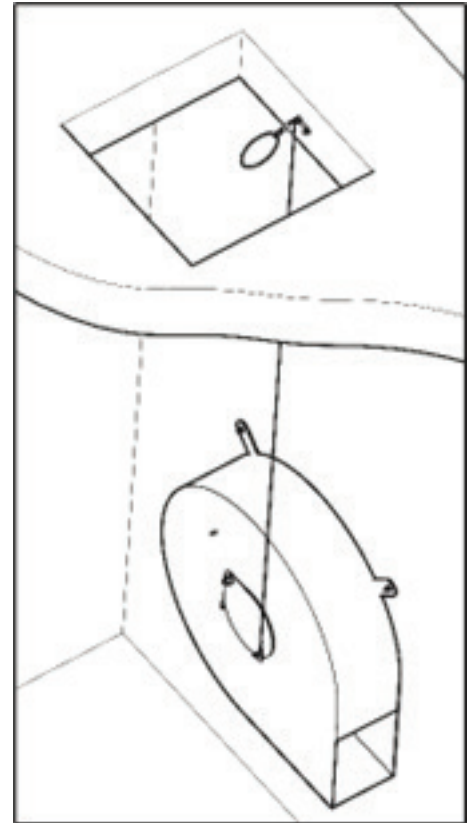


Inspect pre-fitted neoprene rubber gasket to ensure fully attached and undamaged. Position the Hydro-Brake® Optimum Flow Control and bolt up until moderate compression of gasket is achieved.



Fix eye brackets on bypass door operating rope to soffit of roof slab by means of masonry bolts to achieve a direct line of pull from directly over the chamber access cover. The operating rope is to be fixed so that the rope is hung taut at the upper eye bracket when the door is in the closed position.

(Two eye brackets are threaded on the rope, 1 for a change in direction of the line of pull should this be necessary, and the other to serve as a pull-handle retainer in an appropriate position adjacent to the access cover.)



Position the rope stop to ensure that, when the pivoting by-pass door is open, the rope stop can be clipped to the uppermost bracket. Tighten the 4 mm grub screws with the supplied Allen key.

Post installation inspection must take place to:

- Ensure no damage has occurred to the unit during installation and construction/completion of the chamber.
- Ensure there is no debris (wood, plastic bottles/bags etc.), in the chamber.
- Carry out test operation of the bypass door operating rope after fitting and confirm the door closes fully when released.

Patent: [www.hydro-int.com/patents](http://www.hydro-int.com/patents)

## Hydro International Warranty, Maintenance and COSHH Statement

This statement covers Hydro International Hydro-Brake® Optimum, Hydro-Brake®, Hydro-Brake® Basic-S Vortex Flow Control units (hereafter referred to as "Flow Control").

### Defects Liability Period Warranty

The standard Hydro International warranty covers products for one year from date of purchase and will only be considered for those defects or faults reported directly to Hydro International in writing. Warranties will not be considered for defects or faults caused by accident, acts of vandalism or unauthorised repair/rectification. Please Contact Hydro International for more details.

### Maintenance

Normally, little maintenance is required as there are no moving parts within the Flow Control. Experience has shown that if blockages occur they do so at the intake, and the cause on such occasions has been due to a lack of attention to engineering detail such as approach velocities being too low, inadequate benching, or the use of units below the minimum recommended size. The Flow Control (where applicable) is fitted with a pivoting bypass door, which allows the manhole chamber to be drained down should blockage occur. The smaller conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.

Following installation of the Flow Control it is vitally important that any extraneous material i.e. building materials are removed from the unit and the chamber. After the system is made live, and assuming that the chamber design is satisfactory, it is recommended that each unit be inspected monthly for three months and thereafter at six monthly intervals with hose down if required. If problems are experienced, please do not hesitate to contact the company so that an investigation may be made.

All Flow Control units are typically manufactured from grade 304 Stainless Steel, and if required they can also be manufactured in grade 316 Stainless Steel. Both materials have an estimated life span in excess of the design life of drainage systems.

### COSHH

Flow Control units are manufactured from high density polyethylene which is not regarded as hazardous to health and exhibits no chemical hazard when used under normal circumstances for the stated applications.

### Manual Handling

The handling of Flow Control units should be in accordance with the current legislation and regulations:

- The Health and Safety at Work Act 1974
- The Management of Health and Safety at Work Regulations 1999
- The Manual Handling Operations Regulations 1992. All published and printed by the Health and Safety Executive.





Rebekah Wain  
SDP  
14 Museum Place, 4th Floor  
Cardiff  
Wales  
CF10 3BH

Your ref  
24431

Our ref  
DSA000051579

Date  
25<sup>th</sup> of February 2026

Contact  
Tel 0330 303 0119

Dear Miss Wain,  
Level 1 Capacity Check Enquiry: Church Farm, Upper Beeding.

We have completed the capacity check for the above development site and the results are as follows:

### Foul Water

The enquiry has been assessed to determine the capacity available for **3.3m<sup>3</sup>/ day** at manhole reference **TQ19113002 (519328, 111092)**.

There is currently adequate capacity in the local sewerage network to accommodate a foul flow of **3.3m<sup>3</sup>/ day** l/s for the above development at manhole reference **TQ19113002 (519328, 111092)**. Southern Water will not permit a surface water connection into the foul network. Please refer to our surface water management policy.

### Connecting to our network

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal Sewer Connection (S106) application is required to be completed and approved by Southern Water Services. To make an application visit: [developerservices.southernwater.co.uk](https://developerservices.southernwater.co.uk)

Please note the information provided above does not grant approval for any designs/drawings submitted for the capacity analysis. The results quoted above are only valid for 12 months from the date of issue of this letter. **Any revisions in flow rate or alternative point of connection will require a new Pre-Planning Application to be submitted.**



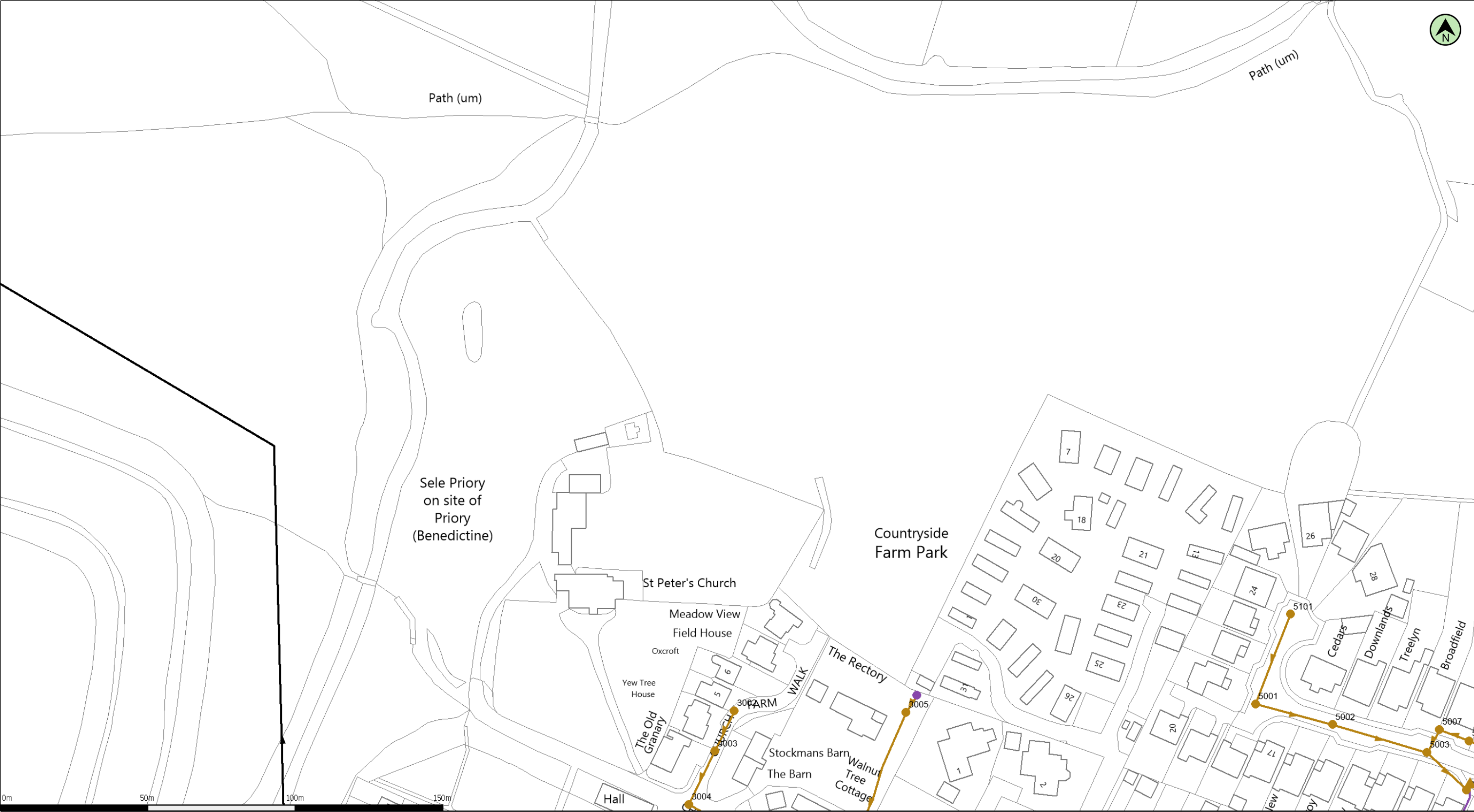
Please get in touch via the Get Connected customer dashboard if you have any queries.

Yours sincerely,

Future Growth Planning Team  
**Developer Services**

[southernwater.co.uk/developing-building/planning-your-development](https://southernwater.co.uk/developing-building/planning-your-development)





(c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122      Date: 20/02/26      Scale: 1:1250      Map Centre: 519330,111196      Data updated: 16/01/26      Our Ref: 2035944 - 1      Wastewater Plan A3  
Powered by digdat

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

|                                                                                                                     |                                                                                                                                                                        |                                                                                                                                  |                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|  Foul Gravity Sewer            |  Combined Gravity Sewer                                                           |  Culverted Water Course or Treated Effluent |  Surface Water Gravity Sewer  |
|  Rising Main, Vacuum or Syphon |  Combined Outfall                                                                 |  Surface Water Outfall                      |  Surface Water Inlet          |
|  Foul Pumping Station          |  Water Treatment Works                                                            |  Section 104 Area                           |  Building Over Agreement Area |
|  Surface Water Pumping Station |  Foul Manhole                                                                     |  Combined Manhole                           |  Surface Water Manhole        |
|                                                                                                                     |  Side Entry Manhole, Demarcation Chamber, Dummy Manhole or Surface Water Soakaway |                                                                                                                                  |                                                                                                                    |

rebekah@aquaterraconsulting.co.uk

Church Farm



[illegible]