

**FLOOD RISK ASSESSMENT AND SURFACE
WATER DRAINAGE STRATEGY**

**ELBRIDGE FARM RECYCLING CENTRE,
BOGNOR REGIS**

**Report Reference: 3419/FRA
Final version F3
October 2023**

Report prepared for:

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GENERAL NOTES

Title of report: Flood Risk Assessment and Surface Water Drainage Strategy
Site: Elbridge Farm Recycling Centre, Bognor Regis
Report ref: 3419/FRA
Date: October 2023

Version	Date	Issued to
Draft version D1	6 th December 2022	Christian Smith, GP Planning
Final version F1	24 th February 2023	Christian Smith, GP Planning
Final version F2	4 th April 2023	Christian Smith, GP Planning
Final version F3	26 th October 2023	Christian Smith, GP Planning

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1 INTRODUCTION

1.1 Background

This report has been prepared in support of a Planning Application for the lateral extension and increase in permitted volumes of the existing materials recycling facility and waste transfer station at Elbridge Farm Recycling Centre, Bognor Regis, West Sussex.

The majority of the site is within Flood Zone 1, with a very small area of land in the northwest, adjacent to the Elbridge Rife is within Flood Zones 2 and 3. Regardless, as the site is over 1 hectare (ha) in size, a Flood Risk Assessment (FRA) is required in accordance with the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG).

1.2 Scope of the assessment

The majority of the site is located within Flood Zone 1, as defined by the Environment Agency (EA), meaning it has less than a 0.1% chance of flooding in any year; whereas land within Flood Zones 2 and 3 has between a 0.1% to 1% chance and greater than 1% chance, respectively, of flooding in any given year.

This FRA considers the likelihood of flooding to and from the site due to the proposed development. Consideration is given to the risk from fluvial flooding and rainfall events with a return period of 1 in 100-years, unless otherwise stated, and includes an adjustment for the effects of potential future climate change.

This version of the FRA includes updates requested by the Lead Local Flood Authority (LLFA), following their response to the planning application dated 25th July 2023, and following a meeting between Hafren Water, GP Planning and the LLFA held on 15th September 2023.

1.3 Data sources

The following data sources were used in this assessment:

GP Planning Ltd

- Site Location Plan – GPP/RS/BR/EXT/22/01
- Site Layout Plan - GPP/RS/BR/EXT/22/02 Rev 11

Craddys

- 2014 FRA for Elbridge Farm, Bognor Regis. Document Reference: 9819w0001
- 2022 FRA for Elbridge Farm, Bognor Regis. Document Reference: 9819w0001e

Ordnance Survey (OS)

- 1:25,000 scale series mapping

British Geological Survey (BGS)

- Geological map, 1:50,000-scale (England & Wales) Map 332
- Geological map, 1:10,000-scale Map SU90SW

Environment Agency (EA)

- Flood risk maps from rivers and surface water
- Product 4 data

West Sussex County Council (WSCC)

- Preliminary Flood Risk Assessment (PFRA)
- Local Flood Risk Management Strategy (LFRMS)
- Surface Water Management Plan

Arun District Council (ADC)

- Strategic Flood Risk Assessment (SFRA)
- Arun Local Plan 2011-2031 (July 2018)

2 PROPOSED DEVELOPMENT

The current site accepts waste that is sorted and then re-exported for a variety of uses. Inert construction and demolition waste is screened to remove large fractions and concrete, which is crushed for use as secondary aggregate.

A Planning Application for the increase in permitted volumes at the site was submitted in March 2022 and was accompanied by an FRA by Craddys (ref: 9819w0001e, dated 13/06/2022). This Application was subsequently withdrawn.

A revised Planning Application has been submitted for the lateral extension of the existing materials recycling facility and waste transfer station (planning ref WSCC/021/23). There are no changes planned to the recycling operation except to increase tonnages with the volume of processed material to increase from the present 30,000 tonnes.

The majority of the development will use existing buildings on-site with the addition of offices, storage sheds, parking and security. For the purposes of this study, the whole area has been taken to be impermeable hardstanding.

The proposed eastern extension will be used for the storage of recycled aggregate and for inert material processing. The proposed extension area will be solely for inert material, with a perimeter soil screening bund along the southern and eastern boundaries, in aid of visual screening and dust protection – see the Site Layout Plan in *Appendix 3419/FRA/A2*.

Hafren Water has been commissioned to produce the requisite FRA and a Drainage Strategy in support of the Planning Application.

3 BASELINE CONDITIONS

3.1 Location and setting

The site is approximately 1.5 ha in extent and comprises an existing materials recycling facility/waste transfer station.

It is situated approximately 2 km northwest of Bognor Regis town centre at National Grid Reference (NGR) SU 91361 02136, and postcode PO21 5EF. The location of the proposed development is shown on *Drawing 3419/FRA/01*.

The site is accessed off the A259 between Chichester and Bognor Regis. It is attached to Elbridge Farm Business Centre, where a number of industrial units bound the southwest of the site. The Elbridge Rife watercourse parallels the northern site boundary, with agricultural grassland to the northeast. Residential dwellings are located to the southeast of the site.

3.2 Topography

LiDAR data has been obtained for this area to produce a contour map of the site (*Drawing 3419/FRA/04*). A topographic survey was also produced in 2022 (*Appendix 3419/FRA/A7*). The topography of the site is relatively flat, with an average height around 4 metres Above Ordnance Datum (mAOD), with low points of approximately 3 mAOD in the northwest adjacent to the watercourse. The site elevations are higher in the southern corner, attaining approximately 5 mAOD.

3.3 Ground conditions

The site is located in an area exhibiting superficial deposits overlying the Cretaceous Upper Chalk Formation.

The nearest British Geological Survey (BGS) borehole to the site, for which records exist, is located approximately 100 m southwest of the site, close to the A259 (BGS ref SU90SW43). The borehole log shows that beneath topsoil, 'Brickearth' silty clay extends to 1.2 m below ground level (mbgl), below which are 1.3 m of Raised Marine Deposits of pale grey silt becoming very sandy with depth to 4.7 mbgl, overlying the chalk. Groundwater was not encountered in this borehole.

Classifications of the Cranfield National Soil Resources Institute show that the predominant soil type in the area surrounding the site is 'Loamy' (Soilscape 6), which is typically a free-draining, slightly acid loamy soil.

The EA classifies the superficial strata as a Secondary 'A' aquifer, which is defined as layers that can provide water at a local scale and may form an important source of baseflow to rivers. The chalk bedrock is classified as a Principal Aquifer.

According to EA mapping, the site is in a location with medium groundwater vulnerability, referring to the likelihood of pollutants reaching the groundwater. The site is not located within a Source Protection Zone (SPZ).

3.4 Hydrology

The hydrological characteristics of the site and its environs have been derived from Ordnance Survey maps, Google Earth imagery and a site walkover on 8th November 2022.

3.4.1 Watercourses

The Elbridge Rife is the closest watercourse to the site, which parallels its northwestern boundary. This watercourse forms part of a wider network that flows into the Aldingbourne Rife. This watercourse flows south through Bognor Regis before discharging into the English Channel. The watercourse is tidally influenced at this point.

At the time of the site visit, the watercourse was observed to be approximately 3 m below site levels.

3.4.2 Waterbodies

There are a number of waterbodies in the local area, the nearest of which is located approximately 1 km northeast of the site. Waterbodies in the area appear to be hydraulically connected to the watercourse network.

Several artificial reservoirs/recreational ponds exist close to the site, which were formed and maintained for ecological value.

4 BACKGROUND AND KEY DOCUMENTS

4.1 National Planning Policy and Guidance

This FRA has been undertaken in accordance with the statutory requirements of the NPPF and PPG regarding development and flood risk.

Major development should incorporate sustainable drainage systems (SuDS), which should meet the Technical Standards for SuDS. Major development, according to Section 2 of Statutory Instrument 2015 N^o 595, Town and Country Planning of England, includes the winning and working of minerals or the use of land for mineral-working deposits, also waste development.

4.1.1 Flood zone and vulnerability classifications

EA mapping shows that the majority of the site lies within Flood Zone 1 ('Low' probability of fluvial and tidal flooding). This zone comprises land assessed as having less than a 1 in 1000 (0.1%) annual probability of river flooding or sea flooding. However, very restricted areas in the north are designated as Flood Zones 2 and 3.

In accordance with the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG), all planning applications for proposed developments within Flood Zones 2 or 3 or over 1 ha in size must be accompanied by an FRA. The proposed site covers 1.5 ha.

'Waste treatment' facilities are considered to be 'Less Vulnerable' in accordance with the NPPF and PPG. According to Table 3 of the PPG, it is considered appropriate for 'Less Vulnerable' development to be located within Flood Zones 2 and 3. The Sequential Test is therefore considered to be passed, and the Exception Test does not need to be applied for this location.

4.2 Local Policies and Guidance

4.2.1 Strategic Flood Risk Assessment Level 1 & 2

The NPPF states that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA), which refines information regarding the probability of flooding, taking all sources of flooding and the impacts of climate change into account. SFRA's provide the foundation for applying the Sequential Test, on the basis of the Flood Zones.

Arun District Council has produced a hybrid Level 1 and Level 2 SFRA, which was completed by JBA Consulting in August 2016. Some key points relevant to the site include:

- Arun District has a history of documented flood events; flood records indicate that the main source of risk within the district is from surface water and groundwater sources
- The site is not identified to be at risk of flooding according to Flood Risk Mapping within the SFRA. The site does not feature on the large-scale historical flood map within the SFRA
- Site-specific FRAs should include an assessment of mitigation measures required to safely manage flood risk along with the promotion of Sustainable Drainage Systems (SuDS) to create a conceptual drainage strategy
- Mapping has been produced as part of the SFRA and is included in *Appendix 3419/FRA/A1*. The mapping shows that the site is not within an area identified to be at risk from tidal or river flooding (including a consideration of climate change), from flooding 'from land' (surface water), or within a Groundwater Emergence Zone. Mapping also shows that the site is not in the vicinity of any historical sewer flooding incidents

The SFRA does not raise any concerns for this site.

4.2.2 Preliminary Flood Risk Assessment

Preliminary Flood Risk Assessments (PFRA's) were a requirement of the Flood Risk Regulations (2009) and were produced by Lead Local Flood Authorities (LLFA's). Their purpose is to provide information on significant historical flood events and summarise future flood risk from all sources of flooding.

The PFRA for West Sussex County Council was last updated in May 2011. Historical incidents of flooding have been recorded across the study area, however there are no records of flooding affecting the development site.

The PFRA does not raise any concerns for this development.

4.2.3 Local Flood Risk Management Strategy

The Local Flood Risk Management Strategy (LFRMS) for WSCC was completed in December 2013. The document provides guidance for new developments on the responsibilities of private landowners in flood risk and important considerations for the planning and implementation of SuDS.

The LFRMS does not hold any records of historical flooding at the site.

Chapter 2 'Responsibilities outside of the Flood and Water Management Act 2010' contains information relevant to the development site as follows:

'Flood Risk should not be increased elsewhere as a result of development.'

'Flooding from new development cannot be allowed to impact on third parties.'

These points will be considered within the surface water drainage design to ensure the development conforms with West Sussex Council strategy.

4.2.4 Local Development Framework

A Local Development Framework (LDF) is a spatial planning strategy for district councils in England and Wales. The LDF comprises of Local Development Documents (including Local Plans), Supplementary Planning Documents (SPD's), Statements of Community Involvement and other documents as required.

4.2.5 Arun Local Plan 2011-2031

The Arun Local Plan 2011-2031 was adopted in 2018 by the Council and sets out a spatial vision, objectives and a sustainable strategy for delivering the necessary growth of the District over the period 2011-2031.

Policy 18.3 - Flooding and 18.4 - Sustainable Drainage Systems, contain information relevant to the development site as follows:

'Development proposed within Bognor Regis should reduce run-off and implement Sustainable Urban Drainage Systems (SUDS) where applicable.'

'Opportunities for incorporating a range of SUDS must be taken wherever possible.'

'Proposals for both major and minor development proposals must incorporate SUDS within the private areas of the development in order to provide source control features to the overall SUDS design.'

This policy has been considered throughout this assessment.

4.2.6 LLFA Policy

West Sussex LLFA Policy for the Management of Surface Water was published in November 2018. This policy set out the requirements that the LLFA has for drainage strategies and surface water management provisions associated with planning applications for development. Some key points relevant to the site include:

Policy 5.6.2 – ‘Discharge to a watercourse or surface water sewer must be restricted to the estimated mean greenfield runoff rate (Q1) by means of a controlled outflow.’

This policy will be considered as part of the surface water drainage strategy.

5 CLIMATE CHANGE

In May 2022 the EA published an update on climate change allowances for both peak river flows and peak rainfall intensity. The site is within the Arun and Western Streams Management Catchment.

5.1 Peak river flows

The guidance specifies different allowances that should be made in terms of peak river flow depending on River Basin District and peak rainfall intensity. A range of climate change allowances for peak river flow is provided, ('Upper end', 'Higher central' and 'Central') depending on the nature of the development. Peak river flow allowances for this catchment are as follows:

3419/FRA/T1: Arun and Western Streams Management Catchment - peak river flow allowances			
	Central	Higher	Upper
2020's	11%	16%	27%
2050's	13%	19%	36%
2080's	25%	36%	64%

5.2 Peak rainfall intensity

Climate change allowances for peak rainfall intensity have also been specified for each management catchment and for different development lifetimes. The guidance states to: 'Use '2050s' for development with a lifetime up to 2060 and use the 2070s epoch for development with a lifetime between 2061 and 2125.'

Peak rainfall allowances for this catchment are as follows:

3419/FRA/T2: Arun and Western Streams Management Catchment - peak rainfall allowances				
	30-yr return period		100-yr return period	
	Central	Upper	Central	Upper
2050's	20%	35%	20%	45%
2070's	25%	40%	25%	45%

As the proposed site use is classified as 'Less Vulnerable', the 'Central' estimate has been used within the drainage strategy for the 30-year and 100-year return periods, both of 25%.

6 FLOOD RISK AT THE SITE

6.1 Potential sources of flooding

The risk of flooding to the site has been assessed by examining the likelihood (frequency or return period) of flooding and the consequences of flooding (fatalities, property damage, disruption) which typically depend on flood depth, velocity, speed of onset and duration. A qualitative assessment of the consequences of flooding to the site has been made for a range of potential flood sources:

- Fluvial
- Tidal
- Pluvial (surface water run-off)
- Groundwater
- Sewer and/or water mains leakage
- Reservoirs, canals and lakes

6.2 History of flooding at the site

There are no records of the site flooding in the past.

6.3 Fluvial flooding

Fluvial (river) flooding occurs when a watercourse cannot accommodate the volume of water draining into it from the surrounding catchment.

The site is located predominantly in Flood Zone 1 with a small section in the northwest of the site designated as Flood Zones 2 and 3 – see *Drawing 3419/FRA/03*.

Product 4 data has been obtained from the EA and is included in *Appendix 3419/FRA/A4*. Maps have been provided, which show modelled flood extents for various return periods.

Modelled flood levels and velocities at three nodes in the vicinity of the site have been provided and are summarised in *Table 3419/FRA/T3* below:

3419/FRA/T3: undefended Modelled Levels [mAOD]						
Node Point	Grid Reference	2009 JFLOW - Fluvial		2009 TUFLOW - Tidal		
		1% AEP [1 in 100-yr]	0.1% AEP [1 in 1000-yr]	1% AEP [1 in 100-yr]	0.5% AEP [1 in 200-yr]	0.1% AEP [1 in 1000-yr]
1	491305 102131	2.55	2.64	2.57	2.74	3.06
2	491367 102211	2.41	2.47	2.57	2.74	3.06
3	491309 102191	2.04	2.13	2.57	2.74	3.06

According to the topographic survey presented in *Appendix 3419/FRA/A7*, the lowest point on-site is at approximately 2.75 mAOD. This level is above predicted flood levels for the 1% and 0.1% AEP fluvial return periods, and the 1% and 0.5% AEP tidal return periods.

For the 0.1% tidal event, flood depths on-site adjacent to the Elbridge Rife could reach 0.31 m. However, elevations across the vast majority of the site exceed 3.06 mAOD and would therefore not be affected by flooding. Considering the site's low vulnerability, and the extreme and unlikely nature of such a flood event, this level of risk is considered to be acceptable.

Despite the proposed development including new parking, offices, security and storage sheds ground levels in the area close to Elbridge Rife will not be altered. Therefore, it is not anticipated that flood waters will encroach on the proposed development and there will be no impact on the current flood regime of the Elbridge Rife, or any loss in floodplain storage as a result of the development.

Furthermore, the Elbridge Rife was observed on a site visit (8th November 2022) following several weeks of heavy rainfall. At the time, the watercourse was approximately 3 m below the site level, after this period of heavy rainfall.

Therefore, based on the above, the potential for fluvial flooding at the site is considered to be low and mitigation measures are not required.

6.4 Surface water flooding

Surface water (pluvial) flooding occurs when rainwater does not drain away through the normal drainage system or soak into the ground, but instead lies on or flows over the ground. This can typically happen following high rainfall storm events when a drainage system is unable to accommodate the amount of surface run-off, or when ground profiles are uneven and facilitate ponding.

The EA's 'Risk of Flooding from Surface Water' mapping (shown on *Drawing 3419/FRA/02*) shows that the site has been identified to be at low to medium risk of surface water flooding where the site borders the Elbridge Rife, likely due to topographical low points in this location. No built development is proposed in this area, and it is not intended to alter ground levels in post-development.

There are no records of surface water flooding affecting the site and the risk of flooding by surface water is considered to be low.

6.5 Groundwater flooding

Groundwater flooding occurs when the watertable rises above the ground surface. It is most likely in areas above an aquifer where water levels can rise following prolonged rainfall.

The SFRA indicates that the area is underlain for the most part by chalk, which makes groundwater emergence a possibility. However, BGS borehole SU90SW43 reached a depth of 5.9 m and groundwater was not struck.

Given no buildings will be constructed with a basement and there are no records of groundwater flooding affecting the site, the risk of flooding posed by groundwater is considered to be extremely low.

6.6 Flooding from sewers and drains

Sewer flooding generally results in localised short-term flooding caused by intense rainfall events overloading the capacity of sewers. Flooding can also occur because of blockage, poor maintenance, structural failure or surcharging of the system due to high water levels in a receiving watercourse.

The site does include an existing on-site drainage system, which has been in place since the inception of the development. Were this system to breach capacity, flows would follow the topography of the site and enter the Elbridge Rife (see *Drawing 3419/FRA/07*).

There is no intention for a surface water connection to the public sewerage system, and no additional foul water discharges are proposed. The SFRA holds no records of sewer flooding at or in the vicinity of the site.

Therefore, the risk of sewer flooding is considered to be low.

6.7 Flooding from reservoirs, canals and lakes

Reservoir and canal flooding occur after the failure or breaching of a dam wall or canal embankment and is rare in the UK due to regulatory inspections and maintenance.

There are no reservoirs with a storage capacity in excess of 25,000 cubic metres (m³) in the Arun District, and there are no canals, lakes or other artificial features in the vicinity of the site. It is therefore considered that the risk of flooding from reservoirs, canals and lakes is low.

7 SURFACE WATER MANAGEMENT

7.1 Existing surface water drainage infrastructure

Existing roof and hardstanding areas are currently formally drained to an on-site surface water drainage system, which was installed at the inception of the site. This is shown on Drawing 9819-0050 in *Appendix 3419/FRA/A3*. Surface water run-off is conveyed by concrete drainage channels to buried chambers, followed by a series of treatment points: a collection chamber, an alarmed oil interceptor, then a holding tank (2 m in diameter and 3 m deep).

The collection chamber is emptied regularly by a suction tanker. Water is drawn from the holding tank and used for dust suppression on-site. Remaining water within the holding tank flows northwestwards into a French drain along the northwestern site boundary, which provides attenuation, filtration and some infiltration. The French drain flows northeastwards, to a point where it discharges into the Elbridge Rife. A second collection chamber is located to the northwest of the Roll on Roll Off (Ro Ro) shed. This discharges to the French Drain, thence the watercourse.

A drain exists on the eastern boundary of the extension area, comprising a 150 mm diameter geotextile-wrapped pipe, within a gravel filled trench. Water is conveyed within this drain northwestwards, where it connects to the northwestern perimeter French drain. It is understood from the site operators that infiltration of surface water occurs in this area.

All of the current inert recycling area is free-draining. The access road is impermeable but not formally drained.

7.2 Proposed surface water drainage

7.2.1 Principles of the Surface Water Drainage Strategy

The existing surface water drainage arrangements shown on the drawing in *Appendix 3419/FRA/A3* will remain and continue to serve the existing roof and hardstanding areas, along with the site access road.

However, to ensure that discharge from the site does not exceed greenfield run-off rates, it is proposed to provide additional surface water attenuation in the form of underground cellular storage, with an orifice plate installed on the final manhole of the drainage network, before it discharges into the Elbridge Rife.

Within the proposed eastern extension area (0.843 ha), the ground surface will remain free-draining, and there is therefore no requirement for formal drainage.

The existing and proposed drainage network has been modelled using InfoDrainage 2024.0

7.2.2 Brownfield run-off rates and volumes

The brownfield run-off rate has been calculated using the Rational Method as follows:

$$Q = 2.78 \times C \times I \times A$$

- Where:
- Q = Discharge (l/s)
 - 2.78 = Standard multiplier
 - C = Run-off coefficient
 - I = Rainfall intensity (50 mm/hr)
 - A = Catchment area to be drained (ha)

Based on a site area of 1.5 ha, the brownfield run-off rate for this site has been calculated to be 208.5 l/s.

Based on a 6-hour storm event, the brownfield run-off volume has been calculated to be 4,503.6 m³.

7.2.3 Greenfield run-off rates and volumes

Surface water flows from the site will be attenuated to pre-development (greenfield) run-off rates, ensuring the sites natural run-off regime is maintained as far as possible.

The calculated greenfield run-off rate for the site is shown in the InfoDrainage Results in *Appendix 3419/FRA/A5* and is summarised in *Table 3419/FRA/T4* below:

3419/FRA/T4: Greenfield run-off rates	
Storm event	Greenfield run-off rate for whole site area (1.5ha) (l/s)
1-year	3.0
Q _{BAR}	3.5
30-year	8.0
100-year	11.2

To ensure betterment is provided, it is intended to restrict discharge from the site to the greenfield Q_{BAR} run-off rate of 3.5 l/s for all storm events, up to and including the 1 in 100-year + climate change event.

Discharge from the site is currently unrestricted, and the rate and volume of run-off discharging into the Elbridge Rife currently increases with rainfall intensity. As requested by the LLFA, post-development, flow from the impermeable area will be restricted to 3.5 l/s for all rainfall events, providing significant betterment over the existing situation.

Based on the values presented in *Table 3419/FRA/T4* above, greenfield run-off volumes have been calculated for each return period. A critical storm duration of 6 hours has been selected. Greenfield run-off volumes are presented in *Table 3419/FRA/T5*:

3419/FRA/T5: Greenfield run-off volumes	
Storm event	Greenfield run-off volume for whole site area (1.5 ha) (m ³)
1-year	64.8
Q_{BAR}	75.6
30-year	172.8
100-year	241.92

7.2.4 InfoDrainage modelling

InfoDrainage 2024.0 was used to model the existing network, along with proposed attenuation to ensure the discharge rate of 3.5 l/s is not exceeded. An indicative drainage layout is shown on *Drawing 3419/FRA/05*, with full InfoDrainage results included in *Appendix 3419/FRA/A5*.

The existing drainage network was simulated in InfoDrainage, based on the existing drainage drawing (*Appendix 3419/FRA/A3*). The following additions were made:

- Underground attenuation tank in the north of the site. A total of 300 crates of size 1 m x 1 m x 1.2 m depth equating to 342.7 m³ of storage
- Additional manholes and pipework to connect the attenuation tank to the existing network, and to ensure the whole site can be drained
- A 0.034 m diameter orifice plate within the final (existing) manhole before discharge into the Elbridge Rife (Manhole (5) within the model) via the existing outfall

Long sections of the network are shown in *Appendix 3419/FRA/A6*.

The 1 in 2-year, 1 in 30-year, 1 in 50-year and 1 in 100-year events have been modelled. As requested by the LLFA, a 25% allowance for climate change for both the 1 in 30-year and 1 in 100-year scenarios has been incorporated. Note that the 1 in 1-year event could not be modelled. FEH results must be limited to a minimum 2-year return period, because the model has not been configured for return periods below two years.

The model results show that no flooding occurs on-site during the 1 in 2-year event. The status of Manhole (5) is shown to be 'Surcharged' during the 1 in 2-year critical storm event. This is due to the water level within this manhole (212 mm) being above the crown of the outgoing pipe (150 mm). The water level does not rise within Manhole (5), and surcharging will not occur in reality.

No flooding is indicated by the model for the 1 in 30-year storm event.

Flooded volumes for the 1 in 30 + climate change, 1 in 50-year, 1 in 100-year and 1 in 100-year + climate change critical storm events are shown in *Table 3419/FRA/T6*. Results for 'Junctions' (manholes) are the sum of all flooded volumes for all manholes.

3419/FRA/T6: Flooded volumes			
Storm event	Flooded volume (m ³)		
	Junctions (manholes)	Cellular storage	Total
1 in 30-year + CC	17.4	1.193	18.60
1 in 50-year	1.49	0	1.49
1 in 100-year	16.23	1.063	17.29
1 in 100-year + CC	131.05	10.53	141.58

The maximum flooded volume for the 1 in 100-year + climate change event is approximately 141.58 m³. ground in the northeast of the site will be regraded to accommodate this volume – see *Drawing 3419/FRA/06*. This will ensure flooding is retained on-site, before entering the on-site drainage network and discharging into the Elbridge Rife at the restricted rate of 3.5 l/s. This area is shown on *Drawing 3419/FRA/06*. Access to and from the site in the south will be unaffected.

The storage capacity of the trench surrounding the French Drain has not been considered within the model. Based on a 0.8 m depth, 0.7 m width, 120 m length and a conservative 10% available storage volume within the gravel, an additional 6.7 m³ of flood water could be

stored. Therefore, a total flooded volume of up to **134.88 m³** is possible during the 1 in 100-year + climate change event.

Surface water run-off from the site is currently unrestricted, with no attenuation provided. Therefore, the proposed updates to the surface water drainage network provide significant betterment in terms of reducing downstream flood risk.

Furthermore, an indeterminate amount of infiltration occurs within the French drains and water will continue to be re-used on-site. These two factors will also reduce the volume of water within the surface water drainage network.

Considering the above and the 'low vulnerability' of the site, this level of flood risk post-development is considered to be acceptable.

7.2.5 Surcharged outfall

As requested by the LLFA, the model has also been run with a surcharged outfall. The surcharge level has been set at the 1 in 100-year flood level of 2.57 mAOD (Section 6.3). Full InfoDrainage results are included in *Appendix 3419/FRA/A5*, with a summary of results in *Table 3419/FRA/T7*.

3419/FRA/T7: Flooded volumes – surcharged outfall			
Storm event	Flooded volume (m ³)		
	Junctions (manholes)	Cellular storage	Total
1 in 30-year	16.19	1.37	17.56
1 in 30-year + CC	98.70	8.85	107.55
1 in 50-year	45.98	4.06	50.04
1 in 100-year	98.24	8.80	107.04
1 in 100-year + CC	222.10	19.12	241.22

Flooded volumes on-site have been modelled to increase with a surcharged outfall, which is to be expected.

7.2.6 Sustainable Drainage Systems (SuDS)

It is possible that infiltration methods of water disposal will be feasible. However, as a conservative measure, the surface water drainage design has currently assumed no infiltration.

Due to the nature of site operations in areas of hardstanding, above ground surface water storage and SuDS is not practical, therefore underground attenuation is proposed. Water will

continue to be re-used from the holding tank (Manhole (3) within the InfoDrainage model), and potentially also from the attenuation tank itself. This will further reduce the volume of water being discharged into the Elbridge Rife, as discussed in Section 7.2.4.

In the proposed extension area, the existing permeable surface and sub-soil will be retained. Therefore, there is no need for formal drainage in this area.

7.2.7 Water quality

The existing oil interceptor shown in Appendix 3419/FRA/A3 will remain. This will continue to remove oil and other pollutants and reduce the risk of pollutants discharging into the Elbridge Rife.

The existing French Drains will remain along the northern site boundary and through the site, adjacent to the weighbridge. As set out in Section 7.2.4, these will provide additional storage not accounted for within the model and also provide water quality benefits.

The Simple Index Approach, in accordance with CIRIA 753: The SuDS Manual, has been undertaken and incorporates the proposed oil/petrol interceptor (see Table 3419/FRA/T8):

3419/FRA/T8: Pollution hazard and mitigation indices							
Land use	SuDS feature	Total suspended solid		Metals		Hydrocarbons	
		Pollution Hazard Index	Pollution Mitigation Index	Pollution Hazard Index	Pollution Mitigation Index	Pollution Hazard Index	Pollution Mitigation Index
Waste management/handling/distribution site	Petrol/oil interceptor	0.8	>0.95	0.8	0.8	0.9	>0.95

Indices for the petrol/oil interceptor have been input into the SEPA spreadsheet tool. Mitigation Indices for the petrol/oil interceptor have been obtained from Kingspan, with those for 'medium risk' sites applied (see Appendix 3419/FRA/A9).

As can be shown in Table 3419/FRA/T8, the Pollution Mitigation Index provided by the petrol/oil interceptor exceeds the Pollution Hazard Index for the land use type draining into it. This provides confidence that the oil interceptor can manage the potential pollutant load presented by the proposed site activities.

7.2.8 Biodiversity

Due to the nature of site operations, above ground SuDS features are not appropriate. Therefore, there is minimal opportunity for biodiversity improvements within the surface water drainage system. Biodiversity enhancements have been considered elsewhere on-site.

7.2.9 Amenity

The site currently has little amenity value and the nature of the site precludes SuDS features, which provide amenity benefit. The site is not publicly accessible.

7.3 Designing for exceedance

The surface water drainage system has been designed to minimise the risk of flooding to the site and surrounding area in the event of exceedance of the system capacity during extreme storm events. Based upon the local topography, exceedance flows would be conveyed towards attenuation features, manholes and the area to be regraded in the northeast of the site and would thus not cause an increase in flood risk elsewhere. Exceedance flows are shown on *Drawing 3419/FRA/07*.

8 ADOPTION AND MAINTENANCE

Since 6th April 2015, SuDS are a planning requirement for all 'Major Development'. In addition, LLFA's became statutory consultees with effect from 15th April 2015. Local Planning Authorities (LPA's), in considering Planning Applications, will consult the relevant LLFA on the management of surface water; satisfy themselves that the proposed minimum standards of operation are appropriate; and ensure through the use of planning conditions or planning obligations that there are clear arrangements in place for the on-going maintenance of SuDS over the lifetime of the development.

8.1 Adoption

All surface water drainage infrastructure and SuDS features will remain privately owned by the landowner.

8.2 Maintenance

Typical maintenance regimes for attenuation tanks, flow control structures and filter drains are included in *Appendix 3419/FRA/A8*. The petrol/oil interceptor will continue to be maintained in accordance with manufacturers instructions.

9 SUMMARY AND CONCLUSIONS

A Planning Application has been prepared for the lateral extension of the existing materials recycling facility and waste transfer station. There are no changes planned to the recycling operation except to increase tonnages with the volume of processed material to increase from the present 30,000 tonnes.

The site is located predominantly in Flood Zone 1, with a small section of the perimeter within Flood Zones 2 and 3. Flood level data has been obtained from the EA. The majority of the site is above all modelled flood levels. Maximum flood depths for the 1 in 1000-year tidal flood event have been modelled to be 3.06 mAOD, which could equate to 0.31 m depth of flooding in isolated locations adjacent to the watercourse. No built development is proposed in this location, and there will be no loss of floodplain storage, therefore mitigation measures are not required. The site is therefore considered to be at low risk of flooding.

The site is considered to be at low risk of flooding from all other sources.

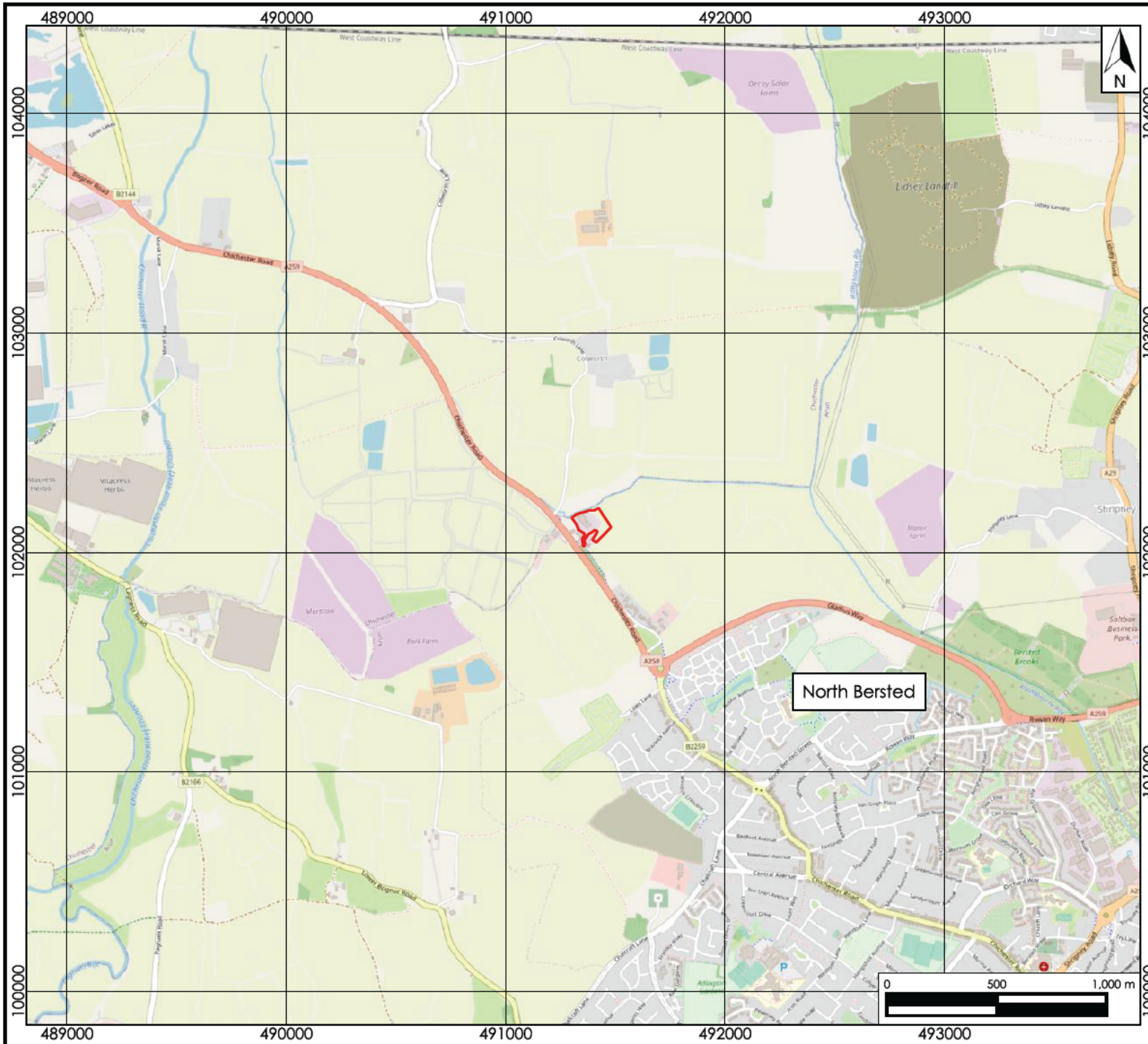
Surface water within the existing site is currently managed within a drainage system, with water conveyed unrestricted to the Elbridge Rife watercourse. To ensure the drainage system will not increase the rate and volume of surface water run-off leaving the site, underground cellular storage is proposed, along with a new orifice plate, which will restrict flows to 3.5 l/s. The InfoDrainage model anticipates some flooding on-site during the 1 in 30-year + climate change, 1 in 50-year, 1 in 100-year and 1 in 100-year + climate change flood events, however the model does not consider water re-use on-site, or the storage and infiltration capacity of the filter drains.

The proposed extension area is currently free-draining and will remain so post-development.

The Simple Index Approach has been applied and demonstrated that the petrol/oil interceptor will provide an acceptable level of treatment prior to discharge into the Elbridge Rife. All on-site surface water drainage infrastructure will remain privately owned. A maintenance schedule for the on-site drainage has been provided.

On consideration of the above, and on implementation of this strategy, it is considered that the development will be appropriate in terms of flood risk and can be suitably drained for the development lifetime.

DRAWINGS



Key
 — Site Boundary

Scale correct at A4

Client Recycle Southern Ltd

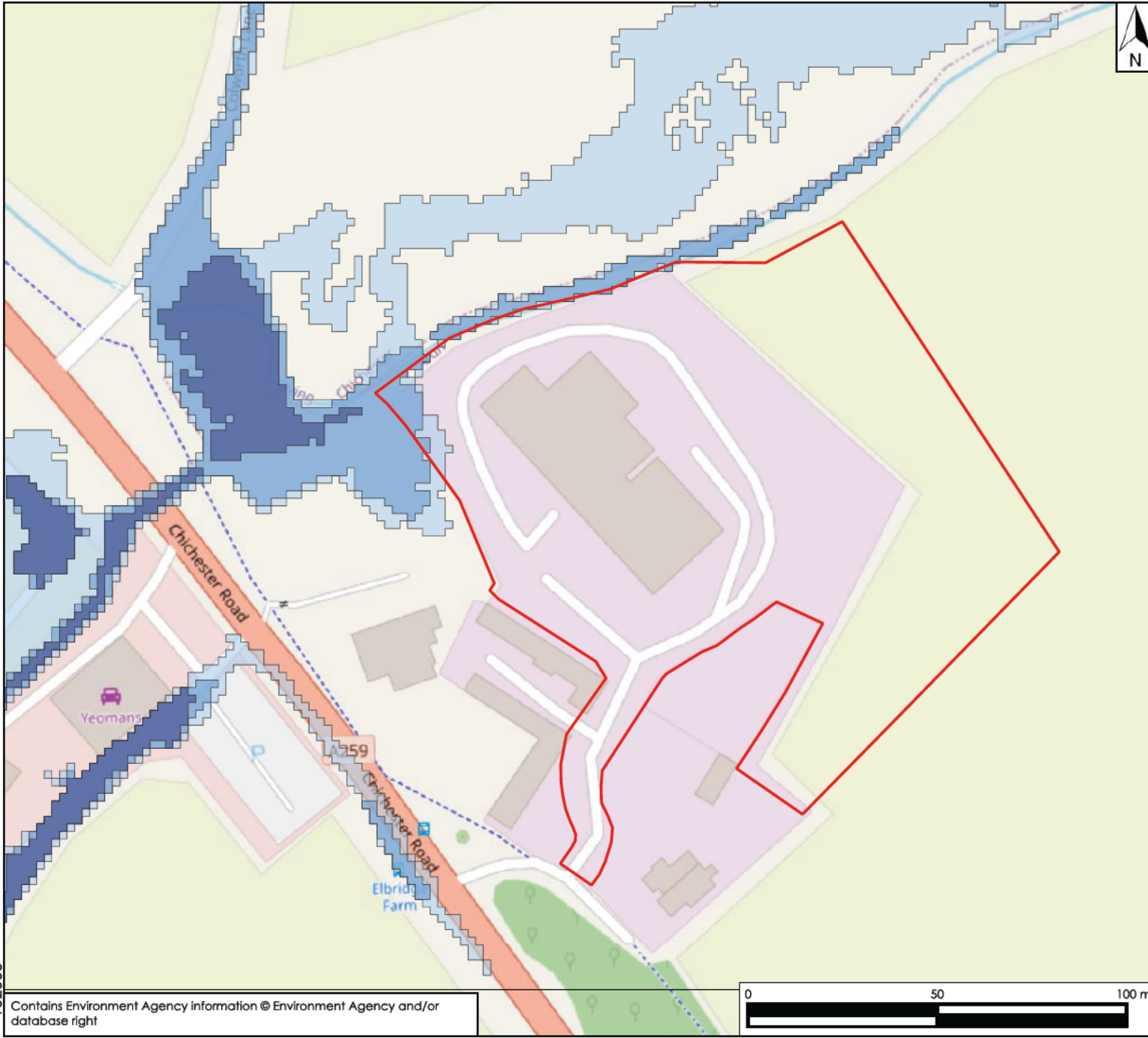
Title Site Location

Project Elbridge Farm Recycling Centre

Drawing 3419/FRA/01 Version 1

Date Oct 2023 Scale 1:25,000

hafrenwater 
 environmental water management
 Barkers Chambers • Barker Street • Shrewsbury •
 Shropshire • SY1 1SB



- Key
- Site Boundary
 - High Risk
 - Medium Risk
 - Low Risk

Scale correct at A4

Client Recycle Southern Ltd

Title Pluvial Flood Risk

Project Elbridge Farm Recycling Centre

Drawing 3419/FRA/02 Version 1

Date Oct 2023 Scale 1:1,500

hafrenwater

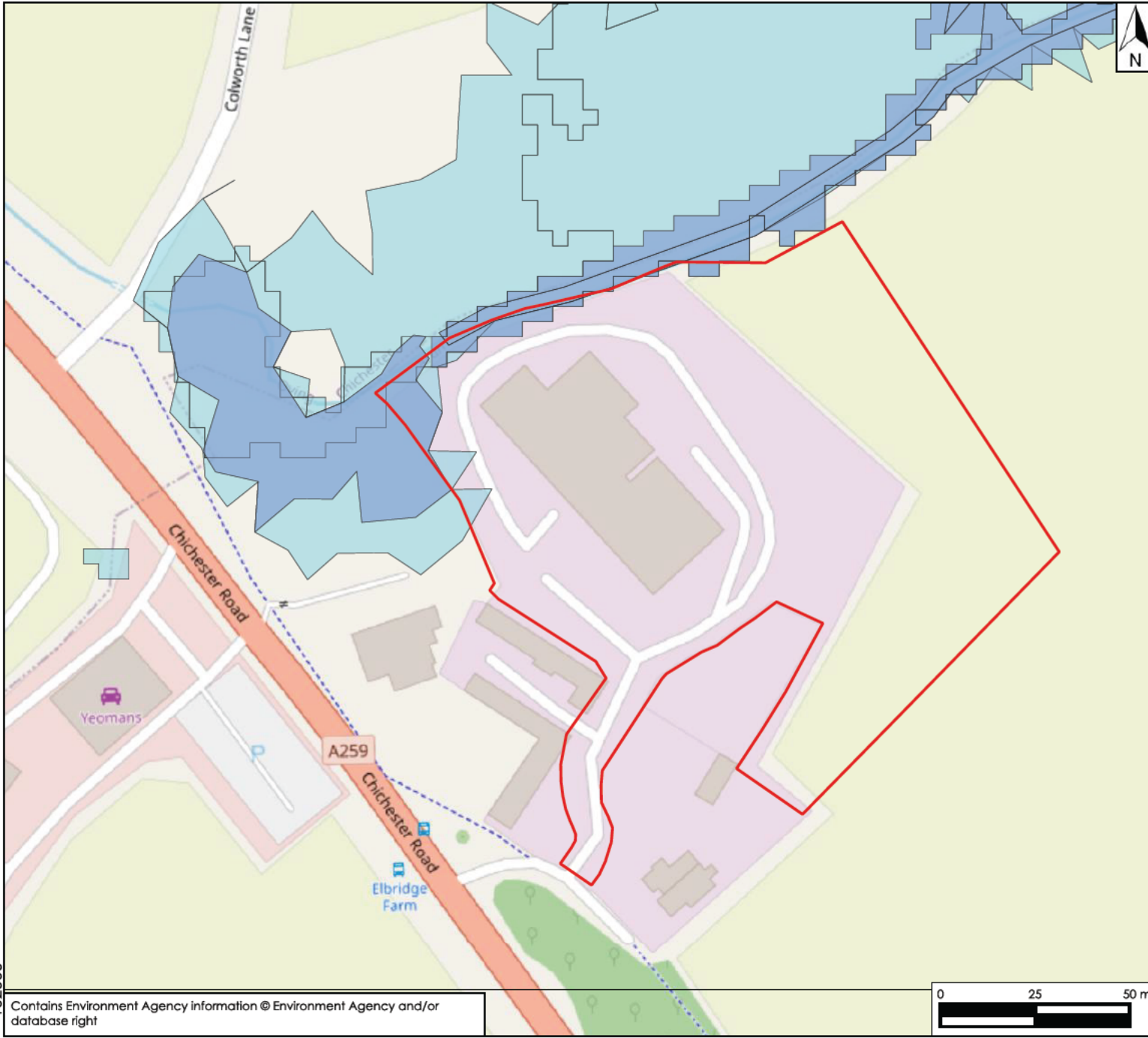
environmental water management

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102000



- Key
- Site Boundary
 - Food Zone 2
 - Food Zone 3

Scale correct at A4

Client Recycle Southern Ltd

Title Fluvial Flood Risk

Project Elbridge Farm Recycling Centre

Drawing 3419/FRA/03 Version 1

Date Oct 2023 Scale 1:1,500

hafrenwater

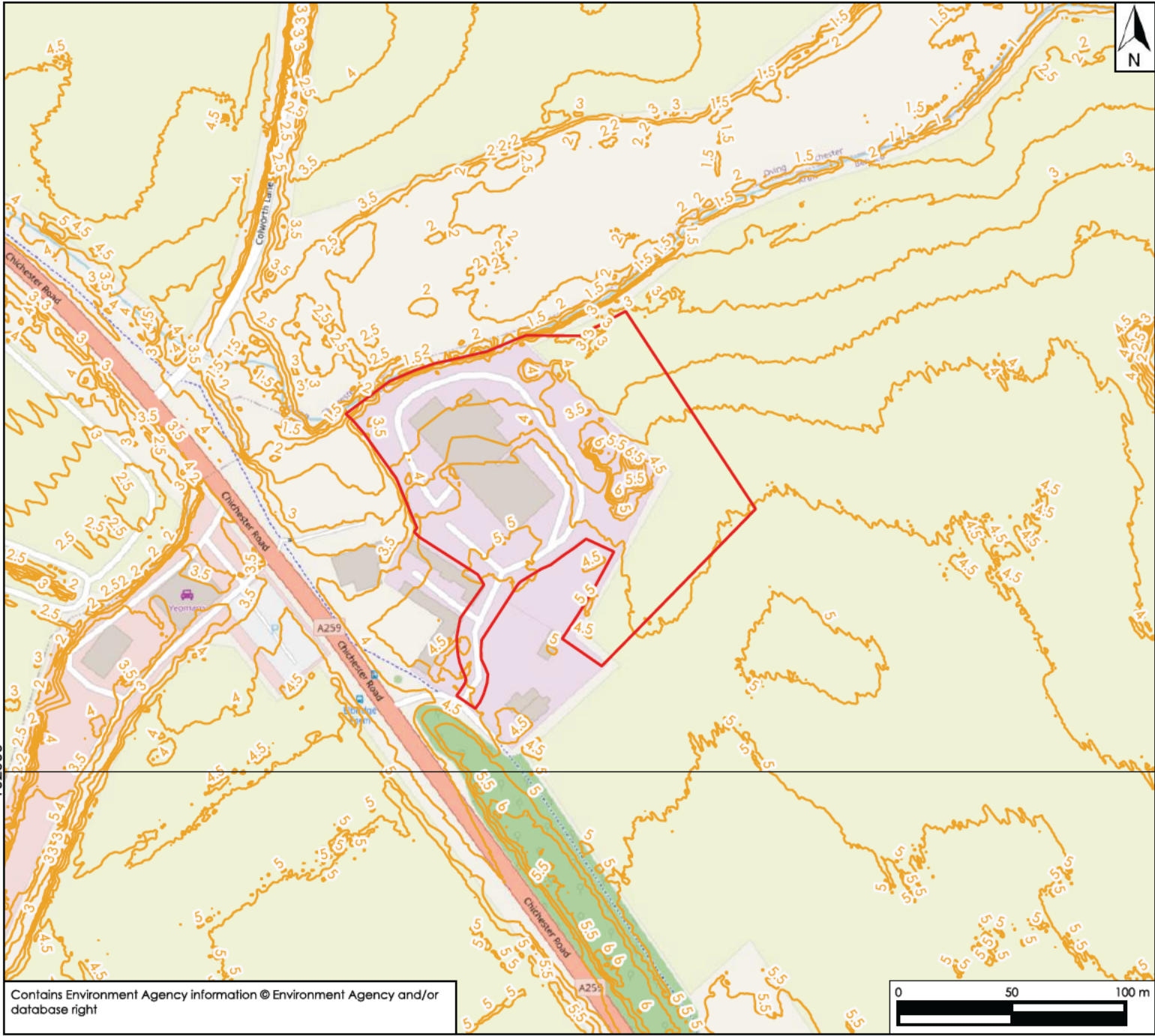
environmental water management

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102000



Key
 — Site Boundary
 — 0.5m Contour

Scale correct at A4

Client Recycle Southern Ltd

Title LIDAR Data

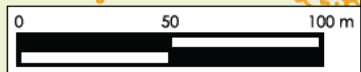
Project Elbridge Farm Recycling Centre

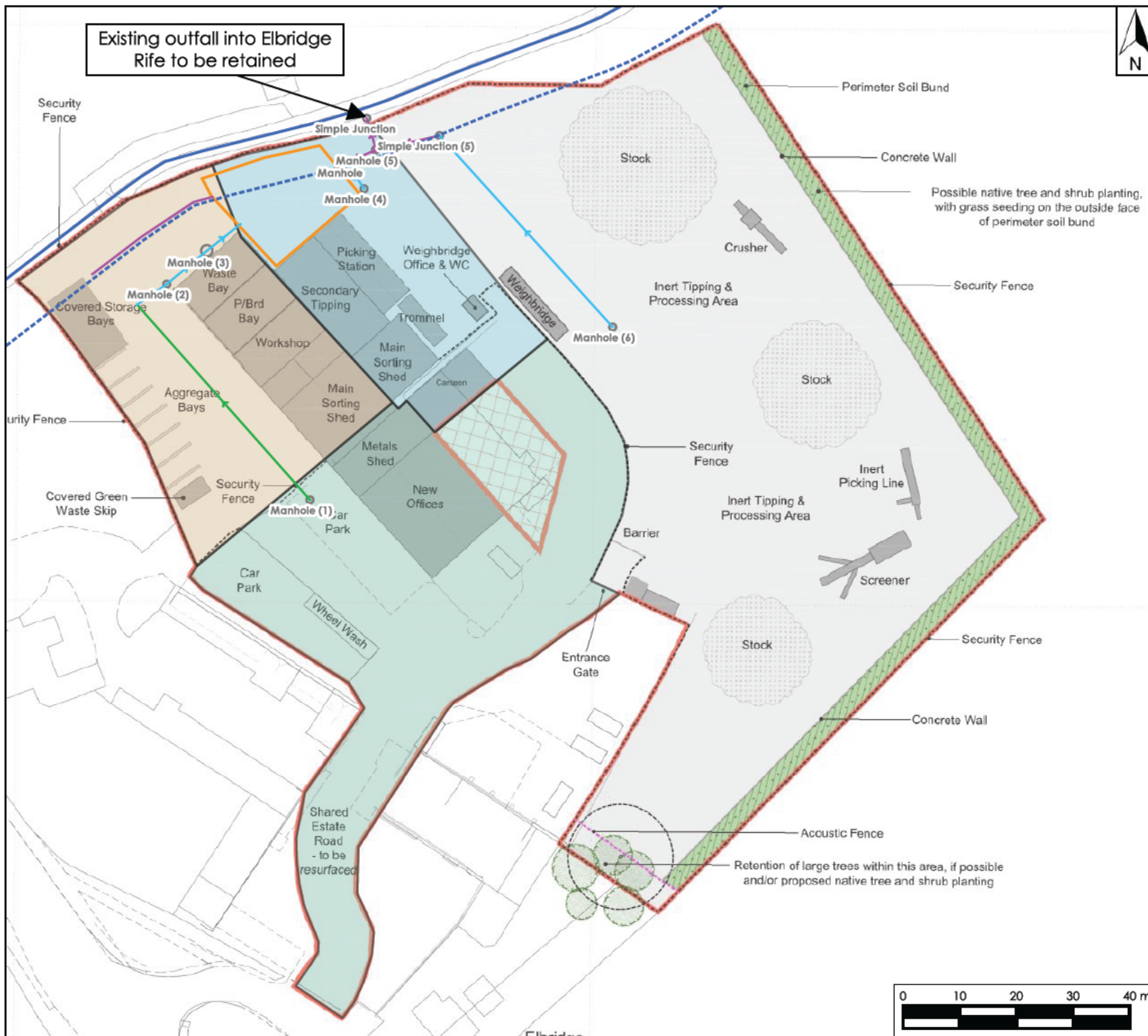
Drawing 3419/FRA/04 Version 1

Date Oct 2023 Scale 1:2,500

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- Key**
- Site Boundary
 - Catchment Area
 - Catchment Area (1)
 - Catchment Area (2)
 - Cellular Storage
 - Watercourse
 - 8m Easement
 - Existing P-pework
 - Filter Drain
 - Proposed P-pework

Scale correct at A4

Client **Recycle Southern Ltd**

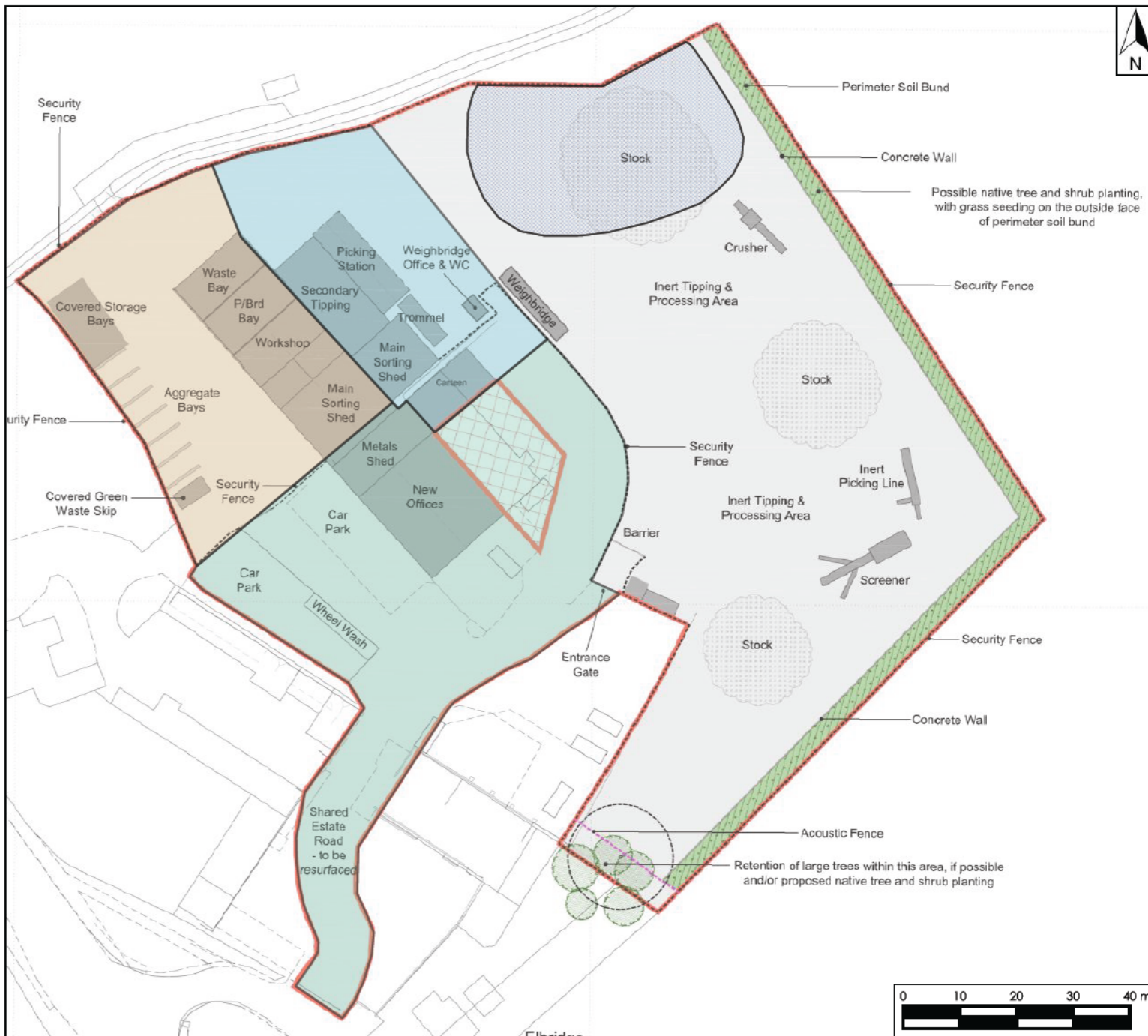
Title **Indicative Surface Water Drainage Layout**

Project **Elbridge Farm**

Drawing **3419/FRA/05** Version **1**

Date **Oct 2023** Scale **1:1,000**

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Key

- Site Boundary
- Ground to be reprofed to accomodate flooding during the 1 in 100 year + climate change event

Scale correct at A4

Client **Recycle Southern Ltd**

Title **1 in 100 Year + CC Flood Area**

Project **Elbridge Farm**

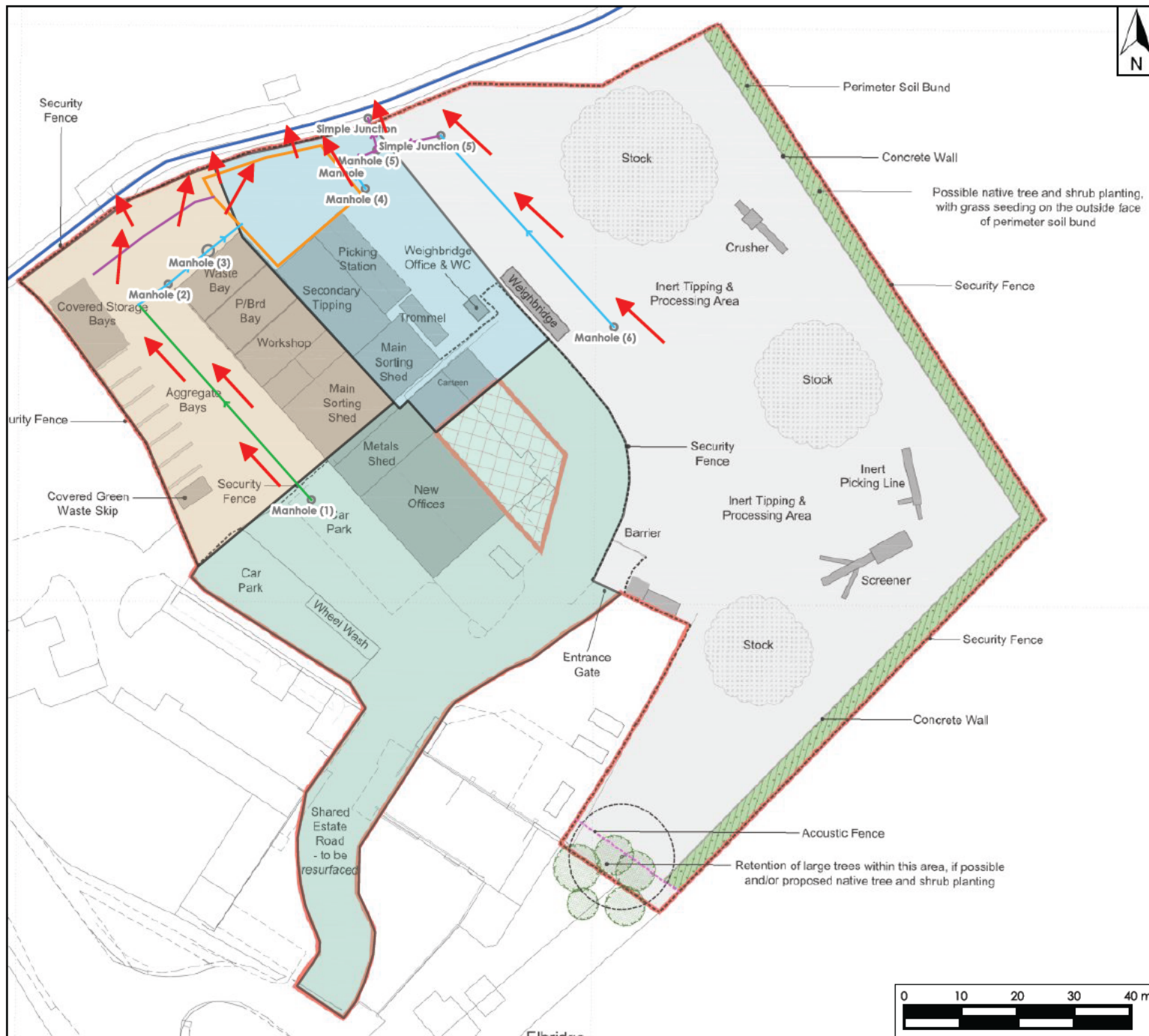
Drawing **3419/FRA/06** Version **1**

Date **Oct 2023** Scale **1:1,000**

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- Key**
- Site Boundary
 - Catchment Area
 - Catchment Area (1)
 - Catchment Area (2)
 - Cellular Storage
 - Watercourse
 - Existing Pipework
 - Fitter Drain
 - Proposed Pipework
 - Direction of Flow

Scale correct at A4

Client **Recycle Southern Ltd**

Title **Exceedance Flow Routes**

Project **Elbridge Farm Recycling Centre**

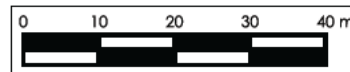
Drawing **3419/FRA/07** Version **1**

Date **Oct 2023** Scale **1:1,000**

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APPENDIX 3419/FRA/A1

SFRA mapping



Notes:

The Arun SFRA is a strategic assessment of flooding. Users of the SFRA should be aware of this when interpreting the information presented. The user is directed to the SFRA reports which outline the uncertainties associated with the studies. Particular attention is drawn to the following:

- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.





Arun District Council SFRA

Map A1-T - Actual and Residual Flooding from the Sea



CAPITA SYMONDS

Legend

-  Arun District Boundary
-  Actual Defended Tidal Flood Risk (0.5% AEP, 2006)
-  Residual Defended Tidal Flood Risk (0.1% AEP, 2006)
-  Coastal Risk Area

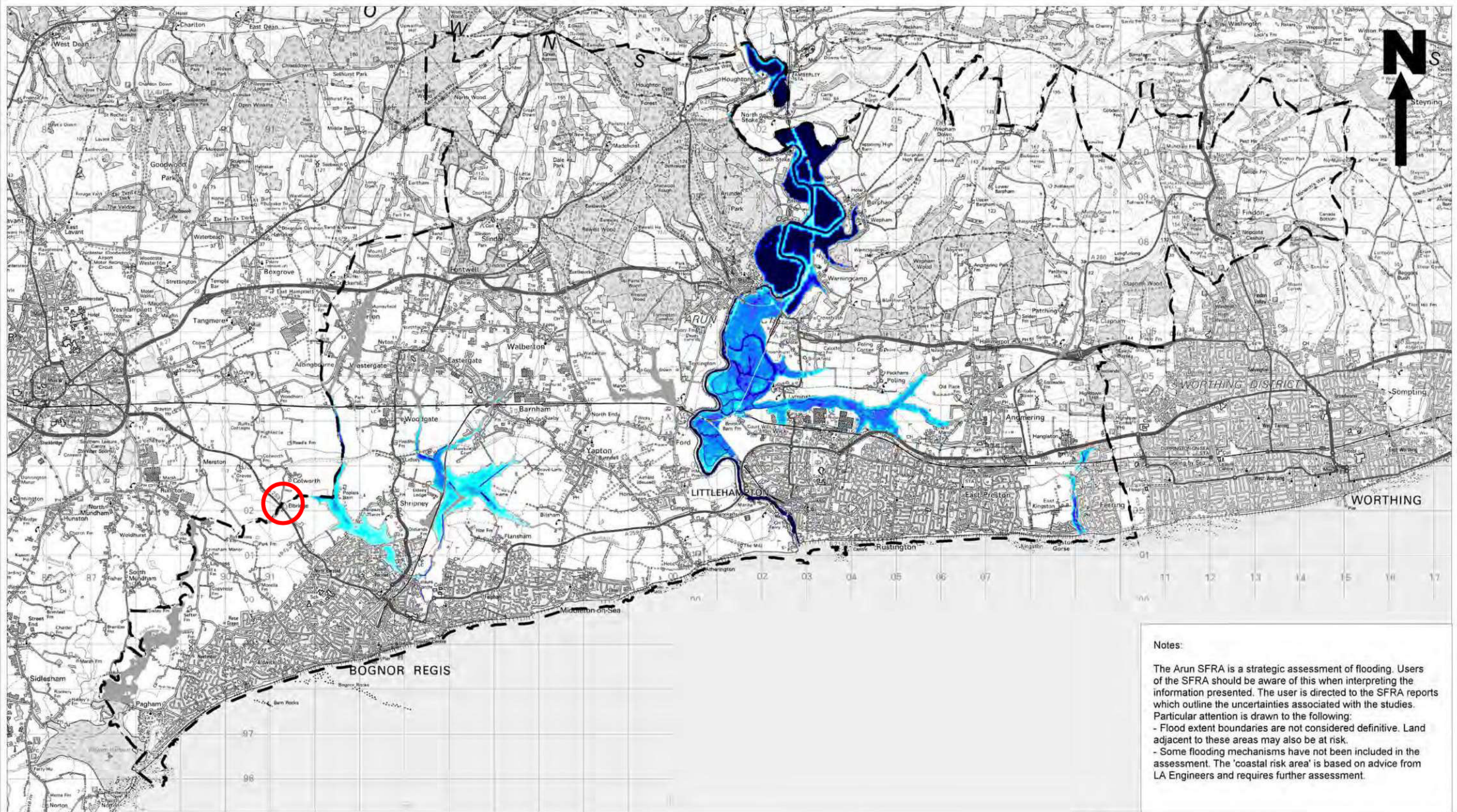


Scale at A3: 1:80,000

Date: 31/01/2008

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Map_A1-T.wor




Notes:

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- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

Arun District Council SFRA
 Map A2-F - Flood Depth - Actual risk of Flooding from Rivers



CAPITA SYMONDS

Legend

— Arun District Boundary

Actual Risk Flood Depths (m) (1% AEP, 2006)

- 0.00 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 1.75
- 1.75 - 2.00
- 2.00 - 2.25
- > 2.25
- Unknown

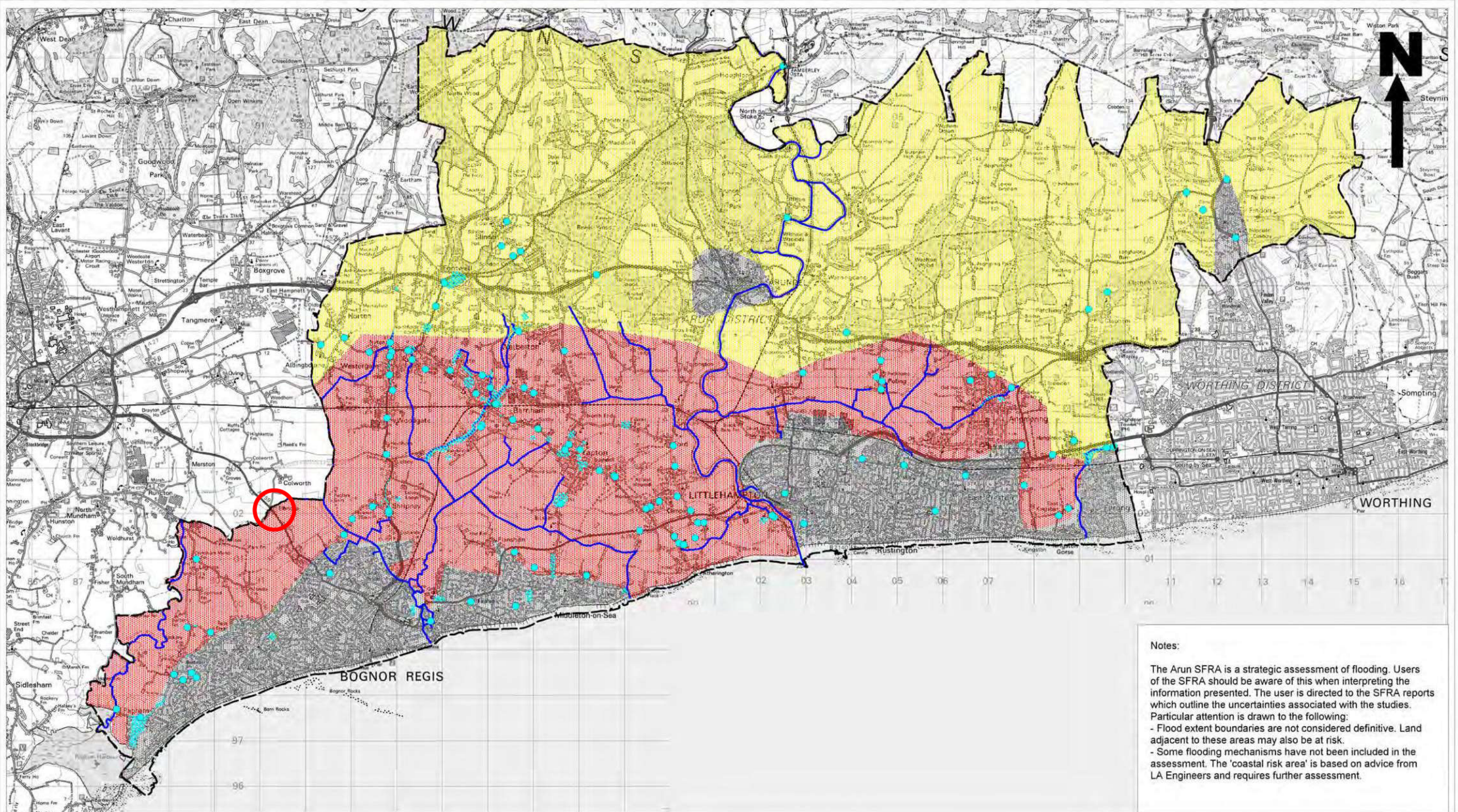


0 2 4
Kilometres

Scale at A3: 1:80,000
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Map_A2-F-wor



Notes:

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Arun District Council SFRA

Map L - Areas Prone to Flooding from the Land



CAPITA SYMONDS

Legend

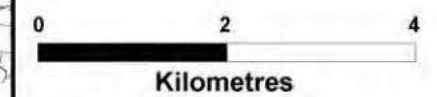
- Arun District Boundary
- Main River

Historic Surface Water Flooding

- Area
- Point

Risk of Flooding from Land

- Low to Medium
- Medium to High
- Urban



Scale at A3: 1:80,000

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Map_L_wor



Notes:

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- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

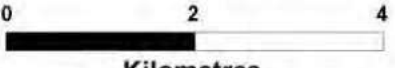
Arun District Council SFRA
 Map S - Historic Incidents of Flooding from Sewers



CAPITA SYMONDS

Legend

- Arun District Boundary
- Historic Incidents of Sewer Flooding

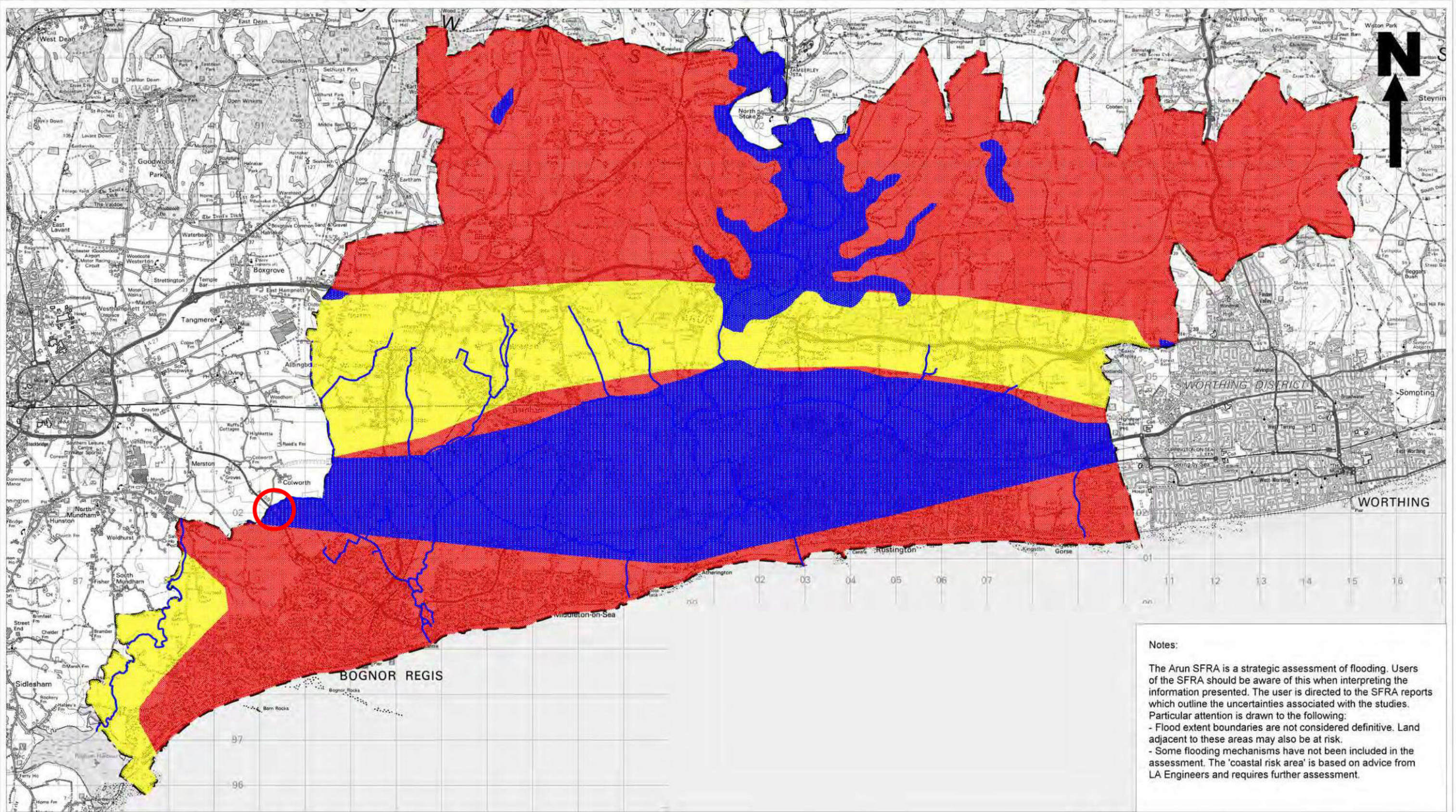
Kilometres

Scale at A3: 1:80,000

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Map_S.wor



Notes:

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- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

Arun District Council SFRA

Map G1 - Indicative Risk of Groundwater Flooding



CAPITA SYMONDS

Legend

- Arun District Boundary
- Main River
- Groundwater Emergence Zones
- Groundwater Flood Risk**
- High
- Medium



Kilometres

Scale at A3: 1:80,000

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Map_G1.wor



Notes:

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- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

Arun District Council SFRA

Map H - Historic Flood Events



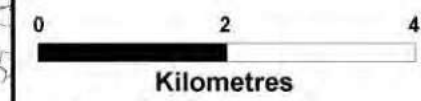
CAPITA SYMONDS

Legend

- Arun District Boundary
- Historic Flood Events - Points**
- Coastal
- Tidal
- Fluvial
- Surface Water
- Sewer
- Failure
- Unknown

Historic Flood Events - Areas

- Coastal
- Tidal
- Fluvial
- Surface Water
- Unknown



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Notes:

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- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

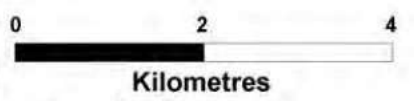
Arun District Council SFRA

Map C1-F - Actual River Climate Change Extents (with defences)



CAPITA SYMONDS

- Legend**
- Arun District Boundary
 - 2056 Climate Change River Flood Extents (1% AEP Defended)
 - 2106 Climate Change River Flood Extents (1% AEP Defended)



Scale at A3: 1:80,000

Date: 31/01/2008

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Map_C1-F_wor



Notes:

The Arun SFRA is a strategic assessment of flooding. Users of the SFRA should be aware of this when interpreting the information presented. The user is directed to the SFRA reports which outline the uncertainties associated with the studies. Particular attention is drawn to the following:

- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.





Arun District Council SFRA

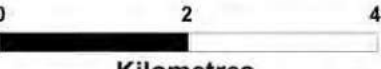
Map C1-T - Actual Sea Climate Change Extents (with defences)



CAPITA SYMONDS

Legend

-  Arun District Boundary
-  2056 Climate Change Tidal Flooding Extents (0.5% AEP, defended)
-  2106 Climate Change Tidal Flooding Extents (0.5% AEP, defended)
-  Coastal Risk Area

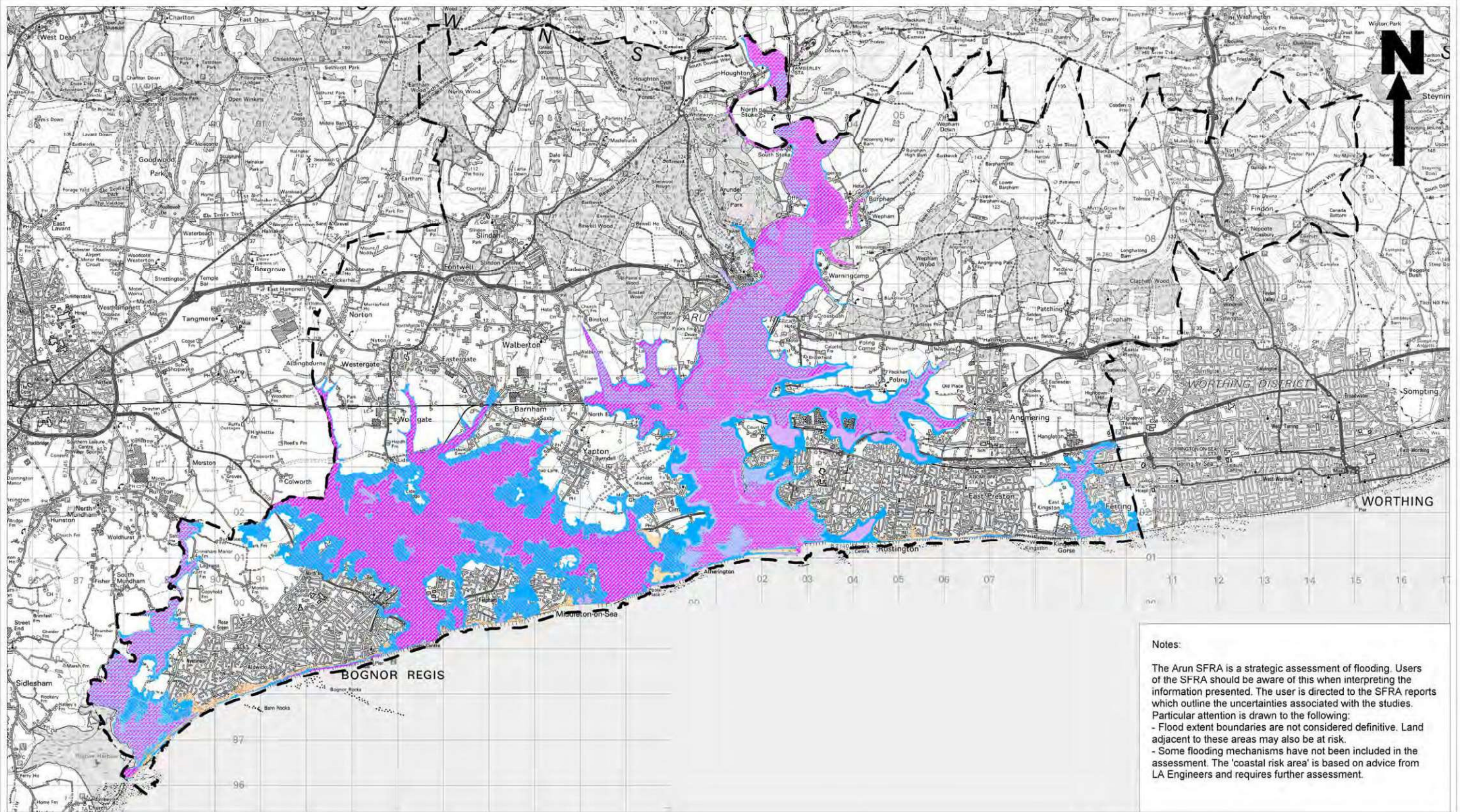



Scale at A3: 1:80,000

Date: 31/01/2008

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Map_wor



Notes:

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- Flood extent boundaries are not considered definitive. Land adjacent to these areas may also be at risk.
- Some flooding mechanisms have not been included in the assessment. The 'coastal risk area' is based on advice from LA Engineers and requires further assessment.

Arun District Council SFRA

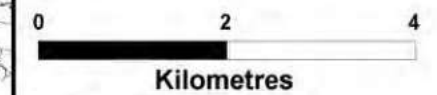
Map C2-T - Tidal Flood Zones with Climate Change



CAPITA SYMONDS

Legend

- Arun District Boundary
- Future Flood Zone 3b (2056)
- Future Flood Zone 3a (2106)
- Future Flood Zone 3b (2106)
- Future Flood Zone 3a (2056)
- Coastal Risk Area
- Future Flood Zone 2 (2056)
- Future Flood Zone 2 (2106)



Scale at A3: 1:80,000

Date: 31/01/2008

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Map_C2-T.wor

APPENDIX 3419/FRA/A2

Site layout plan

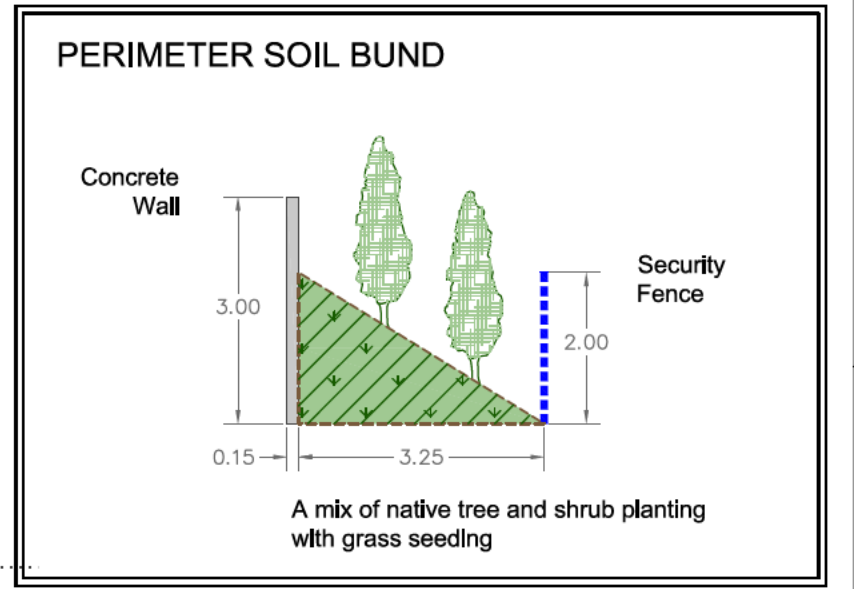


All dimensions to be verified on site. Figure dimensions to take precedence to those scaled. Any areas indicated on this drawing are for guidance only, no responsibility is taken for their accuracy.
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KEY

- Planning Application Boundary
- Not within Planning Application Boundary
- Limit of Use - Crusher/Screener
- Permeable Hardstanding
- Existing - Security Fence - 2m high
- Proposed - Security Fence - 2m high
- Concrete Wall to protect bund - 3m high (3.5m high at the south west section only)
- A mix of native tree and shrub planting with grass seeding
- Lighting



Scale - 1:100 at A2

17	Proposed swale removed, text update.	KD	20/09/23
16	Acoustic fence moved further north of existing trees. Further amended, Acoustic fence removed, concrete wall and perimeter soil bund extended to the south west site.	KD	23/08/23
15	Wood waste bay added, Aggregate bay dimensions amended.	KD	31/05/23
14	Dust Cannon and water tank added.	KD	30/05/23
13	Resurfacing area extended, Covered aggregate bay reduced to one bay. Bay dimensions checked and updated.	KD	28/04/23
12	Proposed swale, fencing, resurfacing area, lighting, permeable hardstanding and wall height increase to 4m, added.	KD	24/04/23
11	Planning application boundary amendment to north. Canteen area reduced. Example of trees added to perimeter soil bund.	KD	20/03/23
10	Amendment to perimeter soil bund, Concrete wall added.	KD	16/03/23
09	Acoustic fence added.	KD	08/02/23
08	Inner Impermeable fence added.	KD	03/02/23
07	Security fence shown on the inside of 8m native tree and shrub planting.	KD	05/12/22
06	Tree / hedgerow planting inside the security fence to the northern boundary removed. Perimeter soil bund stopped at the southern boundary turn, retention of large trees within this area.	KD	01/12/22
05	Details from proposed landscape plan added to site layout plan. Covered grass waste skip added.	KD	23/11/22
04	Perimeter soil bund updated. Refer to proposed landscape plan.	KD	16/11/22
03	Additional aggregate bays added.	KD	17/10/22
02	Perimeter soil bund added.	KD	17/10/22
01	Add wheel wash and relocate screener / stock slightly north east.	KD	14/09/22

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 Daventry, Northamptonshire, NN11 0CS
 Registered in England No. 6019666

TITLE: Proposed Extension Area at Elbridge Farm, Chichester Road, Bognor Regis Site Layout Plan

CLIENT: RECYCLE SOUTHERN LIMITED

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DRAWN BY: KD	CHECKED BY: CS
DRAWING NO.: GPP/RS/BR/EXT/22/02	REV NO.: 17
SCALE: 1:500 at A2	DATE: 12 Sept 2022

SCALE BAR:

APPENDIX 3419/FRA/A3

Existing surface water drainage (drainage arrangement)



IF YOU HAVE A QUERY CALL US
 SCALING FROM THIS DRAWING OR OBTAINING DIMENSIONS ELECTRONICALLY MAY NOT PROVIDE ACCURATE INFORMATION AND SHOULD BE AVOIDED. WORK ONLY FROM DIMENSIONS.

GENERAL NOTES

DRAWINGS AND SPECIFICATIONS: This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialists drawings together with the specification.

PIPE DIAMETERS: All private drains to be 150mm diameter unless stated otherwise.

- KEY**
- Proposed private surface water drain
 - Proposed French drain, 0.7m wide x 0.8m deep stone filled trench with a perforated 150mm diameter land drain at the bottom.
 - Proposed kerb drain
 - Proposed drainage channel
 - Proposed 'Type 4', Rectangular brick chamber
 - Proposed 'Type 2', precast concrete ring overflow chamber
 - Permeable pavement which allows water infiltration. Minimum stone depth 0.4m.
 - Bunded concrete pad with a sealed drainage system and a sump for collecting water for treatment.

C.D.M. - SIGNIFICANT HAZARDS

- THE FOLLOWING HEALTH AND SAFETY HAZARDS ARE IDENTIFIED BY THE DESIGNER AS ABNORMAL IN PURSUANCE OF THE CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS 2007.
- RISK DURING CONSTRUCTION:**
- No abnormal risks have been identified relating to this design element.
- OPERATION / MAINTENANCE RISKS:**
- No abnormal risks have been identified relating to this design element.
- RISKS DURING DEMOLITION / DECOMMISSIONING / DISMANTLING / ALTERATIONS:**
- No abnormal risks have been identified relating to this design element.
- IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY COMPETENT & ADEQUATELY RESOURCED CONTRACTOR(S) WORKING TO SAFE SYSTEMS OF WORK.

C	BACKGROUND LAYOUT CHANGED. SEALED DRAINAGE INDICATED.	13.06.22
B	LOCATION OF OIL INTERCEPTOR CHANGED.	09.01.15
A	1ST ISSUE.	06.01.15
REV	REVISION DETAILS	DATE

CRADDYS
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PROJECT TITLE
 PROPOSED WTS AND MRF DEVELOPMENT AT ELBRIDGE FARM, CHICHESTER ROAD BOGNOR REGIS

DRAWING TITLE
 DRAINAGE ARRANGEMENT

CLIENT
 RECYCLE SOUTHERN LIMITED

STATUS
 INFORMATION

SCALE	DRAWN	CHECKED	APPROVED
1:200	AT A1	CS	CAP
DRG SIZE	DRAWING NUMBER		REV
A1	9819-0050		C

APPENDIX 3419/FRA/A4

EA product 4 data

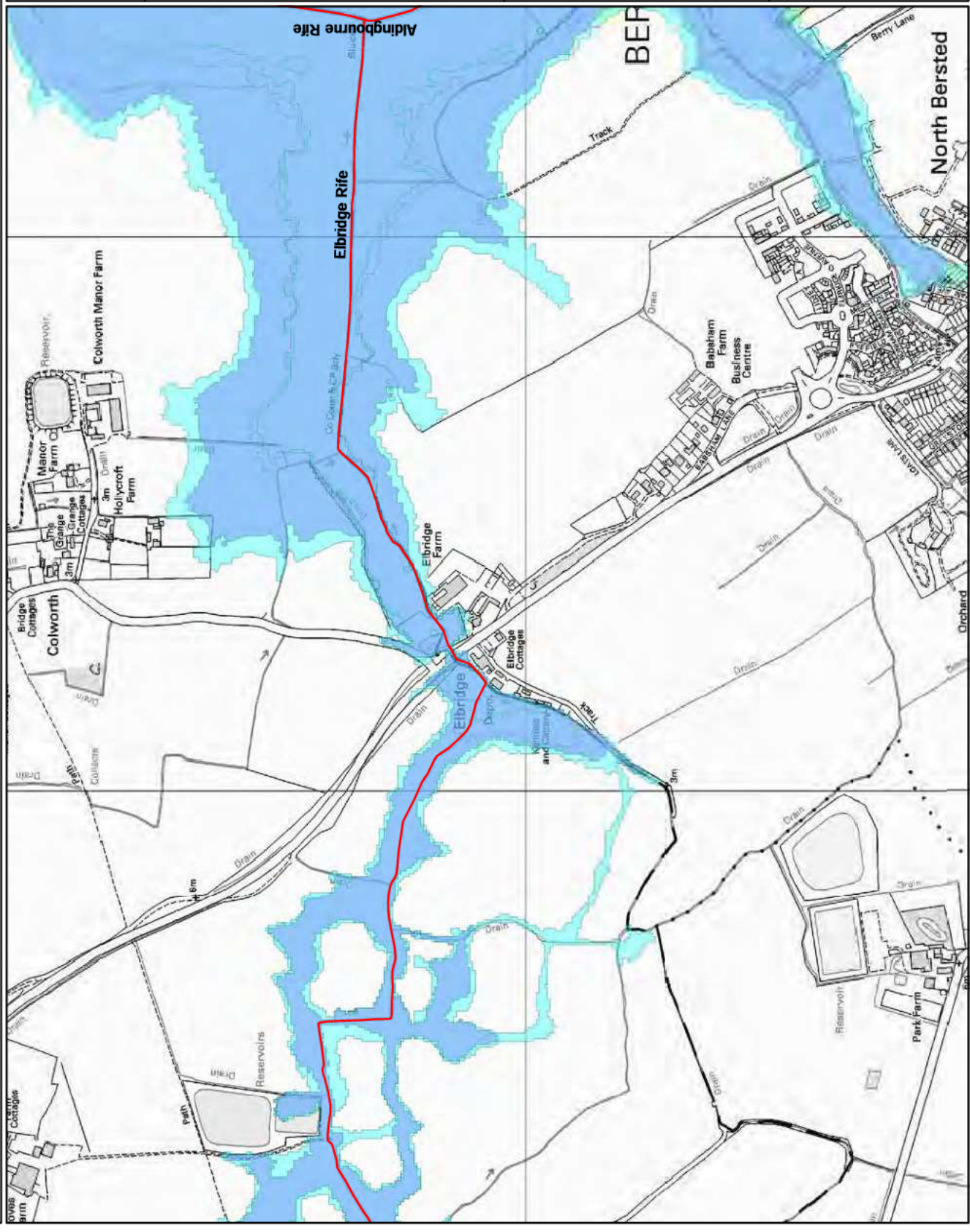
Flood Map for Planning Centered on Elbridge Farm, Chichester Road, Bognor Regis - Created 10/03/2014 [Ref: SSD/3141/KW]



Legend

- Main River
- Flood Zone 3
- Flood Zone 2

1:10,000 *
*when printed at A4.



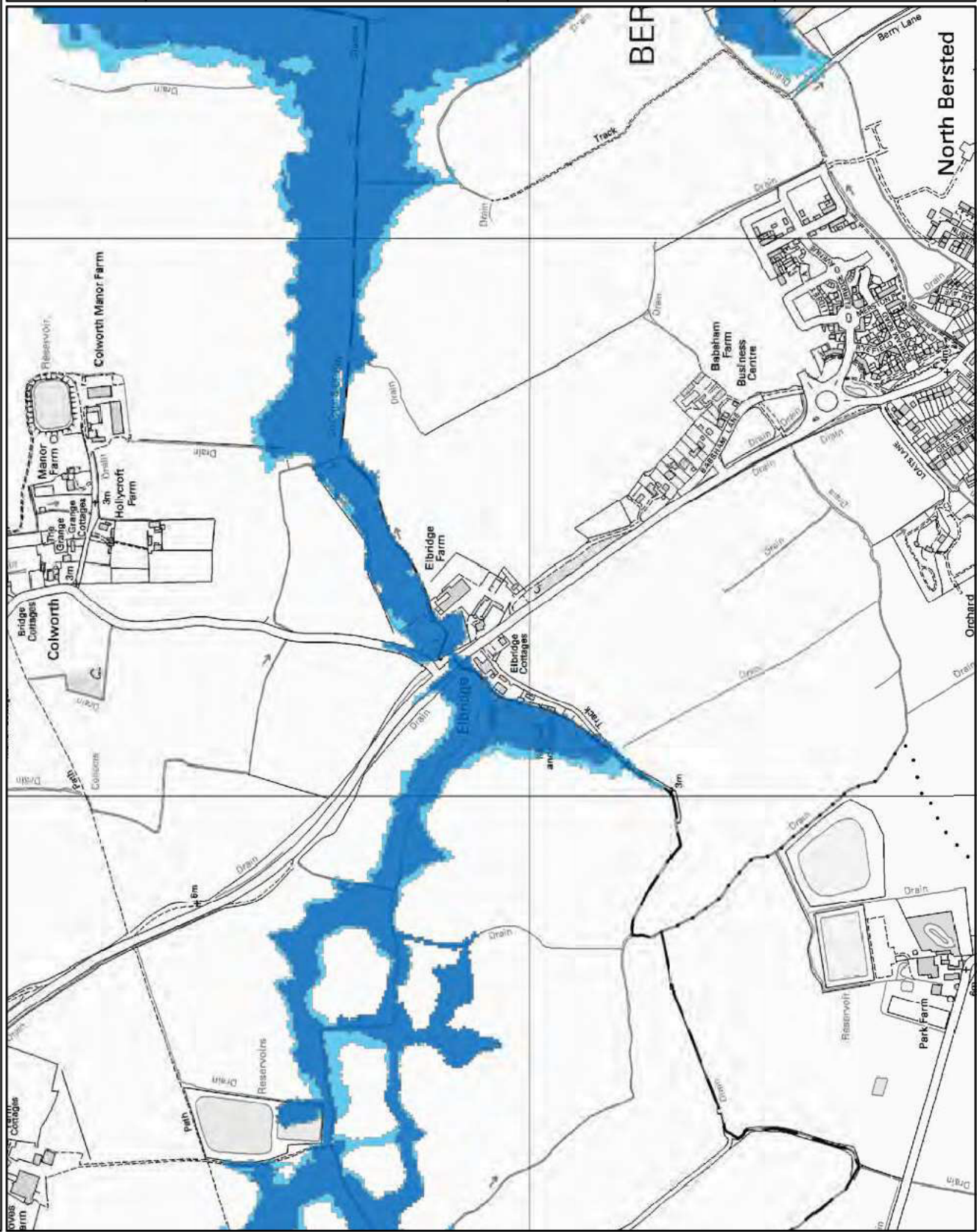
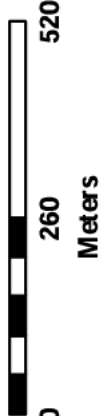
2009 JFLOW Fluvial Outlines Centered on Elbridge Farm, Chichester Road, Bognor Regis - Created 10/03/2014 [Ref: SSD/3141/KW]



Legend

- Fluvial 1% [1in100yr]
- Fluvial 0.1% [1in1000yr]

1:10,000 *
*when printed at A4.



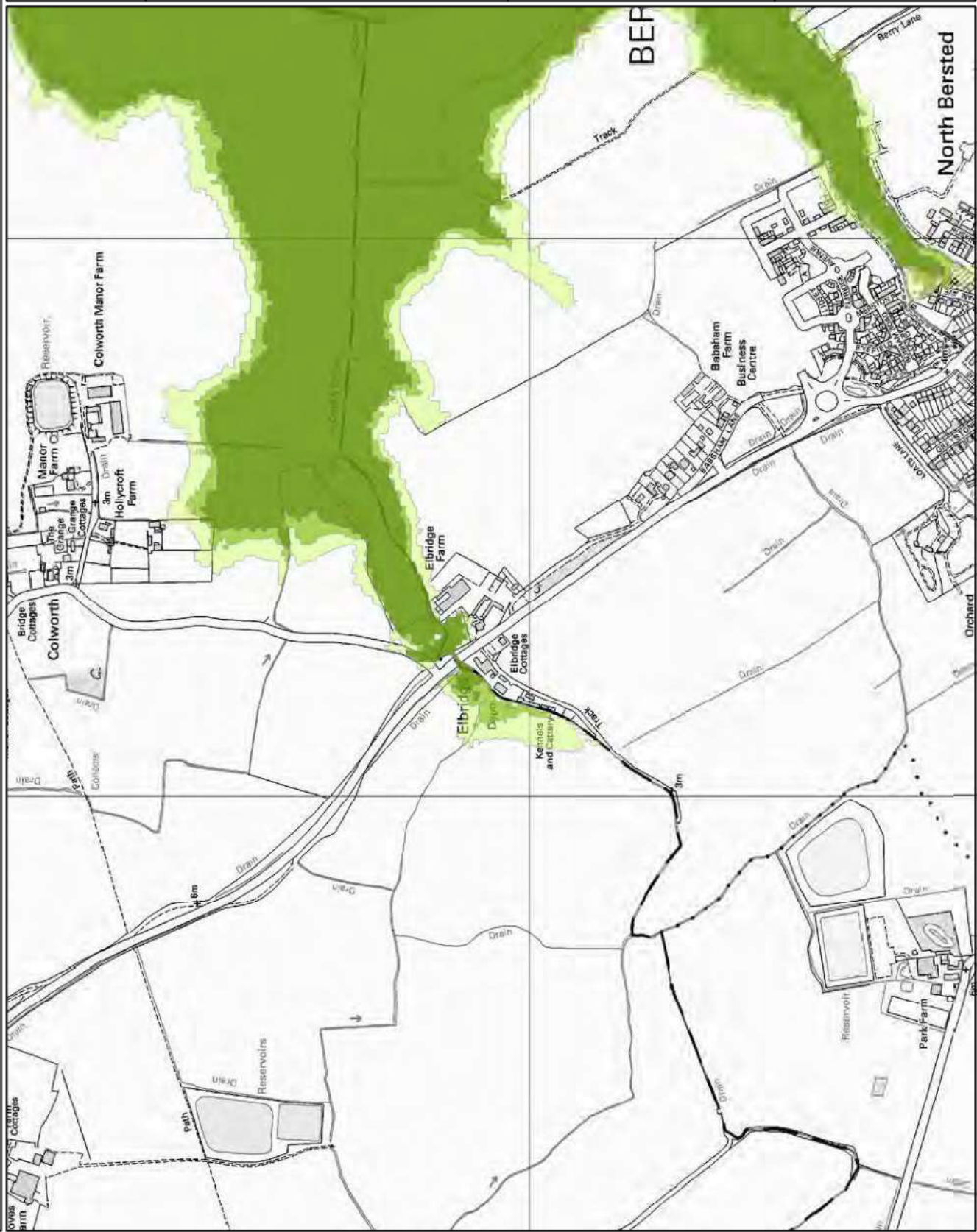
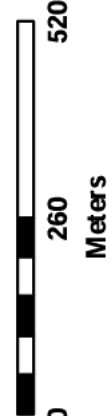
**2009 TUFLOW Tidal Outlines Centered on Elbridge Farm, Chichester Road, Bognor Regis -
Created 10/03/2014 [Ref: SSD/3141/KW]**



Legend

- Tidal 1% [1in100yr]
- Tidal 0.5% [1in200yr]
- Tidal 0.1% [1in1000yr]

1:10,000 *
*when printed at A4.

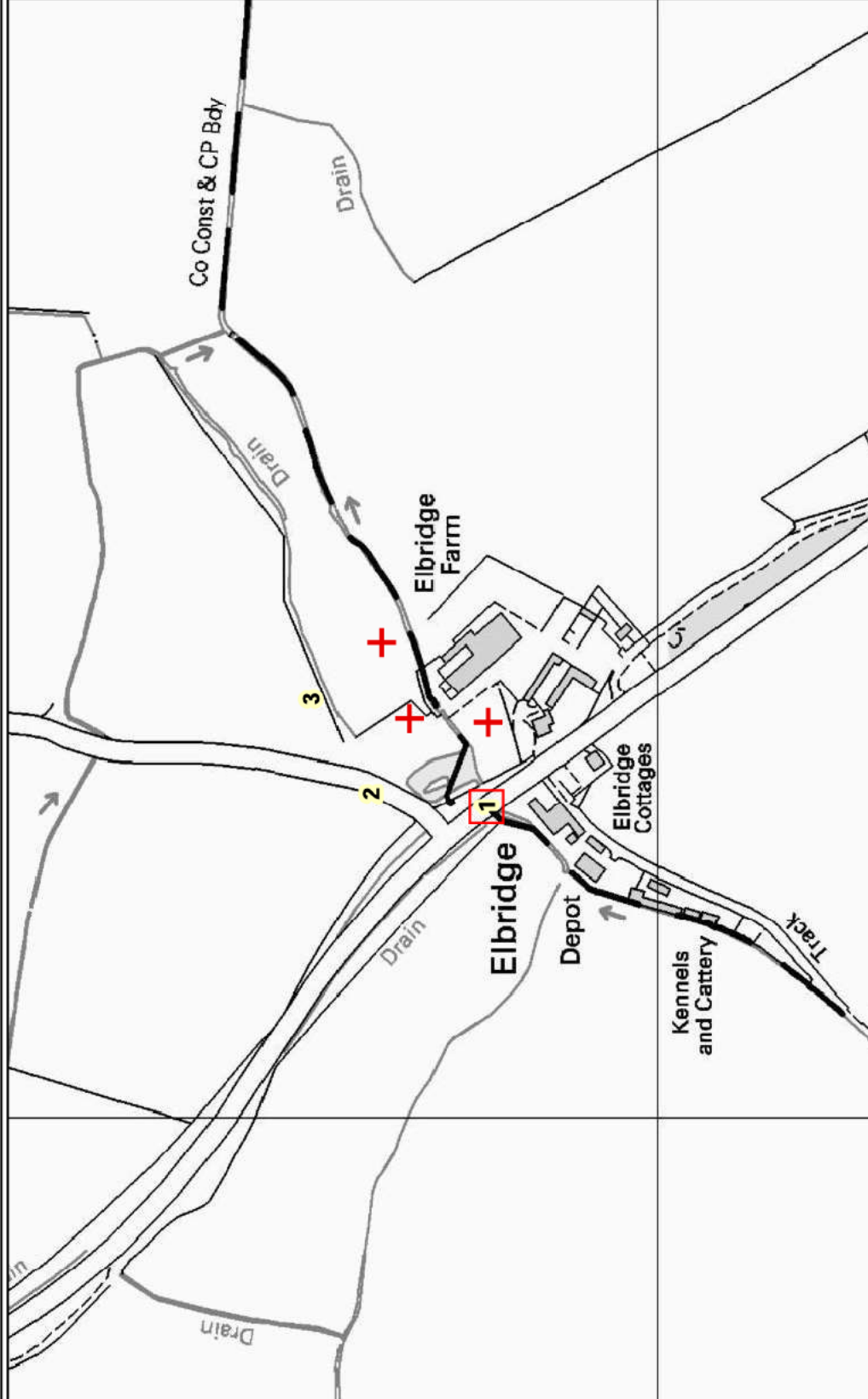
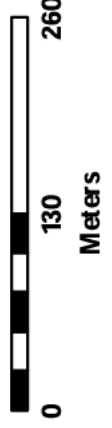


**Modelled Levels Centered on Elbridge Farm, Chichester Road, Bognor Regis -
Created 10/03/2014 [Ref: SSD/3141/KW]**



Legend
 1 + Node Point

1:5,000 *
 *when printed at A4.



Node Point	Easting	Northing	Undefended Modelled Levels [mAOD]		
			2009 JFLOW - Fluvial 1% AEP [1in1000yr]	2009 TUFLOW - Tidal 1% AEP [1in1000yr]	2009 TUFLOW - Tidal 0.5% AEP [1in2000yr]
1	491305	102131	2.55	2.57	2.74
2	491367	102211	2.41	2.57	2.74
3	491309	102191	2.04	2.57	2.74

APPENDIX 3419/FRA/A5

InfoDrainage calculations

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Catchment Area

Type : Catchment Area

Area (ha)	0.357
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (1)

Type : Catchment Area

Area (ha)	0.216
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (2)

Type : Catchment Area

Area (ha)	0.154
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
Simple Junction	Simple Junction	491360.940	102186.610					
Manhole (2)	Manhole	491325.653	102157.329	3.090	0.990	2.100	Circular	1.200
Manhole (3)	Manhole	491332.726	102163.224	3.030	1.030	2.000	Circular	2.000
Manhole (4)	Manhole	491360.467	102174.164	2.940	1.440	1.500	Circular	1.200
Manhole (5)	Manhole	491362.466	102180.973	2.940	1.940	1.000	Circular	1.200
Manhole (1)	Manhole	491350.921	102119.253	3.578	1.008	2.570	Circular	1.200
Simple Junction (5)	Simple Junction	491373.794	102183.554					
Manhole (6)	Manhole	491404.342	102149.756	4.198	1.171	3.027	Circular	1.200
Manhole	Manhole	491357.396	102178.828	2.940	1.929	1.011	Circular	1.200

Name	
Simple Junction	
Manhole (2)	None
Manhole (3)	None
Manhole (4)	None
Manhole (5)	None
Manhole (1)	None
Simple Junction (5)	
Manhole (6)	None
Manhole	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
Simple Junction	Inlet (1)	Pipe (3)	(None)	No Restriction
Manhole (2)	Inlet	Catchment Area (1)	(None)	No Restriction
	Inlet (1)	Pipe (1) (1)	(None)	No Restriction
Manhole (3)	Inlet	Pipe (4)	(None)	No Restriction
Manhole (5)	Inlet	Pipe (5) (1)	(None)	No Restriction
	Inlet (1)	Pipe (9)	(None)	No Restriction
Manhole (1)	Inlet	Catchment Area	(None)	No Restriction
Simple Junction (5)	Inlet	Pipe (8) (1)	(None)	No Restriction
Manhole	Inlet	Pipe (5)	(None)	No Restriction
	Inlet (1)	Pipe (1)	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
Manhole (2)	Outlet	Pipe (4)	Free Discharge
Manhole (3)	Outlet	Pipe	Free Discharge
Manhole (4)	Outlet	Pipe (1)	Free Discharge
Manhole (5)	Outlet	Pipe (3)	Orifice
	Diameter (m)		0.034
	Coefficient of Discharge		0.600
	Invert Level (m)		1.000
Manhole (1)	Outlet	Pipe (1) (1)	Free Discharge
Simple Junction (5)	Outlet	Pipe (9)	Free Discharge
Manhole (6)	Outlet	Pipe (8) (1)	Free Discharge
Manhole	Outlet	Pipe (5) (1)	Free Discharge

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	2.940
Depth (m)	1.200
Base Level (m)	1.040
Number of Crates Long	20
Number of Crates Wide	15
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	1
Crate Height (m)	1.2
Total Volume (m³)	342.700

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (2)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (5)
Outlet Type	Free Discharge

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Curved	Upstream Cover Level (m)
Pipe (4)	9.207	Pipe	92.074		0.6	300	<input type="checkbox"/>	3.090
Pipe (3)	6.067	Pipe	19.572		0.6	150	<input type="checkbox"/>	2.940
Pipe (1) (1)	52.376	Pipe	111.456		0.6	300	<input type="checkbox"/>	3.578
Pipe (9)	11.618	Pipe	33.194		0.6	150	<input checked="" type="checkbox"/>	1.500
Pipe (8) (1)	45.557	Pipe	27.163		0.6	150	<input type="checkbox"/>	4.198
Pipe (5)	14.131	Pipe	495.600		0.6	300	<input type="checkbox"/>	2.940
Pipe (5) (1)	5.505	Pipe	479.225		0.6	300	<input type="checkbox"/>	2.940
Pipe (1)	5.584	Pipe	11.430		0.6	150	<input type="checkbox"/>	2.940
Pipe	7.557	Pipe	125.944		0.6	300	<input type="checkbox"/>	3.030

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Flow Restriction (L/s)
Pipe (4)	2.100	3.030	2.000	All	
Pipe (3)	1.000	0.840	0.690	All	3.3
Pipe (1) (1)	2.570	3.090	2.100	All	
Pipe (9)	1.350	2.940	1.000	All	
Pipe (8) (1)	3.027	1.500	1.350	All	
Pipe (5)	1.040	2.940	1.011	None	
Pipe (5) (1)	1.011	2.940	1.000	None	
Pipe (1)	1.500	2.940	1.011	None	
Pipe	2.000	2.940	1.940	All	

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Manhole Schedule Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
Simple Junction		Diameter / Length: 1.200	{1} Pipe (3)	Pipe	0.690	Diam/Width: 150	Simple Junction
E:491360.940 N:102186.610							Not Applicable
Manhole (2)	3.090 2.100	Diameter / Length: 1.200	{1} Pipe (1) (1)	Pipe	2.100	Diam/Width: 300	Manhole
E:491325.653 N:102157.329	0.990		{a} Pipe (4)	Pipe	2.100	Diam/Width: 300	Not Applicable
Manhole (3)	3.030 2.000	Diameter / Length: 2.000	{1} Pipe (4)	Pipe	2.000	Diam/Width: 300	Manhole
E:491332.726 N:102163.224	1.030		{a} Pipe	Pipe	2.000	Diam/Width: 300	Not Applicable
Manhole (4)	2.940 1.500	Diameter / Length: 1.200					Manhole
E:491360.467 N:102174.164	1.440		{a} Pipe (1)	Pipe	1.500	Diam/Width: 150	Not Applicable
Manhole (5)	2.940 1.000	Diameter / Length: 1.200	{1} Pipe (9)	Pipe	1.000	Diam/Width: 150	Manhole
E:491362.466 N:102180.973	1.940		{2} Pipe (5) (1)	Pipe	1.000	Diam/Width: 300	
			{a} Pipe (3)	Pipe	1.000	Diam/Width: 150	Not Applicable

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Manhole Schedule Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
Manhole (1)	3.578 2.570	Diameter / Length: 1.200					Manhole
E:491350.921 N:102119.253	1.008		{a} Pipe (1) (1)	Pipe	2.570	Diam/Width: 300	Not Applicable
Simple Junction (5)		Diameter / Length: 1.200	{1} Pipe (8) (1)	Pipe	1.350	Diam/Width: 150	Simple Junction
E:491373.794 N:102183.554			{a} Pipe (9)	Pipe	1.350	Diam/Width: 150	Not Applicable
Manhole (6)	4.198 3.027	Diameter / Length: 1.200					Manhole
E:491404.342 N:102149.756	1.171		{a} Pipe (8) (1)	Pipe	3.027	Diam/Width: 150	Not Applicable
Manhole	2.940 1.011	Diameter / Length: 1.200	{1} Pipe (5)	Pipe	1.011	Diam/Width: 300	Manhole
E:491357.396 N:102178.828	1.929		{2} Pipe (1)	Pipe	1.011	Diam/Width: 150	
			{a} Pipe (5) (1)	Pipe	1.011	Diam/Width: 300	Not Applicable

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Network Design Criteria Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	<input type="checkbox"/>
Reduce Channel Depths	<input type="checkbox"/>

Manhole Options

Apply Offset	<input type="checkbox"/>
--------------	--------------------------

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Outfall Details Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
Simple Junction	Free Discharge		

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Title Rainfall Analysis Criteria	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	<input type="checkbox"/>

Rainfall

FEH 2022	Type: FEH
Site Location	GB 491337 102093 SU 91337 02093
Rainfall Version	2022
Summer	<input checked="" type="checkbox"/>
Winter	<input checked="" type="checkbox"/>

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	0.000
30.0	25.000
50.0	0.000
100.0	0.000
100.0	25.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Title UK and Ireland Rural Runoff Calculator	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	1.50
SAAR (mm)	868.0
Soil	0.3
Region	Region 7
Urban	0
Return Period (years)	0

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 7	3.5	3.5	3.0	8.0	11.2

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m ³)
Catchment Area	FEH 2022: 2 years: +0 %: 15 mins: Winter	0.36	61.1	28.266
Catchment Area (1)	FEH 2022: 2 years: +0 %: 15 mins: Winter	0.22	36.9	17.094
Catchment Area (2)	FEH 2022: 2 years: +0 %: 15 mins: Winter	0.15	26.3	12.186

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m ³)
Catchment Area	FEH 2022: 30 years: +0 %: 15 mins: Winter	0.36	131.0	60.588
Catchment Area (1)	FEH 2022: 30 years: +0 %: 15 mins: Winter	0.22	79.2	36.651
Catchment Area (2)	FEH 2022: 30 years: +0 %: 15 mins: Winter	0.15	56.5	26.124

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH 2022: 30 years: +25 %: 15 mins: Winter	0.36	163.7	75.735
Catchment Area (1)	FEH 2022: 30 years: +25 %: 15 mins: Winter	0.22	99.0	45.810
Catchment Area (2)	FEH 2022: 30 years: +25 %: 15 mins: Winter	0.15	70.6	32.655

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 50 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH 2022: 50 years: +0 %: 15 mins: Winter	0.36	144.5	66.861
Catchment Area (1)	FEH 2022: 50 years: +0 %: 15 mins: Winter	0.22	87.4	40.446
Catchment Area (2)	FEH 2022: 50 years: +0 %: 15 mins: Winter	0.15	62.3	28.830

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH 2022: 100 years: +0 %: 15 mins: Winter	0.36	164.1	75.912
Catchment Area (1)	FEH 2022: 100 years: +0 %: 15 mins: Winter	0.22	99.3	45.924
Catchment Area (2)	FEH 2022: 100 years: +0 %: 15 mins: Winter	0.15	70.7	32.730

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Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH 2022: 100 years: +25 %: 15 mins: Winter	0.36	205.1	94.890
Catchment Area (1)	FEH 2022: 100 years: +25 %: 15 mins: Winter	0.22	124.1	57.399
Catchment Area (2)	FEH 2022: 100 years: +25 %: 15 mins: Winter	0.15	88.4	40.917

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flooded Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Simple Junction	FEH 2022: 2 years: +0 %: 15 mins: Summer		0.690	0.707	0.017	1.1			1.1	1.240	OK
Manhole (2)	FEH 2022: 2 years: +0 %: 15 mins: Summer	3.090	2.100	2.348	0.248	91.1	0.281	0.000	85.2	40.493	OK
Manhole (3)	FEH 2022: 2 years: +0 %: 15 mins: Summer	3.030	2.000	2.242	0.242	85.2	0.760	0.000	81.7	40.462	OK
Manhole (4)	FEH 2022: 2 years: +0 %: 15 mins: Summer	2.940	1.500	1.500	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole (5)	FEH 2022: 2 years: +0 %: 15 mins: Summer	2.940	1.000	1.212	0.212	2.7	0.240	0.000	1.1	1.260	Surcharged
Manhole (1)	FEH 2022: 2 years: +0 %: 15 mins: Summer	3.578	2.570	2.726	0.156	58.1	0.176	0.000	55.9	25.242	OK
Simple Junction (5)	FEH 2022: 2 years: +0 %: 15 mins: Summer		1.350	1.350	0.000	0.0			0.0	0.000	OK
Manhole (6)	FEH 2022: 2 years: +0 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 2 years: +0 %: 15 mins: Summer	2.940	1.011	1.212	0.201	5.7	0.227	0.000	2.7	1.778	OK

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flooded Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
Simple Junction	FEH 2022: 30 years: +0 %: 15 mins: Summer		0.690	0.710	0.020	1.5			1.5	1.844	OK
Manhole (2)	FEH 2022: 30 years: +0 %: 15 mins: Summer	3.090	2.100	3.011	0.911	188.5	1.030	0.000	185.6	86.847	Flood Risk
Manhole (3)	FEH 2022: 30 years: +0 %: 15 mins: Summer	3.030	2.000	2.593	0.593	185.6	1.862	0.000	180.1	86.824	Surcharged
Manhole (4)	FEH 2022: 30 years: +0 %: 15 mins: Summer	2.940	1.500	1.500	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole (5)	FEH 2022: 30 years: +0 %: 15 mins: Summer	2.940	1.000	1.414	0.414	2.9	0.468	0.000	1.5	2.040	Surcharged
Manhole (1)	FEH 2022: 30 years: +0 %: 15 mins: Winter	3.578	2.570	3.578	1.008	131.0	1.564	0.424	110.2	60.554	Flood Risk
Simple Junction (5)	FEH 2022: 30 years: +0 %: 15 mins: Summer		1.350	1.414	0.064	1.0			0.0	0.010	OK
Manhole (6)	FEH 2022: 30 years: +0 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 30 years: +0 %: 15 mins: Summer	2.940	1.011	1.414	0.403	5.5	0.455	0.000	2.9	2.870	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Flooded Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
Simple Junction	FEH 2022: 30 years: +25 %: 15 mins: Summer		0.690	0.711	0.021	1.7			1.7	2.064	OK
Manhole (2)	FEH 2022: 30 years: +25 %: 15 mins: Winter	3.090	2.100	3.090	0.990	203.4	1.325	0.205	193.4	121.599	Flood
Manhole (3)	FEH 2022: 30 years: +25 %: 15 mins: Summer	3.030	2.000	2.643	0.643	193.4	2.020	0.000	193.3	108.547	Surcharged
Manhole (4)	FEH 2022: 30 years: +25 %: 480 mins: Winter	2.940	1.500	2.945	1.445	1.1	6.211	4.582	2.9	5.823	Flood
Manhole (5)	FEH 2022: 30 years: +25 %: 480 mins: Winter	2.940	1.000	2.944	1.944	5.2	6.633	4.439	3.3	136.214	Flood
Manhole (1)	FEH 2022: 30 years: +25 %: 15 mins: Winter	3.578	2.570	3.582	1.012	163.7	4.772	3.632	129.5	75.648	Flood
Simple Junction (5)	FEH 2022: 30 years: +25 %: 15 mins: Summer		1.350	1.508	0.158	2.0			0.0	0.005	Surcharged
Manhole (6)	FEH 2022: 30 years: +25 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 30 years: +25 %: 480 mins: Winter	2.940	1.011	2.945	1.934	6.9	6.721	4.539	5.2	142.813	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 50 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flooded Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
Simple Junction	FEH 2022: 50 years: +0 %: 15 mins: Summer		0.690	0.710	0.020	1.6			1.6	1.940	OK
Manhole (2)	FEH 2022: 50 years: +0 %: 15 mins: Summer	3.090	2.100	3.059	0.959	191.4	1.084	0.000	190.2	95.836	Flood Risk
Manhole (3)	FEH 2022: 50 years: +0 %: 15 mins: Summer	3.030	2.000	2.624	0.624	190.2	1.959	0.000	188.5	95.815	Surcharged
Manhole (4)	FEH 2022: 50 years: +0 %: 15 mins: Summer	2.940	1.500	1.500	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole (5)	FEH 2022: 50 years: +0 %: 15 mins: Summer	2.940	1.000	1.452	0.452	3.5	0.512	0.000	1.6	2.279	Surcharged
Manhole (1)	FEH 2022: 50 years: +0 %: 15 mins: Winter	3.578	2.570	3.579	1.010	144.5	2.630	1.490	106.2	66.793	Flood
Simple Junction (5)	FEH 2022: 50 years: +0 %: 15 mins: Summer		1.350	1.452	0.102	1.1			0.0	0.010	OK
Manhole (6)	FEH 2022: 50 years: +0 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 50 years: +0 %: 15 mins: Summer	2.940	1.011	1.453	0.442	7.1	0.499	0.000	3.5	3.154	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flooded Volume


Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
Simple Junction	FEH 2022: 100 years: +0 %: 15 mins: Summer		0.690	0.711	0.021	1.7			1.7	2.067	OK
Manhole (2)	FEH 2022: 100 years: +0 %: 15 mins: Winter	3.090	2.100	3.090	0.990	203.7	1.335	0.215	193.4	121.888	Flood
Manhole (3)	FEH 2022: 100 years: +0 %: 15 mins: Summer	3.030	2.000	2.643	0.643	193.4	2.020	0.000	193.3	108.815	Surcharged
Manhole (4)	FEH 2022: 100 years: +0 %: 960 mins: Winter	2.940	1.500	2.944	1.444	1.0	5.778	4.149	2.2	5.526	Flood
Manhole (5)	FEH 2022: 100 years: +0 %: 960 mins: Winter	2.940	1.000	2.944	1.944	5.5	6.232	4.038	3.3	260.879	Flood
Manhole (1)	FEH 2022: 100 years: +0 %: 15 mins: Winter	3.578	2.570	3.582	1.012	164.1	4.820	3.679	129.5	75.830	Flood
Simple Junction (5)	FEH 2022: 100 years: +0 %: 15 mins: Summer		1.350	1.509	0.159	2.0			0.0	0.005	Surcharged
Manhole (6)	FEH 2022: 100 years: +0 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 100 years: +0 %: 960 mins: Winter	2.940	1.011	2.945	1.933	7.0	6.328	4.146	5.5	266.642	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Flooded Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
Simple Junction	FEH 2022: 100 years: +25 %: 15 mins: Summer		0.690	0.712	0.022	1.9			1.9	2.295	OK
Manhole (2)	FEH 2022: 100 years: +25 %: 15 mins: Winter	3.090	2.100	3.092	0.992	228.9	3.153	2.034	193.6	152.299	Flood
Manhole (3)	FEH 2022: 100 years: +25 %: 15 mins: Summer	3.030	2.000	2.644	0.644	193.5	2.022	0.000	193.5	135.993	Surcharged
Manhole (4)	FEH 2022: 100 years: +25 %: 960 mins: Winter	2.940	1.500	2.977	1.477	4.5	39.030	37.402	1.8	38.607	Flood
Manhole (5)	FEH 2022: 100 years: +25 %: 960 mins: Winter	2.940	1.000	2.977	1.977	10.4	39.480	37.286	3.4	306.054	Flood
Manhole (1)	FEH 2022: 100 years: +25 %: 15 mins: Winter	3.578	2.570	3.595	1.025	205.1	18.069	16.929	120.4	94.767	Flood
Simple Junction (5)	FEH 2022: 100 years: +25 %: 15 mins: Summer		1.350	1.628	0.278	0.6			0.0	0.023	Surcharged
Manhole (6)	FEH 2022: 100 years: +25 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 100 years: +25 %: 960 mins: Winter	2.940	1.011	2.978	1.966	19.5	39.580	37.399	9.9	345.375	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design		Date 23/10/2023			
		Designed by CH	Checked by		Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase		Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB			



FEH 2022: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022: 2 years: +0 %: 480 mins: Winter	1.585	1.585	0.545	0.545	16.9	155.308	0.000	0.000	1.8	84.127	54.681	OK

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022 30 years: +0 %: 480 mins: Winter	2.070	2.070	1.030	1.030	30.2	293.196	0.000	0.000	2.5	116.888	14.445	OK

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022 30 years: +25 %: 480 mins: Winter	2.945	2.945	1.905	1.905	37.8	343.639	1.193	0.000	6.9	139.016	-0.274	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design		Date 23/10/2023		
		Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase		Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 50 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022 50 years: +0 %: 960 mins: Winter	2.176	2.176	1.136	1.136	18.7	323.484	0.000	0.000	2.6	233.906	5.607	OK

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022: 100 years: +0 %: 960 mins: Winter	2.944	2.944	1.904	1.904	21.3	343.509	1.063	0.000	7.0	263.024	-0.236	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank
By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022: 100 years: +25 %: 960 mins: Winter	2.978	2.978	1.938	1.938	26.6	352.977	10.530	0.000	19.5	309.036	-2.999	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 2 years: +0 %: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	3.090	2.362	0.258	45.352	1.4	0.77	89.8	OK
Pipe (3)	FEH 2022: 2 years: +0 %: 480 mins: Winter	Pipe	Manhole (5)	Simple Junction	2.940	1.585	0.022	81.788	1.1	0.04	1.8	Surcharged
Pipe (1) (1)	FEH 2022: 2 years: +0 %: 15 mins: Winter	Pipe	Manhole (1)	Manhole (2)	3.578	2.731	0.211	28.272	1.1	0.56	59.0	OK
Pipe (9)	FEH 2022: 2 years: +0 %: 360 mins: Summer	Pipe	Simple Junction (5)	Manhole (5)	1.500	1.508	0.150	0.000	0.0	0	0.0	Surcharged
Pipe (8) (1)	FEH 2022: 2 years: +0 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.000	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 2 years: +0 %: 15 mins: Winter	Pipe	Cellular Storage	Manhole	2.940	1.233	0.208	2.775	0.4	0.15	7.2	OK
Pipe (5) (1)	FEH 2022: 2 years: +0 %: 15 mins: Winter	Pipe	Manhole	Manhole (5)	2.940	1.234	0.228	1.907	0.2	0.07	3.3	OK
Pipe (1)	FEH 2022: 2 years: +0 %: 480 mins: Winter	Pipe	Manhole (4)	Manhole	2.940	1.585	0.150	0.000	0.0	0	0.0	OK
Pipe	FEH 2022: 2 years: +0 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.254	0.235	45.322	1.4	0.87	86.0	OK

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 30 years: +0 %: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	3.090	3.040	0.300	97.254	2.7	1.62	188.1	Flood Risk
Pipe (3)	FEH 2022: 30 years: +0 %: 480 mins: Winter	Pipe	Manhole (5)	Simple Junction	2.940	2.070	0.026	112.414	1.2	0.06	2.5	Surcharged
Pipe (1) (1)	FEH 2022: 30 years: +0 %: 15 mins: Summer	Pipe	Manhole (1)	Manhole (2)	3.578	3.578	0.300	54.068	1.6	1.07	113.1	Flood Risk
Pipe (9)	FEH 2022: 30 years: +0 %: 15 mins: Winter	Pipe	Simple Junction (5)	Manhole (5)	1.500	1.458	0.150	0.000	0.0	0	0.0	OK
Pipe (8) (1)	FEH 2022: 30 years: +0 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.032	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 30 years: +0 %: 15 mins: Winter	Pipe	Cellular Storage	Manhole	2.940	1.459	0.300	4.549	0.4	0.16	7.7	Surcharged
Pipe (5) (1)	FEH 2022: 30 years: +0 %: 30 mins: Winter	Pipe	Manhole	Manhole (5)	2.940	1.594	0.300	6.592	0.2	0.08	4.2	Surcharged
Pipe (1)	FEH 2022: 30 years: +0 %: 30 mins: Summer	Pipe	Manhole (4)	Manhole	2.940	1.533	0.150	0.000	0.0	0	0.0	OK
Pipe	FEH 2022: 30 years: +0 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.614	0.300	97.231	2.6	1.88	186.2	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 30 years: +25 %: 15 mins: Summer	Pipe	Manhole (2)	Manhole (3)	3.090	3.090	0.300	108.565	2.7	1.67	193.4	Flood
Pipe (3)	FEH 2022: 30 years: +25 %: 480 mins: Winter	Pipe	Manhole (5)	Simple Junction	2.940	2.944	0.030	133.679	1.3	0.08	3.3	Flood
Pipe (1) (1)	FEH 2022: 30 years: +25 %: 15 mins: Winter	Pipe	Manhole (1)	Manhole (2)	3.578	3.582	0.300	75.648	1.8	1.23	129.5	Flood
Pipe (9)	FEH 2022: 30 years: +25 %: 360 mins: Winter	Pipe	Simple Junction (5)	Manhole (5)	1.500	2.944	0.150	0.000	0.0	0.02	0.5	Surcharged
Pipe (8) (1)	FEH 2022: 30 years: +25 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.079	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 30 years: +25 %: 15 mins: Summer	Pipe	Cellular Storage	Manhole	2.940	1.508	0.300	4.919	0.4	0.16	7.9	Surcharged
Pipe (5) (1)	FEH 2022: 30 years: +25 %: 360 mins: Winter	Pipe	Manhole	Manhole (5)	2.940	2.943	0.300	100.863	0.2	0.14	7.1	Flood
Pipe (1)	FEH 2022: 30 years: +25 %: 480 mins: Winter	Pipe	Manhole (4)	Manhole	2.940	2.945	0.150	0.000	0.2	0.05	2.9	Flood
Pipe	FEH 2022: 30 years: +25 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.643	0.300	121.579	2.7	1.95	193.4	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 50 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 50 years: +0 %: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	3.090	3.078	0.300	107.302	2.7	1.66	192.4	Flood Risk
Pipe (3)	FEH 2022: 50 years: +0 %: 960 mins: Winter	Pipe	Manhole (5)	Simple Junction	2.940	2.176	0.026	230.014	1.3	0.06	2.6	Surcharged
Pipe (1) (1)	FEH 2022: 50 years: +0 %: 15 mins: Summer	Pipe	Manhole (1)	Manhole (2)	3.578	3.579	0.300	59.666	1.5	1.03	108.3	Flood
Pipe (9)	FEH 2022: 50 years: +0 %: 15 mins: Winter	Pipe	Simple Junction (5)	Manhole (5)	1.500	1.502	0.150	0.000	0.0	0	0.0	Surcharged
Pipe (8) (1)	FEH 2022: 50 years: +0 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.051	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 50 years: +0 %: 15 mins: Winter	Pipe	Cellular Storage	Manhole	2.940	1.502	0.300	4.890	0.4	0.15	7.4	Surcharged
Pipe (5) (1)	FEH 2022: 50 years: +0 %: 30 mins: Winter	Pipe	Manhole	Manhole (5)	2.940	1.654	0.300	6.998	0.2	0.09	4.7	Surcharged
Pipe (1)	FEH 2022: 50 years: +0 %: 30 mins: Summer	Pipe	Manhole (4)	Manhole	2.940	1.587	0.150	0.000	0.0	0	0.0	OK
Pipe	FEH 2022: 50 years: +0 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.634	0.300	107.279	2.7	1.93	190.9	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 100 years: +0 %: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	3.090	3.090	0.300	121.888	2.7	1.67	193.4	Flood
Pipe (3)	FEH 2022: 100 years: +0 %: 960 mins: Winter	Pipe	Manhole (5)	Simple Junction	2.940	2.944	0.030	258.540	1.3	0.08	3.3	Flood
Pipe (1) (1)	FEH 2022: 100 years: +0 %: 15 mins: Winter	Pipe	Manhole (1)	Manhole (2)	3.578	3.582	0.300	75.830	1.8	1.23	129.5	Flood
Pipe (9)	FEH 2022: 100 years: +0 %: 480 mins: Winter	Pipe	Simple Junction (5)	Manhole (5)	1.500	2.942	0.150	0.000	0.0	0.02	0.7	Surcharged
Pipe (8) (1)	FEH 2022: 100 years: +0 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.080	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 100 years: +0 %: 360 mins: Winter	Pipe	Cellular Storage	Manhole	2.940	2.941	0.300	106.707	0.2	0.17	8.6	Flood
Pipe (5) (1)	FEH 2022: 100 years: +0 %: 960 mins: Winter	Pipe	Manhole	Manhole (5)	2.940	2.945	0.300	260.724	0.1	0.11	5.5	Flood
Pipe (1)	FEH 2022: 100 years: +0 %: 960 mins: Winter	Pipe	Manhole (4)	Manhole	2.940	2.944	0.150	0.000	0.1	0.04	2.2	Flood
Pipe	FEH 2022: 100 years: +0 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.643	0.300	121.868	2.7	1.95	193.4	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 100 years: +25 %: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	3.090	3.092	0.300	152.299	2.7	1.67	193.6	Flood
Pipe (3)	FEH 2022: 100 years: +25 %: 960 mins: Winter	Pipe	Manhole (5)	Simple Junction	2.940	2.977	0.030	303.379	1.3	0.08	3.4	Flood
Pipe (1) (1)	FEH 2022: 100 years: +25 %: 15 mins: Summer	Pipe	Manhole (1)	Manhole (2)	3.578	3.589	0.300	84.605	1.8	1.24	130.0	Flood
Pipe (9)	FEH 2022: 100 years: +25 %: 120 mins: Winter	Pipe	Simple Junction (5)	Manhole (5)	1.500	2.949	0.150	0.000	0.1	0.04	1.1	Surcharged
Pipe (8) (1)	FEH 2022: 100 years: +25 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.139	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 100 years: +25 %: 240 mins: Winter	Pipe	Cellular Storage	Manhole	2.940	2.964	0.300	110.972	0.4	0.62	30.8	Flood
Pipe (5) (1)	FEH 2022: 100 years: +25 %: 360 mins: Winter	Pipe	Manhole	Manhole (5)	2.940	2.971	0.300	131.014	0.2	0.29	14.8	Flood
Pipe (1)	FEH 2022: 100 years: +25 %: 1440 mins: Summer	Pipe	Manhole (4)	Manhole	2.940	2.955	0.150	0.000	0.1	0.04	2.4	Flood
Pipe	FEH 2022: 100 years: +25 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.644	0.300	152.284	2.7	1.96	193.6	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		

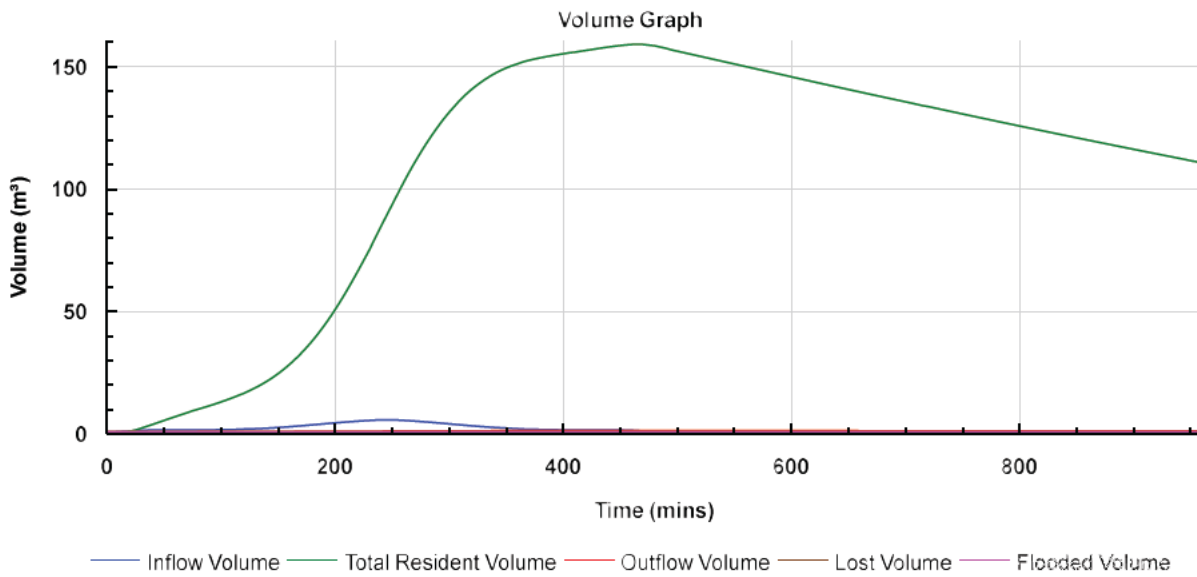
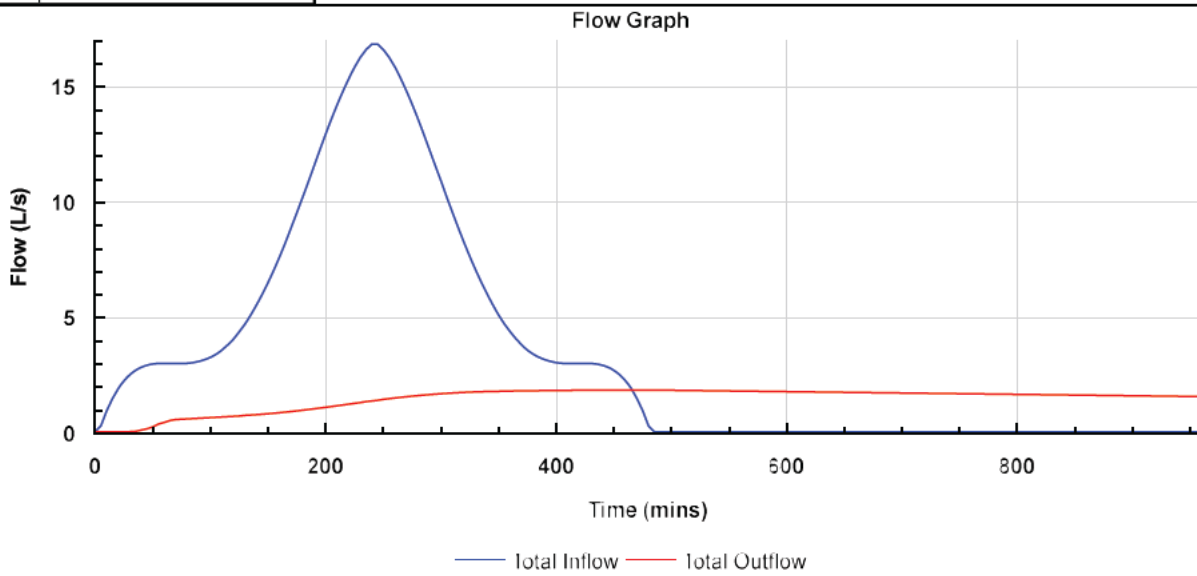


Phase
FEH 2022: 2 years: Increase Rainfall (%): +0: 480 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m ³)	Max. Outflow (L/s)	Total Outflow Volume (m ³)
Simple Junction			1.8	81.788
TOTAL	16.9	192.138	1.8	81.788

Graphs



Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		

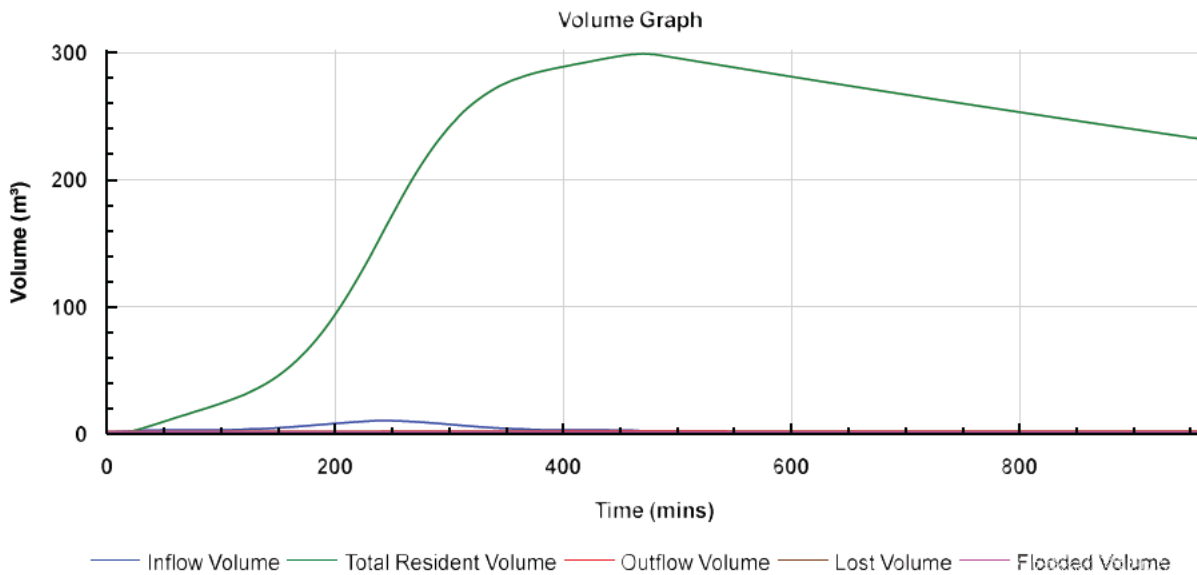
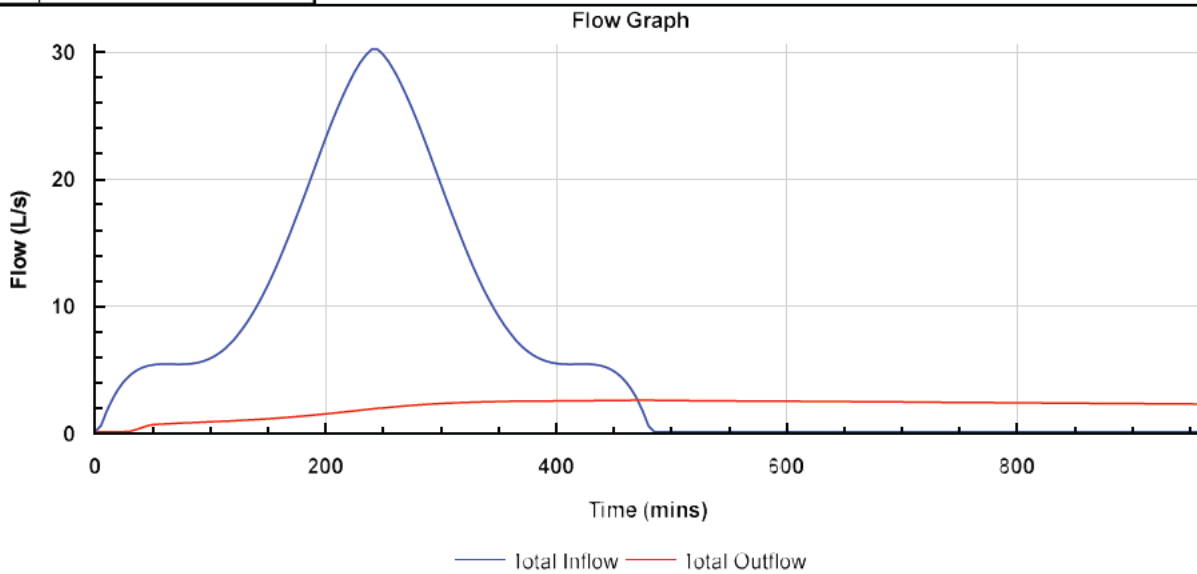


Phase
FEH 2022: 30 years: Increase Rainfall (%): +0: 480 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Simple Junction			2.5	112.414
TOTAL	30.2	344.430	2.5	112.414

Graphs



Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



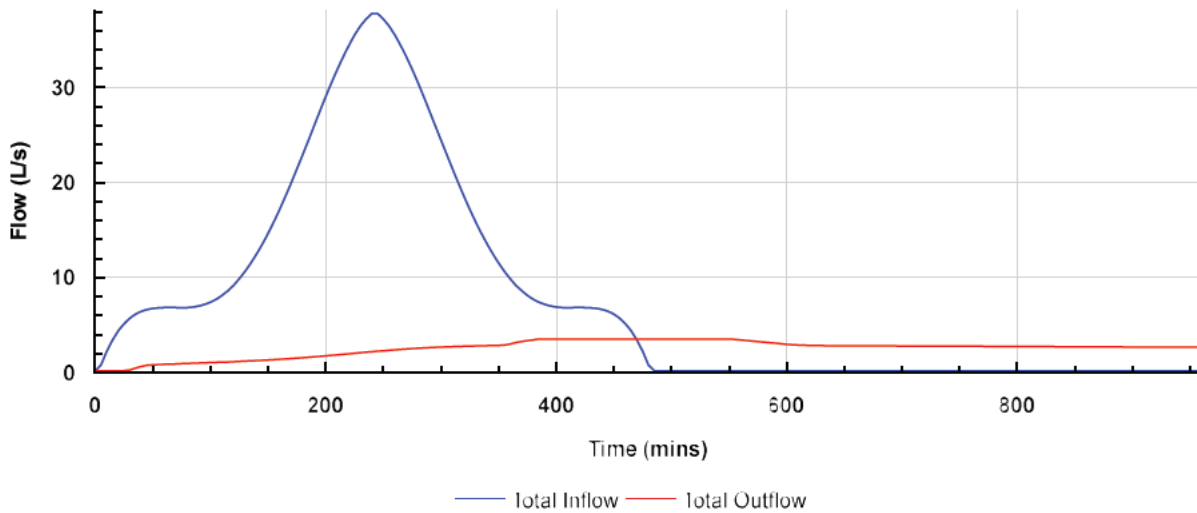
Phase
FEH 2022: 30 years: Increase Rainfall (%): +25: 480 mins: Winter

Tables

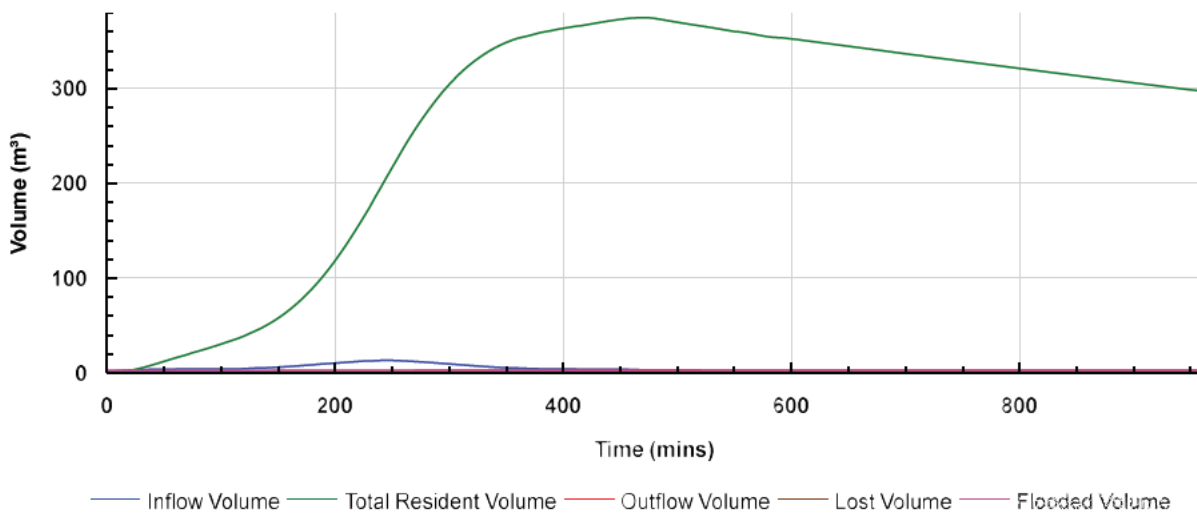
Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Simple Junction			3.3	133.679
TOTAL	37.8	430.500	3.3	133.679

Graphs

Flow Graph



Volume Graph



Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



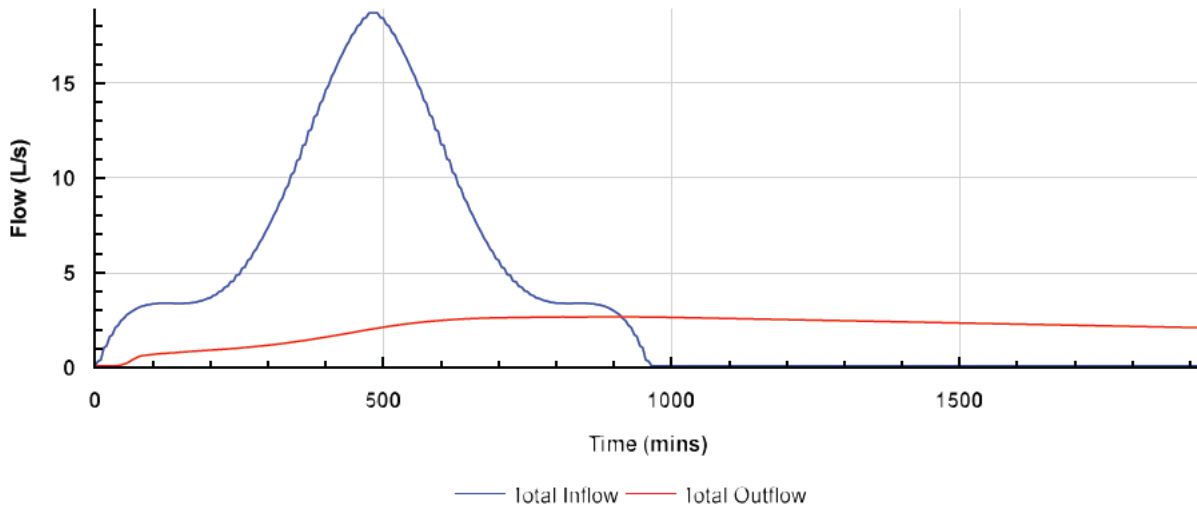
Phase
FEH 2022: 50 years: Increase Rainfall (%): +0: 960 mins: Winter

Tables

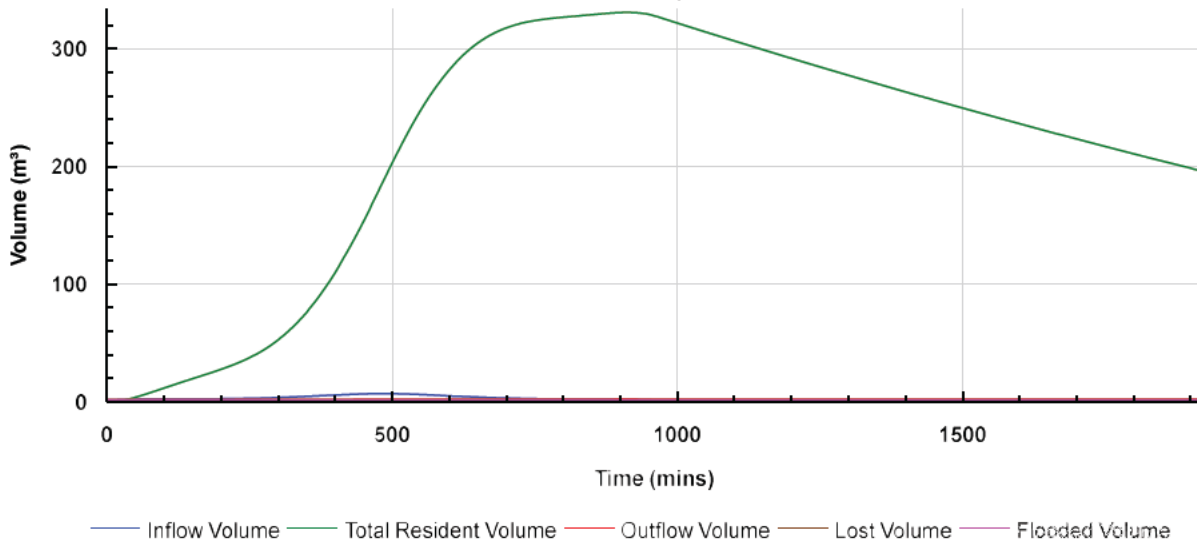
Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Simple Junction			2.6	230.014
TOTAL	18.7	426.108	2.6	230.014

Graphs

Flow Graph



Volume Graph



Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		

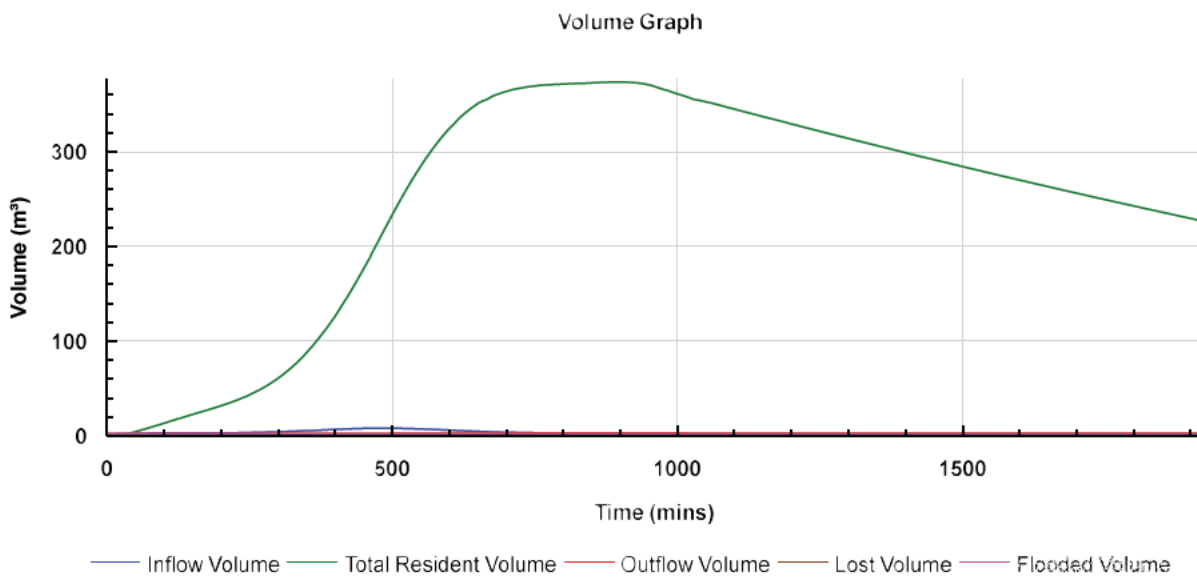
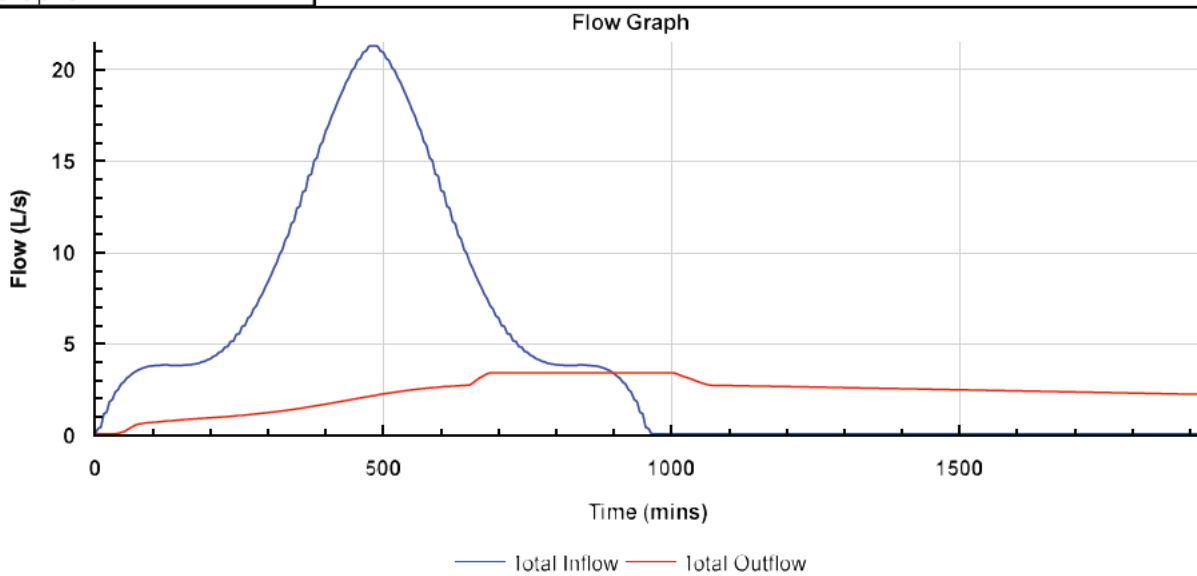


Phase
FEH 2022: 100 years: Increase Rainfall (%): +0: 960 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Simple Junction			3.3	258.540
TOTAL	21.3	485.430	3.3	258.540

Graphs



Elbridge Farm Recycling Centre Surface Water Drainage Design	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		

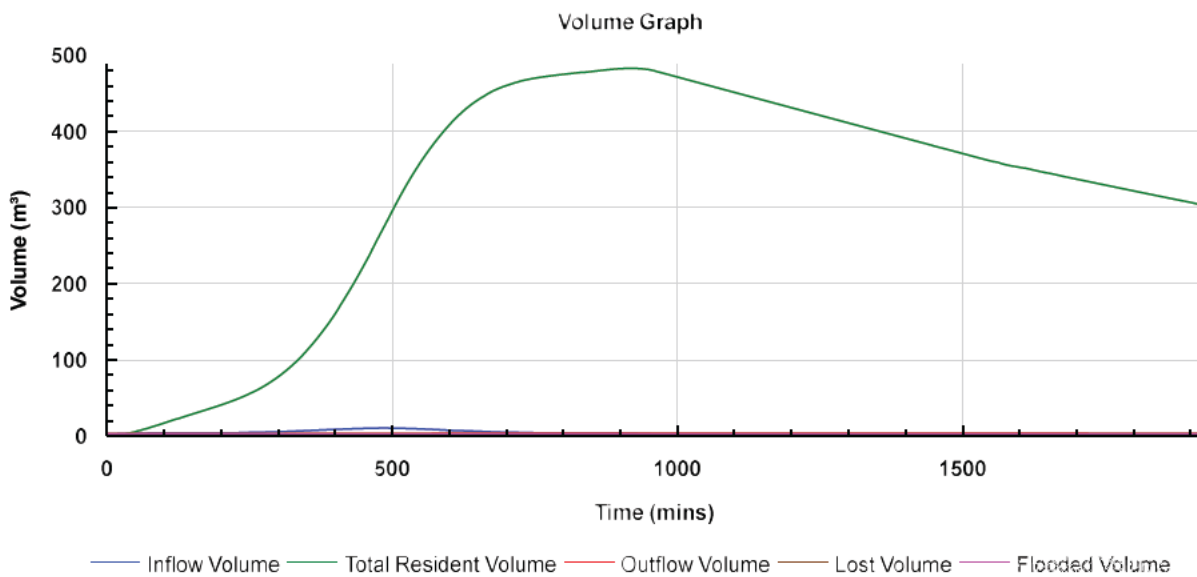
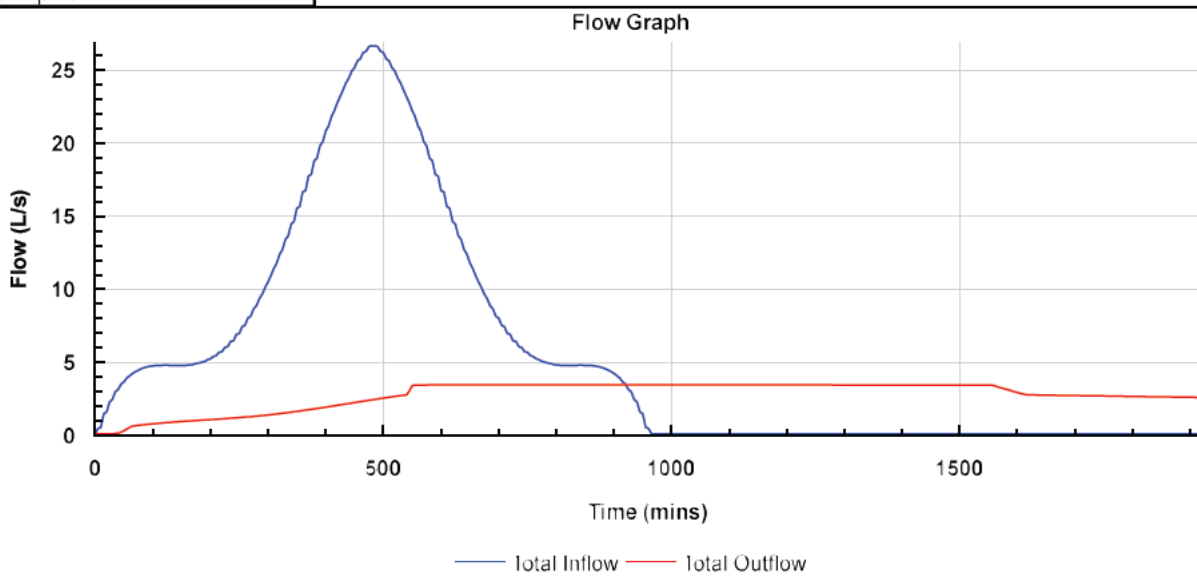


Phase
FEH 2022: 100 years: Increase Rainfall (%): +25: 960 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Simple Junction			3.4	303.379
TOTAL	26.6	606.822	3.4	303.379

Graphs



Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Catchment Area

Type : Catchment Area

Area (ha)	0.357
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (1)

Type : Catchment Area

Area (ha)	0.216
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (2)

Type : Catchment Area

Area (ha)	0.154
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
Simple Junction	Simple Junction	491360.940	102186.610					
Manhole (2)	Manhole	491325.653	102157.329	3.090	0.990	2.100	Circular	1.200
Manhole (3)	Manhole	491332.726	102163.224	3.030	1.030	2.000	Circular	2.000
Manhole (4)	Manhole	491360.467	102174.164	2.940	1.440	1.500	Circular	1.200
Manhole (5)	Manhole	491362.466	102180.973	2.940	1.940	1.000	Circular	1.200
Manhole (1)	Manhole	491350.921	102119.253	3.578	1.008	2.570	Circular	1.200
Simple Junction (5)	Simple Junction	491373.794	102183.554					
Manhole (6)	Manhole	491404.342	102149.756	4.198	1.171	3.027	Circular	1.200
Manhole	Manhole	491357.396	102178.828	2.940	1.929	1.011	Circular	1.200

Name	
Simple Junction	
Manhole (2)	None
Manhole (3)	None
Manhole (4)	None
Manhole (5)	None
Manhole (1)	None
Simple Junction (5)	
Manhole (6)	None
Manhole	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
Simple Junction	Inlet (1)	Pipe (3)	(None)	No Restriction
Manhole (2)	Inlet	Catchment Area (1)	(None)	No Restriction
	Inlet (1)	Pipe (1) (1)	(None)	No Restriction
Manhole (3)	Inlet	Pipe (4)	(None)	No Restriction
Manhole (5)	Inlet	Pipe (5) (1)	(None)	No Restriction
	Inlet (1)	Pipe (9)	(None)	No Restriction
Manhole (1)	Inlet	Catchment Area	(None)	No Restriction
Simple Junction (5)	Inlet	Pipe (8) (1)	(None)	No Restriction
Manhole	Inlet	Pipe (5)	(None)	No Restriction
	Inlet (1)	Pipe (1)	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
Manhole (2)	Outlet	Pipe (4)	Free Discharge
Manhole (3)	Outlet	Pipe	Free Discharge
Manhole (4)	Outlet	Pipe (1)	Free Discharge
Manhole (5)	Outlet	Pipe (3)	Orifice
	Diameter (m)		0.034
	Coefficient of Discharge		0.600
	Invert Level (m)		1.000
Manhole (1)	Outlet	Pipe (1) (1)	Free Discharge
Simple Junction (5)	Outlet	Pipe (9)	Free Discharge
Manhole (6)	Outlet	Pipe (8) (1)	Free Discharge
Manhole	Outlet	Pipe (5) (1)	Free Discharge

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	2.940
Depth (m)	1.200
Base Level (m)	1.040
Number of Crates Long	20
Number of Crates Wide	15
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	1
Crate Height (m)	1.2
Total Volume (m³)	342.700

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (2)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (5)
Outlet Type	Free Discharge

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Curved	Upstream Cover Level (m)
Pipe (4)	9.207	Pipe	92.074		0.6	300	<input type="checkbox"/>	3.090
Pipe (3)	6.067	Pipe	19.572		0.6	150	<input type="checkbox"/>	2.940
Pipe (1) (1)	52.376	Pipe	111.456		0.6	300	<input type="checkbox"/>	3.578
Pipe (9)	11.618	Pipe	33.194		0.6	150	<input checked="" type="checkbox"/>	1.500
Pipe (8) (1)	45.557	Pipe	27.163		0.6	150	<input type="checkbox"/>	4.198
Pipe (5)	14.131	Pipe	495.600		0.6	300	<input type="checkbox"/>	2.940
Pipe (5) (1)	5.505	Pipe	479.225		0.6	300	<input type="checkbox"/>	2.940
Pipe (1)	5.584	Pipe	11.430		0.6	150	<input type="checkbox"/>	2.940
Pipe	7.557	Pipe	125.944		0.6	300	<input type="checkbox"/>	3.030

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Flow Restriction (L/s)
Pipe (4)	2.100	3.030	2.000	All	
Pipe (3)	1.000	0.840	0.690	All	3.3
Pipe (1) (1)	2.570	3.090	2.100	All	
Pipe (9)	1.350	2.940	1.000	All	
Pipe (8) (1)	3.027	1.500	1.350	All	
Pipe (5)	1.040	2.940	1.011	None	
Pipe (5) (1)	1.011	2.940	1.000	None	
Pipe (1)	1.500	2.940	1.011	None	
Pipe	2.000	2.940	1.940	All	

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Manhole Schedule Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
Simple Junction		Diameter / Length: 1.200	{1} Pipe (3)	Pipe	0.690	Diam/Width: 150	Simple Junction
E:491360.940 N:102186.610							Not Applicable
Manhole (2)	3.090 2.100	Diameter / Length: 1.200	{1} Pipe (1) (1)	Pipe	2.100	Diam/Width: 300	Manhole
E:491325.653 N:102157.329	0.990		{a} Pipe (4)	Pipe	2.100	Diam/Width: 300	Not Applicable
Manhole (3)	3.030 2.000	Diameter / Length: 2.000	{1} Pipe (4)	Pipe	2.000	Diam/Width: 300	Manhole
E:491332.726 N:102163.224	1.030		{a} Pipe	Pipe	2.000	Diam/Width: 300	Not Applicable
Manhole (4)	2.940 1.500	Diameter / Length: 1.200					Manhole
E:491360.467 N:102174.164	1.440		{a} Pipe (1)	Pipe	1.500	Diam/Width: 150	Not Applicable
Manhole (5)	2.940 1.000	Diameter / Length: 1.200	{1} Pipe (9)	Pipe	1.000	Diam/Width: 150	Manhole
E:491362.466 N:102180.973	1.940		{2} Pipe (5) (1)	Pipe	1.000	Diam/Width: 300	
			{a} Pipe (3)	Pipe	1.000	Diam/Width: 150	Not Applicable

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Manhole Schedule Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
			Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
Coordinates (m)	Depth (m)		Outgoing Connections				Cover
Manhole (1)	3.578 2.570	Diameter / Length: 1.200					Manhole
E:491350.921 N:102119.253	1.008		{a} Pipe (1) (1)	Pipe	2.570	Diam/Width: 300	Not Applicable
Simple Junction (5)		Diameter / Length: 1.200	{1} Pipe (8) (1)	Pipe	1.350	Diam/Width: 150	Simple Junction
E:491373.794 N:102183.554			{a} Pipe (9)	Pipe	1.350	Diam/Width: 150	Not Applicable
Manhole (6)	4.198 3.027	Diameter / Length: 1.200					Manhole
E:491404.342 N:102149.756	1.171		{a} Pipe (8) (1)	Pipe	3.027	Diam/Width: 150	Not Applicable
Manhole	2.940 1.011	Diameter / Length: 1.200	{1} Pipe (5)	Pipe	1.011	Diam/Width: 300	Manhole
E:491357.396 N:102178.828	1.929		{2} Pipe (1)	Pipe	1.011	Diam/Width: 150	
			{a} Pipe (5) (1)	Pipe	1.011	Diam/Width: 300	Not Applicable

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Network Design Criteria Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	<input type="checkbox"/>
Reduce Channel Depths	<input type="checkbox"/>

Manhole Options

Apply Offset	<input type="checkbox"/>
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Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Outfall Details Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
Simple Junction	Fixed Surcharged Level	2.570	
FEH 2022 : 2 years: +0 %: 15 mins: Summer		2.570	
FEH 2022 : 2 years: +0 %: 15 mins: Winter		2.570	
FEH 2022 : 30 years: +0 %: 15 mins: Summer		2.570	
FEH 2022 : 30 years: +0 %: 15 mins: Winter		2.570	
FEH 2022 : 30 years: +25 %: 15 mins: Summer		2.570	
FEH 2022 : 30 years: +25 %: 15 mins: Winter		2.570	
FEH 2022 : 50 years: +0 %: 15 mins: Summer		2.570	
FEH 2022 : 50 years: +0 %: 15 mins: Winter		2.570	
FEH 2022 : 100 years: +0 %: 15 mins: Summer		2.570	
FEH 2022 : 100 years: +0 %: 15 mins: Winter		2.570	
FEH 2022 : 100 years: +25 %: 15 mins: Summer		2.570	
FEH 2022 : 100 years: +25 %: 15 mins: Winter		2.570	
FEH 2022 : 2 years: +0 %: 30 mins: Summer		2.570	
FEH 2022 : 2 years: +0 %: 30 mins: Winter		2.570	
FEH 2022 : 30 years: +0 %: 30 mins: Summer		2.570	
FEH 2022 : 30 years: +0 %: 30 mins: Winter		2.570	
FEH 2022 : 30 years: +25 %: 30 mins: Summer		2.570	
FEH 2022 : 30 years: +25 %: 30 mins: Winter		2.570	
FEH 2022 : 50 years: +0 %: 30 mins: Summer		2.570	
FEH 2022 : 50 years: +0 %: 30 mins: Winter		2.570	
FEH 2022 : 100 years: +0 %: 30 mins: Summer		2.570	
FEH 2022 : 100 years: +0 %: 30 mins: Winter		2.570	
FEH 2022 : 100 years: +25 %: 30 mins: Summer		2.570	
FEH 2022 : 100 years: +25 %: 30 mins: Winter		2.570	
FEH 2022 : 2 years: +0 %: 60 mins: Summer		2.570	
FEH 2022 : 2 years: +0 %: 60 mins: Winter		2.570	
FEH 2022 : 30 years: +0 %: 60 mins: Summer		2.570	
FEH 2022 : 30 years: +0 %: 60 mins: Winter		2.570	
FEH 2022 : 30 years: +25 %: 60 mins: Summer		2.570	
FEH 2022 : 30 years: +25 %: 60 mins: Winter		2.570	
FEH 2022 : 50 years: +0 %: 60 mins: Summer		2.570	
FEH 2022 : 50 years: +0 %: 60 mins: Winter		2.570	

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Outfall Details Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022 : 100 years: +0 %: 60 mins: Summer		2.570
FEH 2022 : 100 years: +0 %: 60 mins: Winter		2.570
FEH 2022 : 100 years: +25 %: 60 mins: Summer		2.570
FEH 2022 : 100 years: +25 %: 60 mins: Winter		2.570
FEH 2022 : 2 years: +0 %: 120 mins: Summer		2.570
FEH 2022 : 2 years: +0 %: 120 mins: Winter		2.570
FEH 2022 : 30 years: +0 %: 120 mins: Summer		2.570
FEH 2022 : 30 years: +0 %: 120 mins: Winter		2.570
FEH 2022 : 30 years: +25 %: 120 mins: Summer		2.570
FEH 2022 : 30 years: +25 %: 120 mins: Winter		2.570
FEH 2022 : 50 years: +0 %: 120 mins: Summer		2.570
FEH 2022 : 50 years: +0 %: 120 mins: Winter		2.570
FEH 2022 : 100 years: +0 %: 120 mins: Summer		2.570
FEH 2022 : 100 years: +0 %: 120 mins: Winter		2.570
FEH 2022 : 100 years: +25 %: 120 mins: Summer		2.570
FEH 2022 : 100 years: +25 %: 120 mins: Winter		2.570
FEH 2022 : 2 years: +0 %: 240 mins: Summer		2.570
FEH 2022 : 2 years: +0 %: 240 mins: Winter		2.570
FEH 2022 : 30 years: +0 %: 240 mins: Summer		2.570
FEH 2022 : 30 years: +0 %: 240 mins: Winter		2.570
FEH 2022 : 30 years: +25 %: 240 mins: Summer		2.570
FEH 2022 : 30 years: +25 %: 240 mins: Winter		2.570
FEH 2022 : 50 years: +0 %: 240 mins: Summer		2.570
FEH 2022 : 50 years: +0 %: 240 mins: Winter		2.570
FEH 2022 : 100 years: +0 %: 240 mins: Summer		2.570
FEH 2022 : 100 years: +0 %: 240 mins: Winter		2.570
FEH 2022 : 100 years: +25 %: 240 mins: Summer		2.570
FEH 2022 : 100 years: +25 %: 240 mins: Winter		2.570
FEH 2022 : 2 years: +0 %: 360 mins: Summer		2.570
FEH 2022 : 2 years: +0 %: 360 mins: Winter		2.570
FEH 2022 : 30 years: +0 %: 360 mins: Summer		2.570
FEH 2022 : 30 years: +0 %: 360 mins: Winter		2.570
FEH 2022 : 30 years: +25 %: 360 mins: Summer		2.570
FEH 2022 : 30 years: +25 %: 360 mins: Winter		2.570

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Outfall Details Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022 : 50 years: +0 %: 360 mins: Summer		2.570
FEH 2022 : 50 years: +0 %: 360 mins: Winter		2.570
FEH 2022 : 100 years: +0 %: 360 mins: Summer		2.570
FEH 2022 : 100 years: +0 %: 360 mins: Winter		2.570
FEH 2022 : 100 years: +25 %: 360 mins: Summer		2.570
FEH 2022 : 100 years: +25 %: 360 mins: Winter		2.570
FEH 2022 : 2 years: +0 %: 480 mins: Summer		2.570
FEH 2022 : 2 years: +0 %: 480 mins: Winter		2.570
FEH 2022 : 30 years: +0 %: 480 mins: Summer		2.570
FEH 2022 : 30 years: +0 %: 480 mins: Winter		2.570
FEH 2022 : 30 years: +25 %: 480 mins: Summer		2.570
FEH 2022 : 30 years: +25 %: 480 mins: Winter		2.570
FEH 2022 : 50 years: +0 %: 480 mins: Summer		2.570
FEH 2022 : 50 years: +0 %: 480 mins: Winter		2.570
FEH 2022 : 100 years: +0 %: 480 mins: Summer		2.570
FEH 2022 : 100 years: +0 %: 480 mins: Winter		2.570
FEH 2022 : 100 years: +25 %: 480 mins: Summer		2.570
FEH 2022 : 100 years: +25 %: 480 mins: Winter		2.570
FEH 2022 : 2 years: +0 %: 960 mins: Summer		2.570
FEH 2022 : 2 years: +0 %: 960 mins: Winter		2.570
FEH 2022 : 30 years: +0 %: 960 mins: Summer		2.570
FEH 2022 : 30 years: +0 %: 960 mins: Winter		2.570
FEH 2022 : 30 years: +25 %: 960 mins: Summer		2.570
FEH 2022 : 30 years: +25 %: 960 mins: Winter		2.570
FEH 2022 : 50 years: +0 %: 960 mins: Summer		2.570
FEH 2022 : 50 years: +0 %: 960 mins: Winter		2.570
FEH 2022 : 100 years: +0 %: 960 mins: Summer		2.570
FEH 2022 : 100 years: +0 %: 960 mins: Winter		2.570
FEH 2022 : 100 years: +25 %: 960 mins: Summer		2.570
FEH 2022 : 100 years: +25 %: 960 mins: Winter		2.570
FEH 2022 : 2 years: +0 %: 1440 mins: Summer		2.570
FEH 2022 : 2 years: +0 %: 1440 mins: Winter		2.570
FEH 2022 : 30 years: +0 %: 1440 mins: Summer		2.570
FEH 2022 : 30 years: +0 %: 1440 mins: Winter		2.570

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Outfall Details Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022 : 30 years: +25 %: 1440 mins: Summer		2.570	
FEH 2022 : 30 years: +25 %: 1440 mins: Winter		2.570	
FEH 2022 : 50 years: +0 %: 1440 mins: Summer		2.570	
FEH 2022 : 50 years: +0 %: 1440 mins: Winter		2.570	
FEH 2022 : 100 years: +0 %: 1440 mins: Summer		2.570	
FEH 2022 : 100 years: +0 %: 1440 mins: Winter		2.570	
FEH 2022 : 100 years: +25 %: 1440 mins: Summer		2.570	
FEH 2022 : 100 years: +25 %: 1440 mins: Winter		2.570	

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Title Rainfall Analysis Criteria	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	<input type="checkbox"/>

Rainfall

FEH 2022	Type: FEH
Site Location	GB 491337 102093 SU 91337 02093
Rainfall Version	2022
Summer	<input checked="" type="checkbox"/>
Winter	<input checked="" type="checkbox"/>

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	0.000
30.0	25.000
50.0	0.000
100.0	0.000
100.0	25.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Title UK and Ireland Rural Runoff Calculator	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	1.50
SAAR (mm)	868.0
Soil	0.3
Region	Region 7
Urban	0
Return Period (years)	0

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 7	3.5	3.5	3.0	8.0	11.2

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH 2022: 2 years: +0 %: 15 mins: Winter	0.36	61.1	28.266
Catchment Area (1)	FEH 2022: 2 years: +0 %: 15 mins: Winter	0.22	36.9	17.094
Catchment Area (2)	FEH 2022: 2 years: +0 %: 15 mins: Winter	0.15	26.3	12.186

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH 2022: 30 years: +0 %: 15 mins: Winter	0.36	131.0	60.588
Catchment Area (1)	FEH 2022: 30 years: +0 %: 15 mins: Winter	0.22	79.2	36.651
Catchment Area (2)	FEH 2022: 30 years: +0 %: 15 mins: Winter	0.15	56.5	26.124

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH 2022: 30 years: +25 %: 15 mins: Winter	0.36	163.7	75.735
Catchment Area (1)	FEH 2022: 30 years: +25 %: 15 mins: Winter	0.22	99.0	45.810
Catchment Area (2)	FEH 2022: 30 years: +25 %: 15 mins: Winter	0.15	70.6	32.655

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 50 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH 2022: 50 years: +0 %: 15 mins: Winter	0.36	144.5	66.861
Catchment Area (1)	FEH 2022: 50 years: +0 %: 15 mins: Winter	0.22	87.4	40.446
Catchment Area (2)	FEH 2022: 50 years: +0 %: 15 mins: Winter	0.15	62.3	28.830

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH 2022: 100 years: +0 %: 15 mins: Winter	0.36	164.1	75.912
Catchment Area (1)	FEH 2022: 100 years: +0 %: 15 mins: Winter	0.22	99.3	45.924
Catchment Area (2)	FEH 2022: 100 years: +0 %: 15 mins: Winter	0.15	70.7	32.730

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Inflows Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m ³)
Catchment Area	FEH 2022: 100 years: +25 %: 15 mins: Winter	0.36	205.1	94.890
Catchment Area (1)	FEH 2022: 100 years: +25 %: 15 mins: Winter	0.22	124.1	57.399
Catchment Area (2)	FEH 2022: 100 years: +25 %: 15 mins: Winter	0.15	88.4	40.917

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flooded Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
Simple Junction	FEH 2022: 2 years: +0 %: 15 mins: Summer		0.690	2.570	1.880	0.0			0.0	0.000	OK
Manhole (2)	FEH 2022: 2 years: +0 %: 15 mins: Summer	3.090	2.100	2.348	0.248	91.1	0.281	0.000	85.2	40.493	OK
Manhole (3)	FEH 2022: 2 years: +0 %: 15 mins: Summer	3.030	2.000	2.242	0.242	85.2	0.760	0.000	81.7	40.462	OK
Manhole (4)	FEH 2022: 2 years: +0 %: 15 mins: Summer	2.940	1.500	1.500	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole (5)	FEH 2022: 2 years: +0 %: 15 mins: Summer	2.940	1.000	1.215	0.215	2.6	0.243	0.000	0.5	0.259	Surcharged
Manhole (1)	FEH 2022: 2 years: +0 %: 15 mins: Summer	3.578	2.570	2.726	0.156	58.1	0.176	0.000	55.9	25.242	OK
Simple Junction (5)	FEH 2022: 2 years: +0 %: 15 mins: Summer		1.350	1.350	0.000	0.0			0.0	0.000	OK
Manhole (6)	FEH 2022: 2 years: +0 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 2 years: +0 %: 15 mins: Summer	2.940	1.011	1.215	0.204	5.8	0.230	0.000	2.6	0.796	OK

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flooded Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
Simple Junction	FEH 2022: 30 years: +0 %: 15 mins: Summer		0.690	2.570	1.880	0.0			0.0	0.000	OK
Manhole (2)	FEH 2022: 30 years: +0 %: 15 mins: Summer	3.090	2.100	3.011	0.911	188.5	1.030	0.000	185.6	86.847	Flood Risk
Manhole (3)	FEH 2022: 30 years: +0 %: 15 mins: Summer	3.030	2.000	2.593	0.593	185.6	1.862	0.000	180.1	86.824	Surcharged
Manhole (4)	FEH 2022: 30 years: +0 %: 1440 mins: Winter	2.940	1.500	2.945	1.445	1.5	7.014	5.385	2.0	12.663	Flood
Manhole (5)	FEH 2022: 30 years: +0 %: 1440 mins: Winter	2.940	1.000	2.945	1.945	5.1	7.585	5.390	1.5	38.642	Flood
Manhole (1)	FEH 2022: 30 years: +0 %: 15 mins: Winter	3.578	2.570	3.578	1.008	131.0	1.564	0.424	110.2	60.554	Flood Risk
Simple Junction (5)	FEH 2022: 30 years: +0 %: 15 mins: Summer		1.350	1.417	0.067	1.0			0.0	0.006	OK
Manhole (6)	FEH 2022: 30 years: +0 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 30 years: +0 %: 1440 mins: Winter	2.940	1.011	2.946	1.934	5.0	7.594	5.412	4.7	96.141	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Flooded Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
Simple Junction	FEH 2022: 30 years: +25 %: 15 mins: Summer		0.690	2.570	1.880	0.0			0.0	0.000	OK
Manhole (2)	FEH 2022: 30 years: +25 %: 15 mins: Winter	3.090	2.100	3.090	0.990	203.4	1.325	0.205	193.4	121.599	Flood
Manhole (3)	FEH 2022: 30 years: +25 %: 15 mins: Summer	3.030	2.000	2.643	0.643	193.4	2.020	0.000	193.3	108.547	Surcharged
Manhole (4)	FEH 2022: 30 years: +25 %: 1440 mins: Winter	2.940	1.500	2.972	1.472	2.7	33.257	31.629	1.4	33.669	Flood
Manhole (5)	FEH 2022: 30 years: +25 %: 1440 mins: Winter	2.940	1.000	2.972	1.972	5.2	33.799	31.605	1.5	111.841	Flood
Manhole (1)	FEH 2022: 30 years: +25 %: 15 mins: Winter	3.578	2.570	3.582	1.012	163.7	4.772	3.632	129.5	75.648	Flood
Simple Junction (5)	FEH 2022: 30 years: +25 %: 15 mins: Summer		1.350	1.512	0.162	2.0			0.0	0.003	Surcharged
Manhole (6)	FEH 2022: 30 years: +25 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 30 years: +25 %: 1440 mins: Winter	2.940	1.011	2.972	1.961	10.6	33.809	31.627	5.1	206.551	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 50 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flooded Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
Simple Junction	FEH 2022: 50 years: +0 %: 15 mins: Summer		0.690	2.570	1.880	0.0			0.0	0.000	OK
Manhole (2)	FEH 2022: 50 years: +0 %: 15 mins: Summer	3.090	2.100	3.059	0.959	191.4	1.084	0.000	190.2	95.836	Flood Risk
Manhole (3)	FEH 2022: 50 years: +0 %: 15 mins: Summer	3.030	2.000	2.624	0.624	190.2	1.959	0.000	188.5	95.815	Surcharged
Manhole (4)	FEH 2022: 50 years: +0 %: 1440 mins: Winter	2.940	1.500	2.955	1.455	1.6	16.470	14.842	1.6	16.502	Flood
Manhole (5)	FEH 2022: 50 years: +0 %: 1440 mins: Winter	2.940	1.000	2.955	1.955	3.2	17.008	14.814	1.5	106.780	Flood
Manhole (1)	FEH 2022: 50 years: +0 %: 15 mins: Winter	3.578	2.570	3.579	1.010	144.5	2.630	1.490	106.2	66.793	Flood
Simple Junction (5)	FEH 2022: 50 years: +0 %: 15 mins: Summer		1.350	1.456	0.106	1.1			0.0	0.006	OK
Manhole (6)	FEH 2022: 50 years: +0 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 50 years: +0 %: 1440 mins: Winter	2.940	1.011	2.955	1.944	7.3	17.016	14.834	3.2	124.864	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flooded Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
Simple Junction	FEH 2022: 100 years: +0 %: 15 mins: Summer		0.690	2.570	1.880	0.0			0.0	0.000	OK
Manhole (2)	FEH 2022: 100 years: +0 %: 15 mins: Winter	3.090	2.100	3.090	0.990	203.7	1.335	0.215	193.4	121.888	Flood
Manhole (3)	FEH 2022: 100 years: +0 %: 15 mins: Summer	3.030	2.000	2.643	0.643	193.4	2.020	0.000	193.3	108.815	Surcharged
Manhole (4)	FEH 2022: 100 years: +0 %: 1440 mins: Winter	2.940	1.500	2.971	1.471	2.7	33.086	31.458	2.2	41.965	Flood
Manhole (5)	FEH 2022: 100 years: +0 %: 1440 mins: Winter	2.940	1.000	2.971	1.971	5.3	33.629	31.435	1.5	201.100	Flood
Manhole (1)	FEH 2022: 100 years: +0 %: 15 mins: Winter	3.578	2.570	3.582	1.012	164.1	4.820	3.679	129.5	75.830	Flood
Simple Junction (5)	FEH 2022: 100 years: +0 %: 15 mins: Summer		1.350	1.513	0.163	2.0			0.0	0.007	Surcharged
Manhole (6)	FEH 2022: 100 years: +0 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 100 years: +0 %: 1440 mins: Winter	2.940	1.011	2.972	1.960	10.6	33.639	31.457	5.3	234.641	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Junctions Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Flooded Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
Simple Junction	FEH 2022: 100 years: +25 %: 15 mins: Summer		0.690	2.570	1.880	0.0			0.0	0.000	OK
Manhole (2)	FEH 2022: 100 years: +25 %: 15 mins: Winter	3.090	2.100	3.092	0.992	228.9	3.153	2.034	193.6	152.299	Flood
Manhole (3)	FEH 2022: 100 years: +25 %: 15 mins: Summer	3.030	2.000	2.644	0.644	193.5	2.022	0.000	193.5	135.993	Surcharged
Manhole (4)	FEH 2022: 100 years: +25 %: 1440 mins: Winter	2.940	1.500	3.008	1.508	4.6	69.346	67.717	0.5	41.296	Flood
Manhole (5)	FEH 2022: 100 years: +25 %: 1440 mins: Winter	2.940	1.000	3.008	2.008	7.7	69.876	67.682	1.6	202.986	Flood
Manhole (1)	FEH 2022: 100 years: +25 %: 15 mins: Winter	3.578	2.570	3.595	1.025	205.1	18.069	16.929	120.4	94.767	Flood
Simple Junction (5)	FEH 2022: 100 years: +25 %: 15 mins: Summer		1.350	1.631	0.281	0.5			0.0	0.022	Surcharged
Manhole (6)	FEH 2022: 100 years: +25 %: 15 mins: Summer	4.198	3.027	3.027	0.000	0.0	0.000	0.000	0.0	0.000	OK
Manhole	FEH 2022: 100 years: +25 %: 1440 mins: Winter	2.940	1.011	3.008	1.997	16.6	69.918	67.737	7.7	301.226	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022: 2 years: +0 %: 1440 mins: Winter	1.877	1.877	0.837	0.837	7.1	238.449	0.000	0.000	0.2	5.886	30.420	OK

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022 30 years: +0 %: 1440 mins: Winter	2.945	2.945	1.905	1.905	12.2	343.819	1.373	0.000	3.3	76.684	-0.327	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022 30 years: +25 %: 1440 mins: Winter	2.972	2.972	1.932	1.932	15.2	351.292	8.845	0.000	10.6	174.049	-2.507	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 50 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022 50 years: +0 %: 1440 mins: Winter	2.955	2.955	1.915	1.915	13.4	346.509	4.062	0.000	7.3	109.813	-1.111	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022: 100 years: +0 %: 1440 mins: Winter	2.972	2.972	1.932	1.932	15.2	351.243	8.796	0.000	10.6	180.519	-2.493	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank
By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH 2022: 100 years: +25 %: 1440 mins: Winter	3.008	3.008	1.968	1.968	18.7	361.563	19.116	0.000	16.6	289.757	-5.504	Flood

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 2 years: +0 %: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	3.090	2.362	0.258	45.352	1.4	0.77	89.8	OK
Pipe (3)	FEH 2022: 2 years: +0 %: 15 mins: Summer	Pipe	Manhole (5)	Simple Junction	2.940	1.215	0.150	0.000	0.0	0	0.0	Surcharged
Pipe (1) (1)	FEH 2022: 2 years: +0 %: 15 mins: Winter	Pipe	Manhole (1)	Manhole (2)	3.578	2.731	0.211	28.272	1.1	0.56	59.0	OK
Pipe (9)	FEH 2022: 2 years: +0 %: 120 mins: Summer	Pipe	Simple Junction (5)	Manhole (5)	1.500	1.428	0.150	0.000	0.0	0	0.0	OK
Pipe (8) (1)	FEH 2022: 2 years: +0 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.000	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 2 years: +0 %: 15 mins: Winter	Pipe	Cellular Storage	Manhole	2.940	1.236	0.210	1.730	0.4	0.15	7.3	OK
Pipe (5) (1)	FEH 2022: 2 years: +0 %: 15 mins: Winter	Pipe	Manhole	Manhole (5)	2.940	1.236	0.230	0.849	0.2	0.06	3.2	OK
Pipe (1)	FEH 2022: 2 years: +0 %: 360 mins: Summer	Pipe	Manhole (4)	Manhole	2.940	1.589	0.150	0.000	0.0	0	0.0	OK
Pipe	FEH 2022: 2 years: +0 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.254	0.235	45.322	1.4	0.87	86.0	OK

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 30 years: +0 %: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	3.090	3.040	0.300	97.254	2.7	1.62	188.1	Flood Risk
Pipe (3)	FEH 2022: 30 years: +0 %: 1440 mins: Winter	Pipe	Manhole (5)	Simple Junction	2.940	2.945	0.150	75.307	0.1	0.04	1.5	Flood
Pipe (1) (1)	FEH 2022: 30 years: +0 %: 15 mins: Summer	Pipe	Manhole (1)	Manhole (2)	3.578	3.578	0.300	54.068	1.6	1.07	113.1	Flood Risk
Pipe (9)	FEH 2022: 30 years: +0 %: 960 mins: Winter	Pipe	Simple Junction (5)	Manhole (5)	1.500	2.947	0.150	0.000	0.1	0.03	1.0	Surcharged
Pipe (8) (1)	FEH 2022: 30 years: +0 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.034	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 30 years: +0 %: 15 mins: Winter	Pipe	Cellular Storage	Manhole	2.940	1.462	0.300	3.129	0.4	0.15	7.4	Surcharged
Pipe (5) (1)	FEH 2022: 30 years: +0 %: 960 mins: Winter	Pipe	Manhole	Manhole (5)	2.940	2.943	0.300	41.239	0.1	0.11	5.5	Flood
Pipe (1)	FEH 2022: 30 years: +0 %: 1440 mins: Winter	Pipe	Manhole (4)	Manhole	2.940	2.945	0.150	2.111	0.1	0.04	2.0	Flood
Pipe	FEH 2022: 30 years: +0 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.614	0.300	97.231	2.6	1.88	186.2	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 30 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 30 years: +25 %: 15 mins: Summer	Pipe	Manhole (2)	Manhole (3)	3.090	3.090	0.300	108.565	2.7	1.67	193.4	Flood
Pipe (3)	FEH 2022: 30 years: +25 %: 1440 mins: Winter	Pipe	Manhole (5)	Simple Junction	2.940	2.972	0.150	165.758	0.1	0.04	1.5	Flood
Pipe (1) (1)	FEH 2022: 30 years: +25 %: 15 mins: Winter	Pipe	Manhole (1)	Manhole (2)	3.578	3.582	0.300	75.648	1.8	1.23	129.5	Flood
Pipe (9)	FEH 2022: 30 years: +25 %: 240 mins: Winter	Pipe	Simple Junction (5)	Manhole (5)	1.500	2.947	0.150	0.000	0.1	0.05	1.5	Surcharged
Pipe (8) (1)	FEH 2022: 30 years: +25 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.081	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 30 years: +25 %: 480 mins: Winter	Pipe	Cellular Storage	Manhole	2.940	2.956	0.300	77.862	0.2	0.27	13.4	Flood
Pipe (5) (1)	FEH 2022: 30 years: +25 %: 480 mins: Winter	Pipe	Manhole	Manhole (5)	2.940	2.957	0.300	66.330	0.2	0.14	6.8	Flood
Pipe (1)	FEH 2022: 30 years: +25 %: 1440 mins: Summer	Pipe	Manhole (4)	Manhole	2.940	2.955	0.150	2.015	0.1	0.05	2.5	Flood
Pipe	FEH 2022: 30 years: +25 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.643	0.300	121.579	2.7	1.95	193.4	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 50 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 50 years: +0 %: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	3.090	3.078	0.300	107.302	2.7	1.66	192.4	Flood Risk
Pipe (3)	FEH 2022: 50 years: +0 %: 1440 mins: Winter	Pipe	Manhole (5)	Simple Junction	2.940	2.955	0.150	101.077	0.1	0.04	1.5	Flood
Pipe (1) (1)	FEH 2022: 50 years: +0 %: 15 mins: Summer	Pipe	Manhole (1)	Manhole (2)	3.578	3.579	0.300	59.666	1.5	1.03	108.3	Flood
Pipe (9)	FEH 2022: 50 years: +0 %: 480 mins: Winter	Pipe	Simple Junction (5)	Manhole (5)	1.500	2.948	0.150	0.000	0.1	0.03	0.9	Surcharged
Pipe (8) (1)	FEH 2022: 50 years: +0 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.053	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 50 years: +0 %: 1440 mins: Winter	Pipe	Cellular Storage	Manhole	2.940	2.955	0.300	107.937	0.1	0.15	7.3	Flood
Pipe (5) (1)	FEH 2022: 50 years: +0 %: 960 mins: Summer	Pipe	Manhole	Manhole (5)	2.940	2.942	0.300	40.996	0.2	0.14	6.8	Flood
Pipe (1)	FEH 2022: 50 years: +0 %: 960 mins: Summer	Pipe	Manhole (4)	Manhole	2.940	2.942	0.150	2.665	0.1	0.04	2.0	Flood
Pipe	FEH 2022: 50 years: +0 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.634	0.300	107.279	2.7	1.93	190.9	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 100 years: +0 %: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	3.090	3.090	0.300	121.888	2.7	1.67	193.4	Flood
Pipe (3)	FEH 2022: 100 years: +0 %: 1440 mins: Winter	Pipe	Manhole (5)	Simple Junction	2.940	2.971	0.150	182.891	0.1	0.04	1.5	Flood
Pipe (1) (1)	FEH 2022: 100 years: +0 %: 15 mins: Winter	Pipe	Manhole (1)	Manhole (2)	3.578	3.582	0.300	75.830	1.8	1.23	129.5	Flood
Pipe (9)	FEH 2022: 100 years: +0 %: 960 mins: Winter	Pipe	Simple Junction (5)	Manhole (5)	1.500	2.967	0.150	0.000	0.1	0.04	1.3	Surcharged
Pipe (8) (1)	FEH 2022: 100 years: +0 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.081	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 100 years: +0 %: 480 mins: Winter	Pipe	Cellular Storage	Manhole	2.940	2.944	0.300	81.573	0.2	0.27	13.6	Flood
Pipe (5) (1)	FEH 2022: 100 years: +0 %: 480 mins: Winter	Pipe	Manhole	Manhole (5)	2.940	2.942	0.300	82.462	0.2	0.24	11.9	Flood
Pipe (1)	FEH 2022: 100 years: +0 %: 1440 mins: Winter	Pipe	Manhole (4)	Manhole	2.940	2.971	0.150	3.836	0.1	0.04	2.2	Flood
Pipe	FEH 2022: 100 years: +0 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.643	0.300	121.868	2.7	1.95	193.4	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Connections Summary Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



FEH 2022: 100 years: Increase Rainfall (%): +25: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (4)	FEH 2022: 100 years: +25 %: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	3.090	3.092	0.300	152.299	2.7	1.67	193.6	Flood
Pipe (3)	FEH 2022: 100 years: +25 %: 480 mins: Winter	Pipe	Manhole (5)	Simple Junction	2.940	2.987	0.150	62.926	0.1	0.06	2.5	Flood
Pipe (1) (1)	FEH 2022: 100 years: +25 %: 15 mins: Summer	Pipe	Manhole (1)	Manhole (2)	3.578	3.589	0.300	84.605	1.8	1.24	130.0	Flood
Pipe (9)	FEH 2022: 100 years: +25 %: 480 mins: Winter	Pipe	Simple Junction (5)	Manhole (5)	1.500	2.987	0.150	0.000	0.1	0.07	2.2	Surcharged
Pipe (8) (1)	FEH 2022: 100 years: +25 %: 15 mins: Summer	Pipe	Manhole (6)	Simple Junction (5)	4.198	3.027	0.141	0.000	0.0	0	0.0	OK
Pipe (5)	FEH 2022: 100 years: +25 %: 240 mins: Winter	Pipe	Cellular Storage	Manhole	2.940	2.970	0.300	106.885	0.5	0.69	33.9	Flood
Pipe (5) (1)	FEH 2022: 100 years: +25 %: 240 mins: Winter	Pipe	Manhole	Manhole (5)	2.940	2.970	0.300	58.061	0.2	0.31	15.4	Flood
Pipe (1)	FEH 2022: 100 years: +25 %: 360 mins: Summer	Pipe	Manhole (4)	Manhole	2.940	2.964	0.150	0.000	0.0	0.02	0.8	Flood
Pipe	FEH 2022: 100 years: +25 %: 15 mins: Winter	Pipe	Manhole (3)	Cellular Storage	3.030	2.644	0.300	152.284	2.7	1.96	193.6	Surcharged

Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



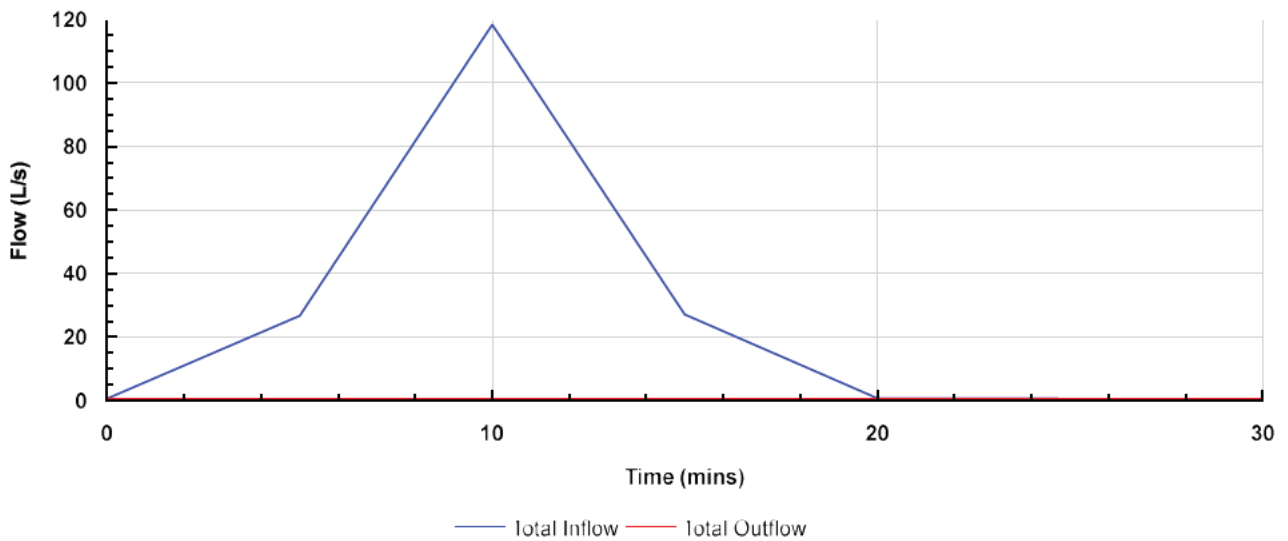
Phase
FEH 2022: 2 years: Increase Rainfall (%): +0: 15 mins: Summer

Tables

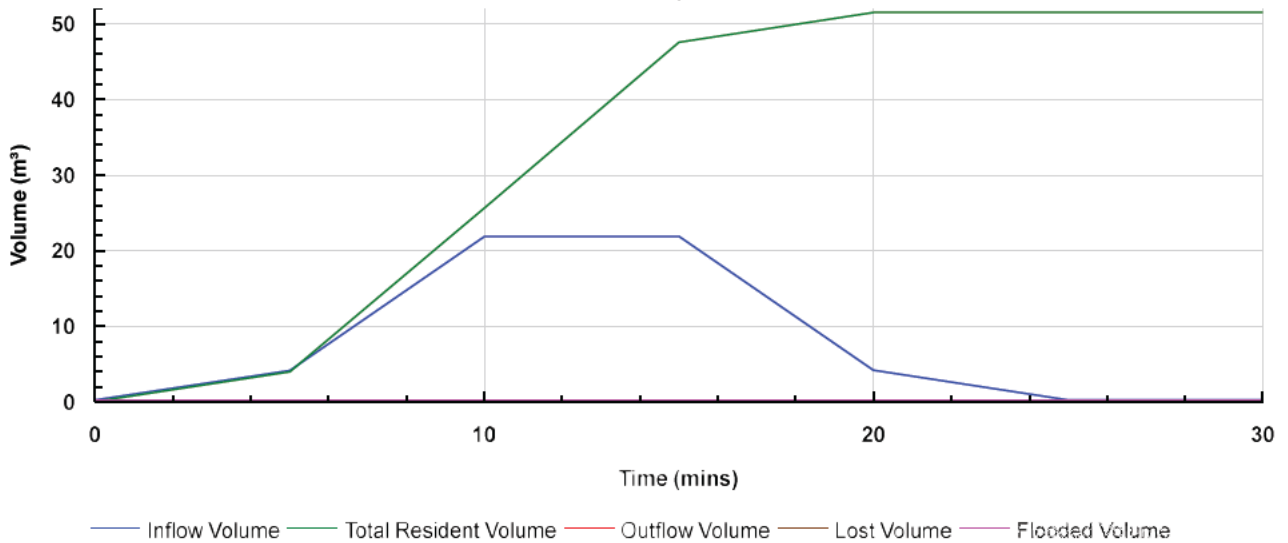
Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Simple Junction			0.0	0.000
TOTAL	118.4	51.378	0.0	0.000

Graphs

Flow Graph



Volume Graph



Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		

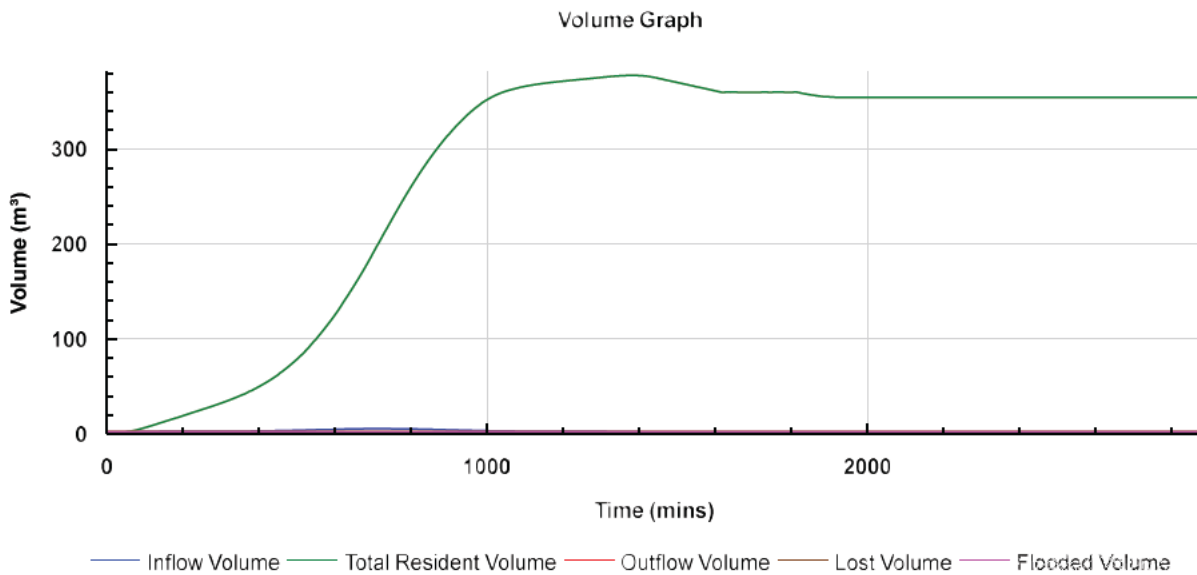
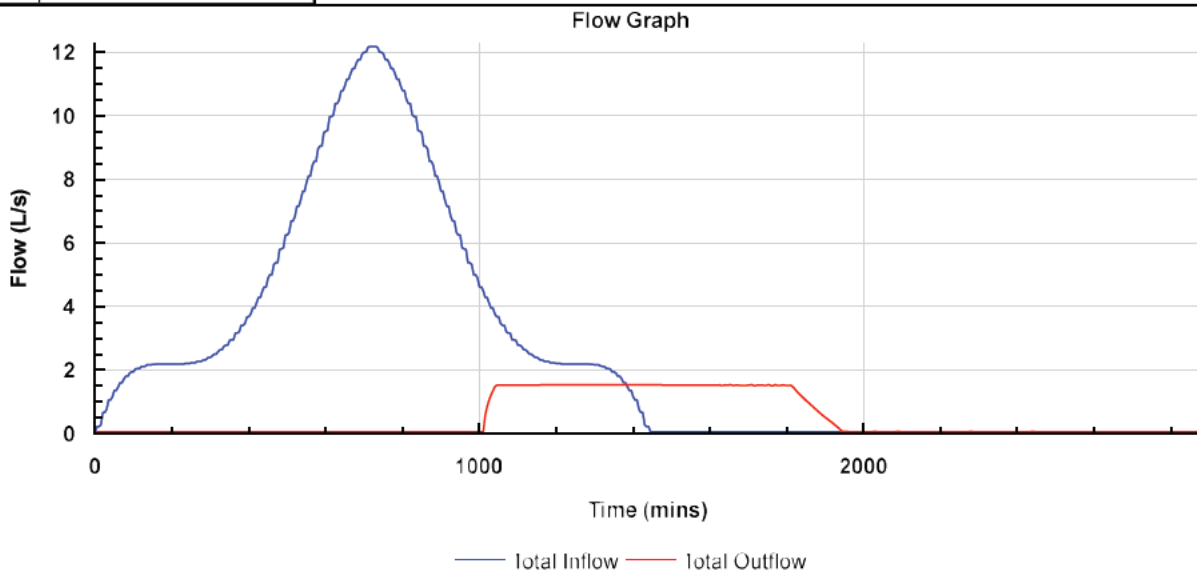


Phase
FEH 2022: 30 years: Increase Rainfall (%): +0: 1440 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Simple Junction			1.5	75.307
TOTAL	12.2	415.644	1.5	75.307

Graphs



Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		

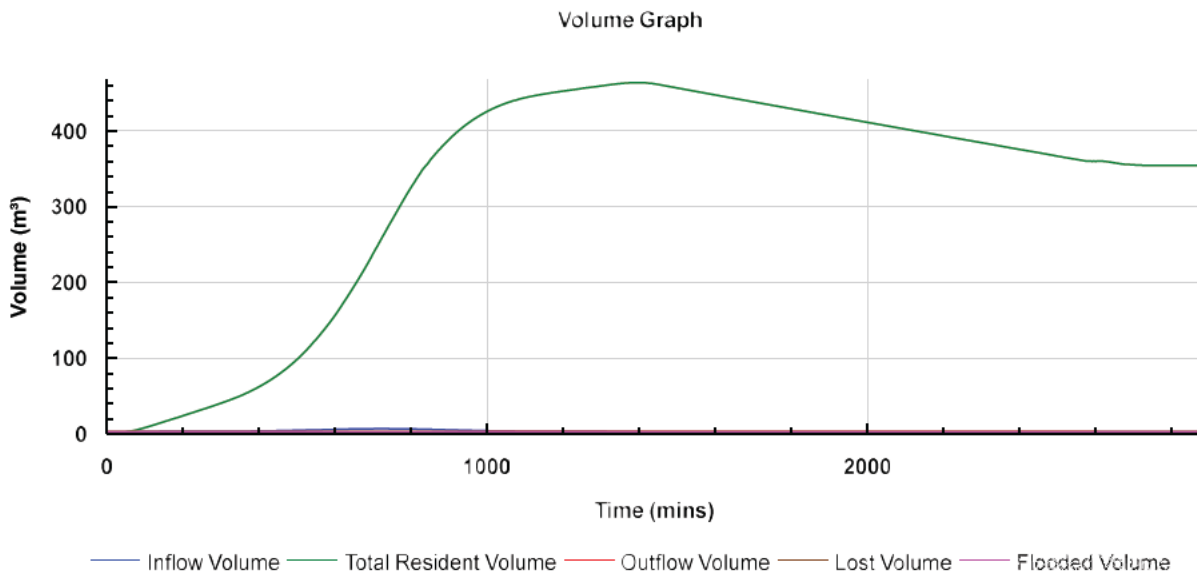
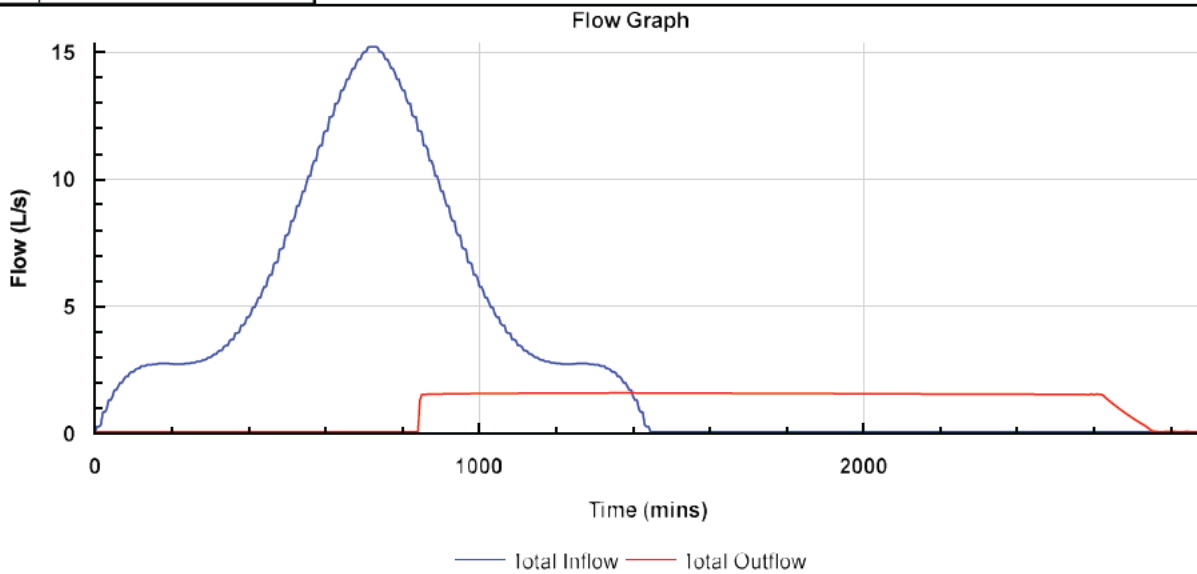


Phase
FEH 2022: 30 years: Increase Rainfall (%): +25: 1440 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Simple Junction			1.5	165.758
TOTAL	15.2	519.600	1.5	165.758

Graphs



Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



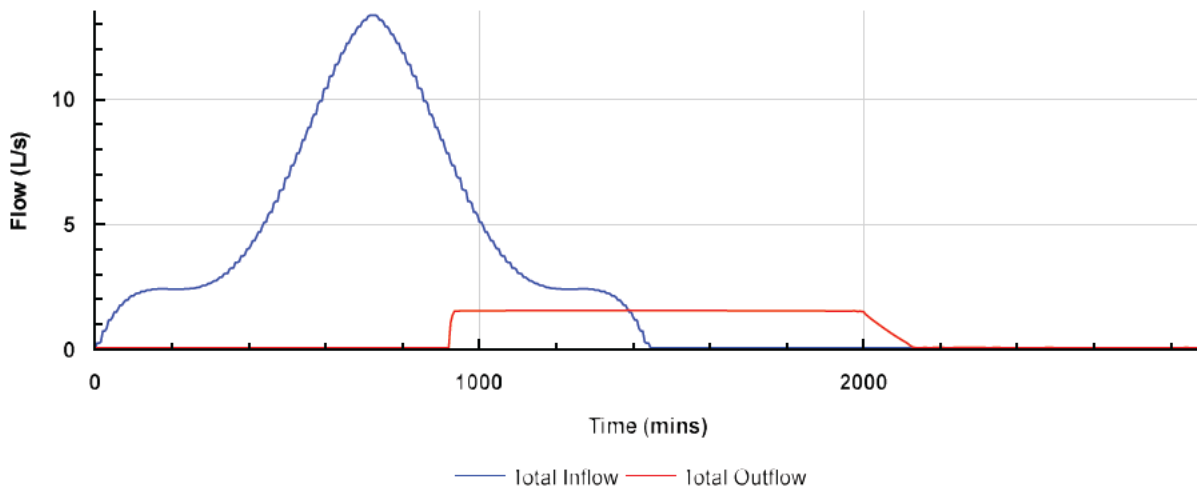
Phase
FEH 2022: 50 years: Increase Rainfall (%): +0: 1440 mins: Winter

Tables

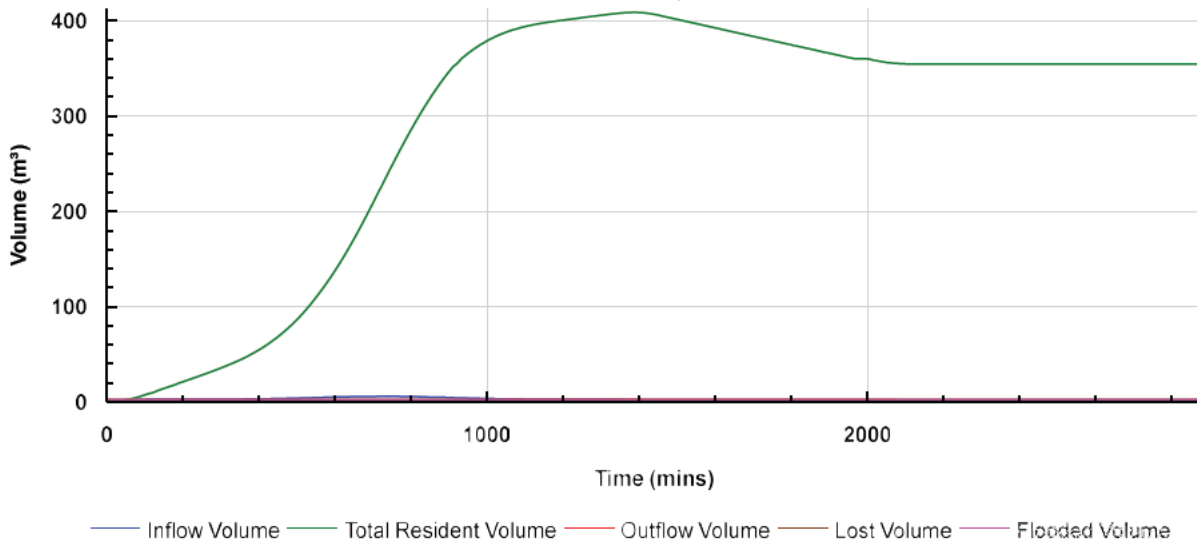
Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Simple Junction			1.5	101.077
TOTAL	13.4	456.000	1.5	101.077

Graphs

Flow Graph



Volume Graph



Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		

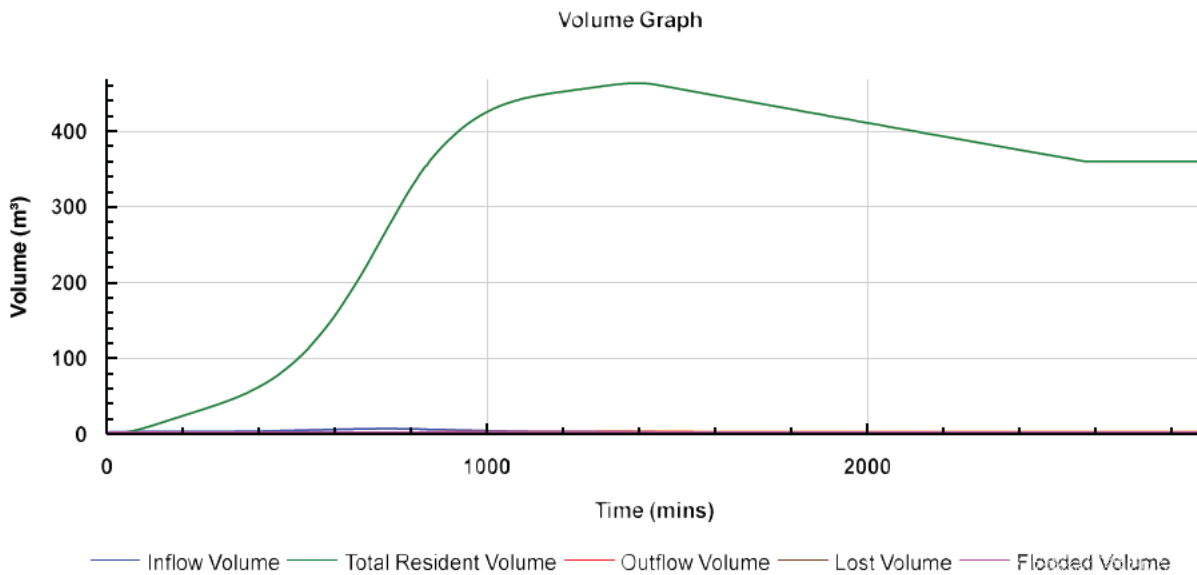
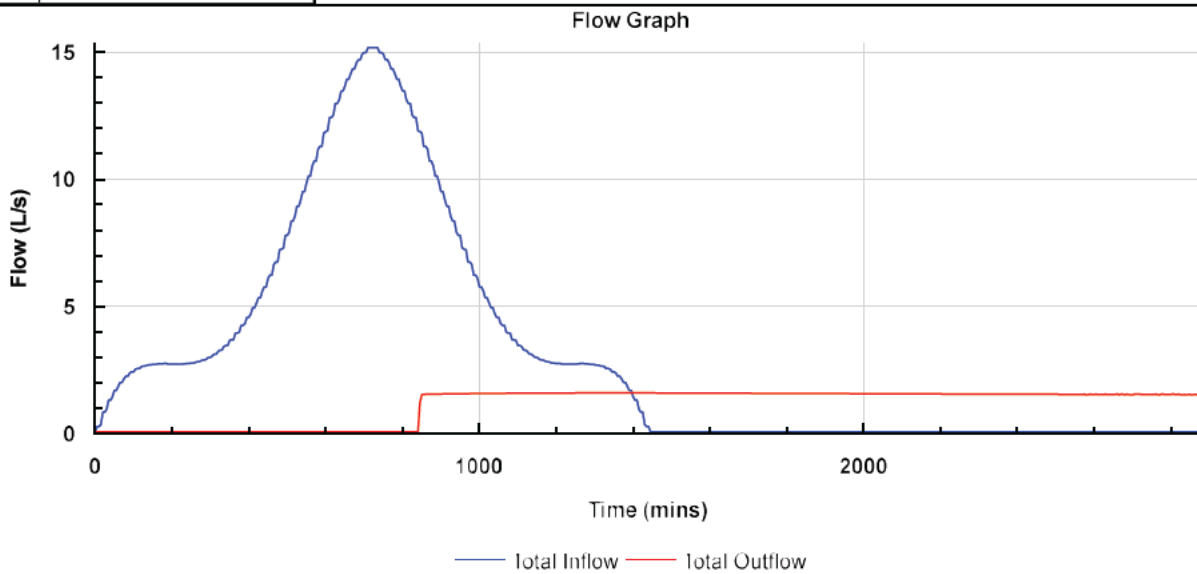


Phase
FEH 2022: 100 years: Increase Rainfall (%): +0: 1440 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Simple Junction			1.5	182.891
TOTAL	15.2	518.973	1.5	182.891

Graphs



Elbridge Farm Recycling Centre Surface Water Drainage Design Surcharged Outfall	Date 23/10/2023		
	Designed by CH	Checked by	Approved By
Report Details Type: Phase Management Storm Phase: Phase	Hafren Water Barkers Chambers, Barker Street Shrewsbury SY1 1SB		



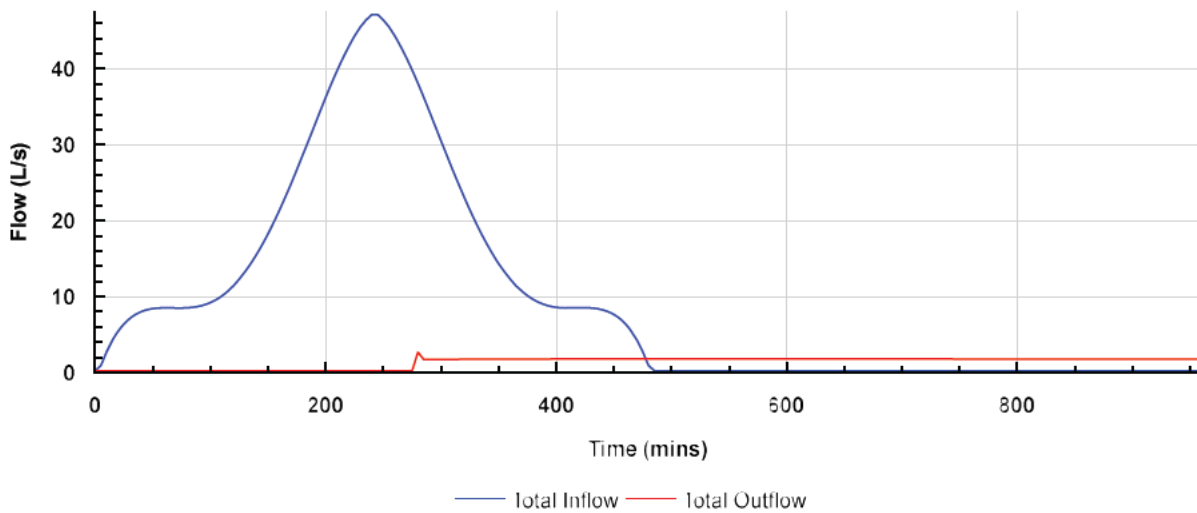
Phase
FEH 2022: 100 years: Increase Rainfall (%): +25: 480 mins: Winter

Tables

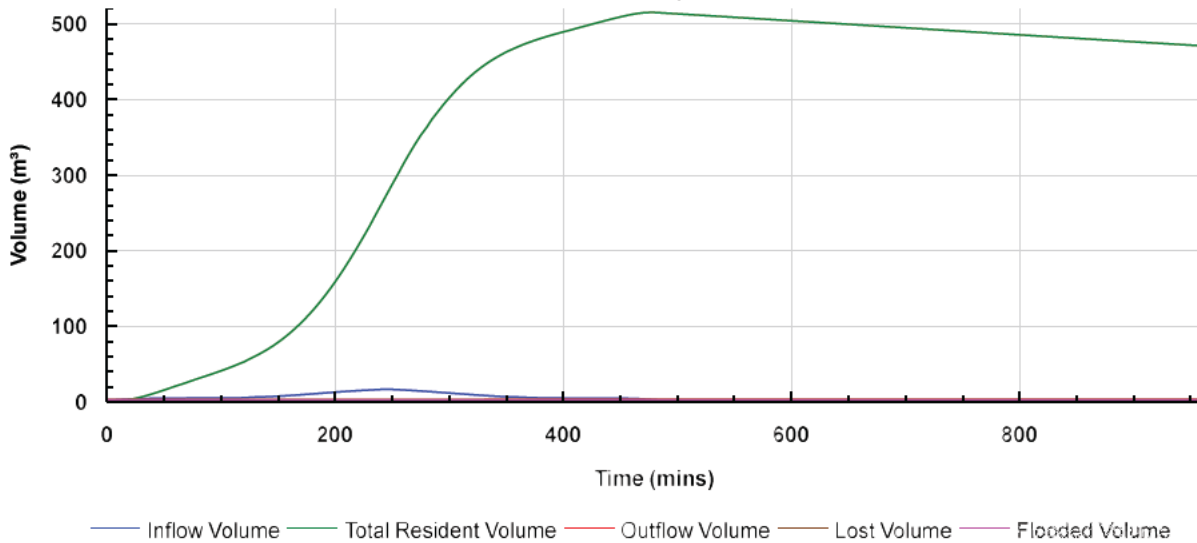
Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
Simple Junction			2.4	62.926
TOTAL	47.1	536.970	2.4	62.926

Graphs

Flow Graph

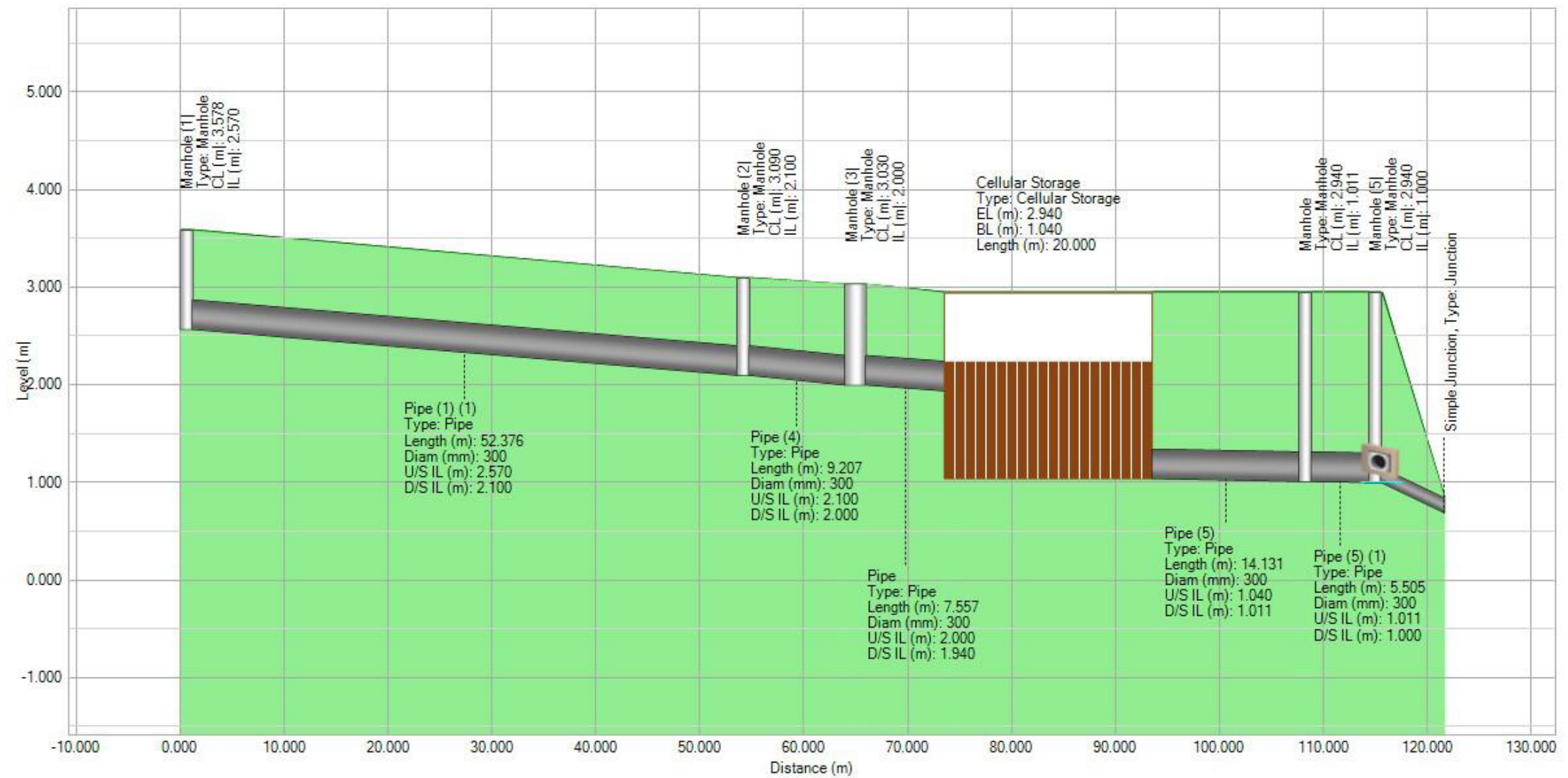


Volume Graph

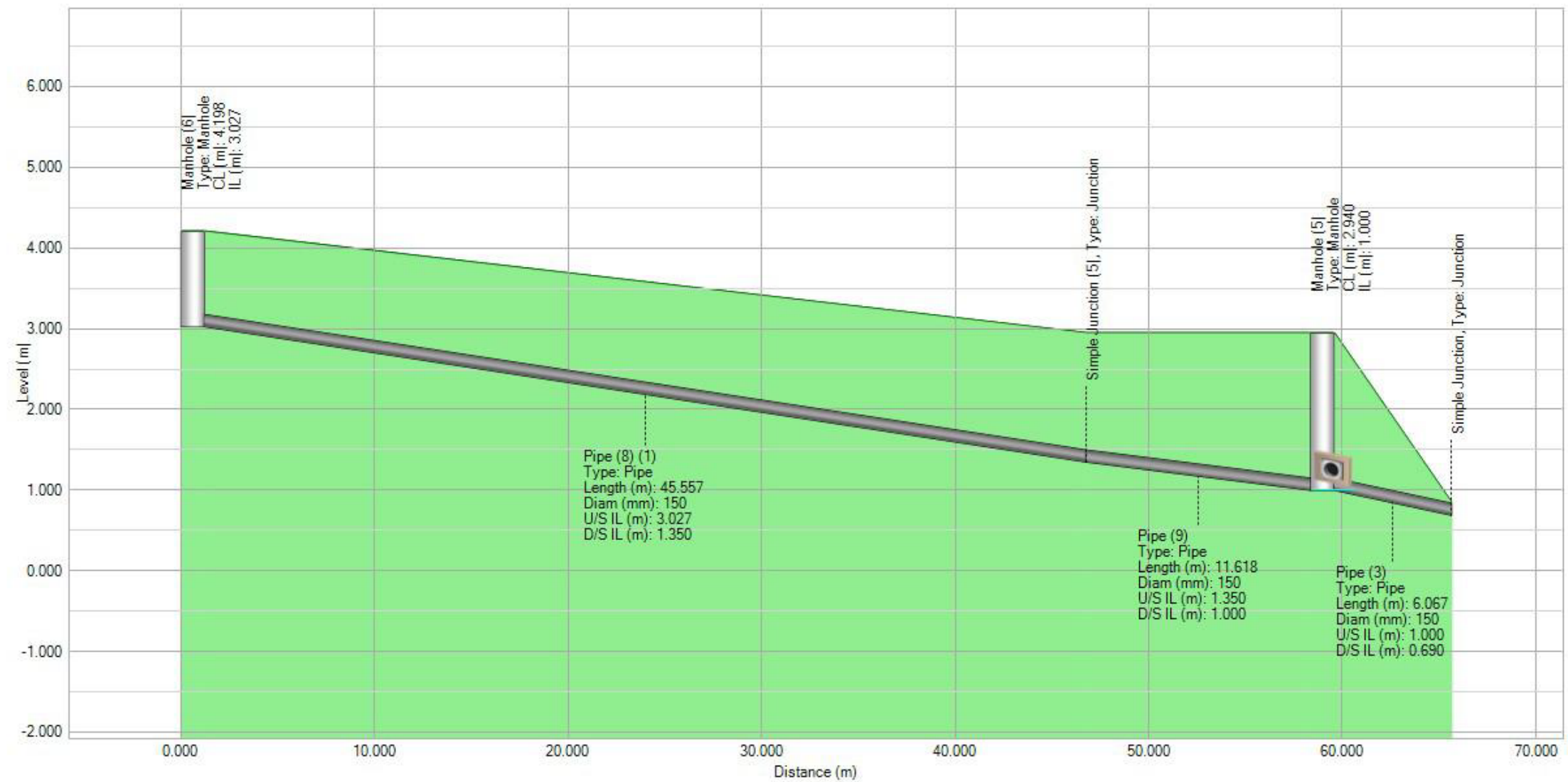


APPENDIX 3419/FRA/A6

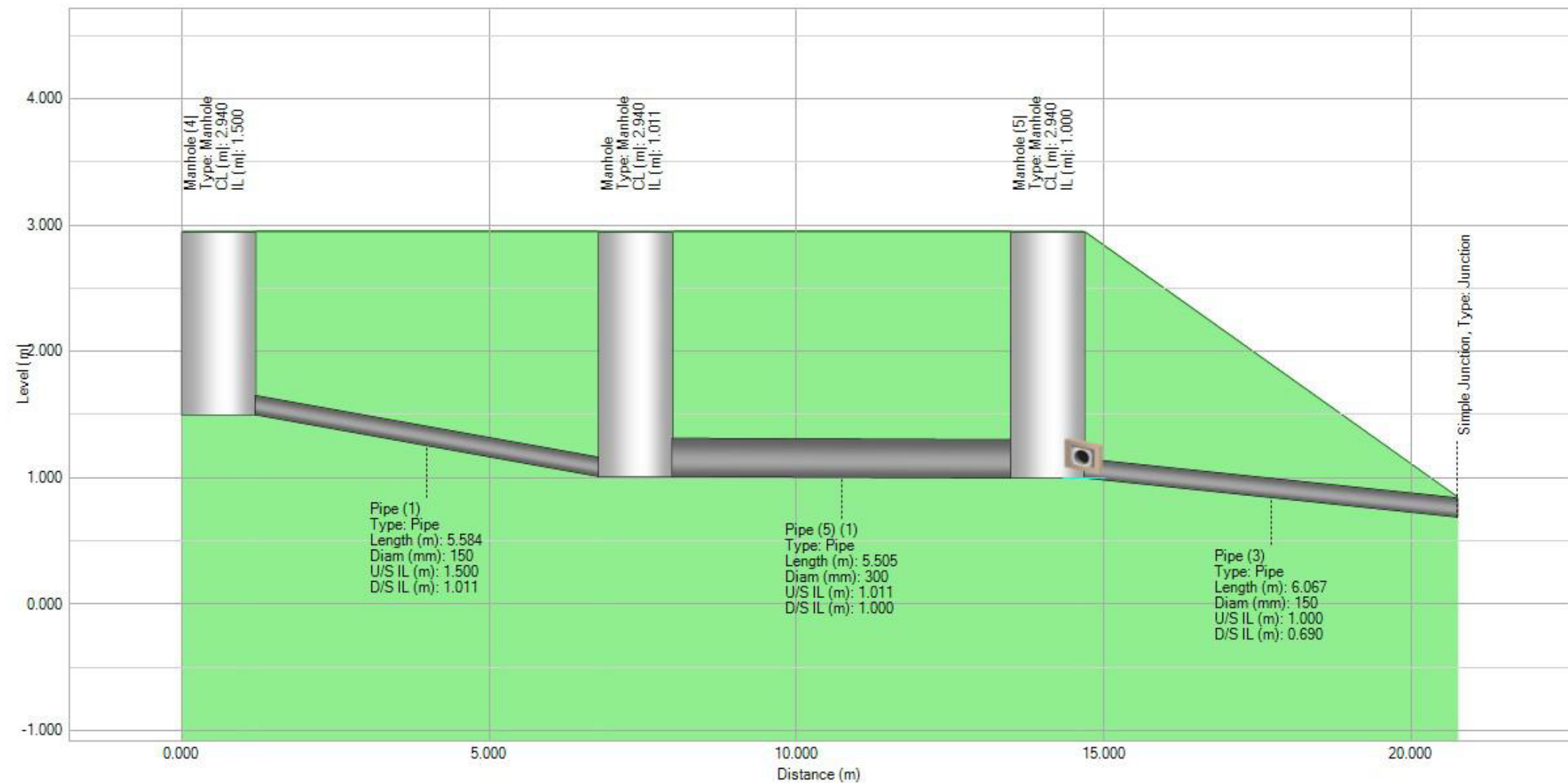
Drainage long sections



Location	Manhole (1) Manhole	Manhole (2) Manhole	Manhole (3) Manhole	Manhole (5) Manhole	Manhole (5) Manhole		
CL (m)	3.578	3.090	3.030	2.940	2.940		
IL (m)	2.570	2.100	2.000	1.011	1.000		
Connection		Pipe (1) (1) Pipe	Pipe (4) Pipe	Pipe Pipe	Pipe (5) Pipe	Pipe (5) (1) Pipe	Pipe (3) Pipe
Is Redundant		No	No	No	No	No	No
Length (m)		52.376	9.207	7.557	14.131	5.505	6.067
Diameter (mm)		300	300	300	300	300	150
U/S IL (m)		2.570	2.100	2.000	1.040	1.011	1.000
D/S IL (m)		2.100	2.000	1.940	1.011	1.000	0.690
Cellular Storage					Cellular Storage		
EL (m)					2.940		
BL (m)					1.040		



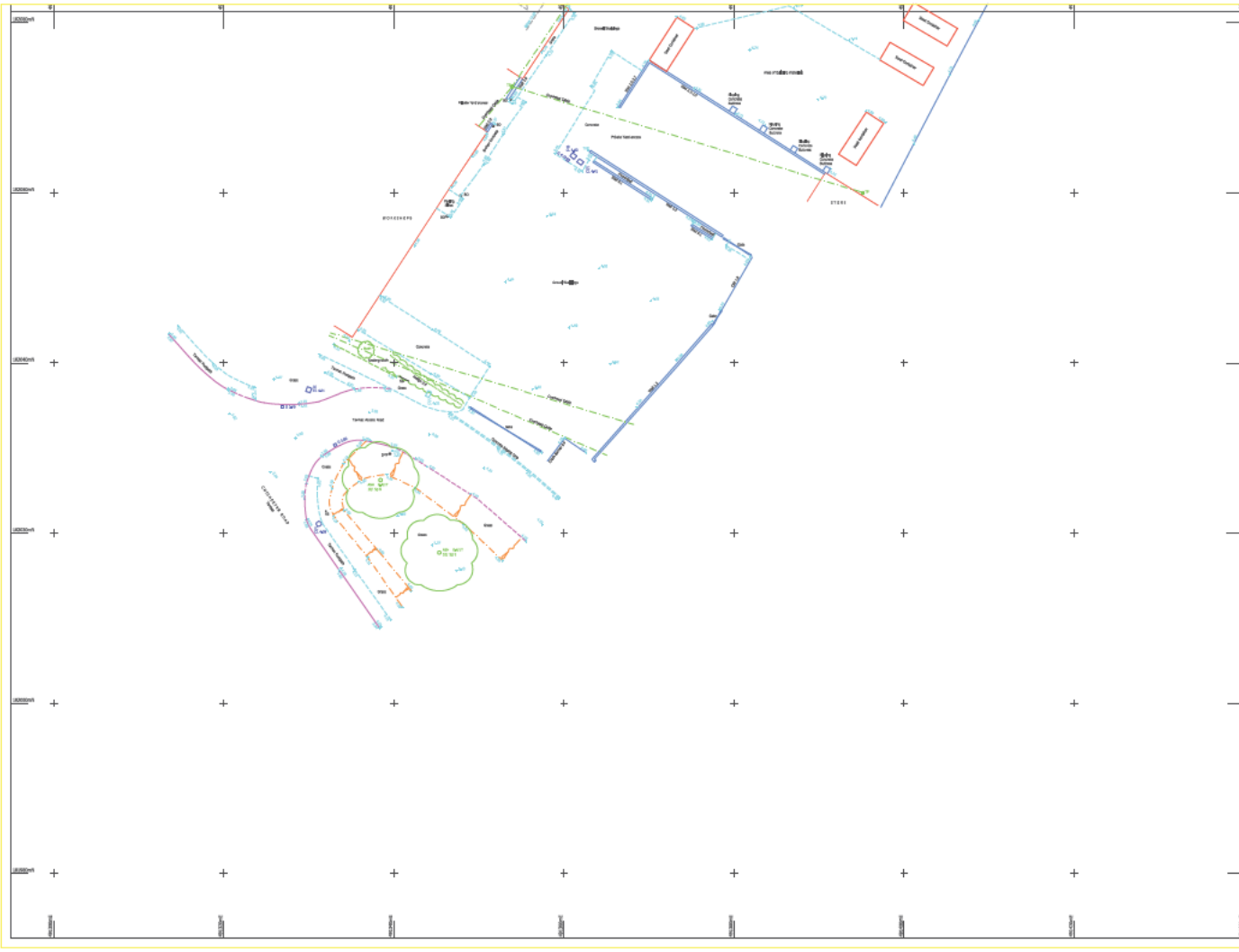
Location	Manhole (6) Manhole		Simple Junction (5) Simple Junction	Manhole (5) Manhole	Simple Junction Simple Junction
CL (m)	4.198			2.940	
IL (m)	3.027			1.000	
Connection		Pipe (8) (1) Pipe		Pipe (9) Pipe	Pipe (3) Pipe
Is connected		No		Yes	No
Length (m)		45.557		11.618	6.067
Diam (mm)		150		150	150
U/S IL (m)		3.027		1.350	1.000
D/S IL (m)		1.350		1.000	0.690
CL (m)					
IL (m)					
Length (m)					
Diam (mm)					
U/S IL (m)					
D/S IL (m)					



Location	Manhole (4) Manhole	Manhole Manhole	Manhole (5) Manhole	Simple Junction Simple Junction
CL (m)	2.940	2.940	2.940	
IL (m)	1.500	1.011	1.000	
Connection		Pipe (1) Pipe	Pipe (5) (1) Pipe	Pipe (3) Pipe
Is Inverted		No	No	No
Length (m)		5.584	5.505	6.067
Diam (mm)		150	300	150
U/S IL (m)		1.500	1.011	1.000
D/S IL (m)		1.011	1.000	0.690

APPENDIX 3419/FRA/A7

Topographic survey



NOTES:
 1. This plan has been made to identify and detail all trees on site but where there are any other trees on site, the client is advised to consult with a qualified arborist to confirm the location and condition of all trees on site.

LEGEND:

TREE SPECIES INFORMATION

Abbreviation	Common Name	Tree Height	Tree Spacing
ALB	ALB	10m	10m
ALN	ALN	10m	10m
ALP	ALP	10m	10m
ALR	ALR	10m	10m
ALY	ALY	10m	10m
ALZ	ALZ	10m	10m
ALB	ALB	10m	10m
ALN	ALN	10m	10m
ALP	ALP	10m	10m
ALR	ALR	10m	10m
ALY	ALY	10m	10m
ALZ	ALZ	10m	10m
ALB	ALB	10m	10m
ALN	ALN	10m	10m
ALP	ALP	10m	10m
ALR	ALR	10m	10m
ALY	ALY	10m	10m
ALZ	ALZ	10m	10m

LEGISLATION INFORMATION

Code	Description	Reference
100	100	100
101	101	101
102	102	102
103	103	103
104	104	104
105	105	105
106	106	106
107	107	107
108	108	108
109	109	109
110	110	110
111	111	111
112	112	112
113	113	113
114	114	114
115	115	115
116	116	116
117	117	117
118	118	118
119	119	119
120	120	120

PROPERTY INFORMATION

Code	Description	Reference
100	100	100
101	101	101
102	102	102
103	103	103
104	104	104
105	105	105
106	106	106
107	107	107
108	108	108
109	109	109
110	110	110
111	111	111
112	112	112
113	113	113
114	114	114
115	115	115
116	116	116
117	117	117
118	118	118
119	119	119
120	120	120

Scale: 1:1000
 Date: 10/10/2023
 Project: [Project Name]
 Client: [Client Name]
 Surveyor: [Surveyor Name]
 License No: [License No.]

APPENDIX 3419/FRA/A8

Maintenance schedules

Sustainable Drainage Systems (SuDS): Typical Maintenance Schedule

Attenuation Tank

Regular Maintenance	
Monthly	<ul style="list-style-type: none">Inspect and identify any areas that are not operating correctly. If required, take remedial action (for 3 months following installation)
Six Monthly	<ul style="list-style-type: none">Inspect and identify any areas that are not operating correctly. If required, take remedial action (following initial 3 month period)
Annually	<ul style="list-style-type: none">Remove sediment from pre-treatment structures
As Required	<ul style="list-style-type: none">De-silt as required
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, a number of actions may be required following such events	
Following all significant storm events	<ul style="list-style-type: none">Inspect and carry out essential recovery works to return the feature to full working order

Sustainable Drainage Systems (SuDS): Typical Maintenance Schedule

Filter Drain

Regular Maintenance	
Monthly	<ul style="list-style-type: none"> Litter and debris removal Mow grasses (where required to promote lateral runoff inflow) and remove resultant clippings (during growing season only) Remove nuisance and invasive vegetation (for 12 months following installation) Inspect/check all inlets, outlets, surface and overflows (where required) to ensure that they are in good condition, free from blockages and operating as designed. Take action where required
Six Monthly	<ul style="list-style-type: none"> Not applicable
Annually	<ul style="list-style-type: none"> Not applicable
Annually	<ul style="list-style-type: none"> Remove nuisance and invasive vegetation Inspect and document the presence of wildlife
As Required	<ul style="list-style-type: none"> Repair erosion or other damage by re-turfing, reseeding or replacing filter material Re-level uneven surfaces and reinstate design levels (typically every 60 month period) Remove and replace top 300 – 500mm of gravel, clean and replace where required (typically every 60 month period) Remove and dispose of oils or petrol residues using safe standard practices
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, a number of actions may be required following such events	
Following all significant storm events	<ul style="list-style-type: none"> Inspect and carry out essential recovery works to return the feature to full working order

Sustainable Drainage Systems (SuDS): Typical Maintenance Schedule



Flow Control Structures

Regular Maintenance	
Monthly	<ul style="list-style-type: none"> Inspect and identify any areas that are not operating correctly. If required, take remedial action (for 3 months following installation)
Six Monthly	<ul style="list-style-type: none"> Inspect and identify any areas that are not operating correctly. If required, take remedial action Remove sediment from pre-treatment structures
Annually	<ul style="list-style-type: none"> Not applicable
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, a number of actions may be required following such events	
Following all significant storm events	<ul style="list-style-type: none"> Inspect and carry out essential recovery works to return the feature to full working order

APPENDIX 3419/FRA/A9

Kingspan data

Charlotte Hale

From: Pooja Aggarwa [REDACTED]
Sent: 10 February 2023 10:55
To: Charlotte Hale
Subject: AquaTreat tables

Hello,

The Klargester AquaTreat have been designed for use in SuDS drainage schemes that require a full pollution treatment. The AquaTreat range is to help reduce pollution in line with SuDS Mitigation Indices by removing metals, suspended solids and hydrocarbons from surface water - UK factory Fitted.

The separator helps to reduce pollution by removing TSS, metals & hydrocarbons, therefore preventing them from polluting local watercourses.

Our aim is to future-proof your SuDS solution in line with the Design and Construction Guidelines from Sewerage Sector Guidance (Appendix C) and CIRIA C753 The Suds Manual 2015 Chapter 26. The AquaTreat range has been developed and tested to the British Water Code of Practice.

Depending on what mitigation indices are required, you can pick from either table below.
(the better the indices, the better the treatment)

The max flow rate columns on the tables let the customer know what the max flow rate could be if they set up a bypass weir upstream of our separator (we don't supply this)
(they would need to bypass all flows over 27mm/hour)

Our mitigation indices for low risk sites:

CoP at 10l/s	% Removal	Mitigation Index
HC	99.6%	0.996
TSS	75.6%	0.756
Heavy Metal	57%	0.567
Heavy Metal	57%	0.567

Our mitigation indices for medium risk sites:

CoP at 6l/s	% Removal	Mitigation Index
HC	99.6%	0.996
TSS	81.8%	0.818
Heavy Metal	61.4%	0.614
Heavy Metal	61.4%	0.614

Tables for both now below:

Model	10 I/s Low Risk			
	Treated Flowrate [l/s]	Max Flowrate* [l/s]	Area Drained [m2]	Treated Flowrate [l/s]
SWT001	10	100	1333	6
SWT002	15	150	2004	9
SWT003	19	190	2535	11
SWT004	23	233	3105	14
SWT005	28	281	3747	17
SWT006	34	342	4563	21
SWT007	44	436	5814	26
SWT008	48	478	6368	29
SWT009	52	516	6880	31
SWT010	61	613	8177	37
SWT011	72	723	9635	43
SWT012	83	831	11082	50
SWT013	94	940	12535	56
SWT014	100	1002	13362	60
SWT015	106	1064	14183	64
SWT016	113	1127	15029	68
SWT017	119	1192	15897	72
SWT018	126	1257	16754	75
SWT019	132	1320	17601	79

*With external bypass only

Regards
Pooja

Pooja Aggarwal
Commercial Support & Sales – Surface Water Management



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www.kingspanwaterandenergy.com