

Proposed Care Home Boorley Gardens, Botley, SO32 2BX

**Flood Risk Assessment
and Drainage Strategy**

**Issue Date:
20 November 2023**

**Report Number:
23094-FRA01**

**Client:
Hedge End Care Home Ltd**

**Revision:
C**

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Revision	Date	Comments	Prepared by	Checked by
A	20.11.23	Initial issue	KR	RH
B	21.11.23	Report title and client name amended	KR	RH
C	05.08.24	Updated to suit revised layout and following consultee comments	KR	PL

Executive Summary

Site Location	West of Winchester Road at Boorley Green, Botley, Hedge End, Eastleigh, Hampshire, SO32 2BX. National Grid reference is SU503149. Located within ongoing residential development.
Site Proposals	Proposed Care home with associated car parking.
Nearest Surface Water Sewer	Sewers installed in highways immediately adjacent to the site.
Nearest Foul Water Sewer	Sewers installed in highways immediately adjacent to the site.
Flood Zone	Site is located entirely in flood zone 1 / low probability of flooding.
Surface Water Flooding	Not at risk of surface water flooding
Ground Water	Not at risk of ground water flooding on basis of available information
Surface Water Discharge Rate	Unrestricted discharge to sewer network installed under ongoing residential development.
Foul Water Drainage	Unrestricted discharge to sewer network installed under ongoing residential development.
SUDS	SuDS features installed under ongoing residential development.

The above summary should not be used in isolation and reference should be made the full report.

1. Introduction

Coast Consulting Engineers have been commissioned by Hedge End Care Home Ltd. to assess the flood risk associated with a proposed care home development at Boorley Gardens, Botley, Eastleigh. This Flood Risk Assessment is reviewed in accordance with the National Planning Policy Framework (NPPF) for Development and Flood Risk. In conjunction with assessing the site for flood risk a proposed drainage strategy has been prepared.

This site-specific Flood Risk Assessment (FRA) has been undertaken to determine the risk of flooding to the proposed development from all sources in accordance with the National Planning Policy Framework (NPPF) and to assess the flood risk to others as a result of the development. The assessment will recommend how the risk can be managed in line with planning policy requirements.

One of the key aims of the National Planning Policy Framework (NPPF) is to ensure that flood risk is considered at all stages of the planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas at highest risk. Where new development is necessary in such areas, the policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall.

1.1 National Planning Policy Framework (NPPF)

The NPPF requires that:

- A site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account the vulnerability of its users, without increasing flood risk elsewhere, and where possible, will reduce flood risk overall.
- A site-specific flood risk assessment is required for proposals greater than 1 ha in size in a Flood Zone 1; all proposals for new development in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as identified in the Strategic Flood Risk Assessment).

The following definitions for flood zones are derived from NPPF:

FLOOD ZONE 1:

This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).

FLOOD ZONE 2:

This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year.

FLOOD ZONE 3:

This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

In addition to the risk of flooding from rivers or sea, consideration must also be given to surface water flooding, flooding due to ground water and flooding from artificial sources such as sewer failure or overtopping of reservoirs.

2. Site location, Topographical Features and Proposals

The proposed care home development is located west of Winchester Road at Boorley Green, Botley, Hedge End, Eastleigh, Hampshire, SO32 2BX. National Grid reference is SU503149.

The site sits within an ongoing residential development called Boorley Gardens being constructed by Bellway Homes and Miller Homes. The ongoing residential development was granted planning approval on appeal ref 0/15/75953.

A site location plan is shown in figure 2.1 below.

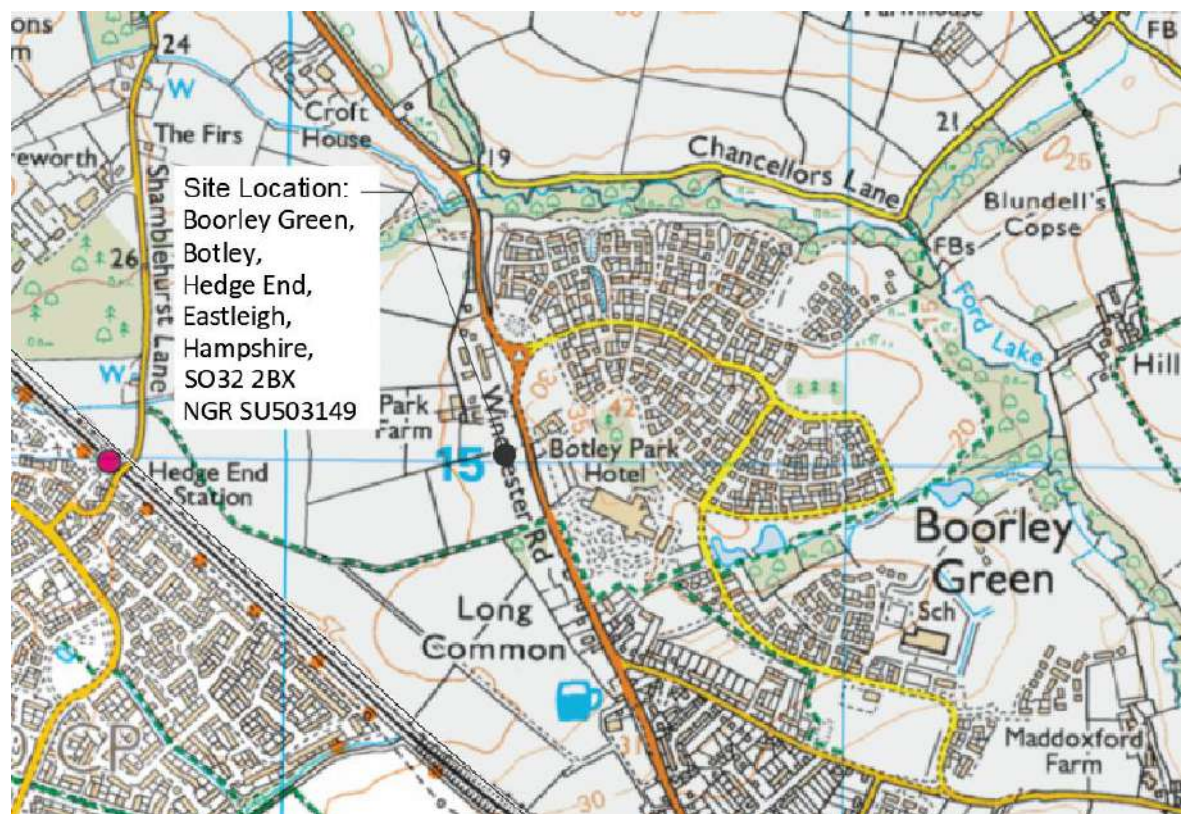


Figure 2.1 – Site Location Plan.

The site is bound to the south by Fieldfare Avenue which is a road recently constructed as part of the ongoing residential development. Existing mature oak trees are located within the site towards the northern boundary. These trees are to be retained and proposed development has been planned to avoid their root protection areas. Proposed site plan is included in Appendix A

3. Potential Sources of Flooding And Proposed Mitigation

As required by the National Planning Policy Framework (NPPF) and Technical Guidance to the NPPF, each potential source of flooding needs to be considered; rivers and sea, land, groundwater, sewers and artificial sources (such as reservoirs and canals). Consideration also needs to be given to the flood risk vulnerability classification for this type of development.

3.1 Flood Zone Classification

Environment Agency flood maps have been acquired to assist with this assessment. The flood maps indicate that the development boundary is located entirely within an area classified as a Flood Zone 1. Land located within a flood zone 1 is defined as having less than a 1 in 1,000 annual probability of river flooding (low risk).

Flood risk map for planning is included in Appendix B and extract is shown in figure 3.1 below. The site is not considered to be at risk of flooding from rivers or sea.

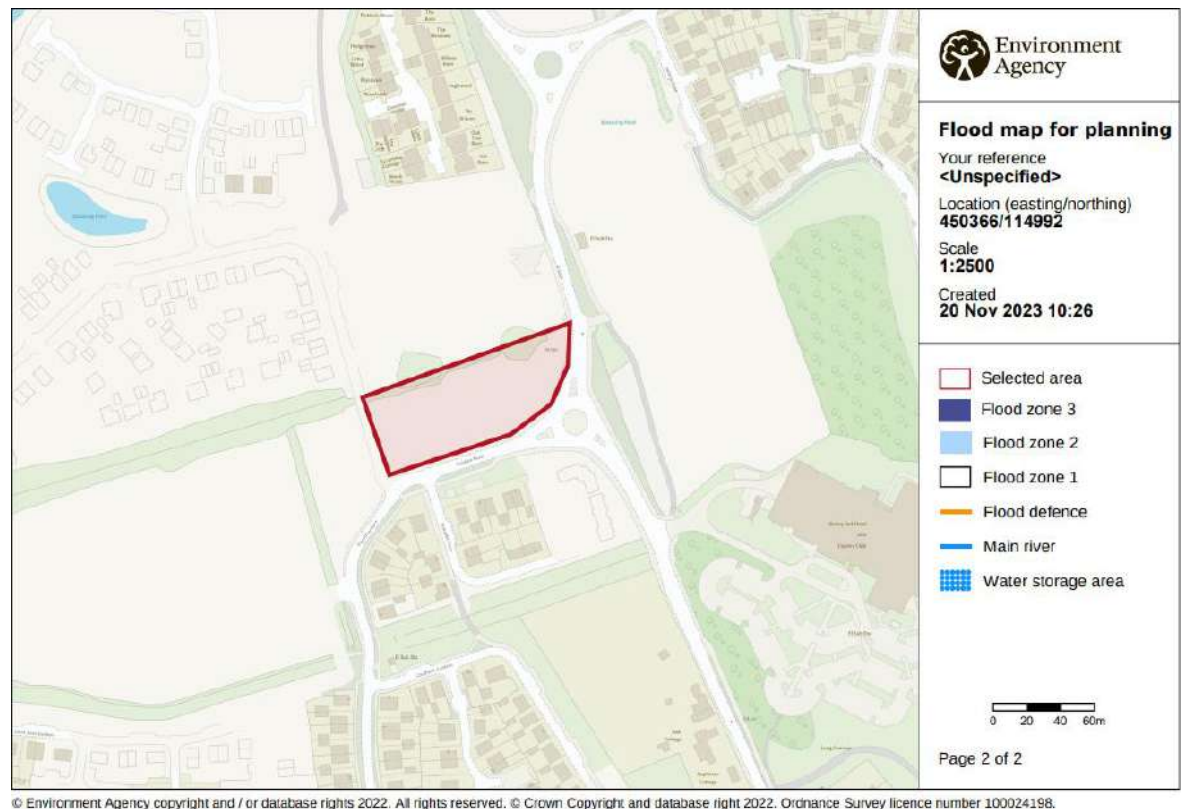


Figure 3.1.1 – Flood Risk Map

3.2 Flood Risk Vulnerability Classification

Table 2 of the Technical Guidance to the National Planning Policy Framework states the following with respect to flood risk vulnerability classification.

3.2.1 More vulnerable

- Hospitals.
- Residential institutions such as **residential care homes**, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan

Table 3 of the Technical Guidance to the National Planning Policy Framework states the following with respect to appropriate land uses:

Table 3: flood risk vulnerability and flood zone 'compaibility'

Flood Risk Vulnerability Classification (See Table 2)	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test required	✓	✓
Zone 3a	Exception Test required	✓	x	Exception Test required	✓
Zone 3b functional floodplain	Exception Test required	✓	x	x	x

Key: ✓ Development is appropriate.
x Development should not be permitted.

An exception test will not be required in this instance as development is located outside of a flood zone 2 or flood zone 3.

3.3 Surface Water Flood Risk

Surface water flood risk mapping shows that the site is not at risk of flooding from surface water as shown in Figure 3.3.1 below.

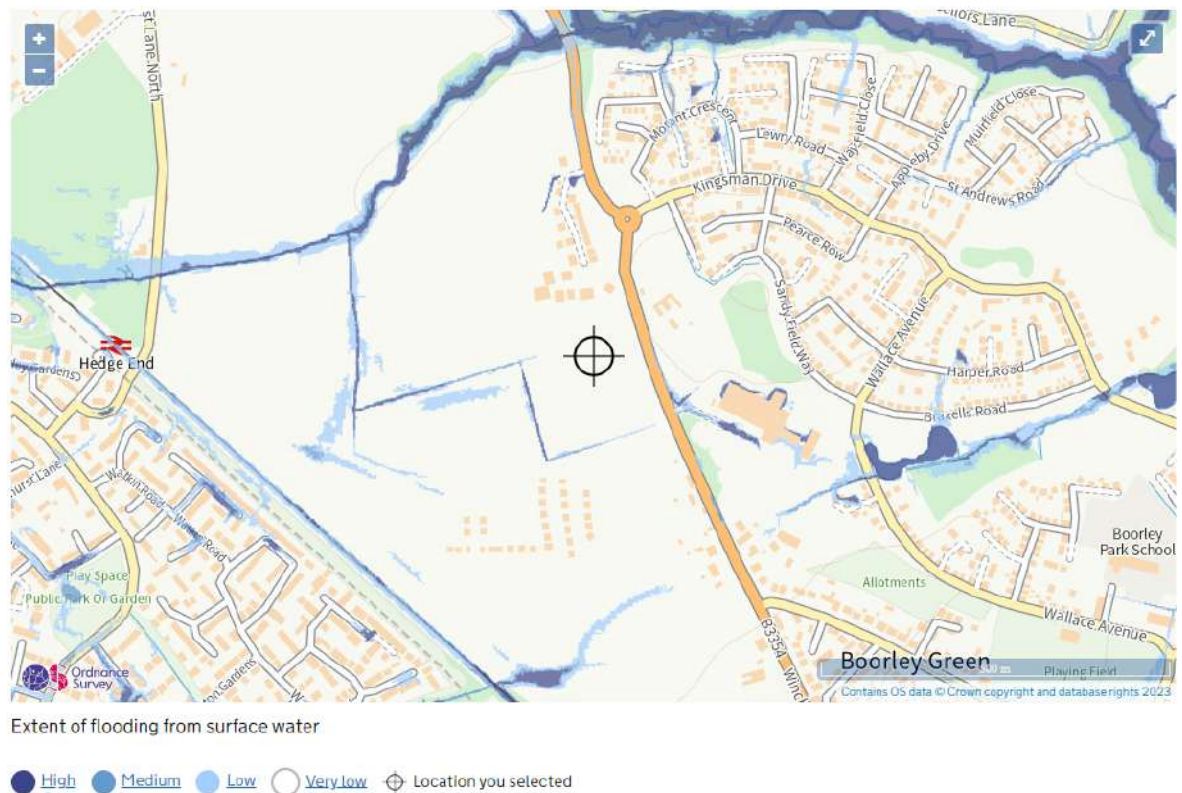


Figure 3.3.1 – Surface Water Flood Risk Map

3.4 Ground Water Flood Risk

Flooding due to ground water occurs when the levels of water below the ground rise and emanate above finished ground level. This occurs more frequently when the site is underlain by a permeable strata.

A site investigation report has not been made available and British Geological Survey does not record superficial deposits at this location. However, we note that there are no recorded springs, bogs or other features identified on available mapping. We also note that site falls within a wider development for which planning has been approved.

3.5 Flood Risk from Sewers

The proposed development is located within ongoing development. Prior to commencement of development the site was greenfield. The sewer network being installed as part of the ongoing development will be sized to convey flows originating from 1 in 100 year including allowance for climate change event storm.

3.6 Flood Risk from Reservoirs

Artificial sources of flood risk such as man-made ponds or reservoirs can cause a potential risk of flooding. There are no such sources of flood risk within the vicinity of the development and confirmation of this from the flood maps shown in figure 3.6.1 below. Therefore, the risk of flooding due to this source can be deemed as **low**.

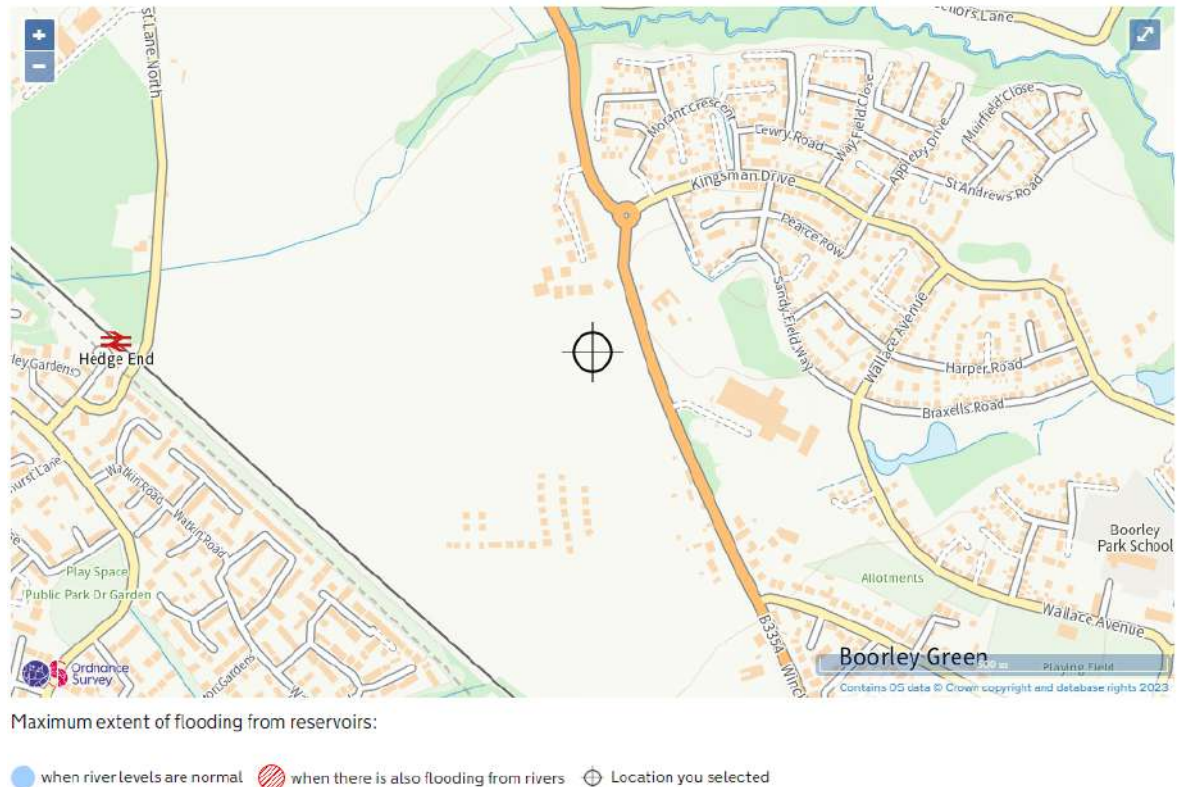


Figure 3.6.1 – Reservoir Flood Risk Map

The proposed development is considered appropriate within a Flood Zone 1 in line with the guidance contained within the National Planning Policy Framework for flooding.

4. Surface and Foul Water Disposal

The proposed development is located within ongoing residential development, and we have been advised that allowance has been made for run off from the proposed development into the sewer network currently being installed. We are further advised that there is no restriction to discharge rates for both foul and surface water drainage.

4.1 Existing Drainage

We have been provided with proposed drainage layout drawings for the residential scheme by PFA Consulting. Drawing M434/67 shows foul and surface water drainage including manholes F40 and S1060 to serve proposed care home development subject of this report. We have been advised these sewers and manholes F40 and S1060 have been installed. A copy of proposed drainage layout drawings by PFA Consulting for the residential development are included in Appendix C.

4.2 Proposed Drainage

A proposed drainage layout to serve the development has been prepared and is included in Appendix D.

Allowance was made within the wider, ongoing residential development that the site sits wholly within. An allowance for run off from a contributing area of 0.315 Ha was included within the original calculations from the wider development as indicated in Figure 4.2.1 below.

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for M380-CATCHMENT A-SW.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
6.001	11.510	0.050	230.2	0.049	0.00	0.0	0.600		o	300	Pipe/Conduit	
6.002	11.510	0.065	177.1	0.007	0.00	0.0	0.600		o	300	Pipe/Conduit	
6.003	16.954	0.089	191.6	0.099	0.00	0.0	0.600		o	450	Pipe/Conduit	
6.004	23.475	0.043	545.9	0.017	0.00	0.0	0.600		o	450	Pipe/Conduit	
1.006	16.001	0.048	336.9	0.116	0.00	0.0	0.600		o	750	Pipe/Conduit	
1.007	25.441	0.048	530.0	0.000	0.00	0.0	0.600		o	750	Pipe/Conduit	
7.000	66.663	1.244	53.6	0.315	5.00	0.0	0.600		o	300	Pipe/Conduit	
1.008	44.468	0.135	329.4	0.022	0.00	0.0	0.600		o	750	Pipe/Conduit	

Figure 4.2.1 – Network details from wider developments original drainage scheme design.

An assessment has been made of the actual contributing area from proposed care home development and the area has been measured at 3,647m² (0.365 Ha). A contributing areas layout is included in Appendix D. The designers of the drainage network of the wider development (PFA Consulting) were consulted with regards to the actual measured contributing area. They advised in email correspondence on 1st August 2024 that the

contributing area of 0.365 Ha would result in no additional flooding in the wider drainage network. A copy of this correspondence is included in Appendix C. PFA Consulting were kind enough to share their microdrainage MDX file for the wider drainage network.

The proposed network for this care home development has been added into the model for the wider development simulations have been ran for 30 and 100 year + 40% climate change allowance return period storms. Results are included in Appendix E.

Hydraulic modelling of the proposed surface water drainage has been undertaken and is included in Appendix E.

4.3 Proposed SUDS and Treatment for Water Quality

Drainage layout drawings for the wider development have been obtained from PFA Consulting are included in Appendix C. The wider development surface water drainage network includes SuDS in form of swales and detention basins to provide treatment to surface water run off and attenuation for flows above the allowable discharge rate. The wider development drainage network and SuDS features are subject to separate planning approval but as discussed previously surface water run off from this proposed development into the wider network was allowed within the original design.

SuDS provided as part of the wider development are considered appropriate to mitigate against pollution from runoff of different land type uses within the development proposals. An assessment of the suitability of SuDS proposed has been undertaken utilising Simple Index Approach (SIA) published by CIRIA and HR Wallingford. The pollution hazard level varies between land types, figure 4.3.1 shows the proposed SuDS features to have greater mitigation indices therefore provide adequate water treatment.

Pollution Hazard Indices				
Land Use	Pollution Hazard Level	Total Suspended Solids (SS)	Metals	Hydrocarbons
Residential Roofing	Very Low	0.2	0.2	0.05
Residential Parking	Low	0.5	0.4	0.4
Low Traffic Roads	Low	0.5	0.4	0.4
Mitigation Indices				
Swale		0.5	0.6	0.6
Detention Basin		0.5	0.5	0.6

Figure 4.3.1 – Pollution hazard matrix based on SIA.

4.4 Proposed Foul Water Drainage

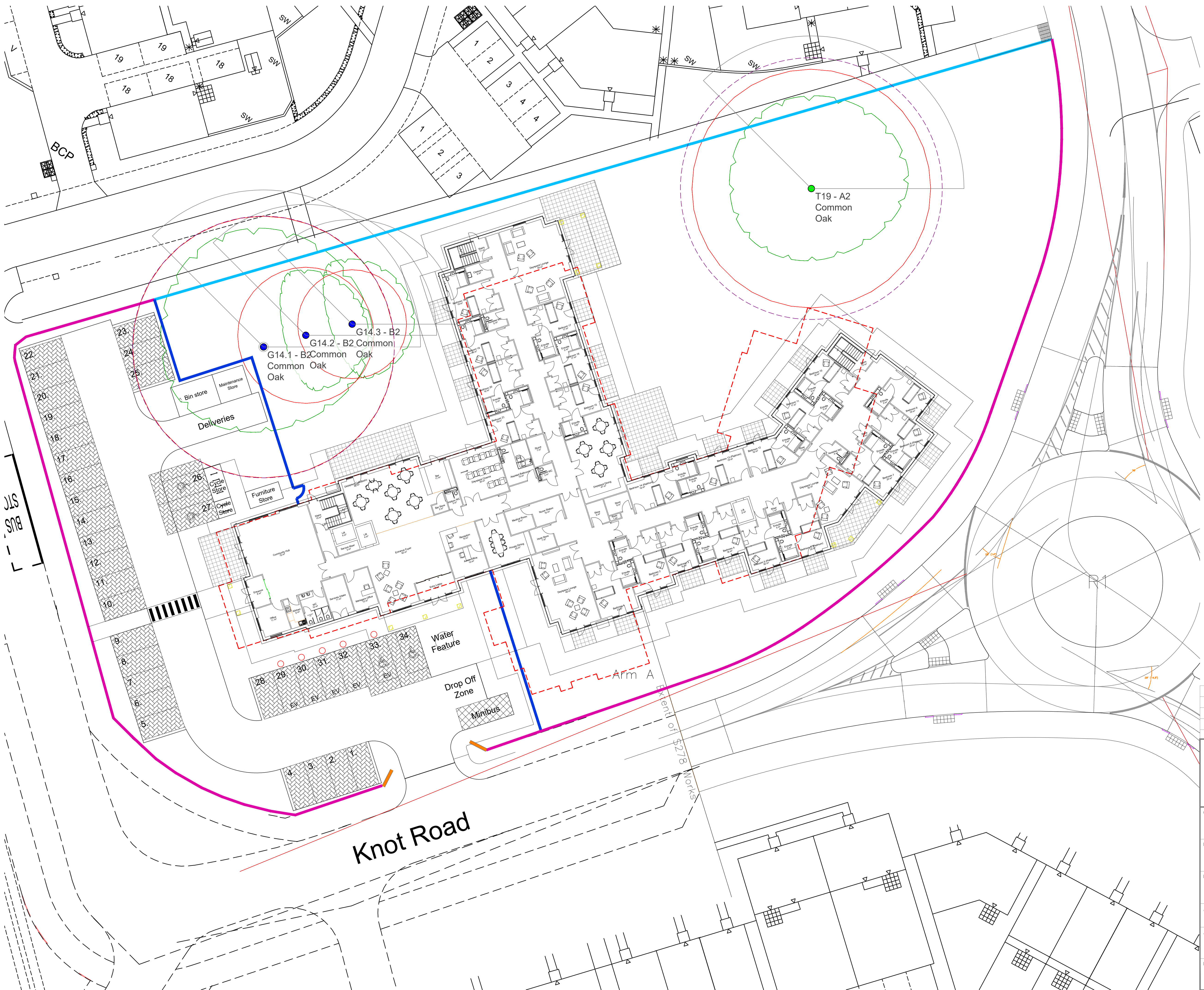
As discussed this proposed development is entirely contained within a wider ongoing development. It is proposed to discharge foul water flows from proposed development into the drainage network installed as part of the wider development. The designer of the wider development network (PFA Consulting) have confirmed that allowance was made for foul water flows from this development into the wider network.

5. Drainage Maintenance

The drainage network serving the proposed development will be designed and constructed in line with Building Regulations Part H and BS 12056 and relevant best practice guidance. As such the drainage network should achieve self-cleansing velocities and maintenance requirements are anticipated to be minimal. Where maintenance is required, in the event of blockage for instance it will be undertaken by the care home operator. As the network is designed in accordance with building regulations access for rodding / jetting will be available to all drainage runs.

Maintenance of the drainage network serving the wider development including proposed SuDS features are addressed by that development.

Appendix A – Proposed Development Layout



- Parking Bays - Block Paving (Colour - Brindle)
- Black Tarmac
- Paths - Resin Bound Gravel
- 600mm x 600mm Saxon Buff Paving Slabs
- 1.8m Red brick wall topped with Iron Railing (Black Metal)
- 1.8m Timber Featheredge Closeboard Fencing
- 1.1m High Estate Rail Fencing (Black Metal)
- Brick wing walls with signage
- 15m RPA Zones
- Outline of previous building footprint
- EV Charging Parking Space

W	12/07/24	Boundary treatments updated	CFF	JB
V	27/06/24	EV charging points added	CFF	JB
U	25/06/24	Entrance area updated	CFF	JB
-	02/01/18	Original Drawing	JB	JB
Rev	Date	Revision Description	Drawn By	Approved By

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t: 01325 464 111
e: studio@adgarchitects.co.uk
w: www.adgarchitects.co.uk

Client Halebourne Group		
Project Information Proposed Care Home Development Boorley Gardens, Botley, Hampshire, SO32 2BX		
Drawing Title Proposed Site Plan		
A1 Scale 1:200	A3 Scale	
Job Number H.21.61	Drawing Number (9-) 2	Revision W
Drawing Issue PLANNING		

Appendix B – Flood Risk Map for Planning

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
450366/114992

Created
20 Nov 2023 10:26

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger than 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

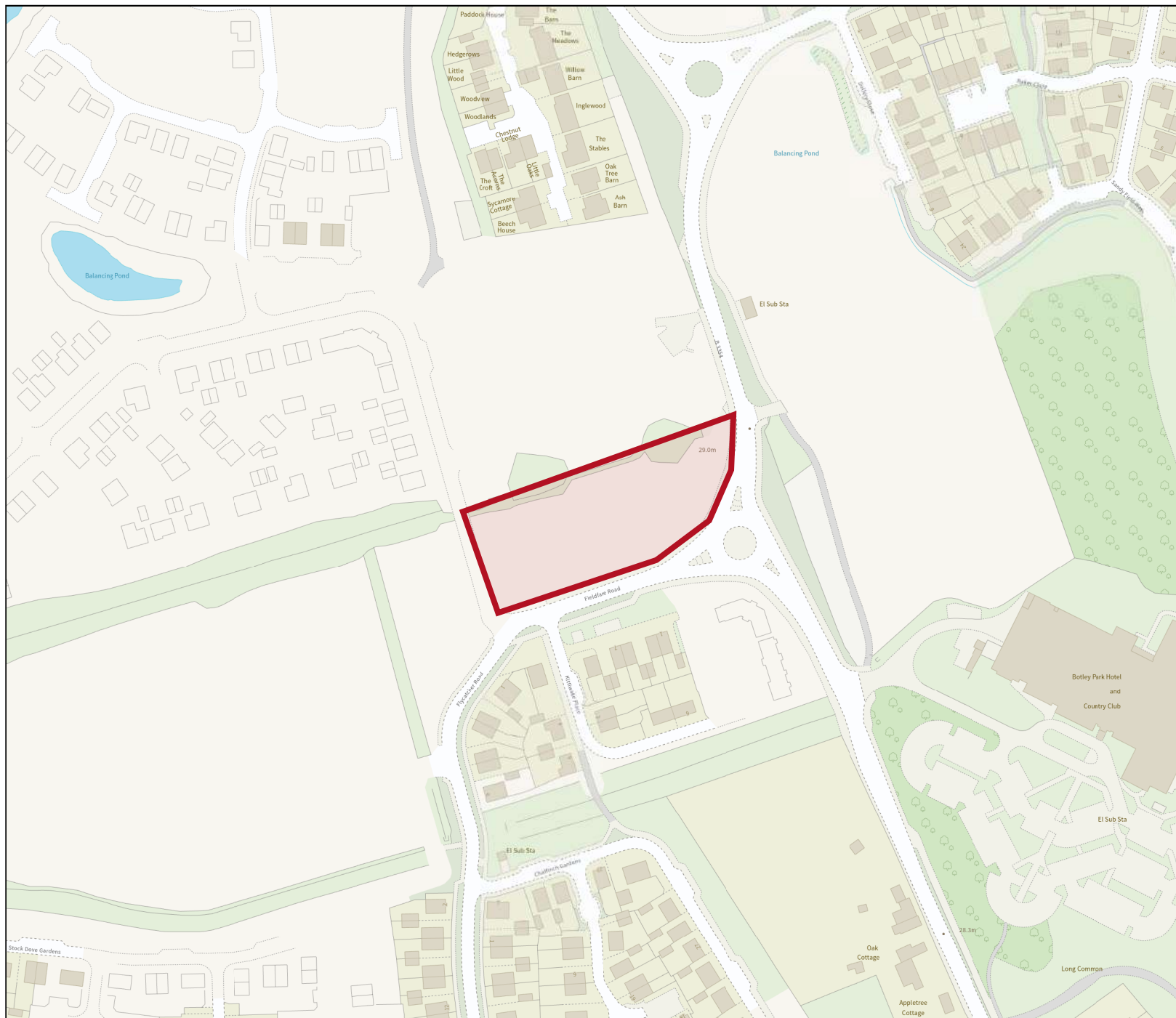
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
450366/114992

Scale
1:2500

Created
20 Nov 2023 10:26

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area

0 20 40 60m

Appendix C – Wider Development Drainage Layouts and Correspondence

Keith Redford

From: David Brock <dbrock@pfaplc.com>
Sent: 01 August 2024 08:38
To: Keith Redford
Cc: 'john.bell'; 'David Lawrence'; 'Rob Stone'
Subject: RE: M434C: Hedge End Care Home - Phase 4 Boorley
Attachments: M380-Catchment A PDF Output.pdf; M380-Catch A-V4.8 with Odyssey (S278+FW).MDX

Afternoon Keith,

The new impermeable area of 3,647m² (0.365 Ha) is 103m² less than our previous assessment - as expected, there will still be **no additional flooding**.

As requested, please find attached a copy of the MDX file – the pipe of interest is PN6.000.

Regards

Dave

Dave Brock
Technical Director



Transport Planning / Highways & Infrastructure Design / Flood Risk & Water Management

PFA Consulting Ltd, Stratton Park House, Wanborough Road, Swindon SN3 4HG

T: 01793 828000 **M:** 07894 587656



PFA Consulting Ltd
Company Registered in England 03871018.
Registered address as above.

From: Keith Redford <kr@coastconsult.co.uk>
Sent: 31 July 2024 15:08
To: David Brock <dbrock@pfaplc.com>
Cc: 'john.bell' <john.bell@adgarchitects.co.uk>; 'David Lawrence' <david.lawrence@bellway.co.uk>; Rob Stone <robstone@halebournegroup.co.uk>
Subject: RE: M434C: Hedge End Care Home - Phase 4 Boorley

Hello David,

Further to earlier correspondence on this scheme we have received amended site layout (copy attached). I have measured hardstanding area and confirm it measures at 3647m² (0.365 Ha) which is less than the previous layout. For completeness can you advise implications to your designed network from this contributing area?

We had previously received comments from the LA asking for evidence of the impact on the wider drainage network. I think the best way we can provide that is to include a copy of your calculations with the amended contributing area. If you could provide us with your MDX file we can run the necessary simulations and provide the results to the LLFA.

Thank you.

Kind regards,

Keith



Keith Redford
Associate

Coast Consulting Engineers Limited
7 Silverton Court
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NE23 7RY

Phone : 0191 5977879
Mobile : 07947 248060
Email : kr@coastconsult.co.uk
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From: David Brock <dbrock@pfaplc.com>
Sent: Wednesday, March 20, 2024 3:08 PM
To: Keith Redford <kr@coastconsult.co.uk>
Cc: 'John Bell' <john.bell@adgarchitects.co.uk>; 'David Lawrence' <david.lawrence@bellway.co.uk>
Subject: RE: M434C: Hedge End Care Home - Phase 4 Boorley

Keith,

Thanks for clarifying the typo – with the impermeable area at 0.375Ha there will be **no additional flooding**.

Regards

Dave

Dave Brock
Technical Director



Transport Planning / Highways & Infrastructure Design / Flood Risk & Water Management



PFA Consulting Ltd
Company Registered in England 03871018.
Registered address as above.

From: Keith Redford <kr@coastconsult.co.uk>
Sent: 20 March 2024 14:43
To: David Brock <dbrock@pfapl.com>
Cc: 'john.bell' <john.bell@adgarchitects.co.uk>; 'David Lawrence' <david.lawrence@bellway.co.uk>
Subject: RE: M434C: Hedge End Care Home - Phase 4 Boorley

Thanks for the response.

SW Flows:

Sorry, that was a typo. It's 0.375Ha NOT 3.75.

FW Flows:

That's great, thanks.

Thanks for the drawings.

Kind regards,

Keith



Keith Redford
Associate

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From: David Brock <dbrock@pfapl.com>
Sent: Wednesday, March 20, 2024 2:35 PM
To: Keith Redford <kr@coastconsult.co.uk>
Cc: 'john.bell' <john.bell@adgarchitects.co.uk>; 'David Lawrence' <david.lawrence@bellway.co.uk>
Subject: M434C: Hedge End Care Home - Phase 4 Boorley

Afternoon Keith,

Thanks for your email dated 20 March 2024 – please see my responses in red, below.

Please let me know if you need anything else.

Regards

Dave

Dave Brock
Technical Director



Transport Planning / Highways & Infrastructure Design / Flood Risk & Water Management

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T: 01793 828000 **M:** 07894 587656



PFA Consulting Ltd
Company Registered in England 03871018.
Registered address as above.

From: Keith Redford <kr@coastconsult.co.uk>
Sent: 20 March 2024 09:44
To: dbrock@pfapl.com
Cc: john.bell <john.bell@adgarchitects.co.uk>
Subject: Hedge End Care Home - Phase 4 Boorley

Hi Dave,

We completed FRA and DS for care home development contained within Phase 4 at Boorley. I've been sent attached copy of email correspondence between yourself and Bellway.

We note you have allowed surface water flows from 0.304Ha of hardstanding into main drainage network. Proposed development hardstanding measures at c.3.75Ha. Can you advise any implications? Or can you send me your current mdx file and we will input actual areas to see implications.

I have run our Micro Drainage simulation with 3.75Ha entering the system, and found it will cause 977m³ of new flooding on the Care Home parcel, and 751m³ of new flooding at Basin A2.

It would be worth checking the 3.75Ha impermeable area, as the whole parcel only measures 6,443m² (0.64Ha).



We note you have allowed foul flows at 1.9 l/sec. Is this peak flow or DWF? This would be very low for peak flows for care home which we will be calculating in line with BS 12056 as specified DCG.

It is DWF.

We consulted Flows and Loads – 4 (attached). For 70 care home bedrooms (persons) = 70 (persons) x 350 litres (per person) x 6 (DWF) x 1.1 (Infiltration) = 161,700 Litres.

(ii) Static not serviced	100	44	8
(iii) Static fully serviced	150	60	8
HOSPITALS & RESIDENTIAL CARE HOMES			
Residential old people / nursing	350	110	13
Small hospitals	450	140	Assess
Large hospitals	Assess individually		
*Staff figures also apply to other applications			

To get to l/s: 161,700 litres divided by 24 x 60 x 60 = 1.87 l/s, which we rounded up to 1.9 l/s

You reference the following drawings, and I wondered if you could send me copies please?

M434/109 rev E

M380/15

Attached as requested.

Kind regards,

Keith



Civil | Structural | Geotechnical

Keith Redford

Associate

Coast Consulting Engineers Limited

7 Silvertown Court

Northumberland Business Park

NE23 7RY

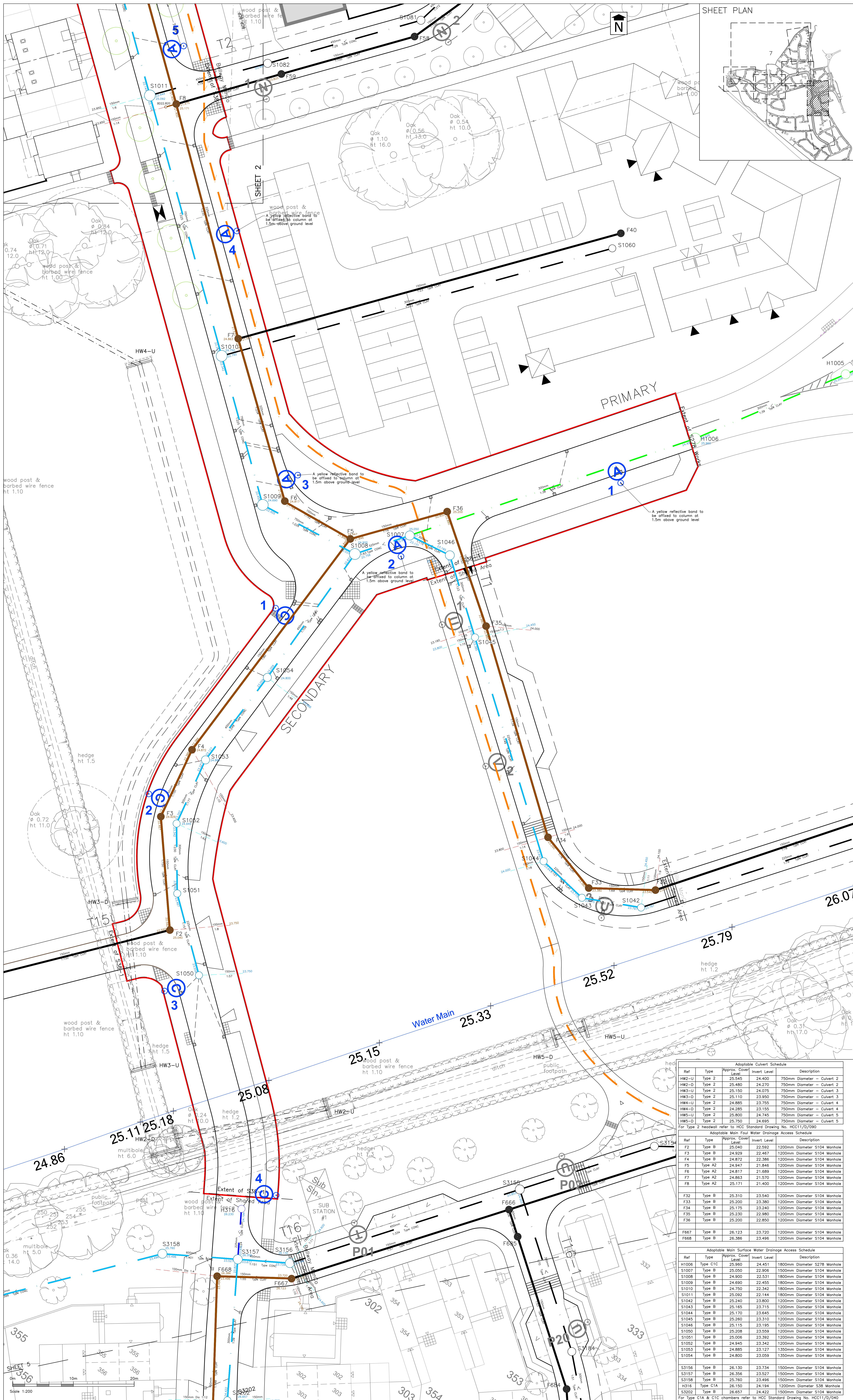
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For Technical Approval
This drawing is produced for the purposes of obtaining the approval of an adopting or maintaining authority and reliance on this drawing, for whatever purpose, at the developer's/contractor's risk until formal technical approval has been received.

NOTES

- As Noted, all proposed alterations are in accordance with the latest revisions of the Minnesota Stormwater Manual, 2nd Edition, 2010.
- Legend:**
- F238 — Foul Water Sewer & Manhole (S104)
 - S140 — Surface Water Sewer & Manhole (S104)
 - S114 — Surface Water Sewer & Manhole (Highway Drainage)
 - Orange line — Potential Rising Main from Phase 1 Pumping Station (PS1)
 - Potential Rising Main from Phase 2 Pumping Station (PS2)
 - Proposed Type 1 Gully and Connection (GCC)
 - 100mm Diameter Foul Water Lateral Connection
 - 150mm Diameter Surface Water Lateral Connection

ADOPTABLE STREET LIGHTING KEY

Refer to SSE drawing Nos. SSE217727-LD-001-D, SSE217727-LD-002-D and SSE217727-LD-003-C for details (subject to updating)

PRIVATE STREET LIGHTING KEY

Date	Description	Drawn	
21/04/2021	Drainage access schedules updated due to value engineering exercise and manhole S38 removed	JM	
E	29/05/2021	Street lighting design updated. Amended as required by E04.	DRB
E	15/06/2021	Amended to reflect the Shared Areas.	DRB
E	23/06/2021	Gullies in Road 1 updated to accord with Eastwood & Partners gullies.	DRB
H	23/06/2021	Gully catchments reviewed for first round of drainage improvements. Stormpore C1C	JW
C	01/07/2021	Street Lighting for Road 1 updated to reflect Enevore design (Rev 1).	JW
E	03/07/2021	Drainage access schedules reviewed. Stormpore C1C	JM
L	27/07/2021	Drawing updated for S38 Redesign 2.	JM
M	16/08/2021	Current 5 headwall details added.	DRB
E	25/08/2021	Pipe gradients in Road 1 updated to accord with the approved S340.	DRB
E	25/08/2021	Handover of Street Lighting Amendment as requested by HCC for S38 Redesign 2.	DRB
A	04/09/2021	Grading added over initial section of the Primary Road, as agreed with HCC.	DRB
P	07/07/2024	Road 15 junction amended in accordance with the approved S340.	DRB

Status

FOR TECHNICAL APPROV

Project

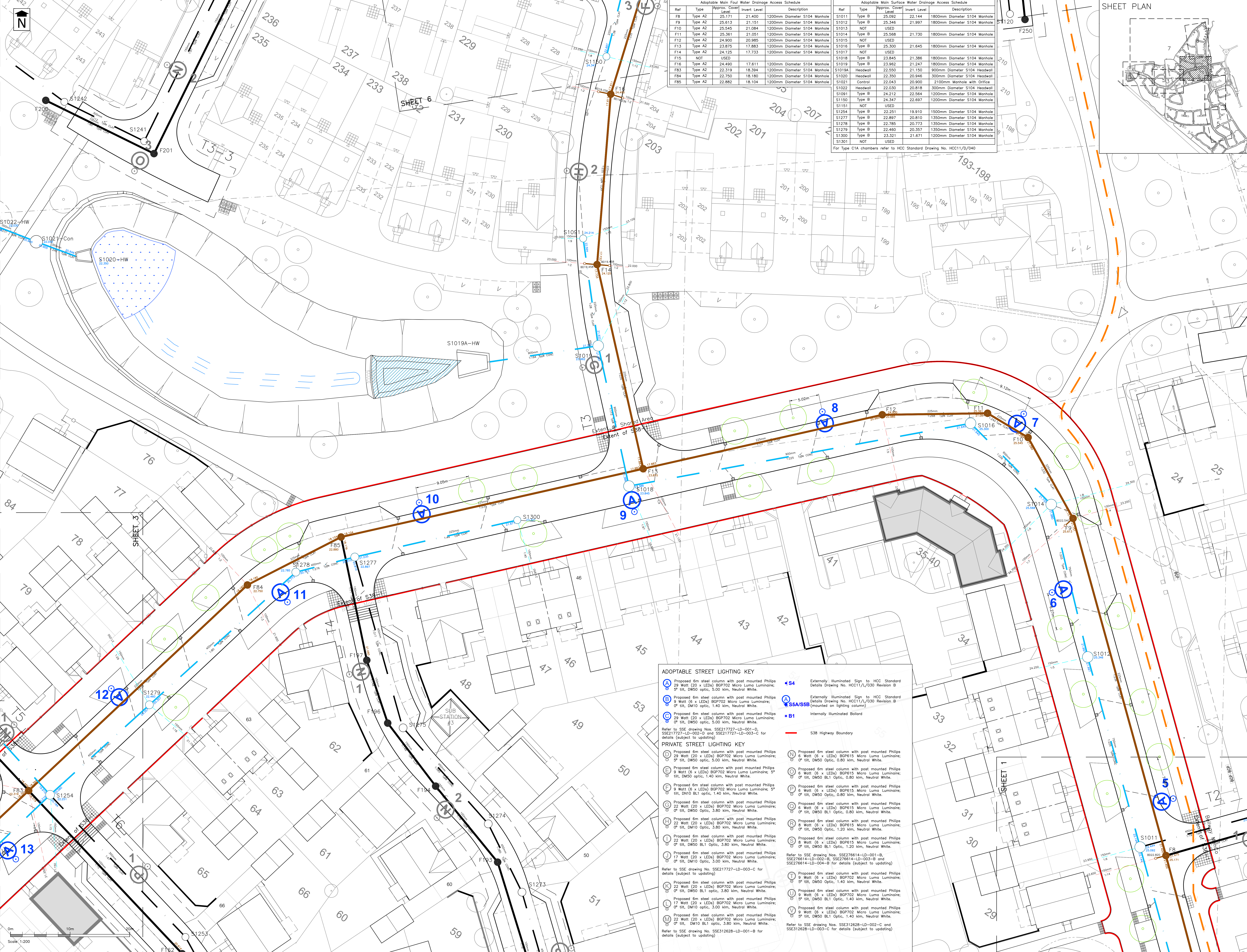
**Boorley Gardens
Winchester Road
Hedge End
S38-1 and Shared Area**

**Proposed Drainage and
Street Lighting Plan
Sheet 1 of 7**

Adoptable CULVERT SCHEDULE				
Ref	Type	Approx. Cover	Invert Level	Description
HWC-U	Type 2	25.540	24.070	750mm Diameter - CULVERT 2
HWC-U	Type 2	25.480	24.270	750mm Diameter - CULVERT 2
HWC-U	Type 2	25.150	24.675	750mm Diameter - CULVERT 3
HWC-U	Type 2	25.130	23.950	750mm Diameter - CULVERT 3
HWC-U	Type 2	24.885	23.750	750mm Diameter - CULVERT 4
HWC-U	Type 2	24.285	23.550	750mm Diameter - CULVERT 4
HWC-U	Type 2	25.800	24.745	750mm Diameter - CULVERT 5
HWC-U	Type 2	25.760	24.695	750mm Diameter - CULVERT 5
For 2m headwater refer to HCS Standard Flood Water Drains Access Schedule				
Adoptable Main Flood Water Drains Access Schedule				
Ref	Type	Approx. Cover	Invert Level	Description
F2	Type B	24.920	22.592	1200mm Diameter S104 Manhole
F3	Type B	25.040	22.592	1200mm Diameter S104 Manhole
F4	Type B	24.810	22.108	1200mm Diameter S104 Manhole
F5	Type A2	24.847	21.846	1200mm Diameter S104 Manhole
F6	Type A2	24.817	21.689	1200mm Diameter S104 Manhole
F7	Type B	25.030	21.530	1200mm Diameter S104 Manhole
F8	Type A2	25.171	21.240	1200mm Diameter S104 Manhole
F32	Type B	25.130	23.540	1200mm Diameter S104 Manhole
F33	Type B	25.070	23.380	1200mm Diameter S104 Manhole
F34	Type B	25.070	23.240	1200mm Diameter S104 Manhole
F35	Type B	25.230	22.850	1200mm Diameter S104 Manhole
F36	Type B	25.230	22.850	1200mm Diameter S104 Manhole
F667	Type B	26.133	23.720	1200mm Diameter S104 Manhole
F668	Type B	26.286	23.496	1200mm Diameter S104 Manhole

Adoptable Main Surface Water Drainage Access Schedule					
Ref	Type	Approx. Level	Invert Level	Description	
H1006	Type C1C	25.960	24.451	1800mm Diameter S104 Manhole	
S1007	Type B	24.950	24.451	1500mm Diameter S104 Manhole	
S1008	Type B	24.960	22.854	1800mm Diameter S104 Manhole	
S1009	Type B	24.680	22.485	1800mm Diameter S104 Manhole	
S1010	Type B	24.750	22.342	1800mm Diameter S104 Manhole	
S1011	Type B	25.195	22.144	1800mm Diameter S104 Manhole	
S1042	Type B	25.195	23.800	1800mm Diameter S104 Manhole	
S1043	Type B	25.262	22.144	1800mm Diameter S104 Manhole	
S1044	Type B	25.170	23.645	1200mm Diameter S104 Manhole	
S1045	Type B	25.260	23.310	1200mm Diameter S104 Manhole	
S1046	Type B	25.115	23.195	1200mm Diameter S104 Manhole	
S1047	Type B	25.115	23.195	1200mm Diameter S104 Manhole	
S1051	Type B	25.006	23.352	1200mm Diameter S104 Manhole	
S1052	Type B	25.044	23.342	1200mm Diameter S104 Manhole	
S1053	Type B	24.885	23.127	1350mm Diameter S104 Manhole	
S1054	Type B	24.800	23.059	1350mm Diameter S104 Manhole	
S1356	Type B	26.130	23.734	1500mm Diameter S104 Manhole	
S1357	Type B	26.266	23.527	1500mm Diameter S104 Manhole	
S1358	Type B	25.730	23.496	1500mm Diameter S104 Manhole	
H216	Type C1C	26.150	24.194	1200mm Diameter S104 Manhole	
H217	Type C1C	26.150	24.194	1200mm Diameter S104 Manhole	

For Type C1A & C1A bevels refer to HCC Standard Drawing No. HCCB1/D/40



Adoptable Main Foul Water Drainage Access Schedule					Adoptable Main Surface Water Drainage Access Schedule				
Ref	Type	Approx. Cover Level	Invert Level	Description	Ref	Type	Approx. Cover Level	Invert Level	Description
F8	Type A2	25.171	21.400	1200mm Diameter S104 Manhole	S1011	Type B	25.092	22.144	1800mm Diameter S104 Manhole
F9	Type A2	25.613	21.191	1200mm Diameter S104 Manhole	S1012	Type B	25.346	21.997	1800mm Diameter S104 Manhole
F10	Type A2	25.549	21.084	1200mm Diameter S104 Manhole	S1013	NOT USED			
F11	Type A2	25.361	21.051	1200mm Diameter S104 Manhole	S1014	Type B	25.568	21.730	1800mm Diameter S104 Manhole
F12	Type A2	24.900	20.985	1200mm Diameter S104 Manhole	S1015	NOT USED			
F13	Type A2	23.875	17.883	1200mm Diameter S104 Manhole	S1016	Type B	25.300	21.645	1800mm Diameter S104 Manhole
F14	Type A2	24.125	17.733	1200mm Diameter S104 Manhole	S1017	NOT USED			
F15	NOT USED				S1018	Type B	23.845	21.386	1800mm Diameter S104 Manhole
F16	Type A2	24.490	17.611	1200mm Diameter S104 Manhole	S1019	Type B	23.962	21.247	1800mm Diameter S104 Manhole
F83	Type A2	22.319	18.394	1200mm Diameter S104 Manhole	S1019A	Headwall	22.550	21.150	900mm Diameter S104 Headwall
F84	Type A2	22.750	18.180	1200mm Diameter S104 Manhole	S1020	Headwall	22.350	20.948	300mm Diameter S104 Headwall
F85	Type A2	22.882	18.104	1200mm Diameter S104 Manhole	S1021	Control	22.043	20.900	2100mm Manhole with Office
					S1022	Headwall	22.030	20.818	300mm Diameter S104 Headwall
					S1091	Type B	24.212	22.564	1200mm Diameter S104 Manhole
					S1150	Type B	24.347	22.697	1200mm Diameter S104 Manhole
					S1151	NOT USED			
					S1254	Type B	22.251	19.910	1500mm Diameter S104 Manhole
					S1277	Type B	22.897	20.810	1350mm Diameter S104 Manhole
					S1278	Type B	22.785	20.773	1350mm Diameter S104 Manhole
					S1279	Type B	22.460	20.357	1350mm Diameter S104 Manhole
					S1300	Type B	23.321	21.671	1200mm Diameter S104 Manhole
					S1301	NOT USED			

For Type C1A chambers refer to HCC Standard Drawing No. HCC11/D/040

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For Technical Approval
These drawings are produced for the purposes of obtaining the approval of an adopting or maintaining authority and reliance on this drawing for whatever purpose, is at the developer's/contractor's risk until formal technical approval has been received.

- NOTES
- Drawing based on Topographical Survey by Anthony Brooks Surveys Ltd, drawing number A258/7834/1 dated June 2014.
 - On-site road layout for Phase 1 based on AAP Architecture's Drawing Numbers P1388.01 Revision R1 & P1388.04 Revision Q dated 01 June 2018.
 - On-site road layout for Phase 2 based on AAP Architecture's Drawing Number P1388.02 Revision S dated 29 April 2019.
 - On-site road layout for Phase 3 based on AAP Architecture's Drawing Number P1388.03 Revision ZK dated 09 March 2022 and Thorne planning layout BEL220612/SL-01 Revision P12, dated 18 January 2023.
 - The works shown on this drawing could affect Statutory Undertaker's apparatus and the Contractor is required to verify the location and depth of all such apparatus prior to commencement of the works and to take any precautions necessary when working in the vicinity of any such apparatus.
 - All adoptable highway works to be in accordance with the Hampshire County Council's Compaction Document to Manual for Streets and the Specification for Highway Works (SHW) November 2009 as amended published by the Statutory Office.
 - All drainage works to be in accordance with Design and Construction Guidance Version 2.1 dated 25 May 2021.
 - Approved drawings should be used in conjunction to the Notes for Guidance (HCC Series 11 Standard Detail Drawings).
 - All manholes located on bands and in junctions to be installed with non-slip manhole covers (i.e. Grapple or similar). Cover slabs to be orientated to avoid access covers ending up within wheel tracks wherever possible.
 - All Diagram Numbers refer to the Traffic Signs Regulations and General Directions 2016.

- ADOPTABLE MAIN DRAINAGE KEY
- F238 Foul Water Sewer & Manhole (S104)
 - S140 Surface Water Sewer & Manhole (Highway Drainage)
 - S114 Surface Water Sewer & Manhole (Highway Drainage)
 - Potential Rising Main from Phase 1 Pumping Station (PS1)
 - Potential Rising Main from Phase 2 Pumping Station (PS2)
 - Proposed Type 1 Gully and Connection (HCC)
 - 100mm Diameter Foul Water Lateral Connection
 - 150mm Diameter Surface Water Lateral Connection

Rev	Date	Description	Drawn	Check
#	03/01/22	First Issue.	JW	DRB
A	08/01/22	Basin Headwall S1022 invert level reviewed.	DRB	CI
B	17/03/22	Gully locations reviewed.	JM	DRB
C	23/03/22	Gradients between manholes S1011-S1019 reviewed as required by Hampshire CC.	JM	DRB
D	21/04/22	Drainage access schedule updated due to value engineering exercise.	JM	DRB
E	29/05/22	Street lighting design updated. Amended as required by Koss.	DRB	CI
F	28/06/22	Details for Headwall S2019A added to the Access Schedules.	DRB	CI
G	23/08/22	Gully catchments reviewed after first round of amendments requested by Hampshire CC.	JW	DRB
H	22/12/22	Drawing updated for S38 Windows 2.2.	JM	DRB
I	27/01/23	Reference for S1019A-HW corrected in schedule.	DRB	CI
J	25/05/23	W229 reviewed S10091 Street Lighting amendments as requested by HCC for S38 Resurround 3.	DRB	CI
K	12/09/23	Control Chamber S1021 corrected to 2100mm diameter in the access schedule.	DRB	CI

FOR TECHNICAL APPROVAL

Client

Project

Boorley Gardens
Winchester Road
Hedge End
S38-1 and Shared Areas

Drawing Title

Proposed Drainage and
Street Lighting Plan
Sheet 2 of 7

Drawing No.

M434/68

Date:

January 2022

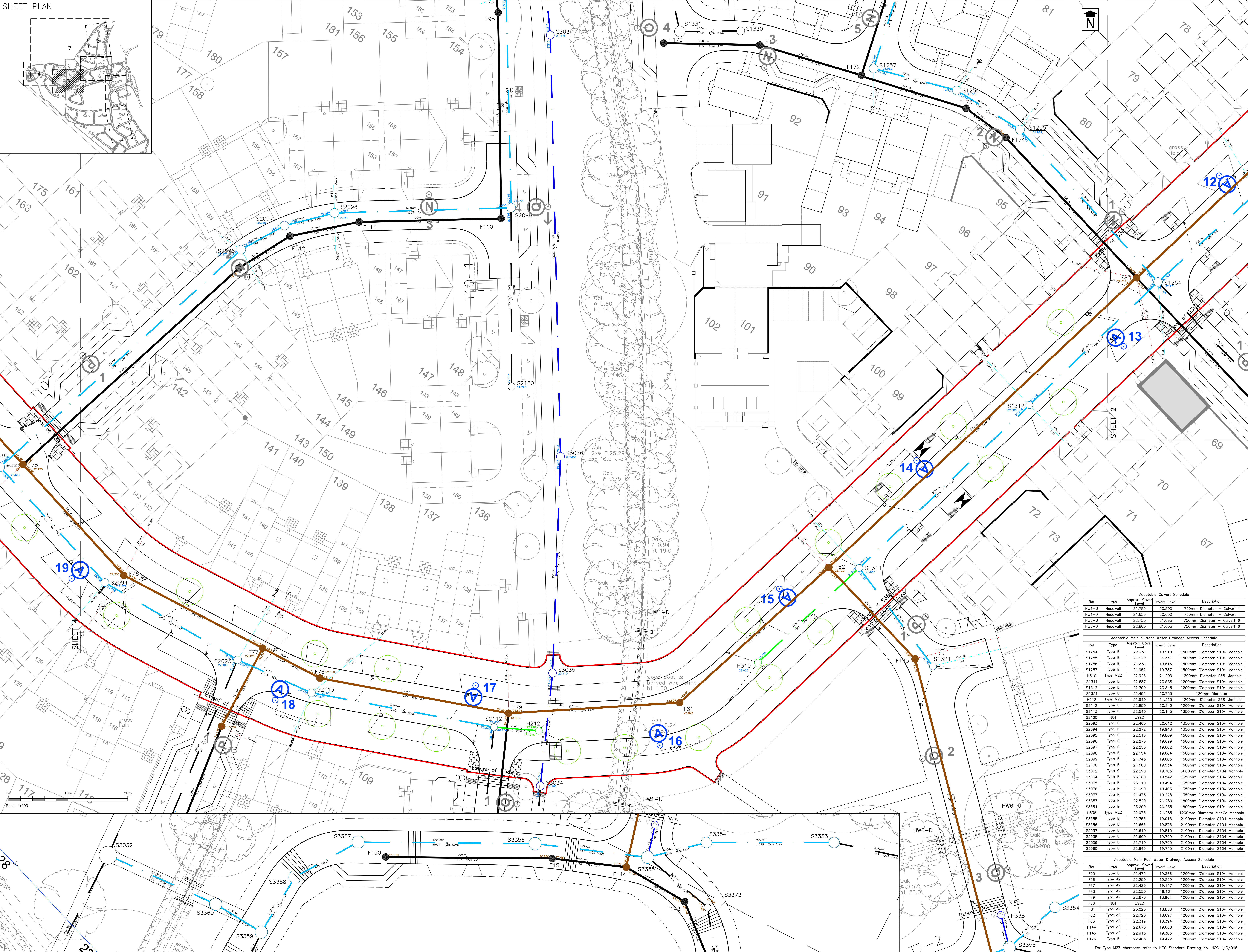
Scale:

1:200 @ A0

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Rev K



For Technical Approval
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 - On-site road layout for Phase 2 based on AAP Architectural Drawing Number P1388.02 Revision 5 dated 29 April 2019.
 - On-site road layout for Phase 3 based on AAP Architectural Drawing Number P1388.03 Revision 2X dated 09 March 2022 and Traffic planning layout BL1220612/SL-01 Revision P12, dated 18 January 2023.
 - The works shown on this drawing could affect Statutory Undertaker's apparatus and the Contractor is required to verify the location and depth of all such apparatus prior to commencement of the works and to take any precautions necessary when working in the vicinity of any such apparatus.
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 - All drainage works to be in accordance with Design and Construction Guidance Version 2.1 dated 25 May 2021.
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 - All Diagram Numbers refer to the Traffic Signs Regulations and General Directions 2016.
 - HCC Standard Detail Drawing No. HCC11/C/080

- ADOPTABLE 'MAIN' DRAINAGE KEY**
- F238 Foul Water Sewer & Manhole (S104)
 - S140 Surface Water Sewer & Manhole (S104)
 - S114 Surface Water Sewer & Manhole (Highway Drainage)
 - Potential Rising Main from Phase 1 Pumping Station (PS1)
 - Potential Rising Main from Phase 2 Pumping Station (PS2)
 - Proposed Type 1 Gully and Connection
 - 100mm Diameter Foul Water Lateral Connection
 - 150mm Diameter Surface Water Lateral Connection

- ADOPTABLE STREET LIGHTING KEY**
- Proposed 6m steel column with post mounted Philips 29 Watt (20 x LED) BGP702 Micro Luma Luminaire of tilt, DW50 optic, 0.80 km, Neutral White.
 - Refer to SSE drawing Nos. SSE217727-LD-001-D, SSE217727-LD-002-D and SSE217727-LD-003-C for details (subject to updating).
- PRIVATE STREET LIGHTING KEY**
- Proposed 6m steel column with post mounted Philips 6 Watt (6 x LED) BGP15 Micro Luma Luminaire of tilt, DW50 optic, 0.80 km, Neutral White.
 - Proposed 6m steel column with post mounted Philips 6 Watt (6 x LED) BGP15 Micro Luma Luminaire of tilt, DW50 optic, 0.80 km, Neutral White.
 - Proposed 6m steel column with post mounted Philips 6 Watt (6 x LED) BGP15 Micro Luma Luminaire of tilt, DW50 optic, 0.80 km, Neutral White.
 - Proposed 6m steel column with post mounted Philips 6 Watt (6 x LED) BGP15 Micro Luma Luminaire of tilt, DW50 optic, 0.80 km, Neutral White.
 - Refer to SSE drawing Nos. SSE276614-LD-001-B, SSE276614-LD-002-B, SSE276614-LD-003-B and SSE276614-LD-004-B for details (subject to updating).

- Externally Illuminated Sign to HCC Standard Detail Drawing No. HCC11/A/030 Revision 6
- Externally Illuminated Sign to HCC Standard Detail Drawing No. HCC11/A/030 Revision 6 (mounted on lighting column)
- Internally Illuminated Ballad
- S38 Highway Boundary

Adoptable Culvert Schedule				
Ref	Type	Approx. Cover Level	Invert Level	Description
HW1-U	Headwall	21.785	20.800	750mm Diameter - Culvert 1
HW1-D	Headwall	21.655	20.650	750mm Diameter - Culvert 1
HW6-U	Headwall	22.750	21.695	750mm Diameter - Culvert 6
HW6-D	Headwall	22.800	21.655	750mm Diameter - Culvert 6

Adoptable Main Surface Water Drainage Access Schedule				
Ref	Type	Approx. Cover Level	Invert Level	Description
S1254	Type B	22.251	19.910	1500mm Diameter S104 Manhole
S1255	Type B	21.929	19.841	1500mm Diameter S104 Manhole
S1256	Type B	21.861	19.816	1500mm Diameter S104 Manhole
S1257	Type B	21.952	19.787	1500mm Diameter S104 Manhole
H310	Type M22	22.925	21.200	1200mm Diameter S38 Manhole
S1311	Type B	22.687	20.506	1200mm Diameter S104 Manhole
S1312	Type B	22.300	20.346	1200mm Diameter S104 Manhole
S1321	Type B	22.455	20.755	120mm Diameter
H212	Type M22	22.940	21.215	1200mm Diameter S38 Manhole
S2112	Type B	22.850	20.349	1200mm Diameter S104 Manhole
S2113	Type B	22.540	20.145	1350mm Diameter S104 Manhole
S2120	NOT	USED		
S2093	Type B	22.400	20.012	1350mm Diameter S104 Manhole
S2094	Type B	22.272	19.948	1350mm Diameter S104 Manhole
S2095	Type B	22.516	19.859	1500mm Diameter S104 Manhole
S2096	Type B	22.270	19.699	1500mm Diameter S104 Manhole
S2097	Type B	22.250	19.682	1500mm Diameter S104 Manhole
S2098	Type B	22.154	19.664	1500mm Diameter S104 Manhole
S2099	Type B	21.745	19.605	1500mm Diameter S104 Manhole
S2100	Type B	21.500	19.534	1500mm Diameter S104 Manhole
S3032	Type C	22.290	19.705	3000mm Diameter S104 Manhole
S3034	Type B	23.160	19.542	1350mm Diameter S104 Manhole
S3035	Type B	23.110	19.494	1350mm Diameter S104 Manhole
S3036	Type B	21.990	19.403	1350mm Diameter S104 Manhole
S3037	Type B	21.475	19.238	1350mm Diameter S104 Manhole
S3353	Type B	22.500	20.280	1800mm Diameter S104 Manhole
S3354	Type B	23.200	20.235	1800mm Diameter S104 Manhole
H338	Type M22	22.975	21.285	1200mm Diameter Manhole
S3355	Type B	22.755	19.915	2100mm Diameter S104 Manhole
S3356	Type B	22.665	19.875	2100mm Diameter S104 Manhole
S3357	Type B	22.610	19.815	2100mm Diameter S104 Manhole
S3358	Type B	22.600	19.790	2100mm Diameter S104 Manhole
S3359	Type B	22.710	19.765	2100mm Diameter S104 Manhole
S3360	Type B	22.945	19.745	2100mm Diameter S104 Manhole

Adoptable Main Foul Water Drainage Access Schedule				
Ref	Type	Approx. Cover Level	Invert Level	Description
F75	Type B	22.475	19.366	1200mm Diameter S104 Manhole
F76	Type A2	22.250	19.259	1200mm Diameter S104 Manhole
F77	Type A2	22.425	19.147	1200mm Diameter S104 Manhole
F78	Type A2	22.550	19.101	1200mm Diameter S104 Manhole
F79	Type A2	22.875	18.964	1200mm Diameter S104 Manhole
F80	NOT	USED		
F81	Type A2	23.020	18.858	1200mm Diameter S104 Manhole
F82	Type A2	22.725	18.697	1200mm Diameter S104 Manhole
F83	Type A2	22.319	18.394	1200mm Diameter S104 Manhole
F144	Type A2	22.675	19.660	1200mm Diameter S104 Manhole
F145	Type A2	22.915	19.305	1200mm Diameter S104 Manhole
F125	Type B	22.485	19.422	1200mm Diameter S104 Manhole

For Type M22 chambers refer to HCC Standard Drawing No. HCC11/D/045

FOR TECHNICAL APPROVAL

Client
millerhomes
Bellway

Project
Boorley Gardens
Winchester Road
Hedge End
S38-1 and Shared Areas

Drawing Title
Proposed Drainage and
Street Lighting Plan
Sheet 3 of 7

Drawing No. **M434/69** Rev J
Date: January 2022 Scale: 1:200 @ A0
E-Mail: dbrock@pfaplcl.com



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- All Diagram Numbers refer to the Traffic Signs Regulations and General Directions 2016.

ADOPTABLE 'MAIN' DRAINAGE KEY

- F238 — Foul Water Sewer & Manhole (S104)
S140 — Surface Water Sewer & Manhole (S104)
S114 — Surface Water Sewer & Manhole (Highway Drainage)
— Potential Rising Main from Phase 1 Pumping Station (PS1)
— Potential Rising Main from Phase 2 Pumping Station (PS2)
— Proposed Type 1 Gully and Connection (HCC)
— 100mm Diameter Foul Water Lateral Connection
— 150mm Diameter Surface Water Lateral Connection

ADOPTABLE STREET LIGHTING KEY

- (A) Proposed 6m steel column with post mounted Philips 25 Watt (20 x LED) BGP702 Micro Luma Luminaire; 5° tilt, DW50 optic, 5.00 km, Neutral White.
(B) Proposed 6m steel column with post mounted Philips 9 Watt (6 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DM10 optic, 1.40 km, Neutral White.
(C) Proposed 6m steel column with post mounted Philips 25 Watt (20 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DW50 optic, 5.00 km, Neutral White.
Refer to SSE drawing Nos. SSE217727-LD-001-D, SSE217727-LD-002-D and SSE217727-LD-003-C for details (subject to updating).
PRIVATE STREET LIGHTING KEY
(D) Proposed 6m steel column with post mounted Philips 25 Watt (20 x LED) BGP702 Micro Luma Luminaire; 5° tilt, DW50 optic, 5.00 km, Neutral White.
(E) Proposed 6m steel column with post mounted Philips 9 Watt (6 x LED) BGP702 Micro Luma Luminaire; 5° tilt, DW50 optic, 1.40 km, Neutral White.
(F) Proposed 6m steel column with post mounted Philips 9 Watt (6 x LED) BGP702 Micro Luma Luminaire; 5° tilt, DM10 optic, 1.40 km, Neutral White.
(G) Proposed 6m steel column with post mounted Philips 22 Watt (20 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DW50 Optic, 3.80 km, Neutral White.
(H) Proposed 6m steel column with post mounted Philips 22 Watt (20 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DM10 Optic, 3.80 km, Neutral White.
(I) Proposed 6m steel column with post mounted Philips 22 Watt (20 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DW50 BL Optic, 3.80 km, Neutral White.
(J) Proposed 6m steel column with post mounted Philips 17 Watt (20 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DM10 Optic, 3.00 km, Neutral White.
Refer to SSE drawing No. SSE217727-LD-003-C for details (subject to updating).
(K) Proposed 6m steel column with post mounted Philips 22 Watt (20 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DW50 BL Optic, 3.80 km, Neutral White.
(L) Proposed 6m steel column with post mounted Philips 17 Watt (20 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DM10 Optic, 3.00 km, Neutral White.
(M) Proposed 6m steel column with post mounted Philips 22 Watt (20 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DM10 BL Optic, 3.80 km, Neutral White.
Refer to SSE drawing No. SSE312628-LD-001-B for details (subject to updating).
(N) Proposed 6m steel column with post mounted Philips 9 Watt (6 x LED) BGP615 Micro Luma Luminaire; 0° tilt, DM50 Optic, 0.80 km, Neutral White.
(O) Proposed 6m steel column with post mounted Philips 9 Watt (6 x LED) BGP615 Micro Luma Luminaire; 0° tilt, DM50 BL Optic, 0.80 km, Neutral White.
(P) Proposed 6m steel column with post mounted Philips 6 Watt (6 x LED) BGP615 Micro Luma Luminaire; 0° tilt, DM50 BL Optic, 0.80 km, Neutral White.
(Q) Proposed 6m steel column with post mounted Philips 8 Watt (6 x LED) BGP615 Micro Luma Luminaire; 0° tilt, DW50 Optic, 1.20 km, Neutral White.
(R) Proposed 6m steel column with post mounted Philips 8 Watt (6 x LED) BGP615 Micro Luma Luminaire; 0° tilt, DW50 BL Optic, 1.20 km, Neutral White.
(S) Proposed 6m steel column with post mounted Philips 9 Watt (6 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DW50 BL Optic, 1.20 km, Neutral White.
Refer to SSE drawing Nos. SSE276614-LD-001-B, SSE276614-LD-002-B, SSE276614-LD-003-B and SSE276614-LD-004-B for details (subject to updating).
(T) Proposed 6m steel column with post mounted Philips 9 Watt (6 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DM50 BL Optic, 1.40 km, Neutral White.
(U) Proposed 6m steel column with post mounted Philips 9 Watt (6 x LED) BGP702 Micro Luma Luminaire; 0° tilt, DW50 BL Optic, 1.40 km, Neutral White.
Refer to SSE drawing Nos. SSE312628-LD-002-C and SSE312628-LD-003-C for details (subject to updating).
(V) Proposed 6m steel column with post mounted Philips 10 Watt (6 x LED) BGP615 Micro Luma Luminaire; 0° tilt, DW50 Optic, 1.60 km, Neutral White.
Refer to Ennevo drawing No. EV202016022-LD-001-A for details (subject to updating).

Rev	Date	Description	Drawn	Check
A	08/01/22	First Issue	JW	DRB
A	08/01/22	Basin Headwall S1182 invert level reviewed.	DRB	CI
B	27/01/22	Gully locations reviewed.	JM	DRB
C	23/03/22	Invert and cover levels added to manholes in the layout, as requested by Miller Homes.	JM	DRB
D	21/04/22	Drainage access schedule updated due to value engineering exercise.	JM	DRB
E	25/05/22	Street lighting design updated, amended as required by local.	DRB	CI
F	26/08/22	Drawing amended to align with S38-1.	JW	DRB
G	26/10/22	Details for Headwall S1182-HW added and pipe size from manhole S1210 corrected.	DRB	CI
H	22/12/22	Drawing updated to align with S38 Headwall.	JM	DRB
I	07/06/23	Cover levels for S1102 to S1104 amended to accord with on panel design.	DRB	CI

Status

FOR TECHNICAL APPROVAL

Client

Miller Homes
Bellway

Project

Boorley Gardens
Winchester Road
Hedge End
S38-1 and Shared Areas

Drawing Title

Proposed Drainage and
Street Lighting Plan
Sheet 6 of 7

Drawing No.

M434/72

Rev

Rev 1

Date: January 2022 Scale: 1:200 @ AD
E-Mail: dbrock@pfaplac.com

Ref	Type	Approx. Level	Invert Level	Description
F16	Type B	24.480	17.611	1200mm Diameter S104 Manhole
F17	Type B	24.350	17.510	1200mm Diameter S104 Manhole
F18	Type A2	24.050	17.380	1200mm Diameter S104 Manhole
F19	Type B	23.525	17.159	1200mm Diameter S104 Manhole
F20	Type B	23.325	17.073	1200mm Diameter S104 Manhole
F21	Type B	23.075	16.967	1200mm Diameter S104 Manhole
F22	Type B	22.890	16.886	1200mm Diameter S104 Manhole
F23	Type B	22.600	16.805	1200mm Diameter S104 Manhole
F24	Type B	21.964	16.622	1200mm Diameter S104 Manhole
F25	Type B	22.055	16.586	1200mm Diameter S104 Manhole
F26	Type B	21.794	16.469	1200mm Diameter S104 Manhole
Inlet	Inlet	21.850	16.415	1500mm Diameter Inlet Manhole*
Wet Well	Wet Well	21.850	16.400	2400mm Diameter Wet Well*
F210	Type B	21.827	17.766	1200mm Diameter S104 Manhole

Ref	Type	Approx. Level	Invert Level	Description
S1025	Headwall	20.650	19.105	375mm Diameter Outlet Headwall
S1026	Control	21.144	19.069	2100mm Manhole with Hydrobrake
S1027	Headwall	21.288	19.043	375mm Diameter Side Headwall
S1100	Type B	24.028	22.304	1200mm Diameter S104 Manhole
S1101	Type B	23.690	21.689	1200mm Diameter S104 Manhole
S1102	Type B	23.355	21.470	1200mm Diameter S104 Manhole
S1103	Type B	23.075	21.166	1200mm Diameter S104 Manhole
S1104	Type B	22.800	20.899	1200mm Diameter S104 Manhole
S1110	Type B	23.557	21.907	1200mm Diameter S104 Manhole
S1124	Type B	24.210	22.410	1200mm Diameter S104 Manhole
S1125	Type B	24.340	22.512	1200mm Diameter S104 Manhole
S1151	NOT	NOT	NOT	NOT
S1174	Type C	21.950	20.579	1200mm Diameter S104 Manhole
S1175	Type C	21.840	20.353	1200mm Diameter S104 Manhole
S1176	Type B	22.088	20.183	1200mm Diameter S104 Manhole
S1177	Type B	21.960	19.997	1350mm Diameter S104 Manhole
S1178	Type B	21.925	19.970	1350mm Diameter S104 Manhole
S1179	Type B	21.794	19.843	1350mm Diameter S104 Manhole
S1180	Type B	21.717	19.766	1350mm Diameter S104 Manhole
S1181	Type B	21.740	19.717	1350mm Diameter S104 Manhole
S1182	Headwall	21.580	19.520	450mm Diameter Outlet Headwall
H119	Type C	21.753	20.400	1200mm Diameter S38 Manhole
S1230	Type C	23.400	22.137	1200mm Diameter S104 Manhole
S1231	Type C	23.300	22.063	1200mm Diameter S104 Manhole
S1206	Type B	23.200	21.489	1350mm Diameter S104 Manhole
S1207	Type B	23.000	21.242	1350mm Diameter S104 Manhole
S1208	Type B	22.890	21.137	1350mm Diameter S104 Manhole
S1209	Type B	22.660	21.023	1350mm Diameter S104 Manhole
S1210	Type B	22.325	20.847	1350mm Diameter S104 Manhole

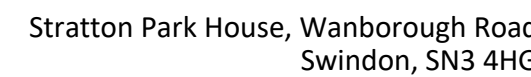
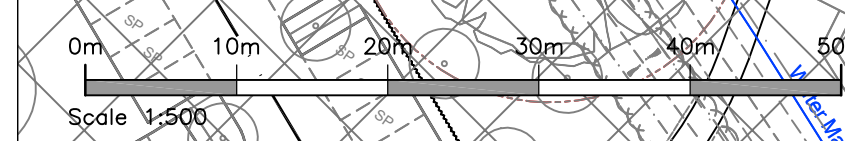
SHEET PLAN

Adoptable Culvert Schedule			
Ref	Type	Approx. Cover Level	Invert Level
HWB-U	Headwall	21.150	19.007
HWB-D	Headwall	21.100	18.975

Adoptable Main Surface Water Drainage Access Schedule			
Ref	Type	Approx. Cover Level	Description
S1105	Type B	21.875	1350mm Diameter S104 Manhole
S1106	Headwall	21.700	450mm Diameter Inlet Headwall
S1126	Type B	22.830	1350mm Diameter S104 Manhole
S1127	Type B	22.440	1350mm Diameter S104 Manhole
S1128	Type B	22.370	1350mm Diameter S104 Manhole
S1129	Type B	22.265	1350mm Diameter S104 Manhole
S1130	Type B	21.980	1350mm Diameter S104 Manhole
S1131	Type B	21.825	1350mm Diameter S104 Manhole
S1243	Type B	21.642	1500mm Diameter S104 Manhole
S1244	Headwall	21.500	1500mm Diameter Inlet Headwall
S1258	Type B	22.067	1500mm Diameter S104 Manhole
S1259	Type B	21.898	1500mm Diameter S104 Manhole
S1260	Type B	21.875	1500mm Diameter S104 Manhole
S1261	Type B	22.100	1500mm Diameter S104 Manhole
S1262	Type B	21.693	1600mm Diameter S104 Manhole
S1263	Type B	21.600	1500mm Diameter S104 Manhole
S2015	Type C	21.872	1490mm Diameter Swale Headwall
S2016	Headwall	21.374	600mm Diameter Inlet Headwall
S2017	Headwall	20.900	525mm Diameter Outlet Headwall
S2018	Control	20.510	210mm Manhole with HydroBreak
S2019	Headwall	20.320	150mm Diameter Swale Headwall
S1022	Headwall	22.030	300mm Diameter Swale Headwall
S1023	Headwall	21.545	300mm Diameter Swale Headwall
S1024	Headwall	21.458	300mm Diameter Swale Headwall
S2100	Type B	21.500	1500mm Diameter S104 Manhole
S2101	Type B	21.300	1500mm Diameter S104 Manhole
S2102	Headwall	21.282	1900mm Diameter Inlet Headwall
S3037	Type B	21.475	1350mm Diameter S104 Manhole
S3038	Type B	21.015	1350mm Diameter S104 Manhole
S3039	Headwall	19.850	450mm Diameter Swale Headwall

Adoptable Curb Schedule				
Ref	Type	Approx. Cost	Invert Level	Description
HWB-U	Headwall	21.150	19.000	750mm Diameter - Curbt 8
HWB-D	Headwall	21.100	18.975	750mm Diameter - Curbt 8

Adoptable Man Surface Water Drainage Access Schedule				
Ref	Type	Approx. Cost	Invert Level	Description
S1105	Type B	21.875	19.863	1350mm Diameter S104 Manhole
S1106	Headwall	21.700	19.500	450mm Diameter Inlet Headwall
S1126	Type B	22.830	20.788	1350mm Diameter S104 Manhole
S1127	Type B	22.440	20.375	1350mm Diameter S104 Manhole
S1128	Type B	22.370	20.313	1350mm Diameter S104 Manhole
S1129	Type B	22.265	20.218	1350mm Diameter S104 Manhole
S1130	Type B	21.980	20.046	1350mm Diameter S104 Manhole
S1131	Type B	21.820	20.020	1350mm Diameter S104 Manhole
S1243	Type B	21.642	19.521	1500mm Diameter S104 Manhole
S1244	Headwall	21.500	19.500	750mm Diameter Inlet Headwall
S1258	Type B	22.067	19.748	1500mm Diameter S104 Manhole
S1259	Type B	21.898	19.718	1500mm Diameter S104 Manhole
S1260	Type B	21.875	19.687	1500mm Diameter S104 Manhole
S1261	Type B	22.100	19.673	1500mm Diameter S104 Manhole
S1262	Type B	21.693	19.600	1500mm Diameter S104 Manhole
S1263	Type B	21.600	19.550	1500mm Diameter S104 Manhole
S2015	Type C	21.872	19.490	1500mm Diameter S104 Manhole
S2016	Headwall	21.374	19.454	600mm Diameter Inlet Headwall
S2017	Headwall	20.909	19.360	525mm Diameter Inlet Headwall
S2018	Control	20.510	19.100	2100mm Manhole with Hydrobrake
S2019	Headwall	20.320	19.017	150mm Diameter Swale Headwall
S1022	Headwall	22.030	20.818	300mm Diameter Swale Headwall
S1023	Headwall	21.545	20.764	300mm Diameter Swale Headwall
S1024	Headwall	21.456	20.676	300mm Diameter Swale Headwall
S2100	Type B	21.500	19.534	1500mm Diameter S104 Manhole
S2101	Type B	21.300	19.470	1500mm Diameter S104 Manhole
S2102	Headwall	21.282	19.300	525mm Diameter Inlet Headwall
S3037	Type B	21.475	19.228	1350mm Diameter S104 Manhole
S3038	Type B	21.015	19.066	1350mm Diameter S104 Manhole
S3039	Headwall	19.850	19.023	450mm Diameter Swale Headwall



Telephone
01793 828000

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For Technical Approval
These drawings are produced for the purposes of obtaining the approval of an adopting or maintaining authority, and reliance on this drawing, for whatever purpose, is at the developer's/contractor's risk until formal technical approval has been received.

1. Drawing based on topographical survey by Anthony & Associates, Inc., L16, drawing number A258/78-01, dated June 2014.
2. On-site road layout for Phase 1 based on Architect's Drawing Number P1388-01. Revision 1, dated 11/1/2013.
3. On-site road layout for Phase 2 based on Architect's Drawing Number P1388-02. Revision 1, dated 11/1/2013.
4. On-site road layout for Phase 3 based on Architect's Drawing Number P1388-03. Revision 1, dated 11/1/2013.
5. On-site road layout for Phase 4 based on BEL2206123-01, Department of Transportation, dated 18 Jan 2013.

The works shown on this drawing could only be undertaken under the authority of the Department of Transport's Under-Secretary of the Minister. It is required to verify the location and depth of all existing utilities prior to commencement of works and to take any precautions necessary to ensure the safety of the workers.

All adaptable highway works to be in accordance with the Hampshire County Council's "Compensation and Monetary Matters" and the Department of Transport's "Specification for Highway Works (SHW) November 2009" as amended published by the State Office.

All drainage works to be in accordance with the Construction Guidance Version 2.1, dated May 2010.

Approved drawings should be used in conjunction with the Notes for Guidance (HOD Series 11) and the Manual for Guidance on Bands and in accordance with the following:

- 1. All manholes located on bends and in junctions to be installed with non-slip manhole covers.
- 2. All manholes located on straight sections of road to be installed with standard manhole covers.
- 3. All manholes to be installed with non-slip manhole covers on end-up slip where the wheel travel is in the wrong direction.

4. Where no numbers are present on the Traffic Regulations and General Directions (Part 6).

	Foul Water Sewer & Manhole (S104)
	Surface Water Sewer & Manhole (S140)
	Surface Water Sewer & Manhole (S114) (Highway Drainage)
	Potential Rising Main from Phase 1 Pumping Station (PS1)
	Potential Rising Main from Phase 2 Pumping Station (PS2)
	Proposed Type 1 Gully and Connection (HCC)
	100mm Diameter Foul Water Laterals Connection
	150mm Diameter Surface Water Laterals Connection

#	Date	Description	JW
M	03/01/02	First Issue.	Drawn
A	08/01/02	Basin Headwall Invert levels reviewed.	JRM
B	27/01/02	Gully locations reviewed.	DRB
C	29/05/02	Amended as required by Icona.	DRB
D	28/06/02	S11263 cover level revised.	DRB
E	23/08/02	Gully catchments reviewed at first round of amendments required by Hampshire CC.	JW
F	26/10/02	Drainage within and serving road T12 amended to keep proposed levels lower.	DRB
G	03/11/02	Details for Culvert 8 revised.	DRB
H	07/12/02	Cover levels to S8307, S8308 and S8309 revised for footpath design.	DRB
I	22/12/02	Drawing updated for S38 Resubmission 2.	JM
J	25/05/03	Drawing updated for S38 Resubmission 3.	DRB
K	07/06/03	Cover levels for S1105 and S1126 to S1133 amended to accord with on parcel design.	DRB

Status

FOR TECHNICAL APPROVAL

Client



Project

**Boorley Gardens
Winchester Road
Hedge End
S38-1 and Shared Area**

Drawing Title

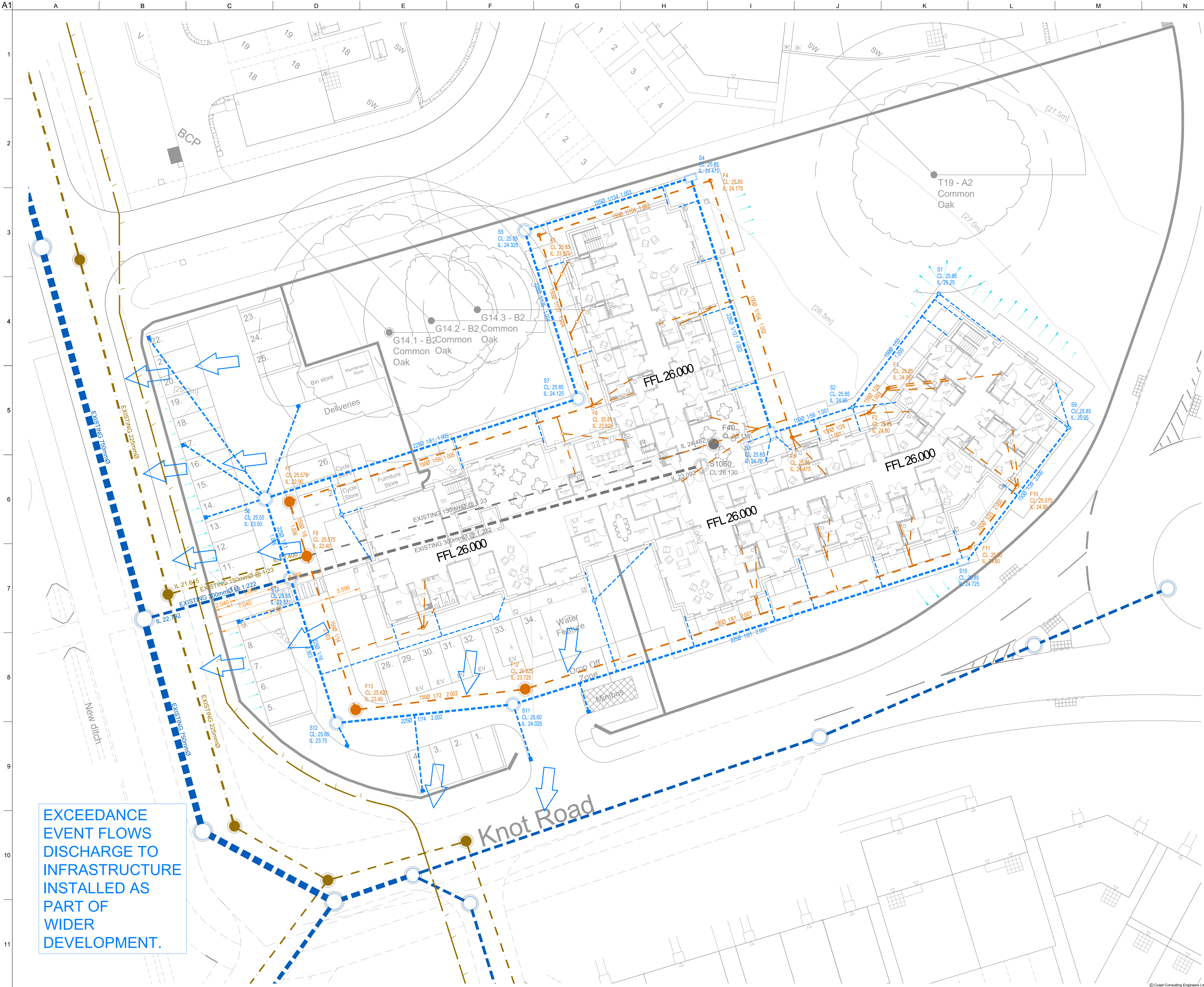
**Proposed Drainage and
Street Lighting Plan
Sheet 7 of 7**

Drawing No. **M434/73**

Date: January 2022 Scale: 1:500 @ A0

E-Mail: dbrock@pfaplc.com

Appendix D – Proposed Drainage Layout Drawings



- SURFACE WATER DRAINAGE**
- EXISTING SURFACE WATER SEWER MAN-HOLE.
 - EXISTING SURFACE WATER SEWER
 - EXISTING SURFACE WATER DRAIN MAN-HOLE TO BE REMOVED
 - EXISTING SURFACE WATER DRAIN TO BE REMOVED.
 - RODDING EYE WITH INVERT LEVEL.
 - 300mmØ SHALLOW INSPECTION CHAMBER. 600mm TO INVERT LEVEL. MAXIMUM 3 INCOMING CONNECTIONS
 - 450mmØ INSPECTION CHAMBER. NON MAN ENTRY (>1.2m) WITH INVERT LEVEL.
 - PRIVATE P.V.C.U 100mmØ (UNLESS OTHERWISE NOTED) DRAINAGE PIPE
 - DRAINAGE CHANNEL WITH SUMP/GULLY. FOR LIGHT VEHICLE LOADING WITH HEEL GUARD
 - PROPOSED HIGHWAY GULLY
 - PRE CAST CONCRETE MAN-HOLE RING. SIZE TO SUIT DEPTH AND DIAMETER OF INCOMING DRAINS.
- FOUL WATER DRAINAGE**
- EXISTING FOUL WATER SEWER MAN-HOLE.
 - EXISTING FOUL WATER SEWER
 - EXISTING FOUL WATER DRAIN MAN-HOLE TO BE REMOVED
 - EXISTING FOUL WATER DRAIN TO BE REMOVED.
 - 300mmØ SHALLOW INSPECTION CHAMBER. 600mm TO INVERT LEVEL. MAXIMUM 3 INCOMING CONNECTIONS
 - 450mmØ INSPECTION CHAMBER. NON MAN ENTRY (>1.2m) WITH INVERT LEVEL.
 - PRIVATE P.V.C.U 100mmØ (UNLESS OTHERWISE NOTED) DRAINAGE PIPE
 - 450mmØ CONNECTION CHAMBER. NON MAN ENTRY (>1.2m) WITH INVERT LEVEL.
 - PRE CAST CONCRETE MAN-HOLE RING. SIZE TO SUIT DEPTH AND DIAMETER OF INCOMING DRAINS.

EXCEEDANCE EVENT FLOW PATH

EXCEEDANCE EVENT FLOW PATH

P3	05.08.24	Exceedance event flow paths added	KR	RH	PL
P2	02.08.24	Revised to suit updated layout	KR	RH	PL
P1	20.11.23	Preliminary Issue	KR	RH	PL
Issue	Date	Description	By	Chkd	Appd



7 Silverton Court, Northumberland Business Park, NE23 7RY
0191 5977879

Client

Halebourne Group

Job Title

Hedge End
Boorley Green, Botley

Drawing Title

Drainage Strategy Layout

Scale at A1

1:200

Drawing Status

PRELIMINARY

Job No

23094

Drawing No

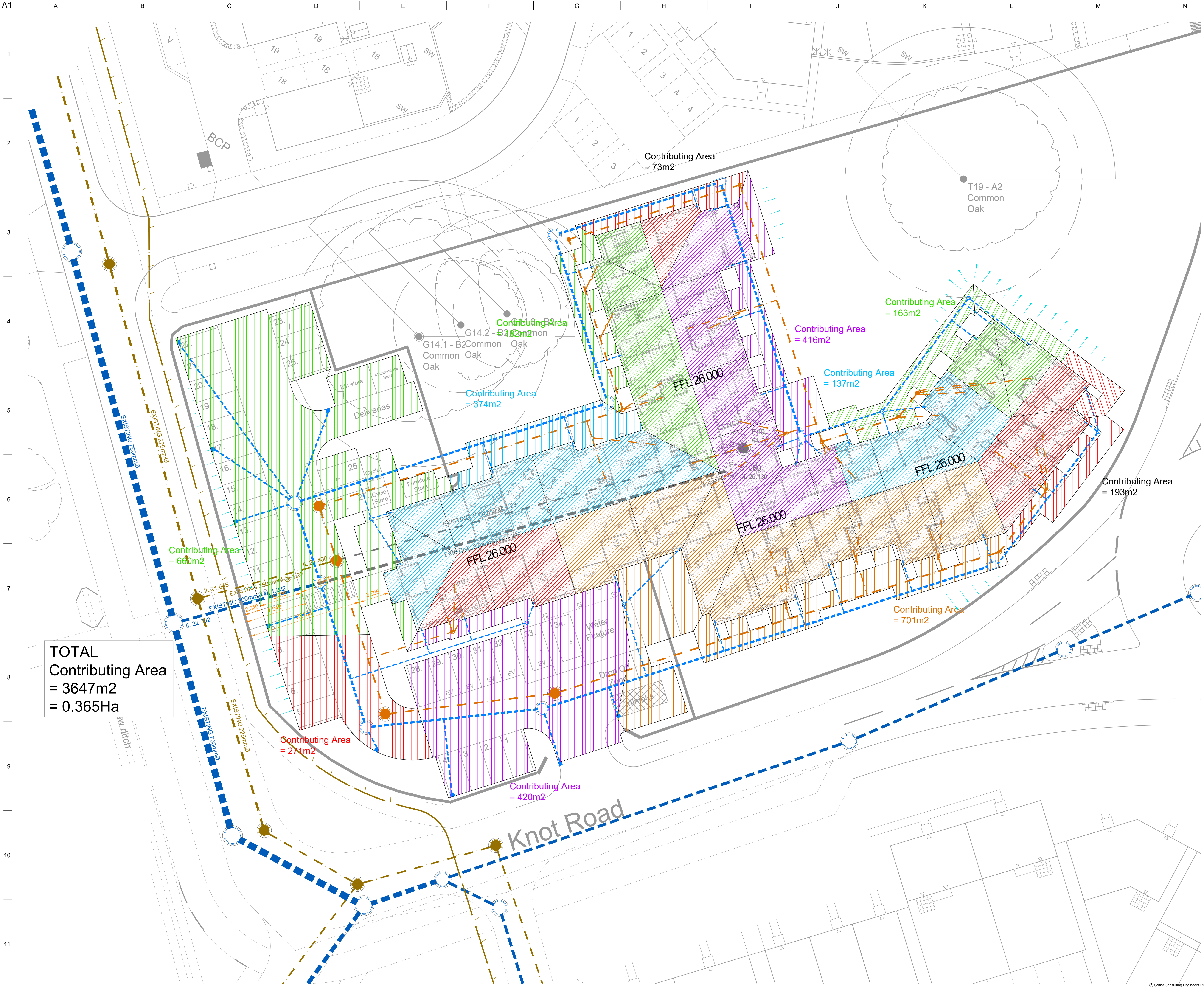
DS01

Issue

P3

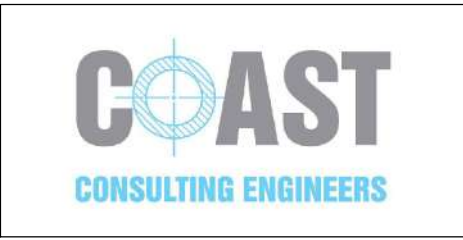
EXCEEDANCE
EVENT FLOWS
DISCHARGE TO
INFRASTRUCTURE
INSTALLED AS
PART OF
WIDER
DEVELOPMENT.

Knot Road



TOTAL
Contributing Area
= 3647m²
= 0.365Ha

P2	05.08.24	Proposed development layout updated	KR	RH	PL
P1	20.11.23	Preliminary Issue	KR	RH	PL
Issue	Date	Description	By	Chkd	Appd



7 Silverton Court, Northumberland Business Park, NE23 7RY
0191 5977679

Client

Halebourne Group

Job Title

Hedge End
Boorley Green, Botley

Drawing Title

Drainage Strategy
Contributing Areas

Scale at A1

1:200

Drawing Status

PRELIMINARY

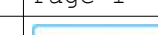
Job No
23094

Drawing No
DS02

Issue
P2

Appendix E – Surface Water Drainage Calculations

E1 – CARE HOME NETWORK ONLY

Coast Consulting Engineers Ltd		Page 1
Suite 6, Vita House Fish Quay North Shields, NE30 1JA	23094 - Hedge End Care Home SW Drainage - Planning Care Home Site Only	
Date 05/08/2024 File STORM CUT.mdx	Designed by KR Checked by	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Pipe Sizes	M380-CATCHMENT	A-S278	TEMP	OUTFALL
Manhole Sizes	M380-CATCHMENT	A-S278	TEMP	OUTFALL

Designed with Level Soffits

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S6.000	16.440	0.300	54.8	0.016	5.00	0.0	0.600	o	150	Pipe/Conduit	
S6.001	9.746	0.175	55.7	0.014	0.00	0.0	0.600	o	150	Pipe/Conduit	
S6.002	30.830	0.225	137.0	0.042	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.003	20.087	0.150	133.9	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.004	20.307	0.200	101.5	0.018	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.005	37.873	0.625	60.6	0.037	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.006	9.672	0.554	17.5	0.066	0.00	0.0	0.600	o	225	Pipe/Conduit	

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S6.000	63.09	5.20	25.250	0.016	0.0	0.0	0.0	1.36	24.1	2.7
S6.001	62.46	5.32	24.950	0.030	0.0	0.0	0.0	1.35	23.9	5.1
S6.002	60.21	5.78	24.700	0.072	0.0	0.0	0.0	1.12	44.3	11.7
S6.003	58.85	6.08	24.475	0.079	0.0	0.0	0.0	1.13	44.9	12.6
S6.004	57.72	6.34	24.325	0.097	0.0	0.0	0.0	1.30	51.6	15.2
S6.005	56.18	6.71	24.125	0.134	0.0	0.0	0.0	1.68	66.9	20.4
S6.006	55.98	6.77	23.500	0.200	0.0	0.0	0.0	3.15	125.1	30.3

Coast Consulting Engineers Ltd		Page 3
Suite 6, Vita House Fish Quay North Shields, NE30 1JA	23094 - Hedge End Care Home SW Drainage - Planning Care Home Site Only	
Date 05/08/2024 File STORM CUT.mdx	Designed by KR Checked by	
Innovyze	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for M380-CATCHMENT A-SW.SWS

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type Point
FEH Rainfall Version	2013 Cv (Summer)	0.750
Site Location GB 450306 114752	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 960, 1440
Return Period(s) (years)	30, 100
Climate Change (%)	0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S6.000	SS1	15 Winter	30	+0%					25.301
S6.001	SS2	15 Winter	30	+0%	100/15 Summer				25.026
S6.002	SS3	15 Winter	30	+0%	100/15 Summer				24.830
S6.003	SS4	15 Winter	30	+0%	100/15 Summer				24.614
S6.004	SS5	15 Winter	30	+0%	100/15 Summer				24.469
S6.005	SS7	15 Winter	30	+0%	100/15 Summer				24.270
S6.006	SS8	15 Winter	30	+0%	100/15 Summer				23.635
S7.000	SS9	15 Winter	30	+0%					25.301
S7.001	SS10	15 Winter	30	+0%	100/15 Summer				24.849
S7.002	SS11	15 Winter	30	+0%	100/15 Summer				24.187
S7.003	SS12	15 Winter	30	+0%	100/15 Summer				23.872
S6.007	SS13	15 Winter	30	+0%	30/15 Summer				23.375

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Coast Consulting Engineers Ltd

Page 5

Suite 6, Vita House
Fish Quay
North Shields, NE30 1JA

23094 - Hedge End Care Home
SW Drainage - Planning
Care Home Site Only

Date 05/08/2024
File STORM CUT.mdx

Designed by KR
Checked by

Innovyze

Network 2020.1.3

Micro Drainage

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 2.000

Hot Start Level (mm) 0

Inlet Coefficient 0.800

Manhole Headloss Coeff (Global) 0.500

Flow per Person per Day (l/per/day) 0.000

Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0

Number of Storage Structures 0

Number of Online Controls 0

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH

Data Type Point

FEH Rainfall Version 2013

Cv (Summer) 0.750

Site Location GB 450306 114752

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5

Second Increment (Extended)

DTS Status OFF

DVD Status OFF

Inertia Status OFF

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 960, 1440

Return Period(s) (years) 30, 100

Climate Change (%) 0, 40

PN

US/MH Name

Storm

Return Period

Climate Change

First (X) Surcharge

First (Y) Flood

First (Z) Overflow

Overflow Act.

Water Level (m)

S6.000

SS1 15 Winter

100

+40%

25.319

S6.001

SS2 15 Winter

100

+40%

100/15 Summer

25.247

S6.002

SS3 15 Winter

100

+40%

100/15 Summer

25.168

S6.003

SS4 15 Winter

100

+40%

100/15 Summer

25.014

S6.004

SS5 15 Winter

100

+40%

100/15 Summer

24.889

S6.005

SS7 15 Winter

100

+40%

100/15 Summer

24.708

S6.006

SS8 15 Winter

100

+40%

100/15 Summer

24.113

S7.000

SS9 15 Winter

100

+40%

25.319

S7.001

SS10 15 Winter

100

+40%

100/15 Summer

25.131

S7.002

SS11 15 Winter

100

+40%

100/15 Summer

24.608

S7.003

SS12 15 Winter

100

+40%

100/15 Summer

24.188

S6.007

SS13 15 Winter

100

+40%

30/15 Summer

23.659

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Coast Consulting Engineers Ltd		Page 6
Suite 6, Vita House Fish Quay North Shields, NE30 1JA	23094 - Hedge End Care Home SW Drainage - Planning Care Home Site Only	
Date 05/08/2024 File STORM CUT.mdx	Designed by KR Checked by	
Innovyze		Network 2020.1.3

100 year Return Period Summary of Critical Results by Maximum Level (Rank
1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Surcharged	Flooded	Flow / Cap.	Overflow (l/s)	Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)			Time (mins)	Flow (l/s)		
S6.000	SS1	-0.081	0.000	0.43			9.7		OK
S6.001	SS2	0.147	0.000	0.82			17.3	SURCHARGED	
S6.002	SS3	0.243	0.000	0.99			41.1	SURCHARGED	
S6.003	SS4	0.314	0.000	0.95			38.5	SURCHARGED	
S6.004	SS5	0.339	0.000	0.99			46.3	SURCHARGED	
S6.005	SS7	0.358	0.000	0.97			61.3	SURCHARGED	
S6.006	SS8	0.388	0.000	0.90			92.9	SURCHARGED	
S7.000	SS9	-0.081	0.000	0.43			11.5		OK
S7.001	SS10	0.181	0.000	0.90			49.9	SURCHARGED	
S7.002	SS11	0.358	0.000	1.24			67.9	SURCHARGED	
S7.003	SS12	0.213	0.000	0.80			80.2	SURCHARGED	
S6.007	SS13	0.488	0.000	2.71			172.7	SURCHARGED	

E2 – WIDER NETWORK + CARE HOME

Coast Consulting Engineers Ltd		Page 1
Suite 6, Vita House Fish Quay North Shields, NE30 1JA	M380 + 23094 SW Drainage - Planning Catchment A (with Care Home)	
Date 05/08/2024 File M380 + STORM.MDX	Designed by BF/DRB / KR Checked by	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for M380-CATCHMENT A-SW.SWS

Pipe Sizes M380-CATCHMENT A-S278 TEMP OUTFALL Manhole Sizes M380-CATCHMENT A-S278 TEMP OUTFALL

FEH Rainfall Model	
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 450306 114752
Data Type	Point
Maximum Rainfall (mm/hr)	550
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.500
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for M380-CATCHMENT A-SW.SWS

- Indicates pipe length does not match coordinates

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	28.548	0.313	91.2	0.023	5.00	0.0	0.600		o	225	Pipe/Conduit	
S1.001	26.956	0.225	119.8	0.059	0.00	0.0	0.600		o	225	Pipe/Conduit	
S1.002	23.416	0.194	120.7	0.051	0.00	0.0	0.600		o	225	Pipe/Conduit	
S2.000	24.325	0.670	36.3	0.026	5.00	0.0	0.600		o	225	Pipe/Conduit	
S2.001	23.456	0.655	35.8	0.020	0.00	0.0	0.600		o	225	Pipe/Conduit	
S2.002	27.383	0.685	40.0	0.009	0.00	0.0	0.600		o	225	Pipe/Conduit	
S2.003	23.637	0.592	39.9	0.035	0.00	0.0	0.600		o	225	Pipe/Conduit	
S3.000	11.648	0.357	32.6	0.034	5.00	0.0	0.600		o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	62.33	5.35	26.575	0.023	0.0	0.0	0.0	1.37	54.5	3.9
S1.001	60.48	5.72	26.262	0.082	0.0	0.0	0.0	1.19	47.5	13.4
S1.002	58.97	6.05	25.962	0.133	0.0	0.0	0.0	1.19	47.3	21.2
S2.000	63.16	5.19	28.445	0.026	0.0	0.0	0.0	2.18	86.6	4.4
S2.001	62.24	5.36	27.775	0.046	0.0	0.0	0.0	2.19	87.2	7.8
S2.002	61.15	5.58	27.120	0.055	0.0	0.0	0.0	2.08	82.5	9.1
S2.003	60.24	5.77	26.360	0.090	0.0	0.0	0.0	2.08	82.6	14.7
S3.000	63.71	5.08	26.125	0.034	0.0	0.0	0.0	2.30	91.4	5.9

Coast Consulting Engineers Ltd		Page 2
Suite 6, Vita House	M380 + 23094	
Fish Quay	SW Drainage - Planning	
North Shields, NE30 1JA	Catchment A (with Care Home)	
Date 05/08/2024	Designed by BF/DRB / KR	
File M380 + STORM.MDX	Checked by	
Innovyze	Network 2020.1.3	

Network Design Table for M380-CATCHMENT A-SW.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.003	16.714	0.410	40.8	0.009	0.00	0.0	0.600		o	300	Pipe/Conduit	
S1.004	26.934	0.682	39.5	0.054	0.00	0.0	0.600		o	300	Pipe/Conduit	
S1.005	49.591	1.320	37.6	0.083	0.00	0.0	0.600		o	300	Pipe/Conduit	
S4.000	15.956	0.145	110.0	0.087	5.00	0.0	0.600		o	150	Pipe/Conduit	
S4.001	53.763	0.683	78.7	0.061	0.00	0.0	0.600		o	225	Pipe/Conduit	
S4.002	9.855	0.082	120.2	0.062	0.00	0.0	0.600		o	225	Pipe/Conduit	
S4.003	8.711	0.072	121.0	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S4.004	38.525	0.258	149.3	0.021	0.00	0.0	0.600		o	225	Pipe/Conduit	
S4.005	14.143	0.115	123.0	0.175	0.00	0.0	0.600		o	300	Pipe/Conduit	
S4.006	7.359	0.064	115.0	0.016	0.00	0.0	0.600		o	300	Pipe/Conduit	
S1.006	9.522	0.150	63.5	0.077	0.00	0.0	0.600		o	525	Pipe/Conduit	
S5.000	13.926	0.092	151.4	0.041	5.00	0.0	0.600		o	225	Pipe/Conduit	
S5.001	11.511	0.050	230.2	0.041	0.00	0.0	0.600		o	300	Pipe/Conduit	
S5.002	11.510	0.065	177.1	0.014	0.00	0.0	0.600		o	300	Pipe/Conduit	
S5.003	16.954	0.068	249.3	0.025	0.00	0.0	0.600		o	450	Pipe/Conduit	
S5.004	24.908	0.228	109.2	0.040	0.00	0.0	0.600		o	450	Pipe/Conduit	
S1.007	17.181	0.076	226.1	0.064	0.00	0.0	0.600		o	750	Pipe/Conduit	
S1.008	25.441	0.113	225.1	0.024	0.00	0.0	0.600		o	750	Pipe/Conduit	
S6.000	16.440	0.300	54.8	0.016	5.00	0.0	0.600		o	150	Pipe/Conduit	
S6.001	9.746	0.175	55.7	0.014	0.00	0.0	0.600		o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.003	58.47	6.16	25.693	0.266	0.0	0.0	0.0	2.47	174.6	42.1
S1.004	57.70	6.34	25.208	0.320	0.0	0.0	0.0	2.51	177.4	50.0
S1.005	56.38	6.66	24.451	0.403	0.0	0.0	0.0	2.57	181.9	61.5
S4.000	62.69	5.28	24.700	0.087	0.0	0.0	0.0	0.96	16.9	14.8
S4.001	59.73	5.89	24.480	0.148	0.0	0.0	0.0	1.48	58.7	23.9
S4.002	59.10	6.02	23.797	0.210	0.0	0.0	0.0	1.19	47.4	33.6
S4.003	58.56	6.15	23.715	0.210	0.0	0.0	0.0	1.19	47.2	33.6
S4.004	56.05	6.75	23.643	0.231	0.0	0.0	0.0	1.07	42.5	35.1
S4.005	55.41	6.91	23.310	0.406	0.0	0.0	0.0	1.42	100.1	60.9
S4.006	55.09	7.00	23.195	0.422	0.0	0.0	0.0	1.47	103.6	63.0
S1.006	54.87	7.05	22.906	0.902	0.0	0.0	0.0	2.81	609.3	134.0
S5.000	62.99	5.22	23.559	0.041	0.0	0.0	0.0	1.06	42.2	7.0
S5.001	62.04	5.40	23.392	0.082	0.0	0.0	0.0	1.03	72.9	13.8
S5.002	61.23	5.57	23.342	0.096	0.0	0.0	0.0	1.18	83.3	15.9
S5.003	60.18	5.79	23.127	0.121	0.0	0.0	0.0	1.28	204.1	19.7
S5.004	59.20	6.00	23.059	0.161	0.0	0.0	0.0	1.94	309.3	25.8
S1.007	54.30	7.21	22.531	1.127	0.0	0.0	0.0	1.86	820.4	165.7
S1.008	53.48	7.44	22.455	1.151	0.0	0.0	0.0	1.86	822.1	166.7
S6.000	63.09	5.20	25.250	0.016	0.0	0.0	0.0	1.36	24.1	2.7
S6.001	62.46	5.32	24.950	0.030	0.0	0.0	0.0	1.35	23.9	5.1

Coast Consulting Engineers Ltd			Page 3
Suite 6, Vita House Fish Quay North Shields, NE30 1JA		M380 + 23094 SW Drainage - Planning Catchment A (with Care Home)	
Date 05/08/2024 File M380 + STORM.MDX		Designed by BF/DRB / KR Checked by	
Innovyze		Network 2020.1.3	

Network Design Table for M380-CATCHMENT A-SW.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S6.002	30.830	0.225	137.0	0.042	0.00	0.0	0.600		o	225	Pipe/Conduit	
S6.003	20.087	0.150	133.9	0.007	0.00	0.0	0.600		o	225	Pipe/Conduit	
S6.004	20.307	0.200	101.5	0.018	0.00	0.0	0.600		o	225	Pipe/Conduit	
S6.005	37.873	0.625	60.6	0.037	0.00	0.0	0.600		o	225	Pipe/Conduit	
S6.006	9.672	0.554	17.5	0.066	0.00	0.0	0.600		o	225	Pipe/Conduit	
S7.000	17.586	0.450	39.1	0.019	5.00	0.0	0.600		o	150	Pipe/Conduit	
S7.001	56.845	0.700	81.2	0.070	0.00	0.0	0.600		o	225	Pipe/Conduit	
S7.002	20.476	0.275	74.5	0.042	0.00	0.0	0.600		o	225	Pipe/Conduit	
S7.003	17.489	0.804	21.8	0.027	0.00	0.0	0.600		o	225	Pipe/Conduit	
S6.007	17.477	0.079	221.2	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S1.009	44.468	0.198	224.6	0.045	0.00	0.0	0.600		o	750	Pipe/Conduit	
S8.000	8.922	0.053	168.3	0.060	5.00	0.0	0.600		o	225	Pipe/Conduit	
S9.000	8.865	0.348	25.5	0.014	5.00	0.0	0.600		o	225	Pipe/Conduit	
S8.001	28.011	0.168	166.7	0.016	0.00	0.0	0.600		o	225	Pipe/Conduit	
S8.002	15.880	0.095	167.2	0.043	0.00	0.0	0.600		o	225	Pipe/Conduit	
S8.003	8.458	0.051	165.8	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S8.004	29.114	0.174	167.3	0.027	0.00	0.0	0.600		o	225	Pipe/Conduit	
S10.000	11.230	1.631	6.9	0.065	5.00	0.0	0.600		o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S6.002	60.21	5.78	24.700	0.072	0.0	0.0	0.0	1.12	44.3	11.7
S6.003	58.85	6.08	24.475	0.079	0.0	0.0	0.0	1.13	44.9	12.6
S6.004	57.72	6.34	24.325	0.097	0.0	0.0	0.0	1.30	51.6	15.2
S6.005	56.18	6.71	24.125	0.134	0.0	0.0	0.0	1.68	66.9	20.4
S6.006	55.98	6.77	23.500	0.200	0.0	0.0	0.0	3.15	125.1	30.3
S7.000	63.19	5.18	25.250	0.019	0.0	0.0	0.0	1.61	28.5	3.3
S7.001	59.96	5.83	24.725	0.089	0.0	0.0	0.0	1.45	57.7	14.5
S7.002	58.94	6.06	24.025	0.131	0.0	0.0	0.0	1.52	60.3	20.9
S7.003	58.49	6.16	23.750	0.158	0.0	0.0	0.0	2.82	112.0	25.0
S6.007	54.91	7.04	22.871	0.358	0.0	0.0	0.0	1.05	74.4	53.2
S1.009	52.11	7.83	22.342	1.554	0.0	0.0	0.0	1.86	823.2	219.3
S8.000	63.37	5.15	25.440	0.060	0.0	0.0	0.0	1.00	40.0	10.3
S9.000	63.86	5.06	25.735	0.014	0.0	0.0	0.0	2.60	103.5	2.4
S8.001	61.02	5.61	25.387	0.090	0.0	0.0	0.0	1.01	40.1	14.9
S8.002	59.78	5.87	25.219	0.133	0.0	0.0	0.0	1.01	40.1	21.5
S8.003	59.15	6.01	25.124	0.133	0.0	0.0	0.0	1.01	40.3	21.5
S8.004	57.08	6.49	25.073	0.160	0.0	0.0	0.0	1.01	40.1	24.7
S10.000	63.97	5.04	26.530	0.065	0.0	0.0	0.0	5.02	199.5	11.3

Coast Consulting Engineers Ltd		Page 4
Suite 6, Vita House	M380 + 23094	
Fish Quay	SW Drainage - Planning	
North Shields, NE30 1JA	Catchment A (with Care Home)	
Date 05/08/2024	Designed by BF/DRB / KR	
File M380 + STORM.MDX	Checked by	
Innovyze	Network 2020.1.3	

Network Design Table for M380-CATCHMENT A-SW.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S8.005	50.998	0.214	238.3	0.029	0.00	0.0	0.600		o	300	Pipe/Conduit	
S8.006	8.814	0.026	339.0	0.052	0.00	0.0	0.600		o	450	Pipe/Conduit	
S8.007	11.977	0.031	386.4	0.060	0.00	0.0	0.600		o	450	Pipe/Conduit	
S8.008	10.052	0.027	372.3	0.000	0.00	0.0	0.600		o	450	Pipe/Conduit	
S8.009	26.192	0.894	29.3	0.024	0.00	0.0	0.600		o	450	Pipe/Conduit	
S8.010	20.077	1.038	19.3	0.106	0.00	0.0	0.600		o	450	Pipe/Conduit	
S1.010	33.101	0.147	225.2	0.085	0.00	0.0	0.600		o	750	Pipe/Conduit	
S1.011	26.319	0.117	224.9	0.113	0.00	0.0	0.600		o	750	Pipe/Conduit	
S1.012	19.218	0.085	226.1	0.052	0.00	0.0	0.600		o	900	Pipe/Conduit	
S1.013	58.302	0.259	225.1	0.039	0.00	0.0	0.600		o	900	Pipe/Conduit	
S1.014	24.102	0.139	173.4	0.232	0.00	0.0	0.600		o	900	Pipe/Conduit	
S11.000	18.194	0.642	28.3	0.023	5.00	0.0	0.600		o	225	Pipe/Conduit	
S1.015	85.903	0.197	436.1	0.113	0.00	0.0	0.600		o	900	Pipe/Conduit	
S1.016	10.176	0.046	221.2	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S1.017	7.577	0.032	236.8	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S1.018	40.502	0.054	750.0	0.000	0.00	0.0		0.045 3 \=/		300	1:3 Swale	
S1.019	9.086	0.038	239.1	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S1.020	8.000#	0.176	45.5	0.000	0.00	0.0		0.045 3 \=/		300	1:3 Swale	
S12.000	32.862	0.540	60.9	0.034	5.00	0.0	0.600		o	225	Pipe/Conduit	
S13.000	14.433	0.143	100.9	0.038	5.00	0.0	0.600		o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S8.005	53.85	7.33	24.824	0.254	0.0	0.0	0.0	1.01	71.7	37.0
S8.006	53.37	7.47	24.460	0.306	0.0	0.0	0.0	1.10	174.7	44.2
S8.007	52.70	7.66	24.434	0.366	0.0	0.0	0.0	1.03	163.5	52.2
S8.008	52.16	7.82	24.403	0.366	0.0	0.0	0.0	1.05	166.6	52.2
S8.009	51.78	7.94	24.376	0.390	0.0	0.0	0.0	3.77	599.1	54.7
S8.010	51.54	8.01	23.482	0.496	0.0	0.0	0.0	4.64	737.9	69.2
S1.010	50.60	8.30	22.144	2.135	0.0	0.0	0.0	1.86	822.1	292.6
S1.011	49.89	8.54	21.997	2.248	0.0	0.0	0.0	1.86	822.5	303.7
S1.012	49.43	8.69	21.730	2.300	0.0	0.0	0.0	2.08	1323.1	307.9
S1.013	48.11	9.16	21.645	2.339	0.0	0.0	0.0	2.08	1326.0	307.9
S1.014	47.65	9.33	21.386	2.571	0.0	0.0	0.0	2.38	1511.9	331.8
S11.000	63.50	5.12	22.564	0.023	0.0	0.0	0.0	2.47	98.1	4.0
S1.015	45.23	10.29	21.247	2.707	0.0	0.0	0.0	1.49	950.4	331.8
S1.016	44.86	10.45	20.946	2.707	0.0	0.0	0.0	1.05	74.4«	331.8
S1.017	44.57	10.57	20.900	2.707	0.0	0.0	0.0	1.02	71.9«	331.8
S1.018	37.03	14.71	20.818	2.707	0.0	0.0	0.0	0.16	18.3«	331.8
S1.019	36.82	14.86	20.764	2.707	0.0	0.0	0.0	1.01	71.6«	331.8
S1.020	36.53	15.06	20.676	2.707	0.0	0.0	0.0	0.66	74.5«	331.8
S12.000	62.44	5.33	22.304	0.034	0.0	0.0	0.0	1.68	66.8	5.7
S13.000	63.17	5.18	21.907	0.038	0.0	0.0	0.0	1.30	51.7	6.5

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Network Design Table for M380-CATCHMENT A-SW.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S12.001	18.287	0.219	83.5	0.099	0.00	0.0	0.600		o	300	Pipe/Conduit	
S12.002	11.426	0.304	37.6	0.015	0.00	0.0	0.600		o	300	Pipe/Conduit	
S12.003	11.455	0.267	42.9	0.016	0.00	0.0	0.600		o	300	Pipe/Conduit	
S12.004	36.976	0.961	38.5	0.041	0.00	0.0	0.600		o	300	Pipe/Conduit	
S14.000	9.559	0.414	23.1	0.082	5.00	0.0	0.600		o	150	Pipe/Conduit	
S15.000	15.521	0.153	101.4	0.032	5.00	0.0	0.600		o	150	Pipe/Conduit	
S14.001	21.433	0.440	48.7	0.012	0.00	0.0	0.600		o	225	Pipe/Conduit	
S14.002	8.283	0.260	31.9	0.027	0.00	0.0	0.600		o	225	Pipe/Conduit	
S14.003	30.938	0.565	54.8	0.015	0.00	0.0	0.600		o	300	Pipe/Conduit	
S14.004	13.620	0.098	139.0	0.034	0.00	0.0	0.600		o	300	Pipe/Conduit	
S16.000	11.835	0.310	38.2	0.035	5.00	0.0	0.600		o	225	Pipe/Conduit	
S14.005	57.782	1.449	39.9	0.062	0.00	0.0	0.600		o	300	Pipe/Conduit	
S14.006	19.501	0.413	47.2	0.124	0.00	0.0	0.600		o	375	Pipe/Conduit	
S14.007	3.946	0.062	63.6	0.045	0.00	0.0	0.600		o	375	Pipe/Conduit	
S14.008	4.967	0.095	52.3	0.009	0.00	0.0	0.600		o	375	Pipe/Conduit	
S14.009	14.725	0.172	85.6	0.018	0.00	0.0	0.600		o	375	Pipe/Conduit	
S14.010	7.909	0.026	304.2	0.012	0.00	0.0	0.600		o	375	Pipe/Conduit	
S17.000	12.385	0.039	317.6	0.008	5.00	0.0	0.600		o	375	Pipe/Conduit	
S14.011	50.303	0.157	320.4	0.038	0.00	0.0	0.600		o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S12.001	61.55	5.50	21.689	0.171	0.0	0.0	0.0	1.72	121.7	28.5
S12.002	61.18	5.58	21.470	0.186	0.0	0.0	0.0	2.57	181.9	30.8
S12.003	60.80	5.66	21.166	0.202	0.0	0.0	0.0	2.41	170.2	33.3
S12.004	59.66	5.90	20.899	0.243	0.0	0.0	0.0	2.54	179.7	39.3
S14.000	63.76	5.08	24.164	0.082	0.0	0.0	0.0	2.10	37.2	14.2
S15.000	62.78	5.26	23.903	0.032	0.0	0.0	0.0	1.00	17.6	5.4
S14.001	61.81	5.45	23.675	0.126	0.0	0.0	0.0	1.88	74.7	21.1
S14.002	61.52	5.51	23.235	0.153	0.0	0.0	0.0	2.33	92.5	25.5
S14.003	60.35	5.75	22.975	0.168	0.0	0.0	0.0	2.13	150.5	27.5
S14.004	59.56	5.92	22.410	0.202	0.0	0.0	0.0	1.33	94.1	32.6
S16.000	63.66	5.09	22.697	0.035	0.0	0.0	0.0	2.12	84.4	6.0
S14.005	57.86	6.31	22.312	0.299	0.0	0.0	0.0	2.50	176.5	46.9
S14.006	57.34	6.43	20.788	0.423	0.0	0.0	0.0	2.64	291.9	65.7
S14.007	57.22	6.46	20.375	0.468	0.0	0.0	0.0	2.27	251.2	72.5
S14.008	57.08	6.49	20.313	0.477	0.0	0.0	0.0	2.51	277.3	73.7
S14.009	56.57	6.62	20.218	0.495	0.0	0.0	0.0	1.96	216.4	75.8
S14.010	56.06	6.74	20.046	0.507	0.0	0.0	0.0	1.03	114.2	77.0
S17.000	63.07	5.20	20.059	0.008	0.0	0.0	0.0	1.01	111.7	1.4
S14.011	52.98	7.58	20.020	0.553	0.0	0.0	0.0	1.01	111.2	79.3

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Innovyze	Network 2020.1.3	

Network Design Table for M380-CATCHMENT A-SW.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S12.005	13.484#	0.363	37.1	0.142	0.00	0.0	0.600		o	375	Pipe/Conduit	
S18.000	35.896	1.035	34.7	0.017	5.00	0.0	0.600		o	225	Pipe/Conduit	
S18.001	8.580	0.211	40.7	0.067	0.00	0.0	0.600		o	225	Pipe/Conduit	
S18.002	21.319	0.466	45.7	0.010	0.00	0.0	0.600		o	300	Pipe/Conduit	
S18.003	9.260	0.299	31.0	0.038	0.00	0.0	0.600		o	300	Pipe/Conduit	
S18.004	22.422	0.400	56.1	0.011	0.00	0.0	0.600		o	300	Pipe/Conduit	
S18.005	8.504	0.226	37.6	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
S19.000	10.382	0.047	220.9	0.110	5.00	0.0	0.600		o	300	Pipe/Conduit	
S18.006	41.037	0.170	241.4	0.005	0.00	0.0	0.600		o	300	Pipe/Conduit	
S18.007	9.158	0.036	254.4	0.095	0.00	0.0	0.600		o	300	Pipe/Conduit	
S20.000	19.893	0.225	88.4	0.000	5.00	0.0	0.600		o	150	Pipe/Conduit	
S20.001	19.602	0.321	61.1	0.038	0.00	0.0	0.600		o	225	Pipe/Conduit	
S20.002	16.804	0.098	171.5	0.039	0.00	0.0	0.600		o	225	Pipe/Conduit	
S21.000	9.247	0.111	83.3	0.018	5.00	0.0	0.600		o	150	Pipe/Conduit	
S20.003	28.520	0.658	43.3	0.034	0.00	0.0	0.600		o	225	Pipe/Conduit	
S20.004	13.311	0.329	40.5	0.019	0.00	0.0	0.600		o	225	Pipe/Conduit	
S20.005	18.021	0.499	36.1	0.012	0.00	0.0	0.600		o	225	Pipe/Conduit	
S22.000	10.328	0.074	139.6	0.037	5.00	0.0	0.600		o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S12.005	52.72	7.65	19.863	0.938	0.0	0.0	0.0	2.98	329.3	133.9
S18.000	62.73	5.27	22.990	0.017	0.0	0.0	0.0	2.23	88.6	2.9
S18.001	62.38	5.34	21.955	0.084	0.0	0.0	0.0	2.06	81.8	14.2
S18.002	61.61	5.49	21.744	0.094	0.0	0.0	0.0	2.33	164.7	15.7
S18.003	61.34	5.54	21.278	0.132	0.0	0.0	0.0	2.84	200.4	21.9
S18.004	60.49	5.72	20.979	0.143	0.0	0.0	0.0	2.10	148.7	23.4
S18.005	60.23	5.78	20.579	0.143	0.0	0.0	0.0	2.57	181.7	23.4
S19.000	63.28	5.16	20.400	0.110	0.0	0.0	0.0	1.05	74.5	18.9
S18.006	57.23	6.46	20.353	0.258	0.0	0.0	0.0	1.01	71.2	40.0
S18.007	56.59	6.61	20.183	0.353	0.0	0.0	0.0	0.98	69.4	54.1
S20.000	62.52	5.31	23.694	0.000	0.0	0.0	0.0	1.07	18.9	0.0
S20.001	61.54	5.50	23.469	0.038	0.0	0.0	0.0	1.68	66.7	6.3
S20.002	60.19	5.79	23.148	0.077	0.0	0.0	0.0	1.00	39.6	12.6
S21.000	63.41	5.14	23.236	0.018	0.0	0.0	0.0	1.10	19.5	3.1
S20.003	59.09	6.02	23.050	0.129	0.0	0.0	0.0	1.99	79.2	20.6
S20.004	58.62	6.13	22.392	0.148	0.0	0.0	0.0	2.06	82.0	23.5
S20.005	58.02	6.27	22.063	0.160	0.0	0.0	0.0	2.18	86.8	25.1
S22.000	63.33	5.16	22.137	0.037	0.0	0.0	0.0	1.10	43.9	6.3

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Network Design Table for M380-CATCHMENT A-SW.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S22.001	10.369	0.424	24.5	0.023	0.00	0.0	0.600		o	225	Pipe/Conduit	
S20.006	20.226	0.247	81.9	0.039	0.00	0.0	0.600		o	375	Pipe/Conduit	
S20.007	13.512	0.105	128.7	0.062	0.00	0.0	0.600		o	375	Pipe/Conduit	
S20.008	16.297	0.114	143.0	0.038	0.00	0.0	0.600		o	375	Pipe/Conduit	
S20.009	14.567	0.176	82.8	0.040	0.00	0.0	0.600		o	375	Pipe/Conduit	
S20.010	14.882	0.775	19.2	0.024	0.00	0.0	0.600		o	375	Pipe/Conduit	
S18.008	9.874	0.027	365.7	0.008	0.00	0.0	0.600		o	450	Pipe/Conduit	
S18.009	8.787	0.127	69.2	0.032	0.00	0.0	0.600		o	450	Pipe/Conduit	
S18.010	10.835	0.077	140.7	0.013	0.00	0.0	0.600		o	450	Pipe/Conduit	
S18.011	15.755	0.049	321.5	0.011	0.00	0.0	0.600		o	450	Pipe/Conduit	
S18.012	13.831#	0.168	82.3	0.000	0.00	0.0	0.600		o	450	Pipe/Conduit	
S23.000	37.361	0.387	96.5	0.008	5.00	0.0	0.600		o	150	Pipe/Conduit	
S23.001	14.941	0.134	111.5	0.161	0.00	0.0	0.600		o	300	Pipe/Conduit	
S23.002	47.282	0.388	121.9	0.009	0.00	0.0	0.600		o	300	Pipe/Conduit	
S24.000	10.938	0.109	100.3	0.065	5.00	0.0	0.600		o	150	Pipe/Conduit	
S24.001	17.658	0.106	166.6	0.020	0.00	0.0	0.600		o	225	Pipe/Conduit	
S24.002	17.882	0.107	167.1	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit	
S24.003	32.948	0.494	66.7	0.048	0.00	0.0	0.600		o	300	Pipe/Conduit	
S25.000	14.911	0.090	165.7	0.062	5.00	0.0	0.600		o	225	Pipe/Conduit	
S25.001	20.331	0.280	72.6	0.032	0.00	0.0	0.600		o	300	Pipe/Conduit	
S25.002	23.650	0.818	28.9	0.059	0.00	0.0	0.600		o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S22.001	62.98	5.22	22.063	0.060	0.0	0.0	0.0	2.66	105.6	10.2
S20.006	57.31	6.44	21.489	0.259	0.0	0.0	0.0	2.00	221.3	40.2
S20.007	56.73	6.58	21.242	0.321	0.0	0.0	0.0	1.60	176.2	49.3
S20.008	56.01	6.76	21.137	0.359	0.0	0.0	0.0	1.51	167.1	54.5
S20.009	55.53	6.88	21.023	0.399	0.0	0.0	0.0	1.99	220.1	60.0
S20.010	55.30	6.94	20.847	0.423	0.0	0.0	0.0	4.15	458.5	63.4
S18.008	54.71	7.10	19.997	0.784	0.0	0.0	0.0	1.06	168.1	116.2
S18.009	54.49	7.16	19.970	0.816	0.0	0.0	0.0	2.45	389.2	120.4
S18.010	54.10	7.26	19.843	0.829	0.0	0.0	0.0	1.71	272.3	121.5
S18.011	53.27	7.49	19.766	0.840	0.0	0.0	0.0	1.13	179.5	121.5
S18.012	52.91	7.60	19.717	0.840	0.0	0.0	0.0	2.24	356.6	121.5
S23.000	61.03	5.61	20.901	0.008	0.0	0.0	0.0	1.02	18.1	1.3
S23.001	60.23	5.78	20.364	0.169	0.0	0.0	0.0	1.49	105.2	27.6
S23.002	57.76	6.33	20.230	0.178	0.0	0.0	0.0	1.42	100.6	27.8
S24.000	63.19	5.18	21.150	0.065	0.0	0.0	0.0	1.00	17.7	11.1
S24.001	61.70	5.47	20.966	0.085	0.0	0.0	0.0	1.01	40.2	14.2
S24.002	60.27	5.77	20.860	0.085	0.0	0.0	0.0	1.01	40.1	14.2
S24.003	58.97	6.05	20.678	0.133	0.0	0.0	0.0	1.93	136.3	21.2
S25.000	62.85	5.25	22.470	0.062	0.0	0.0	0.0	1.01	40.3	10.6
S25.001	61.92	5.43	22.305	0.094	0.0	0.0	0.0	1.85	130.6	15.8
S25.002	61.25	5.56	22.025	0.153	0.0	0.0	0.0	2.94	207.5	25.4

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Network Design Table for M380-CATCHMENT A-SW.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S26.000	12.385	0.123	100.7	0.048	5.00	0.0	0.600		o	150	Pipe/Conduit	
S25.003	24.648	0.064	385.1	0.032	0.00	0.0	0.600		o	450	Pipe/Conduit	
S25.004	12.782	0.033	387.3	0.017	0.00	0.0	0.600		o	450	Pipe/Conduit	
S25.005	21.544	0.056	384.7	0.031	0.00	0.0	0.600		o	450	Pipe/Conduit	
S25.006	29.806	0.094	317.1	0.059	0.00	0.0	0.600		o	450	Pipe/Conduit	
S27.000	27.977	0.636	44.0	0.123	5.00	0.0	0.600		o	225	Pipe/Conduit	
S25.007	10.222	0.037	276.3	0.023	0.00	0.0	0.600		o	450	Pipe/Conduit	
S25.008	33.156	0.416	79.7	0.021	0.00	0.0	0.600		o	450	Pipe/Conduit	
S25.009	22.498	0.297	75.8	0.199	0.00	0.0	0.600		o	450	Pipe/Conduit	
S28.000	23.275	0.567	41.0	0.033	5.00	0.0	0.600		o	225	Pipe/Conduit	
S29.000	20.642	0.121	170.6	0.038	5.00	0.0	0.600		o	225	Pipe/Conduit	
S28.001	39.547	0.212	186.5	0.105	0.00	0.0	0.600		o	300	Pipe/Conduit	
S28.002	29.887	0.136	219.8	0.125	0.00	0.0	0.600		o	300	Pipe/Conduit	
S24.004	34.492	0.069	499.9	0.187	0.00	0.0	0.600		o	600	Pipe/Conduit	
S24.005	12.517	0.025	500.7	0.032	0.00	0.0	0.600		o	600	Pipe/Conduit	
S24.006	14.415	0.029	497.1	0.030	0.00	0.0	0.600		o	600	Pipe/Conduit	
S24.007	19.439	0.039	498.4	0.039	0.00	0.0	0.600		o	600	Pipe/Conduit	
S24.008	14.965	0.030	498.8	0.010	0.00	0.0	0.600		o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S26.000	63.06	5.21	21.480	0.048	0.0	0.0	0.0	1.00	17.7	8.2
S25.003	59.38	5.96	21.057	0.233	0.0	0.0	0.0	1.03	163.8	37.5
S25.004	58.45	6.17	20.993	0.250	0.0	0.0	0.0	1.03	163.3	39.6
S25.005	56.98	6.52	20.960	0.281	0.0	0.0	0.0	1.03	163.9	43.4
S25.006	55.24	6.96	20.904	0.340	0.0	0.0	0.0	1.14	180.7	50.9
S27.000	62.90	5.24	21.671	0.123	0.0	0.0	0.0	1.98	78.6	21.0
S25.007	54.72	7.09	20.810	0.486	0.0	0.0	0.0	1.22	193.7	72.0
S25.008	53.83	7.34	20.773	0.507	0.0	0.0	0.0	2.28	362.4	73.9
S25.009	53.26	7.50	20.357	0.706	0.0	0.0	0.0	2.34	371.8	101.8
S28.000	63.15	5.19	21.200	0.033	0.0	0.0	0.0	2.05	81.4	5.6
S29.000	62.34	5.34	20.754	0.038	0.0	0.0	0.0	1.00	39.7	6.4
S28.001	59.57	5.92	20.558	0.176	0.0	0.0	0.0	1.15	81.1	28.4
S28.002	57.51	6.39	20.346	0.301	0.0	0.0	0.0	1.06	74.7	46.9
S24.004	51.47	8.03	19.910	1.327	0.0	0.0	0.0	1.08	306.0	185.0
S24.005	50.86	8.22	19.841	1.359	0.0	0.0	0.0	1.08	305.8	187.2
S24.006	50.18	8.44	19.816	1.389	0.0	0.0	0.0	1.09	306.9	188.7
S24.007	49.29	8.74	19.787	1.428	0.0	0.0	0.0	1.08	306.5	190.6
S24.008	48.63	8.97	19.748	1.438	0.0	0.0	0.0	1.08	306.3	190.6

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Network Design Table for M380-CATCHMENT A-SW.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
S24.009	15.540	0.031	501.3	0.025	0.00	0.0	0.600		o	600	Pipe/Conduit	
S24.010	6.730	0.014	480.7	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit	
S24.011	34.996	0.073	479.4	0.099	0.00	0.0	0.600		o	600	Pipe/Conduit	
S30.000	10.229	0.030	341.0	0.055	5.00	0.0	0.600		o	450	Pipe/Conduit	
S30.001	41.202	0.060	686.7	0.063	0.00	0.0	0.600		o	750	Pipe/Conduit	
S30.002	19.094	0.030	636.5	0.029	0.00	0.0	0.600		o	750	Pipe/Conduit	
S30.003	28.902	0.045	642.3	0.009	0.00	0.0	0.600		o	750	Pipe/Conduit	
S24.012	33.982	0.050	679.6	0.000	0.00	0.0	0.600		o	750	Pipe/Conduit	
S24.013	5.369	0.029	185.1	0.000	0.00	0.0	0.600		o	750	Pipe/Conduit	
S23.003	10.375#	0.021	494.0	0.088	0.00	0.0	0.600		o	750	Pipe/Conduit	
S1.021	8.756	0.036	243.2	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit	
S1.022	6.724	0.021	320.2	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit	
S1.023	38.389	0.077	498.6	0.000	0.00	0.0	0.045	3 \=/		150	1:3 Swale	
S1.024	42.072	0.084	500.9	0.000	0.00	0.0	0.045	3 \=/		150	1:3 Swale	
S1.025	7.094	0.014	506.7	0.000	0.00	0.0	0.045	3 \=/		150	1:3 Swale	
S1.026	5.150	0.010	515.0	0.000	0.00	0.0	0.045	3 \=/		150	1:3 Swale	
S1.027	21.812	1.288	16.9	0.000	0.00	0.0	0.045	3 \=/		150	1:3 Swale	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S24.009	47.96	9.21	19.718	1.463	0.0	0.0	0.0	1.08	305.6	190.6
S24.010	47.69	9.31	19.687	1.463	0.0	0.0	0.0	1.10	312.1	190.6
S24.011	46.32	9.84	19.673	1.562	0.0	0.0	0.0	1.11	312.6	195.9
S30.000	63.33	5.16	20.065	0.055	0.0	0.0	0.0	1.10	174.2	9.4
S30.001	60.11	5.80	19.735	0.118	0.0	0.0	0.0	1.06	468.4	19.2
S30.002	58.79	6.09	19.675	0.147	0.0	0.0	0.0	1.10	486.7	23.4
S30.003	56.92	6.53	19.645	0.156	0.0	0.0	0.0	1.10	484.5	24.0
S24.012	45.03	10.37	19.600	1.718	0.0	0.0	0.0	1.07	470.9	209.5
S24.013	44.93	10.42	19.550	1.718	0.0	0.0	0.0	2.05	907.2	209.5
S23.003	44.61	10.55	19.521	1.984	0.0	0.0	0.0	1.25	553.2	239.7
S1.021	36.36	15.19	19.105	6.469	0.0	0.0	0.0	1.16	127.8«	636.9
S1.022	36.20	15.30	19.069	6.469	0.0	0.0	0.0	1.01	111.2«	636.9
S1.023	32.14	18.71	19.043	6.469	0.0	0.0	0.0	0.19	16.9«	636.9
S1.024	28.76	22.45	18.966	6.469	0.0	0.0	0.0	0.19	16.9«	636.9
S1.025	28.27	23.09	18.882	6.469	0.0	0.0	0.0	0.19	16.8«	636.9
S1.026	27.92	23.55	18.868	6.469	0.0	0.0	0.0	0.18	16.6«	636.9
S1.027	27.66	23.91	18.858	6.469	0.0	0.0	0.0	1.02	91.7«	636.9

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Simulation Criteria for M380-CATCHMENT A-SW.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	2	Number of Storage Structures	2
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 450306 114752	Cv (Winter)	0.840
Data Type	Point Storm	Duration (mins)	30

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Online Controls for M380-CATCHMENT A-SW.SWS

Orifice Manhole: S1021-Con, DS/PN: S1.017, Volume (m³): 4.5

Diameter (m) 0.300 Discharge Coefficient 0.600 Invert Level (m) 20.900

Hydro-Brake® Optimum Manhole: S1026-Con, DS/PN: S1.022, Volume (m³): 7.9

Unit Reference	MD-SFF-0306-6200-1531-5580
Design Head (m)	1.531
Design Flow (l/s)	62.0
Flush-Flo™	User Defined
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	306
Invert Level (m)	19.069
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.531	62.0	Kick-Flo®	0.924	48.6
Flush-Flo™	0.482	55.8	Mean Flow over Head Range	-	48.5

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.3	0.800	52.7	2.000	70.6	4.000	98.8	7.000	129.8
0.200	31.4	1.000	50.5	2.200	73.9	4.500	104.6	7.500	134.3
0.300	53.6	1.200	55.1	2.400	77.1	5.000	110.2	8.000	138.6
0.400	55.4	1.400	59.4	2.600	80.1	5.500	115.4	8.500	142.8
0.500	55.8	1.600	63.3	3.000	85.9	6.000	120.4	9.000	146.8
0.600	55.3	1.800	67.0	3.500	92.6	6.500	125.2	9.500	150.7

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Storage Structures for M380-CATCHMENT A-SW.SWS

Tank or Pond Manhole: S1020-Basin A2, DS/PN: S1.016

Invert Level (m) 21.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	717.5	0.600	1077.9	1.200	1476.1	1.800	1539.0	2.400	1539.0
0.100	775.0	0.700	1141.7	1.300	1539.0	1.900	1539.0	2.500	1539.0
0.200	833.5	0.800	1206.4	1.400	1539.0	2.000	1539.0		
0.300	893.0	0.900	1272.3	1.500	1539.0	2.100	1539.0		
0.400	953.6	1.000	1339.1	1.600	1539.0	2.200	1539.0		
0.500	1015.2	1.100	1407.1	1.700	1539.0	2.300	1539.0		

Tank or Pond Manhole: S1025-Basin A1, DS/PN: S1.021

Invert Level (m) 19.400

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	3151.7	0.600	4356.5	1.200	5577.3	1.800	5577.3	2.400	5577.3
0.100	3349.9	0.700	4560.9	1.300	5577.3	1.900	5577.3	2.500	5577.3
0.200	3549.2	0.800	4766.4	1.400	5577.3	2.000	5577.3		
0.300	3749.5	0.900	4972.8	1.500	5577.3	2.100	5577.3		
0.400	3950.8	1.000	5170.3	1.600	5577.3	2.200	5577.3		
0.500	4153.2	1.100	5388.8	1.700	5577.3	2.300	5577.3		

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 450306 114752 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status OFF
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 60, 120, 180, 240, 360, 480, 600, 960, 1440
 Return Period(s) (years) 30, 100
 Climate Change (%) 0, 40

										Water	Surcharged
										Level	Depth
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.		(m)	(m)
S1.000	S988	60 Summer	30	+0%						26.623	-0.177
S1.001	S989	60 Summer	30	+0%						26.366	-0.121
S1.002	S990	60 Summer	30	+0%	100/60 Summer					26.104	-0.083
S2.000	S1000	60 Summer	30	+0%						28.486	-0.184
S2.001	S1001	60 Summer	30	+0%						27.830	-0.170
S2.002	S1002	60 Summer	30	+0%						27.182	-0.163
S2.003	S1003	60 Summer	30	+0%						26.441	-0.144
S3.000	S980	60 Summer	30	+0%						26.172	-0.178
S1.003	S1004	60 Summer	30	+0%						25.828	-0.165
S1.004	S1005	60 Summer	30	+0%						25.352	-0.156
S1.005	S1006	60 Summer	30	+0%						24.609	-0.142
S4.000	S1040	60 Summer	30	+0%	30/60 Summer					24.929	0.079
S4.001	S1041	60 Summer	30	+0%	100/60 Summer					24.608	-0.097
S4.002	S1042	60 Summer	30	+0%	30/60 Summer					24.186	0.164
S4.003	S1043	60 Summer	30	+0%	30/60 Summer					24.086	0.146
S4.004	S1044	60 Summer	30	+0%	30/60 Summer					23.992	0.124
S4.005	S1045	60 Summer	30	+0%	30/60 Summer					23.646	0.036
S4.006	S1046	60 Summer	30	+0%	30/60 Summer					23.533	0.038
S1.006	S1007	60 Summer	30	+0%	100/60 Summer					23.219	-0.212
S5.000	S1050	60 Summer	30	+0%						23.636	-0.148
S5.001	S1051	60 Summer	30	+0%						23.510	-0.182
S5.002	S1052	60 Summer	30	+0%						23.465	-0.177
S5.003	S1053	60 Summer	30	+0%						23.254	-0.323
S5.004	S1054	60 Summer	30	+0%						23.173	-0.336
S1.007	S1008	60 Summer	30	+0%						22.881	-0.400
S1.008	S1009	60 Summer	30	+0%	100/60 Summer					22.812	-0.393
S6.000	SS1	60 Summer	30	+0%						25.291	-0.109

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S988	0.000	0.10		5.3	OK	
S1.001	S989	0.000	0.43		19.1	OK	
S1.002	S990	0.000	0.71		31.0	OK	
S2.000	S1000	0.000	0.08		6.0	OK	
S2.001	S1001	0.000	0.13		10.7	OK	
S2.002	S1002	0.000	0.17		12.8	OK	
S2.003	S1003	0.000	0.28		21.0	OK	
S3.000	S980	0.000	0.10		7.8	OK	
S1.003	S1004	0.000	0.42		61.9	OK	
S1.004	S1005	0.000	0.47		74.4	OK	
S1.005	S1006	0.000	0.54		93.3	OK	
S4.000	S1040	0.000	1.25		19.6	SURCHARGED	
S4.001	S1041	0.000	0.60		33.1	OK	
S4.002	S1042	0.000	1.10		43.4	SURCHARGED	
S4.003	S1043	0.000	1.15		43.4	SURCHARGED	
S4.004	S1044	0.000	1.17		47.3	SURCHARGED	
S4.005	S1045	0.000	0.98		81.8	SURCHARGED	
S4.006	S1046	0.000	1.35		85.3	SURCHARGED	
S1.006	S1007	0.000	0.66		194.7	OK	
S5.000	S1050	0.000	0.26		9.4	OK	
S5.001	S1051	0.000	0.33		19.1	OK	
S5.002	S1052	0.000	0.35		22.4	OK	
S5.003	S1053	0.000	0.18		28.2	OK	
S5.004	S1054	0.000	0.14		37.5	OK	
S1.007	S1008	0.000	0.44		245.9	OK	
S1.008	S1009	0.000	0.41		250.7	OK	
S6.000	SS1	0.000	0.16		3.7	OK	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S6.001	SS2	60 Summer	30	+0%					25.009
S6.002	SS3	60 Summer	30	+0%					24.800
S6.003	SS4	60 Summer	30	+0%					24.581
S6.004	SS5	60 Summer	30	+0%					24.435
S6.005	SS7	60 Summer	30	+0%					24.236
S6.006	SS8	60 Summer	30	+0%	100/60 Summer				23.605
S7.000	SS9	60 Summer	30	+0%					25.290
S7.001	SS10	60 Summer	30	+0%					24.821
S7.002	SS11	60 Summer	30	+0%					24.146
S7.003	SS12	60 Summer	30	+0%					23.845
S6.007	SS13	60 Summer	30	+0%	30/60 Summer				23.210
S1.009	S1010	60 Summer	30	+0%	100/60 Summer				22.746
S8.000	S1070A	60 Summer	30	+0%	100/60 Summer				25.543
S9.000	S1070	60 Summer	30	+0%	100/60 Summer				25.763
S8.001	S1071	60 Summer	30	+0%	100/60 Summer				25.514
S8.002	S1072	60 Summer	30	+0%	100/60 Summer				25.380
S8.003	S1073	60 Summer	30	+0%	100/60 Summer				25.298
S8.004	S1074	60 Summer	30	+0%	100/60 Summer				25.249
S10.000	S1076A	60 Summer	30	+0%					26.575
S8.005	S1076	60 Summer	30	+0%	100/60 Summer				25.041
S8.006	S1078	60 Summer	30	+0%	100/60 Summer				24.750
S8.007	S1079	60 Summer	30	+0%	100/60 Summer				24.731
S8.008	S1080	60 Summer	30	+0%					24.693
S8.009	S1081	60 Summer	30	+0%					24.497
S8.010	S1082	60 Summer	30	+0%					23.611
S1.010	S1011	60 Summer	30	+0%	100/60 Summer				22.633
S1.011	S1012	60 Summer	30	+0%	100/60 Summer				22.499
S1.012	S1014	60 Summer	30	+0%					22.209
S1.013	S1016	60 Summer	30	+0%					22.065
S1.014	S1018	60 Summer	30	+0%					21.878
S11.000	S1091	60 Summer	30	+0%					22.600
S1.015	S1019	60 Summer	30	+0%					21.799
S1.016	S1020-Basin A2	60 Winter	30	+0%	30/60 Summer				21.589
S1.017	S1021-Con	60 Winter	30	+0%	30/60 Summer				21.463
S1.018	S1022	60 Winter	30	+0%					21.188
S1.019	S1023	60 Winter	30	+0%	30/60 Summer				21.137
S1.020	S1024	60 Winter	30	+0%					20.836
S12.000	S1100	60 Summer	30	+0%					22.357
S13.000	S1110	60 Summer	30	+0%					21.974
S12.001	S1101	60 Summer	30	+0%					21.829
S12.002	S1102	60 Summer	30	+0%					21.586
S12.003	S1103	60 Summer	30	+0%					21.291
S12.004	S1104	60 Summer	30	+0%					21.020
S14.000	S1120	60 Summer	30	+0%	100/60 Summer				24.245
S15.000	S1140	60 Summer	30	+0%					23.973
S14.001	S1121	60 Summer	30	+0%					23.782
S14.002	S1122	60 Summer	30	+0%					23.347
S14.003	S1123	60 Summer	30	+0%					23.084
S14.004	S1124	60 Summer	30	+0%	100/60 Summer				22.590
S16.000	S1150	60 Summer	30	+0%					22.747
S14.005	S1125	60 Summer	30	+0%	100/60 Summer				22.449
S14.006	S1126	60 Summer	30	+0%	100/60 Summer				20.953
S14.007	S1127	60 Summer	30	+0%	100/60 Summer				20.685
S14.008	S1128	60 Summer	30	+0%	100/60 Summer				20.653
S14.009	S1129	60 Summer	30	+0%	30/60 Summer				20.617

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File M380 + STORM.MDX	Checked by	
Innovyze	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)						
S6.001	SS2	-0.091	0.000	0.33			7.0	OK	
S6.002	SS3	-0.125	0.000	0.41			16.8	OK	
S6.003	SS4	-0.119	0.000	0.45			18.4	OK	
S6.004	SS5	-0.115	0.000	0.48			22.4	OK	
S6.005	SS7	-0.114	0.000	0.48			30.6	OK	
S6.006	SS8	-0.120	0.000	0.44			45.7	OK	
S7.000	SS9	-0.110	0.000	0.16			4.4	OK	
S7.001	SS10	-0.129	0.000	0.37			20.7	OK	
S7.002	SS11	-0.104	0.000	0.56			30.6	OK	
S7.003	SS12	-0.130	0.000	0.37			36.9	OK	
S6.007	SS13	0.039	0.000	1.29			82.1	SURCHARGED	
S1.009	S1010	-0.346	0.000	0.49			336.9	OK	
S8.000	S1070A	-0.122	0.000	0.43			13.8	OK	
S9.000	S1070	-0.197	0.000	0.04			3.2	OK	
S8.001	S1071	-0.098	0.000	0.60			20.6	OK	
S8.002	S1072	-0.064	0.000	0.85			30.1	OK	
S8.003	S1073	-0.051	0.000	0.95			30.3	OK	
S8.004	S1074	-0.049	0.000	0.96			35.9	OK	
S10.000	S1076A	-0.180	0.000	0.09			14.9	OK	
S8.005	S1076	-0.083	0.000	0.85			55.3	OK	
S8.006	S1078	-0.160	0.000	0.59			65.5	OK	
S8.007	S1079	-0.153	0.000	0.74			77.3	OK	
S8.008	S1080	-0.160	0.000	0.74			77.4	OK	
S8.009	S1081	-0.329	0.000	0.16			81.9	OK	
S8.010	S1082	-0.321	0.000	0.18			103.1	OK	
S1.010	S1011	-0.261	0.000	0.75			455.1	OK	
S1.011	S1012	-0.248	0.000	0.78			472.4	OK	
S1.012	S1014	-0.421	0.000	0.55			482.0	OK	
S1.013	S1016	-0.480	0.000	0.44			482.9	OK	
S1.014	S1018	-0.408	0.000	0.58			514.7	OK	
S11.000	S1091	-0.189	0.000	0.06			5.3	OK	
S1.015	S1019	-0.348	0.000	0.68			523.7	OK	
S1.016	S1020-Basin A2	0.343	0.000	1.53			89.3	SURCHARGED	
S1.017	S1021-Con	0.263	0.000	1.68			89.3	SURCHARGED	
S1.018	S1022	-0.842	0.000	0.03			89.2	OK	
S1.019	S1023	0.073	0.000	1.45			89.0	SURCHARGED*	
S1.020	S1024	-0.709	0.000	0.02			89.0	OK	
S12.000	S1100	-0.172	0.000	0.12			7.8	OK	
S13.000	S1110	-0.158	0.000	0.19			8.7	OK	
S12.001	S1101	-0.160	0.000	0.44			39.7	OK	
S12.002	S1102	-0.184	0.000	0.31			43.4	OK	
S12.003	S1103	-0.175	0.000	0.36			47.2	OK	
S12.004	S1104	-0.179	0.000	0.34			56.8	OK	
S14.000	S1120	-0.069	0.000	0.57			18.9	OK	
S15.000	S1140	-0.080	0.000	0.45			7.4	OK	
S14.001	S1121	-0.118	0.000	0.46			29.0	OK	
S14.002	S1122	-0.113	0.000	0.49			35.4	OK	
S14.003	S1123	-0.191	0.000	0.28			38.8	OK	
S14.004	S1124	-0.120	0.000	0.67			46.6	OK	
S16.000	S1150	-0.175	0.000	0.11			8.0	OK	
S14.005	S1125	-0.163	0.000	0.43			68.5	OK	
S14.006	S1126	-0.210	0.000	0.40			97.2	OK	
S14.007	S1127	-0.065	0.000	1.00			106.8	OK	
S14.008	S1128	-0.035	0.000	0.89			106.9	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Surcharged		Flooded		Half Drain		Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)			
S14.009	S1129	0.024	0.000	0.67			109.2		SURCHARGED	

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Innovyze	Network 2020.1.3	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) SurchARGE	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S14.010	S1130	60 Summer	30	+0%	30/60 Summer				20.540	0.119
S17.000	S1160	60 Summer	30	+0%	30/60 Summer				20.460	0.026
S14.011	S1131	60 Summer	30	+0%	30/60 Summer				20.460	0.065
S12.005	S1105	60 Summer	30	+0%	100/60 Summer				20.136	-0.102
S18.000	S1169	60 Summer	30	+0%					23.021	-0.194
S18.001	S1170	60 Summer	30	+0%					22.040	-0.140
S18.002	S1171	60 Summer	30	+0%					21.822	-0.222
S18.003	S1172	60 Summer	30	+0%	100/60 Summer				21.375	-0.203
S18.004	S1173	60 Summer	30	+0%	100/60 Summer				21.082	-0.197
S18.005	S1174	60 Summer	30	+0%	100/60 Summer				20.730	-0.149
S19.000	SH119	60 Summer	30	+0%	30/60 Summer				20.728	0.028
S18.006	S1175	60 Summer	30	+0%	30/60 Summer				20.713	0.060
S18.007	S1176	60 Summer	30	+0%	30/60 Summer				20.588	0.105
S20.000	S1200	60 Summer	30	+0%					23.694	-0.150
S20.001	S1201	60 Summer	30	+0%					23.527	-0.167
S20.002	S1202	60 Summer	30	+0%					23.264	-0.109
S21.000	S1220	60 Summer	30	+0%					23.286	-0.100
S20.003	S1203	60 Summer	30	+0%					23.154	-0.121
S20.004	S1204	60 Summer	30	+0%					22.503	-0.114
S20.005	S1205	60 Summer	30	+0%					22.173	-0.115
S22.000	S1230	60 Summer	30	+0%					22.210	-0.152
S22.001	S1231	60 Summer	30	+0%					22.123	-0.165
S20.006	S1206	60 Summer	30	+0%					21.645	-0.219
S20.007	S1207	60 Summer	30	+0%	100/60 Summer				21.449	-0.168
S20.008	S1208	60 Summer	30	+0%	100/60 Summer				21.354	-0.158
S20.009	S1209	60 Summer	30	+0%	100/60 Summer				21.225	-0.173
S20.010	S1210	60 Summer	30	+0%	100/60 Summer				20.983	-0.239
S18.008	S1177	60 Summer	30	+0%	30/60 Summer				20.502	0.055
S18.009	S1178	60 Summer	30	+0%	30/60 Summer				20.443	0.023
S18.010	S1179	60 Summer	30	+0%	30/60 Summer				20.346	0.053
S18.011	S1180	60 Summer	30	+0%	30/60 Summer				20.246	0.030
S18.012	S1181	60 Summer	30	+0%	100/60 Summer				20.036	-0.131
S23.000	S1240	60 Summer	30	+0%					20.933	-0.118
S23.001	S1241	60 Summer	30	+0%					20.516	-0.148
S23.002	S1242	60 Summer	30	+0%					20.371	-0.159
S24.000	S1250	60 Summer	30	+0%	100/60 Summer				21.265	-0.035
S24.001	S1251	60 Summer	30	+0%	100/60 Summer				21.091	-0.100
S24.002	S1252	60 Summer	30	+0%	100/60 Summer				20.979	-0.106
S24.003	S1253	60 Summer	30	+0%	100/60 Summer				20.778	-0.200
S25.000	S1270	60 Summer	30	+0%					22.569	-0.126
S25.001	S1271	60 Summer	30	+0%					22.398	-0.207
S25.002	S1271A	60 Summer	30	+0%					22.115	-0.210
S26.000	S1290	60 Summer	30	+0%	100/60 Summer				21.572	-0.058
S25.003	S1272	60 Summer	30	+0%	100/60 Summer				21.308	-0.199
S25.004	S1273	60 Summer	30	+0%	100/60 Summer				21.261	-0.182
S25.005	S1274	60 Summer	30	+0%	100/60 Summer				21.235	-0.175
S25.006	S1275	60 Summer	30	+0%	100/60 Summer				21.203	-0.151
S27.000	S1300	60 Summer	30	+0%	100/60 Summer				21.768	-0.128
S25.007	S1277	60 Summer	30	+0%	100/60 Summer				21.169	-0.091
S25.008	S1278	60 Summer	30	+0%	100/60 Summer				20.953	-0.270
S25.009	S1279	60 Summer	30	+0%	100/60 Summer				20.746	-0.061
S28.000	SH310	60 Summer	30	+0%	100/60 Summer				21.248	-0.177
S29.000	S1321	60 Summer	30	+0%	100/60 Summer				20.829	-0.150
S28.001	S1311	60 Summer	30	+0%	100/60 Summer				20.795	-0.063
S28.002	S1312	60 Summer	30	+0%	30/60 Summer				20.755	0.109

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S14.010	S1130	0.000	1.41		110.8	SURCHARGED	
S17.000	S1160	0.000	0.03		2.6	SURCHARGED	
S14.011	S1131	0.000	1.21		117.9	SURCHARGED	
S12.005	S1105	0.000	0.87		196.3	OK	
S18.000	S1169	0.000	0.05		3.9	OK	
S18.001	S1170	0.000	0.30		19.7	OK	
S18.002	S1171	0.000	0.15		22.0	OK	
S18.003	S1172	0.000	0.23		31.0	OK	
S18.004	S1173	0.000	0.26		33.7	OK	
S18.005	S1174	0.000	0.27		32.7	OK	
S19.000	SH119	0.000	0.41		23.8	SURCHARGED	
S18.006	S1175	0.000	0.88		55.3	SURCHARGED	
S18.007	S1176	0.000	1.38		73.4	SURCHARGED	
S20.000	S1200	0.000	0.00		0.0	OK	
S20.001	S1201	0.000	0.15		9.0	OK	
S20.002	S1202	0.000	0.52		18.2	OK	
S21.000	S1220	0.000	0.24		4.1	OK	
S20.003	S1203	0.000	0.43		30.4	OK	
S20.004	S1204	0.000	0.49		34.8	OK	
S20.005	S1205	0.000	0.48		37.6	OK	
S22.000	S1230	0.000	0.23		8.5	OK	
S22.001	S1231	0.000	0.16		13.9	OK	
S20.006	S1206	0.000	0.36		60.5	OK	
S20.007	S1207	0.000	0.59		74.8	OK	
S20.008	S1208	0.000	0.63		83.2	OK	
S20.009	S1209	0.000	0.56		91.9	OK	
S20.010	S1210	0.000	0.28		97.5	OK	
S18.008	S1177	0.000	1.60		169.0	SURCHARGED	
S18.009	S1178	0.000	0.87		174.8	SURCHARGED	
S18.010	S1179	0.000	1.05		177.4	SURCHARGED	
S18.011	S1180	0.000	1.30		179.2	SURCHARGED	
S18.012	S1181	0.000	0.84		178.5	OK	
S23.000	S1240	0.000	0.11		1.8	OK	
S23.001	S1241	0.000	0.50		39.9	OK	
S23.002	S1242	0.000	0.44		41.9	OK	
S24.000	S1250	0.000	0.94		15.0	OK	
S24.001	S1251	0.000	0.59		19.6	OK	
S24.002	S1252	0.000	0.54		19.5	OK	
S24.003	S1253	0.000	0.24		30.3	OK	
S25.000	S1270	0.000	0.40		14.3	OK	
S25.001	S1271	0.000	0.21		21.7	OK	
S25.002	S1271A	0.000	0.19		35.6	OK	
S26.000	S1290	0.000	0.69		11.0	OK	
S25.003	S1272	0.000	0.47		53.5	OK	
S25.004	S1273	0.000	0.52		55.7	OK	
S25.005	S1274	0.000	0.46		61.3	OK	
S25.006	S1275	0.000	0.47		72.4	OK	
S27.000	S1300	0.000	0.39		28.3	OK	
S25.007	S1277	0.000	0.99		102.5	OK	
S25.008	S1278	0.000	0.34		106.4	OK	
S25.009	S1279	0.000	0.45		137.6	OK	
S28.000	SH310	0.000	0.10		7.6	OK	
S29.000	S1321	0.000	0.24		8.7	OK	
S28.001	S1311	0.000	0.52		39.4	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Flooded		Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S28.002	S1312	0.000	0.87		59.0		SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S24.004	S1254	60 Summer	30	+0%	30/60 Summer				20.698
S24.005	S1255	60 Summer	30	+0%	30/60 Summer				20.650
S24.006	S1256	60 Summer	30	+0%	30/60 Summer				20.615
S24.007	S1257	60 Summer	30	+0%	30/60 Summer				20.577
S24.008	S1258	60 Summer	30	+0%	30/60 Summer				20.520
S24.009	S1259	60 Summer	30	+0%	30/60 Summer				20.482
S24.010	S1260	60 Summer	30	+0%	30/60 Summer				20.442
S24.011	S1261	60 Summer	30	+0%	30/60 Summer				20.418
S30.000	S1330	60 Winter	30	+0%					20.350
S30.001	S1331	60 Winter	30	+0%					20.348
S30.002	S1332	60 Summer	30	+0%	100/60 Summer				20.347
S30.003	S1333	60 Summer	30	+0%	100/60 Summer				20.345
S24.012	S1262	60 Summer	30	+0%	100/60 Summer				20.344
S24.013	S1263	60 Summer	30	+0%	100/60 Summer				20.284
S23.003	S1243	60 Summer	30	+0%	100/60 Summer				20.271
S1.021	S1025-Basin A1	360 Winter	30	+0%	30/60 Summer				19.810
S1.022	S1026-Con	360 Winter	30	+0%	30/60 Summer				19.790
S1.023	S1027	360 Winter	30	+0%					19.301
S1.024	S1028	360 Winter	30	+0%					19.221
S1.025	S1029	360 Winter	30	+0%					19.124
S1.026	S1030	360 Winter	30	+0%					19.101
S1.027	S1031	360 Winter	30	+0%					18.977

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S24.004	S1254	0.188	0.000	0.99			253.7	SURCHARGED	
S24.005	S1255	0.209	0.000	1.63			258.7	SURCHARGED	
S24.006	S1256	0.199	0.000	1.58			263.3	SURCHARGED	
S24.007	S1257	0.190	0.000	1.68			267.5	SURCHARGED	
S24.008	S1258	0.172	0.000	1.59			266.4	SURCHARGED	
S24.009	S1259	0.164	0.000	1.57			268.1	SURCHARGED	
S24.010	S1260	0.155	0.000	1.36			265.4	SURCHARGED	
S24.011	S1261	0.145	0.000	1.18			275.3	SURCHARGED	
S30.000	S1330	-0.165	0.000	0.09			10.2	OK	
S30.001	S1331	-0.137	0.000	0.06			20.2	OK	
S30.002	S1332	-0.078	0.000	0.11			28.0	OK	
S30.003	S1333	-0.050	0.000	0.10			36.5	OK	
S24.012	S1262	-0.006	0.000	0.75			246.2	OK	
S24.013	S1263	-0.016	0.000	0.58			241.3	OK	
S23.003	S1243	0.000	0.000	1.30			264.5	OK	
S1.021	S1025-Basin A1	0.330	0.000	0.61			55.7	SURCHARGED	
S1.022	S1026-Con	0.346	0.000	0.78			55.7	SURCHARGED	
S1.023	S1027	-1.997	0.000	0.00			55.7	OK	
S1.024	S1028	-2.040	0.000	0.00			55.7	OK	
S1.025	S1029	-2.051	0.000	0.00			55.7	OK	
S1.026	S1030	-1.917	0.000	0.00			55.7	OK	
S1.027	S1031	-1.992	0.000	0.00			55.7	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 450306 114752 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status OFF
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 60, 120, 180, 240, 360, 480, 600, 960, 1440
 Return Period(s) (years) 30, 100
 Climate Change (%) 0, 40

										Water Surcharged
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)
S1.000	S988	60 Summer	100	+40%					26.640	-0.160
S1.001	S989	60 Summer	100	+40%					26.413	-0.074
S1.002	S990	60 Summer	100	+40%	100/60 Summer				26.280	0.093
S2.000	S1000	60 Summer	100	+40%					28.499	-0.171
S2.001	S1001	60 Summer	100	+40%					27.849	-0.151
S2.002	S1002	60 Summer	100	+40%					27.204	-0.141
S2.003	S1003	60 Summer	100	+40%					26.473	-0.112
S3.000	S980	60 Summer	100	+40%					26.189	-0.161
S1.003	S1004	60 Summer	100	+40%					25.883	-0.110
S1.004	S1005	60 Summer	100	+40%					25.415	-0.093
S1.005	S1006	60 Summer	100	+40%					24.683	-0.068
S4.000	S1040	60 Summer	100	+40%	30/60 Summer				26.146	1.296
S4.001	S1041	60 Summer	100	+40%	100/60 Summer				25.680	0.975
S4.002	S1042	60 Summer	100	+40%	30/60 Summer				25.193	1.171
S4.003	S1043	60 Summer	100	+40%	30/60 Summer				24.970	1.030
S4.004	S1044	60 Summer	100	+40%	30/60 Summer				24.761	0.893
S4.005	S1045	60 Summer	100	+40%	30/60 Summer				24.023	0.413
S4.006	S1046	60 Summer	100	+40%	30/60 Summer				23.737	0.242
S1.006	S1007	60 Summer	100	+40%	100/60 Summer				23.440	0.009
S5.000	S1050	60 Summer	100	+40%					23.666	-0.118
S5.001	S1051	60 Summer	100	+40%					23.557	-0.135
S5.002	S1052	60 Summer	100	+40%					23.515	-0.127
S5.003	S1053	60 Summer	100	+40%					23.309	-0.268
S5.004	S1054	60 Summer	100	+40%					23.278	-0.231
S1.007	S1008	60 Summer	100	+40%					23.256	-0.025
S1.008	S1009	60 Summer	100	+40%	100/60 Summer				23.214	0.009
S6.000	SS1	60 Summer	100	+40%					25.305	-0.095

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S988	0.000	0.19		9.4	OK	
S1.001	S989	0.000	0.77		34.1	OK	
S1.002	S990	0.000	1.23		53.4	SURCHARGED	
S2.000	S1000	0.000	0.13		10.7	OK	
S2.001	S1001	0.000	0.24		19.0	OK	
S2.002	S1002	0.000	0.30		22.8	OK	
S2.003	S1003	0.000	0.49		37.4	OK	
S3.000	S980	0.000	0.18		13.9	OK	
S1.003	S1004	0.000	0.72		107.0	OK	
S1.004	S1005	0.000	0.81		128.9	OK	
S1.005	S1006	0.000	0.94		161.8	OK	
S4.000	S1040	0.000	1.79		28.0	FLOOD RISK	
S4.001	S1041	0.000	0.84		45.9	SURCHARGED	
S4.002	S1042	0.000	1.63		64.3	FLOOD RISK	
S4.003	S1043	0.000	1.72		65.1	FLOOD RISK	
S4.004	S1044	0.000	1.78		71.6	SURCHARGED	
S4.005	S1045	0.000	1.56		129.8	SURCHARGED	
S4.006	S1046	0.000	2.15		135.9	SURCHARGED	
S1.006	S1007	0.000	1.10		327.1	SURCHARGED	
S5.000	S1050	0.000	0.46		16.8	OK	
S5.001	S1051	0.000	0.58		33.9	OK	
S5.002	S1052	0.000	0.63		39.9	OK	
S5.003	S1053	0.000	0.31		50.3	OK	
S5.004	S1054	0.000	0.26		66.1	OK	
S1.007	S1008	0.000	0.70		392.5	OK	
S1.008	S1009	0.000	0.64		389.9	SURCHARGED	
S6.000	SS1	0.000	0.29		6.6	OK	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S6.001	SS2	60 Summer	100	+40%					25.033
S6.002	SS3	60 Summer	100	+40%					24.844
S6.003	SS4	60 Summer	100	+40%					24.629
S6.004	SS5	60 Summer	100	+40%					24.486
S6.005	SS7	60 Summer	100	+40%					24.288
S6.006	SS8	60 Summer	100	+40%	100/60 Summer				23.818
S7.000	SS9	60 Summer	100	+40%					25.305
S7.001	SS10	60 Summer	100	+40%					24.861
S7.002	SS11	60 Summer	100	+40%					24.206
S7.003	SS12	60 Summer	100	+40%					23.884
S6.007	SS13	60 Summer	100	+40%	30/60 Summer				23.514
S1.009	S1010	60 Summer	100	+40%	100/60 Summer				23.167
S8.000	S1070A	60 Summer	100	+40%	100/60 Summer				26.041
S9.000	S1070	60 Summer	100	+40%	100/60 Summer				26.021
S8.001	S1071	60 Summer	100	+40%	100/60 Summer				26.016
S8.002	S1072	60 Summer	100	+40%	100/60 Summer				25.883
S8.003	S1073	60 Summer	100	+40%	100/60 Summer				25.734
S8.004	S1074	60 Summer	100	+40%	100/60 Summer				25.640
S10.000	S1076A	60 Summer	100	+40%					26.589
S8.005	S1076	60 Summer	100	+40%	100/60 Summer				25.300
S8.006	S1078	60 Summer	100	+40%	100/60 Summer				24.915
S8.007	S1079	60 Summer	100	+40%	100/60 Summer				24.890
S8.008	S1080	60 Summer	100	+40%					24.853
S8.009	S1081	60 Summer	100	+40%					24.533
S8.010	S1082	60 Summer	100	+40%					23.650
S1.010	S1011	60 Summer	100	+40%	100/60 Summer				23.045
S1.011	S1012	60 Summer	100	+40%	100/60 Summer				22.829
S1.012	S1014	60 Summer	100	+40%					22.425
S1.013	S1016	60 Summer	100	+40%					22.365
S1.014	S1018	60 Summer	100	+40%					22.254
S11.000	S1091	60 Summer	100	+40%					22.613
S1.015	S1019	60 Summer	100	+40%					22.147
S1.016	S1020-Basin A2	60 Winter	100	+40%	30/60 Summer				21.961
S1.017	S1021-Con	60 Winter	100	+40%	30/60 Summer				21.739
S1.018	S1022	60 Winter	100	+40%					21.264
S1.019	S1023	60 Winter	100	+40%	30/60 Summer				21.229
S1.020	S1024	60 Winter	100	+40%					20.859
S12.000	S1100	60 Summer	100	+40%					22.376
S13.000	S1110	60 Summer	100	+40%					21.998
S12.001	S1101	60 Summer	100	+40%					21.893
S12.002	S1102	60 Summer	100	+40%					21.632
S12.003	S1103	60 Summer	100	+40%					21.343
S12.004	S1104	60 Summer	100	+40%					21.068
S14.000	S1120	60 Summer	100	+40%	100/60 Summer				24.316
S15.000	S1140	60 Summer	100	+40%					24.005
S14.001	S1121	60 Summer	100	+40%					23.828
S14.002	S1122	60 Summer	100	+40%					23.398
S14.003	S1123	60 Summer	100	+40%					23.125
S14.004	S1124	60 Summer	100	+40%	100/60 Summer				22.744
S16.000	S1150	60 Summer	100	+40%					22.765
S14.005	S1125	60 Summer	100	+40%	100/60 Summer				22.633
S14.006	S1126	60 Summer	100	+40%	100/60 Summer				21.994
S14.007	S1127	60 Summer	100	+40%	100/60 Summer				21.845
S14.008	S1128	60 Summer	100	+40%	100/60 Summer				21.676
S14.009	S1129	60 Summer	100	+40%	30/60 Summer				21.502

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)						
S6.001	SS2	-0.067	0.000	0.58			12.4	OK	
S6.002	SS3	-0.081	0.000	0.72			30.0	OK	
S6.003	SS4	-0.071	0.000	0.81			32.8	OK	
S6.004	SS5	-0.064	0.000	0.85			39.8	OK	
S6.005	SS7	-0.062	0.000	0.86			54.4	OK	
S6.006	SS8	0.093	0.000	0.76			78.3	SURCHARGED	
S7.000	SS9	-0.095	0.000	0.29			7.8	OK	
S7.001	SS10	-0.089	0.000	0.66			37.0	OK	
S7.002	SS11	-0.044	0.000	1.00			54.5	OK	
S7.003	SS12	-0.091	0.000	0.66			65.7	OK	
S6.007	SS13	0.343	0.000	2.22			141.4	SURCHARGED	
S1.009	S1010	0.075	0.000	0.78			534.9	SURCHARGED	
S8.000	S1070A	0.376	0.000	0.65			21.2	SURCHARGED	
S9.000	S1070	0.061	0.000	0.07			5.5	SURCHARGED	
S8.001	S1071	0.404	0.000	0.90			30.8	SURCHARGED	
S8.002	S1072	0.439	0.000	1.24			44.0	SURCHARGED	
S8.003	S1073	0.385	0.000	1.41			44.8	SURCHARGED	
S8.004	S1074	0.342	0.000	1.42			53.0	SURCHARGED	
S10.000	S1076A	-0.166	0.000	0.16			26.6	OK	
S8.005	S1076	0.176	0.000	1.32			85.5	SURCHARGED	
S8.006	S1078	0.005	0.000	0.93			103.0	SURCHARGED	
S8.007	S1079	0.006	0.000	1.18			124.0	SURCHARGED	
S8.008	S1080	0.000	0.000	1.18			123.5	OK	
S8.009	S1081	-0.293	0.000	0.26			132.0	OK	
S8.010	S1082	-0.282	0.000	0.29			167.5	OK	
S1.010	S1011	0.151	0.000	1.19			722.9	SURCHARGED	
S1.011	S1012	0.082	0.000	1.25			755.9	SURCHARGED	
S1.012	S1014	-0.205	0.000	0.88			769.7	OK	
S1.013	S1016	-0.180	0.000	0.68			755.2	OK	
S1.014	S1018	-0.032	0.000	0.87			776.9	OK	
S11.000	S1091	-0.176	0.000	0.11			9.4	OK	
S1.015	S1019	0.000	0.000	1.03			794.0	OK	
S1.016	S1020-Basin A2	0.715	0.000	2.02			118.0	SURCHARGED	
S1.017	S1021-Con	0.539	0.000	2.22			117.9	SURCHARGED	
S1.018	S1022	-0.766	0.000	0.04			117.9	OK	
S1.019	S1023	0.165	0.000	1.91			117.1	SURCHARGED*	
S1.020	S1024	-0.686	0.000	0.02			117.1	OK	
S12.000	S1100	-0.153	0.000	0.22			13.9	OK	
S13.000	S1110	-0.134	0.000	0.34			15.6	OK	
S12.001	S1101	-0.096	0.000	0.79			70.9	OK	
S12.002	S1102	-0.138	0.000	0.56			77.4	OK	
S12.003	S1103	-0.123	0.000	0.65			84.1	OK	
S12.004	S1104	-0.131	0.000	0.61			101.1	OK	
S14.000	S1120	0.002	0.000	1.00			33.0	SURCHARGED	
S15.000	S1140	-0.048	0.000	0.80			13.1	OK	
S14.001	S1121	-0.072	0.000	0.80			51.0	OK	
S14.002	S1122	-0.062	0.000	0.87			62.3	OK	
S14.003	S1123	-0.150	0.000	0.50			68.5	OK	
S14.004	S1124	0.034	0.000	1.19			82.5	SURCHARGED	
S16.000	S1150	-0.157	0.000	0.20			14.3	OK	
S14.005	S1125	0.021	0.000	0.74			118.6	SURCHARGED	
S14.006	S1126	0.831	0.000	0.61			147.8	SURCHARGED	
S14.007	S1127	1.095	0.000	1.50			160.8	SURCHARGED	
S14.008	S1128	0.988	0.000	1.35			163.2	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Surcharged	Flooded	Half Drain		Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)		
S14.009	S1129	0.909	0.000	1.04		169.1	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S14.010	S1130	60 Summer	100	+40%	30/60 Summer				21.316	0.895
S17.000	S1160	60 Summer	100	+40%	30/60 Summer				21.124	0.690
S14.011	S1131	60 Summer	100	+40%	30/60 Summer				21.122	0.727
S12.005	S1105	60 Summer	100	+40%	100/60 Summer				20.571	0.333
S18.000	S1169	60 Summer	100	+40%					23.033	-0.182
S18.001	S1170	60 Summer	100	+40%					22.074	-0.106
S18.002	S1171	60 Summer	100	+40%					21.851	-0.193
S18.003	S1172	60 Summer	100	+40%	100/60 Summer				21.809	0.231
S18.004	S1173	60 Summer	100	+40%	100/60 Summer				21.783	0.504
S18.005	S1174	60 Summer	100	+40%	100/60 Summer				21.735	0.856
S19.000	SH119	60 Summer	100	+40%	30/60 Summer				21.735	1.035
S18.006	S1175	60 Summer	100	+40%	30/60 Summer				21.709	1.056
S18.007	S1176	60 Summer	100	+40%	30/60 Summer				21.412	0.929
S20.000	S1200	60 Summer	100	+40%					23.694	-0.150
S20.001	S1201	60 Summer	100	+40%					23.548	-0.146
S20.002	S1202	60 Summer	100	+40%					23.319	-0.054
S21.000	S1220	60 Summer	100	+40%					23.304	-0.082
S20.003	S1203	60 Summer	100	+40%					23.200	-0.075
S20.004	S1204	60 Summer	100	+40%					22.555	-0.062
S20.005	S1205	60 Summer	100	+40%					22.224	-0.064
S22.000	S1230	60 Summer	100	+40%					22.237	-0.125
S22.001	S1231	60 Summer	100	+40%					22.144	-0.144
S20.006	S1206	60 Summer	100	+40%					21.765	-0.099
S20.007	S1207	60 Summer	100	+40%	100/60 Summer				21.679	0.062
S20.008	S1208	60 Summer	100	+40%	100/60 Summer				21.590	0.078
S20.009	S1209	60 Summer	100	+40%	100/60 Summer				21.485	0.087
S20.010	S1210	60 Summer	100	+40%	100/60 Summer				21.356	0.134
S18.008	S1177	60 Summer	100	+40%	30/60 Summer				21.211	0.764
S18.009	S1178	60 Summer	100	+40%	30/60 Summer				20.993	0.573
S18.010	S1179	60 Summer	100	+40%	30/60 Summer				20.758	0.465
S18.011	S1180	60 Summer	100	+40%	30/60 Summer				20.517	0.301
S18.012	S1181	60 Summer	100	+40%	100/60 Summer				20.270	0.103
S23.000	S1240	60 Summer	100	+40%					20.945	-0.106
S23.001	S1241	60 Summer	100	+40%					20.606	-0.058
S23.002	S1242	60 Summer	100	+40%					20.503	-0.027
S24.000	S1250	60 Summer	100	+40%	100/60 Summer				22.116	0.816
S24.001	S1251	60 Summer	100	+40%	100/60 Summer				21.965	0.774
S24.002	S1252	60 Summer	100	+40%	100/60 Summer				21.910	0.825
S24.003	S1253	60 Summer	100	+40%	100/60 Summer				21.864	0.886
S25.000	S1270	60 Summer	100	+40%					22.611	-0.084
S25.001	S1271	60 Summer	100	+40%					22.432	-0.173
S25.002	S1271A	60 Summer	100	+40%					22.274	-0.051
S26.000	S1290	60 Summer	100	+40%	100/60 Summer				22.322	0.692
S25.003	S1272	60 Summer	100	+40%	100/60 Summer				22.227	0.720
S25.004	S1273	60 Summer	100	+40%	100/60 Summer				22.194	0.751
S25.005	S1274	60 Summer	100	+40%	100/60 Summer				22.172	0.762
S25.006	S1275	60 Summer	100	+40%	100/60 Summer				22.140	0.786
S27.000	S1300	60 Summer	100	+40%	100/60 Summer				22.270	0.374
S25.007	S1277	60 Summer	100	+40%	100/60 Summer				22.098	0.838
S25.008	S1278	60 Summer	100	+40%	100/60 Summer				22.031	0.808
S25.009	S1279	60 Summer	100	+40%	100/60 Summer				21.944	1.137
S28.000	SH310	60 Summer	100	+40%	100/60 Summer				22.145	0.720
S29.000	S1321	60 Summer	100	+40%	100/60 Summer				22.147	1.168
S28.001	S1311	60 Summer	100	+40%	100/60 Summer				22.124	1.266
S28.002	S1312	60 Summer	100	+40%	30/60 Summer				22.028	1.382

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S14.010	S1130	0.000	2.20		173.4	SURCHARGED	
S17.000	S1160	0.000	0.06		5.2	SURCHARGED	
S14.011	S1131	0.000	1.92		187.0	SURCHARGED	
S12.005	S1105	0.000	1.39		314.1	SURCHARGED	
S18.000	S1169	0.000	0.08		7.0	OK	
S18.001	S1170	0.000	0.54		35.1	OK	
S18.002	S1171	0.000	0.27		39.2	OK	
S18.003	S1172	0.000	0.37		51.0	SURCHARGED	
S18.004	S1173	0.000	0.36		47.6	SURCHARGED	
S18.005	S1174	0.000	0.39		46.6	FLOOD RISK	
S19.000	SH119	0.000	0.64		37.8	FLOOD RISK	
S18.006	S1175	0.000	1.32		82.9	FLOOD RISK	
S18.007	S1176	0.000	2.08		110.9	SURCHARGED	
S20.000	S1200	0.000	0.00		0.0	OK	
S20.001	S1201	0.000	0.27		16.1	OK	
S20.002	S1202	0.000	0.92		32.4	OK	
S21.000	S1220	0.000	0.43		7.4	OK	
S20.003	S1203	0.000	0.77		54.1	OK	
S20.004	S1204	0.000	0.87		62.0	OK	
S20.005	S1205	0.000	0.86		66.9	OK	
S22.000	S1230	0.000	0.41		15.2	OK	
S22.001	S1231	0.000	0.28		24.7	OK	
S20.006	S1206	0.000	0.64		106.3	OK	
S20.007	S1207	0.000	1.00		126.7	SURCHARGED	
S20.008	S1208	0.000	1.05		138.8	SURCHARGED	
S20.009	S1209	0.000	0.90		148.1	SURCHARGED	
S20.010	S1210	0.000	0.44		149.9	SURCHARGED	
S18.008	S1177	0.000	2.49		262.9	SURCHARGED	
S18.009	S1178	0.000	1.36		272.5	SURCHARGED	
S18.010	S1179	0.000	1.63		275.9	SURCHARGED	
S18.011	S1180	0.000	2.03		279.5	SURCHARGED	
S18.012	S1181	0.000	1.32		279.6	SURCHARGED	
S23.000	S1240	0.000	0.19		3.2	OK	
S23.001	S1241	0.000	0.89		70.5	OK	
S23.002	S1242	0.000	0.76		71.6	OK	
S24.000	S1250	0.000	1.44		22.9	SURCHARGED	
S24.001	S1251	0.000	0.88		29.5	SURCHARGED	
S24.002	S1252	0.000	0.72		25.7	SURCHARGED	
S24.003	S1253	0.000	0.31		38.5	SURCHARGED	
S25.000	S1270	0.000	0.72		25.4	OK	
S25.001	S1271	0.000	0.37		38.7	OK	
S25.002	S1271A	0.000	0.34		63.3	OK	
S26.000	S1290	0.000	1.07		17.3	SURCHARGED	
S25.003	S1272	0.000	0.70		80.9	SURCHARGED	
S25.004	S1273	0.000	0.73		77.7	SURCHARGED	
S25.005	S1274	0.000	0.61		81.9	SURCHARGED	
S25.006	S1275	0.000	0.62		96.8	SURCHARGED	
S27.000	S1300	0.000	0.68		49.6	SURCHARGED	
S25.007	S1277	0.000	1.36		140.8	SURCHARGED	
S25.008	S1278	0.000	0.46		146.5	SURCHARGED	
S25.009	S1279	0.000	0.66		203.1	SURCHARGED	
S28.000	SH310	0.000	0.16		11.6	SURCHARGED	
S29.000	S1321	0.000	0.32		11.5	SURCHARGED	
S28.001	S1311	0.000	0.68		50.9	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Flooded		Half Drain		Pipe Flow (l/s)	Status	Level Exceeded
		Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)			
S28.002	S1312	0.000	1.29		87.6	FLOOD RISK		

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Suite 6, Vita House	M380 + 23094	
Fish Quay	SW Drainage - Planning	
North Shields, NE30 1JA	Catchment A (with Care Home)	
Date 05/08/2024	Designed by BF/DRB / KR	
File M380 + STORM.MDX	Checked by	
Innovyze	Network 2020.1.3	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for M380-CATCHMENT A-SW.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S24.004	S1254	60 Summer	100	+40%	30/60 Summer				21.818
S24.005	S1255	60 Summer	100	+40%	30/60 Summer				21.672
S24.006	S1256	60 Summer	100	+40%	30/60 Summer				21.527
S24.007	S1257	60 Summer	100	+40%	30/60 Summer				21.376
S24.008	S1258	60 Summer	100	+40%	30/60 Summer				21.183
S24.009	S1259	60 Summer	100	+40%	30/60 Summer				21.020
S24.010	S1260	60 Summer	100	+40%	30/60 Summer				20.855
S24.011	S1261	60 Summer	100	+40%	30/60 Summer				20.689
S30.000	S1330	60 Summer	100	+40%					20.472
S30.001	S1331	60 Summer	100	+40%					20.469
S30.002	S1332	60 Summer	100	+40%	100/60 Summer				20.450
S30.003	S1333	60 Summer	100	+40%	100/60 Summer				20.446
S24.012	S1262	60 Summer	100	+40%	100/60 Summer				20.441
S24.013	S1263	60 Summer	100	+40%	100/60 Summer				20.338
S23.003	S1243	60 Summer	100	+40%	100/60 Summer				20.301
S1.021	S1025-Basin A1	600 Winter	100	+40%	30/60 Summer				20.167
S1.022	S1026-Con	600 Winter	100	+40%	30/60 Summer				20.164
S1.023	S1027	240 Summer	100	+40%					19.301
S1.024	S1028	960 Summer	100	+40%					19.221
S1.025	S1029	240 Summer	100	+40%					19.124
S1.026	S1030	960 Summer	100	+40%					19.101
S1.027	S1031	240 Summer	100	+40%					18.977

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S24.004	S1254	1.308	0.000	1.48			377.2	SURCHARGED	
S24.005	S1255	1.231	0.000	2.42			384.7	FLOOD RISK	
S24.006	S1256	1.111	0.000	2.36			392.2	SURCHARGED	
S24.007	S1257	0.989	0.000	2.52			401.0	SURCHARGED	
S24.008	S1258	0.835	0.000	2.41			403.0	SURCHARGED	
S24.009	S1259	0.702	0.000	2.39			408.7	SURCHARGED	
S24.010	S1260	0.568	0.000	2.09			408.4	SURCHARGED	
S24.011	S1261	0.416	0.000	1.83			429.5	SURCHARGED	
S30.000	S1330	-0.043	0.000	0.19			21.4	OK	
S30.001	S1331	-0.016	0.000	0.12			42.4	OK	
S30.002	S1332	0.025	0.000	0.17			44.5	SURCHARGED	
S30.003	S1333	0.051	0.000	0.12			42.4	SURCHARGED	
S24.012	S1262	0.091	0.000	1.43			468.9	SURCHARGED	
S24.013	S1263	0.038	0.000	1.13			469.0	SURCHARGED	
S23.003	S1243	0.030	0.000	2.63			532.4	SURCHARGED	
S1.021	S1025-Basin A1	0.687	0.000	0.62			56.6	SURCHARGED	
S1.022	S1026-Con	0.720	0.000	0.78			55.8	SURCHARGED	
S1.023	S1027	-1.997	0.000	0.00			55.8	OK	
S1.024	S1028	-2.040	0.000	0.00			55.8	OK	
S1.025	S1029	-2.051	0.000	0.00			55.8	OK	
S1.026	S1030	-1.917	0.000	0.00			55.8	OK	
S1.027	S1031	-1.992	0.000	0.00			55.8	OK	

