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Technical Note

Bartons Road, Havant

24-097-RPT 008 Rev A

Response Note to HCC Lead Local Flood Authority

December 2025

Rev	Issue Purpose	Author	Checked	Reviewed	Approved	Date
-	Draft	SAC	GAC			4/11/25
A	PLANNING	SAC	GAC	SAC	GAC	5/11/25

1 Introduction

1.1.1 Charles and Associates Consulting Engineers Ltd (C&A) have prepared this Flood Risk Assessment and Drainage Strategy Addendum (FRAA) on behalf of Stonebond Properties (Guildford) Ltd in relation to a full planning application comprising of 90 residential dwellings with associated landscaping, parking and improved access on land to the west of Petersfield Road (B2149) and south of Bartons Road, Havant. The proposed housing mix consists of 45 affordable units and 45 private dwellings.

1.1.2 The development of the site is subject to an ongoing planning application[1] for which C&A provided a Flood Risk Assessment and Drainage Strategy (FRA)[2].

1.1.3 The application was submitted in August 2025 and subsequently an initial consultation response was provided by Hampshire County Council (HCC), as the Lead Local Flood Authority, dated 27th October 2025. The HCC consultation response is included in **Appendix A** for reference.

1.1.4 This note is intended to provide a response from the applicant to the technical matters/ queries raised by the LLFA in their consultation letter outlined above.

[1] APP/25/00639
[2] Ref: 24-097-002 Rev A Flood Risk Assessment and Drainage Strategy.

2 Overview

2.1.1 In addition to comments from the LLFA there were also comments from other consultees, including HCC as local highway authority. These resulted in a number of amendments to the proposed development layout which in turn required updates to the FRA and Drainage Strategy.

2.1.2 The updated development layout, is included as **Appendix B** to this report.

2.1.3 The impact of these layout changes on the overall drainage strategy are incorporated into the responses to the LLFA's comments below.

2.1.4 Updated foul and surface water strategy drawings together with revised calculations are in **Appendix C.**

3 Responses to LLFA Comments and Updated Strategy

3.1 Surface Water Flood Risk

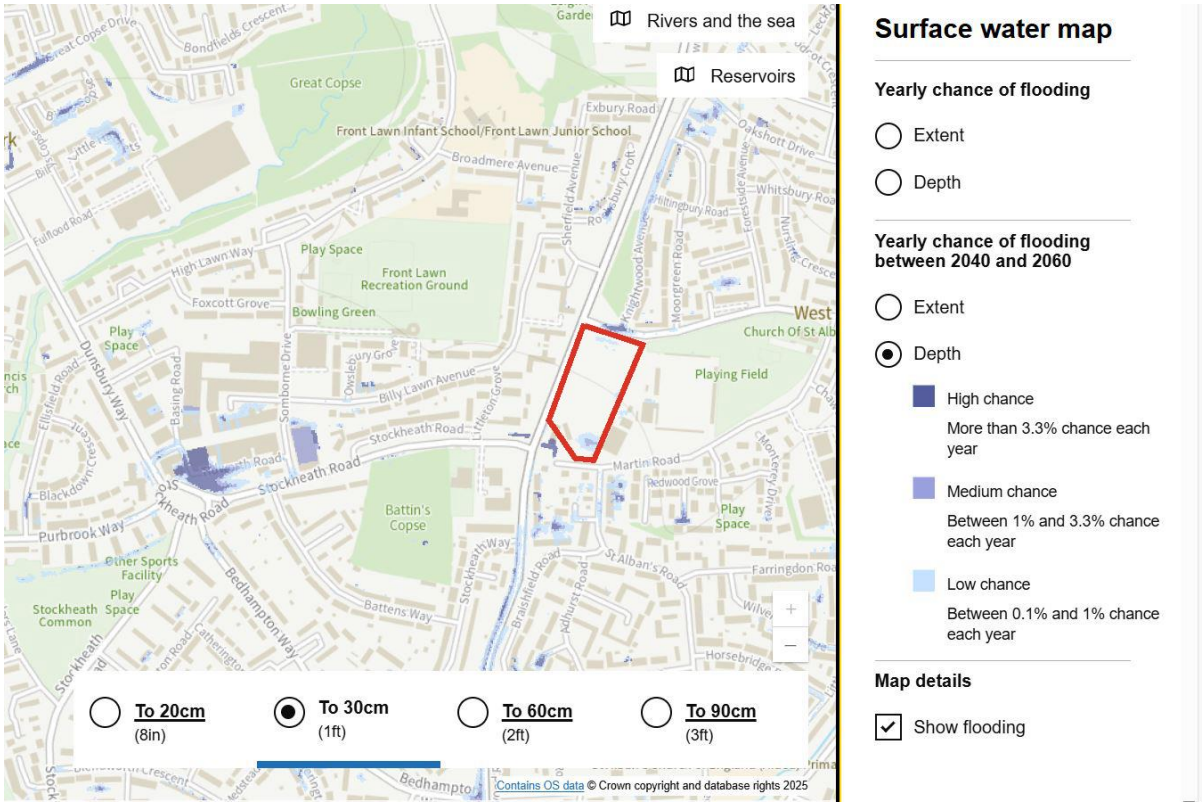
3.1.1 The FRA identifies a surface water flood flow path running through the site, along the western boundary, together with some separate localised areas of surface water flooding within the site. The LLFA expressed concern about the accuracy of the flood mapping used to determine this and suggest that flood modelling may be required to properly assess the impact of this flood risk on the development. The EA's "Flood Map for Planning" website was used to determine the route and extent of this flow path and the other surface water flood risk areas.

3.1.2 This, as the website suggests, is deemed sufficient to assess flood risk at planning stages of developments and therefore it is considered that the FRA adequately assesses the flood risk posed by the existing surface water flow path. This path will be maintained free from any built development and there will be no drainage attenuation features located within this flow path.

3.1.3 The LLFA also suggest that there may be a loss of flood storage on the site due to construction of the development. As noted above the surface water flow path which currently crosses the site will continue to do so unhindered and at the same ground levels so the construction of the development will not impact this flow route.

3.1.4 The above flood mapping also identifies some areas at potential risk from surface water flooding during extreme rainfall events. These are remote from the flow path and are the result of localised shallow surface water ponding within low lying areas on the site. Drawing 24-097 011 in **Appendix C** interpolated from the EA's flood map drawings shows the location of the surface water flow path in relation to the areas of on site ponding.

3.1.5 Figure 5-4 in the original FRA, see below, taken from the EA's published flood mapping, shows that the yearly chance of flooding from this localised ponding up-to 2060 is low, with only a small area in the south east corner of the site at risk of flooding to a depth of 30cm.



3.1.6 These areas were identified in the FRA and mitigation included as part of the sustainable drainage proposals for the development will remove these localised flood areas. This is consistent with a recent appeal decision in Faversham in Kent[3], where the planning inspector considered that such areas of surface water ponding could be "comfortably accommodated" as part of the development's detailed design process. The FRA notes that the implementation of the sustainable drainage strategy proposed for the development will remove these areas of ponding without detriment.

3.2 Infiltration

3.2.1 The LLFA suggest that there is some limited potential for surface water run of to infiltrate to ground on parts of the development. Although the Soakage Investigation undertaken by BRD stated that infiltration in some areas of the site may be "technically feasible" it went on to say that subsequent groundwater monitoring indicated that groundwater levels could be as shallow as 1.0m below ground which would not provide a sufficiently thick unsaturated zone between the base of any infiltration device and the groundwater level to satisfy the Environment Agency.

[3]Ref: APP/V2255/W/24/3350524

3.2.2 Furthermore the site sits within a Source Protection Zone 1 into which the EA would not permit infiltration given the previous site uses and Portsmouth Water Company have in their planning consultation response noted their objection to use of soakaways on this site. There is therefore no opportunity to use any infiltration on the development.

3.3 National Standards for Sustainable Drainage Systems

3.3.1 The LLFA suggest that in determining run off contributions from the development the FRA is not compliant with current National Standards for Sustainable Drainage Systems as it only includes impermeable areas and ignores permeable run off.

3.3.2 The drainage strategy has been developed in line with the requirement to account for permeable areas (para 3.29 and 3.32 of the National Standards). This has been done by calculating the allowable design peak discharge rate, based only on the proportion of the site that will become impermeable, see calculations in **Appendix C.**

3.3.3 Areas that will remain permeable post-development have been excluded from calculations of greenfield discharge rates to ensure they are treated consistently in the pre- and post-development scenarios. In practice exceedance flow from gardens will first use any spare attenuation capacity in the installed drainage system before it contributes to existing overland flow routes and the system will therefore provide a level of betterment compared to the existing situation.

3.3.4 The design is therefore considered compliant with current standards in respect with how it deals with these respective areas.

3.4 Access Road Drainage

3.4.1 The LLFA request clarification as to how the access road will be drained and how some of the permeable paving connects to the network.

3.4.2 The drainage proposals on the drawings within the submitted FRA only included the high level strategy and didn't show details of road drainage designs including gully locations etc. The text of the report however did confirm how the roads would drain, e.g. by conventional trapped road gullies.

3.4.3 The revised surface water drainage strategy drawing 24-097 003 Rev D in **Appendix C** includes indicative road gully locations and connections from permeable paved areas. The exact locations of these will be confirmed as part of the final detailed design.

3.5 Off Site Surface Water Connection

3.5.1 The LLFA noted that written approval of the surface water connection to the public sewer and outfall discharge rate is required for them to be able to recommend approval.

3.5.2 In response to a pre-application enquiry Southern Water indicated that there was inadequate capacity within the local sewerage network to accommodate flows from the development. They noted that SuDS should be included in any drainage strategy in accordance with part H3 of the Building Regulations.

3.5.3 In their consultation response to the planning application Southern Water do not object to proposals within the FRA to connect surface water flows from the site to the off site surface water sewer, subject to introduction of a suitable sustainable drainage system.

3.5.4 The FRA and Drainage Strategy as submitted with the Planning Application, and updated as per this Technical Note includes a fully sustainable system which reduces run off to greenfield rates which reduces the total surface water run off from the site from an existing estimated 520l/s in a 1 in 100 year storm event to 6.0l/s providing significant betterment.

3.6 Surface Water Maintenance

3.6.1 A proposed schedule of maintenance requirements is included in the FRA, the LLFA however suggest further unspecified details are still required. They propose that this is covered by a planning condition which is considered acceptable.

3.7 Foul Drainage

3.7.1 A fully separate foul drainage network will be constructed on site to collect foul drainage from the Development. This will discharge by gravity to an existing 300mm diameter public foul which flows just inside the southern boundary of the site, see drawing 24-097-004 Rev C in **Appendix C**.

3.7.2 In their consultation response to the planning application dated 18th November 2025, see **Appendix D**, Southern Water confirmed that there is currently capacity within their network for 51 housing units. They note however that under the Water Industry Act 1991 a sewer connection cannot be refused on the grounds of capacity restraints.

3.7.3 They also confirm in their response, and in subsequent discussions with the Developer that they will work collaboratively with the Developer to ensure any necessary capacity improvements are delivered in a timely manner to align with projected build-out rates.

Appendix A HCC LLFA Correspondence

Hampshire County Council

Universal Services
The Castle
Winchester, Hampshire SO23 8UD

Tel: 0300 555 1375
Fax 01962 847055
www.hants.gov.uk

Enquiries to	Scott Glover	*My reference*	SWM/2025/0619
Direct Line		*Your reference*	APP/25/00639
Date	27 October 2025	*Email*	swm.consultee@hants.gov.uk

Dear Sir/Madam,

Erection of 90 dwellings with associated landscaping, parking and improved access. at Proposed Development site (former Electricity Board site), Bartons Road, Havant.(Application No. APP/25/00639

Hampshire County Council as Lead Local Flood Authority has provided comments in relation to the above application in our role as statutory consultee on surface water drainage for major developments.

This response does not reflect the position of Hampshire County Council as the Highway Authority. If there is a potential for the drainage features to be offered for adoption, this will need to be discussed separately with Highways development planning as they might not be considered acceptable by the Highway Authority.

In order to assist applicants in providing the correct information to their Local Planning Authority for planning permission, Hampshire County Council has set out the information it requires to provide a substantive response at https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/planning

The County Council has reviewed the following documents relating to the above application:

- Flood Risk Assessment and Drainage Strategy incl. appendix A-I 24-097-002 Rev A Charles and Associates 30.07.2025

Following review of the above document HCC as LLFA has the following comments:

ONEOFF

The above report describes areas of Surface Water Flood Risk within the site as identified in the EA Surface Water Flood Risk maps. A clear surface water flood flow route and areas of potential flood water storage are identified. The above report assessed this risk as very low. The LLFA do not agree with this assessment. If flood risk areas (from any source) are identified, it must be demonstrated that the proposals including drainage attenuation features can be delivered without encroaching on these areas. If the flood risk areas are deemed inaccurate, modelling will be required before changes can be accepted. If development is proposed in these areas without modelling, compensation areas will be required and details on how the topography will be altered to ensure new development is not at risk. Modelling may also be required to support this. Loss of flood storage volume and obstruction of flood flow routes should be avoided. A plan overlaying flood risk mapping with the proposed development plans should be produced to aid assessment of risk.

It is encouraging to see the above report 1.2.1 refer to the newly published National Standards for SuDS. HCC LLFA do not currently require proposed developments to fully comply with the new standards but we do encourage adoption of these standards. Following review of the submitted information we consider that the proposed drainage strategy does not comply with the standards.

Site infiltration testing appears to indicate that there may be some limited potential for infiltration to ground. Best practice guidance states that opportunities for infiltration should be maximised in favour of lower priority discharge destinations. There may be an opportunity for partial infiltration to reduce the surface water discharge to the public sewer.

The site is within the Havant East catchment priority area as defined in the Hampshire County Council Lavant Catchment Management Plan.

We advise that the submitted drainage strategy has not been prepared in accordance with best practice. The proposed drainage design only considers the runoff contribution from impermeable areas and ignores runoff from permeable areas that would be intercepted by the proposed drainage network. The LLFA recommend a catchment based approach to drainage design taking into consideration contribution of runoff from both permeable and impermeable areas. Recently published National Standards for Sustainable Drainage Systems (SuDS): standard 3 (3.32) also supports this approach.

It is not clear how the proposed access road is to be drained. It is not clear how some of the permeable paved parking areas are connected to the network.

We understand an upgrade may be required to the existing sewer but given the lack of capacity in the sewer network the effect of surcharge outfall should be considered. The available storage in the network appears to be well

designed but particularly at the downstream end there is no available capacity during the 1:100 design storm to provide a buffer if the outfall is surcharged.

Approval for proposed surface water connection and discharge rate is required. The LLFA require written confirmation of approval of the proposed connection and surface water discharge into the public sewer before we are able to provide a recommendation to the LPA. Approval from Southern Water is required to demonstrate the proposed outfall is secured and therefore feasibility of the overall drainage strategy. Southern Water correspondence states that there is currently insufficient capacity in the sewer network to accommodate the proposed surface water discharge of 6.1l/s. We note the proposed discharge rate has subsequently been increased to greenfield rate of 7.2l/s.

Further detail will be required regarding the maintenance of the surface water drainage system. This requirement can be covered by condition if the application is granted.

We require this further information before we can make a decision on whether to recommend to the Local Planning Authority that planning permission is granted.

As a statutory consultee, the County Council has a duty to respond to consultations within **21 days**. The 21 day period will not begin until we have received sufficient information to enable us to provide a meaningful response.

Please ensure all data is sent to us via the relevant Local Planning Authority.

If you require additional guidance on providing the correct information, we recommend you use our **Surface Water Management Pre-application service** which will enable discussions with the reviewing engineer and scope out works that would address the points raised. For full details, please visit: https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/planning and click on pre-application advice request form.

This response has been provided using the best knowledge and information submitted by the applicant as part of the planning application at the time of responding and is reliant on the accuracy of that information.

Yours faithfully,

[redacted]

Flood and Water Management Team
Hampshire County Council,

The Castle, Winchester, Hampshire SO23 8UD
Web:
https://www.hants.gov.uk/landplanningandenvironment/environment/flooding

General guidance for the application

It is important to ensure that the long-term maintenance and responsibility for Sustainable Drainage Systems is agreed between the Local Planning Authority and the applicant before planning permission is granted. This should involve discussions with those adopting and/or maintaining the proposed systems, which could include the Highway Authority, Planning Authority, Parish Councils, Water Companies and private management companies.

For SuDS systems to be adopted by Hampshire Highways it is recommended that you visit the website at:
https://www.hants.gov.uk/transport/developers/constructionstandards for guidance on which drainage features would be suitable for adoption.

Where the proposals are connecting to an existing drainage system it is likely that the authorities responsible for maintaining those systems will have their own design requirements. These requirements will need to be reviewed and agreed as part of any surface water drainage scheme.

Works in relation to ordinary watercourses

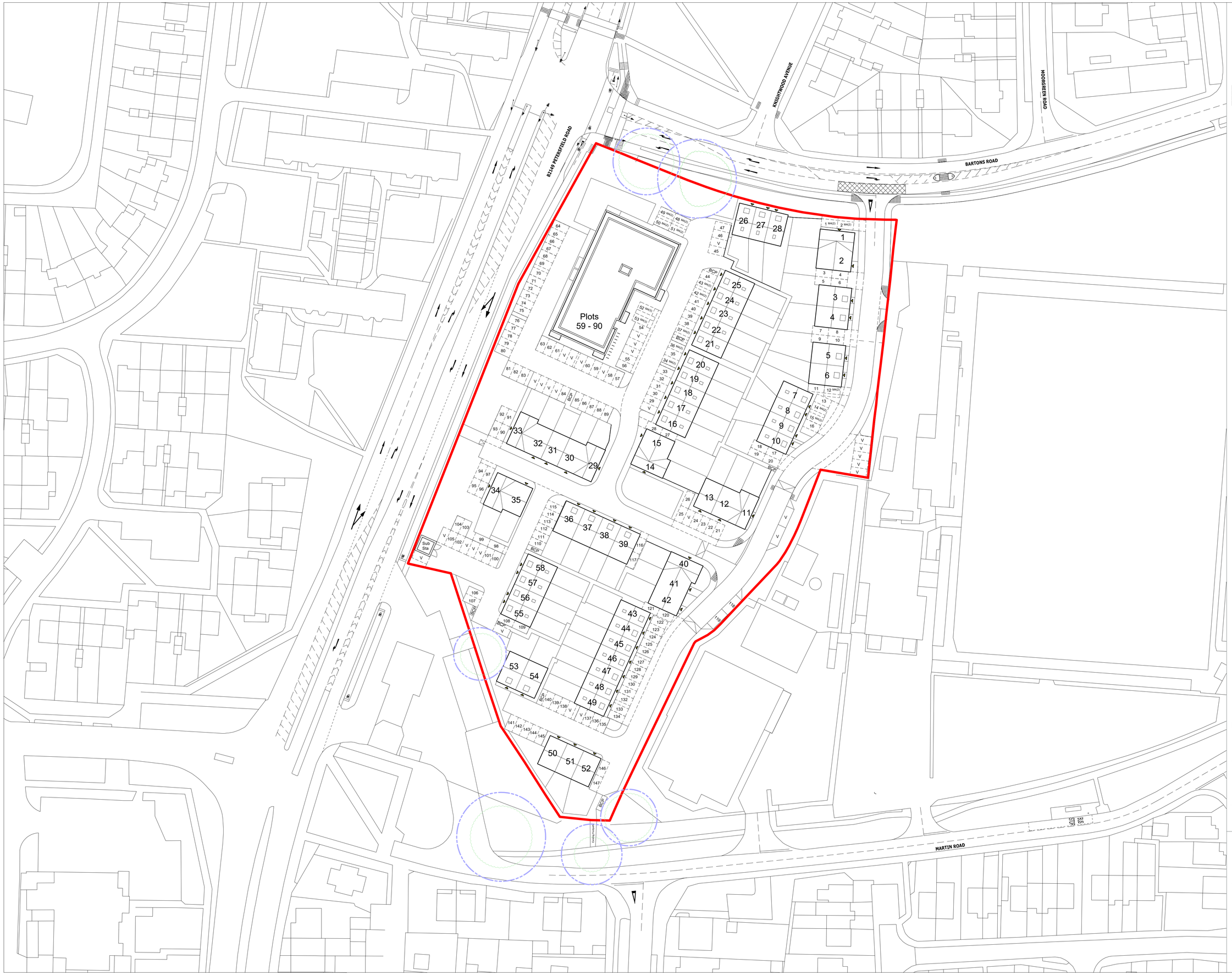
PLEASE NOTE: If the proposals include works to an ordinary watercourse, under the Land Drainage Act 1991, as amended by the Flood and Water Management Act 2010, prior consent from the Lead Local Flood Authority is required. ***This consent is required as a separate permission to planning.***

Information on ordinary watercourse consenting can be found at the following link
https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/changewatercourse

It is strongly recommended that this information is reviewed before Land Drainage consent application is made.

For guidance on providing the correct information, we recommend you use our ***Ordinary Watercourse Consents Pre-application service*** *and help avoid delays occurring at the formal application stage. A Pre-application service for Ordinary Watercourse Consents is available, allowing consents to go through in a smoother, often more timely manner. For full information please visit:*
https://www.hants.gov.uk/landplanningandenvironment/environment/flooding/changewatercourse

Appendix B Development Layout



NOTES
ERRORS AND OMISSIONS TO BE REPORTED TO THE ARCHITECT.
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REVISIONS

A	Issue for Planning	31/07/2025
B	Issue for Planning	01/08/2025
C	Issue for Planning	05/08/2025
D	Issue for Planning	04/12/2025

Key

Application Site Boundary

N

0m 10m 20m 30m 40m

SCALE 1:500 @ A1

EDGINGTONS
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Stonebond Properties (Guildford) Limited

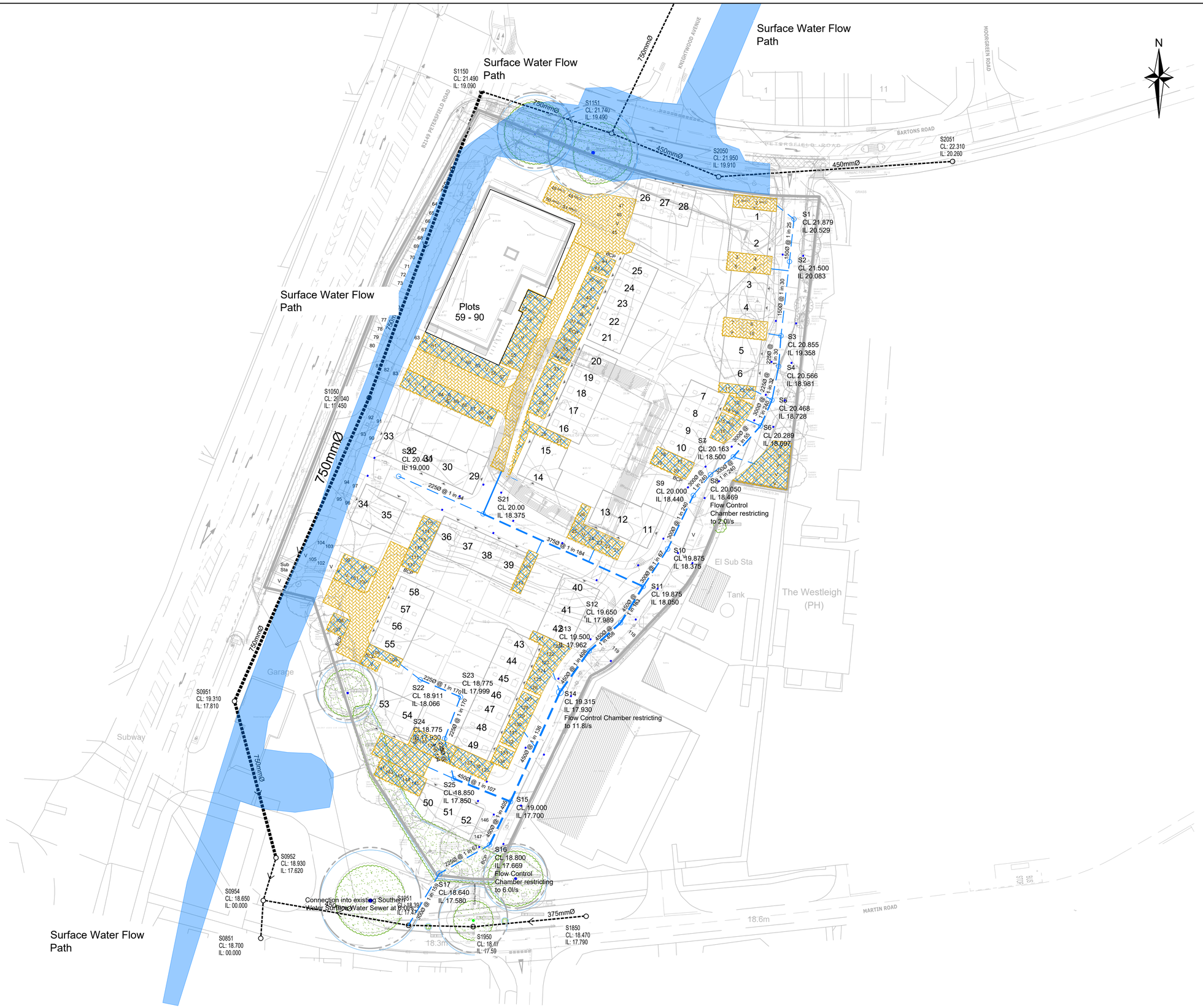
Former SSE Offices

Bartons Road, Havant

Proposed Block Plan

PROJECT STATUS	Planning		
SCALE (A1)	1 : 500		
DATE	31/07/2025	DRAWN	AG
JOB No.	6087	DWG No.	1110 REV. D

Appendix C Updated Drainage Drawings and Calculations



NOTES

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2. This drawing is in metres unless stated otherwise.
3. Topographical Survey has been provided by others. C&A accept no liability for inaccuracies.
4. C&A Consulting Engineers Ltd cannot guarantee the authenticity or reliability of any data and/or records provided by third parties.
5. Surface water will be discharged into the Existing Thames Water Surface Water Sewer, capacity needs to be confirmed by Thames Water. Discharge will be at 6.0l/s
6. The tanks underneath the road by S25 are specialsed geocelluar crates with a low cover level above the tanks to provide extra storage to the network when it backs up. A level of permeable paving ontop with sets of 150mm crates below providing the extra storage needed.
7. Manholes S12, S13, S14, S15, S16 and S25 will require concrete protection.

Key

- Proposed Surface Water Network
- Proposed Permeable Paving (0.7m to 0.95m deep)
- Proposed Geocelluar Crates underneath Permeable Paving
- Proposed Road Gullies
- Existing Southern Water Surface Water Sewer
- Surface Water Flow Path

Rev	Amendments	Dm	Chk	App	Date
E	Comments from Client	MT	SC	GC	Dec 25
D	Updated Site Layout	MM	SC	GC	Dec 25
C	Updated Site Layout	MM	SC	GC	July 25
B	Updated Site Layout	MT	SC	GC	July 25
A	Updated Site Layout	MT	GC	GC	April 25

Charles & Associates

Issued by ☒ ☐

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www.c-a-uk.com

Job Title

Bartons Road,
Havant

Drawing Title

Surface Water Drainage Strategy

Client

Stonebond Properties
(Guildford) Ltd

Scale	Date	Designed
1:500 @ A1	April 2025	MT
Drawn	**Checked**	**Approved**
MT	GAC	GAC
Job No	**Drawing No**	**Rev**
24-097	24-097-003	E

NOTES

Key

- House Catchment
- Parking Catchment
- Road Catchment

Total Catchment

House Catchment (+urban creep) = 3684m²

Parking Catchment = 2600m²

Road Catchment = 3786m²

Rev	Amendments	Drn	Chk	App	Date
C	Comments from Client	MT	SC	GC	Dec 25
B	Updated Site Layout	MT	SC	GC	Dec 25
A	Updated Site Layout	MM	SC	GC	July 25

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Job Title

Bartons Road,
Havant

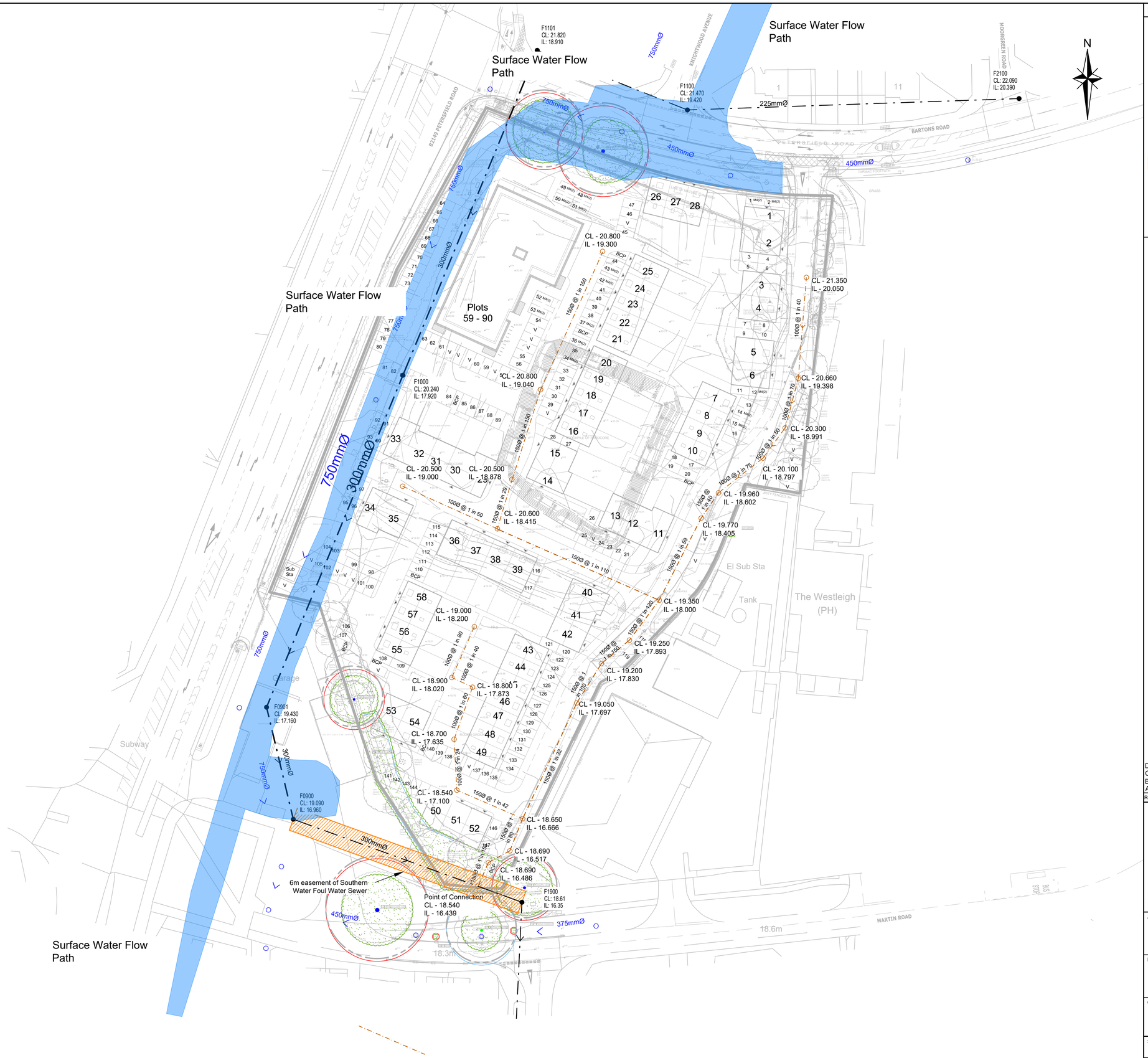
Drawing Title

Catchment Plan

Client

Stonebond Properties
(Guildford) Ltd

Scale	Date	Designed
1:500 @ A1	July 2025	MT
Drawn	**Checked**	**Approved**
MT	SAC	GAC
Job No	**Drawing No**	**Rev**
24-097	24-097-013	C



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3. Topographical Survey has been provided by others. C&A accept no liability for inaccuracies.
4. C&A Consulting Engineers Ltd cannot guarantee the authenticity or reliability of any data and/or records provided by third parties.
5. Foul water will be discharged into the Existing Thames Water Foul Water Sewer, via a new manhole. Gravity connection into Southern Water Foul Water Sewer, assumed connection level of 16.439

Key

- Proposed Foul Water Network
- 6m Easement on Southern Water Foul Sewer
- Existing Southern Water Foul Water Sewer
- Surface Water Flow Path

Rev	Amendments	Drn	Chk	App	Date
D	Comments from Client	MT	SC	GC	Dec 25
C	New Site Layout	MT	SC	GC	Dec 25
B	New Site Layout	MM	SC	GC	July 25
A	New Site Layout	MT	SC	GC	July 25

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Job Title

Bartons Road, Havant

Drawing Title

Foul Water Drainage Strategy

Client

Stonebond Properties (Guildford) Ltd

Scale	Date	Designed
1:500 @ A1	April 2025	MT
Drawn	**Checked**	**Approved**
MT	GAC	GAC
Job No	**Drawing No**	**Rev**
24-097	24-097-004	D

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Key

- Proposed Route of Foul Water Sewer
- 6m Foul Water Easement
- Existing Southern Water Foul Water Sewer
- Proposed Route of Surface Water Sewer
- Proposed Permeable Paving
- Existing Southern Water Surface Water Sewer
- Localised Surface Water Flooding 1 in 100 years
- Surface Water Flow Path

Rev	Amendments	Drn	Chk	App	Date

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Bradbourne Lane
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01732 448120

Job Title

Bartons Road,
Havant

Drawing Title

Constraints Plan

Client

Stonebond

Scale	Date	Designed
1:500 @ A1	July 2025	MT
Drawn	Checked	Approved
MT	SAC	SC
Job No	Drawing No	Rev
24-097	24-097-011	-

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	10	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	1.000
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	250.0		

Nodes

Name	Area (ha)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
S1	0.015	21.879	Manhole	Adoptable	1200	472223.812	108081.105	1.350	20.529
S2	0.016	21.500	Manhole	Adoptable	1200	472222.640	108070.014	1.417	20.083
S3	0.010	20.855	Manhole	Adoptable	1200	472220.426	108050.625	1.497	19.358
S4	0.009	20.566	Manhole	Adoptable	1200	472219.283	108039.381	1.585	18.981
S5	0.007	20.468	Manhole	Adoptable	1200	472218.060	108033.803	1.740	18.728
S6	0.009	20.289	Manhole	Adoptable	1200	472215.085	108027.081	1.646	18.643
S7	0.008	20.163	Manhole	Adoptable	1200	472207.953	108018.991	1.663	18.500
S8	0.006	20.050	Manhole	Adoptable	1500	472202.045	108014.380	1.581	18.469
S9	0.014	20.000	Manhole	Adoptable	1200	472197.516	108008.919	1.560	18.440
S10	0.014	19.875	Manhole	Adoptable	1200	472190.838	107994.943	1.500	18.375
S20	0.073	20.450	Manhole	Adoptable	1200	472120.487	108013.928	1.450	19.000
S21	0.039	20.700	Manhole	Adoptable	1500	472142.620	108004.148	2.325	18.375
S11	0.016	19.750	Manhole	Adoptable	1500	472184.411	107985.139	1.700	18.050
S12	0.032	19.650	Manhole	Adoptable	1200	472178.608	107975.705	1.661	17.989
S13	0.012	19.500	Manhole	Adoptable	1200	472170.311	107968.342	1.538	17.962
S14	0.028	19.315	Manhole	Adoptable	1800	472162.833	107957.522	1.385	17.930
S22	0.000	18.911	Manhole	Adoptable	1200	472126.154	107960.763	0.845	18.066
S23	0.000	18.775	Manhole	Adoptable	1200	472136.657	107956.275	0.776	17.999
S24	0.000	18.775	Manhole	Adoptable	1200	472132.572	107945.465	0.845	17.930
S25	0.018	18.850	Manhole	Adoptable	1800	472134.859	107934.948	1.000	17.850
S15	0.009	19.000	Manhole	Adoptable	1500	472149.907	107928.922	1.300	17.700
S16	0.007	18.800	Manhole	Adoptable	1800	472144.278	107917.570	1.131	17.669
Driveway 1	0.016	21.700	Junction			472217.114	108085.272	0.700	21.000
S17	0.000	18.640	Manhole	Adoptable	1500	472131.101	107910.096	1.060	17.580
S18	0.000	18.440	Manhole	Adoptable	1500	472125.804	107896.807	0.950	17.490
Driveway 2	0.018	21.300	Junction			472214.826	108071.645	0.700	20.600
Driveway 3	0.018	20.600	Junction			472213.942	108052.296	0.700	19.900
Driveway 4	0.003	20.350	Junction			472214.598	108035.410	1.100	19.250
Driveway 5	0.021	20.200	Junction			472209.752	108029.753	1.500	18.700
Driveway 6	0.018	20.000	Junction			472213.743	108017.951	1.100	18.900
Driveway 7	0.010	19.950	Junction			472198.194	108016.515	1.100	18.850
Driveway 9	0.056	19.350	Junction			472157.521	107961.913	1.350	18.000
Private Road and Parking	0.275	20.500	Junction			472147.882	108015.982	1.500	19.000
Driveway 10	0.052	20.200	Junction			472142.346	107993.647	1.100	19.100
Driveway and Road 11	0.098	19.200	Junction			472123.856	107966.146	1.100	18.100
Driveway 12	0.042	18.750	Junction			472126.893	107937.073	0.800	17.950

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Links

US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)
S1	S2	11.154	20.529	20.083	0.446	25.0	150	Circular	5.17
S2	S3	19.515	20.083	19.433	0.650	30.0	150	Circular	5.34
S3	S4	11.301	19.358	18.981	0.377	30.0	225	Circular	5.42
S4	S5	5.710	18.981	18.803	0.178	32.0	225	Circular	5.46
S5	S6	7.351	18.728	18.697	0.031	240.0	300	Circular	5.58
S6	S7	10.785	18.697	18.500	0.197	54.7	300	Circular	5.67
S7	S8	7.530	18.500	18.469	0.031	240.0	300	Circular	5.79
S8	S9	7.066	18.469	18.440	0.029	240.0	300	Circular	5.91
S9	S10	15.537	18.440	18.375	0.065	240.0	300	Circular	6.16
S10	S11	11.674	18.375	18.200	0.175	66.7	300	Circular	6.26
S20	S21	24.169	19.000	18.550	0.450	53.7	225	Circular	5.23
S21	S11	45.938	18.375	18.125	0.250	183.8	375	Circular	5.80
S11	S12	11.163	18.050	17.989	0.061	183.0	450	Circular	6.39
S12	S13	11.024	17.989	17.962	0.027	408.0	450	Circular	6.57
S13	S14	13.222	17.962	17.930	0.032	408.0	450	Circular	6.79
S14	S15	31.376	17.930	17.700	0.230	136.4	450	Circular	7.09
S22	S23	11.422	18.066	17.999	0.067	170.0	225	Circular	5.29
S23	S24	11.669	17.999	17.930	0.069	170.0	225	Circular	5.48
S24	S25	10.678	17.930	17.850	0.080	133.5	225	Circular	5.64
S25	S15	16.051	17.850	17.700	0.150	107.0	450	Circular	5.78
S15	S16	12.553	17.700	17.669	0.031	404.9	450	Circular	7.30
S16	S17	15.150	17.669	17.580	0.089	170.2	225	Circular	7.56
Driveway 1	S1	7.888	21.000	20.579	0.421	18.7	100	Circular	5.07
S17	S18	14.306	17.580	17.490	0.090	159.0	225	Circular	7.79
Driveway 2	S2	7.982	20.600	20.417	0.183	43.6	100	Circular	5.11

Name	US Node	DS Node
1.000	S1	S2
1.001	S2	S3
1.002	S3	S4
1.003	S4	S5
1.004	S5	S6
1.005	S6	S7
1.006	S7	S8
1.007	S8	S9
1.008	S9	S10
1.009	S10	S11
2.000	S20	S21
2.001	S21	S11
1.010	S11	S12
1.011	S12	S13
1.012	S13	S14
1.013	S14	S15
3.000	S22	S23
3.001	S23	S24
3.002	S24	S25
3.003	S25	S15
1.014	S15	S16
1.016	S16	S17
1.000_1	Driveway 1	S1
1.017	S17	S18
2.000_1	Driveway 2	S2

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Links

US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)
Driveway 3	S3	6.696	19.900	19.717	0.183	36.6	100	Circular	5.09
Driveway 4	S5	3.817	19.250	18.803	0.447	8.5	100	Circular	5.02
Driveway 5	S6	5.965	18.700	18.643	0.057	104.7	150	Circular	5.10
Driveway 6	S7	5.883	18.900	18.750	0.150	39.2	100	Circular	5.08
Driveway 7	S8	4.403	18.850	18.567	0.283	15.6	150	Circular	5.03
Driveway 9	S14	6.892	18.000	17.950	0.050	137.8	225	Circular	5.10
Private Road and Parking	S21	12.951	19.000	18.525	0.475	27.3	300	Circular	5.07
Driveway 10	S21	10.505	19.100	18.700	0.400	26.3	150	Circular	5.09
Driveway and Road 11	S22	5.853	18.100	18.066	0.034	170.0	225	Circular	5.10
Driveway 12	S25	8.245	17.950	17.850	0.100	82.4	150	Circular	5.12

Name	US Node	DS Node
3.000_1	Driveway 3	S3
4.000	Driveway 4	S5
5.000	Driveway 5	S6
6.000	Driveway 6	S7
7.000	Driveway 7	S8
11.000	Driveway 9	S14
9.000	Private Road and Parking	S21
10.000	Driveway 10	S21
12.000	Driveway and Road 11	S22
13.000	Driveway 12	S25

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	10080	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	40	0	0
100	45	0	0

Node S16 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.016	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0114-6000-1100-6000
Invert Level (m)	17.669	Min Outlet Diameter (m)	0.150
Design Depth (m)	1.100	Min Node Diameter (mm)	1200
Design Flow (l/s)	6.0		

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Node S8 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.007	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0061-2000-1500-2000
Invert Level (m)	18.469	Min Outlet Diameter (m)	0.075
Design Depth (m)	1.500	Min Node Diameter (mm)	1200
Design Flow (l/s)	2.0		

Node Private Road and Parking Online Orifice Control

Flap Valve	x	Invert Level (m)	19.000	Diameter (m)	0.028
Downstream Link	9.000	Design Depth (m)	1.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	2.0		

Node Driveway and Road 11 Online Orifice Control

Flap Valve	x	Invert Level (m)	18.100	Diameter (m)	0.029
Downstream Link	12.000	Design Depth (m)	0.700	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.5		

Node S14 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.013	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0152-1180-1350-1180
Invert Level (m)	17.930	Min Outlet Diameter (m)	0.225
Design Depth (m)	1.350	Min Node Diameter (mm)	1500
Design Flow (l/s)	11.8		

Node Driveway 10 Online Orifice Control

Flap Valve	x	Invert Level (m)	19.100	Diameter (m)	0.030
Downstream Link	10.000	Design Depth (m)	1.100	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	2.0		

Node Driveway 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	21.000	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	4.000	Inf Depth (m)	
Porosity	0.30	Length (m)	9.500		

Node Driveway 2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	20.600	Slope (1:X)	50.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	8.000	Inf Depth (m)	
Porosity	0.30	Length (m)	6.750		

Node Driveway 3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	19.900	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	8.000	Inf Depth (m)	
Porosity	0.30	Length (m)	6.750		

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Node Driveway 4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	19.250	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	3.000	Inf Depth (m)	
Porosity	0.30	Length (m)	9.000		

Node Driveway 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	19.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	27.0	0.0	0.400	27.0	0.0	0.401	0.0	0.0	1.100	0.0	0.0

Node Driveway 5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	18.700	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	7.100		

Node Driveway 5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	18.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	344

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	71.0	0.0	0.800	71.0	0.0	0.801	0.0	0.0	1.500	0.0	0.0

Node Driveway 6 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	18.900	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	18.200	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node Driveway 6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	18.900
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	504

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	182.0	0.0	0.400	182.0	0.0	0.401	0.0	0.0	1.100	0.0	0.0

Node Driveway 7 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	18.850	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

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Node Driveway 7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	18.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	592

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	50.0	0.0	0.400	50.0	0.0	0.401	0.0	0.0	1.100	0.0	0.0

Node Driveway 9 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	18.400	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	90	Depth (m)	
Safety Factor	2.0	Width (m)	36.400	Inf Depth (m)	
Porosity	0.30	Length (m)	5.000		

Node Driveway 9 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	18.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	608

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	182.0	0.0	0.400	182.0	0.0	0.401	0.0	0.0	1.350	0.0	0.0

Node Private Road and Parking Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	19.000	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	40.000	Inf Depth (m)	
Porosity	0.30	Length (m)	30.000		

Node Private Road and Parking Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	19.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	1620

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	400.0	0.0	0.401	400.0	0.0	0.801	0.0	0.0	1.500	0.0	0.0

Node Driveway 10 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	19.100	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	20.000	Inf Depth (m)	
Porosity	0.30	Length (m)	5.600		

Node Driveway 10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	19.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	172

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	112.0	0.0	0.400	112.0	0.0	0.401	0.0	0.0	1.100	0.0	0.0

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Node Driveway and Road 11 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	18.100	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	525	Depth (m)	
Safety Factor	2.0	Width (m)	31.500	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node Driveway and Road 11 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	18.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	990

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	150.0	0.0	0.400	150.0	0.0	0.401	0.0	0.0	1.100	0.0	0.0

Node Driveway 12 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	17.950	Slope (1:X)	250.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	872	Depth (m)	
Safety Factor	2.0	Width (m)	25.500	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node Driveway 12 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	17.950
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	576

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	285.0	0.0	0.300	285.0	0.0	0.301	0.0	0.0	0.800	0.0	0.0

Other (defaults)

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

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Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	11	20.569	0.040	5.6	0.0454	0.0000	OK
15 minute summer	S2	11	20.148	0.065	11.8	0.0732	0.0000	OK
15 minute summer	S3	11	19.423	0.065	16.3	0.0732	0.0000	OK
15 minute summer	S4	11	19.056	0.075	17.9	0.0853	0.0000	OK
240 minute summer	S5	196	18.898	0.170	6.5	0.1928	0.0000	OK
240 minute summer	S6	196	18.898	0.255	6.9	0.2889	0.0000	OK
240 minute summer	S7	196	18.898	0.398	2.8	0.4507	0.0000	SURCHARGED
240 minute summer	S8	196	18.898	0.429	2.8	0.7588	0.0000	SURCHARGED
15 minute summer	S9	10	18.490	0.050	4.2	0.0565	0.0000	OK
15 minute summer	S10	10	18.422	0.047	6.7	0.0527	0.0000	OK
15 minute summer	S20	10	19.068	0.068	13.7	0.0774	0.0000	OK
15 minute summer	S21	11	18.471	0.096	21.0	0.1702	0.0000	OK
15 minute summer	S11	11	18.182	0.132	30.4	0.2327	0.0000	OK
15 minute summer	S12	11	18.173	0.184	35.9	0.2076	0.0000	OK
15 minute summer	S13	11	18.158	0.196	37.7	0.2220	0.0000	OK
240 minute summer	S14	152	18.149	0.219	15.2	0.5583	0.0000	OK
720 minute summer	S22	510	18.084	0.018	0.5	0.0202	0.0000	OK
360 minute summer	S23	288	18.019	0.020	0.5	0.0230	0.0000	OK
360 minute summer	S24	288	18.019	0.089	0.5	0.1009	0.0000	OK
360 minute summer	S25	288	18.019	0.169	3.8	0.4307	0.0000	OK
360 minute summer	S15	288	18.019	0.319	8.6	0.5641	0.0000	OK
360 minute summer	S16	288	18.019	0.350	6.4	0.8911	0.0000	SURCHARGED
15 minute summer	Driveway 1	11	21.031	0.031	3.0	0.1495	0.0000	OK
360 minute summer	S17	288	17.640	0.060	6.0	0.1059	0.0000	OK
360 minute summer	S18	288	17.548	0.058	6.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	5.6	1.019	0.156	
15 minute summer	S2	1.001	S3	11.8	1.661	0.362	
15 minute summer	S3	1.002	S4	16.3	1.546	0.171	
15 minute summer	S4	1.003	S5	17.9	1.661	0.194	
240 minute summer	S5	1.004	S6	6.4	0.485	0.089	
240 minute summer	S6	1.005	S7	2.6	0.362	0.017	
240 minute summer	S7	1.006	S8	2.6	0.293	0.037	
240 minute summer	S8	1.007	S9	1.6	0.395	0.022	
15 minute summer	S9	1.008	S10	4.1	0.563	0.058	
15 minute summer	S10	1.009	S11	6.6	0.986	0.049	
15 minute summer	S20	2.000	S21	13.5	1.358	0.190	
15 minute summer	S21	2.001	S11	20.8	0.948	0.141	
15 minute summer	S11	1.010	S12	30.2	0.627	0.127	
15 minute summer	S12	1.011	S13	35.6	0.560	0.224	
15 minute summer	S13	1.012	S14	37.3	0.531	0.234	
240 minute summer	S14	1.013	S15	8.7	0.358	0.032	
720 minute summer	S22	3.000	S23	0.5	0.343	0.012	
360 minute summer	S23	3.001	S24	0.5	0.338	0.012	
360 minute summer	S24	3.002	S25	0.7	0.348	0.015	
360 minute summer	S25	3.003	S15	3.4	0.147	0.011	
360 minute summer	S15	1.014	S16	6.1	0.265	0.038	
360 minute summer	S16	1.016	S17	6.0	0.700	0.151	
15 minute summer	Driveway 1	1.000_1	S1	2.9	1.389	0.204	
360 minute summer	S17	1.017	S18	6.0	0.727	0.146	252.8

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Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Driveway 2	11	20.642	0.042	3.4	0.1108	0.0000	OK
15 minute summer	Driveway 3	12	19.937	0.037	3.4	0.3815	0.0000	OK
30 minute summer	Driveway 4	22	19.258	0.008	0.5	0.2030	0.0000	OK
240 minute summer	Driveway 5	196	18.898	0.198	7.6	17.2674	0.0000	SURCHARGED
600 minute summer	Driveway 6	345	18.914	0.014	0.6	2.5412	0.0000	OK
240 minute summer	Driveway 7	196	18.898	0.048	1.6	2.7290	0.0000	OK
240 minute summer	Driveway 9	152	18.149	0.149	10.5	25.8417	0.0000	OK
7200 minute summer	Private Road and Parking	4440	19.140	0.140	1.7	81.7146	0.0000	OK
480 minute summer	Driveway 10	328	19.171	0.071	2.0	9.5242	0.0000	OK
720 minute summer	Driveway and Road 11	510	18.197	0.097	2.7	21.1576	0.0000	OK
360 minute summer	Driveway 12	288	18.019	0.069	4.9	22.5268	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Discharge Vol (m³)
15 minute summer	Driveway 2	2.000_1	S2	3.3	1.056	0.355	
15 minute summer	Driveway 3	3.000_1	S3	2.8	1.076	0.277	
30 minute summer	Driveway 4	4.000	S5	0.2	0.456	0.012	
240 minute summer	Driveway 5	5.000	S6	-6.3	-0.383	-0.362	
600 minute summer	Driveway 6	6.000	S7	0.4	0.482	0.041	
240 minute summer	Driveway 7	7.000	S8	-1.3	0.491	-0.028	
240 minute summer	Driveway 9	11.000	S14	-7.1	-0.324	-0.160	
7200 minute summer	Private Road and Parking	9.000	S21	0.6	0.665	0.003	
480 minute summer	Driveway 10	10.000	S21	0.4	0.679	0.013	
720 minute summer	Driveway and Road 11	12.000	S22	0.5	0.340	0.012	
360 minute summer	Driveway 12	13.000	S25	-3.6	0.461	-0.184	

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Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.96%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	11	20.636	0.107	18.9	0.1211	0.0000	OK
15 minute summer	S2	11	20.497	0.414	37.6	0.4677	0.0000	SURCHARGED
15 minute summer	S3	12	19.494	0.136	51.5	0.1541	0.0000	OK
15 minute summer	S4	12	19.281	0.300	56.6	0.3390	0.0000	SURCHARGED
30 minute summer	S5	20	19.180	0.452	57.3	0.5110	0.0000	SURCHARGED
30 minute summer	S6	20	19.145	0.502	61.3	0.5683	0.0000	SURCHARGED
30 minute summer	S7	20	19.134	0.634	34.7	0.7165	0.0000	SURCHARGED
30 minute summer	S8	20	19.128	0.659	28.7	1.1636	0.0000	SURCHARGED
120 minute summer	S9	108	18.751	0.311	5.2	0.3517	0.0000	SURCHARGED
120 minute summer	S10	108	18.751	0.376	8.9	0.4252	0.0000	SURCHARGED
15 minute summer	S20	10	19.141	0.141	46.5	0.1593	0.0000	OK
120 minute summer	S21	108	18.751	0.376	31.8	0.6646	0.0000	SURCHARGED
120 minute summer	S11	108	18.751	0.701	45.1	1.2383	0.0000	SURCHARGED
120 minute summer	S12	108	18.751	0.762	48.5	0.8615	0.0000	SURCHARGED
120 minute summer	S13	108	18.751	0.789	50.1	0.8919	0.0000	SURCHARGED
120 minute summer	S14	108	18.750	0.820	56.3	2.0879	0.0000	SURCHARGED
480 minute winter	S22	472	18.327	0.261	0.7	0.2952	0.0000	SURCHARGED
480 minute winter	S23	472	18.327	0.328	0.7	0.3712	0.0000	SURCHARGED
480 minute winter	S24	472	18.327	0.397	0.7	0.4495	0.0000	SURCHARGED
480 minute winter	S25	472	18.328	0.478	7.2	1.2156	0.0000	SURCHARGED
480 minute winter	S15	472	18.328	0.628	11.7	1.1092	0.0000	SURCHARGED
480 minute winter	S16	472	18.328	0.659	6.2	1.6765	0.0000	SURCHARGED
15 minute summer	Driveway 1	11	21.064	0.064	10.2	0.5160	0.0000	OK
15 minute winter	S17	147	17.640	0.060	6.0	0.1060	0.0000	OK
15 minute summer	S18	147	17.548	0.058	6.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	18.4	1.251	0.514	
15 minute summer	S2	1.001	S3	35.9	2.042	1.103	
15 minute summer	S3	1.002	S4	51.1	1.800	0.537	
15 minute summer	S4	1.003	S5	55.4	1.723	0.601	
30 minute summer	S5	1.004	S6	56.6	0.804	0.793	
30 minute summer	S6	1.005	S7	30.5	0.737	0.203	
30 minute summer	S7	1.006	S8	25.5	0.363	0.357	
30 minute summer	S8	1.007	S9	2.9	0.395	0.041	
120 minute summer	S9	1.008	S10	5.1	0.604	0.072	
120 minute summer	S10	1.009	S11	8.9	0.985	0.066	
15 minute summer	S20	2.000	S21	46.0	1.838	0.647	
120 minute summer	S21	2.001	S11	31.8	0.934	0.216	
120 minute summer	S11	1.010	S12	39.7	0.488	0.167	
120 minute summer	S12	1.011	S13	46.8	0.390	0.294	
120 minute summer	S13	1.012	S14	48.8	0.353	0.307	
120 minute summer	S14	1.013	S15	11.8	0.473	0.043	
480 minute winter	S22	3.000	S23	0.7	0.357	0.018	
480 minute winter	S23	3.001	S24	0.7	0.358	0.018	
480 minute winter	S24	3.002	S25	0.8	0.380	0.018	
480 minute winter	S25	3.003	S15	-5.9	0.148	-0.019	
480 minute winter	S15	1.014	S16	6.2	0.134	0.039	
480 minute winter	S16	1.016	S17	6.0	0.701	0.151	
15 minute summer	Driveway 1	1.000_1	S1	9.7	1.881	0.690	
15 minute winter	S17	1.017	S18	6.0	0.728	0.146	265.3

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Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.96%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Driveway 2	12	20.706	0.106	11.5	0.6841	0.0000	SURCHARGED
15 minute summer	Driveway 3	12	19.985	0.085	11.5	1.1664	0.0000	OK
30 minute summer	Driveway 4	20	19.267	0.017	1.7	0.4606	0.0000	OK
120 minute winter	Driveway 5	92	19.116	0.416	14.1	36.4985	0.0000	SURCHARGED
600 minute winter	Driveway 6	585	19.104	0.204	5.5	45.4033	0.0000	SURCHARGED
120 minute winter	Driveway 7	92	19.115	0.265	10.9	16.2334	0.0000	SURCHARGED
120 minute summer	Driveway 9	108	18.751	0.751	58.7	87.8412	0.0000	SURCHARGED
10080 minute summer	Private Road and Parking	6420	19.337	0.337	3.1	227.6223	0.0000	SURCHARGED
480 minute summer	Driveway 10	352	19.295	0.195	5.2	26.8408	0.0000	SURCHARGED
720 minute winter	Driveway and Road 11	705	18.377	0.277	4.7	63.6854	0.0000	SURCHARGED
480 minute winter	Driveway 12	472	18.327	0.377	9.8	108.7034	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Discharge Vol (m³)
15 minute summer	Driveway 2	2.000_1	S2	9.3	1.294	1.012	
15 minute summer	Driveway 3	3.000_1	S3	9.6	1.402	0.961	
30 minute summer	Driveway 4	4.000	S5	1.3	0.417	0.060	
120 minute winter	Driveway 5	5.000	S6	-11.3	-0.649	-0.652	
600 minute winter	Driveway 6	6.000	S7	-4.6	-0.593	-0.475	
120 minute winter	Driveway 7	7.000	S8	-9.1	-0.547	-0.200	
120 minute summer	Driveway 9	11.000	S14	-43.3	-1.090	-0.981	
10080 minute summer	Private Road and Parking	9.000	S21	0.9	0.758	0.004	
480 minute summer	Driveway 10	10.000	S21	0.8	0.810	0.023	
720 minute winter	Driveway and Road 11	12.000	S22	0.7	0.373	0.018	
480 minute winter	Driveway 12	13.000	S25	-7.1	0.444	-0.361	

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	11	20.887	0.358	23.2	0.4049	0.0000	SURCHARGED
15 minute summer	S2	11	20.677	0.594	42.0	0.6718	0.0000	SURCHARGED
30 minute summer	S3	19	19.600	0.242	55.7	0.2741	0.0000	SURCHARGED
30 minute summer	S4	19	19.426	0.445	61.1	0.5037	0.0000	SURCHARGED
30 minute summer	S5	20	19.289	0.561	66.3	0.6341	0.0000	SURCHARGED
60 minute summer	S6	38	19.248	0.605	63.3	0.6841	0.0000	SURCHARGED
60 minute summer	S7	38	19.240	0.740	38.2	0.8364	0.0000	SURCHARGED
60 minute summer	S8	38	19.237	0.768	29.3	1.3577	0.0000	SURCHARGED
120 minute winter	S9	112	19.301	0.861	5.2	0.9739	0.0000	SURCHARGED
120 minute winter	S10	112	19.301	0.926	8.2	1.0469	0.0000	SURCHARGED
120 minute winter	S20	112	19.302	0.302	17.9	0.3418	0.0000	SURCHARGED
120 minute winter	S21	112	19.301	0.926	28.8	1.6367	0.0000	SURCHARGED
120 minute winter	S11	112	19.301	1.251	39.5	2.2106	0.0000	SURCHARGED
120 minute winter	S12	112	19.301	1.312	42.4	1.4841	0.0000	SURCHARGED
120 minute winter	S13	114	19.301	1.339	44.8	1.5149	0.0000	FLOOD RISK
120 minute winter	S14	112	19.300	1.370	51.5	3.4876	0.0000	FLOOD RISK
480 minute winter	S22	472	18.740	0.674	1.0	0.7620	0.0000	FLOOD RISK
480 minute winter	S23	472	18.740	0.741	1.0	0.8381	0.0000	FLOOD RISK
480 minute winter	S24	472	18.740	0.810	1.1	0.9161	0.0000	FLOOD RISK
480 minute winter	S25	472	18.740	0.890	8.4	2.2647	0.0000	FLOOD RISK
480 minute winter	S15	472	18.741	1.041	12.3	1.8386	0.0000	FLOOD RISK
480 minute winter	S16	472	18.740	1.071	6.2	2.7253	0.0000	FLOOD RISK
15 minute summer	Driveway 1	12	21.101	0.101	13.3	0.9400	0.0000	SURCHARGED
8640 minute winter	S17	5100	17.640	0.060	6.0	0.1060	0.0000	OK
8640 minute winter	S18	5100	17.548	0.058	6.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	21.3	1.293	0.597	
15 minute summer	S2	1.001	S3	39.3	2.231	1.205	
30 minute summer	S3	1.002	S4	54.3	1.738	0.570	
30 minute summer	S4	1.003	S5	60.1	1.672	0.652	
30 minute summer	S5	1.004	S6	64.8	0.921	0.908	
60 minute summer	S6	1.005	S7	33.8	0.650	0.225	
60 minute summer	S7	1.006	S8	26.0	0.384	0.364	
60 minute summer	S8	1.007	S9	-3.0	0.395	-0.041	
120 minute winter	S9	1.008	S10	4.8	0.588	0.067	
120 minute winter	S10	1.009	S11	8.0	0.964	0.059	
120 minute winter	S20	2.000	S21	17.9	1.466	0.252	
120 minute winter	S21	2.001	S11	28.5	0.900	0.194	
120 minute winter	S11	1.010	S12	34.6	0.522	0.145	
120 minute winter	S12	1.011	S13	41.9	0.413	0.263	
120 minute winter	S13	1.012	S14	44.6	0.327	0.280	
120 minute winter	S14	1.013	S15	11.7	0.484	0.042	
480 minute winter	S22	3.000	S23	-1.0	0.382	-0.024	
480 minute winter	S23	3.001	S24	-1.0	0.389	-0.025	
480 minute winter	S24	3.002	S25	-1.1	0.419	-0.023	
480 minute winter	S25	3.003	S15	-6.6	0.122	-0.021	
480 minute winter	S15	1.014	S16	6.0	0.275	0.037	
480 minute winter	S16	1.016	S17	6.0	0.701	0.151	
15 minute summer	Driveway 1	1.000_1	S1	11.8	1.890	0.839	
8640 minute winter	S17	1.017	S18	6.0	0.728	0.146	1820.8

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.97%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	Driveway 2	13	20.793	0.193	15.0	2.0451	0.0000	SURCHARGED
15 minute summer	Driveway 3	12	20.026	0.126	15.0	1.8316	0.0000	SURCHARGED
30 minute summer	Driveway 4	21	19.284	0.034	3.7	1.0075	0.0000	OK
120 minute winter	Driveway 5	98	19.234	0.534	16.9	46.9945	0.0000	SURCHARGED
360 minute summer	Driveway 6	360	19.204	0.304	11.0	68.0491	0.0000	SURCHARGED
120 minute winter	Driveway 7	98	19.233	0.383	13.2	23.6491	0.0000	SURCHARGED
120 minute winter	Driveway 9	114	19.301	1.301	52.9	117.8747	0.0000	FLOOD RISK
2160 minute winter	Private Road and Parking	2100	19.420	0.420	7.2	288.7516	0.0000	SURCHARGED
240 minute summer	Driveway 10	240	19.362	0.262	11.3	36.1930	0.0000	SURCHARGED
960 minute summer	Driveway and Road 11	975	18.678	0.578	7.3	109.8333	0.0000	SURCHARGED
480 minute winter	Driveway 12	472	18.740	0.790	11.6	140.2646	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Discharge Vol (m³)
15 minute summer	Driveway 2	2.000_1	S2	10.4	1.332	1.134	
15 minute summer	Driveway 3	3.000_1	S3	10.1	1.389	1.005	
30 minute summer	Driveway 4	4.000	S5	3.5	0.616	0.170	
120 minute winter	Driveway 5	5.000	S6	-11.8	-0.668	-0.678	
360 minute summer	Driveway 6	6.000	S7	-8.4	-1.094	-0.868	
120 minute winter	Driveway 7	7.000	S8	-10.9	-0.619	-0.240	
120 minute winter	Driveway 9	11.000	S14	-39.2	-0.985	-0.887	
2160 minute winter	Private Road and Parking	9.000	S21	1.0	0.780	0.005	
240 minute summer	Driveway 10	10.000	S21	1.0	0.835	0.029	
960 minute summer	Driveway and Road 11	12.000	S22	0.9	0.398	0.022	
480 minute winter	Driveway 12	13.000	S25	-8.2	0.523	-0.421	

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Appendix D Southern Water Correspondence

from Southern Water

Your ref
APP/25/00639

Our ref
DSA000047511

Date
18th November 2025

Contact
Tel 0330 303 0119

Havant Borough Council
Civil Centre Road
Havant
Hampshire
PO9 2AX

Dear Sir/Madam,

Proposal: Erection of 90 dwellings with associated landscaping, parking and improved access.
Site: Proposed Development site (former Electricity Board site), Bartons Road, Havant, PO9 5RT.

Further to our letter dated **22 September 2025**, we would like to provide additional clarification regarding network capacity.

At present, Southern Water has capacity for **51 units**. However, please note that **a sewer connection cannot be refused on the grounds of capacity constraints**. Under the **Water Industry Act 1991**, the statutory mechanism for delivering our duties is via a **Section 106 (S106) application**.

This development will discharge into the **Budds Farm Catchment**, which is included in **AMP 2025–2030**. A budget of **£7.66 million** has been allocated for reinforcement works within this catchment, which is expected to positively impact this development and others connected to the **Budds Farm Wastewater Treatment Works (WTW)**.

Southern Water will continue to work collaboratively with the developer to align **build-out rates** with reinforcement planning, ensuring capacity improvements are delivered in a timely manner.

For further advice, please contact Southern Water, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX (Tel: 0330 303 0119) Website: southernwater.co.uk or by email at: SouthernWaterPlanning@southernwater.co.uk

Yours faithfully,

Future Growth Planning Team

southernwater.co.uk/developing-building/planning-your-development

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