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DRAINAGE STATEMENT REPORT

PREMIER INN PORTSMOUTH HAVANT

BEDHAMPTON HILL

HAVANT

P09 3JN

PREPARED FOR:

Premier Inn

JOB NO: P24-0399

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1. INTRODUCTION

1.1 This report has been prepared by Simpson TWS on behalf of Premier Inn Hotels Ltd. to accompany a planning application for the knock down re-build of the existing restaurant to new hotel bedrooms, alterations to the car parking layout and associated soft/hard landscaping.

1.2 The report details a strategy for the disposal & management of surface & foul water runoff that will be generated by the development.

2. SITE LOCATION AND TOPOGRAPHY

2.1 The site is located on Bedhampton Hill, Havant as shown on *Figure 1*, below. The site is centred on Ordnance Survey grid reference SU 69718 06219 and co-ordinates X: 469720; Y: 106219. The site's post code is PO9 3JN.

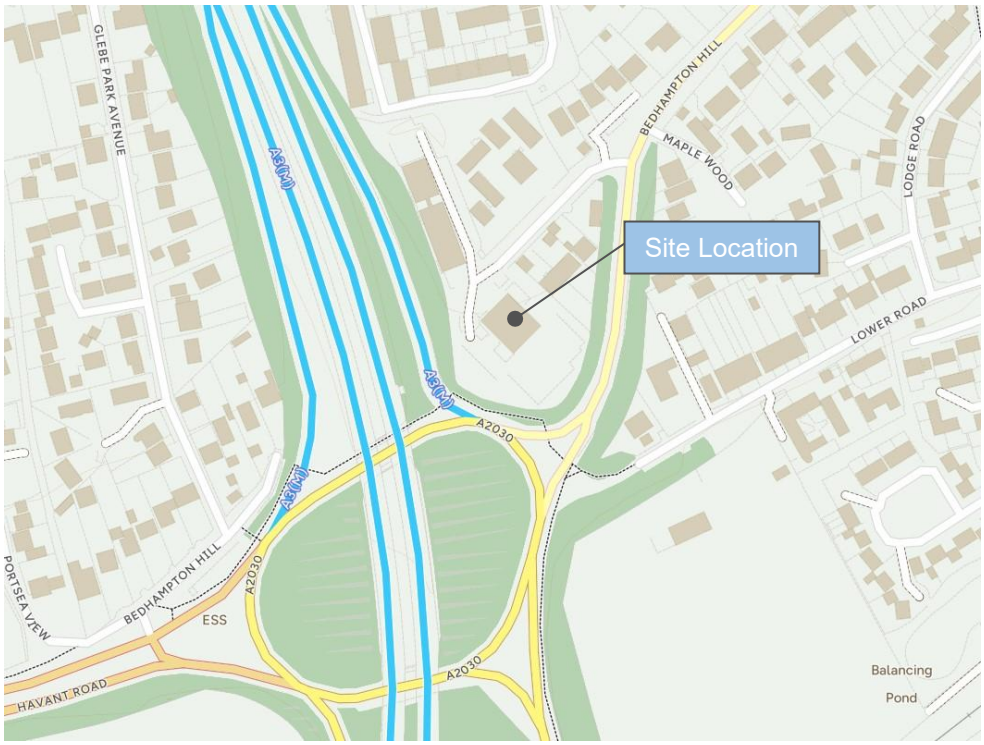

Figure 1: Site Location

Site Description

2.2 The existing site comprises a Premier Inn hotel & Beefeater restaurant, with associated parking, hard/soft landscaping. Vehicular access is gained from Bedhampton Hill northeast of the site. A copy of the topographical survey is included in *Appendix A.*

Topography

2.3 Levels on the topographical survey show the site to have a steep fall in a southeasterly direction from a level of circa 29.68mAOD in the car park along the northern boundary of the site, to level of circa 14.17mAOD along the southeastern edge of the car park.

Existing Drainage Characteristics

2.4 The topographical survey identifies that the site is drained by separate foul and surface water pipework.

2.5 Whilst the topographical survey shows surface water to drain to soakaways the site investigation report states that infiltration drainage is unlikely to be feasible due to underlying clay ground conditions. In addition, the Southern Water sewer records indicate a surface water sewer which runs through the southern portion of the site which discharges off site to the south. On this basis, it is considered that the soakaway indicated in the south of the site on the topographical survey is likely to be a Southern Water manhole which directs surface water off site to the south.

2.6 The retained hotel buildings in the northern portion of the site are served by existing private surface water drainage routes which discharge to the public surface water sewer passing through the site. This public sewer network also conveys flows from off-site/upstream areas.

2.7 All foul water runoff discharges to the Southern Water foul sewer which runs through the southern portion of the site and discharges off site to the southeast. An extract of the Southern Water sewer records is included in *Figure 2* below.

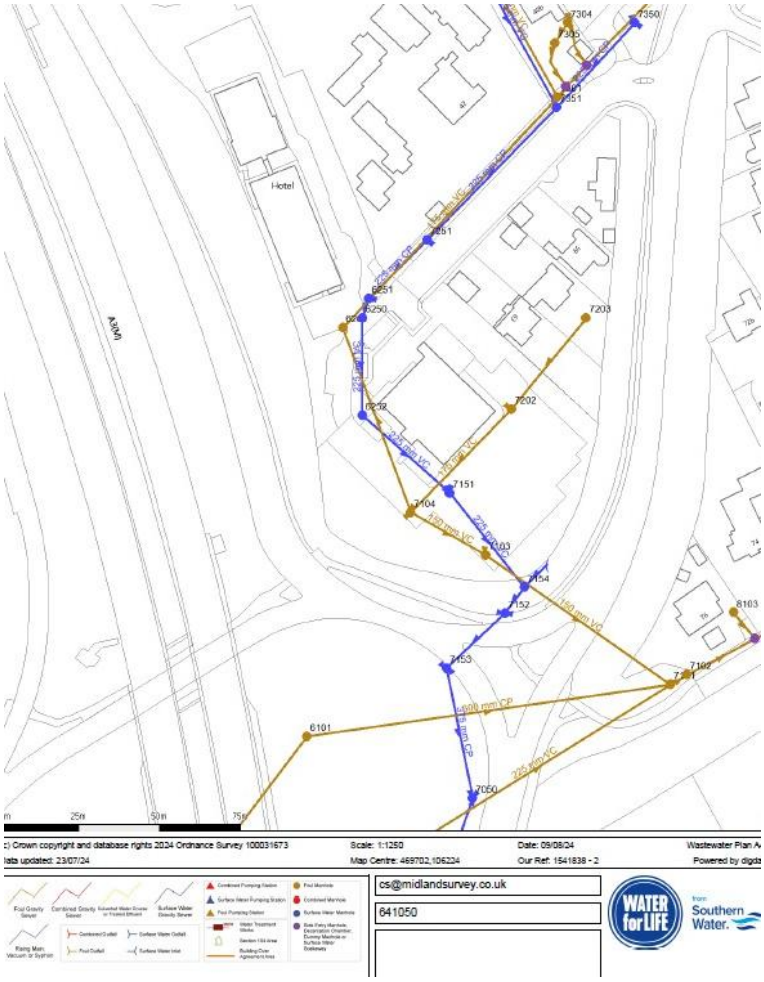

Figure 2: Southern Water Sewer Extract

2.8 An extract from the ground investigation report that was carried out in 2012 has been included in *Appendix B* and identifies the following ground conditions. Made Ground was encountered to a maximum depth of 0.60m bgl which was underlain by gravelly clay and chalk. Additionally, no groundwater was encountered on site.

2.9 The ground investigation report also states that as the underlying soils are predominantly cohesive in nature the underlying soils are unlikely to provide infiltration which would be suitable for soakaway drainage.

Flood Risk

2.10 The site is in Flood Zone 1 and is not affected by fluvial flooding. The site is also considered to be at low risk from all other sources of flooding.

Development Proposals

2.11 It is proposed to knock down the existing Beefeater restaurant and build a Premier Inn Annexe with associated soft/hard landscaping works. Minor amendments to the existing car parking layout are also proposed. A site plan showing the development proposals is included in *Appendix C*.

3. SURFACE WATER MANAGEMENT & DRAINAGE STRATEGY

Methods of Discharge

3.1 In *Section 2* it was established that the site is drained by separate foul and surface water sewers running through the site and discharging off site in a southerly direction. To assess all options of disposal and in accordance with the hierarchy of drainage disposal options, *Table 1* below provides an assessment of each method's suitability.

Table 1: Surface Water Runoff Discharge Method

System	Assessment
Collection of surface water runoff for re-use	The existing hotel and restaurant are not currently served by a rainwater harvesting system and share water supply. Therefore, since the proposed development only comprises a new hotel annexe to replace the restaurant, it is not considered appropriate to retrofit a system to the existing hotel or incorporate a new system for the annexe. In addition, it is unlikely that rainwater harvesting would contribute to a significant reduction in surface water runoff volumes as the development use would have limited requirement for recycled rainwater. Therefore, it is not considered appropriate to use rainwater harvesting for the disposal of roof water runoff.
Discharge to ground by infiltration	In *Section 2*, it was noted that as the ground conditions have been proved to be predominantly cohesive in nature the underlying soils are unlikely to provide infiltration which would be suitable for soakaway drainage. *Section 2* also notes that a below ground drainage survey was carried out at the development site, which discovered that an existing network of surface and foul water sewers is present that are currently serving the site. Therefore, it is assumed that it would be feasible to utilise the existing drainage networks instead of discharging it into the ground by infiltration.

Discharge rainwater direct to a watercourse	The site is drained by an existing surface water drainage network comprising of below ground pipework, which discharges off site to the south of the site. There are also no recorded watercourses in the vicinity of the development. Therefore, surface water flows from the annexe could be discharged to the existing system, however flows would need to be managed so as not to cause an increase in surface water flood risk both on the site and elsewhere in the catchment.
Discharge rainwater to a surface water sewer / drain	In *Section 2* it was identified that separate surface and foul water drainage networks serve the current site. Therefore, it is considered appropriate to replicate the site's existing drainage characteristics and dispose of surface water runoff via the site's existing surface water drainage network.
Discharge rainwater to a combined sewer	Discharge of surface water to the site's existing surface water drainage network has been identified as a feasible solution from the proposed development. Therefore, it is not necessary to consider discharge to a combined sewer.

3.2 Based on the assessment in *Table 1,* discharge of surface water to the site's existing surface water network is the most suitable method for disposal of surface water runoff from the development.

3.3 It is proposed to have a new surface water drainage network to drain roof runoff, surrounding footpath areas, and the new section of car park to the southeast of the annexe. The proposed network will connect to an existing Southern Water surface water sewer manhole to the south of the annexe. As shown on the Areas Layout included in *Appendix E*, there is a minimal 23m^2 decrease in impermeable area as a result of development. To reduce runoff rates and volumes in comparison to the existing situation, it is proposed to drain roof runoff, surrounding footpath areas, and the new section of car park to the southeast of the annexe, which equates to 943m^2 via a new flow control chamber restricting discharge to a maximum rate of 1.3 l/s, based on a minimum orifice diameter of 50mm following the advice provided by Hydro-International Ltd. *Figure 3* below.

From: Sharon King <sking@hydro-int.com>
Sent:
To:
Cc:
Subject:
Attachments: SHE-0067-2100-1100-2100_Design_Drawing(OD).pdf; SHE-0067-2100-1100-2100 _Hydraulic_Characteristics_(OD).pdf; HBO With Mesh Guard.pdf

Good Morning Deanne

Many thanks for your email detailed below.

With regards to suggesting a minimum orifice size the DCG guidance states a minimum of 50mm orifice opening size when the design of the upstream system will prevent debris entering the system.

Many thanks

Sharon King
Applications Engineer
Direct Dial: 01275 878371

Looking for a general or tailored CPD on our products and how they can work for your site? Email
cpdrequests@hydro-int.com

Figure 3: Hydro-International Ltd. Orifice Advice

3.4 The proposed attenuated catchment has been increased in response to the LLFA comments and now includes the proposed annexe roof, surrounding footpath areas and the new section of car park to the southeast of the annexe. The wider retained hotel buildings and existing car park drainage systems are not proposed to be altered as part of the development. The retained hotel buildings already discharge to the public surface water sewer network passing through the site. These sewer routes also convey flows from off-site/upstream areas and therefore do not form isolated private drainage connections serving only the development site. It is therefore not practical or proportionate to intercept and restrict the retained hotel roof drainage as part of the annexe works, as this would require works remote from the proposed development area.

3.5 The strategy therefore focuses on the areas materially affected by the proposed works, with the proposed annexe roof, surrounding footpaths and new parking area drained to the proposed attenuated system. This provides a reduction in surface water discharge rates when compared with the existing situation, while retaining the existing drainage arrangements where no material alterations are proposed.

3.6 A drainage strategy has been developed for the scheme and is shown on the Drainage Strategy included in *Appendix D*. A description of the main principles is provided below.

- Roof runoff, surrounding footpath areas, and the new section of car park to the southeast of the annexe will be captured by a combination of rainwater gutters, downpipes, gullies, and channel drains that would discharge into a traditional network of gravity drained pipework. Runoff will be restricted via a proposed flow control chamber set to a maximum allowable discharge rate of 1.3 l/s using a 50mm orifice diameter, prior to it discharging to the existing Southern Water surface water sewer manhole to the south of the annexe.
- To provide appropriate water quality treatment, runoff from the new section of car park to the southeast of the annexe will pass through a proprietary bypass separator prior to discharge to the proposed surface water drainage system.
- Excess flows will be stored and attenuated in a below ground geocellular attenuation tank located southeast of the proposed annexe. This tank will ensure no flooding occurs on site for all events up to and including a 1 in 100 year event with a 45% allowance for climate change.
- Greenfield runoff calculations have been assessed using the ReFH2 method within Causeway Flow based on the existing unattenuated area of 0.552Ha and a copy of the calculations is included in *Appendix F*. The calculations have been summarised below in *Table 2* for the 2, 30 and 100 year return periods.

Table 2: Greenfield runoff rates and volumes

Return Period	Area (Ha)	Peak Runoff Rate (l/s)	Runoff Volume (m^3)
2	0.552	1.3	17.0
30	0.552	3.2	36.0
100	0.552	4.2	46.0

- Brownfield runoff calculations using the Modified Rational Method for the existing unattenuated area of 0.552Ha have been calculated and a copy of the calculations is included in *Appendix G*. The calculations have been summarised below in *Table 3* for the 2, 30, 100 year, and 100 year plus 45% climate change return periods.

Table 3: Existing unattenuated area brownfield runoff rates and volumes

Return Period	Cv	I (peak) (mm)	I (ave) (mm)	Area (Ha)	Peak Runoff Rate (l/s)	Runoff Volume (m^3)
2	0.95	18.519	4.724	0.552	27.0	148.6
30	0.95	32.652	8.330	0.552	47.6	262.0
100	0.95	39.894	10.177	0.552	58.1	320.1
100 + 45%	0.95	57.846	14.757	0.552	84.3	464.1

- *Table 4* below shows the brownfield runoff calculations using the Modified Rational Method for the proposed unattenuated area of 0.455Ha. A copy of the calculations is also included in *Appendix G*.

Table 4: Proposed unattenuated area brownfield runoff rates and volumes

Return Period	Cv	I (peak) (mm)	I (ave) (mm)	Area (Ha)	Peak Runoff Rate (l/s)	Runoff Volume (m^3)
2	0.95	18.519	4.724	0.455	22.2	122.5
30	0.95	32.652	8.330	0.455	39.2	215.9
100	0.95	39.894	10.177	0.455	47.9	263.8
100 + 45%	0.95	57.846	14.757	0.455	69.5	382.5

- *Table 5* below shows the rates and volumes for the proposed attenuated area of 0.094Ha. These are included in *Appendix H* and have been calculated using the Causeway Flow software package.

Table 5: Proposed attenuated area runoff rates and volumes

Return Period	Area (Ha)	Peak Runoff Rate (l/s)	Runoff Volume (m^3)
2	0.094	1.0	23.6
30	0.094	1.0	40.8
100	0.094	1.0	50.2
100 + 45%	0.094	1.3	79.4

- *Table 6* below compares the runoff rates for the greenfield, existing unattenuated area brownfield, and proposed unattenuated area brownfield with the addition of the proposed attenuation area. *Table 6* demonstrates that there is a 14 – 16% reduction in the post-development runoff rates when compared to the pre-development situation.

Table 6: Comparison of greenfield, existing and proposed runoff rate

Return Period	Greenfield (l/s)	Existing (l/s)	Proposed (l/s)	Difference
2	1.3	27.0	22.2+1.0=**23.1**	-14%
30	3.2	47.6	39.2+1.0=**40.2**	-16%
100	4.2	58.1	47.9+1.0=**48.9**	-16%
100 + 45%	N/A	84.3	69.5+1.3=**70.8**	-16%

Hydraulic Design

3.7 The Causeway Flow software package has been used to design the proposed surface water drainage network based on the following parameters:

- Hydrobrake flow control chamber with a maximum discharge rate of 1.3 l/s, based on a minimum orifice size of 50mm as advised by Hydro International Ltd.
- Total drained of 943m^2.
- 1 in 100 year storm return period with a 45% allowance for potential future increases in rainfall intensities associated with climate change.
- Cv value of 0.95.
- FEH rainfall point data (2022) GB 469722 106218

3.8 The design results for the proposed surface water drainage network are included in *Appendix H*. The results demonstrate that the proposed attenuation tank would have sufficient capacity to store runoff for all rainfall events up to and including the required 1 in 100 year event with 45% allowance for climate change.

3.9 Greenfield runoff rates have been included above but given that this is a brownfield development restriction to the greenfield runoff rate would not be feasible due to the volume of attenuation that would be required, especially considering the scale of the proposed development in proportion to the size of the overall site.

3.10 The results demonstrate that there would generally be a 16% reduction in overall runoff rates leaving site when compared to the pre-development situation, providing a significant improvement to the existing surface water drainage network, decreasing flood risk both on and off site.

Exceedance

3.11 If the capacity of the surface water drainage network was exceeded, site levels would allow surface water to be channelled off-site in a south easterly direction. Further to this, the building's finished floor level would be raised above surrounding levels to minimise the risk from overland flows. Exceedance flood flow route arrows have been shown to demonstrate this on the drainage strategy drawing included in *Appendix D*.

Water Quality

3.12 Water quality has been reviewed. The proposed drainage network serving the new roof areas and surrounding footpaths are considered to present a low pollution risk; however, the new section of car park to the southeast of the annexe drained to the proposed drainage network could have a higher pollution risk.

3.13 The CIRIA C753 SuDS Manual 2015 sets out requirements for delivering appropriate levels of treatment to surface water runoff. *Table 7* below identifies that the proposed drainage network would have a total pollution mitigation index equal to or exceeding the recommended pollution hazard index thus confirming suitable treatment would be provided to surface water runoff.

Table 7: Pollution Mitigation Assessment

Use	Pollution Hazard Index			Drainage Component	Mitigation Index		
	TSS	Metals	TPH		TSS	Metals	TPH
Roof	0.3	0.2	0.05	N/A	N/A	N/A	N/A
Footpaths	0.3	0.2	0.05				
Car Park	0.5	0.4	0.4	Bypass Separator	0.5	0.4	0.8

3.14 The remainder of the existing car park will remain unchanged and therefore its drainage will also remain unchanged. Retrofitting a proprietary treatment chamber to the existing drainage system serving the retained portion of car park is not considered practical, as it would require works to the public sewer or wholesale replacement of the existing car park drainage network. The retained drainage system will continue to be maintained through routine inspection and cleaning. The proposed approach is therefore considered proportionate for the nature and scale of the development.

Amenity & Biodiversity

3.15 SUDS guidance advises that the design of the surface water management system should maximise amenity and biodiversity benefits. Generally, this would involve the use of surface level SUDS such as swales and ponds, however, there is no suitable space for such facilities on the site with it occupied almost entirely by an existing hotel surrounded by hardstanding areas for car parking. With no suitable areas available for swales and ponds it would not be possible to increase amenity or biodiversity benefits in comparison to the existing situation as part of the sites surface water management scheme.

3.16 Whilst SUDS that increase amenity and biodiversity would not be feasible. In comparison to the existing situation there is an increase in soft landscaping areas which is demonstrated via the decrease in overall impermeable areas, which would contribute to increased amenity and biodiversity.

Implementation

3.17 During construction, it is normal practice for a drainage system to be installed at an early stage in the programme. As such, runoff from the construction site, which can be heavily laden with silt, are likely to restrict flow within the drainage system. Therefore, the following measures will be considered to address this issue:

- A catchpit chamber will be installed upstream of the attenuation tank to prevent sediments such as soil and mud from transferring into the drainage system downstream. The catchpit is to be regularly inspected throughout construction.
- Protective coverings will be used to help prevent runoff stripping material stockpiles.
- Surfaces used as access roads and storage areas during construction will be swept regularly to prevent the accumulation of dust and mud.
- Should groundwater be encountered in excavations, the water will not be discharged to the drainage systems until the amount of suspended solids has been reduced through the controlled use of skips or tanks, which will act as stilling basins.

- To prevent contamination associated with the use of oils and hydrocarbons during construction, the contractor shall ensure that the following precautionary measures are employed during construction:
    - Regular maintenance of machinery and plant.
    - Use of drip trays.
    - Regular checking of machinery and plant for oil leaks.
    - Use of correct storage facilities.
    - Regular checks for signs of wear and tear on tanks.
    - Specific procedures are followed when refuelling.
    - Emergency spill kit to be located near refuelling area.
    - Regular emptying of bunds.
    - Tanks should be located in secure areas to stop vandalism.

3.18 On occupation of the development, it is recommended that each element of the as-built drainage system is maintained by Premier Inn Hotels appointed management company in accordance with the regime set out in the tables below.

Table 8: Below Ground Drainage System - Operation and Maintenance Requirements

Maintenance schedule	**Required action**	**Frequency**
Regular maintenance	Remove all litter and debris from external hard landscaped areas and adjacent landscaping, which may pose a risk to the performance of the system.	Monthly.
	Remove build-up of sediment / silt in catch-pits and dispose of oils / petrol residues using safe standard practices.	As required.
	Stabilise and mow adjacent landscaped areas and remove weeds.	
Remedial actions	Repair or rehabilitate inlet and outlets to ensure they are in good condition and operating as designed.	
	Remediate any landscaping, which has raised to within 50mm of the level of adjacent hard landscaping.	
Monitoring	Check of all inlets / outlets for blockages or evidence of physical damage with any necessary remedial action or clearance carried out if required.	On a monthly basis for the first 3 months of operation, thereafter every 6 months & following severe rainfall events.
	Inspect all surfaces for ponding, or silt accumulation. Record areas where water is ponding for more than 48 hours and carry out any remedial work deemed necessary.	After severe storms.

Table 9: Geocellular Storage Tank - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for first 3 months of operation, then every 6 months.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly.
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	Monthly / after severe storms.
	Remove sediment from pre-treatment structures.	Annually, or as required.
Remedial actions	Repair/rehabilitation of inlets, outlet, overflows and vents.	As required.
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually and after large storms.

Table 10: Flow Control Chamber - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Cleaning off the flow control device of any debris/ sediment.	As required.
Remedial actions	Flow control device repairs.	As required.
	Repair of erosion damage, or damage to chamber.	
Monitoring	Inspection of the chamber for debris and sediment build up.	Monthly for first 3 months, thereafter, every 6 months and following severe storm events.

Table 11: Bypass Separator - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Cleaning of interceptor, inlets, and outlets of retained pollutants & silt.	Every 3, 6 or 12 months depending on site conditions (or following poor performance).
Remedial actions	Repair of erosion damage, or damage to tank.	As required.
	Interceptor repairs.	
Monitoring	Inspection of the tank for pollutants and silt.	Every 3, 6 or 12 months depending on site conditions (or following poor performance).
	Inspection of inlets and outlets.	
	Inspection of areas receiving overflow, for evidence of erosion.	

4. FOUL WATER DRAINAGE STRATEGY

4.1 This section of the report outlines an approach for the disposal and management of foul water runoff from the development.

4.2 As reported in *Section 2* of this report, foul water generated from the existing development is drained by a traditional network of below ground pipework discharges to the Southern Water foul sewer via a gravity connection. The Southern Water sewer discharges off site in a southeasterly direction. Additionally, a 3m foul sewer easement on either side of the foul sewer has been shown on the Drainage Strategy included in *Appendix D*.

4.3 Southern Water have been consulted regarding the existing foul sewer systems ability to accommodate additional foul water flows from the proposed development. A consultation response has not been received at this time and it is assumed that they will be consulted as part of the planning process. It should be noted that the foul water drainage scheme will be developed in accordance with the findings of Southern Water's assessment to ensure that there is no increase in the risk of sewer flooding to the site or neighbouring properties.

4.4 A foul water drainage strategy has been developed for the scheme and is shown on the drainage strategy drawing included in *Appendix D*. In summary, the annexe would be provided with a new foul water drainage system comprising of a traditional gravity network of below ground pipework. The proposed network would discharge to the existing Southern Water foul sewer which runs through western side of the development via a gravity connection.

5. CONCLUSIONS

5.1 It has been established that whilst the survey shows surface water to drain to soakaways, the site investigation report states that infiltration drainage is unlikely due to the underlying clay ground conditions. Therefore, it is considered appropriate to discharge surface water runoff from the development to the existing Southern Water surface water sewer in the absence of any other feasible means of connection.

5.2 Roof runoff, surrounding footpath areas, and the new section of car park to the southeast of the annexe equates to 943m^2, which is to be controlled to a maximum flow rate of 1.3 l/s based on a flow control device with a minimum orifice size of 50mm prior to discharging to the Southern Water surface water sewer. Therefore, when comparing the existing runoff rates with the proposed, there is generally a 16% reduction. This ensures that the proposed surface water flows are less than existing, decreasing flood risk on and off site, as well as ensuring the existing surface water drainage system will not be overwhelmed as a result of development.

5.3 Excess flows will be stored and attenuated in a below ground geocellular attenuation tank located southeast of the proposed annexe. This tank will ensure no flooding occurs onsite for all events up to and including a 1 in 100 year event with a 45% allowance for climate change.

5.4 The retained hotel buildings and existing car park drainage arrangements will remain unchanged, as these areas already drain to existing public surface water sewer connections and are not materially altered by the proposed development. Interception and attenuation of these retained catchments is not considered practical or proportionate as part of the proposed annexe works. Water quality treatment will be provided for the new section of car park by a proprietary bypass separator.

5.5 The annexe would be provided with a new foul water drainage system comprising of a traditional gravity network of below ground pipework. This network would discharge to the existing Southern Water foul water sewer which runs on the eastern side of the development via a gravity connection.

5.6 It is concluded that it will be possible to dispose of surface & foul water runoff from the development without increasing the level of flood risk to the site or neighbouring properties. Therefore, the scheme is considered acceptable in terms of drainage strategy and flood risk.

APPENDIX A
TOPOGRAPHICAL SURVEY

NOTES

GENERAL NOTES :–

ALL LEVELS ARE IN METRES DERIVED FROM GPS TRANSFORMATION.

GRID COORDINATES ARE ORDNANCE SURVEY NATIONAL GRID DERIVED FROM GPS TRANSFORMATION. GPS COORDINATES AND LEVELS SET AT ST09 (NO SCALE FACTOR APPLIED)

THIS DRAWING HAS BEEN PRODUCED WITH A PLOT SCALE ACCURACY OF 1:200

SERVICE COVERS INDICATED WHERE VISIBLE. PIPE INVERTS / DETAILS SURVEYED FROM SURFACE INSPECTION ONLY. GENERALLY DAMAGED COVERS AND COVERS WITHIN HIGHWAYS WILL NOT BE LIFTED

TREE SPECIES SHOULD BE CONFIRMED BY TREE SPECIALIST IF CRITICAL.

OVERHEAD CABLES ARE INDICATED USING REMOTE SURVEY METHODS AND ARE SUBJECT TO SEASONAL VARIATION, AND SHOULD BE TREATED AS APPROXIMATE.

THE SURVEYOR WILL NOT BE RESPONSIBLE FOR THE OMISSION OF DETAILS OBSCURED DURING SITE SURVEY

RICS PROFESSIONAL STANDARDS 3RD EDITION RULE 1.19 APPLIES TO THIS SURVEY.

TOPOGRAPHICAL SURVEY/UTILITY KEY :–

(ht) – height
ø – diameter
● – pas trap
a/g – above ground
a/r – assumed route
av – air valve
bb – belisha beacon
bd – back drop
bl – bed level
boll – bollard
bos – bottom of shaft
bt – telecom
c/b fence – closeboard fence
c/box – control box
catv – cable television
cl – cover level
con – conifer
cr – cable riser
cws – combined water sewer
d/chan – drainage channel
ejb – electric junction box
elec – electric
eot – end of trace
ep – electric pole
er – earth rod
f/bed – flower bed
fh – fire hydrant
fl – floor level
fs – fire switch
fws – foul water sewer
g – gully
g/run – gully run
gr – gas riser
h/chestnut – horse chestnut
h/thorn – hawthorn
ic – inspection cover
il – invert level
ill – illuminated
int – interceptor
lp – lamp post
mh – manhole cover
mkr – marker
o/h – over head
ol – off let
osa – off survey area
OSBM – ordnance survey bench mark
p & r fence – post & rail fence
pd – pit depth
pr – pipe riser
ptg – pipe to ground
pts – pipe to surface
re – rodding eye
ret wall – retaining wall
rs – road sign
rwp – rain water pipe
s/birch – silver birch
s/p – safety paving
sap – sapling
sec fence – security fence
sfc – soil filled chamber
sl – spot light
sp – soil pipe
st – stop tap
sv – stop valve
svp – soil vent pipe
sws – storm water sewer
TBM – temporary bench mark
tfr – taken from records
tl – threshold level
toc – top of cap
top – top of pipe
tot – top of tank
tp – telecom pole
ts – traffic signal
t/s – trench scar
u/s – underside
uti – unable to lift
utr – unable to rod
uts – unable to survey
utt – unable to trace
vp – vent pipe
wfc – water filled chamber
wl – water level
wm – water meter
wp – waste pipe
wr – water riser

SURVEY CONTROL :–

STATION	EASTINGS	NORTHINGS	LEVEL
ST03	469647.642	106321.725	27.383
ST04	469665.670	106320.032	27.642
ST05	469675.702	106296.306	25.131
ST06	469694.536	106261.223	22.902
ST07	469686.642	106279.269	24.093
ST08	469684.352	106243.717	22.556
ST09	469698.413	106229.938	20.996
ST10	469693.041	106200.354	18.325
ST11	469712.352	106180.178	16.604
ST12	469733.790	106173.111	14.709
ST13	469753.972	106194.877	14.831
ST14	469675.254	106249.759	23.012
ST15	469707.876	106198.714	17.726
ST16	469741.221	106224.611	17.105

NORTH

UTILITY SURVEY KEY :–

HATCHED AREA
BOREHOLE
CPT
TRIAL PIT
HAND PIT
WINDOW SAMPLE

ELECTRIC CABLE
WATER PIPE
FOUL SEWER
STORM SEWER
COMBINED SEWER
DUCTS
CABLE TELEVISION
DATA CABLE
TELECOM CABLE
GAS PIPE
UNIDENTIFIED SERVICE
OTHER
CCTV
TRAFFIC LIGHT
OFFSET FILL
VENT
FUEL PIPE
GAUGE LINES
PIPE
ASSUMED ROUTE
TAKEN FROM RECORDS

DISCLAIMER :–

Electromagnetic techniques have been used in the location of underground services. The results are not infallible and trial excavations should be carried out to confirm service identification, positions and particularly depths, where these are critical. The completeness of the underground services information cannot be guaranteed.

This method of survey does not differentiate between live and dead services, and as such all services should be treated as live. This drawing may not include the location of all public services that may cross the site, therefore the relevant service drawings should be obtained from the appropriate utility company and used in conjunction with this drawing.

Private service pipes and cables in highways are not shown, but there presence should be anticipated.

Additional below ground structures or obstructions not shown on this drawing may be present. Reference should be made to historical plans and as–built drawings. Excavations in the vicinity of services should be carried out with due diligence ref: HSG47 document avoiding dangers from underground services

Please note that factors such as ground conditions, proximity of other utilities, material and method of construction have an influence on the quality of the data collected on site.

TSA Standards – "Even an appropriate and professionally executed survey may not be able to achieve a 100% detection rate."

UTILITY NOTES

DEEP DRAIN CONNECTIONS HAVE BEEN SOUNDED CONNECTIONS AND ROUTES CONFIRMED WITH RECORDS.

GPR RESULTS POOR ACCROSS WHOLE OF SITE.

FOUL WATER DRAINS EXITS SITE TO MAIN ROAD SOUTH OF SITE NOT POSISBLE TO FIND CONECTING MANHOLE DUE TO ON GOING WORKS AND TRAFFIC IN ROAD.

UNABLE TO TRACE GAS RECORDS SHOW P.E PIPE ENTERING SITE BUT NOT BUILDING ROUTE HAS BEEN ASSUMED.

0 2 4 8 12 16 20

MIDLAND SURVEY LTD

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Client	WHITBREAD GROUP
Project	PREMIER INN, BEDHAMPTON HILL, HAVANT, PORTSMOUTH,
Title	TOPOGRAPHICAL & UTILITY SURVEY
Date	AUGUST 2024.
Scale	1:200@A0
Dwg No	641047/1
Surveyor	J.S, D.J, B.C
Checked	T.J.

Revisions

TOPOGRAPHICAL (LAND) SURVEYORS / UTILITY SURVEYORS
BUILDING MEASUREMENT SURVEYORS / 3D LASER SCANNING

Accredited Contractor · constructionLine · THE SURVEY ASSOCIATION

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APPENDIX B
SITE INVESTIGATION EXTRACT

7.0 GROUND AND GROUNDWATER CONDITIONS

7.1 Ground Conditions

7.1.1 Summary of Ground Conditions

The ground investigation generally confirms the published geology as detailed below.

7.1.2 Made Ground

Made Ground was encountered at all window sample locations to a maximum depth of 0.60m bgl. Made Ground comprised of a black sandy GRAVEL of crushed aggregate to a maximum depth of 0.25m bgl and yellow sandy GRAVEL containing fine to coarse, angular to rounded flint, membrane, shell and chalk fragments to a maximum depth of 0.60m bgl.

7.1.3 Drift Deposits

Head Deposits

Head deposits were encountered to the south of the site within the locations of WS103 and WS104. The deposits comprised of a soft to firm yellow-orange gravelly CLAY with gravel of fine to medium chalk fragments and rare coarse sized angular flint within WS103 (0.6-base not encountered) and WS104 (0.6-4.0m bgl).

7.1.4 Solid Geology

Chalk

Chalk was encountered within all the window sample locations except WS103. The chalk was noted to comprise of white, orange mottled CHALK with clayey matrix and occasional black flecks and rare to occasional angular fragments of coarse flint. The base of this stratum was not encountered.

7.1.5 Particle Size Distribution

One particle size distribution test was undertaken on WS102 at 1.80-2.0m, the result is presented below in Table 7.1.

Table 7.1 PSD Summary

Location	Depth (m)	Strata Description
WS102	1.80-2.00m	CHALK: Slightly sandy silty clayey gravel

7.1.6 Soil Consistency

Results of the Standard Penetration Tests, including undrained shear strengths derived from SPTs are included on Table 7.2.

Table 7.2 Standard Penetration Test Results

Boreholes	Depth (m bgl) (i)	Material Field Description	CPT/SPT "N" Value	Corrected "N" Value $(N_1)_{60}$	Terzaghi & Peck Relative Density (Sands)	Eurocode Soil strength	Consistency (BS5930)	Terzaghi & Peck Approximate Undrained Shear Strength (kN/m^2)
WS101	1.0	CHALK*	22	22	N/A	High Strength	N/A	110.90
	2.0	CHALK*	27	25	N/A	High Strength	N/A	123.33
	3.0	CHALK*	33	29	N/A	High Strength	N/A	143.49
	4.0	CHALK*	25	21	N/A	High Strength	N/A	105.61
	5.0	CHALK*	25	21	N/A	High Strength	N/A	103.70
WS102	1.0	CHALK*	24	24	N/A	High Strength	N/A	120.98
	2.0	CHALK*	25	23	N/A	High Strength	N/A	114.19
	3.0	CHALK*	24	21	N/A	High Strength	N/A	104.36
	4.0	CHALK*	12	10	N/A	Medium Strength	N/A	50.69
	5.0	CHALK*	24	20	N/A	High Strength	N/A	99.55
WS103	1.0	CLAY	11	11	N/A	Medium Strength	Firm	55.45
	2.0	CLAY	13	12	N/A	Medium Strength	Firm	59.38
	3.0	CLAY	14	12	N/A	Medium Strength	Firm	60.88
	4.0	CLAY	17	14	N/A	Medium Strength	Firm	71.81
	5.0	CLAY	17	14	N/A	Medium Strength	Firm	70.52
WS104	1.0	CLAY	9	9	N/A	Medium Strength	Soft to Firm	45.37
	2.0	CLAY	13	12	N/A	Medium Strength	Firm	59.38
	3.0	CLAY	12	10	N/A	Medium Strength	Soft to Firm	52.18
	4.0	CHALK*	20	17	N/A	High Strength	N/A	84.49
	5.0	CHALK*	15	12	N/A	Medium Strength	N/A	62.22
WS105	1.0	CHALK*	21	21	N/A	High Strength	N/A	105.86
	2.0	CHALK*	34	31	N/A	Very High Strength	N/A	155.30

9.5 Ground Floor Slabs

Made Ground was indentified to a maximum thickness of 0.6m within the development. This combined with the variation in geology beneath the proposed development would potentially lead to differential settlement as result it is considered that ground bearing floor slabs, whilst viable, would require detailed design to accommodate variability of the formation and account for differential settlement.

Where suspended floor slabs are employed ventilation of the under floor void will be required to address condensation issues. This would also assist in the mitigation of any potential gas ingress issues.

9.6 Pavement Construction

An assessment of the likely California Bearing Ratio (CBR) for the Made Ground has been assessed from the following sources:

- Correlations with undrained shear strength (summarised in Table 7.2) from Black and Lister;
- Correlations with plasticity index (summarised in Table 7.3) from HD25/94; and
- Description of the materials encountered in the exploratory holes.

Based on this it is considered that a CBR of less than 3% may be required to account for variability of the Made Ground. It is, however, recommended that this be re-assessed using on site plate tests of the formation. It is possible that a higher design CBR of 3% may then be achievable.

Based on the plasticity index, the clay and chalk soils are considered frost susceptible. Following excavation the sub formation should be proof rolled and any soft material inspected and removed.

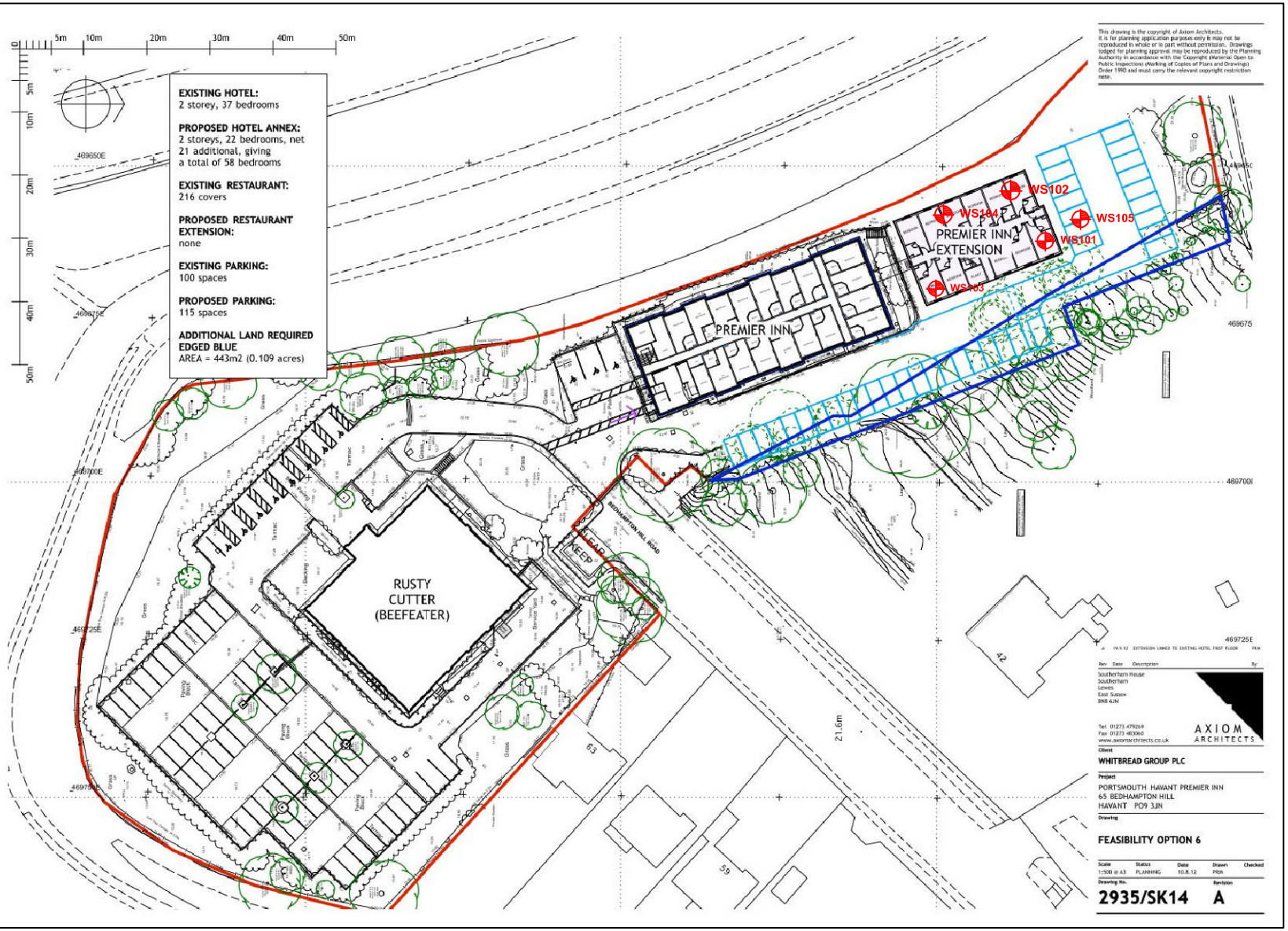
9.7 Drainage

Given the cohesive soils encountered within the natural across the site there is unlikely to be a high degree of soakage potential for drainage systems. Chalk usually has a high permeability but generally the encountered chalk at the site has been bound within a clayey matrix therefore this strata is unlikely to provide a high degree of soakage potential and any SUDS requirement should be met by other methods. The presence of Made Ground across the site and the lithological boundary below the proposed development may result in differential settlement. It is therefore recommended that drain runs are designed using steeper gradients and flexible joints to allow for this.

9.8 Concrete Durability

Based upon the results of the chemical analyses summarised in Table 7.4 it is considered that subsurface concrete can be designed in accordance with Design Sulphate Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1 in accordance with the recommendations provided in BRE Special Digest 1 (2005).

Sulphate and pH was analysed to 2.0m depth at the site but if the client wishes to adopt deeper pile foundations below this depth, it is considered the sulphate and pH at further depth are likely to have similar values due to the presence of chalk throughout the site, however this should be confirmed with additional testing if required. Chalk is formed from the



N

Reproduced from the Axiom Architects (2012) drawing. Ref 2935/SK14

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Premier Inn, Havant

Proposed Extension with Sampling Locations

Job No.: 20385	Figure: 3
Scale: 1:500 @ A3	Drawn: Nov 2012

Window Sample Record

Location Number: WS101

Project Number: 20385
Contract Name: Premier Inn, Havant
Client: Simpson Associates
Consultant: W. Spraggs

Date Started: 19/11/2012
Date Completed: 19/11/2012
Elevation AOD (m): -
Co-ordinates: 469679, 106256
Drilling Equipment: Terrier Rig

REC Geoenvironmental
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SUBSURFACE PROFILE				SAMPLES AND IN-SITU TESTING		
Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	SPT (N-Value)
		MADE GROUND Tarmac.		TGV	0.3-0.5	
		MADE GROUND Black sandy GRAVEL. Gravel of fine to coarse flint and crushed aggregate.	0.50	TGV	0.5-0.7	
			0.70			
1.0		***MADE GROUND*** Yellow sandy GRAVEL. Gravel of fine to coarse, angular to rounded flint.		SPT,TGV	1.0-1.45	(6,5,6,5,5,6) N=22
		MADE GROUND Yellow sandy GRAVEL. Gravel of fine to coarse flint with frequent chalk fragments, rare cobble sized flint and plastic membrane.		T	1.8-2.0	
2.0		***CHALK*** Recovered as off-white with black specks weak CHALK with clayey matrix.		SPT	2.0-2.45	(6,6,7,7,6,7) N=27
		CHALK White orange mottled CHALK with clayey matrix and occasional black flecks and rare angular flint.		T	2.8-3.0	
3.0				SPT	3.0-3.45	(9,10,9,9,9,6) N=33
				T	3.8-4.0	
4.0				SPT	4.0-4.45	(10,8,7,6,5,7) N=25
				T	4.8-5.0	
5.0			5.00	SPT	5.0-5.45	(7,7,7,6,6,6) N=25
		End of borehole at 5.0m.				
6.0						

Key

B. Bulk (Bag)
W. Water
U100. 100mm Undisturbed
U38. 38mm Undisturbed Sample
SPT. Standard Penetration Test
D. Disturbed
G. Amber Glass Jar / Bottle
CPT. Cone Penetration Test
U100. Blows (Recovery mm)
V. 40ml Glass Vial
T. Plastic Tub
N. 'N' Value
HV. Hand Shear Vane
PID. Photo Ionisation Detector
S. Soil

Notes

Notes: Backfilled with arisings

Services: Prior to excavation the location was scanned with a Cable Avoidance Tool (CAT).

Groundwater: None encountered

Status: Completed

Window Sample Record

Location Number: WS102

Project Number: 20385
Contract Name: Premier Inn, Havant
Client: Simpson Associates
Consultant: W.Spraggs

Date Started: 19/11/2012
Date Completed: 19/11/2012
Elevation AOD (m): -
Co-ordinates: ~469679, 106256
Drilling Equipment: Terrier Rig

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SUBSURFACE PROFILE				SAMPLES AND IN-SITU TESTING		
Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	SPT (N-Value)
		MADE GROUND Tarmac.	0.25	TGV	0.3-0.5	
		MADE GROUND Black sandy GRAVEL. Gravel of fine to coarse, angular to rounded crushed aggregate.	0.50	TGV	0.7-0.9	
1.0		***MADE GROUND*** Yellow slightly clayey sandy GRAVEL. Gravel of fine to coarse angular to rounded flint, shell fragments and plastic membrane. Sand is coarse.		SPT	1.0-1.45	(4,4,5,5,6,8) N=24
		CHALK Recovered as white CHALK of slightly sandy slightly silty clayey gravel. Gravel of coarse angular flint.		T	1.8-2.0	
2.0				SPT	2.0-2.45	(7,8,6,5,7,7) N=25
				T	2.8-3.0	
3.0				SPT	3.0-3.45	(8,6,6,5,6,7) N=24
				T	3.8-4.0	
4.0				SPT	4.0-4.45	(3,2,2,2,3,5) N= 12
				T	4.8-5.0	
5.0		End of borehole at 5.0m.	5.00	SPT	5.0-5.45	(3,4,4,7,6,7) N= 24
6.0						

Key

B. Bulk (Bag)
W. Water
U100. 100mm Undisturbed
U38. 38mm Undisturbed Sample
SPT. Standard Penetration Test
D. Disturbed
G. Amber Glass Jar / Bottle
CPT. Cone Penetration Test
U100. Blows (Recovery mm)
V. 40ml Glass Vial
T. Plastic Tub
N. 'N' Value
HV. Hand Shear Vane
PID. Photo Ionisation Detector
S. Soil

Notes

Notes: Backfilled with arisings

Services: Prior to excavation the location was scanned with a Cable Avoidance Tool (CAT).

Groundwater: None encountered

Status: Completed

Window Sample Record

Location Number: WS103

Project Number: 20385
Contract Name: Premier Inn, Havant
Client: Simpson Associates
Consultant: W. Spraggs

Date Started: 19/11/2012
Date Completed: 19/11/2012
Elevation AOD (m): -
Co-ordinates: 469679, 106256
Drilling Equipment: Terrier Rig

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SUBSURFACE PROFILE				SAMPLES AND IN-SITU TESTING		
Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	SPT (N-Value)
		MADE GROUND Tarmac.		TGV	0.3-0.5	
		MADE GROUND Black sandy GRAVEL. Gravel of fine to coarse, angular crushed aggregate.	0.60	TGV	0.7-0.9	
1.0		***MADE GROUND*** Yellow sandy GRAVEL. Gravel of fine to coarse rounded to sub-rounded flint, shell fragments and plastic membrane.		SPT	1.0-1.45	(2,2,2,2,4,3) N= 11
		CLAY Firm yellow to orange slightly sandy gravelly CLAY. Gravel of fine to coarse flint and chalk fragments.		T	1.8-2.0	
2.0		***CLAY*** Firm yellow to orange gravelly CLAY. Gravel of fine to medium chalk fragments and rare cobble sized flint.		SPT	2.0-2.45	(2,2,3,3,3,4) N= 13
				T	2.8-3.0	
3.0				SPT	3.0-3.45	(3,3,2,3,4,5) N= 14
				T	3.8-4.0	
4.0				SPT	4.0-4.45	(3,3,3,5,4,5) N= 17
				T	4.8-5.0	
5.0			5.00	SPT	5.0-5.45	(3,2,3,4,5,5) N= 17
		End of borehole at 5.0m.				
6.0						

Key

B. Bulk (Bag)
W. Water
U100. 100mm Undisturbed
U38. 38mm Undisturbed Sample
SPT. Standard Penetration Test
D. Disturbed
G. Amber Glass Jar / Bottle
CPT. Cone Penetration Test
U100. Blows (Recovery mm)
V. 40ml Glass Vial
T. Plastic Tub
N. 'N' Value
HV. Hand Shear Vane
PID. Photo Ionisation Detector
S. Soil

Notes

Notes: Backfilled with arisings

Services: Prior to excavation the location was scanned with a Cable Avoidance Tool (CAT).

Groundwater: None encountered

Status: Completed

Window Sample Record

Location Number: WS104

Project Number: 20385
Contract Name: Premier Inn, Havant
Client: Simpson Associates
Consultant: W. Spraggs

Date Started: 19/11/2012
Date Completed: 19/11/2012
Elevation AOD (m): -
Co-ordinates: 469679, 106256
Drilling Equipment: Terrier Rig

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SUBSURFACE PROFILE				SAMPLES AND IN-SITU TESTING		
Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	SPT (N-Value)
		MADE GROUND Tarmac.		TGV	0.3-0.5	
		MADE GROUND Black sandy GRAVEL. Gravel of fine to coarse, angular crushed aggregate.	0.60	TGV	0.7-0.9	
1.0		***MADE GROUND*** Yellow slightly sandy slightly clayey GRAVEL. Gravel of fine to coarse angular to rounded flint and plastic membrane.	1.00	SPT	1.0-1.45	(2,2,2,2,3,2) N=9
		CLAY Soft to firm yellow to orange gravelly CLAY. Gravel of fine to medium chalk fragments with rare angular coarse flint.		T	1.8-2.0	
2.0		***CLAY*** Firm yellow to orange gravelly CLAY. Gravel of fine to medium chalk fragments with rare angular coarse flint.		SPT	2.0-2.45	(2,3,3,3,3,4) N= 13
				T	2.8-3.0	
3.0				SPT	3.0-3.45	(2,3,2,3,3,4) N= 12
				T	3.8-4.0	
4.0		***CHALK*** White, orange mottled CHALK with clayey matrix and rare fragments of angular coarse flint.	4.00	SPT	4.0-4.45	(4,4,7,6,3,4) N= 20
				T	4.8-5.0	
5.0		End of borehole at 5.0m.	5.00	SPT	5.0-5.45	(3,3,2,4,5,4) N= 15
6.0						

Key
B. Bulk (Bag)
W. Water
U100. 100mm Undisturbed
U38. 38mm Undisturbed Sample
SPT. Standard Penetration Test
D. Disturbed
G. Amber Glass Jar / Bottle
CPT. Cone Penetration Test
U100. Blows (Recovery mm)
V. 40ml Glass Vial
T. Plastic Tub
N. 'N' Value
HV. Hand Shear Vane
PID. Photo Ionisation Detector
S. Soil

Notes
Notes: Backfilled with arisings
Services: Prior to excavation the location was scanned with a Cable Avoidance Tool (CAT).
Groundwater: None encountered
Status: Completed

Window Sample Record

Location Number: WS105

Project Number: 20385

Contract Name: Premier Inn, Havant

Client: Simpson Associates

Consultant: W. Spraggs

Date Started: 19/11/2012

Date Completed: 19/11/2012

Elevation AOD (m): -

Co-ordinates: 469679, 106256

Drilling Equipment: Terrier Rig

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SUBSURFACE PROFILE				SAMPLES AND IN-SITU TESTING		
Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	SPT (N-Value)
		MADE GROUND Tarmac.	0.25	TGV	0.3-0.5	
		MADE GROUND Black sandy GRAVEL. Gravel of fine to coarse crushed aggregate.	0.50	TGV	0.7-0.9	
1.0		***MADE GROUND*** Yellow sandy GRAVEL. Gravel of fine to coarse rounded to sub-rounded flint with occasional chalk fragments and plastic membrane.		SPT	1.0-1.45	(4,6,4,6,5,6) N= 21
		CHALK Recovered as white, orange mottled CHALK with clayey matrix and occasional coarse angular flint.		T SPT	1.8-2.0 2.0-2.45	(10,10,9,7,8,10) N= 34
2.0			2.00			
		Borehole terminated at 2.0m with no sample recovered.				
3.0						
4.0						
5.0						
6.0						

Key

B. Bulk (Bag)
W. Water
U100. 100mm Undisturbed
U38. 38mm Undisturbed Sample
SPT. Standard Penetration Test

D. Disturbed
G. Amber Glass Jar / Bottle
CPT. Cone Penetration Test
U100. Blows (Recovery mm)
V. 40ml Glass Vial

T. Plastic Tub
N. 'N' Value
HV. Hand Shear Vane
PID. Photo Ionisation Detector
S. Soil

Notes

Notes: Backfilled with arisings. Borehole was terminated at 2.0m due unable to recover sample within Chalk.

Services: Prior to excavation the location was scanned with a Cable Avoidance Tool (CAT).

Groundwater: None encountered

Status: Completed

APPENDIX C
PROPOSED SITE PLAN

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Notes:

Proposed Parking: 137

Proposed Annexe: GEA -1275m²
GIA - 1146m²

Proposed Rooms: 88

Paving:
Buff Concrete Paver

Outline of existing restaurant

PREMIER INN EXTG GROUND FLOOR PLAN
FFL: 23.0

PREMIER INN EXTG FIRST FLOOR PLAN

2 STOREY 22 BEDROOM EXTENSION

Deliveries

1 PROPOSED SITE PLAN
Scale: 1:550

0 10 30 50 M

Rev	Date	Description	By	Chk
A	28/11/24	Updated to match landscaping scheme	IB	RW

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Client
WHITBREAD GROUP PLC

Project
PORTSMOUTH HAVANT PREMIER INN
65 BEDHAMPTON HILL
HAVANT PO9 3JN

Drawing
PROPOSED SITE PLAN

Scale	Date	Drawn	Checked
1:550@A3	26/09/24	IB	RW

Drawing No. 6261-PL- 010 **Revision** A

Status
PLANNING

APPENDIX D
DRAINAGE STRATEGY

DO NOT SCALE

LEGEND

- Trapped yard gully
- Channel drain and trapped outfall unit
- Surface water drain
- Foul water drain
- Surface water shallow inspection chamber
- Surface water inspection chamber
- Surface water catchpit
- Surface water hydrobrake chamber
- Foul water shallow inspection chamber
- Foul water inspection chamber
- Foul water manhole
- Surface water drainage to be removed
- Foul water drainage to be removed
- Exceedance flow route
- Geocellular attenuation tank
- Extent of 3m sewer easement
- Drained area
- Existing surface water sewer
- Existing foul water sewer
- Existing surface water drain
- Existing channel drain
- Existing foul water drain
- Site boundary

BUILD OVER APPLICATION TO BE APPLIED FOR GIVEN SLIGHT ENCROACHMENT INTO SEWER EASEMENT.

FOUNDATIONS FOR FRONT PORCH TO BE SET BACK TO AVOID SEWER EASEMENT.

PROPOSED CONNECTION TO EXISTING SOUTHERN WATER FOUL WATER SEWER VIA NEW MANHOLE.

EXISTING SURFACE AND FOUL WATER CONNECTIONS FROM RESTAURANT TO BE REMOVED GIVEN THAT THEY ARE OF INSUFFICIENT DIAMETER TO TAKE NEW FLOWS FROM HOTEL.

FOUL DRAINAGE SERVING EXISTING RESTAURANT TO BE REMOVED.

SOUTHERN WATER FOUL WATER SEWER SERVING OFFSITE BUILDINGS TO THE EAST TO BE RETAINED.

KLARGESTER NSBP003 BYPASS SEPERATOR TO PROVIDE TREATMENT OF CAR PARK RUNOFF. HIGH LEVEL ALARM TO BE WIRED TO MANAGERS OFFICE.

PROPOSED 14.0 x 3.5 x 1.2m DEEP GEOCELLULAR ATTENUATION TANK BY SDS TO STORE AND ATTENUATE SURFACE WATER FLOWS FOR ALL STORM RETURN PERIODS UP TO AND INCLUDING THE 1 IN 100 YEAR EVENT PLUS A 45% ALLOWANCE FOR CLIMATE CHANGE.

BASE LEVEL:	15.26
TOP LEVEL:	16.46
1 IN 100yr + 45% WATER LEVEL:	16.46
1 IN 100yr + 45% STORAGE VOLUME:	55.9m³
DRAINED AREA:	940m²

HYDROBRAKE FLOW CONTROL CHAMBER TO LIMIT FLOWS TO A MAXIMUM DISCHARGE RATE OF 1.3 l/s, BASED ON A MINIMUM ORIFICE DIAMETER OF 50mm.

PROPOSED CONNECTION TO EXISTING SOUTHERN WATER SURFACE WATER SEWER MANHOLE.

P3	UPDATED TO SUIT LLFA COMMENTS.	PB	01.06.26
P2	UPDATED TO SUIT LATEST LAYOUT AND LLFA COMMENTS.	PB	24.04.26
P1	FIRST ISSUE.	DN	04.11.24
MK	REVISION	BY	DATE

DRAWING STATUS

PRELIMINARY

DRAWING TITLE

DRAINAGE STRATEGY

PROJECT

PORTSMOUTH HAVANT
PREMIER INN
BEDHAMPTON HILL
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London, Henley-on-Thames and Gloucester

Drawn	Ch'kd	Scales	Date
DN	PB	SHOWN	NOV '24

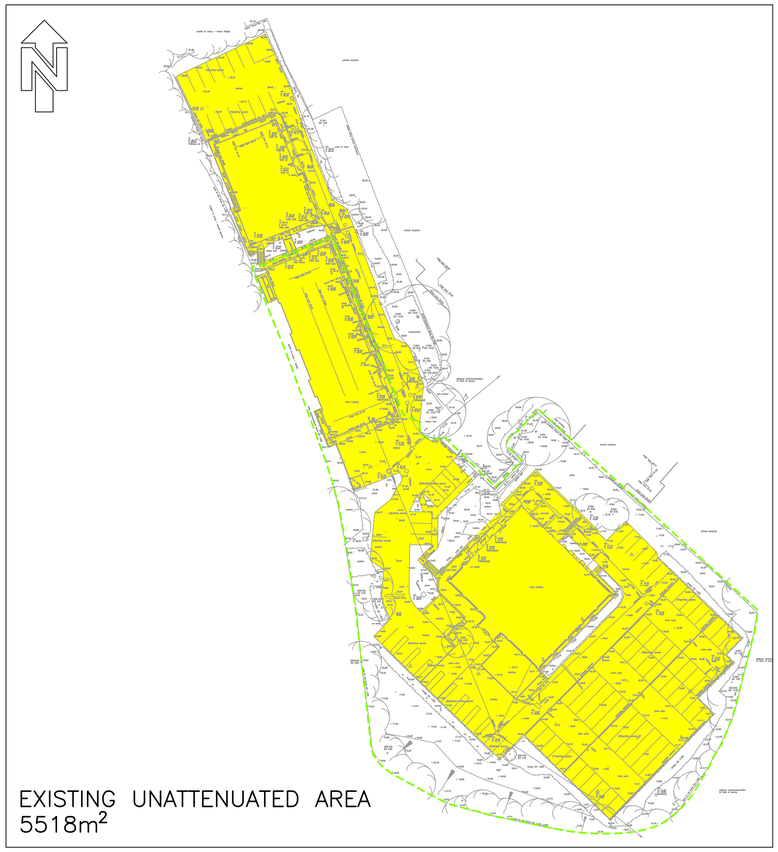
Purpose of Issue: PLANNING

Project Number	Drawing Number	Revision
P24-0399	SK01	P3

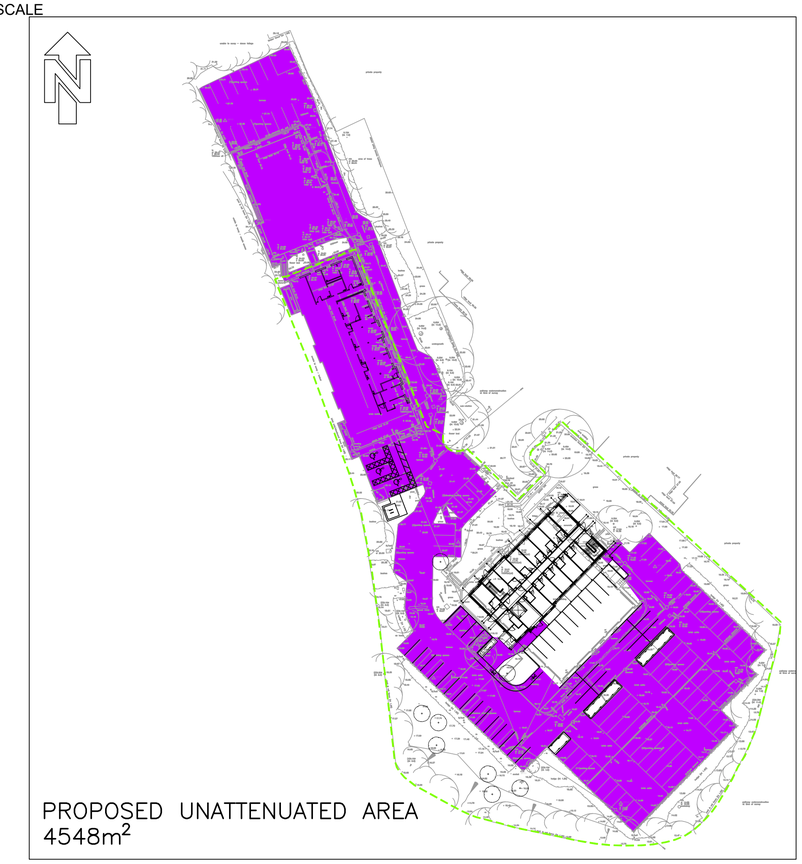
A1

APPENDIX E
AREAS LAYOUT

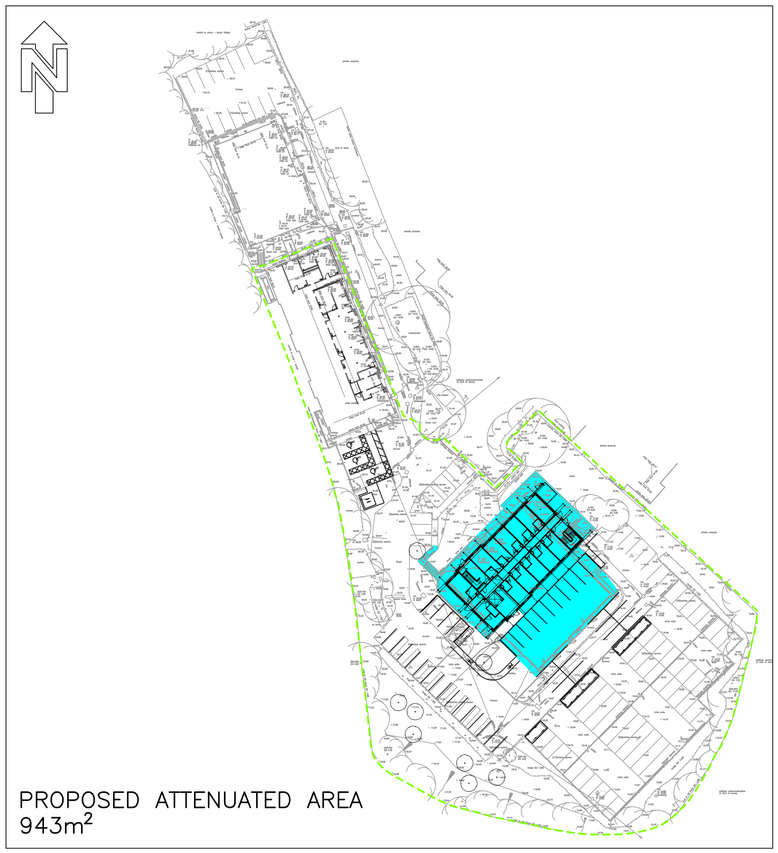
DO NOT SCALE



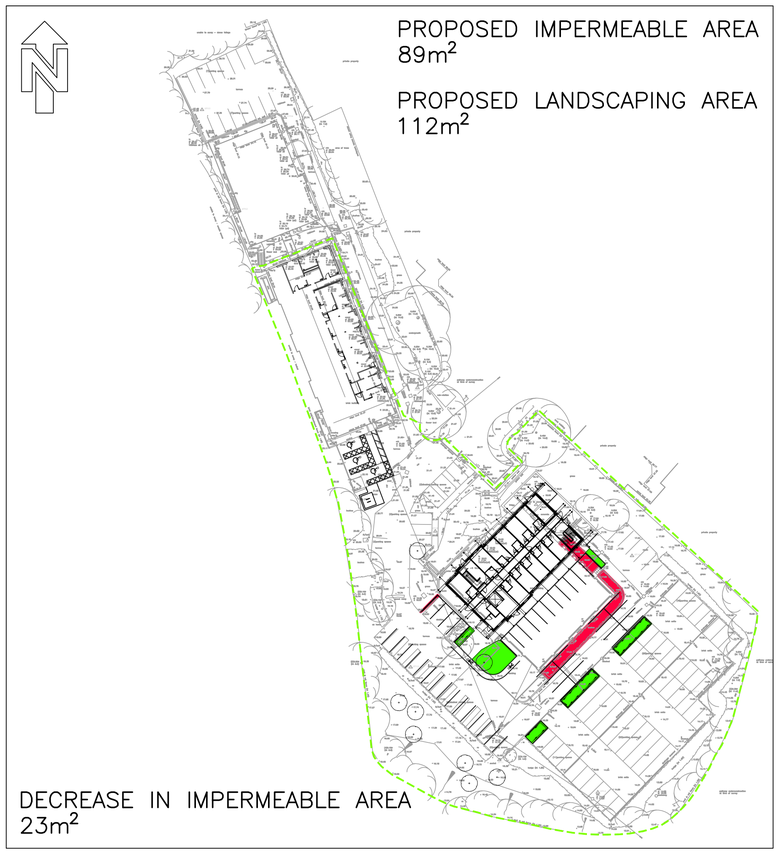
EXISTING UNATTENUATED AREA
5518m^2



PROPOSED UNATTENUATED AREA
4548m^2



PROPOSED ATTENUATED AREA
943m^2



PROPOSED IMPERMEABLE AREA
89m^2

PROPOSED LANDSCAPING AREA
112m^2

DECREASE IN IMPERMEABLE AREA
23m^2

P3	UPDATED TO SUIT LLFA COMMENTS.	PB	01.06.26
P2	UPDATED TO SUIT LATEST LAYOUT AND LLFA COMMENTS.	PB	23.04.26
P1	FIRST ISSUE.	DN	04.11.24
MK	REVISION	BY	DATE

DRAWING STATUS

PRELIMINARY

DRAWING TITLE

AREAS LAYOUT

PROJECT

PORTSMOUTH HAVANT
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London, Henley-on-Thames and Gloucester

Drawn	Ch'kd	Scales	Date
PB	AR	NTS	NOV '24

Purpose of Issue

PLANNING

Project Number	Drawing Number	Revision
P24-0399	SK02	P3

A1

APPENDIX F
GREENFIELD RUNOFF CALCULATIONS

Pre-development discharge

Site Makeup	Brownfield
Brownfield Method	Greenfield
Greenfield Method	ReFH2
FEH filename	S:\2024 Design (P24)\P24
Region	England, Wales, NI
Include Baseflow	☐
Positively Drained Area (ha)	0.552
Betterment (%)	0

OK

Cancel

Load

Calc

Note: FEH point descriptors can be downloaded from fehweb.ceh.ac.uk

Only XML file format can be used

FEH-22 is the current FEH data and this should be used for new development

ReFH2 legacy – Doesn't contain the new BFIHOST19 descriptor
ReFH2 – Contains the new BFIHOST19 descriptor

Return Period (years)	Q (l/s)
2	1.3
30	3.2
100	4.2

Pre-development discharge

Site Makeup	Brownfield
Brownfield Method	Greenfield
Greenfield Method	ReFH2
FEH filename	S:\2024 Design (P24)\P24 Load
Region	England, Wales, NI
Include Baseflow	☐
Positively Drained Area (ha)	0.552
Return Period (years)	2
Storm Duration (mins)	360
Betterment (%)	0
	Calc
Runoff Volume (m³)	17

OK

Cancel

Note: FEH point descriptors can be downloaded from fehweb.ceh.ac.uk

Only XML file format can be used

FEH-22 is the current FEH data and this should be used for new development

ReFH2 legacy – Doesn't contain the new BFIHOST19 descriptor
ReFH2 – Contains the new BFIHOST19 descriptor

Pre-development discharge

Site Makeup	Brownfield
Brownfield Method	Greenfield
Greenfield Method	ReFH2
FEH filename	S:\2024 Design (P24)\P24 Load
Region	England, Wales, NI
Include Baseflow	☐
Positively Drained Area (ha)	0.552
Return Period (years)	30
Storm Duration (mins)	360
Betterment (%)	0
	Calc
Runoff Volume (m³)	36

OK

Cancel

Note: FEH point descriptors can be downloaded from fehweb.ceh.ac.uk

Only XML file format can be used

FEH-22 is the current FEH data and this should be used for new development

ReFH2 legacy – Doesn't contain the new BFIHOST19 descriptor
ReFH2 – Contains the new BFIHOST19 descriptor

Pre-development discharge

Site Makeup	Brownfield
Brownfield Method	Greenfield
Greenfield Method	ReFH2
FEH filename	S:\2024 Design (P24)\P24
Region	England, Wales, NI
Include Baseflow	☐
Positively Drained Area (ha)	0.552
Return Period (years)	100
Storm Duration (mins)	360
Betterment (%)	0
Runoff Volume (m³)	46

OK

Cancel

Load

Note: FEH point descriptors can be downloaded from fehweb.ceh.ac.uk

Only XML file format can be used

FEH-22 is the current FEH data and this should be used for new development

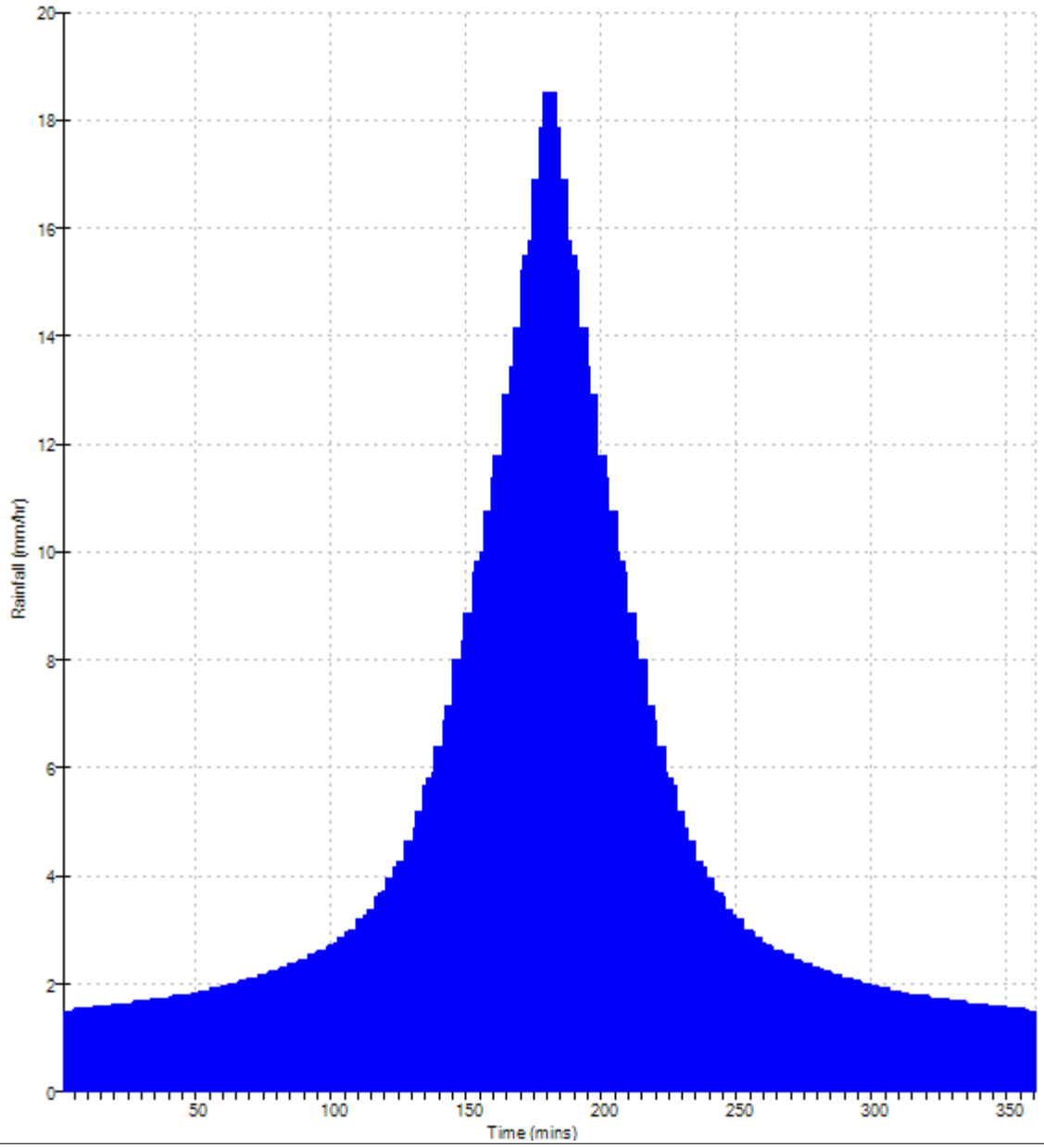
ReFH2 legacy – Doesn't contain the new BFIHOST19 descriptor
ReFH2 – Contains the new BFIHOST19 descriptor

APPENDIX G
BROWNFIELD RUNOFF CALCULATIONS

Rainfall profile

Storm duration (mins) 360

FEH Data	
FEH Rainfall Version	2013
Site Location	GB 469722 106218 SU 69722 06218
Data Type	Point
Peak Intensity (mm/hr)	18.519
Ave. Intensity (mm/hr)	4.724
Return Period (years)	2.0



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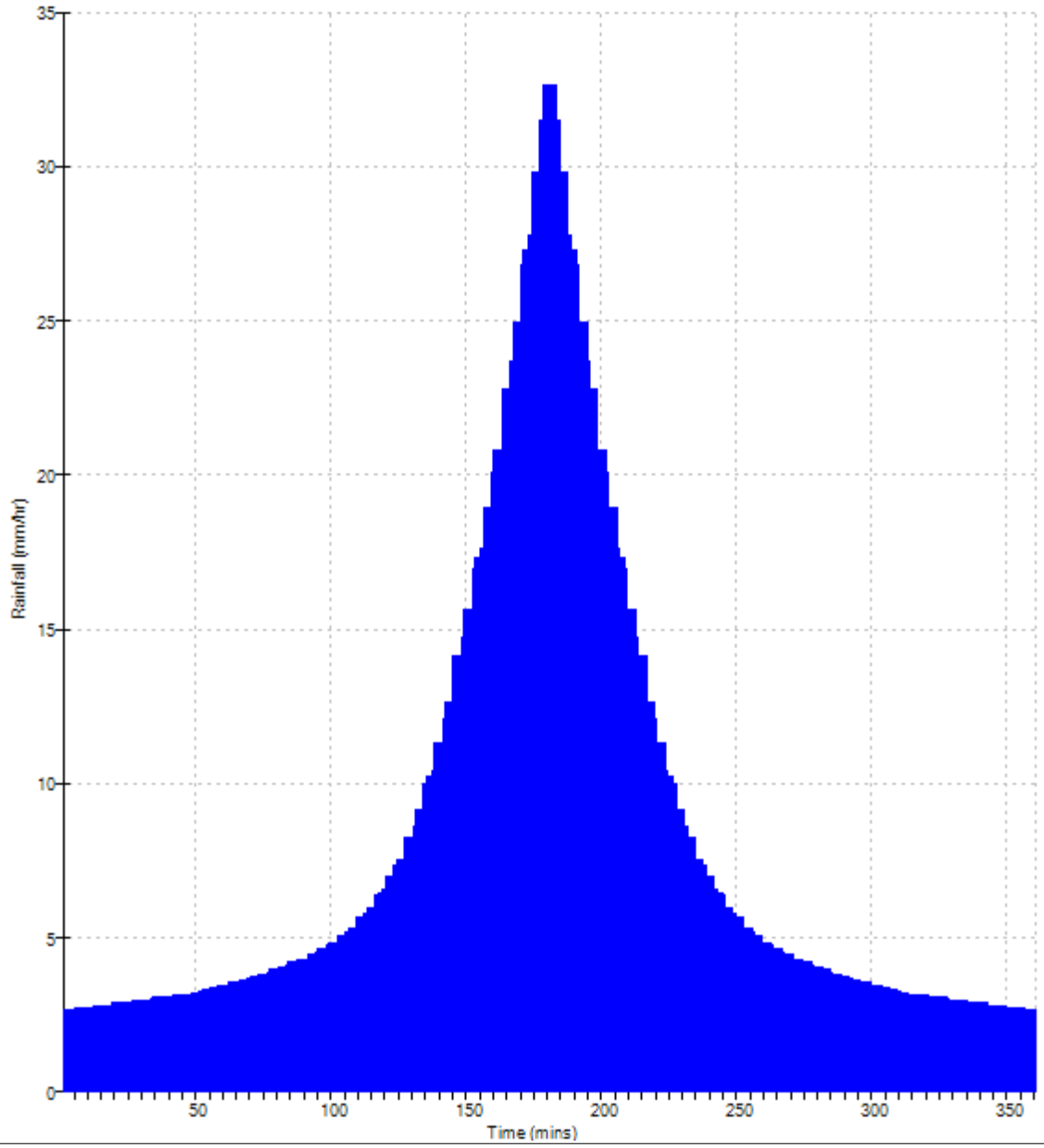
Rainfall profile

Storm duration (mins) 360

FEH Data	
FEH Rainfall Version	2013
Site Location	GB 469722 106218 SU 69722 06218
Data Type	Point
Peak Intensity (mm/hr)	32.652
Ave. Intensity (mm/hr)	8.330
Return Period (years)	30.0



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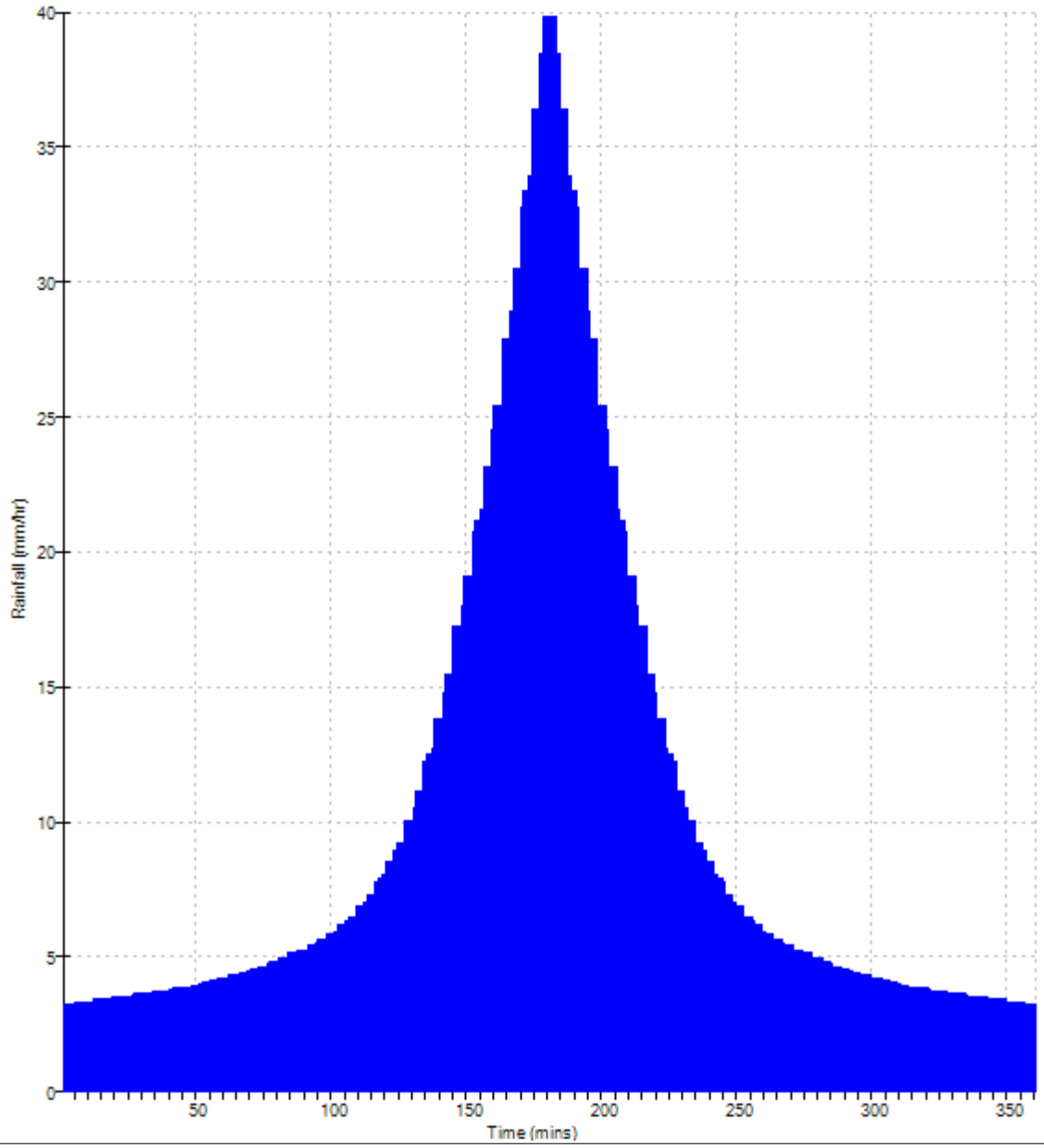
Rainfall profile

Storm duration (mins) 360

FEH Data	
FEH Rainfall Version	2013
Site Location	GB 469722 106218 SU 69722 06218
Data Type	Point
Peak Intensity (mm/hr)	39.894
Ave. Intensity (mm/hr)	10.177
Return Period (years)	100.0



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P24-0399 - PI Portsmouth Havant - Modified Rational Method Runoff Calculations

Peak Runoff Rate = 2.78 x Volume Runoff Coefficient (Cv) x Area (A) x Peak Rainfall Intensity (I_{peak})

Runoff Volume = 2.78 x Volume Runoff Coefficient (Cv) x Area (A) x Peak Rainfall Intensity (I_{avg}) x Storm Duration

Existing unattenuated area

Return Period	Cv	$I_{(peak)}$ (mm)	$I_{(ave)}$ (mm)	A (Ha)	Peak Runoff Rate (l/s)	Runoff Volume (m^3)	Rainfall Data
2	0.95	18.519	4.724	0.552	27.0	148.6	FEH
30	0.95	32.652	8.330	0.552	47.6	262.0	FEH
100	0.95	39.894	10.177	0.552	58.1	320.1	FEH
100+45%	0.95	57.846	14.757	0.552	84.3	464.1	FEH

Proposed unattenuated area

Return Period	Cv	$I_{(peak)}$ (mm)	$I_{(ave)}$ (mm)	A (Ha)	Peak Runoff Rate (l/s)	Runoff Volume (m^3)	Rainfall Data
2	0.95	18.519	4.724	0.455	22.2	122.5	FEH
30	0.95	32.652	8.330	0.455	39.2	215.9	FEH
100	0.95	39.894	10.177	0.455	47.9	263.8	FEH
100+45%	0.95	57.846	14.757	0.455	69.5	382.5	FEH

APPENDIX H
CAUSEWAY FLOW DESIGN RESULTS

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.950	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)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
S1	0.016	5.00	18.190	1200	0.820
S2	0.012	5.00	17.690	1200	0.600
S3	0.034	5.00	17.410	1200	2.150
S4			17.430	1200	2.170
S5			16.570	1200	1.490
S6	0.019	5.00	18.050	1200	0.600
S7	0.013	5.00	17.680	1200	0.600

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S1	S2	17.655	0.600	17.370	17.090	0.280	63.1	150	5.23	50.0
1.001	S2	S3	11.981	0.600	17.090	16.660	0.430	27.9	150	5.34	50.0
1.002	S3	S4	2.000	0.600	15.260	15.260	0.000	0.0	225	5.37	50.0
2.000	S6	S7	18.098	0.600	17.450	17.080	0.370	48.9	150	5.21	50.0
2.001	S7	S4	2.755	0.600	17.080	15.260	1.820	1.5	150	5.21	50.0
1.003	S4	S5	14.513	0.600	15.260	15.080	0.180	80.6	225	5.52	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.268	22.4	2.7	0.670	0.450	0.016	0.0	35	0.863
1.001	1.914	33.8	4.8	0.450	0.600	0.028	0.0	38	1.366
1.002	1.000	39.8	10.6	1.925	1.945	0.062	0.0	0	∞
2.000	1.442	25.5	3.3	0.450	0.450	0.019	0.0	36	0.991
2.001	8.257	145.9	5.5	0.450	2.020	0.032	0.0	20	3.945
1.003	1.457	57.9	16.1	1.945	1.265	0.094	0.0	81	1.255

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	✓	Check Discharge Rate(s)	x
Summer CV	0.950	Drain Down Time (mins)	1440	Check Discharge Volume	x
Winter CV	0.950	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	

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

Node S4 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	15.260	Product Number	CTL-SHE-0050-1300-1350-1300
Design Depth (m)	1.350	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.3	Min Node Diameter (mm)	1200

Node S4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	15.260
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	480

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	50.0	1.200	50.0	80.1	1.201	0.0	80.1

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Results for 2 year Critical Storm Duration. Lowest mass balance: 96.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	17.406	0.036	2.8	0.0404	0.0000	OK
15 minute summer	S2	10	17.130	0.040	4.9	0.0448	0.0000	OK
360 minute summer	S3	240	15.511	0.251	2.7	0.2836	0.0000	SURCHARGED
360 minute summer	S4	240	15.511	0.251	4.0	12.1934	0.0000	SURCHARGED
180 minute summer	S5	120	15.100	0.020	1.0	0.0000	0.0000	OK
15 minute summer	S6	10	17.491	0.041	3.3	0.0465	0.0000	OK
15 minute summer	S7	10	17.099	0.019	5.6	0.0213	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	2.8	0.803	0.124	0.0611	
15 minute summer	S2	1.001	S3	4.8	1.329	0.142	0.0434	
360 minute summer	S3	1.002	S4	2.6	0.388	0.066	0.0795	
360 minute summer	S4	1.003	S5	1.0	0.548	0.017	0.0257	23.6
15 minute summer	S6	2.000	S7	3.3	1.312	0.129	0.0469	
15 minute summer	S7	2.001	S4	5.6	3.357	0.038	0.0226	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 96.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	17.428	0.058	7.0	0.0658	0.0000	OK
15 minute summer	S2	10	17.155	0.065	12.1	0.0740	0.0000	OK
240 minute winter	S3	232	15.877	0.617	4.7	0.6973	0.0000	SURCHARGED
240 minute winter	S4	232	15.877	0.617	7.0	29.9819	0.0000	SURCHARGED
15 minute summer	S5	107	15.100	0.020	1.0	0.0000	0.0000	OK
15 minute summer	S6	10	17.518	0.068	8.3	0.0764	0.0000	OK
15 minute summer	S7	10	17.109	0.029	13.9	0.0331	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	6.9	1.013	0.309	0.1207	
15 minute summer	S2	1.001	S3	12.0	1.689	0.354	0.0850	
240 minute winter	S3	1.002	S4	4.6	0.527	0.115	0.0795	
240 minute winter	S4	1.003	S5	1.0	0.548	0.017	0.0257	40.8
15 minute summer	S6	2.000	S7	8.2	1.675	0.323	0.0915	
15 minute summer	S7	2.001	S4	13.9	3.774	0.095	0.0276	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 96.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	17.436	0.066	8.8	0.0750	0.0000	OK
15 minute summer	S2	10	17.165	0.075	15.3	0.0852	0.0000	OK
240 minute winter	S3	236	16.048	0.788	5.8	0.8917	0.0000	SURCHARGED
240 minute winter	S4	236	16.048	0.788	8.6	38.3437	0.0000	SURCHARGED
240 minute winter	S5	236	15.101	0.021	1.0	0.0000	0.0000	OK
15 minute summer	S6	10	17.527	0.077	10.4	0.0872	0.0000	OK
15 minute summer	S7	10	17.113	0.033	17.4	0.0370	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	8.7	1.066	0.389	0.1443	
15 minute summer	S2	1.001	S3	15.1	1.786	0.447	0.1015	
240 minute winter	S3	1.002	S4	5.6	0.562	0.141	0.0795	
240 minute winter	S4	1.003	S5	1.0	0.555	0.017	0.0265	50.2
15 minute summer	S6	2.000	S7	10.3	1.768	0.405	0.1081	
15 minute summer	S7	2.001	S4	17.4	3.988	0.119	0.0281	

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 96.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	17.453	0.083	12.7	0.0940	0.0000	OK
15 minute summer	S2	10	17.186	0.096	22.1	0.1086	0.0000	OK
360 minute winter	S3	344	16.643	1.383	6.2	1.5640	0.0000	SURCHARGED
360 minute winter	S4	344	16.643	1.383	9.2	58.5878	0.0000	SURCHARGED
360 minute winter	S5	344	15.103	0.023	1.3	0.0000	0.0000	OK
15 minute summer	S6	10	17.548	0.098	15.1	0.1104	0.0000	OK
15 minute summer	S7	10	17.119	0.039	25.3	0.0446	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.000	S2	12.6	1.148	0.562	0.1936	
15 minute summer	S2	1.001	S3	21.9	1.934	0.647	0.1355	
360 minute winter	S3	1.002	S4	6.0	0.543	0.151	0.0795	
360 minute winter	S4	1.003	S5	1.3	0.598	0.023	0.0318	79.4
15 minute summer	S6	2.000	S7	15.0	1.911	0.588	0.1432	
15 minute summer	S7	2.001	S4	25.2	4.215	0.173	0.0293	

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