

Harlech Court, Bute Terrace, Cardiff Drainage Strategy

Jubb

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1 Project Information

1.1 Project Information

Client Draycott Group Ltd.

1.2 Project Details

Project Name Harlech Court

Location Harlech Court, Bute Terrace, Cardiff

Jubb Project Number 24182

1.3 Report Details

No. 24182-JUB-XX-XX-RP-C-0003

Version 01

Status Issue for comment

Date 11/09/2024

1.4 Project Authorisation

Version	Date	Detail	Prepared By	Approved By
01	11/06/24	First Issue	MS	EH

2 Introduction

2.1 Instruction

Jubb have been instructed by Draycott Group Ltd. to provide drainage engineering design input in support of redevelopment of the current Harlech Court site in Cardiff.

This report sets out the principles associated with draining both surface water and foul water flows from the proposed development.

This report is for the private and confidential use of Draycott Group Ltd, to whom alone is owed a duty of care (and their professional advisors and consultants) in connection with the current development proposals for the site. This report may not be relied upon or reproduced by any third party for any use without the written agreement of Jubb Consulting Engineers Ltd.

2.2 Existing Site Address & Location

Site Address;

Harlech Court
Bute Terrace
Cardiff
CF10 2FE

The site is located south of Bute Terrace near the centre of the city of Cardiff, with the road acting as the site's north western boundary. The site is bounded by the dock feeder canal to the south east. The Alto Lusso high rise residential building is to the south west, and the Citrus hotel to the north east.

2.3 Site Description & Topography

The site is relatively flat with levels across the site varying from a high point of 8.50mAOD adjacent to Bute Terrace to a low of 7.70mAOD around the central area. The site currently sits on multiple levels with associated parking.

2.4 Proposed Development

The site is to be cleared to allow for the construction of mixed used residential development featuring apartments and commercial space at ground floor. Associated ancillary features such as bin stores and plant rooms are proposed as well.

3 Surface Water Drainage Strategy

As part of the advancement in Sustainable Drainage Systems (SuDS) design, legislature was implemented on 7th January 2019 in Wales to enforce Schedule 3 of the Flood and Water Management Act 2010. This led to the establishment of SuDS Approval Bodies (SABs) for each LLFA. In the case of this development and under requirements of the above legislature, Cardiff Council would look to review and approve any surface water drainage design proposed for the development, with the intention of adopting possible SuDS features. Any SuDS proposed would need to conform to CIRA C753, 'The SuDS Manual' and any additional guidance or information provided by the LLFA. Any drainage design previously proposed to connect to a Dwr Cymru surface water (SW) or highway asset would now be subject to a detailed application & formal approval process, prior to construction and/or communication of drainage flows from the development.

This document is not to be submitted under the SAB requirements, and a separate application with reports and supporting documents will be submitted to evidence compliance with the legislation. This document has been produced to accompany the planning application.

3.1 Existing Drainage

Existing surface water drainage information for the site is not currently available. It is anticipated that the current development surface water runoff discharges to the sewer network in Bute Terrace, however that has not yet been proven

3.2 Surface Water Drainage Strategy

The site is currently occupied by an office building and associated parking. The site is served by an existing surface water (SW) network of gullies, linear drainage channels and sewers. It is anticipated that these sewers discharge to the Dwr Cymru Welsh Water (DCWW) drainage network on Bute Terrace, or the Highways sewer. Further survey works are required to confirm the discharge point of the surface water drainage network. Approval of flows into the DCWW and Cardiff Highways sewers are required before the existing connections from site can be re-used.

Due to the extensive network of existing stormwater sewers and existing discharge points it is proposed to remove the current onsite drainage network/s up to the last sewer exiting site, to accommodate the change in the building footprint.

The discharge rate is proposed to be restricted to a brownfield discharge rate with 30% betterment. The existing 2 year return period brownfield discharge rate is calculated at 22.2 l/s, refer to Appendix C for supporting calculations. Providing a betterment of 30% on this gives a proposed discharge rate of 15.5 l/s.

Attenuation is provided for all storm events up to and including 100 years + 40% allowance for climate change. The required storage is 62.5m³ and is provided in the form of geocellular attenuation, and the stone sub-base within the rain gardens. Refer to Appendix C for the supporting calculations.

3.3 Sustainable Drainage Systems (SuDS)

Due to the constrained nature of the site there are limited options available to incorporate large SuDS features such as detention basins. Instead, a range of smaller SuDS features are to be proposed.

Approximately half of the impermeable surfacing to the ground flood is proposed to be a permeable block paving surface. The remaining impermeable surfacing, to the north of the building, will drain to the SuDS tree pits.

The bin store to the west will incorporate a roof and a green sedum roof proposed to provide water quality treatment. A plant room is required to the south of the site and the roof will drain to the nearby rain gardens.

All ground level impermeable areas will drain to SuDS features which provide interception for the first 5mm of runoff. Due to the constrained nature of the site and the height of the proposed building, it is not feasible to drain the building roof area to the nearby SuDS features and as such, no interception proposed for the main building.

A Downstream Defender is proposed prior to discharging into the drainage networks in Bute Terrace, ensuring water quality treatment for the proposed building roof.

The SuDS features described above will provide appropriate water quality treatment in line with the indices contained within the CIRIA SuDS Manual.

3.4 Exceedance Events

The proposed levels around the building are to be designed so that overland flows are directed away from doors and towards the canal wall as per existing arrangements.

For further information on flooding, refer to the Flood Consequence Assessment 24182-JUB-XX-XX-RP-C-0004.

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4 Foul Water Drainage Strategy

4.1 Existing Drainage

The proposed development will consist of amendments to the existing foul water drainage system. Further survey work is required to confirm the foul drainage discharge point, however it is anticipated to be a single point of connection to the north of the site into the 900 x 600 DCWW combined sewer within Bute Terrace.

4.2 Foul Water Drainage Strategy

The new foul water drainage system will be privately managed and designed in accordance with Part H of the Building Regulations and BS EN 752:2017. Refer to drawing 0500 in Appendix A for the foul drainage arrangements.

It is anticipated that the sewer from the existing foul connection from the development can be re-used. Contact to DCWW is required to confirm capacity within their system to accommodate the additional foul flows from the development.

Based on a total number of 350 build to rent apartment and guidance from Flows & Loads 4, the anticipated peak foul flow is estimated as 10.9 l/s, and an average flow rate of 1.8 l/s. A more detailed flow rate will be calculated once detailed floor layouts are available.

Any proposed FW connection to a DCWW Sewer will require approval under Section 106 of the WIA 1991, serving notice of intent prior to the connection and/or communication of flows to the DCWW network. If any proposed sewers are to be constructed within adopted highway or areas deemed as Public Open Space, they will be offered for adoption to DCWW under Section 104 of the WIA 1991, and a legal agreement will be required prior to their construction.

5 Summary

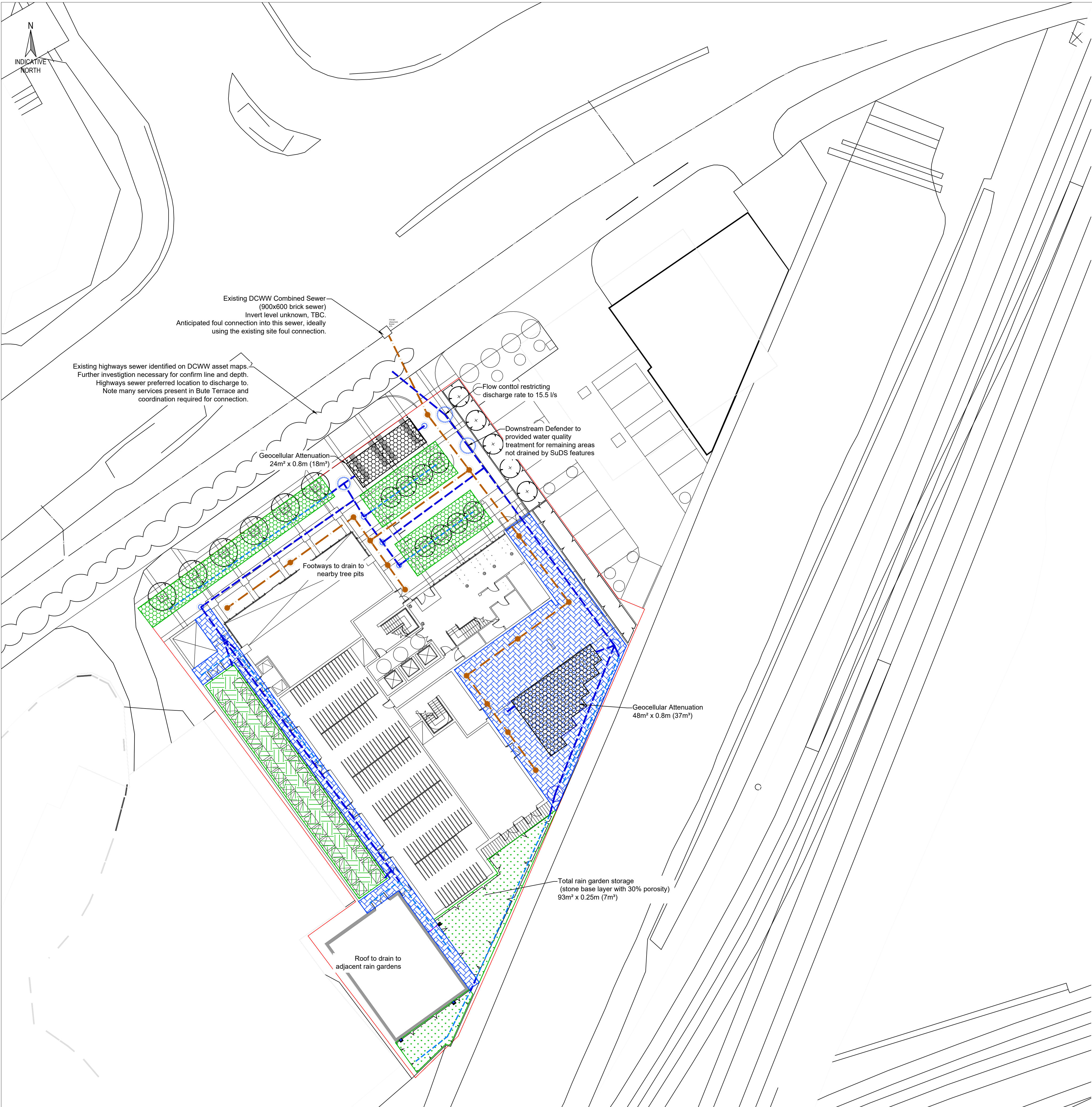
The proposed surface water strategy for the site is to discharge surface water run-off from the proposed buildings and external hardstanding areas through the existing connection to either the Highways sewer or DCWW sewer.

Water quality will be improved from the existing site arrangements. SuDS features proposed include rain gardens, a green roof, SuDS tree pits and permeable surfacing. Any flows not treated by these features will be treated by a Downstream Defender.

The foul water drainage serving the site is to drain via the existing connection into the wider DCWW network.

Both proposed surface water and foul water networks will be constructed in line with Building Regulations requirements and will be managed and maintained by the developer.

Appendix A: 24182-JUBB-XX-XX-DR-C-0500 Drainage layout



Legend	
Surface water sewer	
Foul water sewer	
Perforated pipe	
Linear channel	
Permeable paving	
Geocellular attenuation	
Green sedum roof	
Rain garden	
SuDs Tree Pit Root space	
Stone scour protection	

- Notes
- Do not scale from this drawing, use figured dimensions only. All dimensions in metres unless specified otherwise.
 - This drawing is for planning and SAB purposes only and should not be used for construction.
 - Site layout based on CWA layout received Sept 2024.
 - Existing levels based on Gwalia survey 3032-T-001. Further survey work required to determine drainage discharge points, and potentially further utility information to avoid any clashes in Bute Terrace. Approval from asset owners required for proposed discharge points.
 - Drawing to be read in conjunction with all relevant architect's engineer's and specialist drawings.
 - Any discrepancies noted on site are to be reported to the engineer immediately.
 - All drainage to be constructed in line with Building Regulations Part H, Sewers for Adoption 7th Edition & SAB requirements.
 - The specification in all respects shall be in accordance with the current Cardiff council specification.
 - MH covers and frames to conform to BSEN124, all covers to be D400.
 - Inspection chamber access to be restricted to 350Ø when depth to invert exceeds 1.2m.
 - Levels are approximate and subject to detailed level design.
 - S278 works have not been allowed for on this layout.
 - RWP locations are approximate and subject to further architectural coordination.
 - Based on Flows & Loads 4, peak foul flows calculated as 10.9 l/s, with an average flow of 1.8 l/s. Connection and acceptance of flows subject to DCWW approval. Foul drainage subject to further design one building foul design received from M&E consultants.
 - Existing 2 year return period discharge rate calculated at 22.2l/s, and proposed discharge rate of 15.5 l/s providing 30% betterment.
 - Surface water attenuation sized for all storm periods up to and including 100 years + 40% allowance for climate change.
 - Root space requirement for SuDS tree pits subject to Cardiff Council approval.

P1	11/09/24	Preliminary issue	MS	EH
Rev	Date	Description	By Apvd	

PROJECT:
HARLECH COURT

TITLE:
DRAINAGE LAYOUT

CLIENT:
HARLECH COURT LTD

SCALE@A1:
1:200


PROJECT REF:
24182
DRAWING No:
JUBB-XX-XX-DR-C-0500
REV:
P01

Revision Referencing
P = Preliminary A = Approval T = Tender C = Construction



Appendix B: Site Topographical survey


Appendix C: Outline Drainage Calculations

Project:	Date: 10/09/2024			
	Designed by:	Checked by:	Approved By:	
	MichaelStuttafo			
Report Details: Type: Inflows Summary Storm Phase: Phase		Company Address:		



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

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH: 2 years: +0 %: 30 mins: Summer	0.19	22.2	19.207


Project:	Date: 10/09/2024			
	Designed by: MichaelStuttafo	Checked by:	Approved By:	
Report Details:	Company Address:			
Type: Junctions Summary Storm Phase: Phase				



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

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Manhole	FEH: 2 years: +0 %: 30 mins: Summer	8.000	7.000	7.092	0.092	22.2	0.104	0.000	22.2	19.205	OK
Manhole (1)	FEH: 2 years: +0 %: 30 mins: Summer	8.000	6.800	6.884	0.084	22.2	0.000	0.000	22.2	19.205	OK


Project:	Date: 10/09/2024		
	Designed by: MichaelStuttafo	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		





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

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe	FEH: 2 years: +0 %: 30 mins: Summer	Pipe	Manhole	Manhole (1)	8.000	7.092	0.088	19.205	1.5	0.3	22.2	OK


Project:	Date: 10/09/2024			
	Designed by:	Checked by:	Approved By:	
	MichaelStuttafo			
Report Details: Type: Inflows Summary Storm Phase: Phase		Company Address:		



FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH: 100 years: +40 %: 30 mins: Summer	0.19	90.6	78.602

Project:	Date: 10/09/2024		
	Designed by: MichaelStuttafo	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		






FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Manhole	FEH: 100 years: +40 %: 30 mins: Summer	8.000	6.000	7.495	1.495	14.3	1.691	0.000	13.4	37.699	OK
Manhole (1)	FEH: 100 years: +40 %: 30 mins: Summer	8.000	6.200	7.549	1.349	90.6	1.525	0.000	14.3	93.598	Surcharged

Project:	Date: 10/09/2024		
	Designed by: MichaelStuttafo	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		





FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	FEH: 100 years: +40 %: 120 mins: Summer	7.067	7.067	0.767	0.767	49.1	61.341	0.000	0.000	14.4	60.576	5.484	OK

Project:	Date: 10/09/2024		
	Designed by: MichaelStuttafo	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		



FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe	FEH: 100 years: +40 %: 180 mins: Summer	Pipe	Manhole (1)	Manhole	8.000	7.031	0.150	146.991	0.9	0.52	15.2	Surcharged
Pipe (1)	FEH: 100 years: +40 %: 180 mins: Winter	Pipe	Tank	Manhole (1)	8.000	6.779	0.150	0.000	1.3	0.4	14.6	Surcharged