JODA
ENGINEERING CONSULTANTS
ESTD 1961

O'Flynn Construction Co. Unlimited Company.

LRD Old Fort Road, Ballincollig, Cork

Drainage Impact Assessment

Prepared By
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3866-JODA-02-XX-RP-C-0002

DOCUMENT CONTROL

Project Title		**LRD Old Fort Road**		
Document Title		**Site Drainage Impact Assessment**		
File Ref		**3866-JODA-02-XX-RP-C-0002**		
Suitability		**U1**	Description	**PLANNING**
Revision	Date	Comments		Author
S01	**12/06/2026**	**Planning DRAFT**		**JR**

Table of Contents

1.0 Introduction 1

2.0 Existing Site 1

3.0 Surface Water Drainage and Suds Impact Assessment 2

3.1 Existing site drainage catchments 2

3.2 Existing watercourses in the vicinity 2

4.0 Hydrogeology 3

5.0 Site Investigation 5

5.1 Borehole 15 6

5.2 Borehole 16 7

6.0 Site Geological Features 8

7.0 Drainage Strategy Overview 9

7.1 Proposed Drainage Strategy 9

7.2 Sustainable Drainage Systems (SuDS) –Overview 10

7.3 Storm Network Maintenance 12

8.0 WASTEWATER INFRASTRUCTURE 14

8.1 Existing Wastewater Infrastructure 14

8.2 Pre-Connection Enquiry Stage 14

9.0 WATER SUPPLY Infrastructure 14

9.1 Existing Water Supply Infrastructure 14

9.2 Pre-Connection Enquiry Stage 14

Appendix 1 Greenfield Run-off Rates 15

Appendix 2 Irish Water Pre-Connection 17

Appendix 3 Storm Network Results 20

1.0 Introduction

JODA Engineering Consultants was engaged by O'Flynn Construction Co. Unlimited Company to design the site infrastructure engineering services for the proposed development of 3 apartment blocks and a creche at Old Fort Road, Ballincollig, Cork City. This report has been compiled to support the planning application for these buildings.

2.0 Existing Site

The existing site is a greenfield site on Old Fort Road. Ballincollig Town Centre is located to the south of the site, Ballincollig wastewater treatment plant (WWTP) to the north and to the east is Ballincollig community Nursing Unit. The site has a high point at the south-east of the site of (+25mOD) and slopes to the north to a low point of (+17mOD) along the site boundary. There are 2 banked areas present on the site, a bank to the north of the site where levels fall from (+20mOD) to (+17mOD) and a bank at the site boundary to the west which falls from (+19.5mOD)-(+18.5mOD) to (+17.5mOD).

There is an existing storm sewer of 900DIA running from the south-east to the north-west, the pipe enters the site at a slope of 1:31.5 for 30m then increases to 1:28.6 until it exits the site.

There is an existing wastewater pipe which enters the site alongside the storm pipe, a manhole is located just inside the site boundary where the pipe turns northwards and slopes down at 1:26.7. This wastewater pipes flows to the Ballincollig wastewater treatment plant .

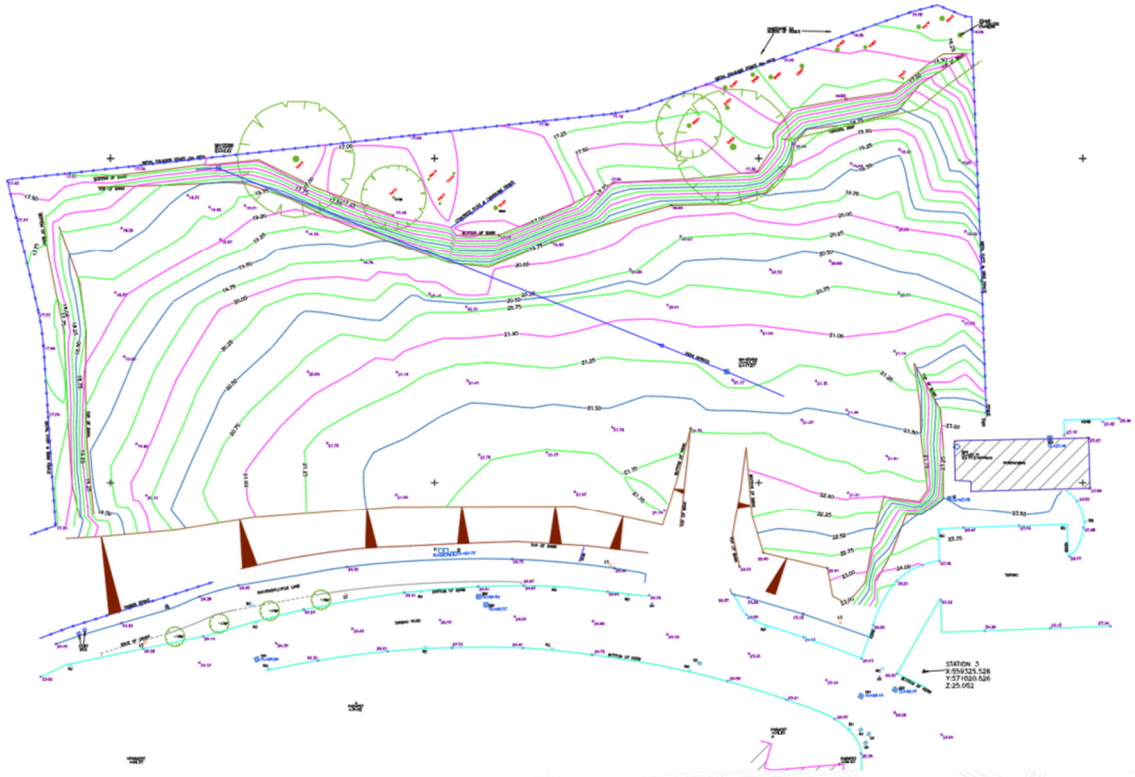


Figure 1 Existing Site

3.0 Surface Water Drainage and Suds Impact Assessment

3.1 Existing site drainage catchments

The sites topography creates one catchment for the natural surface water due to the significant slope and scale of the site. Rainfall that falls within the site will flow northwards towards the site boundary where some pooling may occur during heavy rainfalls. The run-off mainly infiltrates into the ground with some overland flow reaching the tertiary road servicing Ballincollig WWTP and Ballincollig AFC.

3.2 Existing watercourses in the vicinity

Ballincollig is located on the downstream catchment of the River Lee, which is around 500 meters from the site. A Flood Risk Assessment was undertaken for the site and was determined that there is no flooding risk, refer to report 3866-JODA-02-XX-RP-C-0003 Flood Risk Assessment.

4.0 Hydrogeology

The Geological Survey of Ireland mapping site contains information on the hydrogeology of the area.

Subsoil permeability is described (where mapped) as high, promoting infiltration.

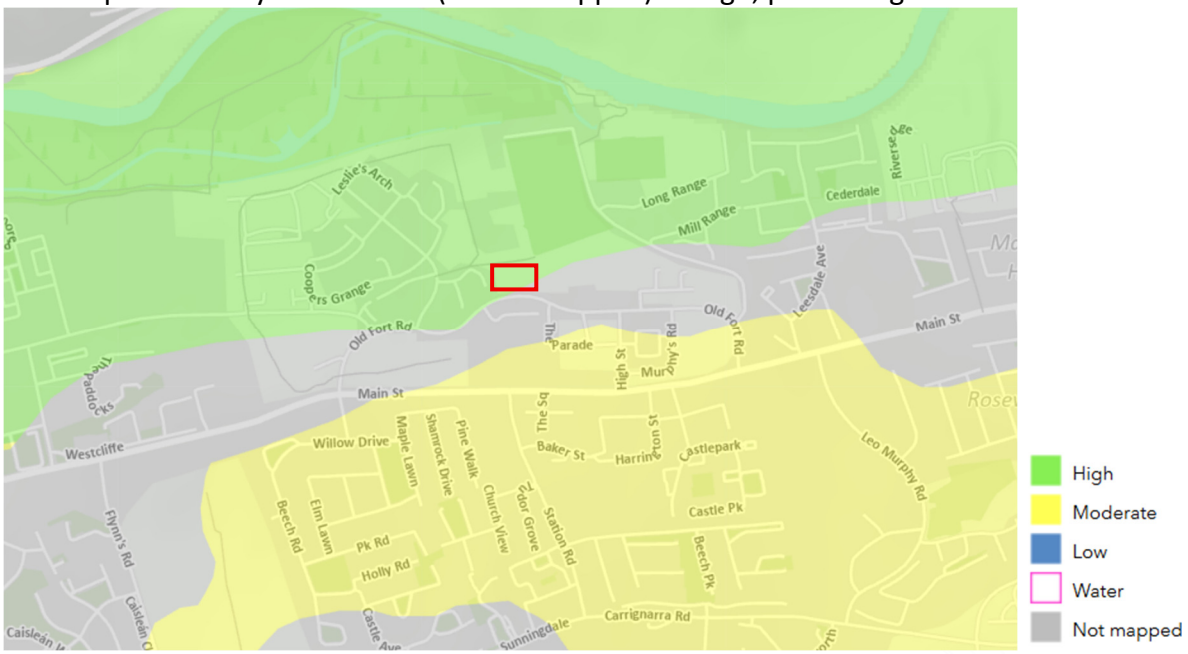


Figure 2 Subsoil permeability (Source: gsi.ie)

No groundwater springs are recorded on site or in the vicinity.

The groundwater conditions are described as follows:

Sand and Gravel Aquifer: Locally Important Gravel Aquifer

Bedrock Aquifer: Regionally Important Aquifer – Karstified (diffuse)

Groundwater Vulnerability: High risk – Boarder to Extreme

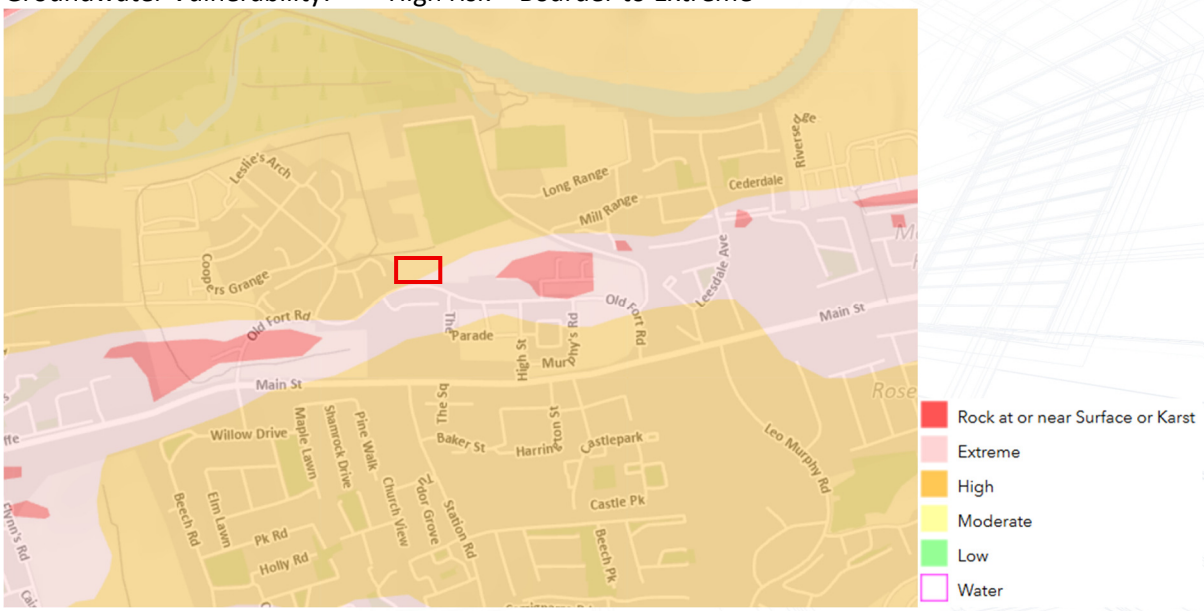


Figure 3 Groundwater vulnerability (Source: gsi.ie)

GSI defines “Vulnerability” as a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities”. The GSI further describes that the vulnerability of groundwater depends on:

- The time of travel of infiltrating water (and contaminants).
- The relative quantity of contaminants that can reach the groundwater; and
- The contaminant attenuation capacity of the geological materials through which the water and contaminants infiltrate

Firstly, the vulnerability rating for an area indicates and is a measure of the likelihood of contamination. Secondly, the vulnerability map helps to ensure that a groundwater protection scheme is not necessarily restrictive on human economic activity. Thirdly, the vulnerability map helps in the choice of preventative measures and enables developments, which have a significant potential to contaminate, to be located on areas of lower vulnerability.

5.0 Site Investigation

A series of boreholes and trial holes were formed around Ballincollig to facilitate the development of Ballincollig Town Centre. Boreholes 15&16 are located within the site boundary and accurately represent the ground build up below.

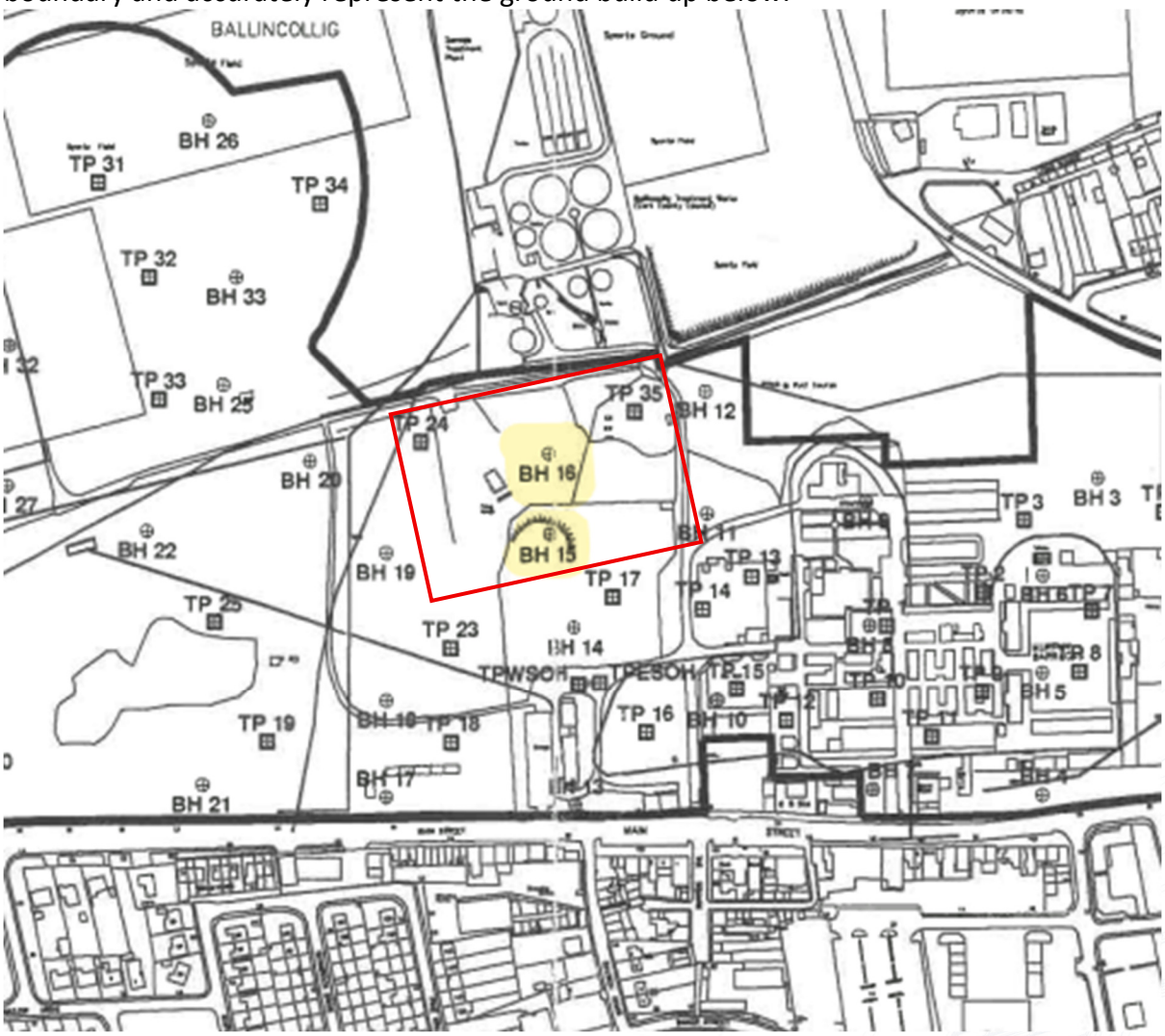
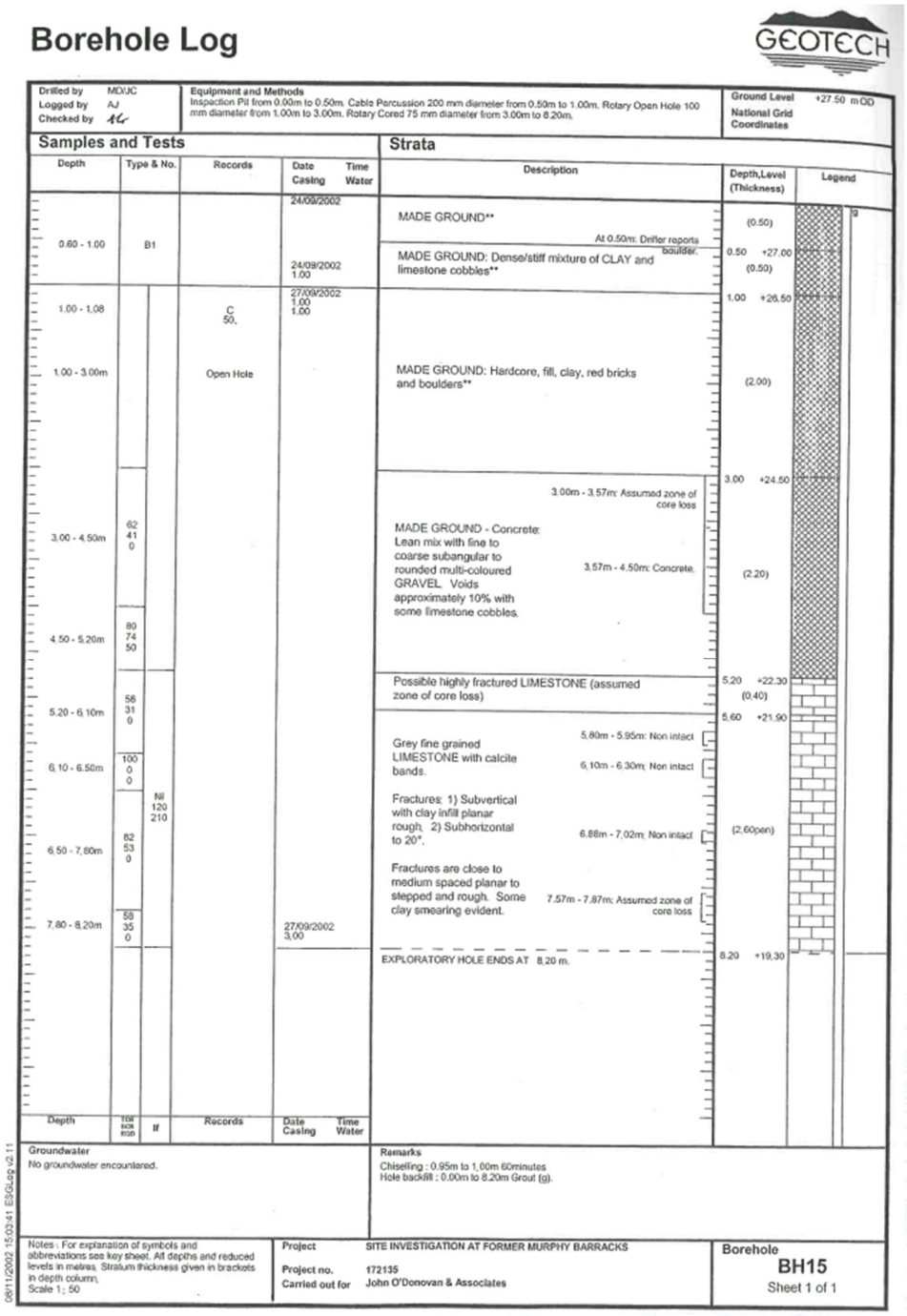


Figure 4 Borehole locations (Source: gsi.ie)

5.1 Borehole 15



Borehole Log

GEOTECH

Drilled by MD/JC
Logged by AJ
Checked by AL

Equipment and Methods
Inspection Pit from 0.00m to 0.50m. Cable Percussion 200 mm diameter from 0.50m to 1.00m. Rotary Open Hole 100 mm diameter from 1.00m to 3.00m. Rotary Cored 75 mm diameter from 3.00m to 8.20m.

Ground Level +27.50 mOD
National Grid Coordinates

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water
0.60 - 1.00	B1		24/09/2002	
			24/09/2002 1.00	
1.00 - 1.08	C 50,		27/09/2002 1.00 1.00	
1.00 - 3.00m		Open Hole		
3.00 - 4.50m	62 41 0			
4.50 - 5.20m	80 74 50			
5.20 - 6.10m	56 31 0			
6.10 - 6.50m	100 0 0			
6.50 - 7.80m	82 53 0	Nil 120 210		
7.80 - 8.20m	58 35 0		27/09/2002 3.00	

Strata

Description	Depth,Level (Thickness)	Legend
MADE GROUND** At 0.50m: Driller reports boulder.	(0.50)	
MADE GROUND: Dense/stiff mixture of CLAY and limestone cobbles**	0.50 +27.00 (0.50)	
MADE GROUND: Hardcore, fill, clay, red bricks and boulders**	1.00 +26.50 (2.00)	
3.00m - 3.57m: Assumed zone of core loss. MADE GROUND - Concrete: Lean mix with fine to coarse subangular to rounded multi-coloured GRAVEL. Voids approximately 10% with some limestone cobbles. 3.57m - 4.50m: Concrete.	3.00 +24.50 (2.20)	
Possible highly fractured LIMESTONE (assumed zone of core loss)	5.20 +22.30 (0.40)	
Grey fine grained LIMESTONE with calcite bands. 5.80m - 5.95m: Non intact. 6.10m - 6.30m: Non intact. Fractures: 1) Subvertical with clay infill planar rough. 2) Subhorizontal to 20°. 6.88m - 7.02m: Non intact. Fractures are close to medium spaced planar to stepped and rough. Some clay smearing evident. 7.57m - 7.87m: Assumed zone of core loss.	5.60 +21.90 (2.60pen)	
EXPLORATORY HOLE ENDS AT 8.20 m.	8.20 +19.30	

Groundwater
No groundwater encountered.

Remarks
Chiselling : 0.95m to 1.00m 60minutes
Hole backfill : 0.00m to 8.20m Grout (g).

Notes : For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.
Scale 1 : 50

Project SITE INVESTIGATION AT FORMER MURPHY BARRACKS
Project no. 172135
Carried out for John O'Donovan & Associates

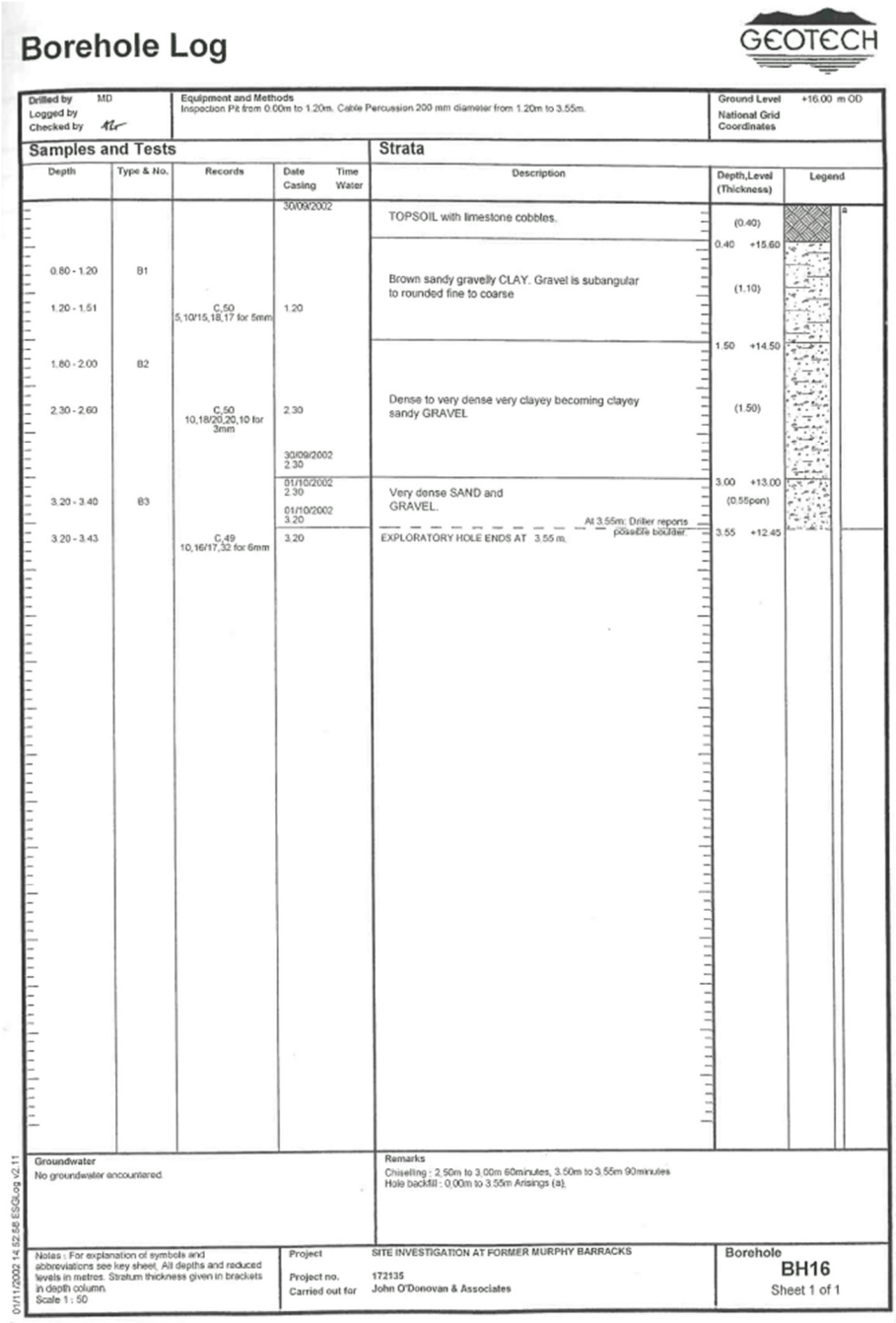
Borehole BH15
Sheet 1 of 1

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Figure 5 Bore Hole 15

Borehole 15 is located to the south of the site where made ground is present for 5.2m from the top of ground. This material is proposed to be removed for the ground floor of the apartment blocks. No groundwater was encountered in the borehole. No significant environmental contaminants were detected in the core allowing for excavated material to be moved off site and disposed of accordingly. Limestone was found below the made ground.

5.2 Borehole 16



Borehole Log

GEOTECH

Drilled by MD
Logged by
Checked by

Equipment and Methods
Inspection Pit from 0.00m to 1.20m. Cable Percussion 200 mm diameter from 1.20m to 3.55m.

Ground Level +16.00 m OD
National Grid Coordinates

Samples and Tests

Depth	Type & No.	Records	Date / Casing	Time / Water
			30/09/2002	
0.80 - 1.20	B1			
1.20 - 1.51		C,50 5,10/15,18,17 for 5mm	1.20	
1.80 - 2.00	B2			
2.30 - 2.60		C,50 10,18/20,20,10 for 3mm	2.30	
			30/09/2002 2.30	
			01/10/2002 2.39	
3.20 - 3.40	B3		01/10/2002 3.20	
3.20 - 3.43		C,49 10,16/17,32 for 6mm	3.20	

Strata

Description	Depth,Level (Thickness)	Legend
TOPSOIL with limestone cobbles.	(0.40)	
	0.40 +15.60	
Brown sandy gravelly CLAY. Gravel is subangular to rounded fine to coarse	(1.10)	
	1.50 +14.50	
Dense to very dense very clayey becoming clayey sandy GRAVEL	(1.50)	
	3.00 +13.00	
Very dense SAND and GRAVEL. At 3.55m: Driller reports possible boulder.	(0.55pen)	
EXPLORATORY HOLE ENDS AT 3.55 m.	3.55 +12.45	

Groundwater
No groundwater encountered.

Remarks
Chiselling : 2.50m to 3.00m 60minutes, 3.50m to 3.55m 90minutes
Hole backfill : 0.00m to 3.55m Arisings (a).

Notes : For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.
Scale 1 : 50

Project SITE INVESTIGATION AT FORMER MURPHY BARRACKS
Project no. 172135
Carried out for John O'Donovan & Associates

Borehole BH16
Sheet 1 of 1

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Figure 6 Bore Hole 16

Borehole 16 is located at the north end of the site where made ground is not present, there is topsoil for the first 0.4m, below topsoil is a gravelly clay layer which transitions into a clayey sandy gravel from 0.4m-3m. A very dense sand and gravel is present below 3m and is present until the core hit an expected boulder.

6.0 Site Geological Features

The site is located on Waulsortian Limestone which confirms borehole 15 where limestone was present 5.2m below surface level. Waulsortian Limestone is rich in lime mud and amenable to percolation providing that run-off is correctly treated to remove pollutants.



Figure 7 Geological Mapping of the Ballincollig Area

7.0 Drainage Strategy Overview

There is an existing 900DIA storm pipe which enters the site from the east and flows north-west and ultimately to its discharge point at the River Lee. This existing pipe will be diverted as it runs through apartment block B & C, the existing capacity of the storm pipe as it travels through the site is 3556l/s but immediately upstream of the site the gradient is ~1:350 with a flow capacity of 1061l/s. The diverted pipe has a decreased capacity from the 3556l/s due to a longer run being required to avoid the apartment blocks and existing foul pipe, the main run of the diverted pipe slopes at 1:63 and has a capacity of 2513l/s, this diversion doesn't reduce the overall capacity of the pipe run. This pipe was constructed by O Flynn Construction Company and an as built drawing was recorded to validate the pipe information.

7.1 Proposed Drainage Strategy

The drainage network was designed following the guidelines from CIRIA SuDS Manual, Greater Dublin Strategic Drainage Study (GDSDS) and Cork City Council Development Plan 2022-2028. The proposed development

The drainage scheme for the proposed development consists of blue roofs to attenuate and treat roof rainfall, percolation areas to infiltrate water and recharge groundwater, filter drains to collect and treat run-off from the pedestrian path to the west of the site, hydrocarbon separator as the last treatment measure before the run-off passes through a flow control limiting the discharged to the 1-1 year green field run-off rate of 2.3l/s then into the public storm sewer to the north-west of the site. There will be conventional road gullies, french drains, pipes and manholes to convey the run-off to the discharge manhole.

The 2 percolation areas are to be constructed with crushed rock resulting in a voids ratio of 30%, the total volume of the 2 percolation areas is 1113m^3, 334m^3 is left in free volume. The total site area including the allocated medical centre parking is approximately 13720m^2. The percolation areas provide an approximate infiltration depth across the site for the first 24mm of rainfall above the required 10mm. See appendix 3 for storm network design report.

7.2 Sustainable Drainage Systems (SuDS) –Overview

<table>
<tr><td>Relevant Studies / References</td><td>• The SuDS Manual (CIRIA C753)
• Greater Dublin Strategic Drainage Scheme (GDSDS)
• BRE Digest 365 Soakaway Design
• Cork City Council Development Plan (2022-2028)</td></tr>
<tr><td>Key Considerations & Benefits of SuDS</td><td>• Reduction of run-off rates
• Provision of water storage
• Reduction in run-off volume
• Water quality improvement
• Biodiversity</td></tr>
<tr><td>SuDS Measures Considered</td><td>JODA has given due consideration to the SuDS measures most applicable for this site.
<table>
<tr><td>Hydrocarbon Interceptor</td><td>Hydrocarbon Interceptor separates hydrocarbons and silt from surface water. This is considered to be appropriate due to the limited treatment provided to the road network catchment.</td></tr>
<tr><td>Raingarden</td><td>Raingardens are used to increase the water quality of runoff by means of filtration. Collected run off will percolate through the filter medium and infiltrate into the ground</td></tr>
<tr><td>Tree Pit</td><td>Tree pits provide similar benefits to a raingarden but requires a more robust system due to the tree roots. Tree pits provide interception, runoff quality improvement and evapotranspiration.</td></tr>
<tr><td>Rainwater Harvesting</td><td>Rainwater harvesting was not chosen due to no significant water quality improvements and no significant control of runoff during low probability events in the wintertime due to the rainwater harvesting tank being full most of the time.</td></tr>
<tr><td>Percolation Area</td><td>Percolation areas provide considerable infiltration which reduces the volume of run-off discharge to the public sewer. Percolation areas are designed to BRE Digest 365 Soakaway Design.</td></tr>
<tr><td>Attenuation Storage</td><td>Attenuation storage does not reduce the volume of run-off but reduces the discharge rate and discharge over a longer period. This provides a stable discharge.</td></tr>
<tr><td>Blue Roof</td><td>Blue roofs provide a range of benefits such as evapotranspiration which reduces run-off volumes, treats run-off improving water quality and attenuates run-off reducing the stress on downstream networks</td></tr>
<tr><td>Filter Drain</td><td>Filter drains treat run-off, removing suspended solids and hydrocarbons while infiltrating run-off</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td><table><tr><td>Filter Drain</td><td>and conveying large flows to the conventional pipe network</td></tr></table></td></tr>
<tr><td>Climate Change</td><td>Rainfall values for the proposed development are sourced from Met Eireann to calculate the input hydrograph for the drainage design. The design rainfall intensities were increased by a factor of 20% to take account of climate change.</td></tr>
<tr><td>Discharge Rate / Flow Control</td><td>The site discharge was calculated using HR Wallingford's tool "Greenfield run-off rate estimation". This calculates expected greenfield run-off rates using the IH124 method, only impermeable surfaces were contributed to the site area for the calculation. See the full Greenfield runoff rate report in Appendix 1.

Results
<table><tr><td>Method</td><td>IH124</td><td></td></tr><tr><td>Flow rate 1 year (l/s)</td><td>2.3</td><td>l/s</td></tr><tr><td>Flow rate 2 year (l/s)</td><td>2.6</td><td>l/s</td></tr><tr><td>Flow rate 10 years (l/s)</td><td>3.8</td><td>l/s</td></tr><tr><td>Flow rate 30 years (l/s)</td><td>4.5</td><td>l/s</td></tr><tr><td>Flow rate 100 years (l/s)</td><td>5.3</td><td>l/s</td></tr><tr><td>Flow rate 200 years (l/s)</td><td>5.8</td><td>l/s</td></tr></table></td></tr>
<tr><td>Biodiversity</td><td>SuDS features such as blue roofs, filter drains and raingardens boost biodiversity by providing more green area, habitats and or food sources for small fauna.</td></tr>
<tr><td>Return Period</td><td>The storm sewer network was designed to effectively manage the surface water for up to a 100-year return period with +20% climate change allowance.</td></tr>
<tr><td>Health & Safety and maintenance issues</td><td>The proposed drainage system comprises SuDS devices, traditional gullies, manholes, and underground pipes. These elements are considered acceptable from a Health & Safety perspective once supplier/manufacturers guides are followed and complied with during the detailed design, construction, and operation.</td></tr>
<tr><td>Conclusion</td><td>JODA Engineering Consultants considers that the surface water drainage design for the proposed development is acceptable. See storm network design report in appendix 3.</td></tr>
</table>

7.3 Storm Network Maintenance

SuDS features are great tools to manage and treat run-off, as SuDS features clean and treat the run-off the suspended solids and hydrocarbons remain in the SuDS feature until physically removed during maintenance intervals. Each SuDS feature will require is own unique maintenance plan. Regular inspections of SuDS features are required to minimize blockages from leaf's or other debris as well as inspecting for any issues with the SuDS features. The maintenance guides for the SuDS features are shown in the below figures.

Operation and maintenance requirements for filter drains		
Maintenance schedule	**Required action**	**Typical frequency**
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

Figure 8 Operation and Maintenance Requirements for Filter Drains

Operation and maintenance requirements for soakaways		
Maintenance schedule	**Required action**	**Typical frequency**
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

Figure 9 Operation and Maintenance Requirements for Soakaways / Percolation Areas

Operation and maintenance requirements for bioretention systems		
Maintenance schedule	**Required action**	**Typical frequency**
Regular inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly
Regular maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planting density	As required
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

Figure 10 Operation and Maintenance Requirements for Bioretention Systems (Rain Garden / Tree Pit)

Operation and maintenance requirements for green roofs		
Maintenance schedule	**Required action**	**Typical frequency**
Regular inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
	During establishment (ie year one), replace dead plants as required	Monthly (but usually responsibility of manufacturer)
	Post establishment, replace dead plants as required (where > 5% of coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

Figure 11 Operation and Maintenance Requirements for green/blue roofs

8.0 WASTEWATER INFRASTRUCTURE

8.1 Existing Wastewater Infrastructure

There is an existing 225mm wastewater gravity sewer located at the south-east corner of the site which flows north at a slope of 1:26.7 towards the Ballincollig WWTP.

8.2 Pre-Connection Enquiry Stage

A Pre-connection enquiry has been made to Uisce Éireann regarding the proposed development and a connection to the existing wastewater network. The Reference number for the enquiry is CDS25007197. Uisce Éireann has issued a Confirmation of Feasibility regarding the capacity of the existing infrastructure, a copy of which is included in Appendix 2 to this document.

9.0 WATER SUPPLY Infrastructure

9.1 Existing Water Supply Infrastructure

There is an existing 250DIA Uisce Éireann watermain on Old Forth Road supplied from the Inniscarra water supply reservoir.

9.2 Pre-Connection Enquiry Stage

A Pre-connection enquiry has been made to Uisce Éireann regarding the proposed development and a connection to the existing water supply network. The Reference number for the enquiry is CDS25007197.

Uisce Éireann has issued a Confirmation of Feasibility statement for the development, a copy of which is contained in Appendix 2 of this document.

Appendix 1 Greenfield Run-off Rates

Greenfield runoff rate estimation tool

hrwallingford www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

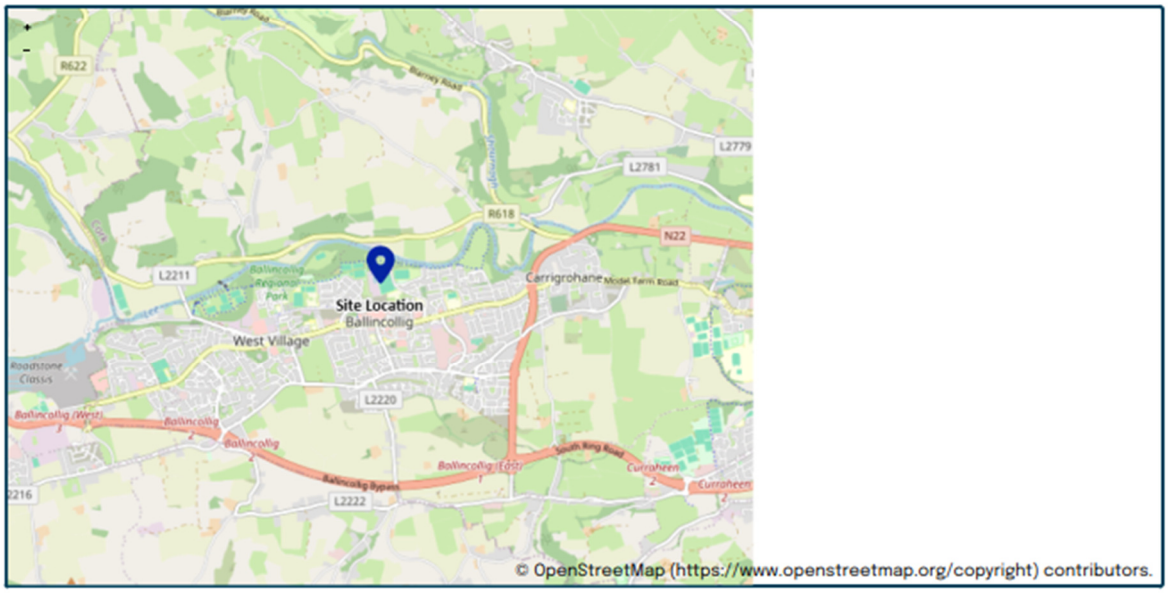
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	31/03/2026
Calculated by	Jack Ryall
Reference	3866_02
Model version	2.2.3

Location

Site name	Old Fort Road
Site location	Ballincollig



Site easting (Irish Grid)	159309
Site northing (Irish Grid)	71005
Site easting (Irish Transverse Mercator)	559268
Site northing (Irish Transverse Mercator)	571068

Site details

Total site area (ha)	0.9032 ha

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Greenfield runoff

Method

Method	IH124

IH124

	My value		Map value
SAAR (mm)	1186 mm		1186
How should SPR be derived?	WRAP soil type		
WRAP soil type	2		2
SPR	0.3		
QBar (IH124) (l/s)	2.7 l/s		

Growth curve factors

	My value		Map value
Hydrological region	13		13
1 year growth factor	0.85		
2 year growth factor	0.95		
10 year growth factor	1.4		
30 year growth factor	1.65		
100 year growth factor	1.95		
200 year growth factor	2.15		

Results

Method	IH124
Flow rate 1 year (l/s)	2.3 l/s
Flow rate 2 year (l/s)	2.6 l/s
Flow rate 10 years (l/s)	3.8 l/s
Flow rate 30 years (l/s)	4.5 l/s
Flow rate 100 years (l/s)	5.3 l/s
Flow rate 200 years (l/s)	5.8 l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

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Appendix 2 Irish Water Pre-Connection

CONFIRMATION OF FEASIBILITY

Robert O' Driscoll

Beckett House
Barrack Square
Ballincollig
Cork
P31 FK2

2 December 2025

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

Our Ref: CDS25007197 Pre-Connection Enquiry
Site at, Old Fort Road, Ballincollig, Cork City

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 160 unit(s) at Site at, Old Fort Road, Ballincollig, Cork City, (the **Development**).

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible without infrastructure upgrade by Uisce Éireann
  The proposed 150 mm dia connection DW point to the public water network should be onto the existing 250 mm water main on the public road to the South of the development on Old fort Road from Old Quarter (Ballincollig) DMA.
  The confirmation of feasibility to connect to the Uisce Éireann infrastructure does not extend to your fire flow requirements. Uisce Éireann cannot guarantee that the flow rates and residual pressures will meet the requirements of the Fire Authority.
- **Wastewater Connection** - Feasible without infrastructure upgrade by Uisce Éireann
  Please note that according to our records there is an existing sewer running through this site. It will not be permitted to build over any Uisce Éireann infrastructure. The layout of the development must ensure that this pipe is protected and adequate separation distances are provided between Uisce

Stiúrthóirí / Directors: Niall Gleeson (POF / CEO), Jerry Grant (Cathaoirleach / Chairperson), Gerard Britchfield, Liz Joyce, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Paul Reid, Michael Walsh.
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a designated activity company, limited by shares.
Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.

UE / LH / OP448 / 0323

Éireann infrastructure and any structures on site. Alternatively you may enter into a diversion agreement and divert the pipe to accommodate your development. If you wish to proceed with this option please make contact with Uisce Éireann. It will be necessary to provide a wayleave over this pipe to the benefit of Uisce Éireann and ensure that it is accessible for maintenance.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Uisce Éireann's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Uisce Éireann's network(s). This is not a connection offer and capacity in Uisce Éireann's network(s) may only be secured by entering into a connection agreement with Uisce Éireann.

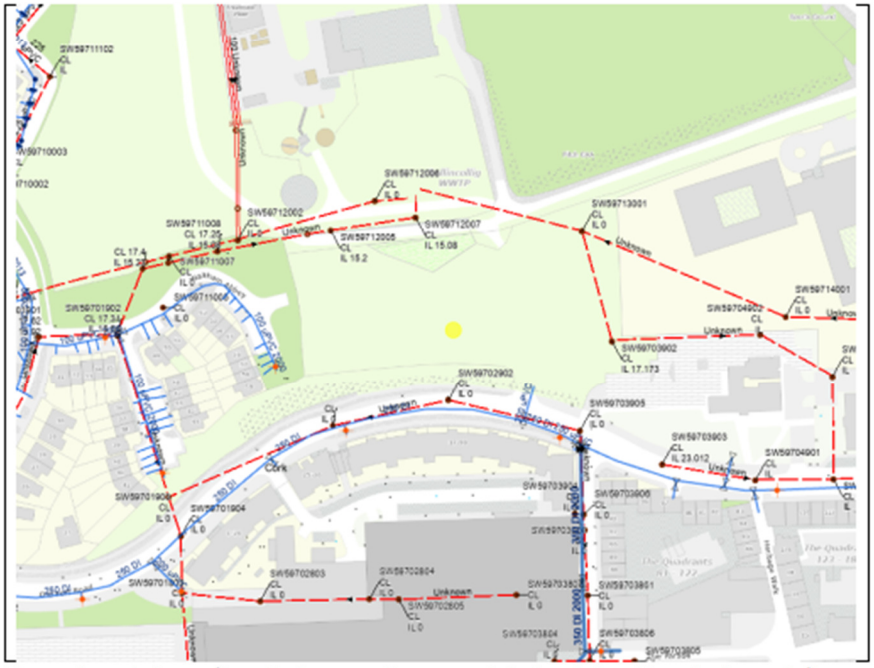
For any further information, visit **www.water.ie/connections**, **email newconnections@water.ie** or contact 1800 278 278.

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

Section B – Details of Uisce Éireann's Network(s)

The map included below outlines the current Uisce Éireann infrastructure adjacent the Development: To access Uisce Éireann Maps email datarequests@water.ie



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Note: The information provided on the included maps as to the position of Uisce Éireann's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Uisce Éireann.

Whilst every care has been taken in respect of the information on Uisce Éireann's network(s), Uisce Éireann assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Uisce Éireann's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Uisce Éireann's underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

Appendix 3 Storm Network Results

JODA ENGINEERING CONSULTANTS	JODA Engineering Consultants Ballycurreen House Ballycurreen Cork, T12 P4AY	File: 3866_02_Combined.rev8.pf Network: Storm Jack Ryall 02/04/2026	Page 1 Checker: TON Check Date: 18/12/2025

Design Settings

Rainfall Methodology	FSR
Return Period (years)	100
Additional Flow (%)	20
FSR Region	Scotland and Ireland
M5-60 (mm)	16.700
Ratio-R	0.222
CV	0.750
Time of Entry (mins)	5.00
Maximum Time of Concentration (mins)	30.00
Maximum Rainfall (mm/hr)	50.0
Minimum Velocity (m/s)	1.00
Connection Type	Level Soffits
Minimum Backdrop Height (m)	0.600
Preferred Cover Depth (m)	1.800
Include Intermediate Ground	✓
Enforce best practice design rules	✓

Nodes

Name	Area (ha)	Cover Level (m)	Depth (m)	Invert Level (m)
001	0.014	34.695	1.950	32.745
002	0.022	18.100	1.200	16.900
003	0.074	18.440	1.832	16.608
004	0.033	37.935	1.950	35.985
006	0.046	37.935	1.950	35.985
007	0.005	18.100	1.350	16.750
008	0.022	37.935	1.950	35.985
009	0.004	18.100	1.350	16.750
010	0.023	31.230	1.950	29.280
011	0.005	18.100	1.497	16.603
012	0.020	18.000	1.486	16.514
013	0.015	18.086	2.218	15.868
016	0.023	37.935	1.950	35.985
017	0.046	34.695	1.950	32.745
018	0.022	31.230	1.950	29.280
019	0.005	18.100	2.045	16.055
020	0.028	18.100	2.201	15.899
021	0.011	17.830	0.600	17.230
022	0.005	18.100	0.962	17.138
024	0.005	18.100	1.017	17.083
025	0.033	34.695	1.950	32.745
026	0.001	18.100	1.082	17.018
027		18.100	1.092	17.008
028		18.000	2.424	15.576
029		17.950	3.126	14.824
030		22.775	4.555	18.220
031		18.845	2.700	16.145
032		17.900	3.239	14.661
033		17.900	3.470	14.430

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JODA ENGINEERING CONSULTANTS ESTD 1961	JODA Engineering Consultants Ballycurreen House Ballycurreen Cork, T12 P4AY	File: 3866_02_Combined.rev8.pf Network: Storm Jack Ryall 02/04/2026	Page 2 Checker: TON Check Date: 18/12/2025

Nodes

Name	Area (ha)	Cover Level (m)	Depth (m)	Invert Level (m)
1	0.004	18.100	1.950	16.150
2	0.005	18.100	1.950	16.150
034	0.026	23.500	5.010	18.490
035	0.017	18.000	1.560	16.440
036	0.033	37.935	1.950	35.985

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
2.000	001	002	7.574	0.600	32.745	16.900	15.845	0.5	150
1.000	034	030	8.457	0.600	18.490	18.220	0.270	31.3	900
2.001	002	003	36.540	0.600	16.900	16.608	0.292	125.0	150
1.002	031	029	83.250	0.600	16.145	14.824	1.321	63.0	900
4.000	006	007	8.576	0.600	35.985	16.750	19.235	0.4	150
2.002	003	013	33.840	0.600	16.608	16.415	0.193	175.0	225
4.001	007	011	9.014	0.600	16.750	16.678	0.072	125.2	150
3.000	008	009	9.877	0.600	35.985	16.750	19.235	0.5	150
3.001	009	011	9.014	0.600	16.750	16.678	0.072	125.2	150
5.000	010	011	4.266	0.600	29.280	16.750	12.530	0.3	150
3.002	011	012	17.747	0.600	16.603	16.514	0.089	199.4	225
3.003	012	035	16.268	0.600	16.514	16.440	0.074	219.8	225
6.000	004	035	14.844	0.600	35.985	16.440	19.545	0.8	150
3.004	035	013	5.779	0.600	16.440	16.415	0.025	231.2	225
8.000	016	2	7.535	0.600	35.985	16.150	19.835	0.4	150
2.003	013	028	43.440	0.600	15.868	15.651	0.217	200.0	300
7.000	017	1	9.527	0.600	32.745	16.150	16.595	0.6	150
9.000	018	019	3.835	0.600	29.280	16.055	13.225	0.3	150

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)
2.000	14.704	259.8	2.3	1.800	1.050	0.014	0.0	10	4.598
1.000	5.608	3567.9	4.2	4.110	3.655	0.026	0.0	22	0.972
2.001	0.897	15.9	7.7	1.050	1.682	0.047	0.0	74	0.890
1.002	3.950	2512.9	4.2	1.800	2.226	0.026	0.0	27	0.769
4.000	15.225	269.0	7.5	1.800	1.200	0.046	0.0	17	6.714
2.002	0.985	39.2	25.1	1.607	1.446	0.154	0.0	131	1.045
4.001	0.897	15.8	8.2	1.200	1.272	0.050	0.0	76	0.904
3.000	14.186	250.7	3.6	1.800	1.200	0.022	0.0	13	5.090
3.001	0.897	15.8	4.2	1.200	1.272	0.026	0.0	52	0.757
5.000	17.424	307.9	3.7	1.800	1.200	0.023	0.0	11	5.861
3.002	0.922	36.7	16.9	1.272	1.261	0.104	0.0	108	0.905
3.003	0.878	34.9	20.1	1.261	1.335	0.124	0.0	123	0.908
6.000	11.662	206.1	5.4	1.800	1.410	0.033	0.0	17	5.029
3.004	0.856	34.0	28.3	1.335	1.446	0.174	0.0	157	0.954
8.000	16.495	291.5	3.7	1.800	1.800	0.023	0.0	12	5.736
2.003	1.108	78.3	62.0	1.918	2.049	0.381	0.0	202	1.224
7.000	13.416	237.1	7.4	1.800	1.800	0.046	0.0	18	6.168
9.000	18.881	333.7	3.5	1.800	1.895	0.022	0.0	11	6.132

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JODA ENGINEERING CONSULTANTS ESTD 1961	JODA Engineering Consultants Ballycurreen House Ballycurreen Cork, T12 P4AY	File: 3866_02_Combined.rev8.pf Network: Storm Jack Ryall 02/04/2026	Page 3 Checker: TON Check Date: 18/12/2025

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
7.002	019	020	23.451	0.600	16.055	15.899	0.156	150.0	225
7.003	020	028	16.679	0.600	15.899	15.726	0.173	96.4	225
11.000	036	020	15.299	0.600	35.985	15.974	20.011	0.8	150
10.000	025	020	15.321	0.600	32.745	15.974	16.771	0.9	150
12.000	021	022	18.346	0.600	17.230	17.138	0.092	199.4	500
12.001	022	027	26.079	0.600	17.138	17.008	0.130	200.6	500
12.002	027	028	8.000	0.600	17.008	15.726	1.282	6.2	225
13.000	024	026	12.934	0.600	17.083	17.018	0.065	199.0	500
2.004	028	029	2.884	0.600	15.576	15.566	0.010	300.0	375
1.003	029	032	10.311	0.600	14.824	14.661	0.163	63.3	900
13.001	026	027	2.002	0.600	17.018	17.008	0.010	200.2	500
1.001	030	031	41.764	0.600	18.220	16.145	2.075	20.1	900
1.004	032	033	6.868	0.600	14.661	14.430	0.231	29.7	900
7.001	1	019	9.000	0.600	16.150	16.055	0.095	94.7	150
8.001	2	019	9.500	0.600	16.150	16.055	0.095	100.0	150

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)
7.002	1.065	42.3	17.0	1.820	1.976	0.104	0.0	99	1.007
7.003	1.332	52.9	32.3	1.976	2.049	0.199	0.0	127	1.395
11.000	11.624	205.4	5.4	1.800	1.976	0.033	0.0	17	5.012
10.000	10.633	187.9	5.4	1.800	1.976	0.033	0.0	17	4.687
12.000	1.997	798.9	1.8	-0.200	0.162	0.011	0.0	11	0.305
12.001	1.991	796.5	2.6	0.162	0.292	0.016	0.0	14	0.357
12.002	5.271	209.6	3.6	0.867	2.049	0.022	0.0	21	2.031
13.000	1.999	799.8	0.8	0.217	0.282	0.005	0.0	7	0.228
2.004	1.041	114.9	97.8	2.049	2.009	0.601	0.0	267	1.163
1.003	3.943	2508.1	102.1	2.226	2.339	0.628	0.0	122	1.996
13.001	1.993	797.3	1.0	0.282	0.292	0.006	0.0	8	0.244
1.001	7.000	4453.0	4.2	3.655	1.800	0.026	0.0	21	1.151
1.004	5.757	3662.3	102.1	2.339	2.570	0.628	0.0	101	2.603
7.001	1.032	18.2	8.1	1.800	1.895	0.050	0.0	70	1.002
8.001	1.005	17.8	4.5	1.800	1.895	0.028	0.0	51	0.838

SuDS Carriers

Link	US Node	DS Node	Link Type	Base Inf Coef (m/hr)	Sides Inf Coef (m/hr)	Safety Factor	Time to Half Empty (mins)
12.000	021	022	FilterCarrier	0.00000	0.03600	1.0	6
12.001	022	027	FilterCarrier	0.00000	0.03600	1.0	5
13.000	024	026	FilterCarrier	0.00000	0.03600	1.0	4
13.001	026	027	FilterCarrier	0.00000	0.03600	1.0	5

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	720
M5-60 (mm)	16.700	Additional Storage (m³/ha)	0.0
Ratio-R	0.222	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x

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Simulation Settings

Check Discharge Volume x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
10	0	0	0
30	0	0	0
100	20	0	0

Node 004 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.140	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	2.0		
Invert Level (m)	35.985	Diameter (m)	0.053		

Node 001 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.140	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	4.0		
Invert Level (m)	32.745	Diameter (m)	0.077		

Node 006 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.140	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	10.0		
Invert Level (m)	35.985	Diameter (m)	0.132		

Node 010 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.140	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	2.0		
Invert Level (m)	29.280	Diameter (m)	0.053		

Node 008 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.140	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	4.0		
Invert Level (m)	35.985	Diameter (m)	0.077		

Node 016 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.140	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	4.0		
Invert Level (m)	35.985	Diameter (m)	0.077		

Node 018 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.140	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.3		
Invert Level (m)	29.280	Diameter (m)	0.042		

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Node 017 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.140	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	9.0		
Invert Level (m)	32.745	Diameter (m)	0.124		

Node 025 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.140	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.8		
Invert Level (m)	32.745	Diameter (m)	0.050		

Node 028 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	15.576	Product Number	CTL-SHE-0072-2300-1000-2300
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.3	Min Node Diameter (mm)	1200

Node 036 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.140	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	2.5		
Invert Level (m)	35.985	Diameter (m)	0.060		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	83.463	23.617
1 year 30 minute summer	59.271	16.772
1 year 60 minute summer	43.818	11.580
1 year 120 minute summer	29.827	7.882
1 year 180 minute summer	24.392	6.277
1 year 240 minute summer	20.201	5.339
1 year 360 minute summer	16.462	4.236
1 year 480 minute summer	13.606	3.596
1 year 600 minute summer	11.636	3.183
1 year 720 minute summer	10.687	2.864
1 year 960 minute summer	9.208	2.425
1 year 1440 minute summer	7.150	1.916
10 year 15 minute summer	146.322	41.404
10 year 30 minute summer	103.404	29.260
10 year 60 minute summer	75.228	19.881
10 year 120 minute summer	50.054	13.228
10 year 180 minute summer	40.272	10.363
10 year 240 minute summer	32.926	8.701
10 year 360 minute summer	26.387	6.790
10 year 480 minute summer	21.530	5.690
10 year 600 minute summer	18.130	4.959
10 year 720 minute summer	16.534	4.431
10 year 960 minute summer	14.089	3.710
10 year 1440 minute summer	10.770	2.886
30 year 15 minute summer	185.154	52.392

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Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 30 minute summer	131.837	37.305
30 year 60 minute summer	95.503	25.239
30 year 120 minute summer	62.975	16.643
30 year 180 minute summer	50.331	12.952
30 year 240 minute summer	40.940	10.819
30 year 360 minute summer	32.559	8.378
30 year 480 minute summer	26.416	6.981
30 year 600 minute summer	22.145	6.057
30 year 720 minute summer	20.122	5.393
30 year 960 minute summer	17.049	4.490
30 year 1440 minute summer	12.924	3.464
100 year +20% CC 15 minute summer	287.571	81.373
100 year +20% CC 30 minute summer	206.461	58.421
100 year +20% CC 60 minute summer	148.859	39.339
100 year +20% CC 120 minute summer	97.195	25.686
100 year +20% CC 180 minute summer	77.115	19.844
100 year +20% CC 240 minute summer	62.374	16.484
100 year +20% CC 360 minute summer	49.191	12.659
100 year +20% CC 480 minute summer	39.664	10.482
100 year +20% CC 600 minute summer	33.088	9.050
100 year +20% CC 720 minute summer	29.946	8.026
100 year +20% CC 960 minute summer	25.215	6.640
100 year +20% CC 1440 minute summer	18.940	5.076

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JODA ENGINEERING CONSULTANTS ESTD 1961	JODA Engineering Consultants Ballycurreen House Ballycurreen Cork, T12 P4AY	File: 3866_02_Combined.rev8.pf Network: Storm Jack Ryall 02/04/2026	Page 7 Checker: TON Check Date: 18/12/2025

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	001	20	32.789	0.044	1.4	0.3161	0.0000	OK
30 minute summer	002	19	16.944	0.044	3.1	0.0500	0.0000	OK
30 minute summer	2.001:50%	19	16.806	0.052	4.1	0.0000	0.0000	OK
30 minute summer	003	19	16.684	0.076	9.4	0.0859	0.0000	OK
30 minute summer	2.002:50%	19	16.600	0.088	12.4	0.1088	0.0000	OK
180 minute summer	004	112	36.028	0.043	1.6	2.4804	0.0000	OK
60 minute summer	006	38	36.035	0.050	3.8	1.7779	0.0000	OK
60 minute summer	007	36	16.790	0.040	2.4	0.0458	0.0000	OK
60 minute summer	008	37	36.031	0.046	1.8	0.7877	0.0000	OK
60 minute summer	009	36	16.780	0.030	1.3	0.0336	0.0000	OK
240 minute summer	010	140	29.318	0.038	1.0	1.4896	0.0000	OK
60 minute summer	011	37	16.656	0.053	4.4	0.0597	0.0000	OK
1440 minute summer	012	1080	14.794	-1.720	1.9	28.1398	0.0000	OK
30 minute summer	013	21	16.035	0.167	15.5	0.1891	0.0000	OK
30 minute summer	2.003:50%	21	16.031	0.272	17.6	0.8101	0.0000	OK
60 minute summer	016	37	36.033	0.048	1.9	0.8251	0.0000	OK
60 minute summer	017	38	32.797	0.052	3.7	1.7905	0.0000	OK
180 minute summer	018	112	29.320	0.040	1.0	1.5490	0.0000	OK
60 minute summer	019	37	16.104	0.049	4.4	0.0557	0.0000	OK
960 minute summer	020	840	14.174	-1.725	6.1	57.4094	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)
30 minute summer	001	2.000	002	1.0	0.612	0.004	0.0175	
30 minute summer	002	2.001	2.001:50%	3.0	0.624	0.190	0.0885	
30 minute summer	002	2.001	003	4.1	0.574	0.256	0.1307	
30 minute summer	003	2.002	2.002:50%	9.3	0.718	0.239	0.2217	
30 minute summer	003	2.002	013	12.4	0.871	0.316	0.2400	
180 minute summer	004	6.000	035	0.7	0.663	0.003	0.0209	
60 minute summer	006	4.000	007	2.1	1.109	0.008	0.0184	
60 minute summer	007	4.001	011	2.4	0.632	0.149	0.0336	
60 minute summer	008	3.000	009	1.1	0.891	0.004	0.0137	
60 minute summer	009	3.001	011	1.3	0.535	0.082	0.0218	
240 minute summer	010	5.000	011	0.6	3.360	0.002	0.0007	
60 minute summer	011	3.002	012	4.4	0.623	0.119	0.1242	
1440 minute summer	012	3.003	035	0.0	0.000	0.000	0.0176	
1440 minute summer	012	Infiltration		0.3				
30 minute summer	013	2.003	2.003:50%	14.9	0.605	0.190	1.1673	
30 minute summer	013	2.003	028	15.9	0.480	0.202	1.4939	
60 minute summer	016	8.000	2	1.2	0.996	0.004	0.0101	
60 minute summer	017	7.000	1	2.1	1.229	0.009	0.0181	
180 minute summer	018	9.000	019	0.5	0.386	0.001	0.0088	
60 minute summer	019	7.002	020	4.3	0.684	0.102	0.1481	
960 minute summer	020	7.003	028	-2.8	-0.123	-0.052	0.3568	
960 minute summer	020	Infiltration		0.5				

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Results for 1 year Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	021	11	17.238	0.008	1.1	0.0000	0.0000	OK
15 minute summer	022	11	17.148	0.010	1.6	0.0000	0.0000	OK
30 minute summer	024	19	17.088	0.005	0.5	0.0000	0.0000	OK
240 minute summer	025	144	32.789	0.044	1.4	2.5286	0.0000	OK
30 minute summer	026	19	17.024	0.006	0.6	0.0000	0.0000	OK
30 minute summer	027	19	17.024	0.016	2.2	0.0000	0.0000	OK
30 minute summer	028	21	16.028	0.452	17.9	0.6465	0.0000	SURCHARGED
30 minute summer	029	20	14.854	0.030	4.7	0.0768	0.0000	OK
15 minute summer	030	11	18.237	0.017	2.7	0.0443	0.0000	OK
30 minute summer	031	20	16.167	0.022	2.6	0.0549	0.0000	OK
30 minute summer	032	20	14.686	0.025	4.6	0.0639	0.0000	OK
30 minute summer	033	21	14.454	0.024	4.6	0.0000	0.0000	OK
60 minute summer	1	38	16.186	0.036	2.3	0.0411	0.0000	OK
60 minute summer	2	37	16.179	0.029	1.5	0.0329	0.0000	OK
15 minute summer	034	10	18.510	0.020	2.7	0.0515	0.0000	OK
30 minute summer	035	19	16.477	0.037	1.9	0.0419	0.0000	OK
360 minute summer	036	216	36.020	0.035	1.1	2.8764	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	021	12.000	022	1.1	0.242	0.001	0.0867	
15 minute summer	022	12.001	027	1.6	0.237	0.002	0.1721	
15 minute summer	022	Infiltration (12.000)		0.0				
30 minute summer	024	13.000	026	0.5	0.181	0.001	0.0371	
240 minute summer	025	10.000	020	0.7	2.475	0.004	0.0041	
30 minute summer	026	13.001	027	0.6	0.113	0.001	0.0112	
30 minute summer	026	Infiltration (13.000)		0.0				
30 minute summer	027	12.002	028	2.1	0.934	0.010	0.1641	
30 minute summer	027	Infiltration (13.001)		0.0				
30 minute summer	027	Infiltration (12.001)		0.0				
30 minute summer	028	2.004	029	2.3	0.432	0.020	0.0153	
30 minute summer	029	1.003	032	4.6	0.844	0.002	0.0565	
15 minute summer	030	1.001	031	2.6	0.945	0.001	0.1276	
30 minute summer	031	1.002	029	2.4	0.490	0.001	0.4132	
30 minute summer	032	1.004	033	4.6	1.013	0.001	0.0311	10.3
60 minute summer	1	7.001	019	2.3	0.556	0.126	0.0374	
60 minute summer	2	8.001	019	1.5	0.405	0.082	0.0353	
15 minute summer	034	1.000	030	2.7	0.903	0.001	0.0250	
30 minute summer	035	3.004	013	1.9	0.462	0.055	0.0233	
360 minute summer	036	11.000	020	0.6	2.524	0.003	0.0034	

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JODA ENGINEERING CONSULTANTS ESTD 1961	JODA Engineering Consultants Ballycurreen House Ballycurreen Cork, T12 P4AY	File: 3866_02_Combined.rev8.pf Network: Storm Jack Ryall 02/04/2026	Page 9 Checker: TON Check Date: 18/12/2025

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	001	20	32.812	0.067	2.4	0.4769	0.0000	OK
30 minute summer	002	18	16.961	0.061	5.5	0.0689	0.0000	OK
15 minute summer	2.001:50%	11	16.825	0.071	7.3	0.0000	0.0000	OK
30 minute summer	003	19	16.713	0.105	16.6	0.1193	0.0000	OK
30 minute summer	2.002:50%	19	16.634	0.123	21.7	0.2110	0.0000	OK
180 minute summer	004	112	36.051	0.066	2.6	3.8019	0.0000	OK
60 minute summer	006	37	36.062	0.077	6.4	2.7258	0.0000	OK
60 minute summer	007	37	16.807	0.057	4.5	0.0650	0.0000	OK
30 minute summer	008	21	36.055	0.070	3.8	1.2105	0.0000	OK
30 minute summer	009	21	16.792	0.042	2.5	0.0472	0.0000	OK
120 minute summer	010	74	29.338	0.058	2.3	2.2604	0.0000	OK
60 minute summer	011	36	16.676	0.073	8.3	0.0831	0.0000	OK
1440 minute summer	012	1110	15.105	-1.409	2.7	43.9193	0.0000	OK
30 minute summer	013	20	16.173	0.305	27.4	0.3450	0.0000	SURCHARGED
30 minute summer	2.003:50%	20	16.159	0.400	32.8	1.7505	0.0000	SURCHARGED
30 minute summer	016	21	36.058	0.073	4.0	1.2499	0.0000	OK
60 minute summer	017	37	32.825	0.080	6.4	2.7564	0.0000	OK
180 minute summer	018	112	29.343	0.063	1.7	2.4727	0.0000	OK
60 minute summer	019	36	16.124	0.069	8.2	0.0775	0.0000	OK
1440 minute summer	020	1050	14.728	-1.171	7.8	103.2604	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)
30 minute summer	001	2.000	002	1.9	0.728	0.007	0.0270	
30 minute summer	002	2.001	2.001:50%	5.4	0.730	0.343	0.1363	
30 minute summer	002	2.001	003	7.3	0.681	0.460	0.1960	
30 minute summer	003	2.002	2.002:50%	16.5	0.824	0.422	0.3414	
30 minute summer	003	2.002	013	21.7	1.005	0.554	0.3657	
180 minute summer	004	6.000	035	1.2	0.789	0.006	0.0320	
60 minute summer	006	4.000	007	4.1	1.304	0.015	0.0298	
60 minute summer	007	4.001	011	4.5	0.751	0.284	0.0540	
30 minute summer	008	3.000	009	2.1	1.043	0.008	0.0222	
30 minute summer	009	3.001	011	2.5	0.642	0.158	0.0351	
120 minute summer	010	5.000	011	1.0	3.989	0.003	0.0011	
60 minute summer	011	3.002	012	8.3	0.746	0.225	0.1966	
1440 minute summer	012	3.003	035	0.0	0.000	0.000	0.0226	
1440 minute summer	012	Infiltration		0.5				
30 minute summer	013	2.003	2.003:50%	26.8	0.597	0.342	1.5295	
30 minute summer	013	2.003	028	30.9	0.491	0.394	1.5295	
30 minute summer	016	8.000	2	2.2	1.203	0.007	0.0157	
60 minute summer	017	7.000	1	4.0	1.403	0.017	0.0300	
180 minute summer	018	9.000	019	0.8	0.502	0.002	0.0128	
60 minute summer	019	7.002	020	8.2	0.816	0.193	0.2344	
1440 minute summer	020	7.003	028	-3.7	-0.156	-0.070	0.3699	
1440 minute summer	020	Infiltration		0.9				

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Results for 10 year Critical Storm Duration. Lowest mass balance: 99.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	021	10	17.242	0.012	2.0	0.0000	0.0000	OK
15 minute summer	022	11	17.153	0.015	2.9	0.0000	0.0000	OK
15 minute summer	024	11	17.090	0.007	0.9	0.0000	0.0000	OK
180 minute summer	025	112	32.813	0.068	2.6	3.9238	0.0000	OK
15 minute summer	026	11	17.029	0.011	1.1	0.0000	0.0000	OK
15 minute summer	027	11	17.029	0.021	3.8	0.0000	0.0000	OK
30 minute summer	028	20	16.140	0.564	34.2	0.8068	0.0000	SURCHARGED
15 minute summer	029	12	14.859	0.035	6.5	0.0895	0.0000	OK
15 minute summer	030	11	18.242	0.022	4.7	0.0569	0.0000	OK
15 minute summer	031	12	16.173	0.028	4.6	0.0711	0.0000	OK
15 minute summer	032	13	14.690	0.029	6.4	0.0744	0.0000	OK
15 minute summer	033	13	14.458	0.028	6.4	0.0000	0.0000	OK
60 minute summer	1	37	16.203	0.053	4.4	0.0595	0.0000	OK
30 minute summer	2	20	16.190	0.040	2.7	0.0449	0.0000	OK
15 minute summer	034	10	18.516	0.026	4.7	0.0660	0.0000	OK
30 minute summer	035	19	16.490	0.050	3.4	0.0569	0.0000	OK
180 minute summer	036	116	36.037	0.052	2.6	4.2709	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	021	12.000	022	2.0	0.296	0.002	0.1235	
15 minute summer	022	12.001	027	2.8	0.313	0.004	0.2350	
15 minute summer	022	Infiltration (12.000)		0.0				
15 minute summer	024	13.000	026	0.9	0.231	0.001	0.0596	
180 minute summer	025	10.000	020	1.1	2.852	0.006	0.0058	
15 minute summer	026	13.001	027	1.0	0.133	0.001	0.0160	
15 minute summer	026	Infiltration (13.000)		0.0				
15 minute summer	027	12.002	028	3.8	0.866	0.018	0.1665	
15 minute summer	027	Infiltration (13.001)		0.0				
15 minute summer	027	Infiltration (12.001)		0.0				
30 minute summer	028	2.004	029	2.3	0.432	0.020	0.0153	
15 minute summer	029	1.003	032	6.4	0.926	0.003	0.0714	
15 minute summer	030	1.001	031	4.6	1.108	0.001	0.1960	
15 minute summer	031	1.002	029	4.3	0.654	0.002	0.5600	
15 minute summer	032	1.004	033	6.4	1.116	0.002	0.0392	9.9
60 minute summer	1	7.001	019	4.4	0.665	0.242	0.0599	
30 minute summer	2	8.001	019	2.7	0.494	0.154	0.0543	
15 minute summer	034	1.000	030	4.7	1.058	0.001	0.0374	
30 minute summer	035	3.004	013	3.4	0.540	0.099	0.0362	
180 minute summer	036	11.000	020	1.0	2.987	0.005	0.0052	

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JODA ENGINEERING CONSULTANTS ESTD 1961	JODA Engineering Consultants Ballycurreen House Ballycurreen Cork, T12 P4AY	File: 3866_02_Combined.rev8.pf Network: Storm Jack Ryall 02/04/2026	Page 11 Checker: TON Check Date: 18/12/2025

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	001	20	32.825	0.080	3.1	0.5695	0.0000	OK
30 minute summer	002	18	16.971	0.071	7.2	0.0806	0.0000	OK
30 minute summer	2.001:50%	19	16.837	0.083	9.6	0.0000	0.0000	OK
30 minute summer	003	19	16.732	0.124	21.4	0.1400	0.0000	OK
30 minute summer	2.002:50%	19	16.656	0.144	27.9	0.2932	0.0000	OK
120 minute summer	004	78	36.066	0.081	4.1	4.6991	0.0000	OK
60 minute summer	006	37	36.078	0.093	8.2	3.2846	0.0000	OK
60 minute summer	007	36	16.818	0.068	6.0	0.0764	0.0000	OK
30 minute summer	008	21	36.070	0.085	4.8	1.4699	0.0000	OK
30 minute summer	009	20	16.798	0.048	3.3	0.0545	0.0000	OK
120 minute summer	010	76	29.352	0.072	2.9	2.8201	0.0000	OK
60 minute summer	011	36	16.688	0.085	10.9	0.0966	0.0000	OK
1440 minute summer	012	1050	15.277	-1.237	3.2	52.6184	0.0000	OK
30 minute summer	013	20	16.259	0.391	35.3	0.4426	0.0000	SURCHARGED
30 minute summer	2.003:50%	20	16.236	0.477	42.4	2.4896	0.0000	SURCHARGED
30 minute summer	016	21	36.074	0.089	5.1	1.5387	0.0000	OK
60 minute summer	017	37	32.841	0.096	8.2	3.3184	0.0000	OK
180 minute summer	018	112	29.358	0.078	2.1	3.0541	0.0000	OK
30 minute summer	019	21	16.134	0.079	10.7	0.0894	0.0000	OK
1440 minute summer	020	1020	15.087	-0.812	10.1	132.9990	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)
30 minute summer	001	2.000	002	2.5	0.774	0.010	0.0331	
30 minute summer	002	2.001	2.001:50%	7.1	0.778	0.448	0.1669	
30 minute summer	002	2.001	003	9.5	0.740	0.598	0.2336	
30 minute summer	003	2.002	2.002:50%	21.3	0.868	0.545	0.4168	
30 minute summer	003	2.002	013	27.9	1.062	0.712	0.4442	
120 minute summer	004	6.000	035	1.4	0.830	0.007	0.0401	
60 minute summer	006	4.000	007	5.4	1.386	0.020	0.0368	
60 minute summer	007	4.001	011	6.0	0.806	0.376	0.0666	
30 minute summer	008	3.000	009	2.7	1.129	0.011	0.0269	
30 minute summer	009	3.001	011	3.3	0.690	0.206	0.0426	
120 minute summer	010	5.000	011	1.3	4.199	0.004	0.0013	
60 minute summer	011	3.002	012	10.9	0.805	0.298	0.2413	
1440 minute summer	012	3.003	035	0.0	0.000	0.000	0.0268	
1440 minute summer	012	Infiltration		0.5				
30 minute summer	013	2.003	2.003:50%	34.8	0.597	0.445	1.5295	
30 minute summer	013	2.003	028	39.8	0.566	0.509	1.5295	
30 minute summer	016	8.000	2	2.8	1.306	0.010	0.0190	
60 minute summer	017	7.000	1	5.3	1.485	0.023	0.0374	
180 minute summer	018	9.000	019	0.9	0.536	0.003	0.0149	
30 minute summer	019	7.002	020	10.7	0.878	0.252	0.2848	
1440 minute summer	020	7.003	028	-5.1	-0.198	-0.096	0.3815	
1440 minute summer	020	Infiltration		1.1				

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.88%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	021	10	17.244	0.014	2.5	0.0000	0.0000	OK
15 minute summer	022	11	17.155	0.017	3.7	0.0000	0.0000	OK
15 minute summer	024	11	17.091	0.008	1.1	0.0000	0.0000	OK
120 minute summer	025	80	32.829	0.084	4.1	4.8357	0.0000	OK
15 minute summer	026	11	17.032	0.014	1.3	0.0000	0.0000	OK
15 minute summer	027	11	17.032	0.024	4.9	0.0000	0.0000	OK
30 minute summer	028	20	16.204	0.628	44.1	0.8980	0.0000	SURCHARGED
15 minute summer	029	12	14.862	0.038	7.6	0.0961	0.0000	OK
30 minute summer	030	18	18.245	0.025	5.8	0.0629	0.0000	OK
30 minute summer	031	19	16.176	0.031	5.8	0.0797	0.0000	OK
30 minute summer	032	20	14.693	0.032	7.4	0.0802	0.0000	OK
30 minute summer	033	20	14.460	0.030	7.5	0.0000	0.0000	OK
60 minute summer	1	37	16.212	0.062	5.8	0.0701	0.0000	OK
30 minute summer	2	20	16.196	0.046	3.6	0.0515	0.0000	OK
15 minute summer	034	10	18.519	0.029	5.9	0.0732	0.0000	OK
30 minute summer	035	18	16.498	0.058	4.5	0.0656	0.0000	OK
240 minute summer	036	144	36.047	0.062	2.8	5.1255	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	021	12.000	022	2.5	0.320	0.003	0.1424	
15 minute summer	022	12.001	027	3.6	0.349	0.004	0.2668	
15 minute summer	022	Infiltration (12.000)		0.0				
15 minute summer	024	13.000	026	1.1	0.228	0.001	0.0711	
120 minute summer	025	10.000	020	1.3	2.991	0.007	0.0065	
15 minute summer	026	13.001	027	1.3	0.140	0.002	0.0186	
15 minute summer	026	Infiltration (13.000)		0.0				
15 minute summer	027	12.002	028	4.8	0.711	0.023	0.1679	
15 minute summer	027	Infiltration (13.001)		0.0				
15 minute summer	027	Infiltration (12.001)		0.0				
30 minute summer	028	2.004	029	2.3	0.432	0.020	0.0153	
15 minute summer	029	1.003	032	7.5	0.967	0.003	0.0797	
30 minute summer	030	1.001	031	5.8	1.087	0.001	0.2308	
30 minute summer	031	1.002	029	5.6	0.724	0.002	0.6405	
30 minute summer	032	1.004	033	7.5	1.168	0.002	0.0439	14.4
60 minute summer	1	7.001	019	5.8	0.720	0.320	0.0730	
30 minute summer	2	8.001	019	3.6	0.530	0.201	0.0660	
15 minute summer	034	1.000	030	5.9	1.131	0.002	0.0438	
30 minute summer	035	3.004	013	4.4	0.579	0.130	0.0442	
240 minute summer	036	11.000	020	1.3	3.249	0.007	0.0063	

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JODA ENGINEERING CONSULTANTS ESTD 1961	JODA Engineering Consultants Ballycurreen House Ballycurreen Cork, T12 P4AY	File: 3866_02_Combined.rev8.pf Network: Storm Jack Ryall 02/04/2026	Page 13 Checker: TON Check Date: 18/12/2025

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	001	20	32.869	0.124	4.9	0.8835	0.0000	OK
30 minute summer	002	18	16.992	0.092	11.0	0.1035	0.0000	OK
30 minute summer	2.001:50%	19	16.906	0.152	14.9	0.0000	0.0000	SURCHARGED
30 minute summer	003	20	16.781	0.173	32.5	0.1954	0.0000	OK
30 minute summer	2.002:50%	19	16.716	0.204	43.1	0.5884	0.0000	OK
180 minute summer	004	116	36.112	0.127	4.9	7.3592	0.0000	OK
30 minute summer	006	21	36.119	0.134	15.9	4.7139	0.0000	OK
30 minute summer	007	21	16.846	0.096	10.6	0.1081	0.0000	OK
30 minute summer	008	21	36.118	0.133	7.6	2.2847	0.0000	OK
30 minute summer	009	20	16.809	0.059	4.7	0.0669	0.0000	OK
120 minute summer	010	76	29.392	0.112	4.4	4.3817	0.0000	OK
30 minute summer	011	20	16.715	0.112	17.7	0.1267	0.0000	OK
1440 minute summer	012	1050	15.808	-0.706	4.9	79.5644	0.0000	OK
1440 minute summer	013	960	16.543	0.675	8.5	0.7630	0.0000	SURCHARGED
1440 minute summer	2.003:50%	960	16.542	0.783	10.0	6.7074	0.0000	SURCHARGED
30 minute summer	016	21	36.124	0.139	7.9	2.3880	0.0000	OK
30 minute summer	017	21	32.884	0.139	15.9	4.7864	0.0000	OK
180 minute summer	018	116	29.404	0.124	3.3	4.8624	0.0000	OK
1440 minute summer	019	960	16.543	0.488	4.0	0.5515	0.0000	SURCHARGED
1440 minute summer	020	960	16.543	0.644	15.9	207.0414	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	001	2.000	002	3.6	0.917	0.014	0.0451	
30 minute summer	002	2.001	2.001:50%	11.0	0.836	0.694	0.2613	
30 minute summer	002	2.001	003	14.3	0.828	0.899	0.3216	
30 minute summer	003	2.002	2.002:50%	32.5	0.924	0.829	0.5972	
30 minute summer	003	2.002	013	42.3	1.194	1.081	0.5965	
180 minute summer	004	6.000	035	1.9	0.903	0.009	0.0479	
30 minute summer	006	4.000	007	9.5	1.525	0.035	0.0565	
30 minute summer	007	4.001	011	10.4	0.919	0.656	0.1019	
30 minute summer	008	3.000	009	3.8	1.246	0.015	0.0355	
30 minute summer	009	3.001	011	4.7	0.761	0.299	0.0561	
120 minute summer	010	5.000	011	1.7	4.596	0.006	0.0016	
30 minute summer	011	3.002	012	17.6	0.912	0.480	0.3431	
1440 minute summer	012	3.003	035	-1.0	-0.107	-0.028	0.1624	
1440 minute summer	012	Infiltration		0.8				
1440 minute summer	013	2.003	2.003:50%	8.5	0.446	0.109	1.5295	
1440 minute summer	013	2.003	028	10.0	0.412	0.128	1.5295	
30 minute summer	016	8.000	2	3.9	1.440	0.013	0.0247	
30 minute summer	017	7.000	1	8.9	1.631	0.038	0.0562	
180 minute summer	018	9.000	019	1.2	0.716	0.004	0.0198	
1440 minute summer	019	7.002	020	4.0	0.671	0.095	0.9327	
1440 minute summer	020	7.003	028	-8.5	-0.294	-0.161	0.6633	
1440 minute summer	020	Infiltration		1.8				

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Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	021	10	17.248	0.018	3.9	0.0000	0.0000	OK
30 minute summer	022	18	17.161	0.023	5.6	0.0000	0.0000	OK
15 minute summer	024	10	17.094	0.011	1.8	0.0000	0.0000	OK
180 minute summer	025	116	32.878	0.133	4.9	7.6767	0.0000	OK
15 minute summer	026	11	17.037	0.019	2.1	0.0000	0.0000	OK
15 minute summer	027	11	17.037	0.029	7.6	0.0000	0.0000	OK
1440 minute summer	028	960	16.543	0.967	10.8	1.3831	0.0000	SURCHARGED
30 minute summer	029	19	14.868	0.044	10.8	0.1129	0.0000	OK
30 minute summer	030	18	18.250	0.030	9.1	0.0769	0.0000	OK
30 minute summer	031	19	16.184	0.039	9.1	0.0981	0.0000	OK
30 minute summer	032	20	14.698	0.037	10.6	0.0947	0.0000	OK
30 minute summer	033	20	14.465	0.035	10.6	0.0000	0.0000	OK
1440 minute summer	1	960	16.543	0.393	2.0	0.4441	0.0000	SURCHARGED
1440 minute summer	2	960	16.543	0.393	1.1	0.4441	0.0000	SURCHARGED
15 minute summer	034	10	18.525	0.035	9.2	0.0903	0.0000	OK
1440 minute summer	035	960	16.543	0.103	1.8	0.1161	0.0000	OK
180 minute summer	036	116	36.079	0.094	4.9	7.7332	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	021	12.000	022	3.9	0.379	0.005	0.1866	
30 minute summer	022	12.001	027	5.5	0.429	0.007	0.3374	
30 minute summer	022	Infiltration (12.000)		0.0				
15 minute summer	024	13.000	026	1.8	0.253	0.002	0.0975	
180 minute summer	025	10.000	020	1.7	3.285	0.009	0.0080	
15 minute summer	026	13.001	027	2.0	0.169	0.003	0.0241	
15 minute summer	026	Infiltration (13.000)		0.0				
15 minute summer	027	12.002	028	7.6	0.653	0.036	0.1711	
15 minute summer	027	Infiltration (13.001)		0.0				
15 minute summer	027	Infiltration (12.001)		0.0				
1440 minute summer	028	2.004	029	2.3	0.432	0.020	0.0153	
30 minute summer	029	1.003	032	10.6	1.063	0.004	0.1030	
30 minute summer	030	1.001	031	9.1	1.230	0.002	0.3174	
30 minute summer	031	1.002	029	8.8	0.870	0.003	0.8529	
30 minute summer	032	1.004	033	10.6	1.285	0.003	0.0566	18.5
1440 minute summer	1	7.001	019	2.0	0.520	0.109	0.1584	
1440 minute summer	2	8.001	019	1.1	0.335	0.062	0.1672	
15 minute summer	034	1.000	030	9.1	1.287	0.003	0.0602	
1440 minute summer	035	3.004	013	1.8	0.460	0.054	0.1180	
180 minute summer	036	11.000	020	1.9	3.611	0.009	0.0080	

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