

Limerick WWTP Upgrade and Regional Bioresource Centre

Appendix 3.1 - Technical Note SuDS Strategy

June 2026



Formerly JB Barry Partners who became part of Egis in 2023

TECHNICAL NOTE – STORMWATER & SUDS STRATEGY



UPGRADE TO LIMERICK (BUNLICKY) WWTP AND PROPOSED SLUDGE HUB CENTRE

18 March 2026

Document information

GENERAL INFORMATION

Author(s)	DS/KBS/EF
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Stormwater & SuDS Strategy – Limerick WWTP, Bunlicky, Limerick

This technical note aims to present the proposed stormwater network design strategy including sustainable urban drainage (SuDS) solutions to be adopted as part of surface water management for the Limerick (Bunlicky) WWTP and Sludge Hub Centre and Corcanree PS, on the south-west of Limerick City. A site visit, GI Testing and topographical survey of the site were carried out to inform this strategy. Throughout the design process, principles embodied in the CIRIA SuDS Manual (C753), CIRIA Report C753 and Limerick City and County Council Surface Water Specifications 2022 were considered.

1 INTRODUCTION

Egis Engineering Ireland Ltd. (EEL) were commissioned by the Uisce Éireann, to undertake the upgrade of the wastewater treatment plant (WWTP) at Bunlicky, Limerick, the pumping station (PS) at Corcanree and the development of a Regional Bioresource Centre. The proposed works are described under Section 1.1 and 1.2 below. In addition, a flood risk assessment (FRA) has been carried out for this proposed development which outlines the impacts of flooding in this area.

1.1 Site Overview

The proposed developments, illustrated in Figure 1-1 below, are located to the south of the Shannon Estuary off the Dock Road and the N18 Galway / Limerick Road. The WWTP can be accessed via a private access road and the PS is access via Corcanree Business Park.



FIGURE 1-1: LOCATION OF PROPOSED DEVELOPMENT (SOURCE: GOOGLE MAPS, ANNOTATIONS BY EGIS)

Limerick WWTP and Corcanree PS were constructed in the early 2000's as part of the Limerick Main Drainage Scheme and were designed for a PE of 130,000. The plant treats both domestic and non-domestic wastewater. Details of the existing storm-sewer network are described under Section 1.3 of this report.

1.2 Existing Surface Water Regime

1.2.1 Limerick WWTP

The previously developed site is serviced by an existing surface water network which flows to the final effluent discharge chamber. The network in place is believed to be of sufficient capacity for the run-off produced. There is no reports of pluvial flooding in the immediate site.

Anecdotal reports and satellite imagery (see Figure 1-2) suggest the presence of artificial land drains crossing the site in a south-westerly direction, discharging to Bunlicky Lake. The extents and performance of these drains is unknown. In the interest of conservative design the land drains have not been considered to collect any run-off from the proposed site.



FIGURE 1-2: SATELLITE IMAGERY OF LAND DRAINS AT LIMERICK (BUNLICKY) WWTP (SOURCE: GOOGLE)

1.2.2 Corcanree PS

The existing surface water network at the site is mapped in orange in the as-built drawing in Figure 1-3. The surface water system is comprised of pipes, gullies and manholes which drain to the Corcanree Business Park roadway and to locations throughout the site which are believed to be soakpits. Cover levels are available but invert levels are not.

The network in place is believed to be of sufficient capacity for the run-off produced. There is no reports of pluvial flooding in the immediate site.

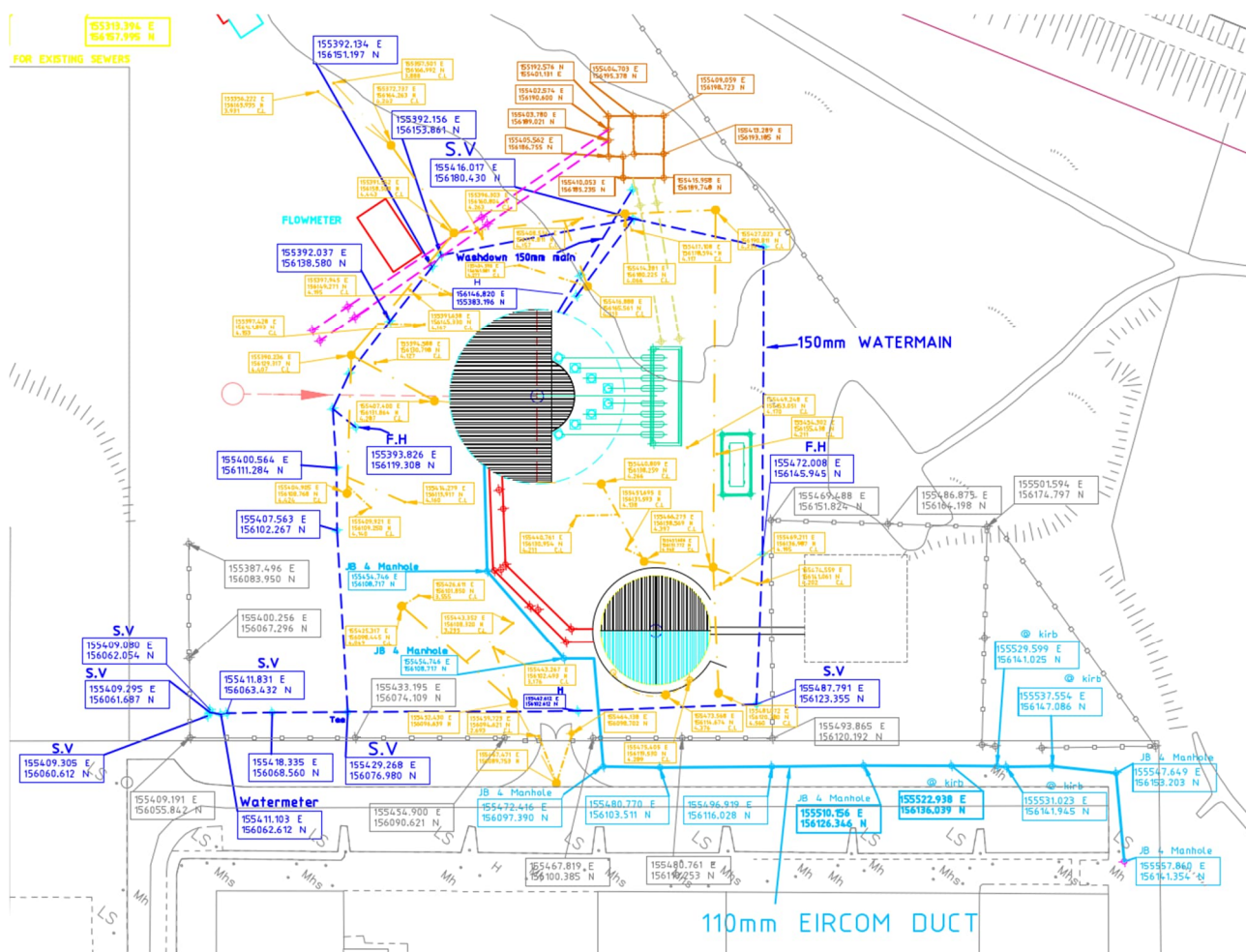


FIGURE 1-3: CORCANREE PS AS-BUILT (SOURCE: LIMERICK MAIN DRAINAGE)

1.3 Proposed Development

1.3.1 Limerick WWTP

The Limerick (WWTP) upgrade consists of the following elements:

- The wastewater treatment plant (WWTP) capacity upgrade project (CUP) will cater for the +10-year growth projections of 130,000 to 285,000 PE, which includes a future IDA load of 27,500 PE. There will be provision made in the civil infrastructural development of the plant (tank sizing and pipework) for the +25-year growth projections of 325,000PE. However, a planning review will be required before any uplift above 285,000PE can be instated.

- Sludge Treatment Plant Upgrade (Regional Sludge Hub)

As both projects have interdependencies, they were merged by Uisce Éireann and will be carried out as a single project. Detailed proposed layout is available in Appendix 1.

1.3.2 Corcanree PS

The upgrades to Corcanree PS include:

- A new storm tank 40m dia. x 12m depth with green roof and associated pipework.
- Storm return pumps and rising main.

Detailed proposed layout including proposed surface water drainage is available in Appendix 1.

2 STORMWATER DRAINAGE OVERVIEW

2.1 Design Principles

The following design principles for surface water including SuDs were considered in preparation of the proposed storm drainage network and SuDs for the proposed upgrade:

- CIRIA Report C753 The SuDs Manual – v6
- Strategic Flood Risk Assessment for the Limerick Development Plan 2022 - 2028
- Limerick City and County Council Surface Water Specifications 2022

The SuDS Manual (CIRIA Report C753) -V6 is the current best practice guidance document which promotes sustainable surface water management through the use of SuDS. The four main aspects of a successful SuDS design, are described in the SuDS Manual and listed in Table 2-1 overleaf:

TABLE 2-1: DESIGN CRITERIA FOR SUDS (SOURCE: SUDS MANUAL C753)

	Design Criteria
Water Quantity	● Use surface water run-off as a resource ● Support the management of flood risk in the receiving catchment ● Protect morphology and ecology in receiving surface waters ● Preserve and protect natural hydrological systems on the site ● Drain the site effectively ● Manage on-site flood risk ● Design system flexibility/ adaptability to cope with future change
Water Quality	● Support the management of water quality in the receiving surface waters and groundwaters ● Design system resilience to cope with future change
Amenity	● Maximise multi-functionality ● Enhance visual character ● Deliver safe surface water management systems ● Support development resilience/ adaptability to future change ● Maximise legibility ● Support community environmental learning
Biodiversity	● Support and protect natural local habitats and species ● Contribute to the delivery of local biodiversity objectives ● Contribute to habitat connectivity ● Create diverse, self-sustaining and resilient ecosystems

The CIRIA SuDS Manual also identifies a “SuDS management train” for run-off (also known as a preference hierarchy). This describes the use of sequence of components that collectively provide the necessary processes to control the frequency of run-off, the flow rates and the volumes of run-off, and to reduce concentrations of contaminants to acceptable levels:

- Prevention – the use of good site design and housekeeping measures on individual sites to prevent run-off and pollution (e.g. minimise areas of hardstanding);
- Source Control – control of run-off at or very near its source (such as the use of soakaways and rainwater harvesting);

- Site Control – management of water from several sub-catchments (including routing water from roofs and car parks to one/ several large soakaways for the whole site); and
- Regional Control – management of run-off from several sites, typically in a retention pond or wetland.

The CIRIA SuDS Manual recommends that when considering SuDS solutions, the preferred approach should be to manage run-off using source scale solutions where reasonably practicable. Where Source type of solutions cannot fully address an increase in run-off from a development, residual flows are discharged to be managed further downstream at the Site and Regional Controls.

The above principles were adopted for the proposed stormwater network including SuDS and are discussed in the following sections of this report.

Area (River Shannon and River Fergus Estuaries). Discharge to the final effluent discharge chamber as the existing surface water collection system currently does is the chosen discharge location for the proposed surface water system. As per the CIRIA SuDS Manual (C753), discharge from the proposed site developments will be limited to the Q_1 run-off rate (discussed in Section 3.3). The layout of the collection system, SuDS and discharge location are available in the Appendix 2.

3.3 Greenfield Run-off Estimation

The total developable site area (redline boundary) has been calculated as 9.184 hectares. The greenfield run-off rate has been estimated initially using the HR Wallingford Greenfield run-off estimation tool. The online tool calculated a Q_{BAR} of 68.88l/s and a Q_1 of 58.55 l/s. In addition, this value was also verified by calculating greenfield run-off rate using the Institute of Hydrology report 124 "Flood estimation for small catchments". See Appendix 3 for greenfield run-off calculation sheets. A summary of the design parameters for greenfield run-off estimation are presented in Table 3-1 below.

TABLE 3-2: DESIGN PARAMETERS FOR GREENFIELD RUN-OFF ESTIMATION

Parameter	Value
Catchment Area (Ha)	9.184
Soil Type	4
SPR	0.47
SAAR (mm)	1020

A summary of calculated flow rates using IH124 method of estimation per return period is presented in Table 3-3 below.

TABLE 3-3: SUMMARY OF CALCULATED FLOW RATES FOR THE PROPOSED DEVELOPMENT

Return Period (years)	Growth Curve Factor	Flow Rate (l/s)
1	0.85	58.55
Q_{BAR}	1	68.88
10	1.4	96.432
30	1.65	113.65
100	1.95	134.31
200	2.15	148.09

In order to accommodate run-off volume generated from the proposed upgrade which is in excess of the greenfield run-off volume into the existing storm-sewer network, attenuation storage and incorporation of SuDS is proposed. This will ensure sufficient run-off is retained on the proposed upgrade for extreme events. Attenuation storage of the proposed upgrade is discussed in Section 3.4 below and SuDS appraisal is discussed in Section 5 of this report

3.4 Preliminary Storage Estimation

3.4.1 Interception Storage

In accordance with the requirements of GDSDS, at least 5mm, and preferably 10mm of interception storage should be provided on site, where run-off to the receiving water can be prevented. It has been assumed that where the rainfall falls on green areas there will be no run-off occurring for the first 5mm – 10mm.

The total catchment area for interception purposes (impermeable areas) is 0.605ha. This results in a required interception storage volume of 30.25m³ (6050 x 0.005).

The overall volume provided for interception is equal to 67.61m³ which represents approximately 11.17mm of interception storage which is above the required minimum provision as detailed above. The distribution of this interception storage is detailed in Table 3-4 below.

TABLE 3-4: INTERCEPTION STORAGE ESTIMATION

SuDS Feature	Area (m ²)	Gravel Layer Depth (mm)	Gravel Layer Porosity (%)	Storage Depth (m)	Interception Storage Provided (m ³)
Porous Paving	577.33	150	30	0.045	25.98
Swale	555	150	50	0.075	41.63
Total					67.61

3.4.2 Attenuation Storage

The proposed rate of surface water discharge from the upgrade has been limited to Q₁-year, as described in Section 3.3.1 of the CIRIA SuD Manual (C753). In addition, storage volumes in the site have been designed for extreme events in particular 100-year, 6-hour storm event with 20% allowance for climate change which has been adopted for the proposed development.

As discussed in Section 3.1 above, the proposed upgrade consists of new hardstanding areas in addition the existing hardstanding. This exercise evaluates the new proposed and provide attenuation for the proposed elements.

The proposed attenuation will consist of a porous paving and swale allowing a combined storage volume of 295.8m³. With the addition of manholes and pipes the total storage of the system is 330m³.

A hydrocarbon interceptor is to be installed downstream of the swale to mitigate pollution risk from vehicles. Flow restriction is via a Hydro-Brake, which will be installed on the swale's immediate downstream manhole to limit flow rate to Q₁ prior to discharge to the final effluent chamber.

A summary of the attenuation storage tank volumes estimated using the GSDSDS method is included in Table 3-4 below and in Appendix 3.

TABLE 3-5: SUMMARY OF ATTENUATION REQUIREMENTS CALCULATED USING GSDSDS METHODS

Contributing Area (ha)	Q _{Bar} (l/s)	Q ₁ -yr Discharge Rate (l/s)	Required Storage Volume – 100yr +20% CC (m ³)
0.605	68.88	58.55	360

Storage requirements were also assessed using InfoDrainage. The software was used assumed as the most reliable method of storage estimation due to its advanced simulations of rainfall intensity, surface water run-off, flow restriction and discharge. Quick Storage Estimation approximated the storage required to be between 71-144m³.

Storage volumes assessed were sufficient for all storm simulated, including 1 in 100 year storms of varying durations. These volumes were therefore chosen for design and are shown in Table 3-6 below.

TABLE 3-6: SUMMARY OF ATTENUATION ASSESSED USING INFODRAINAGE SOFTWARE

Contributing Area (ha)	Hydro-Brake Discharge Rate (l/s)	Swale Storage Volume (m³)	Porous Paving Storage Volume (m³)
0.605	58.55	165.95	130.85
Total			295.8

A summary of the InfoDrainage model take-off data which presents the total storage volume accounting for manholes, pipes and attenuation storage is presented in Appendix 4.

4 PROPOSED STORMWATER NETWORK DESIGN

4.1 Method of Design

Stormwater network design and calculations were carried out using InfoDrainage. The software uses the 'Modified Rational Method' to calculate run-off from an impermeable area for a storm of a particular return period.

As a first preference the stormwater network design was developed with consideration of incorporating SuDS within the proposed development. SuDS appraisal of the proposed development is discussed in Section 5 of this report. It is noted that existing discharges to the existing drainage network are considered as fully stand-alone elements and have no influence on the proposed SuDS solutions and proposed drainage. The existing drainage is assumed to facilitate the discharges due to the existing WWTP. All new hardstanding surfaces proposed as part of the upgrade project and the discharges resulting thereof are calculated and addressed as part of this report.

4.2 Stormwater Network – Design Criteria

The proposed surface water drains have been designed in accordance with the CIRIA SuDS Manual (C753) and Limerick City and County Council Surface Water Specification 2022.

The following inputs were sourced from Met Eireann and CIRIA SuDS Manual (C753) are used in the development of the drainage design. Table 4-1 below shows Rainfall Design Criteria Variables.

TABLE 4-1 RAINFALL DESIGN CRITERIA VARIABLES

Variable	Value
Region	Ireland
Return Period (Limerick Dev Plan-Limerick City and County Council Surface Water specifications 2022)	For adequate protection: No surcharging in respect of flow for return period less than 30 years No flooding in respect of flow for return period less than 100 years
Minimum Global Time of Entry	5 minutes
Max. Rainfall (Met Eireann)	10.2 mm/hr
Max. Time of Concentration (Wallingford Procedure State Modified Rational Method has only been tested for time of concentration not greater than 30 minutes)	4.65 minutes
Climate Change (LDP)	20%

A summer and winter rainfall profiles were simulated on all systems to give the critical design. A summer profile gives higher rainfall intensities and results in higher run-off rates used to determine the required capacity of the pipework. A winter rainfall profile gives flatter more sustained profile and results in higher run-off volumes and is used to determine attenuation requirements.

The proposed stormwater network was assessed for compliance with maximum and minimum velocities, pipe lengths. The network was designed to ensure velocities in the network and pipe gradients did not exceed the maximum velocity of 3.0m/sec.

Design of pipes was carried out for a 1 in 5 year return period. The design of the drainage network was assessed using events with a range of different durations to determine the critical event for each return period analysed as follows:

- 1 in 30-year return period events were used to ensure that the system did not surcharge.
- 1 in 100-year return period events were used to ensure that flooding did not occur.

5 SUDS APPRAISAL

During the initial site assessment process of the proposed upgrade site, it was noted that the site lies on relatively flat terrain with its lowest point located along the northwestern boundary. The site is located on the outskirts of Limerick City in an industrial/commercial area. The site is located close to the Shannon estuary, and a small watercourse flows 200m away from the site boundary (identified as Ballinacurra Creek). Infiltration rates at the site were assessed by Ground Investigations Ireland in February 2026. Testing was carried out in accordance with BRE 365. Results returned a 0 mm/hr infiltration rate.

Considering the site constraints: floodplain proximity, lack of infiltration, site use of wastewater treatment and associated drainage discharges – control of surface water run-off will be via attenuation and release with flow restriction to imitate natural run-off rates and reduce adverse impacts on the receiving waterbody. A SuDS management train assessment was conducted and the following SuDS measures are deemed to be practical and achievable.

● Source Control

- Porous Paving: The proposed accessway to the new tanks is designed as a porous pavement with 30% porosity.

● Interception Storage

- Swale: It is located close to the western boundary of the site, in the vicinity of the proposed works (subject to infiltration rates). The swale will be accompanied by a hydrocarbon interceptor and a Hydro-Brake for maintaining the discharge quality and the rate of discharge.

Throughout the selection process, the SuDS Management Train was taken into consideration as well as maintenance aspects of each SuDS element. Well-designed SuDS are rarely used for a single function, hence it is noted that SuDS can be designed with multiple functions: water conservation and re-use (collection and re-use of surface water), detention / attenuation (temporary storage of run-off and slow down flow), retention (permanent storage of run-off), filtration (run-off passes through a filter layer to remove pollutants) and conveyance of run-off at Q_1 rate.

5.1 Water Quality

The proposed upgrade and development involve wastewater treatment purposes and import of sludge. It therefore is considered a high-level pollution hazard, in accordance with CIRIA SuDS Manual. Where possible surface water run-off will be directed to the SuDS features as mentioned above and will therefore benefit from their pollutant removal qualities.

5.1.1 Simple Index Approach

The effectiveness of the chosen SuDS components to achieve water quality can be assessed using the simple index approach as described in CIRIA SuDS Manual C753.

The simple index approach designates risk indices to the various areas of development to determine their pollutant contribution. Similarly, the SUDs features are designated mitigation indices and if the mitigation indices are larger than the risk indices the water quality objectives are considered satisfied.

TABLE 5-1: POLLUTION HAZARD INDICES FOR DIFFERENT LAND USES

Land Use	Pollution Hazard	Landuse Pollution Hazard Index		
		Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other (Wastewater Treatment Plant)	High	0.8	0.8	0.9

As shown in Table 5-2 below, the total mitigation potential of the SuDS features outweigh the contamination risks. Secondary (or further) stages in the treatment train are assigned 50% of the stated treatment indices value.

TABLE 5-2: INDICATIVE SUDS MITIGATION INDICES FOR DISCHARGES TO SURFACE WATER

SuDs Component	TSS	Metals	Hydrocarbons
Hydrocarbon Interceptor	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Porous Paving	0.7	0.6	0.7
Aggregated Surface Water Pollution Mitigation Index	0.85	0.9	0.95

It is concluded from Table 5-1 & Table 5-2 that the aggregate pollution mitigation index for selected SuDS is sufficient for TSS, metals and hydrocarbons, as calculated using the Simple Index Approach.

5.2 Amenity and Biodiversity

Meeting amenity and biodiversity standards requires creating attractive, pleasant and liveable urban areas for both humans and for nature.

The proposed SuDS features within the proposed development will not only be aesthetically pleasing, but they will also assist the creation of liveable habitats for nature by retaining run-off at source.

6 BASIS OF STORMWATER DESIGN – CORCANREE PS

6.1 Contributing Areas

A numerical summary of hardstanding areas is presented in Table 6-1 and the proposed developments are shown in Figure 6-1 below. Additional impermeable areas proposed are Corcanree PS are limited. The impermeable area proposed, a storm tank with green roof are shown in the figure below. The proposed SuDS features were sized to accommodate run-off produced as a result of the increase in impermeable area at the site.

TABLE 6-1: SUMMARY OF CONTRIBUTING AREAS

Contributing Areas	Area (ha)
Proposed Impermeable	0.153
Proposed Open Space	2.507
Red Line Boundary	2.66

TABLE 6-3: SUMMARY OF CALCULATED FLOW RATES FOR THE PROPOSED DEVELOPMENT

Return Period (years)	Growth Curve Factor	Flow Rate (l/s)
1	0.85	17
Q_{BAR}	1	20
10	1.4	28
30	1.65	33
100	1.95	38.9
200	2.15	42.9

In order to accommodate run-off volume generated from the proposed upgrade which is in excess of the greenfield run-off volume into the existing storm-sewer network, attenuation storage and incorporation of SuDS is proposed. This will ensure sufficient run-off is retained on the proposed upgrade for extreme events. Attenuation storage of the proposed upgrade is discussed in Section 6.4 below and SuDS appraisal for the site is discussed in Section 7 of this report.

6.4 Preliminary Storage Estimation

6.4.1 Interception Storage

The total catchment area for interception purposes (impermeable areas) is 0.153ha. This results in a required interception storage volume of 7.65m^3 (1530×0.005).

The overall volume provided for interception is equal to 28.93m^3 which represents approximately 18.9mm of interception storage which is above the required minimum provision as detailed above. The distribution of this interception storage is detailed in Table 3-4 below.

TABLE 6-4: INTERCEPTION STORAGE ESTIMATION

SuDS Feature	Area (m^2)	Gravel Layer Depth (mm)	Gravel Layer Porosity (%)	Storage Depth (m)	Interception Storage Provided (m^3)
Green Roof	153	50	35	0.0175	2.68
French Drain	75	1000	35	0.35	26.25
Total					28.93

6.4.2 Attenuation Storage

The proposed rate of surface water discharge from the upgrade has been limited to Q_1 , as described in Section 3.3.1 of the CIRIA SuD Manual (C753). In addition, storage volumes in the site have been designed for extreme events in particular 100-year, 6-hour storm event with 20% allowance for climate change which has been adopted for the proposed development.

The proposed attenuation will consist of a french drain providing a (modelled) storage volume of 25.28m^3 . With the addition of manholes and pipes the total storage of the system is 28.07m^3 .

A summary of the attenuation storage volumes estimated using the GDSDS method is included in Table 6-5 below and in Appendix 3.

TABLE 6-5: SUMMARY OF ATTENUATION REQUIREMENTS CALCULATED USING GSDS METHODS

Contributing Area (ha)	QBar (l/s)	Q1-yr Discharge Rate (l/s)	Required Storage Volume - 100yr +20% CC (m³)
0.153	20	17	32

Storage requirements were also assessed using InfoDrainage. The software was used assumed as the most reliable method of storage estimation due to its advanced simulations of rainfall intensity, surface water run-off, flow restriction and discharge. Quick Storage Estimation approximated the storage required to be between 16-34m³.

Storage volumes assessed were sufficient for all storm simulated, including 1 in 100 year storms of varying durations. These volumes were therefore chosen for design and are shown in Table 6-6 below.

TABLE 6-6: SUMMARY OF ATTENUATION ASSESSED USING INFODRAINAGE SOFTWARE

Contributing Area (ha)	Allowable discharge Rate (l/s)	French Drain Storage Volume (m³)
0.153	17	25.282

A summary of the InfoDrainage model take-off data which presents the total storage volume accounting for manholes, pipes and attenuation storage is presented in Appendix 4. The max discharge rate modelled for the critical storm was 15 l/s. Flow restriction is not required.

7 SUDS APPRAISAL

A SuDS management train assessment was conducted and the following SuDS measures are deemed to be practical and achievable.

- Source Control
 - Green roof: The proposed storm tank is designed with a green roof.
- Interception & Attenuation Storage
 - Green roof: The proposed storm tank is designed with a green roof.
 - French Drain: This is proposed to be constructed leading from the storm tank roof collection gully to the existing drainage system.

7.1 Water Quality

The proposed upgrade and development consists for a storm tank and associated pipework. It therefore is considered a low-level pollution hazard, in accordance with CIRIA SuDS Manual.

7.1.1 Simple Index Approach

The effectiveness of the chosen SuDS components to achieve water quality can be assessed using the simple index approach as described in CIRIA SuDS Manual C753.

The simple index approach designates risk indices to the various areas of development to determine their pollutant contribution. Similarly, the SUDs features are designated mitigation indices and if the mitigation indices are larger than the risk indices the water quality objectives are considered satisfied.

TABLE 7-1: POLLUTION HAZARD INDICES FOR DIFFERENT LAND USES

Land Use	Pollution Hazard	Landuse Pollution Hazard Index		
		Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2	0.05

As shown in Table 7-2 below, the total mitigation potential of the SuDS features outweigh the contamination risks. Secondary (or further) stages in the treatment train are assigned 50% of the stated treatment indices value.

TABLE 7-2: INDICATIVE SUDS MITIGATION INDICES FOR DISCHARGES TO SURFACE WATER

SuDs Component	TSS	Metals	Hydrocarbons
Filter Drain	0.4	0.4	0.4

It is concluded from Table 7-1 & Table 7-2 that the SuDS pollution mitigation index for selected SuDS is sufficient for TSS, metals and hydrocarbons, as calculated using the Simple Index Approach.

7.2 Amenity and Biodiversity

Meeting amenity and biodiversity standards requires creating attractive, pleasant and liveable urban areas for both humans and for nature.

The proposed SuDS features within the proposed development will not only be aesthetically pleasing, but they will also assist the creation of liveable habitats for nature by retaining run-off at source.

APPENDIX 1 – PROPOSED DEVELOPMENT LAYOUTS



X=554944,Y=656034

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NOTES:
1. ALL LEVELS ARE IN METRES AND RELATE TO O.S. DATUM MALIN
2. THIS DRAWING IS REPRODUCED FROM DIGITAL MAPS:
O.S. MAPS - SCALE 1:2,500
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6. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE
7. FOR LANDSCAPING DETAILS, PLEASE REFER TO LANDSCAPE
MITIGATION PLAN
8. PROPOSED STRUCTURAL HEIGHTS, LEVELS & DIMENSIONS ARE
INDICATIVE
9. LOCATION OF PIPEWORK IS INDICATIVE AND SUBJECT TO
ALTERATIONS PENDING FINAL DESIGN.
10. SOLAR PANELS SPECIFICATION & LAYOUT TO BE FINALISED

MAPPING
OS SHEET: 4742

LEGEND

- PLANNING BOUNDARY
- LANDS IN UISCÉ ÉIREANN OWNERSHIP OUTLINED IN BLUE
- LANDS IN THIRD PARTY OWNERSHIP OUTLINED IN ORANGE
- LOCATION OF SITE NOTICE
- CONTOURS AT 0.5m OD
- EXISTING GROUND LEVEL
- EXISTING FINISHED FLOOR LEVEL
- PROPOSED FINISHED FLOOR LEVEL
- PROPOSED GROUND LEVEL
- PROPOSED FINISHED FLOOR LEVEL
- PROPOSED SUBJECT OF THIS PLANNING APPLICATION
- EXISTING LANDSCAPING
- TOWNLAND BOUNDARY

LOCATION OF PROPOSED SURFACE WATER DRAINAGE DRY SWALE - SEE DRAWING 20702-EEI-00-XX-DR-Z-1209 Limerick WWTP Proposed Surface Water Drainage Layout 1:500

LEGEND:

- PROPOSED AGS TANKS
- PROPOSED INLET WORKS
- PROPOSED EXPORT CAKE SILO STORAGE
- PROPOSED SLUDGE SCREENING
- PROPOSED LTP BUFFER TANK
- PROPOSED SLUDGE THICKENING & DEWATERING BUILDING
- PROPOSED LTP TANK
- PROPOSED THICKENED SLUDGE STORAGE TANK
- EXISTING PRIMARY SLUDGE TANK
- EXISTING PRIMARY / IMPORTED SLUDGE TANK
- EXISTING WAS BUFFER TANK (PRE GBT)
- PROPOSED DIGESTER NO. 3
- EXISTING TANKS TO BE USED AS DIGESTED SLUDGE TANKS
- EXISTING TANKS TO BE USED AS BLENDING TANKS
- EXISTING THERMAL OXIDISERS TO BE DECOMMISSIONED / NEW ODOUR UNIT
- EXISTING MCC
- EXISTING CHP
- PROPOSED GAS BELL
- PROPOSED IMPORTED CAKE RECEPTION AREA
- NEW MCC KIOSK
- PROPOSED THP SILOS
- EXISTING WEIGH BRIDGE
- PROPOSED VEHICLE PARKING AREA
- PROPOSED NEW HARDSTANDING AREA
- EXISTING ADMINISTRATION BUILDING AND SCADA ROOM
- EXISTING INLET WORKS
- EXISTING MUNGRET PUMPING STATION TO BE MODIFIED
- EXISTING BUILDING
- EXISTING STORM TANK
- EXISTING FINAL EFFLUENT PUMPING STATION
- EXISTING OUTFALL TIE IN LOCATION
- PROPOSED ESS TRANSFORMER
- ODOUR EXTRACTION
- SLUDGE PUMPING STATION
- SLUDGE RECEIVING STATION
- ELECTRICAL CABLE CONTAINMENT
- PROPOSED HEAT EXCHANGER

X=554244,Y=655469



PROPOSED SITE LAYOUT PLAN
SCALE 1:1000 @ A1

C01	A1	ISSUED FOR PLANNING	PJ	26-03-26	
Rev:	Suit:	Revision Description	Checked:	Date:	

Client



Uisce Éireann
Irish Water

Colville House
24-26 Talbot Street
Dublin 1

Tel: 1890 278 278
Int: 353-1-707 2828
email: info@water.ie
Web: www.water.ie



info.ireland@egis-group.com

Formerly JB Barry & Partners who became part of Egis in 2023

Project
LIMERICK WWTP UPGRADE AND
REGIONAL BIORESOURCE CENTRE

Drawing Title
LIMERICK WWTP & CORCANREE PS
LIMERICK WWTP -
PROPOSED SITE LAYOUT PLAN
SHEET 1 OF 2 - SCALE 1:1000

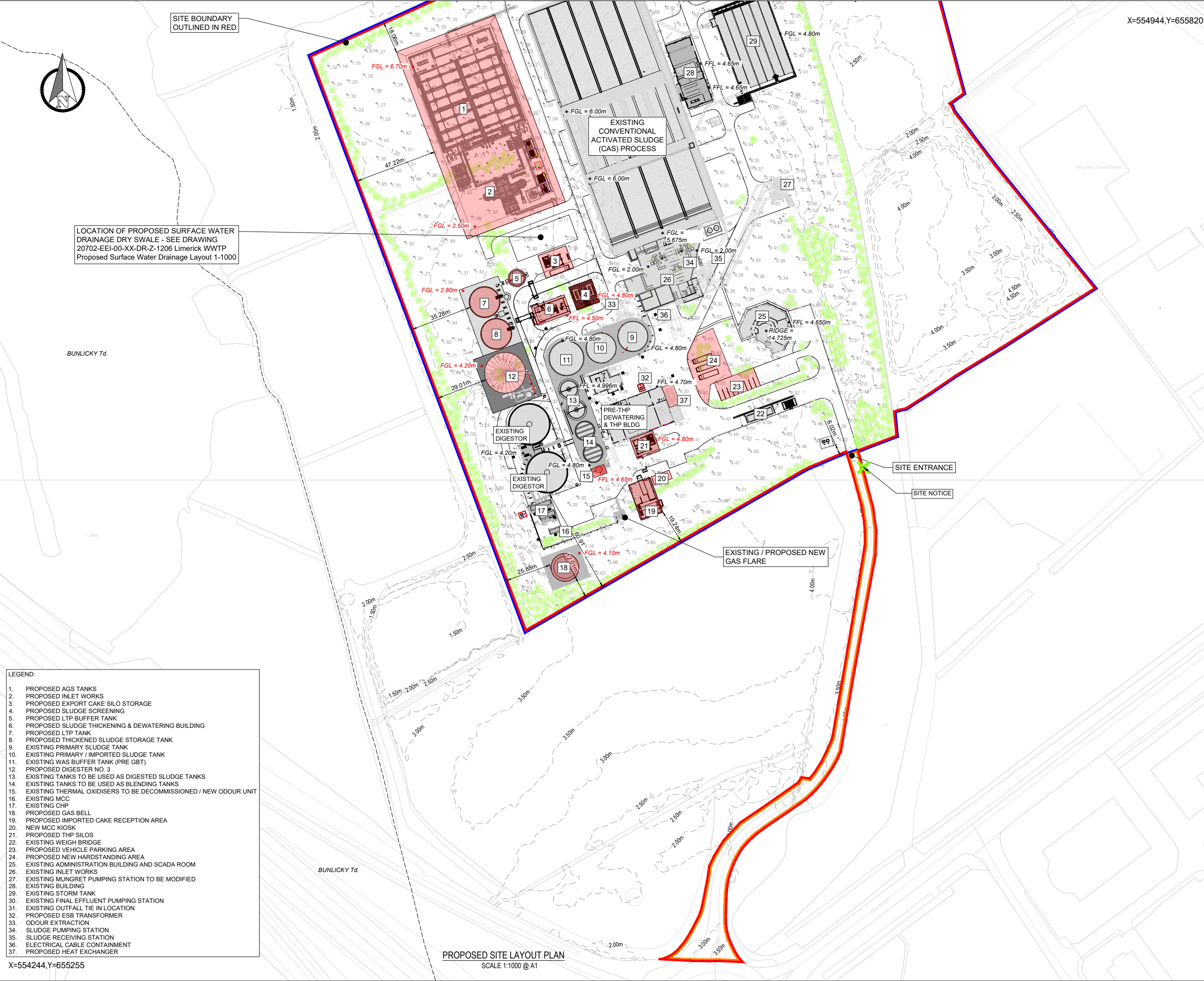
Drawn by:	KM	Date:	16.01.26
Checked by:	OOB	Date:	16.01.26
Approved by:	PJ	Date:	16.01.26

Internal Project REF: EEI: 20702

Scales: AS INDICATED

Stage: PLANNING

Drawing No:	Revision	Suitability
20702-EEI-00-XX-DR-Z-1202	C01	A1



SITE BOUNDARY
OUTLINED IN RED

X=554944,Y=655820

LOCATION OF PROPOSED SURFACE WATER
DRAINAGE DRY SWALE - SEE DRAWING
20702-EEI-00-XX-DR-Z-1206 Limerick WWTP
Proposed Surface Water Drainage Layout 1-1000

BUNLICKY Td.

SITE ENTRANCE

SITE NOTICE

EXISTING / PROPOSED NEW
GAS FLARE

BUNLICKY Td.

PROPOSED SITE LAYOUT PLAN
SCALE 1:1000 @ A1

LEGEND:

1. PROPOSED AGS TANKS
2. PROPOSED INLET WORKS
3. PROPOSED EXPORT CAKE SILO STORAGE
4. PROPOSED SLUDGE SCREENING
5. PROPOSED LTP BUFFER TANK
6. PROPOSED SLUDGE THICKENING & DEWATERING BUILDING
7. PROPOSED LTP TANK
8. PROPOSED THICKENED SLUDGE STORAGE TANK
9. EXISTING PRIMARY SLUDGE TANK
10. EXISTING PRIMARY / IMPORTED SLUDGE TANK
11. EXISTING WAS BUFFER TANK (PRE GBT)
12. PROPOSED DIGESTER NO. 3
13. EXISTING TANKS TO BE USED AS DIGESTED SLUDGE TANKS
14. EXISTING TANKS TO BE USED AS BLENDING TANKS
15. EXISTING THERMAL OXIDISERS TO BE DECOMMISSIONED / NEW ODOUR UNIT
16. EXISTING MCC
17. EXISTING CHP
18. PROPOSED GAS BELL
19. PROPOSED IMPORTED CAKE RECEPTION AREA
20. NEW MCC KIOSK
21. PROPOSED THP SILOS
22. EXISTING WEIGH BRIDGE
23. PROPOSED VEHICLE PARKING AREA
24. PROPOSED NEW HARDSTANDING AREA
25. EXISTING ADMINISTRATION BUILDING AND SCADA ROOM
26. EXISTING INLET WORKS
27. EXISTING MUNGRET PUMPING STATION TO BE MODIFIED
28. EXISTING BUILDING
29. EXISTING STORM TANK
30. EXISTING FINAL EFFLUENT PUMPING STATION
31. EXISTING OUTFALL TIE IN LOCATION
32. PROPOSED ESB TRANSFORMER
33. ODOUR EXTRACTION
34. SLUDGE PUMPING STATION
35. SLUDGE RECEIVING STATION
36. ELECTRICAL CABLE CONTAINMENT
37. PROPOSED HEAT EXCHANGER

X=554244,Y=655255

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INDICATIVE
 9. LOCATION OF PIPEWORK IS INDICATIVE AND SUBJECT TO
ALTERATIONS PENDING FINAL DESIGN.
 10. SOLAR PANELS SPECIFICATION & LAYOUT TO BE FINALISED

MAPPING
OS SHEET: 4742

LEGEND

- PLANNING BOUNDARY
- LANDS IN UISCÉ ÉIREANN
OWNERSHIP OUTLINED IN BLUE
- LANDS IN THIRD PARTY
OWNERSHIP OUTLINED IN ORANGE
- LOCATION OF SITE NOTICE
- CONTOURS AT 0.5m OD
- EXISTING GROUND LEVEL
- EXISTING FINISHED
GROUND LEVEL
- EXISTING FINISHED FLOOR
LEVEL
- PROPOSED FINISHED
GROUND LEVEL
- PROPOSED FINISHED
FLOOR LEVEL
- PROPOSED
SUBJECT OF THIS
PLANNING APPLICATION
- EXISTING LANDSCAPING
- TOWNLAND BOUNDARY

C01	A1	ISSUED FOR PLANNING	PJ	26-03-26
Rev:	Suit:	Revision Description	Checked:	Date:

Client



Uisce Éireann
Irish Water

Colvill House
24-26 Talbot Street
Dublin 1

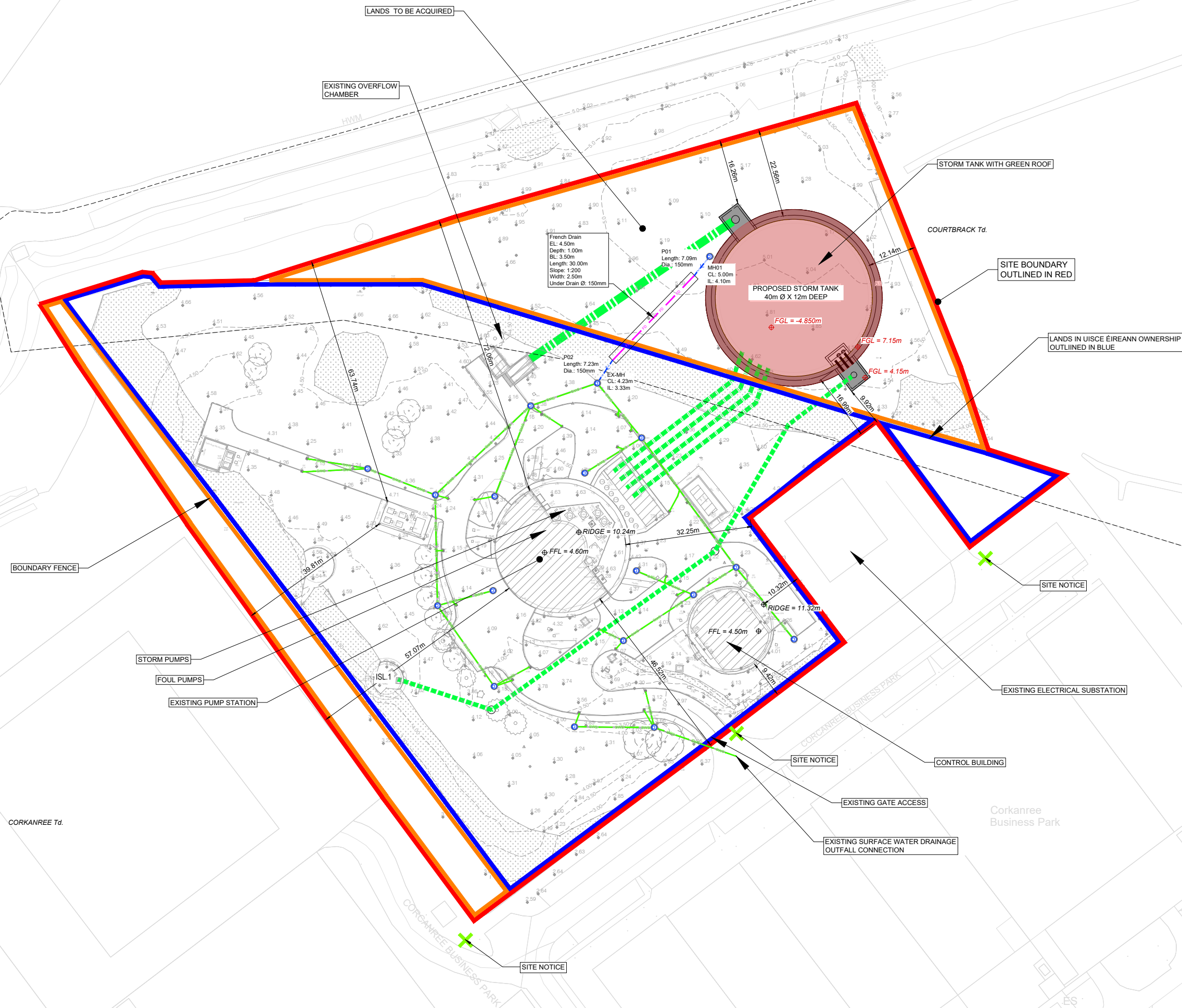
Tel: 1890 278 278
Int: 353-1-707 2828
email: info@water.ie
Web: www.water.ie



info.ireland@egis-group.com

Formerly JB Barry & Partners who became part of Egis in 2023

Project	LIMERICK WWTP UPGRADE AND REGIONAL BIORESOURCE CENTRE		
Drawing Title	LIMERICK WWTP & CORCANREE PS LIMERICK WWTP - PROPOSED SITE LAYOUT PLAN SHEET 2 OF 2 - SCALE 1:1000		
Drawn by :	KM	Date :	16.01.26
Checked by :	OOB	Date :	16.01.26
Approved by :	PJ	Date :	16.01.26
Internal Project REF :	EEI: 20702		
Scales:	AS INDICATED		
Stage :	PLANNING		
Drawing No.:	20702-EEI-00-XX-DR-Z-1203	Revision	C01
Suitability	A1		



PROPOSED SITE LAYOUT PLAN
SCALE 1:500 @ A1

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O.S. MAPS - SCALE 1:1,000
DISCOVERY SERIES - SCALE 1:50,000
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 7. FOR LANDSCAPING DETAILS, PLEASE REFER TO LANDSCAPE MITIGATION PLAN
 8. PROPOSED STRUCTURAL HEIGHTS, LEVELS & DIMENSIONS ARE INDICATIVE
 9. LOCATION OF PIPEWORK IS INDICATIVE AND SUBJECT TO ALTERATIONS PENDING FINAL DESIGN.
 10. SOLAR PANELS SPECIFICATION & LAYOUT TO BE FINALISED

MAPPING
OS SHEET: 4742

LEGEND

- PLANNING BOUNDARY
 - LANDS IN UISCE ÉIREANN OWNERSHIP OUTLINED IN BLUE
 - LANDS IN THIRD PARTY OWNERSHIP OUTLINED IN ORANGE
 - LOCATION OF SITE NOTICE
 - CONTOURS AT 0.5m OD
 - EXISTING GROUND LEVEL
 - EXISTING FINISHED GROUND LEVEL
 - EXISTING FINISHED FLOOR LEVEL
 - PROPOSED FINISHED GROUND LEVEL
 - PROPOSED FINISHED FLOOR LEVEL
 - PROPOSED SUBJECT OF THIS PLANNING APPLICATION
 - TOWNLAND BOUNDARY
 - STORM TANK OVERFLOW
 - STORM TANK FEED RISING MAINS
 - STORM TANK RETURN RISING MAIN
 - EXISTING SURFACE WATER DRAINAGE
 - EXISTING ROAD GULLY
 - PROPOSED SURFACE WATER DRAINAGE FILTER DRAIN 150mm DIA.
 - PROPOSED SURFACE WATER DRAINAGE PIPE 150mm DIA.
- NOTE:
SURFACE WATER DRAINAGE IS INDICATIVE & SUBJECT TO ALTERATIONS PENDING TESTING & FINAL DESIGN

C01	A1	ISSUED FOR PLANNING	PJ	01.07.26	
Rev.	Suit.	Description	Checked	Date	

Client



Uisce Éireann
Irish Water

Uisce Éireann
Colvill House
24-26 Talbot Street
Dublin 1

Tel: 1890 278 278
Int: 353-1-707 2828
email: info@water.ie
Web: www.water.ie



info.ireland@egis-group.com

Formerly JB Barry & Partners who became part of Egis in 2023

Project
**LIMERICK WWTW UPGRADE AND
REGIONAL BIORESOURCE CENTRE**

Drawing Title
LIMERICK WWTW & CORCANREE PS

**CORCANREE PS
- PROPOSED SITE LAYOUT PLAN**

Drawn by :	KM	Date :	16.01.26
Checked by :	OOB	Date :	16.01.26
Approved by :	PJ	Date :	16.01.26

Internal Project REF : EEI: 20702

Scales:
AS INDICATED

Stage:
PLANNING

Drawing No.:	Revision	Suitability
20702-EEI-00-XX-DR-Z-1211	C01	A1

APPENDIX 2 – PROPOSED STORMWATER DRAINAGE LAYOUTS



X=554770,Y=655838

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ALTERATIONS PENDING FINAL DESIGN.
 10. SOLAR PANELS SPECIFICATION & LAYOUT TO BE FINALISED

MAPPING
OS SHEET: 4742

LEGEND

- PLANNING BOUNDARY
- LANDS IN ÚISCE ÉIREANN
OWNERSHIP OUTLINED IN BLUE
- CONTOURS AT 0.5m OD
- FD FILTER DRAIN
- SCS STORM CARRIER
PIPE
- SM STORM MANHOLE
- DS DRY SWALE
- PP POROUS PAVING
- 0.00 EXISTING GROUND LEVEL
- FGL=0.00m PROPOSED FINISHED
GROUND LEVEL
- PROPOSED -
SUBJECT OF THIS
PLANNING APPLICATION

C01	A1	ISSUED FOR PLANNING	PJ	24-07-26	
Rev:	Suit:	Revision Description	Checked:	Date:	

Client



Uisce Éireann
Irish Water

Colville House
24-26 Talbot Street
Dublin 1

Tel: 1890 278 278
Int: 353-1-707 2828
email: info@water.ie
Web: www.water.ie



info.ireland@egis-group.com

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Project
LIMERICK WWTP UPGRADE AND
REGIONAL BIORESOURCE CENTRE

Drawing Title
LIMERICK WWTP & CORCANREE PS

LIMERICK WWTP - PROPOSED
SURFACE WATER DRAINAGE LAYOUT

Drawn by: KM Date: 16.01.26
Checked by: OOB Date: 16.01.26
Approved by: PJ Date: 16.01.26
Internal Project REF: EEI: 20702

Scales:
AS INDICATED
Stage:
PLANNING

Drawing No.:
20702-EEI-00-XX-DR-Z-1209
Revision:
C01
Suitability:
A1

SITE BOUNDARY
OUTLINED IN RED

X=554420,Y=655556

PROPOSED SITE LAYOUT PLAN
SCALE:1:500 @ A1

SITE ENTRANCE

APPENDIX 3 – GREENFIELD RUN-OFF AND STORAGE ESTIMATIONS

Calculated by:	Kagiso Boniface Selaledi
Site name:	Bunlicky WwTP
Site location:	Limerick

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.

Site Details

Latitude:	52.65125° N
Longitude:	8.67021° W
Reference:	1970125980
Date:	Jun 13 2024 12:45

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	9.184
-----------------------	-------

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	1020	1020
Hydrological region:	13	13
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	1.65	1.65
Growth curve factor 100 years:	1.95	1.95
Growth curve factor 200 years:	2.15	2.15

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	68.88	68.88
1 in 1 year (l/s):	58.55	58.55
1 in 30 years (l/s):	113.65	113.65
1 in 100 year (l/s):	134.31	134.31
1 in 200 years (l/s):	148.09	148.09

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at 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 www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of 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, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

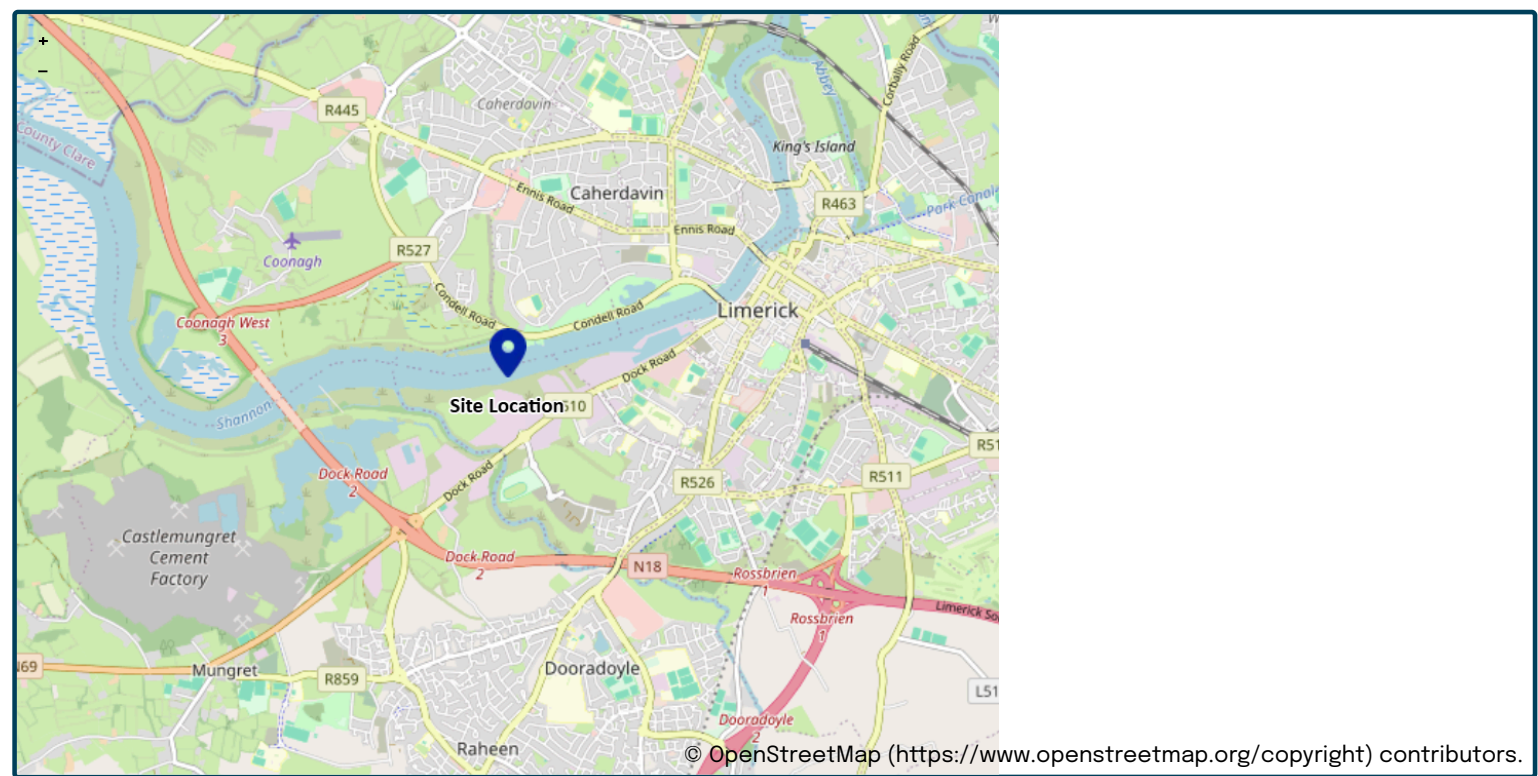
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	22/06/2026
Calculated by	
Reference	
Model version	2.2.3

Location

Site name	Corcanree PS
Site location	



Site easting (Irish Grid)	155427
Site northing (Irish Grid)	156135
Site easting (Irish Transverse Mercator)	555387
Site northing (Irish Transverse Mercator)	656179

Site details

Total site area (ha)	2.66	ha
----------------------	-----------------	----

Greenfield runoff

Method

Method	IH124
--------	-------

IH124

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	1021	mm	1021
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	20	l/s	

Growth curve factors

	<u>My value</u>		<u>Map value</u>
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)	17.0	l/s
Flow rate 2 year (l/s)	19.0	l/s
Flow rate 10 years (l/s)	28.0	l/s
Flow rate 30 years (l/s)	33.0	l/s
Flow rate 100 years (l/s)	38.9	l/s
Flow rate 200 years (l/s)	42.9	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/) (<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) (<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.



Stormwater Storage Calculations

Bunlicky (Limerick) WWTP

06-Mar-26

**All calculations are based on zero infiltration rate.*

Document information

General information

Client: Glanua & Uisce Éireann

History of Changes

<u>Issue Date</u>	<u>Revision</u>	<u>Suitability</u>	<u>Author(s)</u>	<u>Reviewer(s)</u>	<u>Approver(s)</u>
06/03/2026	P01	S3	EF	ML	ML
24/06/2026	P02	S4	EF	ML	ML

BIM DEFINITIONS

Shared (non-contractual)

Suitability /Status	Definition	Revision Code
S2	Suitable for Information	
S3	Suitable for Review and Comment	Pnn (Major Revision) starting at P01
S4	Suitable for Stage Approval	

Published Documentation (Contractual)

Suitability /Status	Definition	Revision Code
	Approved and accepted as stage complete.	
A1	Add phase/stage	
A2	Add phase/stage	
A3	Add phase/stage	
A4	Add phase/stage	Cnn (C=Contractual/Complete) starting at C01
A5	Add phase/stage	
A6	Add phase/stage	
A7	Add phase/stage	

Published for Asset Information Model (AIM) Acceptance

Suitability /Status	Definition	Revision Code
CR	As Constructed Record file	Cnn (C=Contractual/Complete) starting at C01

PROJECT:

Bunlicky (Limerick) WWTP Upgrade

DESCRIPTION:

Preliminary Surface Water Attenuation Calculations
(Existing Development)

DATE:

04/03/2026

SHEET

1, 30, 100 Year +20%,



Sheet 1

Catchment Characteristics

Site Area

9.184 ha

SAAR

1020 mm

From HR Wallingford

Soil Category

4

SOIL =

0.47

From HR Wallingford

M5-60

17.4 mm

From DDF

M5-2D

53.4 mm

From DDF

r = M5-60 / M5-2d =

0.33

QBAR = 0.00108 (Area^0.89)(SAAR^1.17)(Soil^2.17) for CA>50 ha

If CA<50 ha, apply it for 50 ha and get value for smaller catchment by linear interpolation (refer page 70, Vol. 2 of GSDSDS, RDP).

Let the Area be

50 ha

Qbar for 50 ha area =

0.3750 m3/s

374.99 l/s

Qbar for the given area =

0.0689 m3/s

68.88 l/s

(Overall Development 4.28ha)

For Bunlicky Region,

1 year factor

0.85

Qvalue

0.0585 m3/s

Qvalue (l/s)

58.5 l/sec

30year factor

1.65

0.1137 m3/s

113.7 l/sec

100 year factor

1.96

0.1350 m3.s

135.0 l/sec

Return Period =

1 yr

Developent Area =

9.184 ha

Impervious Area =

2.528 ha

<--(Roof, Road & Footpath)

Rainfall duration hrs	Rainfall depth (R1) mm	(R1)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	6.3	7.6	191.12	0.212	0.0585	0.154	138
0.5	8	9.6	242.69	0.135	0.0585	0.076	137
1	10.2	12.2	309.43	0.086	0.0585	0.027	99
2	12.9	15.5	391.34	0.054	0.0585	-0.004	-30
4	14.9	17.9	452.01	0.031	0.0585	-0.027	-391
6	16.4	19.7	497.52	0.023	0.0585	-0.036	-767
12	18.8	22.6	570.32	0.013	0.0585	-0.045	-1959
24	21.6	25.9	655.27	0.008	0.0585	-0.051	-4403
48	23.9	28.7	725.04	0.004	0.0585	-0.054	-9392

Required Volume = Maxum of storage volume, V1 =

138 m³

Return Period =

30 yr

Developent Area =

9.184 ha

Impervious Area =

2.528 ha

<--(Roof, Road & Footpath)

Rainfall duration hrs	Rainfall depth (R30) mm	(R30-R1)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	21.3	18.0	455.05	0.506	0.0551	0.451	405
0.5	25.3	20.8	524.82	0.292	0.0551	0.236	426
1	30.2	24.0	606.73	0.169	0.0551	0.113	408
2	36	27.7	700.77	0.097	0.0551	0.042	304
4	39.9	30.0	758.41	0.053	0.0551	-0.002	-35
6	42.9	31.8	803.91	0.037	0.0551	-0.018	-386
12	47.5	34.4	870.65	0.020	0.0551	-0.035	-1510
24	52.6	37.2	940.43	0.011	0.0551	-0.044	-3821
48	56.6	39.2	992.00	0.006	0.0551	-0.049	-8530

Required Volume = Maxum of storage volume, V30 =

426 m³

Return Period =

100 yr

Developent Area =

9.184 ha

Impervious Area =

2.528 ha

<--(Roof, Road & Footpath)

Rainfall duration hrs	Rainfall depth (R100) mm	(R100-R30)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	31.1	11.8	297.30	0.330	0.0214	0.309	278
0.5	36.3	13.2	333.70	0.185	0.0214	0.164	295
1	42.5	14.8	373.14	0.104	0.0214	0.082	296
2	49.6	16.3	412.57	0.057	0.0214	0.036	259
4	54.3	17.3	436.84	0.030	0.0214	0.009	129
6	57.9	18.0	455.05	0.021	0.0214	0.000	-6
12	63.5	19.2	485.38	0.011	0.0214	-0.010	-437
24	69.5	20.3	512.68	0.006	0.0214	-0.015	-1332
48	74.1	21.0	530.89	0.003	0.0214	-0.018	-3159

Required Volume = Maxum of storage volume, V100 =

296 m³

Total volume = V1 + V30 + V100 =

860 m³

Long Term Storage Volume (100 year, 6 hour storm event)

-6 m³

Total attenuation volume =

854 m³

Data sensitivity - Internal

PROJECT:

Bunlicky (Limerick) WWTP Upgrade

DESCRIPTION:

Preliminary Surface Water Attenuation Calculations
(Proposed Development)

DATE:

04/03/2026

SHEET

1, 30, 100 Year +20%,



Sheet 1

Catchment Characteristics

Site Area

9.184 ha

SAAR

1020 mm

From HR Wallingford

Soil Category

4

SOIL =

0.47

From HR Wallingford

M5-60

17.4 mm

From DDF

M5-2D

53.4 mm

From DDF

r = M5-60 / M5-2d =

0.33

QBAR = 0.00108 (Area^0.89)(SAAR^1.17)(Soil^2.17) for CA>50 ha

If CA<50 ha, apply it for 50 ha and get value for smaller catchment by linear interpolation (refer page 70, Vol. 2 of GDSDS, RDP).

Let the Area be

50 ha

Qbar for 50 ha area =

0.3750 m3/s

374.99 l/s

Qbar for the given area =

0.0689 m3/s

68.88 l/s

(Overall Development 4.28ha)

For Bunlicky Region,

1 year factor

0.85

Qvalue

0.0585 m3/s

Qvalue (l/s)

58.5 l/sec

30year factor

1.65

0.1137 m3/s

113.7 l/sec

100 year factor

1.96

0.1350 m3.s

135.0 l/sec

Return Period =

1 yr

Developent Area =

9.184 ha

Impervious Area =

3.133 ha

<--(Roof, Road & Footpath)

Rainfall duration hrs	Rainfall depth (R1) mm	(R1)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	6.3	7.6	236.86	0.263	0.0585	0.205	184
0.5	8	9.6	300.77	0.167	0.0585	0.109	195
1	10.2	12.2	383.48	0.107	0.0585	0.048	173
2	12.9	15.5	484.99	0.067	0.0585	0.009	63
4	14.9	17.9	560.19	0.039	0.0585	-0.020	-283
6	16.4	19.7	616.58	0.029	0.0585	-0.030	-648
12	18.8	22.6	706.81	0.016	0.0585	-0.042	-1823
24	21.6	25.9	812.08	0.009	0.0585	-0.049	-4247
48	23.9	28.7	898.55	0.005	0.0585	-0.053	-9219

Required Volume = Maxum of storage volume, V1 =

195 m³

Return Period =

30 yr

Developent Area =

9.184 ha

Impervious Area =

3.133 ha

<--(Roof, Road & Footpath)

Rainfall duration hrs	Rainfall depth (R30) mm	(R30-R1)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	21.3	18.0	563.95	0.627	0.0551	0.572	514
0.5	25.3	20.8	650.42	0.361	0.0551	0.306	551
1	30.2	24.0	751.93	0.209	0.0551	0.154	554
2	36	27.7	868.48	0.121	0.0551	0.066	472
4	39.9	30.0	939.91	0.065	0.0551	0.010	146
6	42.9	31.8	996.30	0.046	0.0551	-0.009	-194
12	47.5	34.4	1079.02	0.025	0.0551	-0.030	-1302
24	52.6	37.2	1165.49	0.013	0.0551	-0.042	-3596
48	56.6	39.2	1229.40	0.007	0.0551	-0.048	-8293

Required Volume = Maxum of storage volume, V30 =

554 m³

Return Period =

100 yr

Developent Area =

9.184 ha

Impervious Area =

3.133 ha

<--(Roof, Road & Footpath)

Rainfall duration hrs	Rainfall depth (R100) mm	(R100-R30)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	31.1	11.8	368.44	0.409	0.0214	0.388	349
0.5	36.3	13.2	413.56	0.230	0.0214	0.208	375
1	42.5	14.8	462.44	0.128	0.0214	0.107	386
2	49.6	16.3	511.31	0.071	0.0214	0.050	358
4	54.3	17.3	541.39	0.038	0.0214	0.016	234
6	57.9	18.0	563.95	0.026	0.0214	0.005	103
12	63.5	19.2	601.54	0.014	0.0214	-0.007	-321
24	69.5	20.3	635.38	0.007	0.0214	-0.014	-1210
48	74.1	21.0	657.94	0.004	0.0214	-0.018	-3032

Required Volume = Maxum of storage volume, V100 =

386 m³

Total volume = V1 + V30 + V100 =

1134 m³

Long Term Storage Volume (100 year, 6 hour storm event)

103 m³

Total attenuation volume =

1237 m³

Data sensitivity - Internal

PROJECT:	Bunlicky (Limerick) WWTP Upgrade		
DESCRIPTION:	Preliminary Surface Water Attenuation Volume Calculation (Existing Development)		
DATE:	04/03/2026	SHEET	100 Year +20%, @ 58.55ls



Sheet 1

Catchment Characteristics

Site Area		9.184	ha
SAAR		1020	mm
Soil Category	4	SOIL =	0.47
M5-60		17.4	mm
M5-2D		53.4	mm
r = M5-60 / M5-2d =		0.33	

Permissible flow = 58.55 l/s

Calculation of attenuation volume for the 100-year return period storm event with discharge at 58.55 l/s

Development Area = 9.184 ha
 Impervious Area = 2.528 ha

Rainfall duration hrs	Rainfall depth (R100) mm	Including CCF (R100)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	31.1	37.3	943.46	1.048	0.0586	0.990	891
0.5	36.3	43.6	1101.21	0.612	0.0586	0.553	996
1	42.5	51.0	1289.29	0.358	0.0586	0.300	1079
2	49.6	59.5	1504.68	0.209	0.0586	0.150	1083
4	54.3	65.2	1647.26	0.114	0.0586	0.056	804
6	57.9	69.5	1756.47	0.081	0.0586	0.023	492
12	63.5	76.2	1926.36	0.045	0.0586	-0.014	-603
24	69.5	83.4	2108.38	0.024	0.0586	-0.034	-2950
48	74.1	88.9	2247.92	0.013	0.0586	-0.046	-7870

Required Volume = Maxum of storage volume, V100 = **1083** m3

Total attenuation storage required (m3) = **1083** m3

PROJECT:	Bunlicky (Limerick) WWTP Upgrade		
DESCRIPTION:	Preliminary Surface Water Attenuation Volume Calculation (Proposed Development)		
DATE:	04/03/2026	SHEET	100 Year +20%, @ 58.55ls



Sheet 1

Catchment Characteristics

Site Area		9.184 ha
SAAR		1020 mm
Soil Category	4	SOIL = 0.47
M5-60		17.4 mm
M5-2D		53.4 mm
r = M5-60 / M5-2d =		0.33

Permissible flow = 58.55 l/s

Calculation of attenuation volume for the 100-year return period storm event with discharge at 58.55 l/s

Development Area = 9.184 ha
 Impervious Area = 3.133 ha

Rainfall duration hrs	Rainfall depth (R100) mm	Including CCF (R100)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	31.1	37.3	1169.25	1.299	0.0586	1.241	1117
0.5	36.3	43.6	1364.75	0.758	0.0586	0.700	1259
1	42.5	51.0	1597.84	0.444	0.0586	0.385	1387
2	49.6	59.5	1864.78	0.259	0.0586	0.200	1443
4	54.3	65.2	2041.48	0.142	0.0586	0.083	1198
6	57.9	69.5	2176.83	0.101	0.0586	0.042	912
12	63.5	76.2	2387.37	0.055	0.0586	-0.003	-142
24	69.5	83.4	2612.95	0.030	0.0586	-0.028	-2446
48	74.1	88.9	2785.89	0.016	0.0586	-0.042	-7332
Required Volume = Maxum of storage volume, V100 =							1443 m3

Existing 100yr storage =	1083	m3
Total attenuation storage required =	360	m3

PROJECT: Bunlicky (Limerick) WWTP Upgrade

DESCRIPTION: Preliminary Permeable Paving Calculation

DATE: 30/11/2023



Sheet 2

Permeable Paving Area (Main Car Park) 577.33 m²

Volume Required m³

Minimum depth of Proposed Permeable 0.25 m

Void factor: 30%

Attenuation volume available: 43.3 m³

Note:

Balance of required storage volume provided by Swale/ Infiltration System

PROJECT:

Bunlicky (Limerick) WWTP Upgrade

DESCRIPTION:

Preliminary Surface Water Attenuation Calculations
(Corcanree PS)

DATE:

24/06/2026

SHEET

1, 30, 100 Year +20%,



Sheet 1

Catchment Characteristics

Site Area

2.660 ha

SAAR

1020 mm

From HR Wallingford

Soil Category

4

SOIL =

0.47

From HR Wallingford

M5-60

17.4 mm

From DDF

M5-2D

53.4 mm

From DDF

r = M5-60 / M5-2d =

0.33

QBAR = 0.00108 (Area^0.89)(SAAR^1.17)(Soil^2.17) for CA>50 ha

If CA<50 ha, apply it for 50 ha and get value for smaller catchment by linear interpolation (refer page 70, Vol. 2 of GDSDS, RDP).

Let the Area be

50 ha

Qbar for 50 ha area =

0.3750 m3/s

374.99 l/s

Qbar for the given area =

0.0199 m3/s

19.95 l/s

(Overall Development 4.28ha)

For Bunlicky Region,

1 year factor

0.85

Qvalue

0.0170 m3/s

Qvalue (l/s)

17.0 l/sec

30year factor

1.65

0.0329 m3/s

32.9 l/sec

100 year factor

1.96

0.0391 m3.s

39.1 l/sec

Return Period =

1 yr

Developent Area =

2.660 ha

Impervious Area =

0.126 ha

<--(Roof, Road & Footpath)

Rainfall duration hrs	Rainfall depth (R1) mm	(R1)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	6.3	7.6	9.53	0.011	0.0170	-0.006	-6
0.5	8	9.6	12.10	0.007	0.0170	-0.010	-18
1	10.2	12.2	15.42	0.004	0.0170	-0.013	-46
2	12.9	15.5	19.50	0.003	0.0170	-0.014	-103
4	14.9	17.9	22.53	0.002	0.0170	-0.015	-222
6	16.4	19.7	24.80	0.001	0.0170	-0.016	-341
12	18.8	22.6	28.43	0.001	0.0170	-0.016	-704
24	21.6	25.9	32.66	0.000	0.0170	-0.017	-1432
48	23.9	28.7	36.14	0.000	0.0170	-0.017	-2894

Required Volume = Maxum of storage volume, V1 =

-6 m³

Return Period =

30 yr

Developent Area =

2.660 ha

Impervious Area =

0.126 ha

<--(Roof, Road & Footpath)

Rainfall duration hrs	Rainfall depth (R30) mm	(R30-R1)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	21.3	18.0	22.68	0.025	0.0160	0.009	8
0.5	25.3	20.8	26.16	0.015	0.0160	-0.001	-3
1	30.2	24.0	30.24	0.008	0.0160	-0.008	-27
2	36	27.7	34.93	0.005	0.0160	-0.011	-80
4	39.9	30.0	37.80	0.003	0.0160	-0.013	-192
6	42.9	31.8	40.07	0.002	0.0160	-0.014	-305
12	47.5	34.4	43.39	0.001	0.0160	-0.015	-646
24	52.6	37.2	46.87	0.001	0.0160	-0.015	-1332
48	56.6	39.2	49.44	0.000	0.0160	-0.016	-2708

Required Volume = Maxum of storage volume, V30 =

8 m³

Return Period =

100 yr

Developent Area =

2.660 ha

Impervious Area =

0.126 ha

<--(Roof, Road & Footpath)

Rainfall duration hrs	Rainfall depth (R100) mm	(R100-R30)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	31.1	11.8	14.82	0.016	0.0062	0.010	9
0.5	36.3	13.2	16.63	0.009	0.0062	0.003	6
1	42.5	14.8	18.60	0.005	0.0062	-0.001	-4
2	49.6	16.3	20.56	0.003	0.0062	-0.003	-24
4	54.3	17.3	21.77	0.002	0.0062	-0.005	-67
6	57.9	18.0	22.68	0.001	0.0062	-0.005	-111
12	63.5	19.2	24.19	0.001	0.0062	-0.006	-243
24	69.5	20.3	25.55	0.000	0.0062	-0.006	-509
48	74.1	21.0	26.46	0.000	0.0062	-0.006	-1042

Required Volume = Maxum of storage volume, V100 =

9 m³

Total volume = V1 + V30 + V100 =

12 m³

Long Term Storage Volume (100 year, 6 hour storm event)

-111 m³

Total attenuation volume =

-99 m³

Data sensitivity - Internal

PROJECT:

Bunlicky (Limerick) WWTP Upgrade

DESCRIPTION:

Preliminary Surface Water Attenuation Volume Calculation
(Corcanree PS)

DATE:

24/06/2026

SHEET

100 Year +20%, @ 17ls



Sheet 1

Catchment Characteristics

Site Area

2.660 ha

SAAR

1020 mm

Soil Category

4

SOIL =

0.47

M5-60

17.4 mm

M5-2D

53.4 mm

r = M5-60 / M5-2d =

0.33

Permissible flow = 17.00 l/s

Calculation of attenuation volume for the 100-year return period storm event with discharge at 17 l/s

Development Area = 2.660 ha

Impervious Area = 0.126 ha

Rainfall duration hrs	Rainfall depth (R100) mm	Including CCF (R100)*1.2 mm	Total volume of runoff m3	Average flow m3/s	Permsble Flow m3/s	Flow to be stored m3/s	Storage Volume m3
0.25	31.1	37.3	47.02	0.052	0.0170	0.035	32
0.5	36.3	43.6	54.89	0.030	0.0170	0.013	24
1	42.5	51.0	64.26	0.018	0.0170	0.001	3
2	49.6	59.5	75.00	0.010	0.0170	-0.007	-47
4	54.3	65.2	82.10	0.006	0.0170	-0.011	-163
6	57.9	69.5	87.54	0.004	0.0170	-0.013	-280
12	63.5	76.2	96.01	0.002	0.0170	-0.015	-638
24	69.5	83.4	105.08	0.001	0.0170	-0.016	-1364
48	74.1	88.9	112.04	0.001	0.0170	-0.016	-2826
Required Volume = Maxum of storage volume, V100 =							32 m3

APPENDIX 4 – MODEL TAKE-OFF SUMMARIES



Stormwater Drainage Model Results

PROPOSED STORMWATER DESIGN FOR LIMERICK (BUNLICKY) WWTP

12-Mar-26

Document information

General information

Uisce Éireann

STORM DRAINAGE NETWORK - CALCULATION SUMMARY

History of Changes

<u>Issue Date</u>	<u>Revision</u>	<u>Suitability</u>	<u>Author(s)</u>	<u>Reviewer(s)</u>	<u>Approver(s)</u>
12/03/2026	P01	S3	EF	ML	ML

BIM DEFINITIONS

Shared (non-contractual)

Suitability /Status	Definition	Revision Code
S2	Suitable for Information	
S3	Suitable for Review and Comment	
S4	Suitable for Stage Approval	Pnn (Major Revision) starting at P01

Published Documentation (Contractual)

Suitability /Status	Definition	Revision Code
	Approved and accepted as stage complete.	
A1	Add phase/stage	
A2	Add phase/stage	
A3	Add phase/stage	
A4	Add phase/stage	
A5	Add phase/stage	
A6	Add phase/stage	
A7	Add phase/stage	
		Cnn (C=Contractual/Complete) starting at C01

Published for Asset Information Model (AIM) Acceptance

Suitability /Status	Definition	Revision Code
CR	As Constructed Record file	Cnn (C=Contractual/Complete) starting at C01

SUMMARY OF TAKE-OFF DATA

PROPOSED STORMWATER DESIGN FOR LIMERICK (BUNLICKY) WWTP

Summary of Take Off Data

Limerick WWTP

JUNCTIONS

Type	Chamber	Diameter (m)	Number	Total Volume (m³)	Depth (m)
Manhole	Circular		13	18.80	16.63
1.200m		1.2	13	18.80	16.63
TOTAL				18.80	16.63

STORMWATER CONTROLS

Type	Number	Porosity (%)	Total Displaced Volume (m³)	Material Volume (m³)
Porous Paving	1	30%	577.36	431.67
Swale	1	35%	599.40	598.66
TOTAL	2		1176.76	1030.33

CONNECTIONS

Type	Diameter(mm)	Number	Total Volume (m³)	Total Length (m)
225mm	225	14	19.15	481.72
TOTAL		14	19.15	481.72

Corcanree PS

JUNCTIONS

Type	Chamber	Diameter (m)	Number	Total Volume (m³)	Depth (m)
Manhole	Circular		2	2.04	1.80
1.200m		1.2	2	2.04	1.80
TOTAL			2	2.04	1.80

STORMWATER CONTROLS

Type	Number	Porosity (%)	Total Displaced Volume (m³)	Material Volume (m³)
French Drain	1	35%	75.00	74.47
TOTAL	1.000		75.00	74.47

CONNECTIONS

Type	Diameter(mm)	Number	(m³)	(m)
Pipe		2	0.75	42.48
150mm	150	2	0.75	42.48
TOTAL		2.000	0.7508	42.4845

PROPOSED STORMWATER DESIGN FOR LIMERICK (BUNLICKY) WWTP

Stormwater Controls - Take Off Data

STORMWATER CONTROLS

Limerick WWTP

POROUS PAVING

Name	Total Depth (m)	Paving Layer Depth (mm)	Membrane Percolation (m/hr)	Volume (m3)	Length (m)	Width (m)	Porosity (%)	Under Drain Diameter (mm)	Under Drain No. of Barrels
Porous Paving	1.00	250.00	0.40	577.36	67.03	8.61	30	160	1

SWALE

Name	Total Depth (m)	Swale Depth (m)	Trench Depth (m)	Top Width (m)	Side Slope (1:X)	Base Width (m)	Volume (m³)	Length (m)	Porosity (%)	Under Drain Diameter (mm)	Under Drain No. of Barrels
Dry Swale	1.55	0.75	1	15.00	4.00	9.00	599.40	37.00	35%	160	1

Corcanree PS

FRENCH DRAIN

Name	Total Depth (m)	Volume (m3)	Length (m)	Width (m)	Porosity (%)	Under Drain Diameter (mm)	Under Drain No. of Barrels
French Drain	1.00	75.00	30.00	2.50	35.00	150.00	1

PROPOSED STORMWATER DESIGN FOR LIMERICK (BUNLICKY) WWTP

Junctions - Take Off Data

Limerick WWTP

JUNCTIONS

Type	Chamber Shape	Diameter (m)	Number	Total Volume (m3)	Depth (m)
Manhole	Circular		13	18.80	16.63
1.200m		1.200	13	18.80	16.63
TOTAL			13	19.31	15.93

MANHOLE

Name	Depth (m)	Chamber	Diameter	Volume (m³)
MH08	1.270	Circular	1.2	1.436
MH07 (Hydro-Brake)	1.280	Circular	1.2	1.448
MH06	1.250	Circular	1.2	1.414
MH09	1.475	Circular	1.2	1.668
MH01	0.900	Circular	1.2	1.018
MH02	1.100	Circular	1.2	1.244
MH03	1.200	Circular	1.2	1.357
MH04.01	1.000	Circular	1.2	1.131
MH04	1.700	Circular	1.2	1.923
MH05 (Inlet MH)	1.550	Circular	1.2	1.753
MH02.01	0.900	Circular	1.2	1.018
Discharge to Treated Effluent Chamber	1.400	Circular	1.2	1.583
MH10	1.600	Circular	1.2	1.810

Corcanree PS

JUNCTIONS

Type	Chamber Shape	Diameter (m)	Number	Total Volume (m3)	Depth (m)
Manhole	Circular		2	2.04	1.80
1.200m		1.200	2	2.04	1.80
TOTAL			2	2.04	1.80

MANHOLE

Name	Depth (m)	Chamber	Diameter	Volume (m³)
EX-MH	0.900	Circular	1.2	1.018
MH01	0.900	Circular	1.2	1.018

PROPOSED STORMWATER DESIGN FOR LIMERICK (BUNLICKY) WWTP

Connections - Take Off Data

Limerick WWTP

CONNECTIONS

Type	Diameter	Number	Total Volume (m³)	Total Length (m)
225mm	225	14	19.15	481.72
TOTAL		14	19.15	481.72

PIPE

Name	Length (m)	No. of Barrels	Diameter / Base Width (mm)	Volume (m³)
P04	20.37	1	225	0.81
P07	22.30	1	225	0.89
P03	27.70	1	225	1.10
P08	8.70	1	225	0.35
P10	59.15	1	225	2.35
P09	49.15	1	225	1.95
P01	46.38	1	225	1.84
P02	42.80	1	225	1.70
P05.01	17.43	1	225	0.69
P05	6.08	1	225	0.24
P06	20.46	1	225	0.81
P03.01	102.37	1	225	4.07
P11	18.77	1	225	0.75
P12	40.07	1	225	1.59

Corcanree PS

CONNECTIONS

Type	Diameter	Number	Total Volume (m³)	Total Length (m)
Pipe		2	0.75	42.48
150mm	150	2	0.75	42.48
TOTAL		2.000	0.7508	42.4845

PIPE

Name	Length (m)	No. of Barrels	Diameter / Base Width (mm)	Volume (m³)
P01	26.20	1	150	0.46
P02	16.29	1	150	0.29

MODEL RESULTS - CRITICAL STORMS

PROPOSED STORMWATER DESIGN FOR LIMERICK (BUNLICKY) WWTP

Inflows - Critical Storm Results

Limerick WWTP

INFLOWS

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (l/s)	Total Inflow Volume (m3)
Sludge Screening (4.7mOD)	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	0.02	8.19	3.56
LTP Tank (2.5mOD)	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	0.02	10.32	4.49
Thickened Sludge Storage Tank (2.5 mOD)	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	0.02	10.33	4.49
Future Gas Bell Storage	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	0.04	17.80	7.75
LTP Buffer Tank (4.7mOD)	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	0.01	3.15	1.37
Export Cake Silo Storage (4.7mOD)	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	0.02	9.76	4.25
WAS, Poly Dosing, Digested Sludge Dewatering (4.5mOD)	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	0.02	9.99	4.35
Inlet Works & Slab (2.5mOD)	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winter	0.29	127.56	58.86
Vehicle Parking Area (4.45mOD)	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winter	0.09	41.16	18.99
Imported Cake Reception Area (4.65mOD)	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winter	0.03	13.05	6.02
MCC (4.65mOD)	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winter	0.01	2.44	1.13
Odour Unit	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winter	0.00	1.89	0.87
Pre THP Silos (4.7mOD)	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winter	0.02	7.73	3.57

Corcanree PS

INFLOWS

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (l/s)	Total Inflow Volume (m3)
Green Roof	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 30 mins: Summer	0.153	19.283	31.625

PROPOSED STORMWATER DESIGN FOR LIMERICK (BUNLICKY) WWTP

Junctions - Critical Storm Results

Limerick WWTP

JUNCTIONS

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max Depth (m)	Max. Inflow (m)	Max. Resident Volume (m3)	Max Flooded Volume (m3)	Max Outflow (l/s)	Total Discharge Volume (m3)	Status
MH08	FSR: 100 years: +20 %: 180 mins: Winter	2.17	0.93	1.12	0.20	28.74	0.22	0.00	28.75	209.33	OK
MH07 (Hydro-Brake)	FSR: 100 years: +20 %: 180 mins: Winter	2.25	0.97	1.40	0.43	28.75	0.49	0.00	28.74	209.55	Surcharged
MH06	FSR: 100 years: +20 %: 180 mins: Winter	2.25	1.00	1.41	0.41	28.75	0.46	0.00	28.75	209.62	Surcharged
MH09	FSR: 100 years: +20 %: 180 mins: Winter	2.30	0.85	1.01	0.16	28.75	0.19	0.00	28.75	209.20	OK
MH01	FSR: 100 years: +20 %: 30 mins: Winter	4.45	3.25	3.57	0.32	27.57	0.37	0.00	26.59	25.46	Surcharged
MH02	FSR: 100 years: +20 %: 30 mins: Winter	4.40	3.20	3.56	0.36	26.59	0.40	0.00	25.51	25.26	Surcharged
MH03	FSR: 100 years: +20 %: 120 mins: Winter	3.85	2.65	2.70	0.05	18.74	0.06	0.00	18.74	77.85	OK
MH04.01	FSR: 100 years: +20 %: 15 mins: Winter	2.45	1.45	2.35	0.90	19.38	1.60	0.00	19.80	9.12	Flood Risk
MH04	FSR: 100 years: +20 %: 15 mins: Winter	2.35	1.30	2.32	1.02	146.60	1.80	0.00	136.31	67.66	Flood Risk
MH05 (Inlet MH)	FSR: 100 years: +20 %: 15 mins: Winter	2.35	1.20	2.19	0.99	136.31	1.12	0.00	114.30	66.92	Flood Risk
MH02.01	FSR: 100 years: +20 %: 30 mins: Winter	4.27	3.37	3.56	0.19	16.83	0.21	0.00	15.56	15.57	OK
Discharge to Treated Effluent Chamber	FSR: 100 years: +20 %: 180 mins: Winter	2.10	0.70	0.85	0.15	28.75	0.00	0.00	28.75	209.11	OK
MH10	FSR: 100 years: +20 %: 180 mins: Winter	2.40	0.80	0.96	0.16	28.75	0.18	0.00	28.75	209.11	OK

Corcanree PS
JUNCTIONS

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max Depth (m)	Max. Inflow (m)	Max. Resident Volume (m3)	Max Flooded Volume (m3)	Max Outflow (l/s)	Total Discharge Volume (m3)	Status
EX-MH	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Summer	4.23	3.33	3.40	0.07	14.99	0.00	0.00	14.99	37.94	OK
MH01	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Summer	5.00	4.10	4.29	0.19	18.93	0.22	0.00	18.88	44.71	Surcharged

PROPOSED STORMWATER DESIGN FOR LIMERICK (BUNLICKY) WWTP

Connections - Critical Storm Results

Limerick WWTP
CONNECTIONS

Connection	Storm Event	Connection Type	From	To	US Cover Level (m)	Max US Water Level (m)	Max Flow Depth (m)	Discharge Volume (m3)	Max Velocity (m/s)	Flow / Capacity	Max Flow	Status
P04	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Winter	Pipe	MH03	MH04	3.85	2.71	0.06	62.36	1.71	0.17	15.86	OK
P07	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Winter	Pipe	Dry Swale	MH06	2.69	1.96	0.22	89.15	0.67	0.29	21.65	Surcharged
P03	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Winter	Pipe	Porous Paving	MH03	4.03	3.18	0.08	62.48	1.31	0.23	15.85	Surcharged
P08	100 years: +20 %: 60 mins: Winter	Pipe	MH06	MH07 (Hydro- Brake)	2.25	1.41	0.22	88.62	0.54	0.71	21.50	Surcharged
P10	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Winter	Pipe	MH08	MH09	2.17	1.12	0.20	86.06	0.59	1.17	21.26	OK
P09	100 years: +20 %: 60 mins: Winter	Pipe	MH07 (Hydro- Brake)	MH08	2.25	1.39	0.22	87.57	0.59	1.10	21.33	Surcharged
P01	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winter	Pipe	MH01	MH02	4.45	3.75	0.19	18.98	1.07	1.00	38.11	OK
P02	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winter	Pipe	MH02	Porous Paving	4.40	3.48	0.22	18.21	0.97	0.92	34.15	OK
P05.01	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	Pipe	MH04.01	MH04	2.45	2.04	0.22	16.10	0.92	0.76	36.62	Surcharged
P05	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	Pipe	MH04	MH05 (Inlet MH)	3.00	1.93	0.22	25.73	0.93	0.55	36.87	Surcharged
P06	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	Pipe	MH05 (Inlet MH)	Dry Swale	2.75	1.88	0.22	0.00	0.90	0.62	35.98	Surcharged
P03.01	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winter	Pipe	MH02.01	Porous Paving	4.27	3.50	0.19	11.16	0.76	0.63	23.27	OK
P11	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Winter	Pipe	MH09	MH10	2.30	1.01	0.18	84.94	0.63	1.13	21.18	OK
P12	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Winter	Pipe	MH10	Discharge to Treated Effluent Chamber	2.40	0.96	0.16	84.22	0.71	0.82	21.11	OK

Corcanree PS
CONNECTIONS

Connection	Storm Event	Connection Type	From	To	US Cover Level (m)	Max US Water Level (m)	Max Flow Depth (m)	Discharge Volume (m3)	Max Velocity (m/s)	Flow / Capacity	Max Flow	Status
P01	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 30 mins: Summer	Pipe	MH01	French Drain	5.00	4.21	0.15	31.58	1.09	0.43	19.23	OK
P02	Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Summer	Pipe	French Drain	EX-MH	4.65	4.02	0.07	37.94	1.88	0.40	14.99	Surcharged

MODEL RESULTS - SUSTAINABLE URBAN DRAINAGE SYSTEMS

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Velocity (m/s)	Max. Outflow (l/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 15 mins: Summer 3.186		2.992	0.152	0.092	42.876	18.522	0.000	0.000		5.545	4.562	86	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 15 mins: Winter 3.189		2.999	0.155	0.099	43.596	19.807	0.000	0.000		6.218	5.362	85	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 30 mins: Summer 3.194		3.016	0.160	0.116	32.612	22.850	0.000	0.000		8.023	16.133	83	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 30 mins: Winter 3.200		3.023	0.166	0.123	33.069	24.295	0.000	0.000		8.763	17.736	81	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 60 mins: Summer 3.202		3.029	0.168	0.129	28.846	25.378	0.000	0.000		9.404	30.224	81	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 60 mins: Winter 3.193		3.035	0.159	0.135	25.036	26.353	0.000	0.000		10.060	32.873	80	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 120 mins: Summer 3.181		3.035	0.147	0.135	21.372	25.701	0.000	0.000		10.113	42.329	80	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 120 mins: Winter 3.165		3.037	0.131	0.137	16.602	24.983	0.000	0.000		10.283	45.578	81	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 240 mins: Summer 3.152		3.029	0.117	0.129	14.420	22.577	0.000	0.000		9.363	54.183	83	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 240 mins: Winter 3.133		3.022	0.099	0.122	10.484	20.447	0.000	0.000		8.647	58.644	84	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 360 mins: Summer 3.135		3.019	0.101	0.119	11.105	20.085	0.000	0.000		8.291	61.615	85	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 360 mins: Winter 3.117		3.008	0.083	0.108	7.911	17.494	0.000	0.000		7.124	66.731	87	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 720 mins: Summer 3.110		2.997	0.076	0.097	6.971	15.813	0.000	0.000		6.045	76.279	88	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 720 mins: Winter 3.095		2.982	0.061	0.082	4.850	13.181	0.000	0.000		4.695	82.504	90	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 1440 mins: Summer 3.092		2.975	0.058	0.075	4.260	12.192	0.000	0.000		4.034	93.674	91	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 1440 mins: Winter 3.081		2.961	0.047	0.061	2.980	10.053	0.000	0.000		2.947	101.083	92	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 2880 mins: Summer 3.079		2.956	0.045	0.056	2.600	9.429	0.000	0.000		2.563	114.933	93	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 2880 mins: Winter 3.071		2.945	0.037	0.045	1.840	7.799	0.000	0.000		1.827	124.180	94	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 7200 mins: Summer 3.067		2.938	0.033	0.038	1.370	6.763	0.000	0.000		1.361	147.977	95	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 7200 mins: Winter 3.061		2.930	0.027	0.030	0.950	5.574	0.000	0.000		0.950	160.751	96	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 10080 mins: Summer 3.063		2.932	0.029	0.032	1.060	5.937	0.000	0.000		1.060	162.309	95	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 10080 mins: Winter 3.057		2.926	0.023	0.026	0.730	4.886	0.000	0.000		0.730	175.382	96	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 15 mins: Summer 3.210		3.005	0.176	0.105	50.567	21.328	0.000	0.000		6.796	5.874	84	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 15 mins: Winter 3.215		3.011	0.181	0.111	51.429	22.845	0.000	0.000		7.462	6.818	83	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 30 mins: Summer 3.225		3.027	0.191	0.127	38.024	26.267	0.000	0.000		9.229	19.143	80	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 30 mins: Winter 3.231		3.033	0.196	0.133	38.541	27.923	0.000	0.000		9.813	20.799	79	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 60 mins: Summer 3.232		3.037	0.198	0.137	33.506	29.035	0.000	0.000		10.363	35.456	78	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 60 mins: Winter 3.223		3.043	0.189	0.143	29.094	30.164	0.000	0.000		11.044	38.493	77	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 120 mins: Summer 3.209		3.042	0.175	0.142	24.718	29.112	0.000	0.000		10.960	49.327	78	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 120 mins: Winter 3.193		3.044	0.159	0.144	19.205	28.316	0.000	0.000		11.123	52.549	78	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 240 mins: Summer 3.168		3.037	0.134	0.137	16.592	25.288	0.000	0.000		10.375	62.471	81	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 240 mins: Winter 3.147		3.032	0.113	0.132	12.035	22.787	0.000	0.000		9.736	67.658	83	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 360 mins: Summer 3.146		3.028	0.112	0.128	12.737	22.282	0.000	0.000		9.336	70.838	83	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 360 mins: Winter 3.126		3.017	0.092	0.117	9.052	19.297	0.000	0.000		8.107	76.643	85	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 720 mins: Summer 3.117		3.005	0.083	0.105	7.962	17.273	0.000	0.000		6.879	87.058	87	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 720 mins: Winter 3.100		2.990	0.066	0.090	5.550	14.315	0.000	0.000		5.349	94.041	89	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 1440 mins: Summer 3.096		2.981	0.062	0.081	4.840	13.152	0.000	0.000		4.576	106.130	90	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 1440 mins: Winter 3.084		2.966	0.050	0.066	3.360	10.744	0.000	0.000		3.326	114.687	92	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 2880 mins: Summer 3.082		2.961	0.048	0.061	2.950	10.091	0.000	0.000		2.906	129.699	92	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 2880 mins: Winter 3.073		2.949	0.039	0.049	2.050	8.253	0.000	0.000		2.039	139.803	94	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 7200 mins: Summer 3.068		2.940	0.034	0.040	1.520	7.126	0.000	0.000		1.519	165.464	95	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 7200 mins: Winter 3.062		2.932	0.028	0.032	1.050	5.859	0.000	0.000		1.050	181.178	96	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 10080 mins: Summer 3.064		2.934	0.030	0.034	1.180	6.267	0.000	0.000		1.180	180.174	95	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 10080 mins: Winter 3.059		2.928	0.025	0.028	0.840	5.252	0.000	0.000		0.840	194.816	96	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 15 mins: Summer 3.263		3.021	0.229	0.121	65.258	26.726	0.000	0.000		8.552	8.249	80	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 15 mins: Winter 3.269		3.027	0.235	0.127	66.396	28.601	0.000	0.000		9.160	9.301	78	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 30 mins: Summer 3.288		3.041	0.254	0.141	48.437	32.870	0.000	0.000		10.827	24.084	75	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 30 mins: Winter 3.295		3.047	0.261	0.147	49.126	35.121	0.000	0.000		11.481	25.855	73	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 60 mins: Summer 3.296		3.050	0.262	0.150	42.455	36.191	0.000	0.000		11.901	44.990	72	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 60 mins: Winter 3.289		3.058	0.254	0.158	36.887	37.705	0.000	0.000		12.843	48.753	71	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 120 mins: Summer 3.268		3.056	0.234	0.156	31.087	35.935	0.000	0.000		12.561	62.631	73	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 120 mins: Winter 3.255		3.058	0.221	0.158	24.183	35.677	0.000	0.000		12.805	67.789	73	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 240 mins: Summer 3.216		3.047	0.182	0.147	20.691	31.040	0.000	0.000		11.491	78.386	76	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 240 mins: Winter 3.188		3.044	0.154	0.144	15.025	28.022	0.000	0.000		11.150	84.670	79	OK

Porous Paving - Criticial Storm Results

Stormwater Controls

Limerick WWTP
CRITICAL STORM

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Velocity (m/s)	Max. Outflow (l/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 360 mins: Sumn 3.178	3.041		0.144	0.141	15.826	26.738	0.000	0.000		10.760	88.314	80	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 360 mins: Winte 3.146	3.032		0.112	0.132	11.253	22.900	0.000	0.000		9.803	95.351	82	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 720 mins: Sumn 3.131	3.019		0.097	0.119	9.783	20.006	0.000	0.000		8.360	107.169	85	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 720 mins: Winte 3.110	3.002		0.076	0.102	6.800	16.405	0.000	0.000		6.559	115.854	87	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 1440 mins: Sum 3.104	2.992		0.070	0.092	5.881	14.869	0.000	0.000		5.558	129.244	89	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 1440 mins: Wint 3.090	2.975		0.056	0.075	4.100	12.046	0.000	0.000		4.057	139.666	91	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 2880 mins: Sum 3.087	2.968		0.053	0.068	3.560	11.207	0.000	0.000		3.514	155.836	91	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 2880 mins: Wint 3.077	2.955		0.043	0.055	2.470	9.123	0.000	0.000		2.464	168.024	93	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 7200 mins: Sum 3.072	2.945		0.038	0.045	1.800	7.790	0.000	0.000		1.800	197.913	94	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 7200 mins: Wint 3.065	2.936		0.030	0.036	1.240	6.375	0.000	0.000		1.240	214.921	95	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 10080 mins: Sur 3.067	2.938		0.033	0.038	1.400	6.848	0.000	0.000		1.400	214.030	95	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 10080 mins: Wir 3.061	2.931		0.027	0.031	0.980	5.663	0.000	0.000		0.980	232.335	96	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Sumn 3.342	3.037		0.308	0.137	85.418	34.199	0.000	0.000		10.355	10.983	74	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winte 3.349	3.045		0.315	0.145	86.770	36.604	0.000	0.000		11.239	11.964	72	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 30 mins: Sumn 3.383	3.059		0.349	0.159	62.501	42.472	0.000	0.000		12.940	29.623	68	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 30 mins: Winte 3.393	3.061		0.359	0.161	61.763	44.910	0.000	0.000		15.199	31.957	66	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Sumn 3.391	3.062		0.357	0.162	54.948	45.757	0.000	0.000		15.315	57.800	65	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Winte 3.389	3.070		0.355	0.170	47.801	47.869	0.000	0.000		15.854	62.552	63	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 120 mins: Sum 3.360	3.064		0.325	0.164	40.018	45.214	0.000	0.000		15.430	80.811	65	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 120 mins: Wint 3.348	3.065		0.314	0.165	31.152	45.360	0.000	0.000		15.548	87.689	65	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 240 mins: Sum 3.291	3.060		0.257	0.160	26.399	39.420	0.000	0.000		14.367	100.334	70	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 240 mins: Wint 3.260	3.060		0.226	0.160	19.186	36.721	0.000	0.000		13.060	108.527	72	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 360 mins: Sum 3.240	3.054		0.206	0.154	20.059	34.131	0.000	0.000		12.309	112.200	74	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 360 mins: Wint 3.198	3.045		0.164	0.145	14.254	29.340	0.000	0.000		11.310	121.239	78	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 720 mins: Sum 3.155	3.035		0.121	0.135	12.272	23.976	0.000	0.000		10.115	134.578	82	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 720 mins: Wint 3.125	3.018		0.091	0.118	8.551	19.343	0.000	0.000		8.183	145.594	85	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 1440 mins: Sur 3.116	3.005		0.082	0.105	7.311	17.181	0.000	0.000		6.878	160.541	87	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 1440 mins: Wir 3.097	2.986		0.063	0.086	5.080	13.739	0.000	0.000		5.035	173.440	90	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 2880 mins: Sur 3.093	2.978		0.059	0.078	4.340	12.578	0.000	0.000		4.290	191.091	90	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 2880 mins: Wir 3.082	2.962		0.048	0.062	3.010	10.151	0.000	0.000		3.006	205.664	92	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 7200 mins: Sur 3.075	2.950		0.041	0.050	2.170	8.591	0.000	0.000		2.170	239.970	93	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 7200 mins: Wir 3.068	2.940		0.034	0.040	1.520	7.080	0.000	0.000		1.520	260.583	95	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 10080 mins: St 3.071	2.943		0.036	0.043	1.690	7.549	0.000	0.000		1.690	259.042	94	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 10080 mins: W 3.064	2.934		0.030	0.034	1.170	6.193	0.000	0.000		1.170	282.451	95	OK

Swale- Critcial Storm Results

Stormwater Controls

Limerick WWTP
CRITICAL STORM

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Total Lost Volume (m ³)	Max Velocity (m/s)	Max Ouflow (L/s)	Total Discharge Volume (m ³)	Percentage Available (%)	Status
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 15 mins: Summer	1.374	1.327	0.239	0.377	81.534	35.732	0.000	0.000	0.000	3.660	1.980	78.338	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 15 mins: Winter	1.398	1.339	0.263	0.389	83.960	38.585	0.000	0.000	0.000	4.748	3.185	76.608	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 30 mins: Summer	1.476	1.365	0.341	0.415	57.485	46.162	0.000	0.000	0.000	7.513	15.478	72.014	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 30 mins: Winter	1.516	1.378	0.381	0.428	59.224	49.634	0.000	0.000	0.000	8.962	18.354	69.909	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 60 mins: Summer	1.597	1.392	0.462	0.442	52.119	56.822	0.000	0.000	0.000	10.725	43.705	65.552	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 60 mins: Winter	1.648	1.403	0.513	0.453	46.822	61.129	0.000	0.000	0.000	12.089	49.100	62.941	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 120 mins: Summer	1.691	1.407	0.556	0.457	41.815	64.432	0.000	0.000	0.000	12.674	83.668	60.938	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 120 mins: Winter	1.750	1.417	0.615	0.467	34.931	69.372	0.000	0.000	0.000	13.947	92.865	57.943	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 240 mins: Summer	1.751	1.415	0.616	0.465	31.514	69.537	0.000	0.000	0.000	13.701	118.758	57.843	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 240 mins: Winter	1.790	1.418	0.655	0.468	25.240	72.760	0.000	0.000	0.000	14.057	131.825	55.889	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 360 mins: Summer	1.758	1.413	0.623	0.463	25.507	70.079	0.000	0.000	0.000	13.471	138.815	57.515	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 360 mins: Winter	1.766	1.412	0.631	0.462	19.943	70.625	0.000	0.000	0.000	13.276	153.684	57.183	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 720 mins: Summer	1.694	1.401	0.559	0.451	17.154	64.581	0.000	0.000	0.000	11.859	177.875	60.848	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 720 mins: Winter	1.642	1.392	0.507	0.442	14.094	60.213	0.000	0.000	0.000	10.728	195.957	63.496	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 1440 mins: Summer	1.565	1.380	0.430	0.430	12.076	53.709	0.000	0.000	0.000	9.193	224.424	67.439	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 1440 mins: Winter	1.494	1.366	0.359	0.416	8.660	47.601	0.000	0.000	0.000	7.543	246.324	71.142	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 2880 mins: Summer	1.448	1.355	0.313	0.405	7.504	43.644	0.000	0.000	0.000	6.425	281.153	73.541	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 2880 mins: Winter	1.392	1.340	0.257	0.390	5.708	38.708	0.000	0.000	0.000	4.856	307.785	76.533	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 7200 mins: Summer	1.355	1.326	0.220	0.376	4.275	35.280	0.000	0.000	0.000	3.591	372.641	78.612	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 7200 mins: Winter	1.330	1.314	0.195	0.364	2.973	32.822	0.000	0.000	0.000	2.578	409.741	80.102	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 10080 mins: Summe	1.337	1.318	0.202	0.368	3.309	33.521	0.000	0.000	0.000	2.877	413.353	79.678	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 10080 mins: Winter	1.318	1.307	0.183	0.357	2.243	31.560	0.000	0.000	0.000	2.026	450.717	80.867	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 15 mins: Summer	1.420	1.346	0.285	0.396	94.890	40.655	0.000	0.000	0.000	5.472	4.170	75.353	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 15 mins: Winter	1.454	1.356	0.319	0.406	97.774	43.924	0.000	0.000	0.000	6.516	5.663	73.371	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 30 mins: Summer	1.547	1.386	0.412	0.436	67.325	52.337	0.000	0.000	0.000	9.959	20.661	68.271	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 30 mins: Winter	1.593	1.400	0.458	0.450	69.446	56.606	0.000	0.000	0.000	11.746	23.817	65.683	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 60 mins: Summer	1.684	1.408	0.549	0.458	61.099	64.154	0.000	0.000	0.000	12.790	53.377	61.107	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 60 mins: Winter	1.743	1.424	0.608	0.474	55.088	69.180	0.000	0.000	0.000	14.820	59.380	58.059	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 120 mins: Summer	1.788	1.426	0.653	0.476	49.184	72.532	0.000	0.000	0.000	15.222	100.575	56.027	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 120 mins: Winter	1.852	1.435	0.717	0.485	40.841	77.871	0.000	0.000	0.000	16.057	110.337	52.791	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 240 mins: Summer	1.852	1.430	0.717	0.480	36.394	78.012	0.000	0.000	0.000	15.629	141.198	52.705	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 240 mins: Winter	1.900	1.433	0.765	0.483	29.042	81.872	0.000	0.000	0.000	15.863	156.233	50.365	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 360 mins: Summer	1.857	1.426	0.722	0.476	29.316	78.393	0.000	0.000	0.000	15.200	163.696	52.474	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 360 mins: Winter	1.867	1.425	0.732	0.475	22.850	79.081	0.000	0.000	0.000	15.011	180.579	52.057	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 720 mins: Summer	1.774	1.412	0.639	0.462	19.592	71.267	0.000	0.000	0.000	13.311	206.793	56.794	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 720 mins: Winter	1.717	1.403	0.582	0.453	14.634	66.431	0.000	0.000	0.000	12.087	227.401	59.726	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 1440 mins: Summe	1.619	1.389	0.484	0.439	13.853	58.277	0.000	0.000	0.000	10.304	258.105	64.669	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 1440 mins: Winter	1.535	1.374	0.400	0.424	9.802	51.119	0.000	0.000	0.000	8.480	282.621	69.009	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 2880 mins: Summe	1.479	1.363	0.344	0.413	8.547	46.387	0.000	0.000	0.000	7.212	320.666	71.878	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 2880 mins: Winter	1.412	1.346	0.277	0.396	5.947	40.508	0.000	0.000	0.000	5.452	350.549	75.442	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 7200 mins: Summe	1.368	1.332	0.233	0.382	4.756	36.489	0.000	0.000	0.000	4.054	419.646	77.879	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 7200 mins: Winter	1.337	1.318	0.202	0.368	3.330	33.497	0.000	0.000	0.000	2.867	461.452	79.693	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 10080 mins: Summ	1.345	1.322	0.210	0.372	3.722	34.286	0.000	0.000	0.000	3.197	461.709	79.214	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 10080 mins: Winte	1.323	1.310	0.188	0.360	2.652	32.095	0.000	0.000	0.000	2.262	504.024	80.543	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 15 mins: Summer	1.520	1.378	0.385	0.428	120.598	49.888	0.000	0.000	0.000	8.975	8.584	69.755	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 15 mins: Winter	1.566	1.392	0.431	0.442	124.321	54.156	0.000	0.000	0.000	10.752	10.475	67.168	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 30 mins: Summer	1.685	1.426	0.550	0.476	86.576	64.719	0.000	0.000	0.000	15.199	29.920	60.764	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 30 mins: Winter	1.744	1.446	0.609	0.496	89.442	70.147	0.000	0.000	0.000	17.020	33.574	57.473	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 60 mins: Summer	1.848	1.455	0.713	0.505	78.670	78.079	0.000	0.000	0.000	17.748	70.517	52.665	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 60 mins: Winter	1.911	1.798	0.776	0.848	71.208	84.843	0.000	0.000	0.166	18.773	77.354	48.564	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 120 mins: Summer	1.918	1.873	0.783	0.923	62.893	88.448	0.000	0.000	0.189	18.876	128.433	46.378	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 120 mins: Winter	1.957	1.957	0.822	1.007	52.316	97.432	0.000	0.000	0.260	19.098	135.189	40.932	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 240 mins: Summer	1.940	1.940	0.805	0.990	45.396	95.049	0.000	0.000	0.241	18.513	177.499	42.376	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 240 mins: Winter	1.991	1.991	0.856	1.041	35.996	101.732	0.000	0.000	0.246	18.513	190.627	38.325	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 360 mins: Summer	1.942	1.942	0.807	0.992	36.368	95.419	0.000	0.000	0.219	18.034	206.844	42.152	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 360 mins: Winter	1.962	1.962	0.827	1.012	27.854	97.851	0.000	0.000	0.219	17.614	225.958	40.678	OK

Swale- Critcial Storm Results

Stormwater Controls

Limerick WWTP
CRITICAL STORM

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Total Lost Volume (m ³)	Max Velocity (m/s)	Max Ouflow (L/s)	Total Discharge Volume (m ³)	Percentage Available (%)	Status
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 720 mins: Summer	1.911	1.805	0.776	0.855	24.112	84.231	0.000	0.000	0.126	15.769	261.132	48.935	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 720 mins: Winter	1.863	1.422	0.728	0.472	17.969	78.579	0.000	0.000	0.000	14.469	286.527	52.361	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 1440 mins: Summe	1.726	1.404	0.591	0.454	15.328	67.231	0.000	0.000	0.000	12.278	320.355	59.241	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 1440 mins: Winter	1.621	1.388	0.486	0.438	12.001	58.363	0.000	0.000	0.000	10.233	350.597	64.617	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 2880 mins: Summe	1.540	1.375	0.405	0.425	10.248	51.598	0.000	0.000	0.000	8.618	391.266	68.719	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 2880 mins: Winter	1.453	1.357	0.318	0.407	7.242	44.104	0.000	0.000	0.000	6.548	427.621	73.262	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 7200 mins: Summe	1.390	1.340	0.255	0.390	5.639	38.559	0.000	0.000	0.000	4.805	506.149	76.624	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 7200 mins: Winter	1.349	1.324	0.214	0.374	3.888	34.760	0.000	0.000	0.000	3.389	552.453	78.927	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 10080 mins: Summ	1.360	1.328	0.225	0.378	4.457	35.752	0.000	0.000	0.000	3.771	551.548	78.325	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 10080 mins: Winter	1.332	1.315	0.197	0.365	3.045	32.992	0.000	0.000	0.000	2.651	604.478	79.998	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	1.665	1.437	0.530	0.487	156.615	63.341	0.000	0.000	0.000	16.206	14.630	61.600	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winter	1.724	1.461	0.589	0.511	162.182	69.006	0.000	0.000	0.000	18.224	16.908	58.165	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 30 mins: Summer	1.879	1.504	0.744	0.554	114.139	82.517	0.000	0.000	0.000	19.992	41.342	49.974	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 30 mins: Winter	1.923	1.862	0.788	0.912	118.013	90.688	0.000	0.000	0.276	21.067	44.833	45.020	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Summer	1.975	1.975	0.840	1.025	103.606	101.235	0.000	0.000	0.192	21.266	85.892	38.626	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Winter	2.053	2.053	0.918	1.103	93.567	112.305	0.000	0.000	0.311	21.794	89.485	31.915	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 120 mins: Summe	2.112	2.112	0.977	1.162	78.904	118.827	0.000	0.000	0.332	21.492	146.419	27.961	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 120 mins: Winter	2.194	2.194	1.059	1.244	64.931	131.345	0.000	0.000	0.248	21.372	153.398	20.372	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 240 mins: Summe	2.163	2.163	1.028	1.213	55.720	125.665	0.000	0.000	0.187	20.684	206.756	23.816	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 240 mins: Winter	2.228	2.228	1.093	1.278	44.024	135.647	0.000	0.000	0.298	20.235	220.355	17.764	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 360 mins: Summe	2.152	2.152	1.017	1.202	44.731	124.253	0.000	0.000	0.288	19.952	245.139	24.672	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 360 mins: Winter	2.195	2.195	1.060	1.245	35.305	130.795	0.000	0.000	0.218	19.249	264.835	20.706	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 720 mins: Summe	2.041	2.041	0.906	1.091	29.646	108.244	0.000	0.000	0.232	18.223	331.756	34.377	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 720 mins: Winter	1.987	1.987	0.852	1.037	22.438	100.771	0.000	0.000	0.187	16.903	366.113	38.908	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 1440 mins: Summ	1.881	1.424	0.746	0.474	18.837	80.123	0.000	0.000	0.000	14.762	404.625	51.426	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 1440 mins: Winter	1.749	1.406	0.614	0.456	14.556	69.055	0.000	0.000	0.000	12.520	442.255	58.136	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 2880 mins: Summ	1.629	1.390	0.494	0.440	12.613	59.116	0.000	0.000	0.000	10.442	487.058	64.161	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 2880 mins: Winter	1.514	1.370	0.379	0.420	8.901	49.325	0.000	0.000	0.000	7.991	530.355	70.097	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 7200 mins: Summ	1.424	1.349	0.289	0.399	6.370	41.532	0.000	0.000	0.000	5.785	617.363	74.821	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 7200 mins: Winter	1.369	1.332	0.234	0.382	4.574	36.627	0.000	0.000	0.000	4.103	675.869	77.795	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 10080 mins: Sum	1.382	1.337	0.247	0.387	4.963	37.837	0.000	0.000	0.000	4.547	671.368	77.062	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 10080 mins: Wint	1.345	1.322	0.210	0.372	3.702	34.274	0.000	0.000	0.000	3.192	735.075	79.221	OK

PROPOSED STORMWATER DESIGN FOR LIMERICK (BUNLICKY) WWTP

French Drain - Critcial Storm Results

Stormwater Controls

Corcanree PS

CRITICAL STORM

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max Outflow (m/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 15 mins: Summer	3.893	3.867	0.243	0.367	8.575	7.884	0.000	0.000	3.808	1.331	68.815	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 15 mins: Winter	3.893	3.866	0.243	0.366	8.470	7.868	0.000	0.000	3.766	1.274	68.878	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 30 mins: Summer	3.926	3.890	0.276	0.390	9.915	8.756	0.000	0.000	5.950	8.911	65.367	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 30 mins: Winter	3.925	3.889	0.275	0.389	9.573	8.735	0.000	0.000	5.897	8.818	65.449	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 60 mins: Summer	3.957	3.901	0.307	0.401	9.879	9.299	0.000	0.000	7.156	16.379	63.220	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 60 mins: Winter	3.956	3.901	0.306	0.401	9.302	9.270	0.000	0.000	7.107	16.269	63.334	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 120 mins: Summer	3.969	3.907	0.319	0.407	8.974	9.533	0.000	0.000	7.734	22.638	62.292	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 120 mins: Winter	3.956	3.901	0.306	0.401	7.771	9.276	0.000	0.000	7.121	22.596	63.311	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 240 mins: Summer	3.948	3.899	0.298	0.399	7.224	9.156	0.000	0.000	6.906	29.715	63.783	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 240 mins: Winter	3.919	3.887	0.269	0.387	5.769	8.617	0.000	0.000	5.660	29.763	65.915	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 360 mins: Summer	3.924	3.889	0.274	0.389	6.066	8.721	0.000	0.000	5.928	34.577	65.505	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 360 mins: Winter	3.898	3.875	0.248	0.375	4.609	8.174	0.000	0.000	4.571	34.646	67.667	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 720 mins: Summer	3.891	3.871	0.241	0.371	4.250	8.029	0.000	0.000	4.202	44.026	68.241	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 720 mins: Winter	3.869	3.857	0.219	0.357	2.990	7.534	0.000	0.000	2.976	44.129	70.199	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 1440 mins: Summer	3.866	3.854	0.216	0.354	2.809	7.456	0.000	0.000	2.782	55.623	70.507	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 1440 mins: Winter	3.850	3.841	0.200	0.341	1.870	7.073	0.000	0.000	1.863	55.620	72.023	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 2880 mins: Summer	3.848	3.840	0.198	0.340	1.770	7.030	0.000	0.000	1.765	69.516	72.193	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 2880 mins: Winter	3.836	3.830	0.186	0.330	1.150	6.743	0.000	0.000	1.150	69.450	73.329	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 7200 mins: Summer	3.831	3.826	0.181	0.326	0.930	6.630	0.000	0.000	0.930	91.956	73.775	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 7200 mins: Winter	3.823	3.819	0.173	0.319	0.600	6.444	0.000	0.000	0.600	92.193	74.510	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 10080 mins: Summer	3.826	3.822	0.176	0.322	0.730	6.520	0.000	0.000	0.730	101.079	74.212	OK
Limerick (Bunlicky) WWTP FSR: 5 years: +20 %: 10080 mins: Winter	3.821	3.817	0.171	0.317	0.470	6.369	0.000	0.000	0.470	100.986	74.809	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 15 mins: Summer	3.905	3.880	0.255	0.380	9.975	8.344	0.000	0.000	5.024	2.376	66.995	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 15 mins: Winter	3.905	3.880	0.255	0.380	9.849	8.331	0.000	0.000	4.987	2.302	67.047	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 30 mins: Summer	3.963	3.904	0.313	0.404	11.534	9.422	0.000	0.000	7.472	11.448	62.733	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 30 mins: Winter	3.962	3.904	0.312	0.404	11.130	9.406	0.000	0.000	7.426	11.341	62.798	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 60 mins: Summer	3.995	3.915	0.345	0.415	11.463	9.991	0.000	0.000	8.683	20.022	60.483	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 60 mins: Winter	3.994	3.914	0.344	0.414	10.809	9.954	0.000	0.000	8.571	19.893	60.627	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 120 mins: Summer	4.008	3.920	0.358	0.420	10.383	10.206	0.000	0.000	9.177	27.686	59.631	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 120 mins: Winter	3.989	3.913	0.339	0.413	8.990	9.870	0.000	0.000	8.422	27.712	60.961	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 240 mins: Summer	3.975	3.909	0.325	0.409	8.304	9.634	0.000	0.000	7.957	35.445	61.896	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 240 mins: Winter	3.939	3.895	0.289	0.395	6.638	8.987	0.000	0.000	6.505	35.520	64.453	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 360 mins: Summer	3.946	3.898	0.296	0.398	6.955	9.107	0.000	0.000	6.787	40.778	63.978	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 360 mins: Winter	3.911	3.882	0.261	0.382	5.289	8.444	0.000	0.000	5.242	40.895	66.602	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 720 mins: Summer	3.902	3.878	0.252	0.378	4.849	8.263	0.000	0.000	4.791	51.490	67.318	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 720 mins: Winter	3.877	3.862	0.227	0.362	3.400	7.700	0.000	0.000	3.392	51.509	69.543	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 1440 mins: Summer	3.872	3.859	0.222	0.359	3.179	7.603	0.000	0.000	3.148	64.131	69.929	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 1440 mins: Winter	3.854	3.845	0.204	0.345	2.110	7.179	0.000	0.000	2.109	64.215	71.604	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 2880 mins: Summer	3.852	3.843	0.202	0.343	1.990	7.126	0.000	0.000	1.985	79.395	71.814	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 2880 mins: Winter	3.839	3.832	0.189	0.332	1.290	6.812	0.000	0.000	1.290	79.470	73.057	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 7200 mins: Summer	3.833	3.828	0.183	0.328	1.040	6.687	0.000	0.000	1.040	104.049	73.549	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 7200 mins: Winter	3.825	3.821	0.175	0.321	0.670	6.485	0.000	0.000	0.670	104.016	74.350	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 10080 mins: Summe	3.828	3.824	0.178	0.324	0.810	6.565	0.000	0.000	0.810	114.132	74.033	OK
Limerick (Bunlicky) WWTP FSR: 10 years: +20 %: 10080 mins: Winter	3.822	3.818	0.172	0.318	0.520	6.399	0.000	0.000	0.520	114.183	74.691	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 15 mins: Summer	3.958	3.901	0.308	0.401	12.671	9.297	0.000	0.000	7.078	4.473	63.226	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 15 mins: Winter	3.957	3.900	0.307	0.400	12.520	9.266	0.000	0.000	7.039	4.368	63.351	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 30 mins: Summer	4.036	3.929	0.386	0.429	14.720	10.709	0.000	0.000	10.206	16.340	57.641	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 30 mins: Winter	4.034	3.928	0.384	0.428	14.207	10.688	0.000	0.000	10.152	16.195	57.725	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 60 mins: Summer	4.076	3.939	0.426	0.439	14.544	11.370	0.000	0.000	11.438	27.044	55.029	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 60 mins: Winter	4.080	3.939	0.430	0.439	13.709	11.421	0.000	0.000	11.524	27.988	54.826	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 120 mins: Summer	4.087	3.941	0.437	0.441	13.082	11.484	0.000	0.000	11.682	36.426	54.577	OK

PROPOSED STORMWATER DESIGN FOR LIMERICK (BUNLICKY) WWTP

French Drain - Critcial Storm Results

Stormwater Controls

Corcanree PS

CRITICAL STORM

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max Inflow (L/s)	Max. Resident Volume (m ³)	Max. Flooded Volume (m ³)	Total Lost Volume (m ³)	Max Outflow (m/s)	Total Discharge Volume (m ³)	Percentage Available (%)	Status
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 120 mins: Winter	4.056	3.932	0.406	0.432	11.319	10.998	0.000	0.000	10.658	36.459	56.497	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 240 mins: Summer	4.030	3.926	0.380	0.426	10.373	10.592	0.000	0.000	9.911	46.583	58.104	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 240 mins: Winter	3.980	3.910	0.330	0.410	8.288	9.720	0.000	0.000	8.127	46.278	61.552	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 360 mins: Summer	3.987	3.913	0.337	0.413	8.644	9.855	0.000	0.000	8.416	52.724	61.018	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 360 mins: Winter	3.939	3.895	0.289	0.395	6.569	8.983	0.000	0.000	6.507	52.925	64.469	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 720 mins: Summer	3.923	3.889	0.273	0.389	5.960	8.706	0.000	0.000	5.887	65.261	65.566	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 720 mins: Winter	3.891	3.871	0.241	0.371	4.190	8.018	0.000	0.000	4.174	65.153	68.286	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 1440 mins: Summer	3.885	3.867	0.235	0.367	3.869	7.881	0.000	0.000	3.831	80.048	68.827	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 1440 mins: Winter	3.862	3.851	0.212	0.351	2.570	7.370	0.000	0.000	2.569	80.049	70.849	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 2880 mins: Summer	3.859	3.849	0.209	0.349	2.400	7.298	0.000	0.000	2.393	97.707	71.134	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 2880 mins: Winter	3.844	3.837	0.194	0.337	1.560	6.938	0.000	0.000	1.559	97.611	72.558	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 7200 mins: Summer	3.838	3.831	0.188	0.331	1.230	6.783	0.000	0.000	1.230	125.775	73.172	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 7200 mins: Winter	3.828	3.823	0.178	0.323	0.790	6.554	0.000	0.000	0.790	125.658	74.078	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 10080 mins: Summe	3.832	3.827	0.182	0.327	0.960	6.646	0.000	0.000	0.960	137.559	73.712	OK
Limerick (Bunlicky) WWTP FSR: 30 years: +20 %: 10080 mins: Winter	3.823	3.820	0.173	0.320	0.620	6.455	0.000	0.000	0.620	137.373	74.466	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Summer	4.045	3.930	0.395	0.430	16.430	10.836	0.000	0.000	10.355	7.365	57.140	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 15 mins: Winter	4.043	3.929	0.393	0.429	16.289	10.804	0.000	0.000	10.277	7.238	57.268	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 30 mins: Summer	4.152	3.958	0.502	0.458	19.226	12.570	0.000	0.000	13.530	22.760	50.282	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 30 mins: Winter	4.157	3.959	0.507	0.459	18.545	12.632	0.000	0.000	13.629	23.042	50.036	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Summer	4.216	3.977	0.566	0.477	18.885	13.648	0.000	0.000	14.989	38.132	46.019	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 60 mins: Winter	4.205	3.973	0.555	0.473	17.079	13.504	0.000	0.000	14.730	38.148	46.587	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 120 mins: Summer	4.205	3.974	0.555	0.474	16.489	13.509	0.000	0.000	14.784	49.404	46.568	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 120 mins: Winter	4.158	3.959	0.508	0.459	14.412	12.683	0.000	0.000	13.576	49.508	49.836	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 240 mins: Summer	4.117	3.948	0.467	0.448	13.231	12.012	0.000	0.000	12.584	61.503	52.490	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 240 mins: Winter	4.045	3.930	0.395	0.430	10.568	10.815	0.000	0.000	10.346	61.233	57.221	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 360 mins: Summer	4.054	3.932	0.404	0.432	10.963	10.972	0.000	0.000	10.626	69.221	56.602	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 360 mins: Winter	3.983	3.911	0.333	0.411	8.329	9.772	0.000	0.000	8.244	69.140	61.348	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 720 mins: Summer	3.960	3.903	0.310	0.403	7.479	9.374	0.000	0.000	7.374	84.064	62.924	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 720 mins: Winter	3.911	3.882	0.261	0.382	5.250	8.442	0.000	0.000	5.237	84.070	66.607	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 1440 mins: Summe	3.901	3.877	0.251	0.377	4.799	8.249	0.000	0.000	4.757	101.432	67.371	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 1440 mins: Winter	3.873	3.859	0.223	0.359	3.190	7.618	0.000	0.000	3.187	101.523	69.866	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 2880 mins: Summe	3.869	3.856	0.219	0.356	2.940	7.519	0.000	0.000	2.937	122.055	70.260	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 2880 mins: Winter	3.851	3.842	0.201	0.342	1.910	7.094	0.000	0.000	1.910	121.965	71.941	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 7200 mins: Summe	3.843	3.835	0.193	0.335	1.480	6.902	0.000	0.000	1.480	154.119	72.702	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 7200 mins: Winter	3.832	3.827	0.182	0.327	0.960	6.646	0.000	0.000	0.960	154.056	73.712	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 10080 mins: Summr	3.836	3.830	0.186	0.330	1.150	6.743	0.000	0.000	1.150	167.499	73.328	OK
Limerick (Bunlicky) WWTP FSR: 100 years: +20 %: 10080 mins: Wintei	3.826	3.822	0.176	0.322	0.740	6.525	0.000	0.000	0.740	167.064	74.190	OK

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