

PINNACLE

CONSULTING ENGINEERS

- Swales
- Filter Drains
- Further Permeable/ Porous paved areas
- Tree pits
- Rain Gardens
- Rainwater Harvesting for use within data halls where possible.

The applicant shall clarify what attenuation volumes can be provided in all proposed SuDS features and shall provide cross sectional details of all SuDS features.

Response:

- (a) Refer to Dwg. No. 201107-PIN-ZZ-ZZ-DR-DR-C-201 Rev. P02, for the surface water drainage layout, including for all manholes, pipe sizes etc., around the data hall area in question. There are no existing surface water drainage pipe runs located within this area of the site.
- (b) Refer to Dwg. No. 201107-PIN-ZZ-ZZ-DR-DR-C-263 for cross sections through the proposed attenuation pond. The current top water level in the pond relative to a 1:100yr storm event + 20% c/c is circa 64.316m. The proposed floor level of the Data Hall is set at 67.48m, which is circa 3.164m higher than the predicted top water level in the pond and well in excess of the 500mm freeboard as required in this item.
- (c) Refer to Dwg. No. 201107-PIN-05-ZZ-DR-C-202 Rev. P02 for a revised hydrobrake outflow in Manhole SWMH54, i.e. 24l/s, as notated within the attenuation pond. This outflow rate was confirmed in the micro drainage calculations as submitted with the initial planning application – refer Appendix A for confirmation of the Qbar rate.
- (d) All parking spaces, circa 34 No., along the western elevation of the data hall will constitute permeable paving. In addition, tree pits will be positioned in accordance with the Landscape Architect, Kevin Fitzpatrick and details of same will be included with the landscape package. Furthermore, it is proposed to install rain water harvesting in conjunction with Ethos (M&E Consultants), in order to serve the office building area of the data centre.

Obviously all of the above measures are in addition to the surface water attenuation pond, restricted outflow in accordance with greenfield run-off rates and enhanced water quality in the form of interceptors. We would be of the opinion that the proposed SuDS features, as mentioned, would be appropriate and in line with similar data centre projects within the Grange Castle Business Park and surrounds.

Refer to Dwg. No. 201107-PIN-ZZ-ZZ-DR-DR-263 Rev. P01 for cross sections through the attenuation pond.

9. *In order to assess the feasibility of a connection to public water infrastructure the applicant is requested to engage with Irish Water through the submission of a Pre-Connection Enquiry (PCE) in order to determine the feasibility of connection to the public water infrastructure. Please note this is required for indirect connections to the public system also. The Confirmation of Feasibility (COF) must be submitted to the planning department as the response to this further information request. Pre-connection enquiries can be made at <https://www.water.ie/connections/get-connected/>.*

Response:-

A PCE was submitted and a positive response, i.e. a COF, (Ref: CDS 21000754 dated 10th June 2021), has been received from IW in respect of same. The water supply connection can be facilitated with no upgrades required to the network – refer Appendix B.

10. *(a) There is no drawing submitted which shows the proposed foul water drainage layout for the proposed data hall area to the west/north west of the site. The applicant is required to submit a drawing showing existing and proposed foul water drainage layouts for the proposed data hall area of the site. The drawing shall include the location of all AJs, manholes, pipe size, material type and direction of flow.*
- (b) In order to assess the feasibility of a connection to public waste water infrastructure further information is requested as follows; The applicant is requested to engage with Irish Water through the submission of a Pre-Connection Enquiry (PCE) in order to determine the feasibility of connection to the public waste water infrastructure. Please note this is required for indirect connections to the public system also. The Confirmation of Feasibility (COF) must be submitted to the planning department as the response to this further information request. Pre-connection enquiries can be made at <https://www.water.ie/connections/get-connected/>.*

Response:-

- (a) Refer to Dwg. No. 201107-PIN-ZZ-ZZ-DR-DR-C-201 Rev. P02, for the foul water drainage layout, including for all manholes, pipe sizes etc., around the data hall area in question. There are no existing foul drainage pipe runs located within this area of the site.
- (b) As with similar previous schemes, in which this client has had involvement in and whereby connections into Grange Castle Business Park Pumping Station have been utilised, there is no requirement to submit a PCE to IW in respect of waste water, as the connecting infrastructure laid from the subject site and ultimately into the aforementioned pumping station, does not fall under the jurisdiction of IW and is solely under the control of SDCC.
11. *There potentially is a series of drainage ditches/watercourses traversing the site. The applicant is requested to submit a drawing showing all existing watercourses/drainage ditches which traverse the site and which run around the perimeter of the site. The applicant shall clarify what these drainage systems currently serve, what condition they are in and how they will be modified as part of this development.*

Response:-


Refer to the Technical Note as prepared by AWN Consulting dated 12th July 2021, Ref. No. LB/20/11901TN01 in response to the above item.

In addition to the above, the ditches as identified in the aforementioned report, will essentially be infilled during the construction stage, if the footprint of the data hall and ancillary buildings and infrastuctural works, impact on the location of these ditches, in their current state.

These ditches will be infilled with suitable material and compacted in accordance current specifications and regulations, in order to provide the required bearing strata for the various buildings and/or suitable material will be imported and regulated in layers, in order to form pipe trench and road build-up layers, as and when it may be required.

PINNACLE
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We trust that the above meets with your requirements, however should you require any further information, or copies of drawings, please do not hesitate to contact us.



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Encl. (18)

APPENDIX A
Qbar Calculation Sheet

Qbar Calculation
Using IOH Report 124 for Sites < 25 km²

Catchment Name
Ballymakilly Lands Catchment

${}^1Q_{bar} = 0.00108 * (AREA)^{0.89} (SAAR)^{1.17} (SOIL)^{2.17}$ Estimation of QBAR from IOH Report 124 for catchments less than 25 km² using the 3 variable equation

AREA = **11.75** Ha Overall Catchment Area (Hectares) For catchments < 50 hectares in area flow rates are linearly interpolated for smaller areas

AREA = **0.117** km² Area of the Catchment (km²)

SAAR = **771** mm Standard Annual Average Rainfall (mm)

SOIL = **0.30**

Soil Type Expressed as a Percentage	Soil 1	Soil 2	Soil 3	Soil 4	Soil 5
	0	100	0	0	0
SOIL Value	0.15	0.30	0.40	0.45	0.50

M5₅₀ = **16.6** mm

M5_{2day} = **61** mm

Ratio M5₅₀/M5_{2d} = **0.272**

Soil index value (SPR) calculated from Flood Studies Report Vol V Fig 1.4.18(1) - The Classification of Soils from Winter Rainfall Acceptance Rate

Flood Return Event	Growth Factor	Permitted Flow (l/s)
1	0.85	20.4
QBAR	1	24.0
10	1.67	40.0
30	2.1	50.3
50	2.33	55.9
100	2.6	62.3
200	2.85	68.3
1000	3.5	83.9

QBAR from Site with Factorial Error Allowance	
r ² =	0.847
n =	71
fse =	1.651
Q _{bar} =	39.58 l/s

(With Allowance for the standard factorial error)

Pro-rata based on 50 Ha Site area to calculate Qbar

Q_{bar} = **0.00004** cumecs/Ha Q_{bar} = **2.0** l/s/Ha

Q_{bar[rural]} = **24.0** l/s

Block A - Catchment Characteristics			
Ballymakilly Lands Catchment	Area (m ²)	Runoff Coeff.	Effective Area (m ²)
Roofs - Type 1 (Draining to gullies)	22,625	1.00	22625.0
Roofs - Type 2 (Draining to SUDS features)	-	0.70	0.0
Roofs - Type 3 (Draining to Back Gardens)	-	0.00	0.0
Green Roofs	-	0.70	0.0
Yard Slabs - Type 1 (Draining to gullies)	6,753	0.80	5402.4
Roads and Footpaths - Type 1 (Draining to gullies)	9,920	0.80	7936.0
Roads and Footpaths - Type 2 (Draining to SUDS features)	-	0.70	0.0
Porous Asphalt/Permeable Paving	900	0.50	450.0
Gravel Access/Parking Areas	9,323	0.50	4661.5
Verges	-	0.15	0.0
Parks	-	0.15	0.0
Public Open Space	67,960	0.05	3398.0

Impermeable Contributing Area = **4.447** Hectares

Effective Catchment Runoff Coefficient = **0.38**



Date 01/01/0001

Designed by

File Ballymakaily Attenuation...

Checked by

Innovyze

Source Control 2020.1

Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
15 min Summer	63.600	0.300	24.0	780.9	O K
30 min Summer	63.712	0.412	24.0	1071.9	O K
60 min Summer	63.826	0.526	24.0	1368.7	O K
120 min Summer	63.944	0.644	24.0	1674.0	O K
180 min Summer	64.012	0.712	24.0	1851.5	O K
240 min Summer	64.058	0.758	24.0	1971.6	O K
360 min Summer	64.113	0.813	24.0	2114.6	O K
480 min Summer	64.142	0.842	24.0	2188.3	O K
600 min Summer	64.155	0.855	24.0	2221.8	O K
720 min Summer	64.158	0.858	24.0	2229.8	O K
960 min Summer	64.150	0.850	24.0	2211.3	O K
1440 min Summer	64.137	0.837	24.0	2176.6	O K
2160 min Summer	64.113	0.813	24.0	2114.9	O K
2880 min Summer	64.082	0.782	24.0	2033.5	O K
4320 min Summer	64.002	0.702	24.0	1824.2	O K
5760 min Summer	63.903	0.603	24.0	1567.2	O K
7200 min Summer	63.811	0.511	24.0	1327.7	O K
8640 min Summer	63.725	0.425	24.0	1105.4	O K
10080 min Summer	63.648	0.348	24.0	904.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	86.704	0.0	806.2	19
30 min Summer	60.113	0.0	1117.7	34
60 min Summer	39.120	0.0	1455.0	64
120 min Summer	24.753	0.0	1842.3	122
180 min Summer	18.772	0.0	2095.0	182
240 min Summer	15.405	0.0	2293.9	242
360 min Summer	11.622	0.0	2596.6	362
480 min Summer	9.503	0.0	2830.2	482
600 min Summer	8.124	0.0	3024.0	600
720 min Summer	7.146	0.0	3192.1	720
960 min Summer	5.834	0.0	3473.9	898
1440 min Summer	4.382	0.0	3748.5	1142
2160 min Summer	3.289	0.0	4405.5	1540
2880 min Summer	2.681	0.0	4792.0	1960
4320 min Summer	2.006	0.0	5379.0	2808
5760 min Summer	1.632	0.0	5835.9	3576
7200 min Summer	1.391	0.0	6210.0	4328
8640 min Summer	1.220	0.0	6536.8	5096
10080 min Summer	1.092	0.0	6825.8	5760



Date 01/01/0001

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Innovyze

Source Control 2020.1

Summary of Results for 100 year Return Period (+20%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
15 min Winter	63.638	0.338	24.0	877.8	O K
30 min Winter	63.764	0.464	24.0	1207.0	O K
60 min Winter	63.894	0.594	24.0	1544.5	O K
120 min Winter	64.032	0.732	24.0	1903.1	O K
180 min Winter	64.111	0.811	24.0	2109.8	O K
240 min Winter	64.166	0.866	24.0	2251.8	O K
360 min Winter	64.235	0.935	24.0	2431.5	O K
480 min Winter	64.275	0.975	24.0	2535.8	O K
600 min Winter	64.299	0.999	24.0	2596.5	O K
720 min Winter	64.311	1.011	24.0	2628.7	O K
960 min Winter	64.316	1.016	24.0	2640.6	O K
1440 min Winter	64.286	0.986	24.0	2563.0	O K
2160 min Winter	64.251	0.951	24.0	2472.3	O K
2880 min Winter	64.200	0.900	24.0	2340.6	O K
4320 min Winter	64.073	0.773	24.0	2010.2	O K
5760 min Winter	63.909	0.609	24.0	1584.5	O K
7200 min Winter	63.758	0.458	24.0	1191.5	O K
8640 min Winter	63.628	0.328	24.0	852.6	O K
10080 min Winter	63.518	0.218	24.0	567.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Winter	86.704	0.0	902.6	19
30 min Winter	60.113	0.0	1252.1	33
60 min Winter	39.120	0.0	1629.9	62
120 min Winter	24.753	0.0	2063.2	122
180 min Winter	18.772	0.0	2347.9	180
240 min Winter	15.405	0.0	2569.2	238
360 min Winter	11.622	0.0	2906.2	356
480 min Winter	9.503	0.0	3168.0	470
600 min Winter	8.124	0.0	3387.8	584
720 min Winter	7.146	0.0	3574.8	696
960 min Winter	5.834	0.0	3854.4	914
1440 min Winter	4.382	0.0	3779.5	1300
2160 min Winter	3.289	0.0	4938.1	1644
2880 min Winter	2.681	0.0	5364.7	2128
4320 min Winter	2.006	0.0	6023.4	3064
5760 min Winter	1.632	0.0	6531.3	3864
7200 min Winter	1.391	0.0	6957.2	4616
8640 min Winter	1.220	0.0	7327.6	5352
10080 min Winter	1.092	0.0	7645.4	5960



Date 01/01/0001

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Innovyze

Source Control 2020.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	16.600	Shortest Storm (mins)	15
Ratio R	0.272	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+20

Time Area Diagram

Total Area (ha) 4.965

Time (mins)	Area
From:	To: (ha)

0	4	4.965
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Date 01/01/0001

Designed by

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Innovyze

Source Control 2020.1

Model Details

Storage is Online Cover Level (m) 65.500

Tank or Pond Structure

Invert Level (m) 63.300

Depth (m) Area (m²)

0.000 2600.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0208-2400-1500-2400
 Design Head (m) 1.500
 Design Flow (l/s) 24.0
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 208
 Invert Level (m) 63.000
 Minimum Outlet Pipe Diameter (mm) 225
 Suggested Manhole Diameter (mm) 1800

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	24.0	Kick-Flo®	1.000	19.8
Flush-Flo™	0.457	24.0	Mean Flow over Head Range	-	20.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.1	1.200	21.6	3.000	33.4	7.000	50.3
0.200	20.0	1.400	23.2	3.500	36.0	7.500	52.0
0.300	23.3	1.600	24.7	4.000	38.4	8.000	53.7
0.400	23.9	1.800	26.2	4.500	40.6	8.500	55.3
0.500	24.0	2.000	27.5	5.000	42.8	9.000	56.9
0.600	23.7	2.200	28.8	5.500	44.8	9.500	58.4
0.800	22.7	2.400	30.0	6.000	46.7		
1.000	19.9	2.600	31.2	6.500	48.6		

APPENDIX B

Irish Water COF

Ref: CDS 21000754



Shaun O' Reilly
67A Patrick Street
Dun Laoighaire
Co. Dublin

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

10 June 2021

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City

Re: CDS21000754 pre-connection enquiry - Subject to contract | Contract denied

www.water.ie

Connection for Business Connection of 1 unit(s) at Ballymaikly Lands to the west of the Newcastle Road, Lucan, Co. Dublin

Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water connection at Ballymaikly Lands to the west of the Newcastle Road, Lucan, Co. Dublin (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

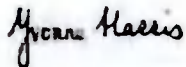
SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY <u>THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.</u>
Water Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
The design and construction of the Water pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

General Notes:

- 1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
- 2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
- 3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
- 4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at <https://www.water.ie/connections/get-connected/>
- 5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
- 6) Irish Water Connection Policy/ Charges can be found at <https://www.water.ie/connections/information/connection-charges/>
- 7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
- 8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
- 9) To access Irish Water Maps email datarequests@water.ie
- 10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Marko Komso from the design team on or email mkomso@water.ie. For further information, visit www.water.ie/connections.

Yours sincerely,



Yvonne Harris
Head of Customer Operations