Appendix B Supporting Drainage Information

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 303671, Northing: 228124,

	Interval		Years												
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.4,	3.6,	4.3,	5.3,	6.0,	6.6,	8.5,	10.7,	12.2,	14.4,	16.4,	17.9,	20.3,	22.3,	23.9,	N/A ,
10 mins	3.4,	5.0,	6.0,	7.4,	8.4,	9.2,	11.8,	14.9,	17.0,	20.0,	22.8,	25.0,	28.3,	31.0,	33.3,	N/A ,
15 mins	4.0,	5.9,	7.0,	8.7,	9.9,	10.8,	13.9,	17.6,	20.0,	23.6,	26.8,	29.4,	33.3,	36.5,	39.1,	N/A ,
30 mins	5.2,	7.7,	9.1,	11.2,	12.7,	13.9,	17.8,	22.3,	25.4,	29.8,	33.8,	36.9,	41.8,	45.6,	48.8,	N/A ,
1 hours	6.9,	10.0,	11.8,	14.5,	16.4,	17.8,	22.7,	28.4,	32.2,	37.6,	42.5,	46.3,	52.3,	57.0,	60.9,	N/A ,
2 hours	9.0,	13.1,	15.3,	18.7,	21.1,	22.9,	29.0,	36.0,	40.7,	47.4,	53.5,	58.2,	65.5,	71.3,	76.1,	N/A ,
3 hours	10.6,	15.3,	17.8,	21.8,	24.4,	26.5,	33.5,	41.5,	46.8,	54.4,	61.2,	66.5,	74.8,	81.2,	86.6,	N/A ,
4 hours	11.8,	17.0,	19.9,	24.2,	27.1,	29.4,	37.0,	45.8,	51.6,	59.9,	67.3,	73.1,	82.1,	89.1,	95.0,	N/A ,
6 hours	13.9,	19.9,	23.1,	28.1,	31.4,	34.1,	42.7,	52.7,	59.3,	68.6,	77.0,	83.5,	93.7,	101.5,	108.1,	N/A ,
9 hours	16.3,	23.2,	26.9,	32.6,	36.4,	39.4,	49.3,	60.6,	68.1,	78.7,	88.1,	95.5,	106.8,	115.7,	123.1,	N/A ,
12 hours	18.2,	25.9,	30.0,	36.2,	40.5,	43.8,	54.6,	66.9,	75.1,	86.6,	96.9,	104.9,	117.3,	126.9,	134.9,	N/A ,
18 hours	21.4,	30.2,	34.9,	42.1,	46.9,	50.7,	63.0,	77.0,	86.2,	99.3,	110.9,	119.9,	133.8,	144.6,	153.6,	N/A ,
24 hours	23.9,	33.7,	38.9,	46.8,	52.1,	56.2,	69.7,	85.0,	95.1,	109.4,	122.0,	131.8,	146.9,	158.7,	168.4,	202.6,
2 days	30.1,	41.2,	47.0,	55.6,	61.4,	65.8,	80.2,	96.1,	106.5,	121.0,	133.7,	143.5,	158.5,	170.0,	179.5,	212.5,
3 days	35.2,	47.3,	53.6,	62.8,	68.9,	73.6,	88.7,	105.2,	116.0,	130.8,	143.8,	153.7,	168.8,	180.4,	189.9,	222.7,
4 days	39.6,	52.6,	59.3,	69.0,	75.4,	80.4,	96.1,	113.2,	124.3,	139.5,	152.7,	162.8,	178.1,	189.8,	199.4,	232.3,
6 days	47.4,	61.8,	69.1,	79.8,	86.8,	92.1,	108.9,	127.0,	138.6,	154.5,	168.2,	178.7,	194.4,	206.4,	216.1,	249.5,
8 days	54.2,	69.9,	77.8,	89.2,	96.6,	102.3,	120.0,	139.0,	151.1,	167.6,	181.8,	192.5,	208.6,	220.9,	230.9,	264.8,
10 days	60.5,	77.3,	85.7,	97.8,	105.6,	111.5,	130.0,	149.9,	162.4,	179.4,	194.0,	205.0,	221.5,	234.0,	244.2,	278.6,
12 days	66.5,	84.2,	93.1,	105.7,	113.9,	120.0,	139.3,	159.8,	172.7,	190.2,	205.2,	216.5,	233.3,	246.1,	256.4,	291.4,
16 days	77.4,	96.9,	106.5,	120.2,	129.0,	135.7,	156.2,	178.0,	191.6,	209.9,	225.5,	237.3,	254.8,	268.0,	278.6,	314.5,
20 days	87.6,	108.6,	118.9,	133.5,	142.9,	149.9,	171.6,	194.4,	208.6,	227.7,	243.9,	256.1,	274.1,	287.7,	298.7,	335.4,
25 days	99.5,	122.2,	133.3,	148.9,	158.9,	166.3,	189.3,	213.3,	228.1,	248.1,	264.9,	277.5,	296.2,	310.2,	321.5,	359.2,

NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

R = m5-60minutes / m5-2days
R= 17.8 / 65.8 = 0.27

Appendix C Causeway Flow Drainage Design Calculations

Design Settings

Frequency of use (kDU)	0.00	Minimum Velocity (m/s)	0.75
Flow per dwelling per day (l/day)	0	Connection Type	Level Soffits
Domestic Flow (l/s/ha)	0.0	Minimum Backdrop Height (m)	0.200
Industrial Flow (l/s/ha)	0.0	Preferred Cover Depth (m)	1.200
Additional Flow (%)	0	Include Intermediate Ground	✓

Nodes

Name	Cover Level (m)	Manhole Type	Easting (m)	Northing (m)	Depth (m)
F1-0	99.000	Adoptable	703587.064	728092.495	1.764
F1-1	98.600	Adoptable	703611.750	728132.213	1.832
FJ1	98.320		703619.826	728138.899	1.657
FJ2	99.100		703583.536	728087.111	1.800

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.002	F1-1	FJ1	10.485	1.500	96.768	96.663	0.105	100.0	150
1.001	F1-0	F1-1	46.764	1.500	97.236	96.768	0.468	100.0	150
1.000	FJ2	F1-0	6.438	1.500	97.300	97.236	0.064	100.0	150

Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
1.002	0.000	0.876	15.5	0.0	1.682	1.507	0.000	0	0.0	0.0	0	0.000
1.001	0.000	0.876	15.5	0.0	1.614	1.682	0.000	0	0.0	0.0	0	0.000
1.000	0.000	0.876	15.5	0.0	1.650	1.614	0.000	0	0.0	0.0	0	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.002	10.485	100.0	150	Circular	98.600	96.768	1.682	98.320	96.663	1.507
1.001	46.764	100.0	150	Circular	99.000	97.236	1.614	98.600	96.768	1.682
1.000	6.438	100.0	150	Circular	99.100	97.300	1.650	99.000	97.236	1.614

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.002	F1-1	1200	Manhole	Adoptable	FJ1		Junction	
1.001	F1-0	1200	Manhole	Adoptable	F1-1	1200	Manhole	Adoptable
1.000	FJ2		Junction		F1-0	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
F1-0	703587.064	728092.495	99.000	1.764	1200		1	1.000	97.236	150
							0	1.001	97.236	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
F1-1	703611.750	728132.213	98.600	1.832	1200	1	1.001	96.768	150
						0	1.002	96.768	150
FJ1	703619.826	728138.899	98.320	1.657		1	1.002	96.663	150
FJ2	703583.536	728087.111	99.100	1.800		0	1.000	97.300	150

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	18.700	Minimum Backdrop Height (m)	0.200
Ratio-R	0.271	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1-0	0.045	4.00	99.000	1800	703577.047	728097.354	1.718
S2-0		4.00	98.660	1800	703596.634	728127.507	1.560
S1-1	0.038	4.00	98.700	1800	703589.900	728120.167	1.650
HEADWALL			98.000	1200	703581.508	728127.397	1.005
SJ1		4.00	99.100		703576.958	728093.750	1.800

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.002	S1-1	HEADWALL	11.077	0.600	97.050	96.995	0.055	200.0	300	4.39	50.0
1.001	S1-0	S1-1	26.185	0.600	97.282	97.151	0.131	200.0	900	4.22	50.0
2.000	S2-0	S1-1	9.961	0.600	97.100	97.050	0.050	200.0	900	4.08	50.0
1.000	SJ1	S1-0	3.605	0.600	97.300	97.282	0.018	200.0	900	4.03	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.002	1.108	78.3	11.2	1.350	0.705	0.082	0.0	76	0.790
1.001	2.212	1407.0	6.1	0.818	0.649	0.045	0.0	42	0.572
2.000	2.212	1407.0	0.0	0.660	0.750	0.000	0.0	0	0.000
1.000	2.212	1407.0	0.0	0.900	0.818	0.000	0.0	0	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.002	11.077	200.0	300	Circular	98.700	97.050	1.350	98.000	96.995	0.705
1.001	26.185	200.0	900	Circular	99.000	97.282	0.818	98.700	97.151	0.649
2.000	9.961	200.0	900	Circular	98.660	97.100	0.660	98.700	97.050	0.750
1.000	3.605	200.0	900	Circular	99.100	97.300	0.900	99.000	97.282	0.818

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.002	S1-1	1800	Manhole	Adoptable	HEADWALL	1200	Manhole	Adoptable
1.001	S1-0	1800	Manhole	Adoptable	S1-1	1800	Manhole	Adoptable
2.000	S2-0	1800	Manhole	Adoptable	S1-1	1800	Manhole	Adoptable
1.000	SJ1		Junction		S1-0	1800	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1-0	703577.047	728097.354	99.000	1.718	1800	1	1.000	97.282	900
						0	1.001	97.282	900
S2-0	703596.634	728127.507	98.660	1.560	1800	0	2.000	97.100	900
S1-1	703589.900	728120.167	98.700	1.650	1800	1	2.000	97.050	900
						2	1.001	97.151	900
						0	1.002	97.050	300
HEADWALL	703581.508	728127.397	98.000	1.005	1200	1	1.002	96.995	300
SJ1	703576.958	728093.750	99.100	1.800		0	1.000	97.300	900

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
FSR Region	Scotland and Ireland	Drain Down Time (mins)	240
M5-60 (mm)	18.700	Additional Storage (m³/ha)	20.0
Ratio-R	0.271	Check Discharge Rate(s)	✓
Summer CV	0.750	Check Discharge Volume	✓
Winter CV	0.840	100 year 360 minute (m³)	
Analysis Speed	Detailed		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

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

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m^3)	

Node HEADWALL Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m^2)	0	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	0		

Applies to All storms

Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	0.550	10080	0.550

Node S1-1 Online Hydro-Brake® Control

Flap Valve	✓	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	97.050	Product Number	CTL-SHE-0064-2000-1200-2000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 98.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	S1-0	352	98.273	0.991	2.8	3.0356	0.0000	SURCHARGED
480 minute winter	S2-0	344	98.273	1.173	0.6	2.9856	0.0000	SURCHARGED
480 minute winter	S1-1	352	98.273	1.223	4.0	3.6715	0.0000	SURCHARGED
15 minute summer	HEADWALL	1	97.545	0.550	0.9	0.0000	0.0000	OK
480 minute winter	SJ1	352	98.273	0.973	0.3	0.0000	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	S1-0	1.001	S1-1	1.8	0.380	0.001	16.5954	
480 minute winter	S2-0	2.000	S1-1	-0.6	-0.027	0.000	6.3130	
480 minute winter	S1-1	Hydro-Brake®	HEADWALL	1.8				44.6
480 minute winter	SJ1	1.000	S1-0	-0.3	-0.020	0.000	2.2848	

Appendix D Local Government Consultation

a. Correspondence with Inland Fisheries Ireland

b. Irish Water Confirmation of Feasibility

UISCE ÉIREANN : IRISH WATER

Mark Richardson

Punch Consulting

Carnegie House
Library Road
Dun Laoghaire
Co. Dublin
A96C7W7

Uisce Éireann
Bosca OP 448
Oifig Sheachadta
Cathrach Theas
Cathair Chorcaí

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

www.water.ie

17 May 2022

Re: CDS22002784 pre-connection enquiry - Subject to contract | Contract denied

Connection for Business Connection of 1 unit(s) at Junction to Clonlara Road, Dublin, Dublin

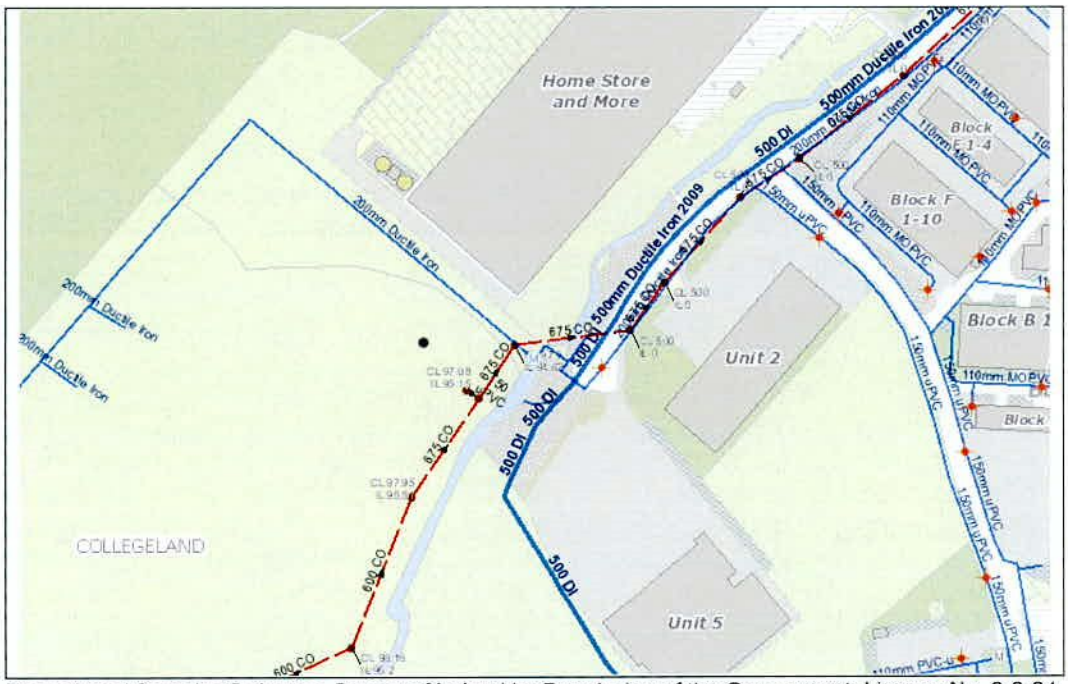
Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Junction to Clonlara Road, Dublin, 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 THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.
Water Connection	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Water Connection	A 200mm diameter watermain section is feasible to be laid in the roadway. All works are to be carried out in accordance with the Irish Water Codes of Practice and Standard Details. No connection to the Irish Water network will be carried out until a connection application is made to Irish Water including flow demands as per the Irish Water Codes of Practice. This section of watermain will be subject to inspection from Irish Water at connection application stage. The applicant will be responsible for funding the rectification of any defects identified during these inspection works.

	Diversion of the infrastructure may be required subject to layout proposal of the development and separation distances. For design submissions and queries related to diversion/build near or over, please contact IW Diversion Team via email address diversions@water.ie . For further information related to diversion please visit www.water.ie/connections/developer-services/diversions.
Wastewater Connection	A 225mm diameter wastewater sewer section is feasible to be laid in the roadway. All works are to be carried out in accordance with the Irish Water Codes of Practice and Standard Details. No connection to the Irish Water network will be carried out until a connection application is made to Irish Water including flow demands as per the Irish Water Codes of Practice. This section of wastewater sewer will be subject to inspection from Irish Water at connection application stage. The applicant will be responsible for funding the rectification of any defects identified during these inspection works.
The design and construction of the Water & Wastewater 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.	

The map included below outlines the current Irish Water infrastructure adjacent to your site:



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Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available

information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

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 Kevin McManmon from the design team at kmcmanmon@water.ie For further information, visit **www.water.ie/connections.**

Yours sincerely,

Yvonne Harris

Yvonne Harris

Head of Customer Operations

Mark Richardson | PUNCH

From: Roisin O'Callaghan <Roisin.O'Callaghan@fisheriesireland.ie>
Sent: Wednesday 25 May 2022 16:44
To: Mark Richardson | PUNCH
Cc: Matthew Carroll
Subject: RE: 212126 Access Rd , Clonlara Rd Baldonnell - Headwall discharge to River Camac

Hi Mark

The headwalls drawing plans seem acceptable to IFI in principle. We will comment fully at the planning stage.

Kind Regards,

Roisin

From: Mark Richardson | PUNCH <mrichardson@punchconsulting.com>
Sent: Tuesday 24 May 2022 14:59
To: Gretta Hannigan <Gretta.Hannigan@fisheriesireland.ie>; Roisin O'Callaghan <Roisin.O'Callaghan@fisheriesireland.ie>
Cc: Leonard Brennan | PUNCH <lbrennan@punchconsulting.com>; Garrett Robinson <grobinson@oversite.ie>
Subject: RE: 212126 Access Rd , Clonlara Rd Baldonnell - Headwall discharge to River Camac

Hi Gretta / Roisin,

I hope you are well.

I wonder did you have a chance to review the drawing provided, and whether you have any comments in advance of our planning application.

Please refer attached slightly updated drawing for ease of reference.

Thanks

Mark Richardson
BA BAI(Hons) CEng
Senior Engineer

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From: Mark Richardson | PUNCH
Sent: Tuesday 10 May 2022 12:46
To: Gretta Hannigan <Gretta.Hannigan@fisheriesireland.ie>
Cc: Roisin O'Callaghan <Roisin.OCallaghan@fisheriesireland.ie>; Leonard Brennan | PUNCH

<lbrennan@punchconsulting.com>; Garrett Robinson <grobinson@oversite.ie>
Subject: 212126 Access Rd , Clonlara Rd Baldonnell - Headwall discharge to River Camac [Filed 10 May 2022 12:46]

Good Afternoon Gretta,

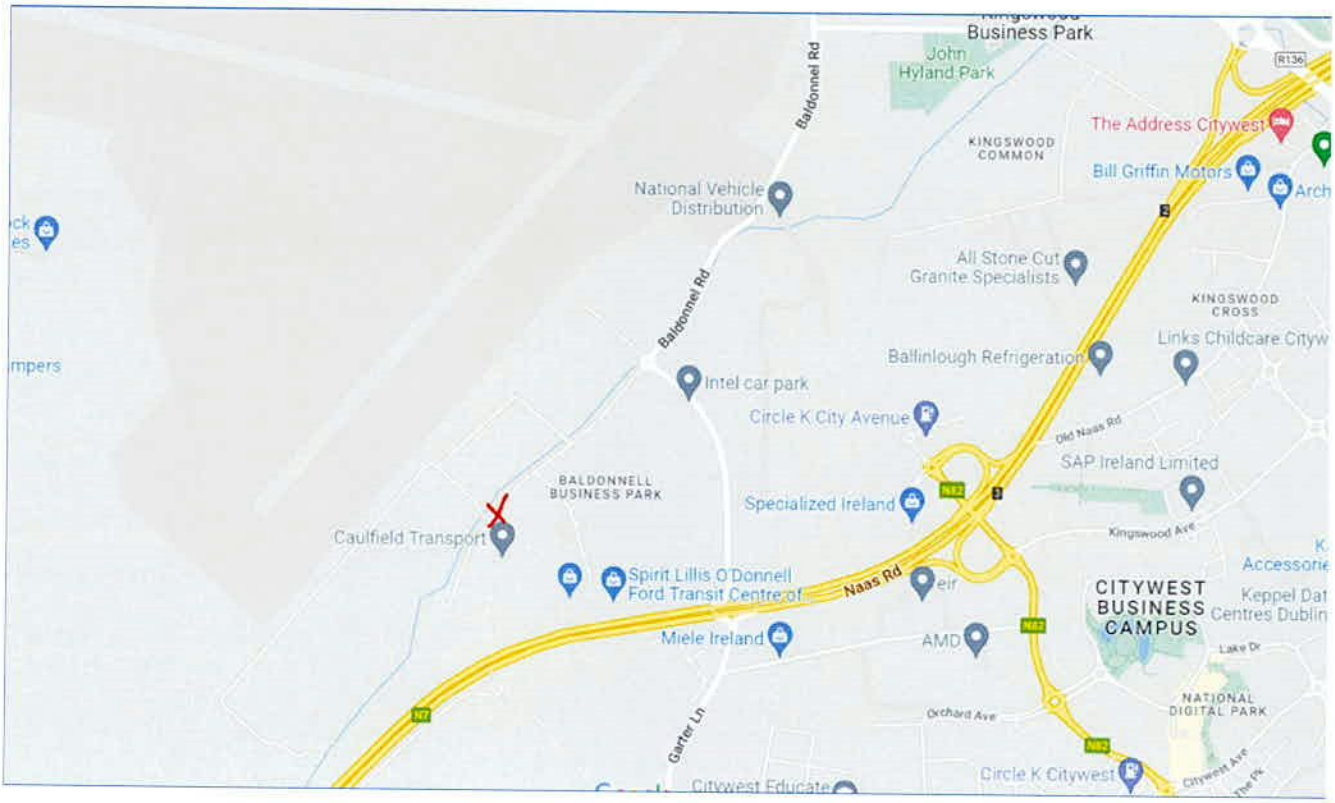
I trust you are well.

Please note that there is a planning application intended for a new access road at the above location.

As part of the development drainage, a new headwall discharge is proposed to the River Camac. Surface water attenuation is proposed for the road in oversized pipes indicated. Please see attached drainage drawing and scaled out drawing showing location. The final location of the headwall may be slightly different than that located on this drawing in the final planning application, however the general location will remain.

Please can you provide IFI comment on the proposed headwall discharge location. We would very much like to have IFI endorsement of the development for the planning application. If you wish, please feel free to call and discuss.

The overall location of the site is at the red 'x' indicated below, between N7 and Casement Aerodrome.



Thank you very much,

Mark Richardson
BA BAI(Hons) CEng
Senior Engineer

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