LINK ROAD TO CLONLARA ROAD, BALDONNELL BUSINESS PARK, DUBLIN

Flood Risk Assessment

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REPORT

Document status

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1 INTRODUCTION

RPS were appointed by MLEU Dublin Ltd in July 2017 to develop a flood risk mitigation strategy in support of a business park development at Baldonnell. The Mountpark Baldonnell Phase 2 lands (henceforth referred to as the 'Phase 2 lands') represented a second phase of the development at Baldonnell following an approval for a first phase in early 2017 granted by An Bord Pleanála. Planning Approval was granted for the Phase 2 lands and associated flood risk management strategy for the entire site in March 2020 (Planning Reference: SD19A/0370).

This report has been prepared to support a detailed application for a link road from the Phase 2 lands / Clonlara Road into a portion of lands on the eastern side of the Camac. This report represents a Stage 3 detailed flood risk assessment as defined under the 'Planning System and Flood Risk Management Guidelines' (DEHLG/OPW, 2009).

2 OVERVIEW OF THE SITE AND THE PROPOSED DEVELOPMENT

The Baldonnell Business Park Phase 2 lands are located between Casement Aerodrome and the Camac River, as shown in Figure 2.1. The Camac River flows from the south at Saggart under the N7 and along the eastern boundary of the Phase 2 lands before flowing north and east towards Clondalkin.

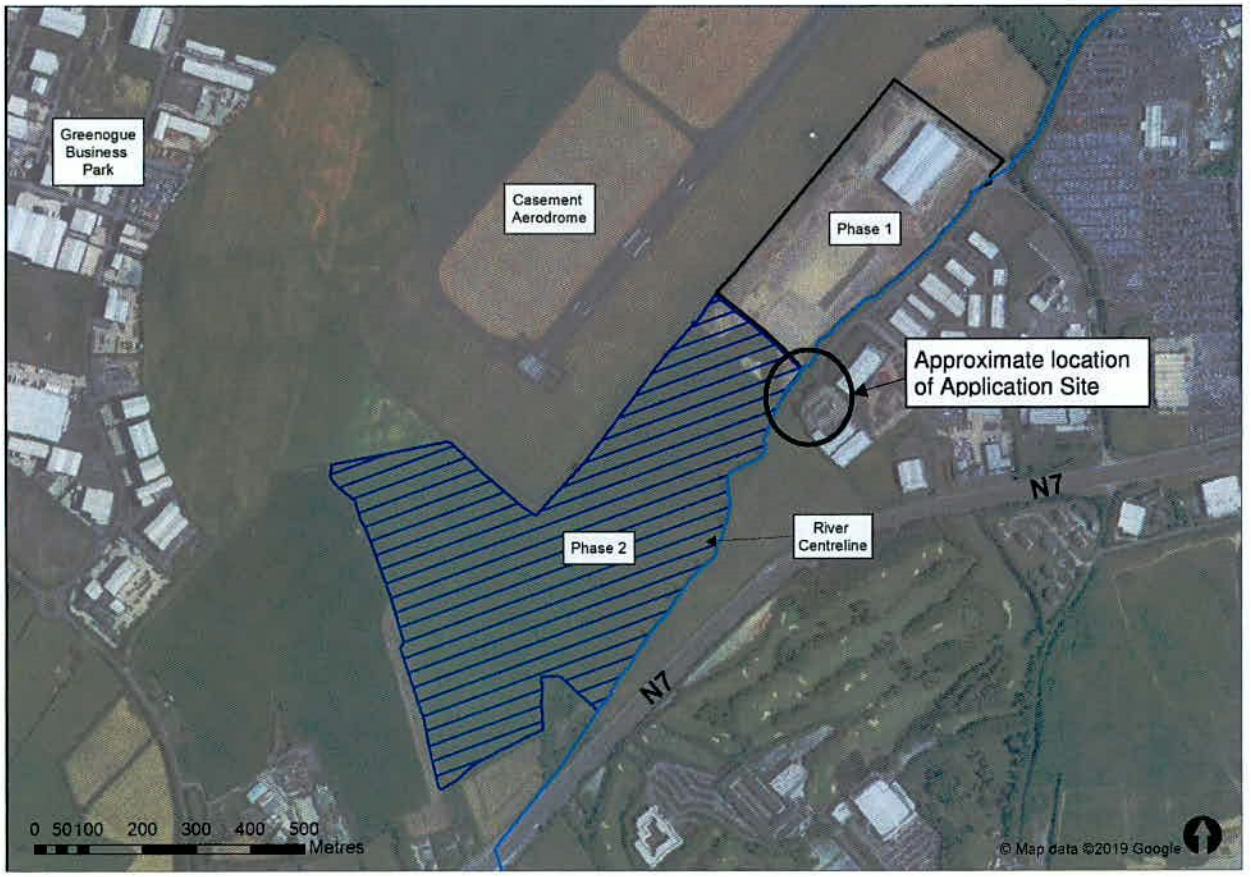

Figure 2.1 Location of Phase 2 lands

The proposed link road (Application Site) is situated to the south of the Phase 2 lands, on the opposite side of the River Camac. The extent of the proposed works is shown in Figure 2.2, and in Appendix A. A typical section through the road is shown in Appendix B.

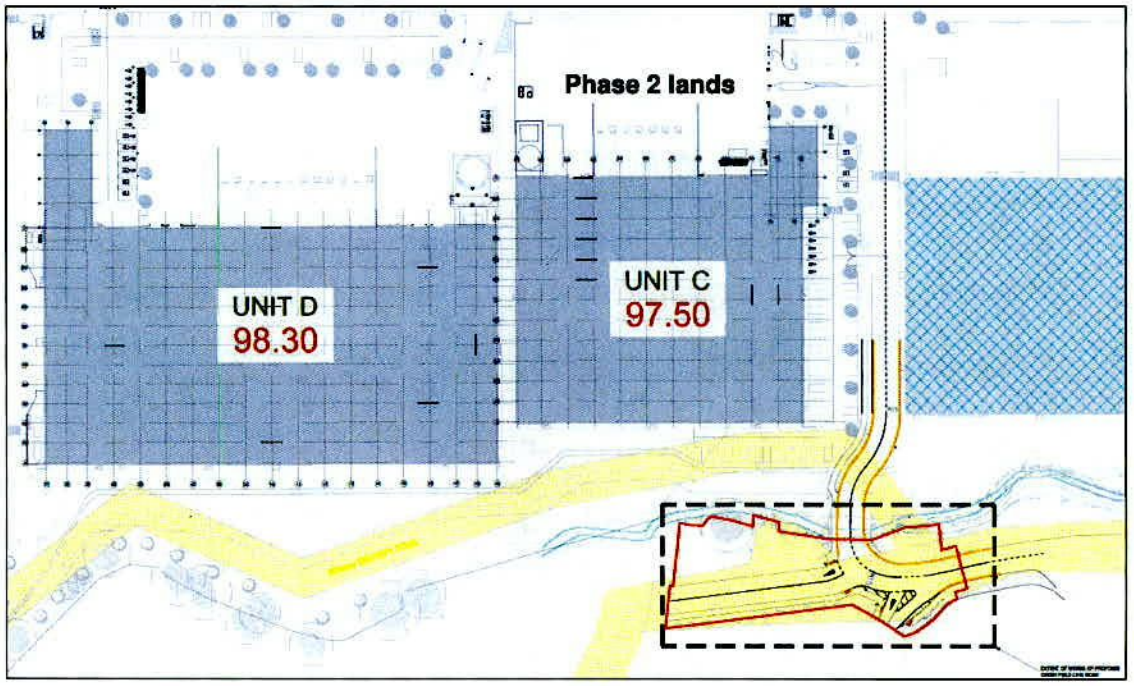

Figure 2.2 Extent of works for proposed link road

3 EXISTING FLOOD RISK

3.1 CFRAM Study

The Eastern CFRAM Study (2011- 2017) mapped the flood risk from fluvial flooding across the Camac catchment. The Study predicted that parts of the Phase 2 lands were at risk of flooding from out of bank fluvial flows, with the channel capacity being exceeded in all the mapped present-day scenarios (10%, 1% and 0.1% AEP). However, the location of the proposed link road is outside the predicted flood extents. The predicted flood extents from the Eastern CFRAM Study are shown in Figure 3.1 overleaf.

The proposed link road is not considered to be at significant risk of flooding from any other source. The site is inland with a minimum level of over 90m above mean sea level. There is no scope for pluvial flooding from outside of the application site as the Camac channel lies directly and adjacent and would act to intercept and drain any overland flow from the field in which the application site is located. The N7 and its associated drainage network sits above (to the south-east) of the application site and acts to intercept and channel any runoff from higher ground above the site (Saggart / Citywest).

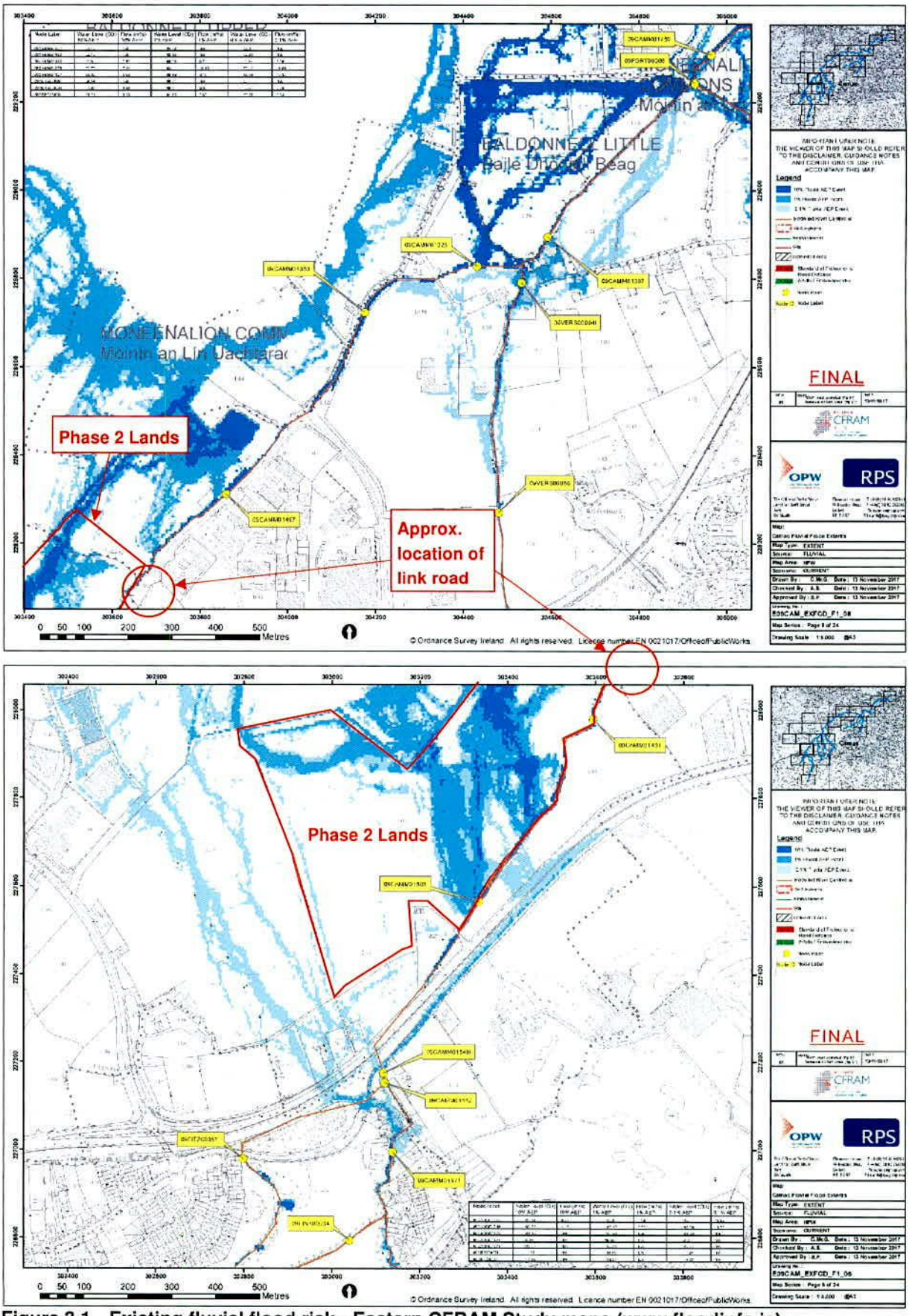

Figure 3.1 Existing fluvial flood risk - Eastern CFRAM Study maps (www.floodinfo.ie)

3.2 Flood Risk Management Strategy

Given the level of flood risk to the Mountpark Baldonnell Phase 2 lands, a Flood Risk Management (FRM) strategy and resulting mitigation measures were proposed and constructed as part of the site masterplan.

The final FRM solution consists of a controlled spillway from the upper most reaches of the Camac where it meets the Baldonnell Phase 2 lands boundary. This flows into a large swale (FR1a) at the west of the Phase 2 lands that is then connected via a series of long, narrower swales back to the Camac at the Phase 1 portion of the Mountpark development. There is just under 150,000m^3 of storage provided within the FRM system. Swales are connected at their base level by culverts that are designed to attenuate flows through the system and control the filling of the swales. At the upper level, typically 300-500mm below the top of the swales, controlled spills allow the swales to overtop and floodwaters to progress to the next swale in the system once the swale has reached capacity. The system also functions as a Sustainable Drainage System (SuDS) for surface water run-off from the development in line with SuDS best practice guidance. Pluvial / drainage system events have been simulated peak on peak with the fluvial flooding in the design scenarios to demonstrate robustness of system. Levels are proposed across the Phase 2 lands such that flood waters only breach the left bank at controlled spill points, primarily the Phase 2 spillway where flows of up to 7.2m^3/s are conveyed to the large swale basin FR1a in the 1% AEP Mid-Range Future Scenario (allowing for climate change and future urbanisation of the catchment). The large swale FR1a and overspill swale FR1b will be retained for agricultural use consistent with the zoning in the South Dublin County Council Development Plan 2016 – 2022. The works were constructed on site in 2021-2022.

Modelling of the proposed development with the FRM system in place demonstrates that the Phase 2 is at low risk of flooding. Flood risk to receptors beyond the Phase 2 lands and communities downstream is shown to be reduced in events up to and including the 1% AEP Mid-Range Future Scenario. Full details of the FRM works and the modelling can be found in the Flood Risk Assessment for the Phase 2 lands.

Figure 3.2 shows the predicted 1% AEP flood extents following completion of the FRM works, with the location of the proposed link road. This shows that the proposed application site for the link road is not at risk of flooding following completion of the Phase 2 FRM works.

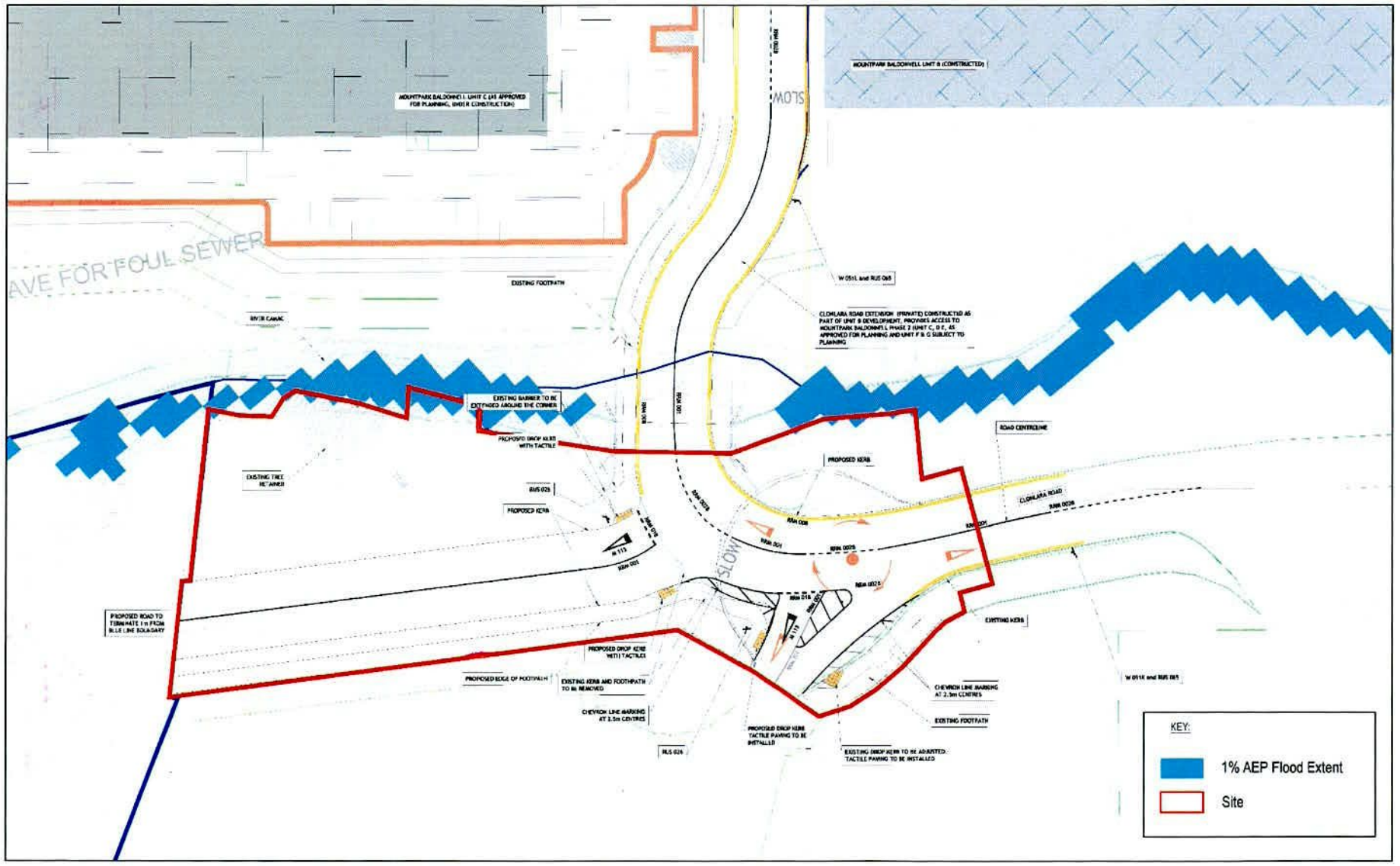

Figure 3.2 Predicted 1% AEP flood extents post-construction of FRM works

4 STORM DRAINAGE

The proposed drainage layout is shown in Appendix C, and the proposed SUDs layout is shown in Appendix D.

The proposed road will form an impermeable surface that will create additional volumes of surface runoff. There will be a 125mm high kerb along the road that will contain outlets to a 2m wide swale, which will be constructed parallel to the road. The swale will be dished to a filter drain in the centre. The swale will outlet to a proposed hydrobrake manhole with a 2l/s outflow to the River Camac.

5 COMPLIANCE WITH PLANNING SYSTEM AND FLOOD RISK MANAGEMENT GUIDELINES

5.1 Flood Zones

'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' (DEHLG 2009) sets out the types of development which are appropriate in the different flood zones, A, B and C defined as:

- **Flood Zone A** – where the probability of flooding from rivers is highest (area within the 1% AEP flood extents);
- **Flood Zone B** – where the probability of flooding from rivers is moderate (the area beyond the 1% AEP fluvial flood extents but within the 0.1% AEP flood extents);
- **Flood Zone C** – where the probability of flooding from rivers is low (the area outside the 0.1% AEP flood extents).

The location for the proposed access road lies entirely within Flood Zone C.

5.2 Development Classification

The 'Planning System and Flood Risk Management' Guidelines classify different types of development in terms of their vulnerability class (Table 3.1 of the Guidelines). This table has been reproduced as Figure 4.1.

Vulnerability class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding;
	Hospitals;
	Emergency access and egress points;
	Schools;
	Dwelling houses, student halls of residence and hostels;
	Residential institutions such as residential care homes, children's homes and social services homes;
	Caravans and mobile home parks;
	Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and
	Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less vulnerable development	Buildings used for: retail; leisure; warehousing; commercial; industrial and non-residential institutions;
	Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans;
	Land and buildings used for agriculture and forestry;
	Waste treatment (except landfill and hazardous waste);
	Mineral working and processing; and
	Local transport infrastructure.
Water-compatible development	Flood control infrastructure;
	Docks, marinas and wharves;
	Navigation facilities;
	Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location;
	Water-based recreation and tourism (excluding sleeping accommodation);
	Lifeguard and coastguard stations;
	Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and
	Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).

*Uses not listed here should be considered on their own merits

Table 3.1 Classification of vulnerability of different types of development

Figure 5.1 Extract from Planning Guidelines- Classification of vulnerability of development

Table 3.2 of the Guidelines identifies the type of development that would be appropriate to each flood zone and those that would need the Justification Test. This table has been reproduced as Figure 5.2.

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

Table 3.2: Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.

Figure 5.2 Extract from Planning Guidelines- Vulnerability versus flood zones

The development can be classified within the category *'Local transport infrastructure'* as defined under the Guidelines and as such are classed as Less vulnerable development. Less vulnerable development only requires application of the Justification Test where it is located within Flood Zone A. For this application the site is located in Flood Zone C, and therefore a Justification Test is not required.

6 CONCLUSION

RPS were appointed by MLEU Dublin Ltd in July 2017 to develop a flood risk mitigation strategy in support of a warehouse/ logistics development at Baldonnell. The Phase 2 lands represented a second phase of the development at Baldonnell following an approval for a first phase in early 2017 granted by An Bord Pleanála. Planning Approval was granted for the Phase 2 lands and associated flood risk management strategy for the entire site in March 2020 (Planning Reference: SD19A/0370).

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The Eastern CFRAM Study (2011- 2017) mapped the flood risk from fluvial flooding across the Camac catchment. The Study predicted that parts of the Phase 2 lands were at risk of flooding from out of bank fluvial flows, with the channel capacity being exceeded in all the mapped present-day scenarios (10%, 1% and 0.1% AEP). However, the location of the proposed link road is outside the predicted flood extents.

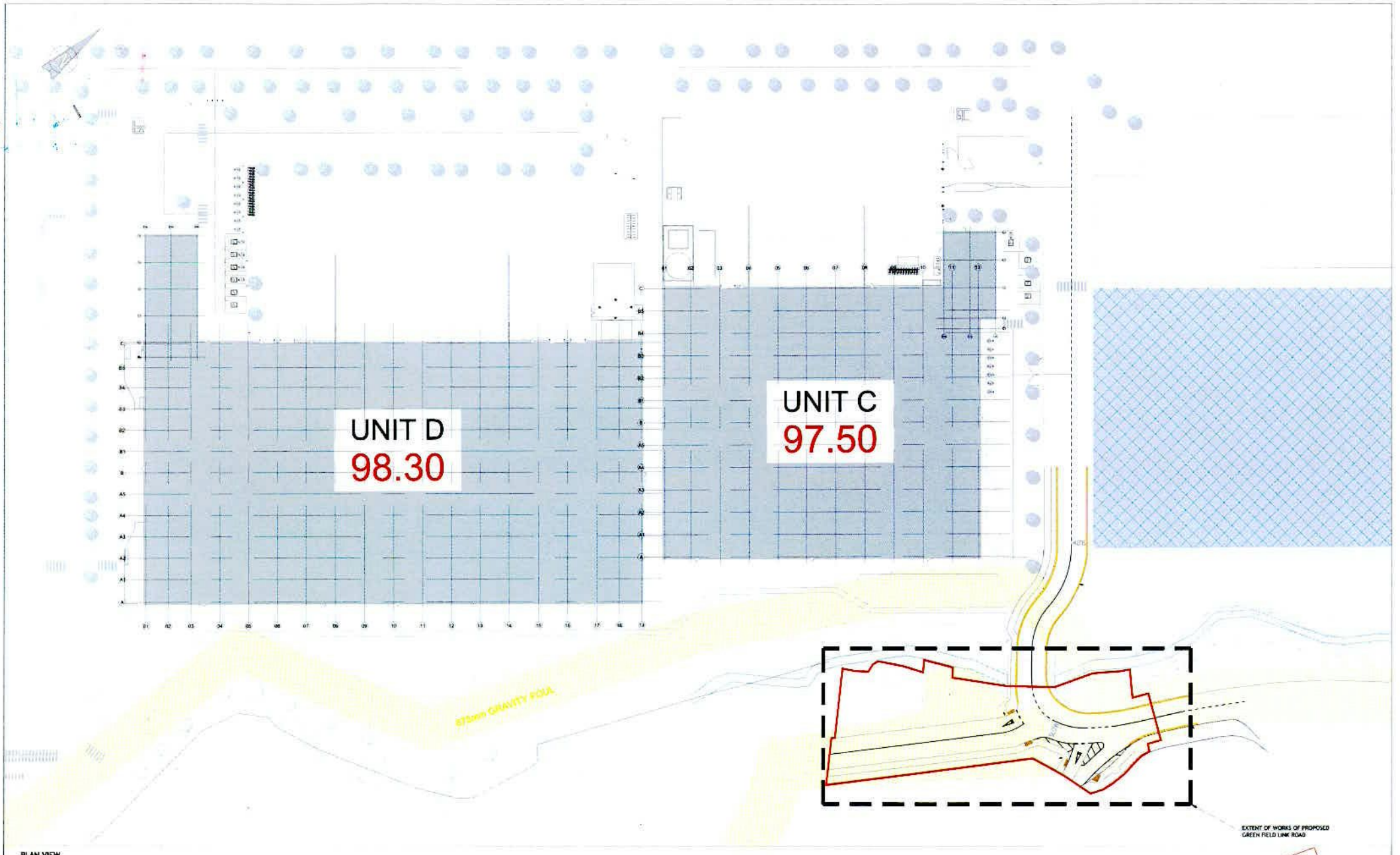
Given the level of flood risk, a Flood Risk Management (FRM) strategy and resulting mitigation measures were proposed and constructed as part of the site masterplan for the Baldonnell Business Park. The works were constructed on site in 2021 – 2022. Modelling of the proposed development with the FRM system in place demonstrates that the proposed site for the link road is not at risk of flooding.

The proposed road will form an impermeable surface that will create additional volumes of surface runoff. There will be a 125mm high kerb along the road that will contain outlets to a 2m wide swale, which will be constructed parallel to the road. The swale will be dished to a filter drain in the centre. The swale will outlet to a proposed hydrobrake manhole with a 2l/s outflow to the River Camac.

The development of the application site (the link road) can be classified within the category *'Local transport infrastructure'* as defined under the 'Planning System and Flood Risk Management' Guidelines and as such are classed as Less vulnerable development. Less vulnerable development only requires application of the Justification Test where it is located within Flood Zone A. For this application the site is located in Flood Zone C, and therefore a Justification Test is not required.

Appendix A

Site plan



PLAN VIEW
SCALE 1:500

DRAFT

Rev	Amendment	By	Date	Rev	Amendment	By	Date	Chkd
C01	PLANNING ISSUE	RD	2022/05/24					

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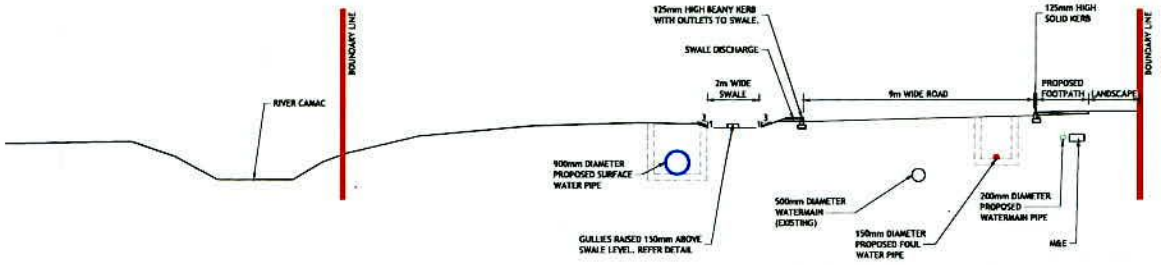
Project	SITE ACCESS ROAD BALDONNELL BUSINESS PARK NORTH, DUBLIN 22
Title	SITE KEY PLAN
Drawn	RD
Date drawn	MAY 2022
Technician Check	RD
Engineer Check	MK
Approved	
Project No.	212126
Scale @ A1	1:100
Metric No.	212126-PUN-01-XX-M2-C-0401
Drawing Status	A0
Document No.	212126-PUN-XX-XX-DR-C-0401
Revision No.	C01

Appendix B

Typical road section

REFER PLAN VIEW ON
212126-PUN-XX-XX-DR-C-0402



PROPOSED ROAD - TYPICAL SECTION

SCALE 1:100

DRAFT

Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	PLANNING ISSUE	RD	2022/05/20				

Client: MLEU DUBLIN 3 LTDA AND CHARLES GREENE

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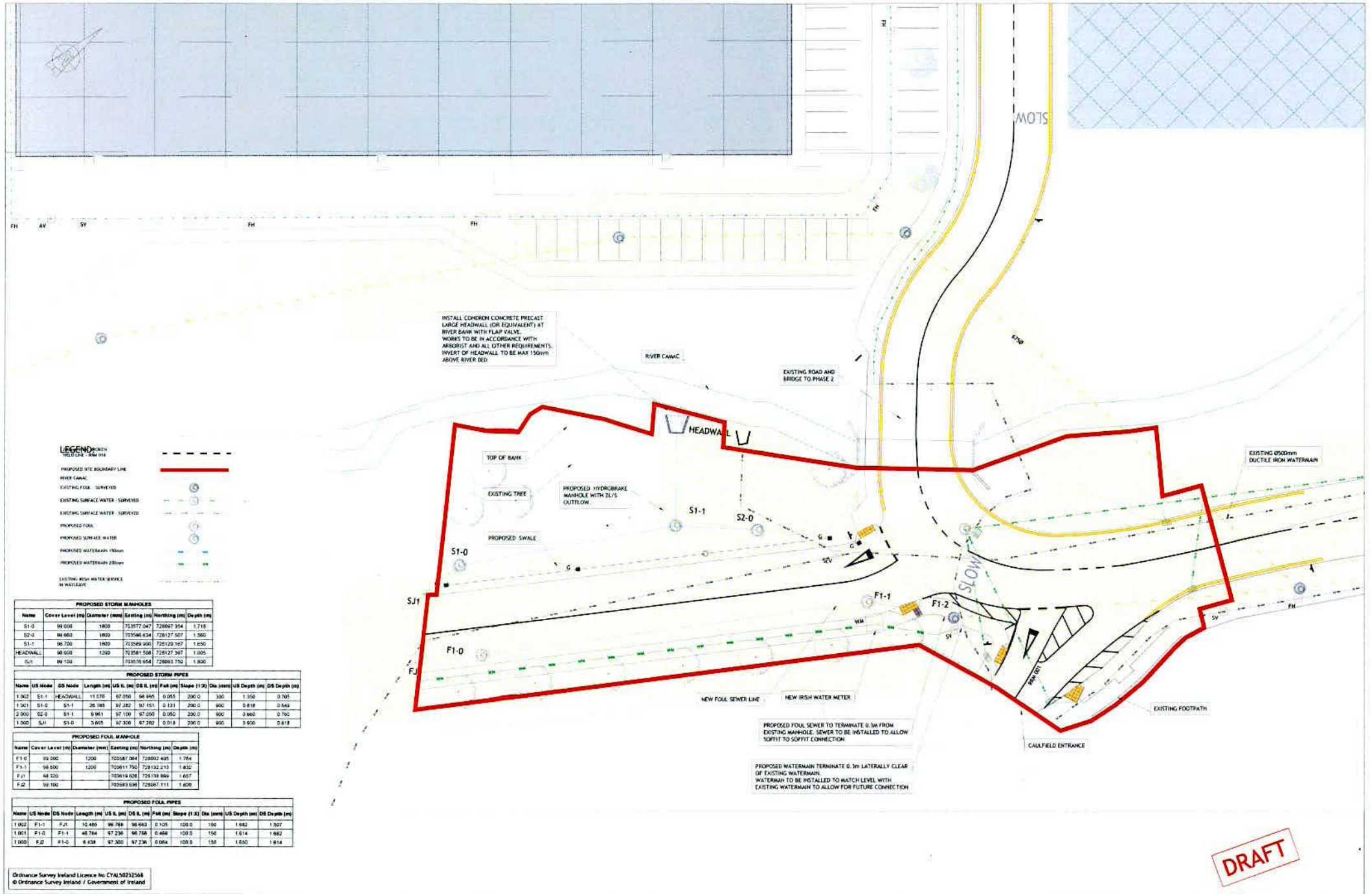
Project: LINK ROAD TO CLONLARA ROAD, BALDONNELL BUSINESS PARK, DUBLIN 22
Title: ROAD DETAIL - SHEET 1 OF 2
Drawn: RD | Date drawn: MAY 2022 | Technician Check: RB | Engineer Check: AM | Approved:
Project No.: 212126
Model Ref.: 212126-PUN-XX-XX-M2-C-0551
Drawing Status: A0
Scale at A1: 1:100
Document No.: 212126-PUN-XX-XX-DR-C-0551
Revision No.: C01

Appendix C

Proposed drainage layout



PROPOSED STORM MANHOLES

Name	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1-0	99.000	1800	703577.047	728097.354	1.715
S2-0	98.660	1800	703596.634	728127.507	1.560
S1-1	98.700	1800	703589.900	728120.167	1.650
HEADWALL	98.000	1200	703581.508	728127.397	1.005
SJ1	99.100		703576.958	728093.750	1.800

PROPOSED STORM PIPES

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	US Depth (m)	DS Depth (m)
1.002	S1-1	HEADWALL	11.070	97.050	96.995	0.055	200.0	300	1.350	0.705
1.001	S1-0	S1-1	26.185	97.282	97.151	0.131	200.0	900	0.818	0.949
2.000	S2-0	S1-1	9.961	97.100	97.050	0.050	200.0	900	0.960	0.790
1.000	SJ1	S1-0	3.865	97.300	97.282	0.018	200.0	900	0.900	0.818

PROPOSED FOUL MANHOLE

Name	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
F1-0	99.000	1200	703587.084	728092.495	1.764
F1-1	98.500	1200	703611.756	728132.213	1.832
FJ1	98.320		703619.628	728138.899	1.657
FJ2	99.100		703583.936	728087.111	1.800

PROPOSED FOUL PIPES

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	US Depth (m)	DS Depth (m)
1.002	F1-1	FJ1	10.486	96.768	96.663	0.105	100.0	150	1.682	1.507
1.001	F1-0	F1-1	46.764	97.236	96.768	0.468	100.0	150	1.614	1.682
1.000	FJ2	F1-0	6.438	97.300	97.236	0.064	100.0	150	1.650	1.614

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MSAI Certified

Rev	Amendment	By	Date
C01	PLANNING ISSUE	RD	2022/05/20

Rev	Amendment	By	Date

Client: MLEU DUBLIN 3 LTDA AND CHARLES GREENE

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Project: LINK ROAD TO CLONKARA ROAD, BALDONNELL BUSINESS PARK, DUBLIN 22
Title: PROPOSED DRAINAGE AND WATERMAIN LAYOUT

Drawn	Date drawn	Production check	Engineer check	Approved
RD	MAY 2022	RD	AB	

Project No.	Model file	Drawing Status
212126	212126-PUN-XX-XX-M2-C-0100	AD

Scale @ A1	Document No.	Revision No.
1:200	212126-PUN-XX-XX-DR-C-0100	C01

Appendix D

Proposed SUDs layout

DRAFT

Rev	Amendment	By	Date	Rev	Amendment	By	Date
C01	PLANNING ISSUE	MD	2022/05/20				

Client: MLEU DUBLIN 3 LTDA AND CHARLES GREENE

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Project: LINK ROAD TO CLONLARA ROAD, BALDONNELL BUSINESS PARK, DUBLIN 22
Title: PROPOSED SUDS LAYOUT

Drawn:	Date drawn:	Technician Check:	Engineer Check:	Approved:
MD	MAY 2022	RD	AM	

Project No:	Model File:	Drawing Status:
212126	212126-PUN-XX-XX-M2-C-0150	S0

Scale @ A1:	Document No:	Revision No:
1:200	212126-PUN-XX-XX-DR-C-0150	C01