12th Lock Studios
Lucan
Co. Dublin

StormWater Management Plan Report

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23764

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1 Introduction

1.1 General

This report addresses the storm water management for the proposed studio development within the site that is adjacent to Adamstown Road.

A description of the proposed development is as follows:

- The demolition of the existing buildings to the south of the Main Industrial Units (refer to Architect's Demolition Plans)
- The internal fit out of the existing Industrial Unit as a Studio Facility.
- External site works including soft landscaping, permeable pacing and improving the overall site area.

The external ground area is currently finished with impermeable surfaces and this shall be improved by introducing soft landscaping and permeable paving features over the majority of the area.

1.2 Proposed Stormwater Management Plan Summary

In order to comply with modern standards, stormwater shall be treated using nature based solutions as far as possible in line with the SDCC Development Plan.

The external surface treatment shall be improved by introducing soft landscaping, filter strips, permeable paving and large planter features. All these elements shall link together to treat stormwater run-off from the site.

2 Stormwater Management Plan

2.1.1 Existing Site

The site is occupied by a large industrial unit, a smaller warehouse unit and an old building, next to Adamstown road. All surfaces are currently impermeable with stormwater discharged directly to the public sewers or out onto Adamstown road.

2.1.2 Proposed StormWater Management.

The proposed new development shall incorporate Nature based solutions for the treatment of stormwater and all stormwater shall be contained within the site. Permeable paving will be incorporated in the surrounding floor and landscape features and gravel surfaces will also help deal with the storm water.

Sedum/ Blue Roofs

The existing large industrial unit has a pitched lightweight roof and the works are an internal fit out only, The roof is not suitable for sedum or blue roofs and no new structures are proposed on the site.

Planters

Stormwater discharge from the roof of the industrial unit shall be connected to new large feature planters adjacent to the East elevation.

External Area – Permeable Finishes and Soft Landscaping.

There is a substantial area of the site overed with impermeable concrete yard. The design intent is to soften this external yard, however given the substantial area involved the full area shall not be broken up and all the concrete removed off site as there would be a significant cost in disposal along with a significant carbon footprint (embodied and operational) in removing the concrete, so a substantial portion shall be retained on site.

Therefore the external areas shall be modified to include a combination of permeable paving and the original hard concrete surfacing. Filter strips shall be formed at the interface between the original yard areas the new permeable paving systems which shall intercept the run-off from the hard paving. The retained concrete yard shall also be covered with permeable paving with the sub-base acting as a stormwater treatment system which shall retain a substantial volume of stormwater and allowing a path for run-off to be directed to the adjacent filterstrips.

Details of the stormwater management are shown on CORA drawings 23764/C0003

2.1.3 Conclusion of Stormwater Management Plan

The above stormwater management plan proposes *nature based solutions* to treat stormwater on the site. All suite of measures included in the proposed development shall make a significant improvement to the current situation where all stormwater is directed to the public combined sewers and result in stormwater being fully treated on the site.

Appendix A – Infiltration System Calculations

PLANE INFILTRATION SYSTEM DESIGN

In accordance with CIRIA C753 SUDS

Tedds calculation version 2.0.04

Design rainfall intensity

Location of catchment area	Dublin
Impermeable area drained to the system	A = **1600.0** m^2
Return period	Period = **100** yr
Ratio 60 min to 2 day rainfall of 5 yr return period	r = **0.300**
5-year return period rainfall of 60 minutes duration	M5_60min = **17.0** mm
Increase of rainfall intensity due to global warming	$p_{climate}$ = **30** %

Infiltration blanket details

Base area of blanket	A_b = **180.0** m^2
Porosity	n = **0.5**
Drainage ratio	R = A / A_b = **8.9**
Soil infiltration rate	f = **25.0×10^{-6}** m/s

Table equations

Rainfall intensity	i = M100 / D
Minimum depth required (Eq. 25.1)	H = D / n × (R × i - f)

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Intensity, i (mm/hr)	Depth (mm)
5	0.34;	7.5;	1.92;	14.4;	172.70;	241;
10	0.49;	10.8;	1.97;	21.4;	128.11;	350;
15	0.59;	13.0;	1.98;	25.8;	103.06;	413;
30	0.77;	17.0;	1.96;	33.4;	66.70;	503;
60	1.00;	22.1;	1.91;	42.3;	42.28;	572;
120	1.25;	27.6;	1.87;	51.6;	25.82;	558;
240	1.57;	34.7;	1.81;	62.9;	15.72;	398;
360	1.78;	39.3;	1.78;	69.8;	11.64;	162;
600	2.12;	46.9;	1.74;	81.3;	8.13;	0;
1440	2.84;	62.8;	1.67;	104.7;	4.36;	0;

Min depth of blanket req'd	H_{max} = **572** mm
Time to empty blanket to half volume - Eq.25.6(1)	t_{s50} = n × H_{max} / (2 × f) = 1hr 35min 17s

PASS - Infiltration system discharge time less than or equal to 24 hours