Coughlan Consulting Engineering
Consulting Structural & Civil Engineering
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22035

5th July 2022

SD22B/0124 - Condition No.2 for 54 Beechfield Road, Dublin 12

2. Drainage - Surface Water.
Prior to the commencement of development, the applicant/developer shall submit the following for the written agreement of the Planning Authority:
(1) a report showing site specific soil percolation test results and design calculations for the proposed soakaway in accordance with BRE Digest 365 – Soakaway Design.
(2) a revised drawing showing plan and cross-sectional views, dimensions, and location of proposed soakaway. Any proposed soakaway shall be located fully within the curtilage of the property and shall be:
(i) At least 5m from any building, public sewer, road boundary or structure.
(ii) Generally, not within 3m of the boundary of the adjoining property.
(iii) Not in such a position that the ground below foundations is likely to be adversely affected.
(iv) 10m from any sewage treatment percolation area and from any watercourse / floodplain.
(v) Soakaways must include an overflow connection to the surface water drainage network.
(3) Should a soakaway prove not to be feasible, then the applicant shall submit the following:
(a) Soil percolation test results demonstrating a soakaway is not feasible
(b) A revised surface water layout drainage drawing for the development showing the inclusion of alternative SuDS (Sustainable Drainage Systems) features such as rain gardens and rain planter boxes

Response:

Coughlan Consulting Engineering were appointed by Cillian and Gayle McCormack Doyle of 54 Beechfield Road, Dublin 12 to prepare an engineering response to Item 2

Coughlan Consulting Engineering instructed an infiltration test on site to determine the required size for the soakaway test. Based on these tests, Coughlan Consulting Engineering can confirm that a Soakaway is suitable to be used on this site. The soakaway will be minimum 5m from the proposed

extension and will be 2.6m clear of the side boundary wall. This is slightly under the suggested 3m and is hoped is considered acceptable.

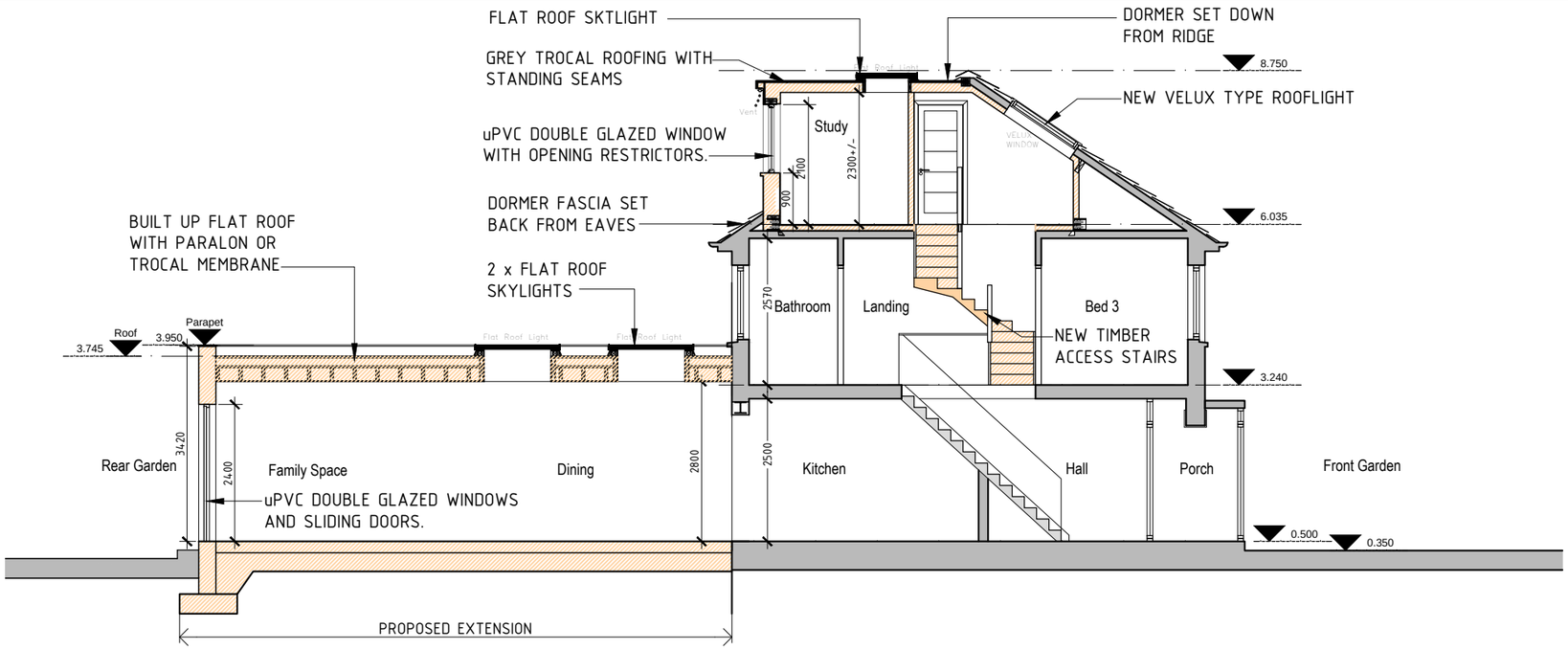
Please see CCE-SK01 and SK02 attached in Appendix A and Soakaway calculations can be found in Appendix B.

For and on behalf of: Coughlan Consulting Engineering
25 Kiltipper Avenue,
Aylesbury,
Tallaght,
Dublin 24.

Signed: 
_____

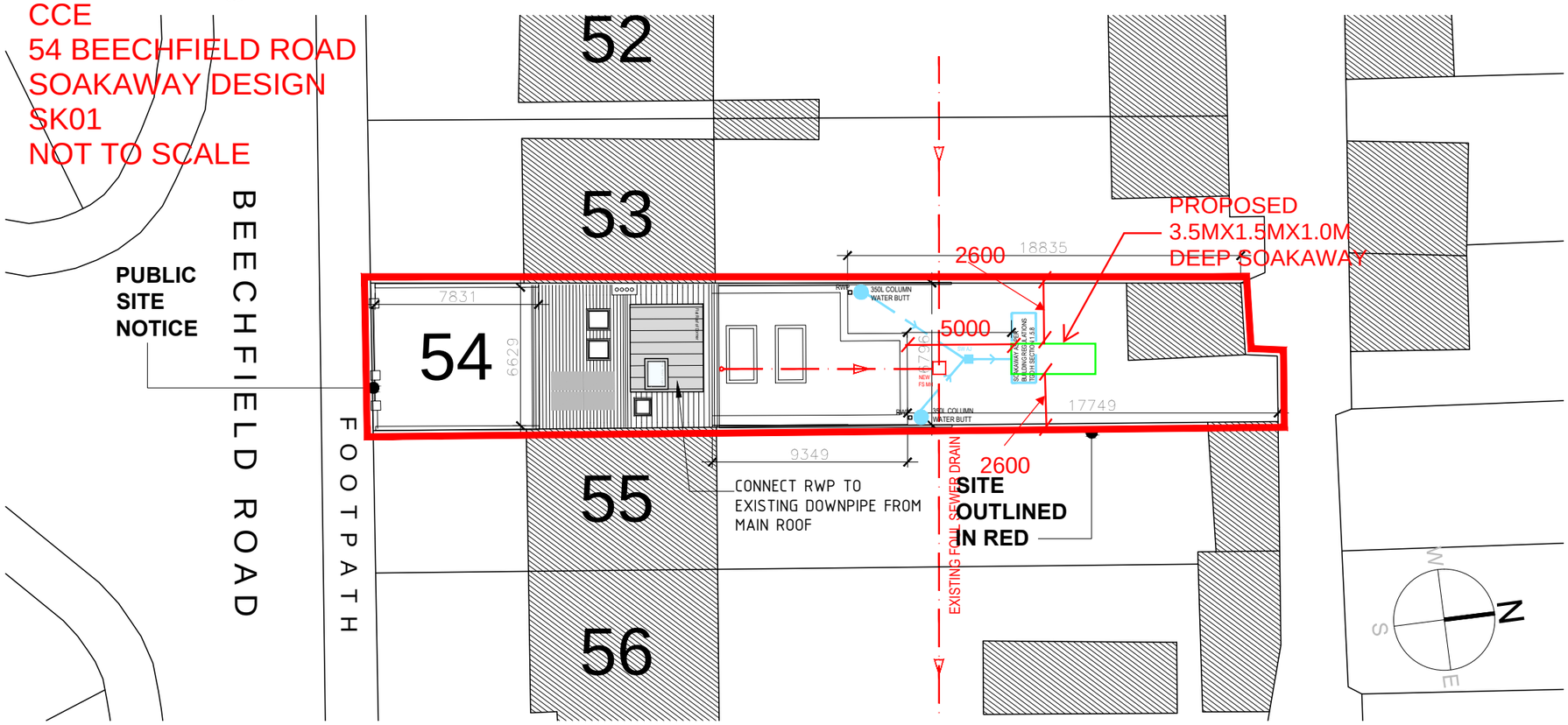
Name: Robert Coughlan
Qualifications: BE, CEng, MIEI, MIStuctE, BER Assessor.
Professional Body/Membership No. MIEI No.: 053927

Appendix A – CCE SK01 AND SK02



05 SECTION A:A
SCALE 1:100

CCE
54 BEECHFIELD ROAD
SOAKAWAY DESIGN
SK01
NOT TO SCALE



01 PROPOSED SITE LAYOUT
SCALE 1: 250

LEGEND:
SW AJ
SURFACE WATER
FW AJ
FOUL DRAIN

EXTENT OF WORKS TO WHICH THIS APPLICATION RELATES

REV	DESCRIPTION	DRWN	CHKD	DD/MM/YY

REVISION INFORMATION

Project : ALTERATION TO 54 BEECHFIELD ROAD, WALKINSTOWN, DUBLIN 12

Drawing : PROPOSED SECTION A-A & SITE PLAN

Client : CILLIAN & GALE McCORMACK DOYLE

Date	Scale	Sheet size
FEB. 2022	as shown	A3

K+B Architecture+Design
2 Ridgeway Villas, Kilmainham Lane Dublin 8
Ph.+353 (0)87 6816037 +353 (0)1 6588803
email. kbad.ie

Do not scale if drawing size does not match sheet size

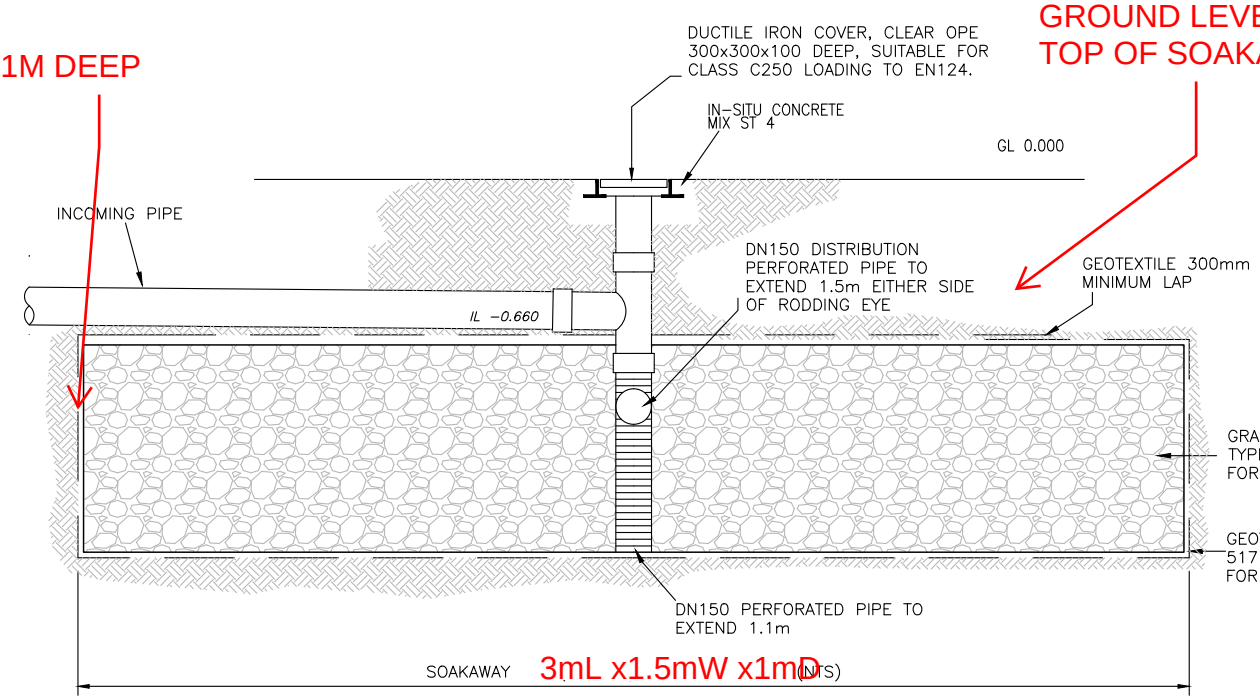
Drawing no. 377 -P-06

Revision

CCE
54 BEECHFIELD ROAD
SOAKAWAY DESIGN
SK02
NOT TO SCALE

PIT 1M DEEP

250MM FROM GROUND LEVEL TO TOP OF SOAKAWAY



SOAKAWAY DETAIL
NTS

Appendix B – SOAKAWAY CALCULATIONS

SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.04

Design rainfall intensity

Location of catchment area	Other
Impermeable area drained to the system	A = **50.0** m^2
Return period	Period = **30** yr
Ratio 60 min to 2 day rainfall of 5 yr return period	r = **0.360**
5-year return period rainfall of 60 minutes duration	M5_60min = **19.0** mm
Increase of rainfall intensity due to global warming	$p_{climate}$ = **0** %

Soakaway / infiltration trench details

Soakaway type	Rectangular
Minimum depth of pit (below incoming invert)	d = **858** mm
Width of pit	w = **1500** mm
Length of pit	l = **3500** mm
Percentage free volume	V_{free} = **30** %

Soil infiltration rate (BRE digest 365)

Length of trial pit	l_{trial} = **1000** mm
Width of trial pit	b_{trial} = **1000** mm
Depth of trial pit (below invert)	d_{trial} = **1000** mm
Free volume (if fill used)	V_{trial} = **100** %
75% depth of pit	$d_{75} = (d_{trial} \times 0.75)$ = **750.00** mm
50% depth of pit	$d_{50} = (d_{trial} \times 0.50)$ = **500.00** mm
25% depth of pit	$d_{25} = (d_{trial} \times 0.25)$ = **250.00** mm
Test 1 - time to fall from 75% depth to 25% depth	T1 = **200** min
Test 2 - time to fall from 75% depth to 25% depth	T2 = **200** min
Test 3 - time to fall from 75% depth to 25% depth	T3 = **200** min
Longest time to fall from 75% depth to 25% depth	t_{lg} = max(T1, T2, T3) = **200** min
Storage volume from 75% to 25% depth	$V_{p75\_25} = (l_{trial} \times b_{trial} \times (d_{75} - d_{25})) \times V_{trial}$ = **0.50** m^3
Internal surface area to 50% depth	$a_{p50} = ((l_{trial} \times b_{trial}) + (l_{trial} + b_{trial}) \times 2 \times d_{50})$ = **3.00** m^2
Surface area of soakaway to 50% storage depth	$A_{s50} = 2 \times (l_{trial} + b_{trial}) \times d_{trial} / 2$ = **2.000** m^2
Soil infiltration rate	$f = V_{p75\_25} / (a_{p50} \times t_{lg})$ = **13.9×10^{-6}** m/s
Wetted area of pit 50% full	$a_{s50} = l \times d + w \times d$ = **4292415** mm^2

Table equations

Inflow (cl.3.3.1)	$I = M30 \times A$
Outflow (cl.3.3.2)	$O = a_{s50} \times f \times D$
Storage (cl.3.3.3)	S = I - O

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	30 year rainfall, M30 (mm)	Inflow (m^3)	Outflow (m^3)	Storage required (m^3)
5	0.36;	6.8;	1.45;	9.9;	0.50;	0.02;	0.48
10	0.51;	9.7;	1.49;	14.4;	0.72;	0.04;	0.68
15	0.62;	11.8;	1.50;	17.7;	0.89;	0.05;	0.83
30	0.79;	15.0;	1.53;	22.9;	1.15;	0.11;	1.04

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	30 year rainfall, M30 (mm)	Inflow (m^3)	Outflow (m^3)	Storage required (m^3)
60	1.00;	19.0;	1.54;	29.3;	1.46;	0.21;	1.25
120	1.22;	23.2;	1.54;	35.6;	1.78;	0.43;	1.35
240	1.48;	28.1;	1.52;	42.8;	2.14;	0.86;	1.28
360	1.67;	31.7;	1.51;	47.8;	2.39;	1.29;	1.10
600	1.90;	36.1;	1.48;	53.6;	2.68;	2.15;	0.53
1440	2.42;	46.0;	1.44;	66.2;	3.31;	5.15;	0.00

Required storage volume S_{req} = **1.35** m^3

Soakaway storage volume $S_{act} = l \times d \times w \times V_{free}$ = **1.35** m^3

PASS - Soakaway storage volume

Time for emptying soakaway to half volume $t_{s50} = S_{req} \times 0.5 / (a_{s50} \times f)$ = 3hr 8min 43s

PASS - Soakaway discharge time less than or equal to 24 hours