

**JOB NUMBER: C7784**

**PROJECT TITLE: Extension to Simeon House, Bieldside, Aberdeen**

**REPORT TITLE: Drainage Impact Assessment**

**DATE: 25/04/24**



Revision	Date	Originator	Checker	Approver	Issue Description
A	25/04/24	SNC	-	-	Planning

**1. DEVELOPMENT DESCRIPTION.**

The proposed development consists of the demolition of an existing care home building and the extension of the remaining care home building at Simeon House, Bieldside, Cairnlee Road, Aberdeen (National Grid reference NJ879027).

The site is bounded by the existing care home to the east, Cairnlee Road to the north and west, and existing housing fronting onto Baillieswells Road to the south.

**2. CURRENT AND HISTORICAL DRAINAGE PATTERNS.**

The existing site comprises an existing care home building to be demolished. The adjacent building to be extended discharges to an existing surface water pipe running through the north of the development, discharging to a nearby open watercourse.

Existing surface water sewers run through the site to the north and Baillieswells Road to the south. An existing foul sewer runs through Baillieswells Road.

**3. SUDS PROVISION.**

The proposed development requires that the SUDS measures are designed in accordance with CIRIA C753 : The SUDS Manual. The levels of treatment for various land uses are to be based on the pollution hazard level for any given land use.

The Simple Index Approach is used to assess the requirements for surface water discharge from land uses which are classed as low and medium hazard risks.

		Pollution Hazard Indices		
Land Use	Hazard Level	Suspended Solids	Metals	Hydrocarbons
Commercial Roofing	Very Low	0.3	0.2	0.05
Infrequent Use Non-Residential Parking	Low	0.5	0.4	0.4

**Table 1: Land Use Pollution Hazard Index**

		Pollution Hazard Indices		
Component	Component Description	Suspended Solids	Metals	Hydrocarbons
1	Pervious Pavement	0.7	0.6	0.7
2	-	-	-	-
	<b>Aggregated Surface Water Pollution Mitigation Index</b>	0.7	0.6	0.7

**Table 2.1: SUDS Component Design**

\*Indices halved where this component is providing secondary treatment.

Sufficiency Of Pollution Mitigation Indices		
Suspended Solids	Metals	Hydrocarbons
Sufficient	Sufficient	Sufficient

**Table 3: Sufficiency of Pollution Mitigation Indices**

**Commercial Parking:-**

The car parking spaces within the redevelopment will be collected by pervious paving. The paving and porous sub-base below will provide treatment. Storage will be provided by cellular attenuation prior to discharge at an attenuated rate.

**Parking => Pervious Paviours => Attenuation => Existing Surface Water Sewer**

**4. SOIL CLASSIFICATION & SUBSOIL POROSITY.**

The existing building to be extended discharges to an existing surface water sewer. It is anticipated that ground conditions will necessitate replicating this solution for the extension.

**5. DEVELOPMENT RUN-OFF AND ATTENUATION.**

The site drainage has been designed based on the greenfield run-off rate of an M30 event, providing storage sufficient for an M30 event including a 40% allowance for climate change.

Existing and proposed flows from the site currently discharge to the combined sewer.

A drawing showing outline proposed drainage based is located in the Appendix.

**6. WASTEWATER DRAINAGE PROPOSALS.**

The wastewater from the buildings will be collected in foul sewers. The foul sewers will discharge to the existing Scottish Water foul sewer in Baillieswells Road.

**7. EXISTING TRUNK SEWER INFORMATION.**

Existing foul and surface water sewer runs adjacent to the site in Baillieswells Road. An existing surface water sewer runs through the north of the site.

**8. MAINTENANCE RESPONSIBILITY.**

The internal site drainage and parking drainage measures will remain the responsibility of the site/plot owner.

**9. CONSTRUCTION STAGE SUDS.**

The site is to be temporarily bunded. Any fuel storage areas are to be protected against any contamination of ground water. The construction stage SUDS will be evaluated by the Contractor and agreed with SEPA prior to site start.

**10. CALCULATIONS.**

A copy of the calculations for attenuation rates and storage volumes is located in the Appendix.

## **APPENDIX**



**NOT FOR CONSTRUCTION**

**GENERAL NOTES:-**  
 THE CONTRACTOR MUST CONSULT THE CIVIL/STRUCTURAL DESIGN ENGINEER IMMEDIATELY IF:  
 a) GROUND CONDITIONS VARY ON SITE.  
 b) EXISTING BUILDINGS VARY ON SITE.  
 c) DIMENSIONS OR LEVELS SHOWN ARE CHANGED BY ANYONE ON SITE.  
 d) COMPLETE OR PARTIALLY COMPLETE STRUCTURES ARE TO BE SUBJECT TO CONSTRUCTION LOADING OR AFFECTED BY TEMPORARY WORKS.

DO NOT SCALE - IF IN DOUBT, ASK.  
 LARGE SCALE DETAILS TAKE PRECEDENCE OVER SMALL SCALE DETAILS.  
 ALL MATERIALS ARE TO BE USED STRICTLY IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.  
 THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS INVOLVED IN CHANGES OR MODIFICATIONS REQUESTED AND APPROVED, TO SUIT HIS PREFERRED WORK METHOD.  
 ALL NECESSARY METHOD STATEMENTS MUST BE PROVIDED PRIOR TO COMMENCEMENT OF ASSOCIATED SITE OPERATIONS.  
 THIS DRAWING SHOULD ONLY BE USED FOR CONSTRUCTION PURPOSES WHEN THE ISSUE STATUS IS "FOR CONSTRUCTION".  
 ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.  
 ALL LEVELS ARE IN METERS UNLESS OTHERWISE STATED.

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A	SNC	INITIAL ISSUE	15.04.2024
Rev.	By	App. Description	Date

Project  
**EXTENSION TO SIMEON HOUSE, BIELDSIDE, ABERDEEN.**

Drawing Title  
**DRAINAGE LAYOUT.**

Architect  
**TAYLOR ARCHITECTURE.**

Drawing ID  
**XXX-RAC-ZZ-XX-DR-C-0100-A**

Job No. <b>C7784</b>	Scale 1:200 - A1 1:400 - A3	Issue Status <b>FOR PLANNING</b>
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SITE INFORMATION (USED IN FURTHER CALCULATIONS)

SITE AREA (OVERALL) = 3600 m<sup>2</sup>

SITE HARDSTANDING AREA = 1650 m<sup>2</sup>

SAAR = 808 mm (Taken from Wallingford maps)

WRAP = 3 (Taken from Wallingford maps)

Therefore SOIL = 0.4

INFILTRATION RATE = - m/s

(M5-60 min to M5-2 day ratio) r = 0.2 (Taken from Wallingford maps)

(M5-60 min rainfall) d = 14 mm (Taken from Wallinford maps)

Climate Change = 40 %

GREENFIELD SITE. PRE & POST-DEVELOPMENT RUN-OFF.

NOTE: The Pre-development flow calculation is based on the following equation:

$$\text{MAF} = 0.00108 \times \text{AREA}^{0.89} \times \text{SAAR}^{1.17} \times \text{SOIL}^{2.17}$$

- AREA = 0.3600 hectares.
- SAAR = 808 mm (Taken from Wallingford maps)
- WRAP = 3 (Taken from Wallingford maps)
- SOIL = 0.4 Soil values are relative to WRAP figure. (see table below)

WRAP VALUE	SOIL VALUE
1	0.15
2	0.3
3	0.4
4	0.45
5	0.5

Therefore MAF = 0.2012 m<sup>3</sup>/s

NOTE: For areas less than 50Ha, an area of 50Ha is used and the final value is reduced based on a ratio of site area.

Growth values for Scotland	
Return Period	Growth Factor
M10	1.45
M30	1.9
M50	2.2
M200	2.95

- M1 Greenfield run-off is: 1.23 litres/second
- M10 Greenfield run-off is: 2.10 litres/second
- M30 Greenfield run-off is: 2.75 litres/second
- M50 Greenfield run-off is: 3.19 litres/second
- M200 Greenfield run-off is: 4.27 litres/second

The Post-Development Run-off figure for a greenfield site should be limited to the Pre-Development Run-off figure as shown above.



CELLULAR ATTENUATION DESIGN for MT

Allowable discharge = 2.75 litres/second  
 Hardstanding area = 1650 m<sup>2</sup>  
 Additional flow = 0 litres/second

Rainfall Data	
r =	0.2
d =	14
T =	30

Duration (min)	MT-D (mm)	MT-D with CC (mm)	Inflow (m <sup>3</sup> )	Outflow (m <sup>3</sup> )	Storage (m <sup>3</sup> )
5	5.22	7.31	12.06	0.83	11.23
10	8.25	11.56	19.07	1.65	17.42
15	10.50	14.71	24.27	2.48	21.79
30	15.27	21.38	35.28	4.95	30.33
60	21.30	29.82	49.20	9.90	39.30
120	28.68	40.15	66.25	19.80	46.45
240	38.03	53.25	87.86	39.60	48.26
360	44.67	62.53	103.18	59.40	43.78
720	58.54	81.96	135.23	118.80	16.43
1440	76.54	107.16	176.81	237.60	-60.79
2880	99.72	139.61	230.36	475.20	-244.84

Allowing for 40 % climate change, storage required = 48.26 m<sup>3</sup>

CELLULAR SYSTEM CAPACITY CHECK

Based on 95% void storage capacity:

Aquacell units: 1 m long x 0.5 m wide x 0.4 m high. Capacity = 0.19 m<sup>3</sup>  
 Stormbloc units: 0.8 m long x 0.8 m wide x 0.33 m high. Capacity = 0.2 m<sup>3</sup>  
 Stormbrixx units: 1.2 m long x 1.2 m wide x 0.61 m high. Capacity = 0.83 m<sup>4</sup>

Capacity per cell of unit specified = 0.83 m<sup>3</sup>  
 Minimum number of cells required = 58 No.

Depth of system specified = 0.61 m  
 Plan width of system specified = 14.4 m  
 Plan length of system specified = 6 m

Therefore total number of cells = 60 No.  
 Therefore total storage provided = 50.07 m<sup>3</sup>