

JOB NUMBER: C6497

PROJECT TITLE: PROPOSED BAKERY, NEWTON DEE, BIELDSIDE, ABERDEEN

REPORT TITLE: DRAINAGE IMPACT ASSESSMENT



Revision	Date	Originator	Checker	Approver	Issue Description
A	23/02/24	NJH	LD	SNC	INITIAL ISSUE

TABLE OF CONTENTS

- 1. DEVELOPMENT DESCRIPTION.....3
- 2. CURRENT AND HISTORICAL DRAINAGE PATTERNS.....3
- 3. SURFACE WATER DRAINAGE.....3
- 4. SOIL CLASSIFICATION.....4
- 5. SUBSOIL POROSITY4
- 6. DESIGN ATTENUATION4
- 7. FOUL WATER DRAINAGE4
- 8. EXISTING TRUNK SEWER INFORMATION4
- 9. MAINTENANCE RESPONSIBILITY4
- 10. FLOODING HISTORY5

APPENDIX A

ND/23-01/PL/000 - Location Plan
C6497 – XXX-RAC-ZZ-XX-DR-C-0100-A – Proposed Drainage Layout

1. DEVELOPMENT DESCRIPTION

It is proposed to build a new bakery on the existing Camphill community campus at Newton Dee, Bieldside. The site is located at (OS Grid Ref: 387998E, 802202N) which is bounded by the Deeside Way to the North, farmland to the East, Old Ferry Road to the South and West.

The whole site has a total approximate area of 3548m². The proposed hardstanding area has been calculated as 870m².

A copy of Camphill Architecture and Development drawing ND/23-01/PL/000 - Location Plan has been included in Appendix A.

This document is to be used for planning purposes only.

2. CURRENT AND HISTORICAL DRAINAGE PATTERNS

The existing site falls north to south, and it is anticipated the existing greenfield overland flows will shed in this direction.

3. SURFACE WATER DRAINAGE

Proposed surface water flows from the developments roof water will be collected in a drainage network and discharged into the sub-base of the porous paving providing treatment. Proposed surface water flows from the development car park will be collected and treated via porous paving and its sub-base. These combined surface water flows will be attenuated via a control manhole to 1.45l/s, storage will be provided via offline attenuation. The discharging flow will combine with the treated foul water before discharging into the nearby watercourse.

Refer to appendix A for Ramsay and Chalmers drawings C6497 – XXX-RAC-ZZ-XX-DR-X-0100-A – Proposed Drainage Layout.

		Pollution Hazard Indices		
Land Use	Hazard Level	Suspended Solids	Metals	Hydrocarbons
Commercial Roofing Inert Materials	Very Low	0.3	0.2	0.05
Non-Residential parking with infrequent change	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	Porous Paving	0.7	0.6	0.7

Table 2: Low Traffic Road Component Design

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

Table 3: Sufficiency of Pollution Mitigation Indices for Low Traffic Roads

4. SOIL CLASSIFICATION

The soil classification for the site is Type 2 as taken from the “Wallingford Maps Volume 3.”

5. SUBSOIL POROSITY

A site investigation has been carried out to demonstrate infiltration on site, however due to the limited space available on this site a discharge to ground is not feasible. Report available on request.

6. DESIGN ATTENUATION

The proposed site will be attenuated to the M30 Greenfield run off rate of 1.45l/s. The required storage is 25.45m³ allowing for 40% climate change. Refer to calculations in in Appendix B.

7. FOUL WATER DRAINAGE

Proposed foul drainage flows from the development will be collected in a drainage network and treated via a private treatment plant. The discharge from the treatment plan will combine with the attenuated surface water discharge. This combined treated flow will discharge into the nearby watercourse.

Refer to appendix A for Ramsay and Chalmers drawings C6497 – XXX-RAC-ZZ-XX-DR-X-0100-A – Proposed Drainage Layout.

8. EXISTING TRUNK SEWER INFORMATION

A copy of the drawing highlighting the existing Scottish Water foul and surface water pipe infrastructure is available on request.

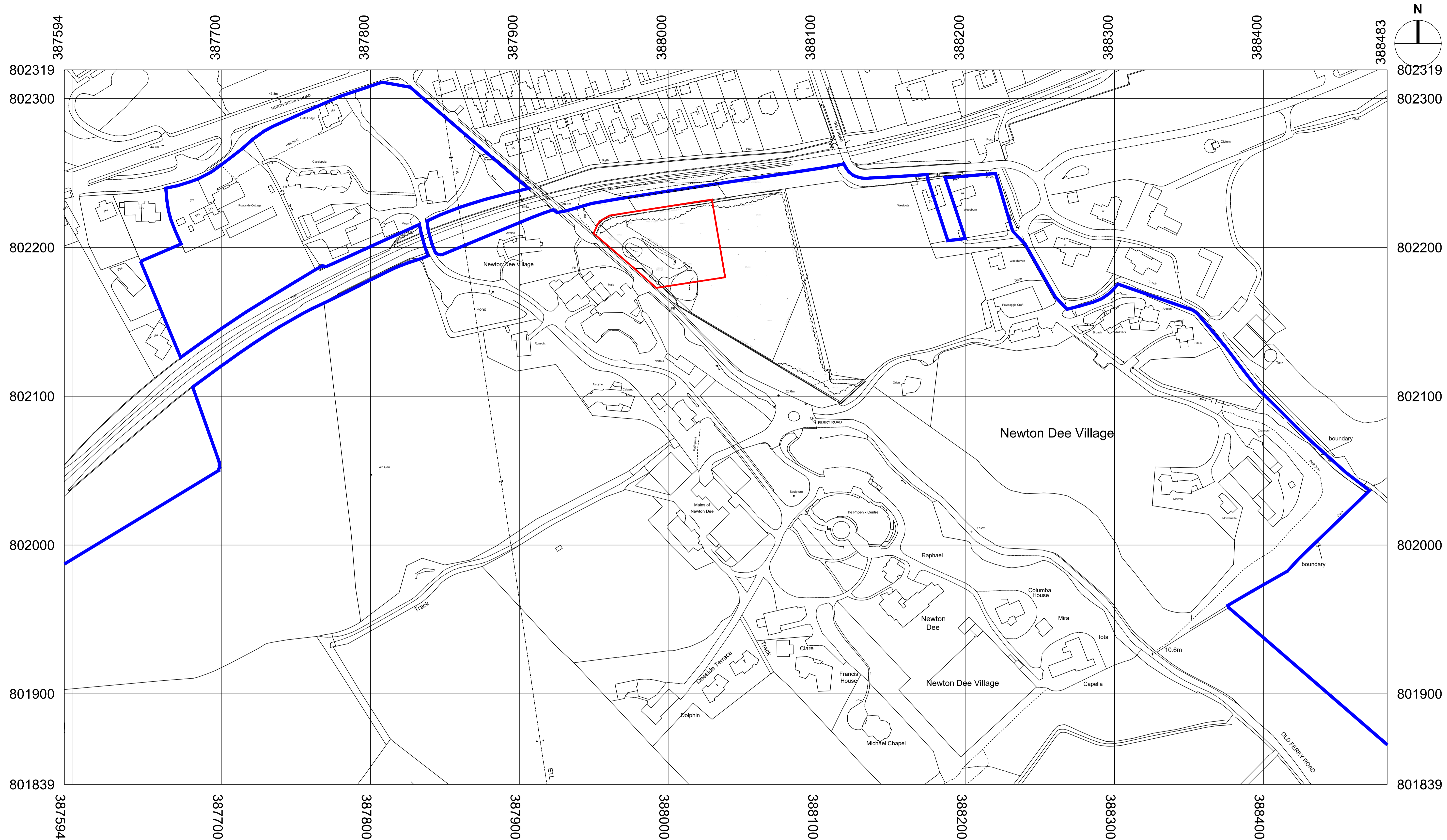
9. MAINTENANCE RESPONSIBILITY

Drainage Item	Maintenance Responsibility
Surface Water Sewers	Client
Foul Sewers	Client
Individual Plot Drainage	Client

10. FLOODING HISTORY

The flooding history has been researched and the SEPA mapping shows surface water flooding. A detailed flood model has been carried out and the report is included as part of the planning submission. The drainage design complies with the conclusions of the report.

APPENDIX A



Key

——— Ownership Boundary

——— Site Boundary

Proposed Bakery & Confectionary, Newton Dee, Bieldside, Aberdeen for Newton Dee Camphill Community		
Location Plan		
SCALE: 1:1250 @ A1	DRWG. NO. ND/23-01/PL/000	REV.
DATE: 25/ 04/ 2023		
Camphill Architecture and Development		
Newton Dee, Bieldside, Aberdeen AB15 9DX (01224) 867 450 camphill.architecture@newtondee.org.uk		
Botton, Danby, Whitby, N. Yorks YO21 2NJ (01287) 661 241		



Path

NB3

ASPHALT PATH

ASPHALT PATH

GRASS

AREA OF DENSE VEGETATION

RETAINING WALL

POST & RAIL FENCE 1.3m

TREE CANOPY

GRASS

NB2

TREE CANOPY

GRASS

GRASS

Bins

TREATMENT PLANT

ICF1

ICF2

ICF3

ICF4

ICF5

ICF6

ICF7

ICF8

ICF9

ICF10

ICF11

ICF12

ICF13

ICF14

ICF15

ICF16

ICF17

ICF18

ICF19

ICF20

MHS1

MHS2

MHS3

MHS4

MHS5

MHS6

MHS7

MHS8

MHS9

MHS10

MHS11

MHS12

MHS13

MHS14

MHS15

MHS16

MHS17

MHS18

MHS19

MHS20

DBS9

MHS8

MHS7

CMHS3

DCS4

DCF4

MHC1

RES10

RES9

RES8

RES7

RES6

RES5

RES4

RES3

RES2

RES1

PROPOSED STORMCELL 4.8m WIDE x 12m LONG x 0.52m DEEP

38.1m

Path (um)

FB

Maia

FB

DRAINAGE LEGEND	
	DENOTES SURFACE WATER SEWER.
	DENOTES FOUL WATER SEWER.
	DENOTES COMBINED SEWER.
	DENOTES SURFACE WATER MANHOLE.
	DENOTES FOUL WATER MANHOLE.
	DENOTES COMBINED MANHOLE.
	DENOTES SURFACE WATER RODDING EYE.

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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Rev.	By	App.	Description	Date
A	NJH		INITIAL ISSUE	22.02.2024

Project
PROPOSED BAKERY, NEWTON DEE, BIELDSIDE, ABERDEEN.

Drawing Title
PROPOSED DRAINAGE LAYOUT

Architect
CAMPBILL ARCHITECTURE

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

Job No.	Scale	Issue Status
C6497	1:200 - A1 1:400 - A3	FOR PLANNING

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APPENDIX B

SITE INFORMATION (USED IN FURTHER CALCULATIONS)

SITE AREA (OVERALL) = 3548 m²

SITE HARDSTANDING AREA = 870 m²

SAAR = 808 mm (Taken from Wallingford maps)

WRAP = 2 (Taken from Wallingford maps)

Therefore **SOIL =** 0.3

INFILTRATION RATE = 6.61E-05 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 = 0.3548 hectares.
SAAR = 808 mm (Taken from Wallingford maps)
WRAP = 2 (Taken from Wallingford maps)
SOIL = 0.3 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 = 0.1078** m³/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: 0.65 litres/second
M10 Greenfield run-off is: 1.11 litres/second
M30 Greenfield run-off is: 1.45 litres/second
M50 Greenfield run-off is: 1.68 litres/second
M200 Greenfield run-off is: 2.26 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 = 1.45 litres/second
 Hardstanding area = 870 m²
 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 ³)	Outflow (m ³)	Storage (m ³)
5	5.22	7.31	6.36	0.44	5.92
10	8.25	11.56	10.05	0.87	9.18
15	10.50	14.71	12.79	1.31	11.49
30	15.27	21.38	18.60	2.61	15.99
60	21.30	29.82	25.94	5.22	20.72
120	28.68	40.15	34.93	10.44	24.49
240	38.03	53.25	46.33	20.88	25.45
360	44.67	62.53	54.40	31.32	23.08
720	58.54	81.96	71.30	62.64	8.66
1440	76.54	107.16	93.23	125.28	-32.05
2880	99.72	139.61	121.46	250.56	-129.10

Allowing for 40 % climate change, storage required = 25.45 m³

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 m³
 Stormcell units: 2.4 m long x 1.2 m wide x 0.52 m high. Capacity = 1.42 m³
 Stormbrixx units: 1.2 m long x 1.2 m wide x 0.61 m high. Capacity = 0.83 m⁴

Capacity per cell of unit specified = 1.42 m³
Minimum number of cells required = 18 No.

Depth of system specified = 0.52 m
 Plan width of system specified = 4.8 m
 Plan length of system specified = 12 m

Therefore total number of cells = 20 No.
Therefore total storage provided = 28.45 m³