

Cameron+Ross

Drainage Statement

Proposed Dwelling
84 Station Road, Ellon



prepared for

Carla Robertson


230780-000 – November 2023

Document Issue Record

Revision	Description	Issued by	Checked by	Date
-	Initial Issue	GCO	GGC	22/11/2023

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Authorisation Record

Author		Signature	Date
Name:	George-Cristian Olteanu		22/11/2023
Position:	Engineer		


Approver		Signature	Date
Name:	Graham Christie		22/11/2023
Position:	Director		

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1. Introduction

Cameron + Ross were appointed by Ken Mathieson Architectural Design Ltd on behalf of Carla Robertson to prepare a Drainage Statement in support of the Planning Application for the proposed dwelling at 84 Station Road, Ellon. This report will consider appropriate drainage proposals in accordance with the following documents.

- The SUDS Manual C753 –Guidance on the planning, design, construction and maintenance of Sustainable Drainage Systems, published by CIRIA, 2015.
- Aberdeenshire Council –Drainage Impact Assessment –Guidance for Developers and Regulators
- Sewers for Scotland –A technical specification for the design and construction of sewerage infrastructure (Version 4.0 –October 2018)

This report will establish the suitability of the site for development and identify the drainage principals in recognition of the aforementioned documents to satisfy source control, conveyance measures, attenuation, treatment and enhanced amenity.

2. Existing Site Description

The site is located at Grid Reference NJ 95182 30621 (395182E, 830621N), at 84 Station Road, Ellon. The site consists of an existing dwelling with two existing garages located at the rear of the property and an asphalt driveway fronting the property.

The site is bounded by Station Road to the South; by adjoining properties to the East and West; and by the McDonald Golf Course to the North. Please refer to the Site Location Plan contained within *Appendix A* of this report.

3. Ground Conditions

An intrusive site investigation was undertaken by Cameron + Ross to determine the existing ground conditions and to carry out infiltration testing. This was carried out on 3rd of October 2023 and confirmed the sub-soils to be medium density sands and gravels.

An infiltration rate of $2.5 \times 10^{-5} \text{m/s}$ was calculated for the site, based on the undertaken site investigation. Groundwater has not been encountered at depths up to 2.0 metres below ground level.

Based on the site investigation showing good infiltration on site, the preferable method of surface water runoff discharge will be to groundwater via a soakaway.

4. Proposed Development

It is proposed to retain the existing dwelling and demolish the existing 2no. garages at the rear of the dwelling. It is proposed to construct a new dwelling at the rear of the plot and extend the driveway to facilitate access to the new property. Please refer to the Architect Site Layout Drawing provided in *Appendix B*.

5. Existing Drainage Network

According to the Scottish Water GIS records, there are existing Scottish Water sewers nearby the site. Please refer to below summary.

- Scottish Water 225mm Vitrified Clay Foul Water Sewer located underneath Station Road.
- Scottish Water 300mm Vitrified Clay Surface Water Sewer located underneath Station Road.

Refer to *Appendix C* which contains the Scottish Water GIS Plan for the site.

6. Foul Water Drainage

It is proposed to connect the new dwelling to the Scottish Water 225mm Vitrified Clay Foul Water Sewer located underneath Station Road. The foul connection will be subject to Scottish Water Technical Approvals.

Please refer to C+R Drawing 230780-000-CAM-DR-C-400 – Drainage Layout, provided in *Appendix C* of this report.

7. Surface Water Drainage

The roof water from the proposed dwelling will be conveyed via a surface water drain to a surface water soakaway, before discharging to the ground. It has been assumed the proposed access road is to be of self-draining material and, as such, it was not considered for the provision of surface water drainage. Please refer to C+R Drainage Calculations provided in *Appendix D*.

The treatment level required as stated within Table 26.2 of CIRIA C753 for 'residential roofs' is shown in *Table 7.1* overleaf, and the treatment level provided by the proposed SuDS method is stated in *Table 7.2* overleaf, which shows adequate treatment is achieved by the proposed system.

In accordance with CIRIA document C753 the risk posed by surface water runoff to the receiving environment is a function of the land use, the effectiveness of SuDS treatment components and the sensitivity of the receiving watercourse or groundwater.

Determining the hazard posed by the land use activities at a site can be established by using a simple index approach by allocating pollution hazards indices for the proposed land use as outlined in *Table 7.1* below.

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Total Pollution Hazard Index	Very low	0.2	0.2	0.05

Table 7.1: Pollution Hazard Indices (based on Table 26.2 in the SuDS Manual - C753 by CIRIA)

The mitigation indices from Table 26.4 of CIRIA C753 are contained in *Table 7.2* below.

Type of SuDS Component	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Infiltration Trench (where a suitable depth of filtration material is included that provides treatment, ie graded gravel with sufficient smaller particles but not single sized coarse aggregate such as 20mm gravel) underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.4	0.4	0.4
Total Pollution SuDS Mitigation Index	0.4	0.4	0.4

Table 7.2: SuDS Mitigation Indices for discharges to groundwater (based on Table 26.4 in the SuDS Manual – C753 by CIRIA)

To deliver adequate treatment for each type of use, the selected SuDS components suggested in *Table 7.2* above should have a total pollution mitigation index (for each

contaminant type) that equates or exceeds the pollution hazard index specified in *Table 7.1*.

Total SuDS Mitigation Index > Pollution Hazard Index

As a result, the proposed SuDS components identified in *Table 7.2* exceed the land use pollution hazard providing the required level of treatment for a development of this nature. Please refer to C+R Drainage Layout & Construction Detail Drawings provided in *Appendix E*.

8. Adoption & Future Maintenance

The proposed on-site surface water sewer systems shall be designed and constructed to the standards set out in Sewers for Scotland (4th Edition) in accordance with good practice.

It is proposed that the surface water soakaway and all new drains are maintained by the homeowner. The homeowner will require a suitable maintenance regime and therefore the drainage system should be inspected and maintained as follows;

The CIRIA C753 Document provides guidance on the maintenance requirements for SuDS features. Please refer to *Table 8.1* for maintenance details of the proposed surface water soakaway.

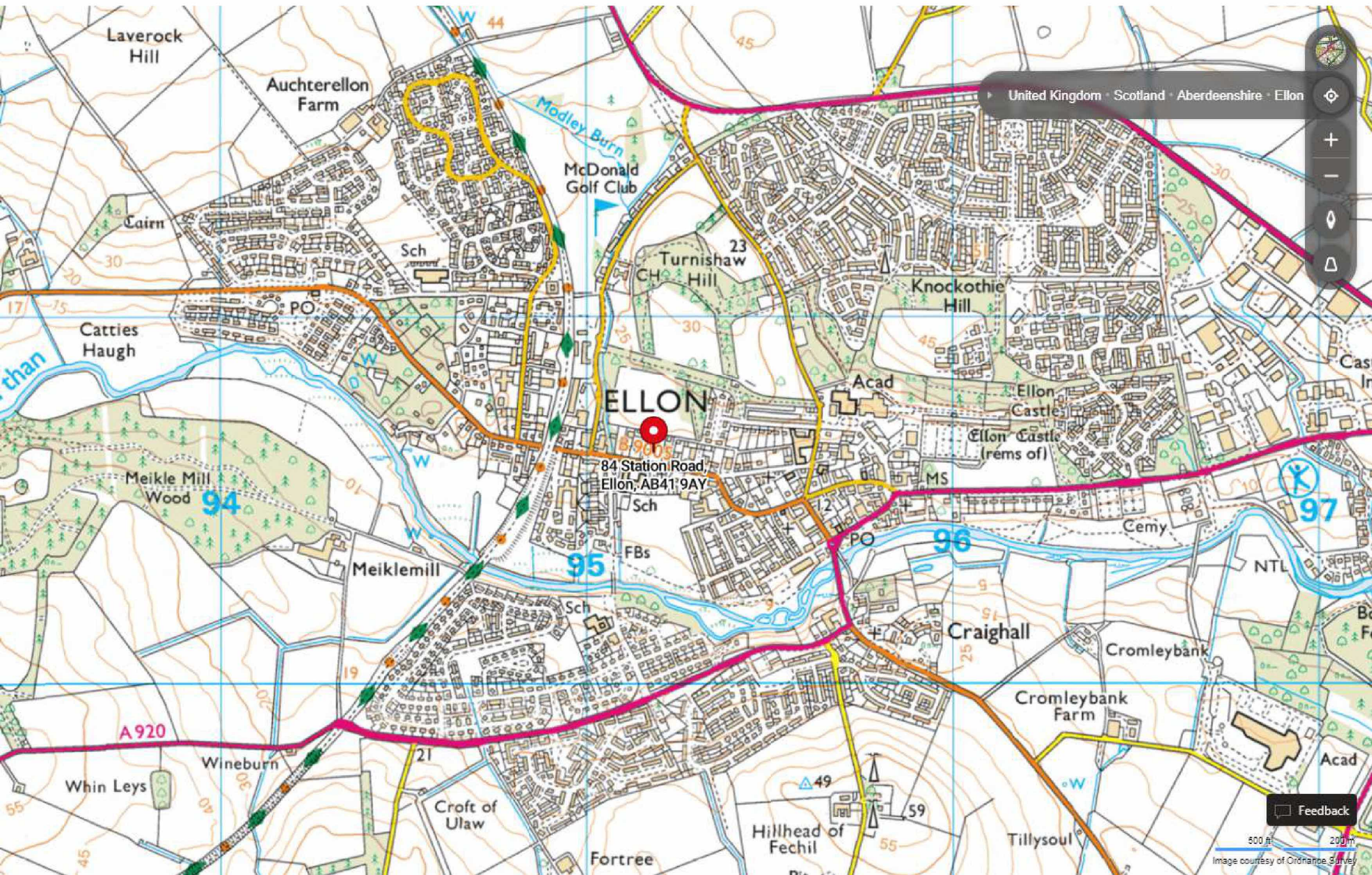
TABLE 13.1 Operation and maintenance requirements for soakaways		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

Table 8.1 – Extract of Table 13.1 from CIRIA C753 – The SuDS Manual



APPENDIX A

Site Location Plan



United Kingdom · Scotland · Aberdeenshire · Ellon

ELLON

84 Station Road,
Ellon, AB41 9AY

Feedback

500 ft 200 m
Image courtesy of Ordnance Survey

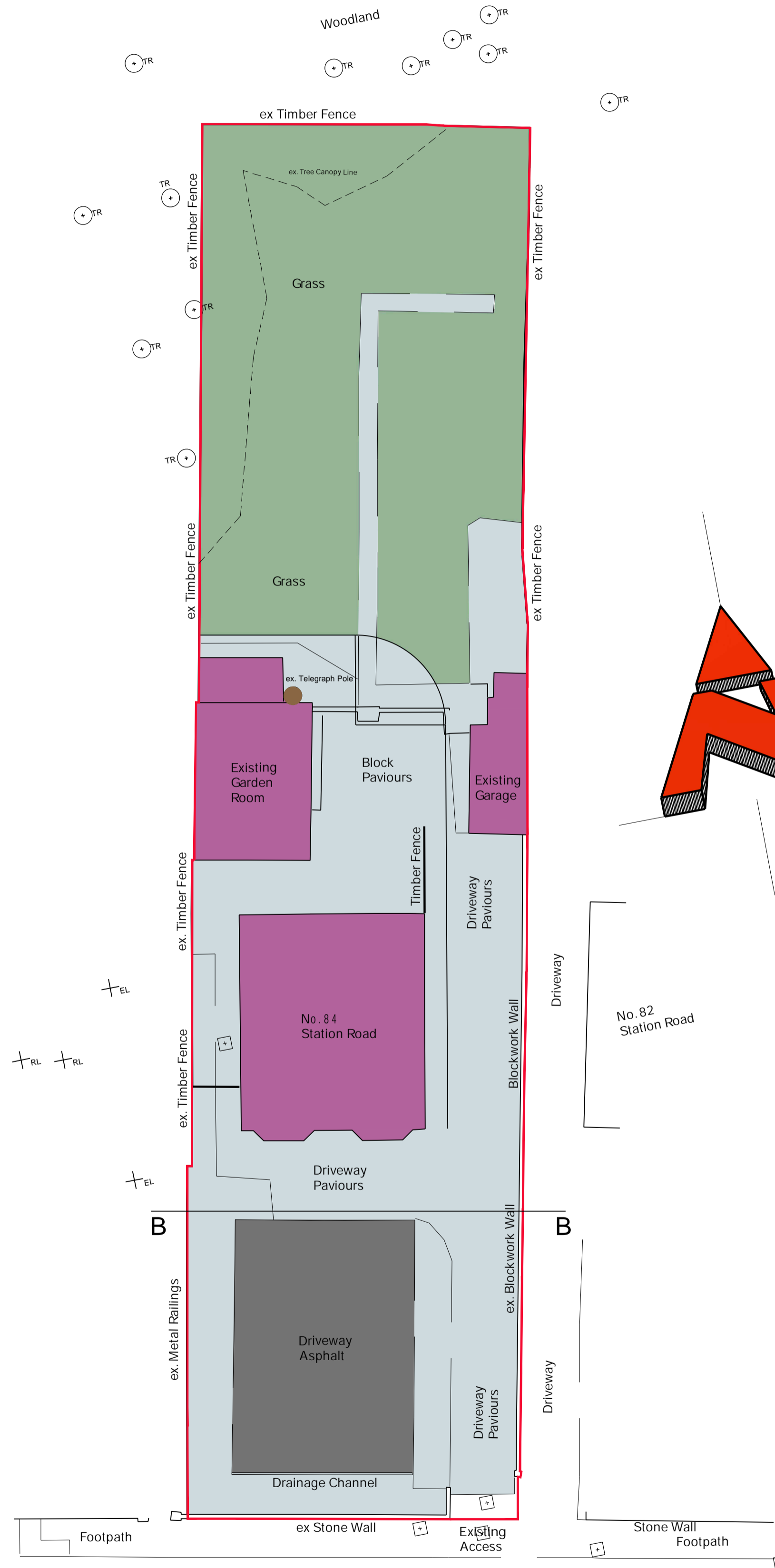


APPENDIX B

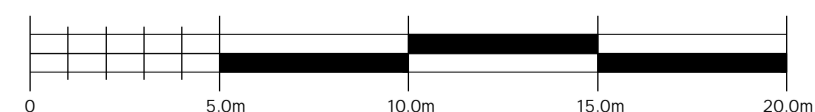
Architect Site Layout

Sub Division of Site & Proposed New Dwelling : Dunnydeer, 84 Station Road, Ellon, Aberdeenshire, AB41 9AY

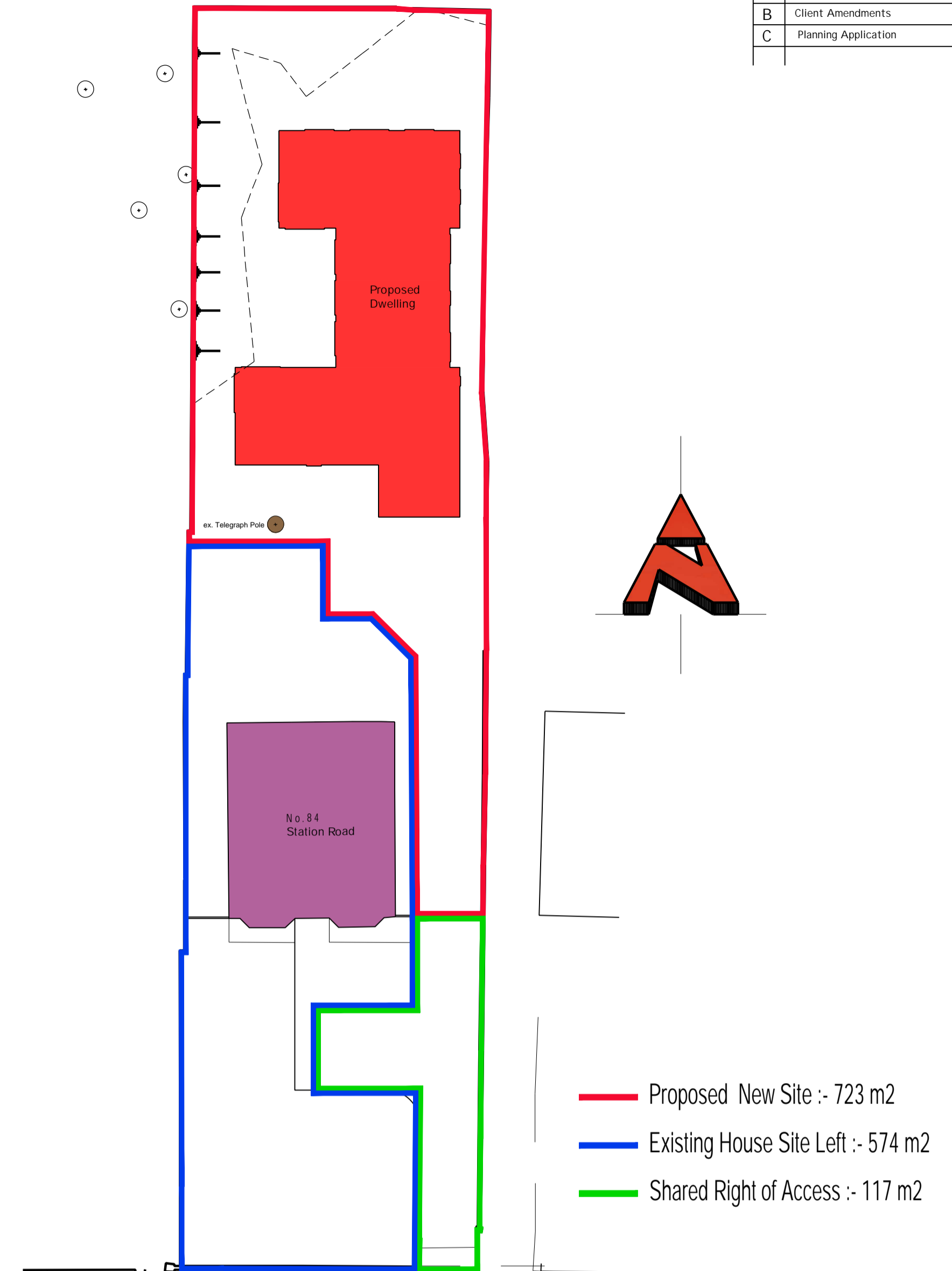
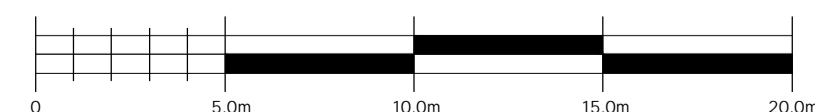
Amendments	Date
A First Issue	Oct 23
B Client Amendments	Oct 23
C Planning Application	Nov 23



Existing Layout Plan :- Scale 1:200



Proposed Site Layout Plan :- Scale 1:200



Proposed Site Division



Site Location Plan Scale 1:1250 @ A1

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ken mathieson
 ARCHITECTURAL DESIGN
 & DEVELOPMENT CONSULTANT
 LTD.
 MANSARD HOUSE
 15 OLD MELDRUM ROAD
 BUCKS BURN
 ABERDEEN
 AB21 9AD
 TEL: 01224 710357
 FAX: 01224 710336
 E-MAIL: info@kenmathieson.com

DOMESTIC, COMMERCIAL & INDUSTRIAL

Client: Carla Robertson

Project: Sub Division of Site & Proposed Dwelling at :- Dunnydeer, 84 Station Road Ellon, Aberdeenshire, AB41 9AY

Title: Existing & Proposed Site Layout Plans Location Plan & Plot Sub Division

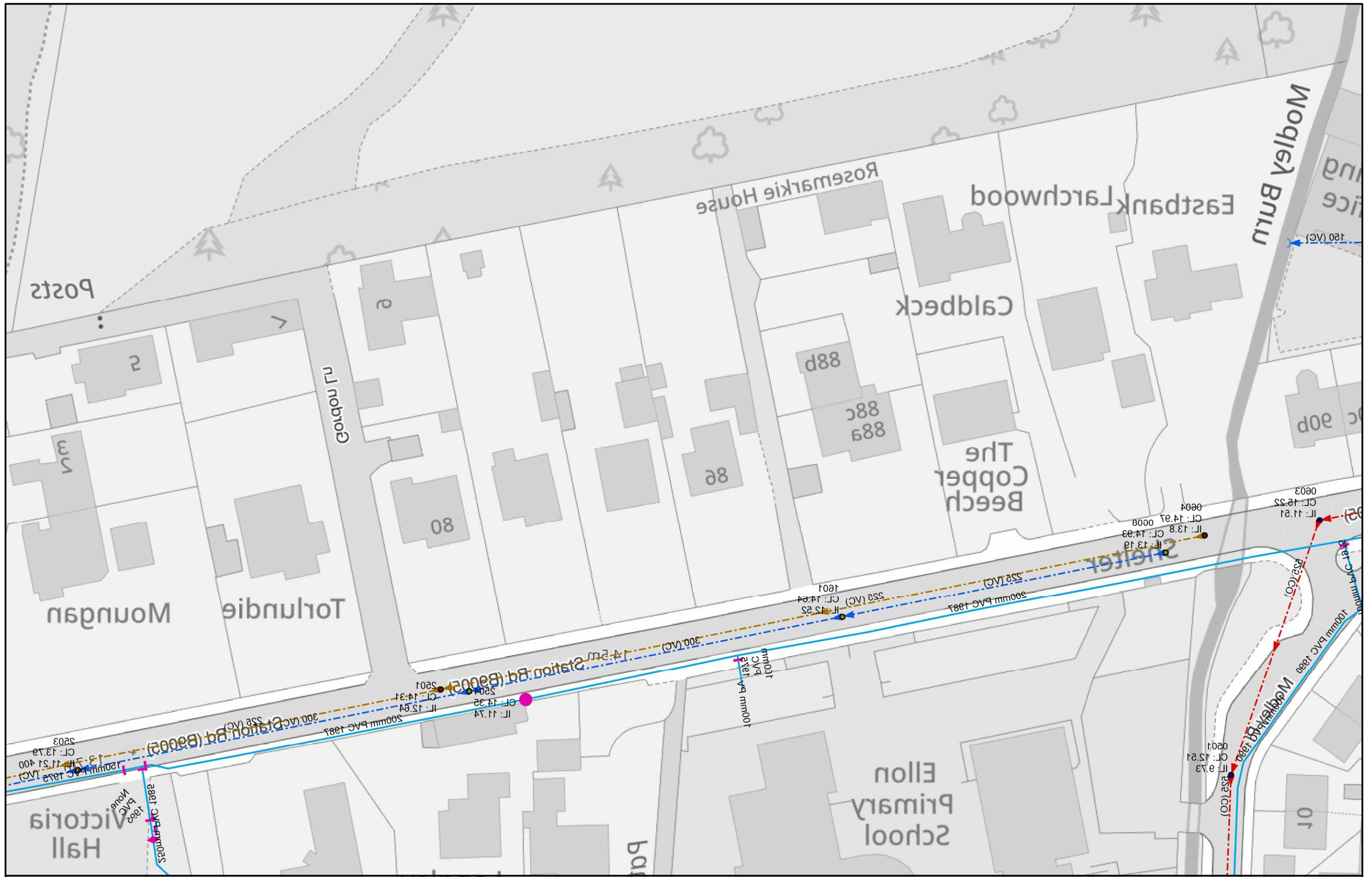
Job No	Scale	Date	Drawn by	Issue
2804	As Shown	Oct 23	CG	C

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APPENDIX C

Scottish Water GIS Plan



Warning! Damaging a large diameter trunk main (12"/300mm and above) can result in loss of life and major water supply and water quality problems. If you're planning any extension work in the vicinity of any large diameter mains shown on our maps, you must contact Scottish Water to arrange a site visit 08000 778 778 WELL IN ADVANCE OF THE WORKS

Plotted By: gchristie@cameronross.co.uk

The representation of physical assets and the boundaries of areas in which Scottish Water and others have an interest does not necessarily imply their true positions. For further details contact the appropriate District office.

Date: 11/08/2023

station road

0 3.25 6.5 13 Meters

SCALE: 1:661

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The Bridge
6 Buchanan Gate
Stepps
Glasgow
G33 6FB

Tel No: 08000 778 778



APPENDIX D

C+R Drainage Calculations

Project: **Proposed Dwelling**
Address: **84 Station Road**
Location: **Ellon**

Job No: **230780-000**
Date: **22/11/2023**
Calcs by: **GCO**
Page No:

Design Rainfall

Additional flow multiplier **20%**

From Wallingford Procedure, Volume 3 - Maps
Rainfall Depths (M5 - 60minutes)

$M5_{60} =$

from BRE Digest 365, fig. 1

rainfall ratio $r =$

Design Storm Return Period,

$P =$

D mins	M5_D	Z2	R = MP_D	Rainfall Intensity
5	4.7 mm	1.944	9.0 mm	109 mm/hr
10	7.0 mm	1.978	13.9 mm	83 mm/hr
15	8.7 mm	2.004	17.4 mm	70 mm/hr
30	12.0 mm	2.033	24.3 mm	49 mm/hr
60	16.0 mm	2.031	32.5 mm	33 mm/hr
120	21.0 mm	1.988	41.7 mm	21 mm/hr
240	27.3 mm	1.952	53.3 mm	13 mm/hr
360	31.7 mm	1.922	60.9 mm	10 mm/hr
600	38.3 mm	1.883	72.1 mm	7 mm/hr
1440	52.7 mm	1.817	95.8 mm	4 mm/hr
2880	67.8 mm	1.767	119.9 mm	2 mm/hr

Scotland and Nth Ireland

England and Wales

Measured Infiltration Rate

Infiltration Rate (eff) m/s
Impermeable Area m²
Width m
Depth m
Fixed Lgth (optional) m

(OR Outlet Flow Rate l/s)
ie m³/hr

Gravel Pit or Trench Soakaway

Gravel, free volume

Insert 100% for Net Storage Chamber Volume

D	Length	Inflow	Outflow	Storage Req	t ₅₀ (hrs)	Storage Prov	Overflow
5	1	2.0	0.0	2.0	1.75	2.0	
10	2	3.1	0.1	3.0	2.39	3.0	
15	2	3.9	0.2	3.7	2.77	3.7	
30	3	5.5	0.4	5.1	3.37	5.1	
60	4	7.3	0.8	6.5	3.86	6.5	
120	5	9.4	1.8	7.6	4.19	7.6	
240	5	12.0	3.8	8.2	4.36	8.2	
360	5	13.7	5.6	8.1	4.33	8.1	
600	5	16.2	8.9	7.3	4.12	7.3	
1440	3	21.6	17.1	4.4	3.08	4.4	
2880	1	27.0	25.6	1.4	1.30	1.4	

Time until system can cope with additional influx of 50% design storage volume < 24 hrs ~ OK

Provide gravel filled soakaway, 5.5 m x 5 m x 1 m deep

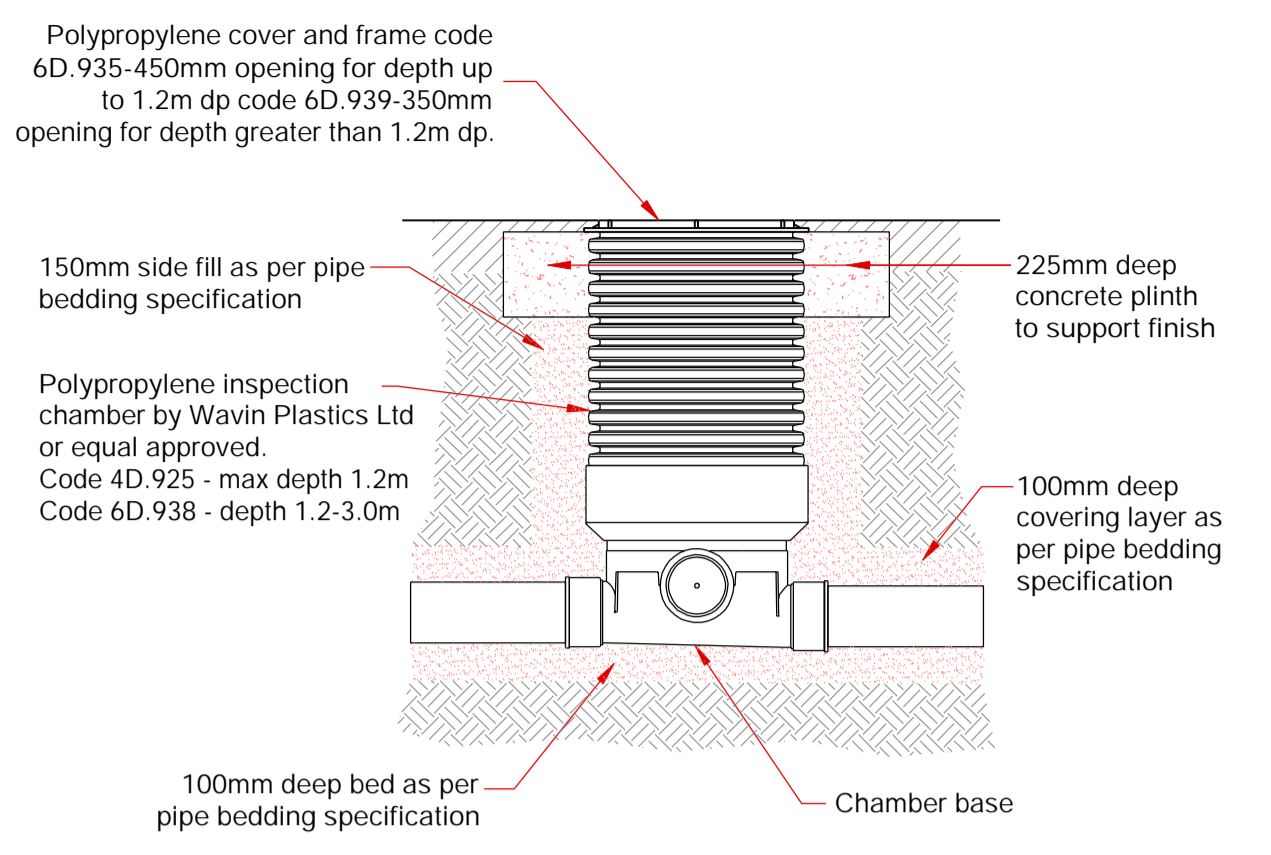
Minimum Free Volume = 30%

Total Pit Volume = 27.5m³

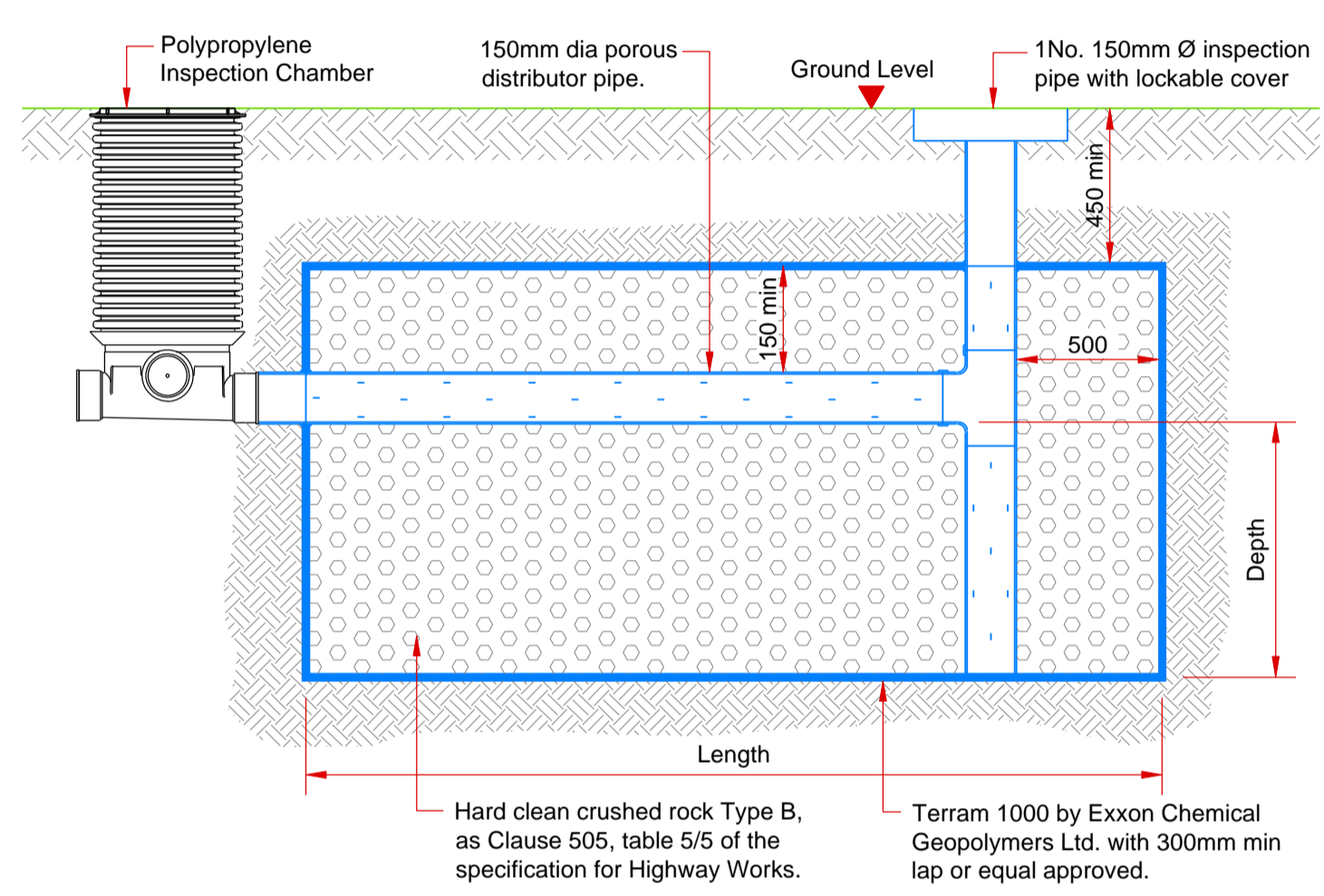
(Note that the depth is measured below the inlet pipe invert)

APPENDIX E

C+R Drainage Layout & Drainage Construction Details Drawings



Polypropylene Inspection Chamber
Scale 1:20



TYPICAL PRIVATE SURFACE WATER SOAKAWAY LONGITUDINAL SECTION
SCALE NTS

NOTE:-
Soakaway dimensions based on a soil infiltration rate (f) = 2.25×10^{-6} m/sec as determined by Cameron + Ross' site investigation of 04/10/23 in accordance with in BRE Digest 365 with 30% free volume of fill material.

- GENERAL DRAINAGE NOTES:-**
- This drawing is to be read in conjunction with all relevant engineers and architects drawings.
 - Drainage - all drains to be constructed in accordance with Scottish water's publication "Sewers for Scotland (4th edition October 2018) a policy, design and construction guide for developers in Scotland". All drains will remain private.
 - Drains laid within roads should have a minimum cover of 1.5m from final road surface to pipe soffit level. Where this cannot be achieved then ridged pipes shall be protected by a full concrete surround, similarly, flexible pipes shall be protected by a concrete slab at a depth less than 1.2m.
 - The contractor is responsible for checking the line and level of all existing services prior to commencement of works. Any discrepancies from design information must be reported to the site manager and site engineer in writing.
 - Drainage tail positions to be confirmed on site to suit house type discharge points. A surface water and foul water branch should be established for each plot.
 - The contractor should allow for CCTV camera survey of entire drainage system upon substantial completion of works. If any remedial works are required a repeat survey should also be carried out prior to formal submission to Engineer together with as-built drawing including manhole co-ordinates, cover and invert levels and pipe gradients.

- SURFACE DRAINAGE LEGEND:-**
- Surface water drain (150mm dia uPVC Marley Quantum rigid solid pipework) unless otherwise noted on drawing.
 - Surface Water Soakaway
 - Surface Water Manhole
- FOUL DRAINAGE LEGEND:-**
- Foul water drain (150mm dia uPVC Marley Quantum rigid solid pipework) unless otherwise noted on drawing.
 - Foul Water Manhole
 - Disconnecting Manhole

- DOMESTIC EFFLUENT DISPOSAL - SEPTIC TANK/TREATMENT PLANT:**
- The tank shall be located:
 - 5m from any building
 - 5m from any boundary
 - A hard access suitable for use by a desludging tanker of 14 tonne axle load shall be no greater than 25m from the septic tank and at a level of no more than 4m above the height of the septic tank and with a clear route for the suction hose between the tanker and unit.
 - A notice/label complying with CI 3.8.7 of the current Building regulations shall be printed thus:

'The drainage system from this property discharges to a septic tank. The owner of the properties is legally responsible for routine maintenance and for ensuring that the system complies with any discharge consent issue by SEPA and that it does not present a health hazard or nuisance.'

The notice/label shall be located adjacent to gas unit, electric consumer unit or water stopcock.
 - The treatment tank shall be designed, constructed and installed in accordance with BS EN 12566-1:2000 or BS 6297:1983 and manufacturers written instructions.
 - The tank shall be fitted with a sealed, secure cover capable of being removed by 1 person.
 - The inspection/sampling chamber located between the tank and discharge point shall be at least 300mm diameter and be in accordance with CI 3.8.3 of current Building Regulations.
 - The infiltration/attenuation system
 - 5m from any building
 - 5m from any boundary
 - 10m horizontally from a watercourse, including inland/coastal waters, permeable drain, road or railway.
 - 50m from any spring, borehole or well used as drinking water supply.
 - Drainage pipes used for construction of the infiltration system shall be rigid plastic and not flexible.

Issue	Revision	Initial	Date

Cameron + Ross
CIVIL + STRUCTURAL ENGINEERING
Forbes House | 15 Victoria Street | Aberdeen | AB10 1XB
1 01224 642 400 | w.cameronross.com
Mulberry House | 39-41 Harbour Road | Inverness | IV1 1UF
1 01463 570 100 | w.cameronross.com

Client:
Carla Robertson

Project:
Sub Division of Site & Proposed Dwelling at Dunnydeer, 84 Station Road, Ellon.

Drawing Title:
Drainage Layout

Status:
Planning

Scale: 1:250 @ A1 Date: 09/11/2023
By: MML Checked: GGC Approved: GGC

Dwg. No. 230780-000-CAM-DR-C-400 Rev. -

DRAINAGE LAYOUT
Scale 1:200

Refer to Architects drawings for internal drainage runs and details.

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Civil+Structural Engineering Expertise

Aberdeen

01224 642400

Forbes House
15 Victoria Street
Aberdeen, AB10 1XB

Inverness

01463 570100

Mulberry House
39-41 Harbour Road
Inverness, IV1 1UA

www.cameronross.co.uk
info@cameronross.co.uk

Registered in Scotland SC142061
The Capitol, 431 Union Street, Aberdeen, AB11 6DA