



# **SITE INVESTIGATION & DRAINAGE DESIGN REPORT**

**PROPOSED DWELLING**

**PLOT 1  
HILLHEAD CROFT  
CHAPEL OF GARIOCH  
AB51 5HE**

---

## CONTENTS

<b>INTRODUCTION</b>	<b>PAGE 2</b>
<b>SITE DESCRIPTION</b>	<b>PAGE 3</b>
<b>ON SITE INVESTIGATION &amp; TESTING</b>	<b>PAGE 3</b>
<b>FOUL WATER DRAINAGE DESIGN</b>	<b>PAGE 4</b>
<b>SURFACE WATER DRAINAGE DESIGN</b>	<b>PAGE 4</b>
<b>REGULATIONS</b>	<b>PAGE 5</b>
<b>MAINTENANCE</b>	<b>PAGE 5</b>
<b>STRUCTURAL RECOMMENDATIONS</b>	<b>PAGE 6</b>
<b>SUMMARY</b>	<b>PAGE 6</b>
<b>REFERENCES</b>	<b>PAGE 6</b>
<b>APPENDIX 1</b>	<b>PAGE 7</b>
<b>APPENDIX 2</b>	<b>PAGE 8</b>
<b>APPENDIX 3</b>	<b>PAGE 9</b>
<b>APPENDIX 4</b>	<b>PAGE 10</b>

## INTRODUCTION

The following has been prepared on behalf of Dr & Mrs Munro who are proposing to erect a new dwelling on Plot 1, Hillhead Croft, Chapel of Garioch, AB51 5HE

This report has been completed by Daniel Cumming of Caledonia Homes for the purposes of the design of infiltration systems.

---

## SITE DESCRIPTION

The site is located approximately 120m West of the village of Chapel of Garioch and has a grid reference of NJ 71486 24274.

The site area is 0.228 hectares including the shared access and is currently a vacant building plot. There is currently no buildings on site.

The existing site levels are generally flat with only minor falls across the entire site.

No mains or private drainage was noted on site during the site visit with this further investigated via the Scottish Water GIS System and discussions with current/former landowner/s.

There are no known wells or boreholes within 50m of the site.

There are no known watercourses within 10m of the site.

## ON-SITE INVESTIGATION & TESTING

On-site investigation and testing was carried out on the 11<sup>th</sup> March 2016 by Grampian Geotechnical (Scotland) Ltd. Reference should be made to a copy of the certificate from their report contained within Appendix 2 of this report.

As Grampian Geotechnical are a suitably qualified and indemnified professional company, their calculated average percolation value (VP) of 3.8 sec/mm is deemed acceptable for the purposes of this report and no additional testing is deemed necessary.

The report by Grampian Geotechnical summarises the ground conditions encountered within the trial pit as follows,

340mm topsoil

410mm medium dense to dense silty, gravelly sand

1750mm dense slightly silty, sandy, very gravelly, highly fractured rock

---

## FOUL WATER DRAINAGE DESIGN

The results of the on-site testing (see Appendix 2) confirm that the subsoil materials are suitable for a soakaway, albeit the calculated VP is lower than 15 sec/mm. It is therefore proposed to discharge the foul water from the proposed dwelling to a new treatment plant and soakaway.

Based on a 3 bedroom house (population equivalent of 5) it is recommended that a Graf One2Clean 5 pop treatment plant is installed on site complete with necessary sampling chamber etc with a discharge to a traditional stone filled soakaway with dimensions of 5.0m long x 5.0m wide x 1.0m deep.

Should an alternative treatment plant be proposed, Caledonia Homes should be consulted prior to purchase/installation to confirm that the alternative tank proposed still meets the requirements of SEPA and Scottish Building Regulations.

This system has been designed based on the proposed dwelling at the time of writing this report, should the dwelling be amended/extended following preparation of this report a new/amended drainage design may be required.

Any treatment plant/soakaway should be constructed in accordance with SEPA and Scottish Building Regulations as well as in accordance with the typical construction detail (see Appendix 4).

## SURFACE WATER DRAINAGE DESIGN

The results of the on-site testing (see Appendix 2) confirm that the subsoil materials are suitable for a soakaway, albeit the calculated VP is lower than 15 sec/mm. It is therefore proposed to discharge all of the rainwater from the proposed dwelling roof areas to a new surface water soakaway. The proposed roof plan area of the new dwelling is approximately 225m<sup>2</sup>.

In line with the calculations carried out (see Appendix 3) a traditional stone filled soakaway with dimensions of 4.0m long x 2.0m wide x 1.0m deep can be adopted.

This soakaway has been designed to take the rainwater from the house roof only, and should any other buildings or hardstanding areas (ie garage, shed, tarred drive etc) require discharge then a new/amended soakaway design will be required.

Any soakaway should be constructed in accordance with SEPA and Scottish Building Regulations as well as in accordance with the typical construction detail (see Appendix 4) or manufacturers printed guidance as appropriate.

---

## REGULATIONS

The proposed treatment plant and soakaways should be installed in accordance with all relevant SEPA and Scottish Building Standards Regulations, including;

- Soakaways to be located at least 50m from any spring, well or borehole used as a drinking water supply
- Soakaways to be located at least 10m away from any watercourse
- Soakaways to be located at least 10m away from any other soakaway
- Soakaways to be located at least 5m away from any building (unless structural engineer has certified that a smaller distance can be used)
- Soakaways to be located at least 5m away from any boundary (unless adjacent land owner has confirmed that a smaller distance can be used and this will not have a negative impact on neighbouring property/land)
- Treatment Plant to be located at least 5m away from any building (unless structural engineer has certified that a smaller distance can be used)
- Treatment Plant to be located at least 5m away from any boundary (unless adjacent land owner has confirmed that a smaller distance can be used and this will not have a negative impact on neighbouring property/land)
- Dwelling to be fitted with label alerting owner that drainage system discharges to treatment plant with label situated adjacent to electricity consumer unit. Label to state that owner is legally responsible for routine maintenance and is in full compliance with all consents and is not a health hazard or nuisance.
- Desludging access capable of supporting vehicle access load of 14 tonnes to be provided. Clear route for suction hose from tanker to tank not more than 25m distance and not more than 4m higher than invert level of tank.

## MAINTENANCE

The on-going maintenance of the entire drainage system as designed will be the sole responsibility of the property owner.

The treatment plant should be fully maintained in accordance with the manufacturers printed literature and should be regularly inspected and desludged/emptied when necessary to ensure solids/silts do not adversely affect the soakaways performance.

All soakaways/silt traps/inspection chambers/sampling chambers should be regularly inspected/emptied to ensure that pipework/soakaways are not allowed to be blocked/affected by silting.

Should a soakaway fail due to blockage or silting then it should be fully excavated and re-constructed as per the design including new pipework, terram and clean broken stone.

---

## STRUCTURAL RECOMMENDATIONS

All excavations and foundations should be taken down through topsoil and any made/disturbed ground to suitable undisturbed natural hard-bearing ground. If there is any doubt as to the suitability of ground conditions then contact should be made with the structural engineer who designed and certified the foundations.

## SUMMARY

Following on on-site investigations and testing the ground conditions are deemed suitable for a treatment plant and separate soakaways.

The drainage system to the dwelling should be installed in accordance with the design recommendations within this report and associated appendixes.

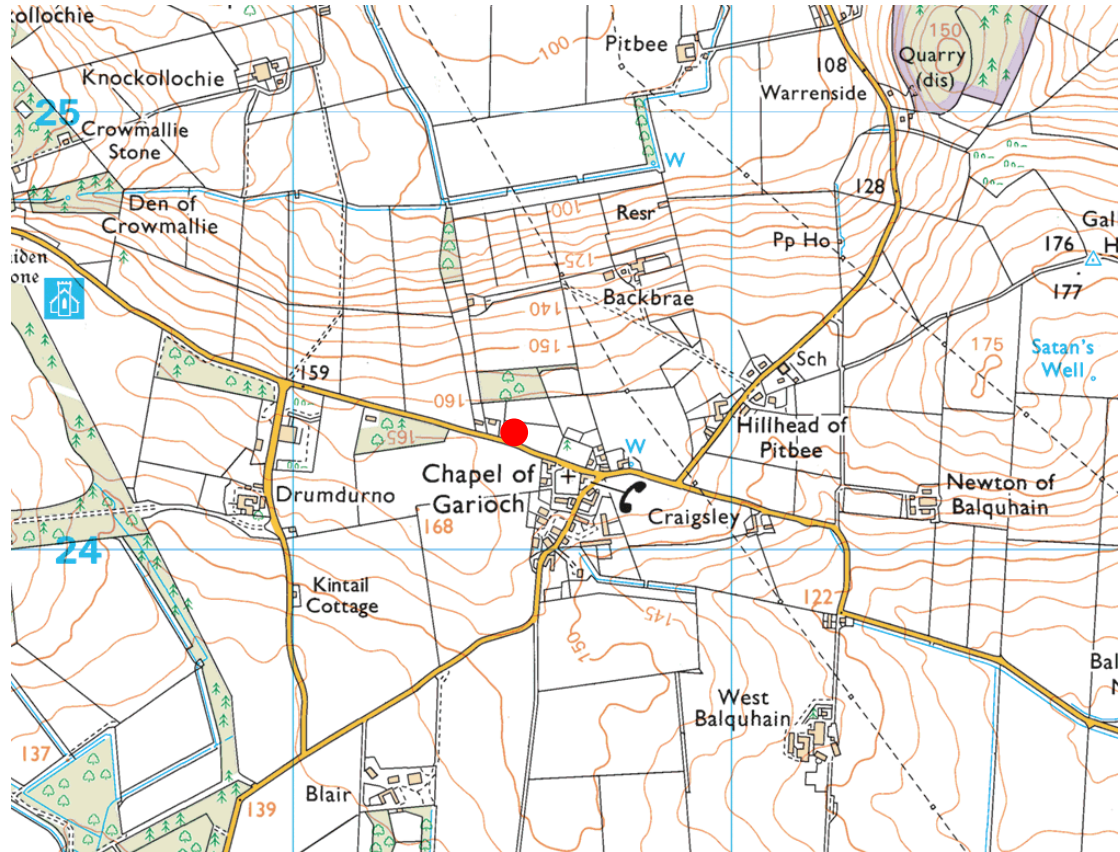
The subsoil materials identified as being undisturbed natural hard-bearing ground are deemed to be suitable for the proposed development.

## REFERENCES

The above report, on-site testing and design has been carried out in accordance with the guidance given in the following documents;

- Scottish Building Standards Technical Handbook 2019: Domestic Buildings
- BRE 365 Digest 365 – Soakaway Design – Revised 2016
- The Water Environment (Controlled Activities) (Scotland) Regulations 2013
- SEPA WAT-RM-03 – Sewage Discharges to Surface Waters
- SEPA WAT-RM-04 – Indirect Sewage Discharges to Groundwater

## Appendix 1



### SITE LOCATION PLAN

Not to scale

## Appendix 2



**GRAMPIAN GEOTECHNICAL (SCOTLAND) LTD**

Rosehall Commercial Park  
Rosehall  
Newmachar  
Aberdeenshire  
AB21 0UT  
*info@grampiangeotechnical.co.uk*

Planning Application Ref. No. ....

### CERTIFICATE FOR PROPOSED FOUL WATER SUB-SURFACE SOAKAWAYS

Two tests are normally required to demonstrate the suitability of the proposed drainage scheme:

1. A trial pit must be excavated to a depth of 1 metre below the proposed invert of the drain to establish whether or not the water table will interfere with the operation of the soakaway.  
and
2. A percolation test must also be carried out to determine the area of ground required.

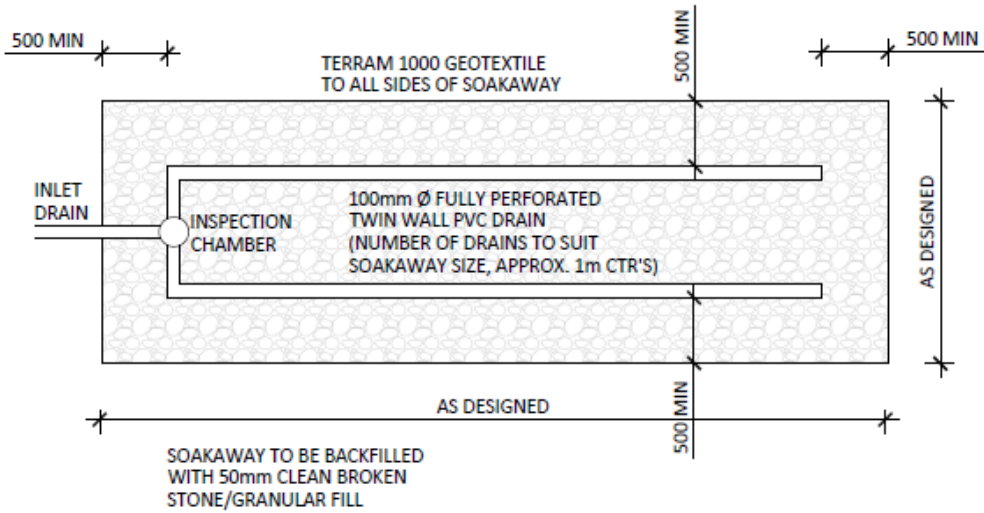
<b>Certificate</b>	
Applicant's name	Mr & Mrs Edwards
Address	Hillhead Croft, Chapel of Garioch, Aberdeenshire
Site address	Land at Hillhead Croft, Chapel Garioch, Aberdeenshire
Date of test	17-12-2013
Weather conditions	Dry
	Time 0830 hrs
<b>1. TRIAL PIT TEST – Trial Pit 1</b>	
Depth of excavation	Test depth – 1.10-1.40m (TP) – max depth of pit – 2.50m
Water table present	NO (mbgl)
<b>2. PERCOLATION TEST</b>	
Time taken	2160 seconds
Percolation value Vp	3.8
Number of persons	6
Floor area of soakaway	21.60 m <sup>2</sup> with mini treatment plant
I hereby certify that I have carried out the above tests in full accordance with the procedures specified in British Standard BS6297:1983, as amended by AMD6510 1990, the results of which are tabulated above.	
Signed	Connor Mckenzie BSc (Hons)
Company	Grampien Geotechnical (Scotland) Ltd
	Date: 11-03-2016



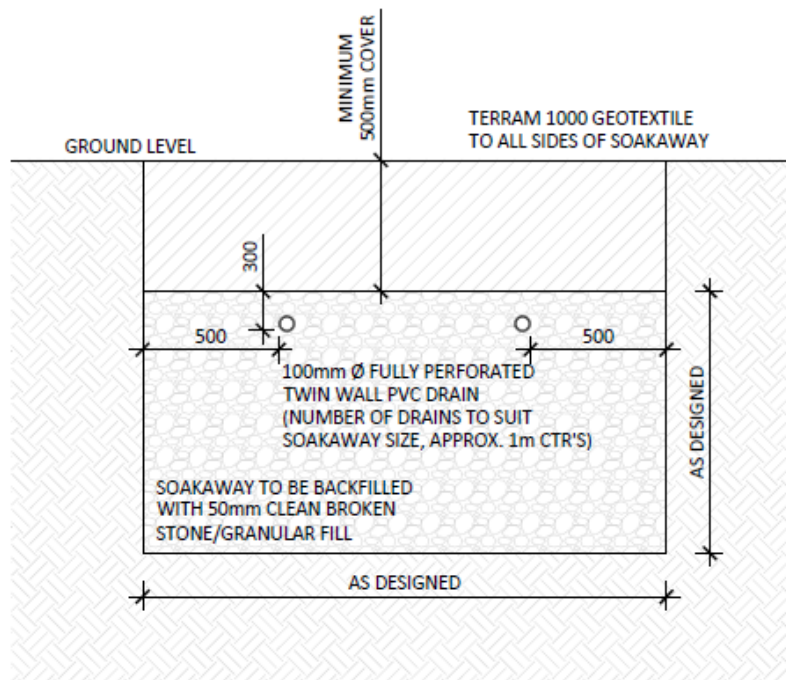
## Appendix 3

SURFACE WATER SOAKAWAY	
<b>Input Data</b>	
VP (sec/mm) = 3.8	Area to be drained (m2) = 225.00
Assumed soakaway size for calculation purposes (m) = 12 x 2 x 1	
Internal surface area of assumed soakaway to 50% effective depth (m2) = 9.8	
<div style="border: 1px solid black; padding: 5px;"> <p><b>Storage Volume Calculation</b></p> <p><math>S = (A \times 0.0145) - (a \times f \times 900)</math></p> <p><math>S = 0.94145</math></p> </div>	
<div style="border: 1px solid black; padding: 5px;"> <p><b>Traditional Stone Filled Soakaway Calculation</b></p> <p>(Assumed 20% voids and effective depth of 0.7m below invert of inlet pipe)</p> <p>Size (m3) = <math>(S \times 5) \times (1 \div 0.7)</math></p> <p>Size (m3) = 6.72462</p> <p><u>Adopt soakaway size of 4.0m long x 2.0m wide x 1.0m deep</u></p> </div>	

## Appendix 4



INDICATIVE SOAKAWAY PLAN VIEW



INDICATIVE SOAKAWAY CROSS SECTION