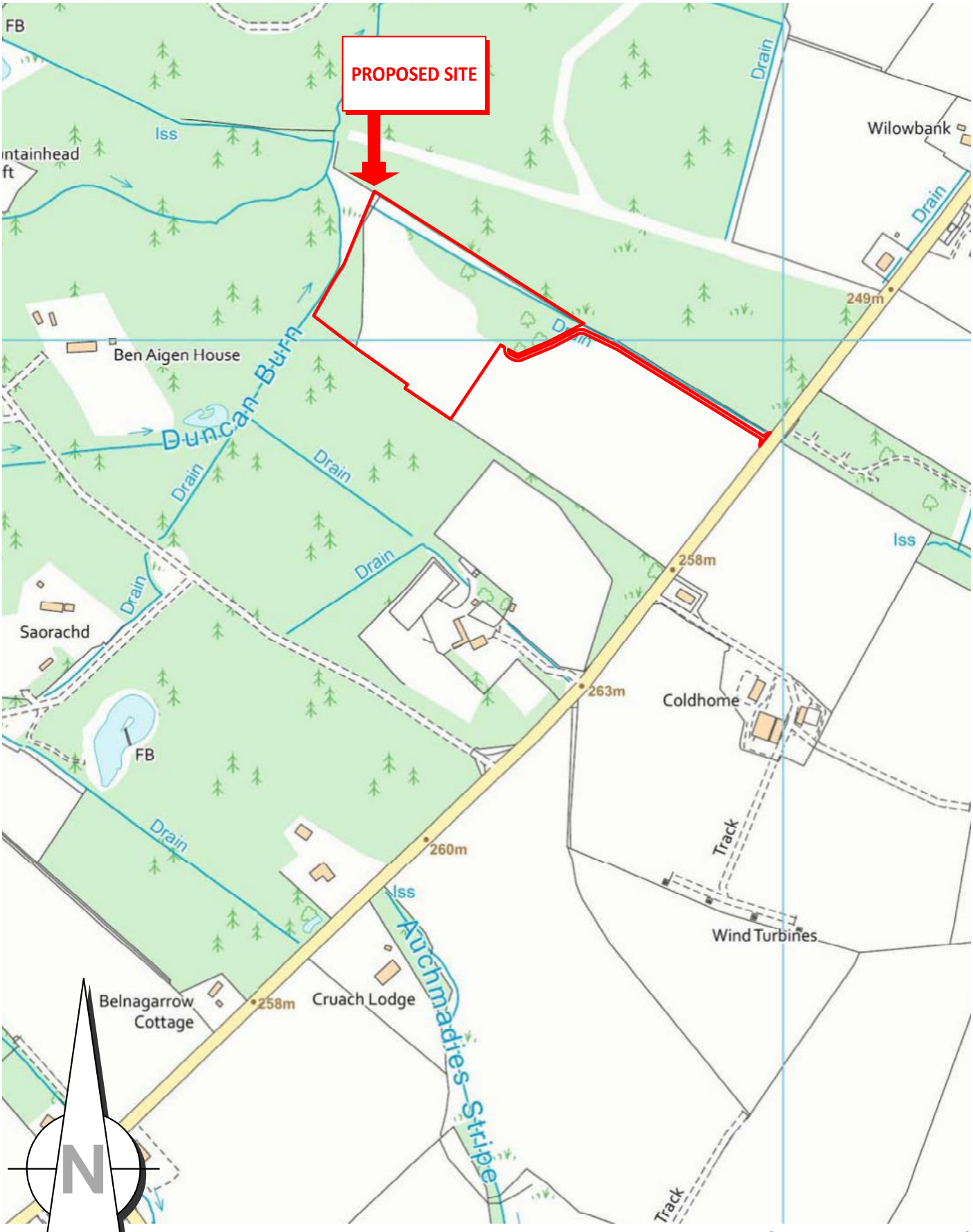

OS LOCATION PLAN (SCALE - 1:5000)

Proposed dwelling-house and detached garage at Site at Boharm Neuk, Boharm, Craigellachie, Aberlour AB38 9RL
For Mr and Mrs Morrison

S.REID MCIAT
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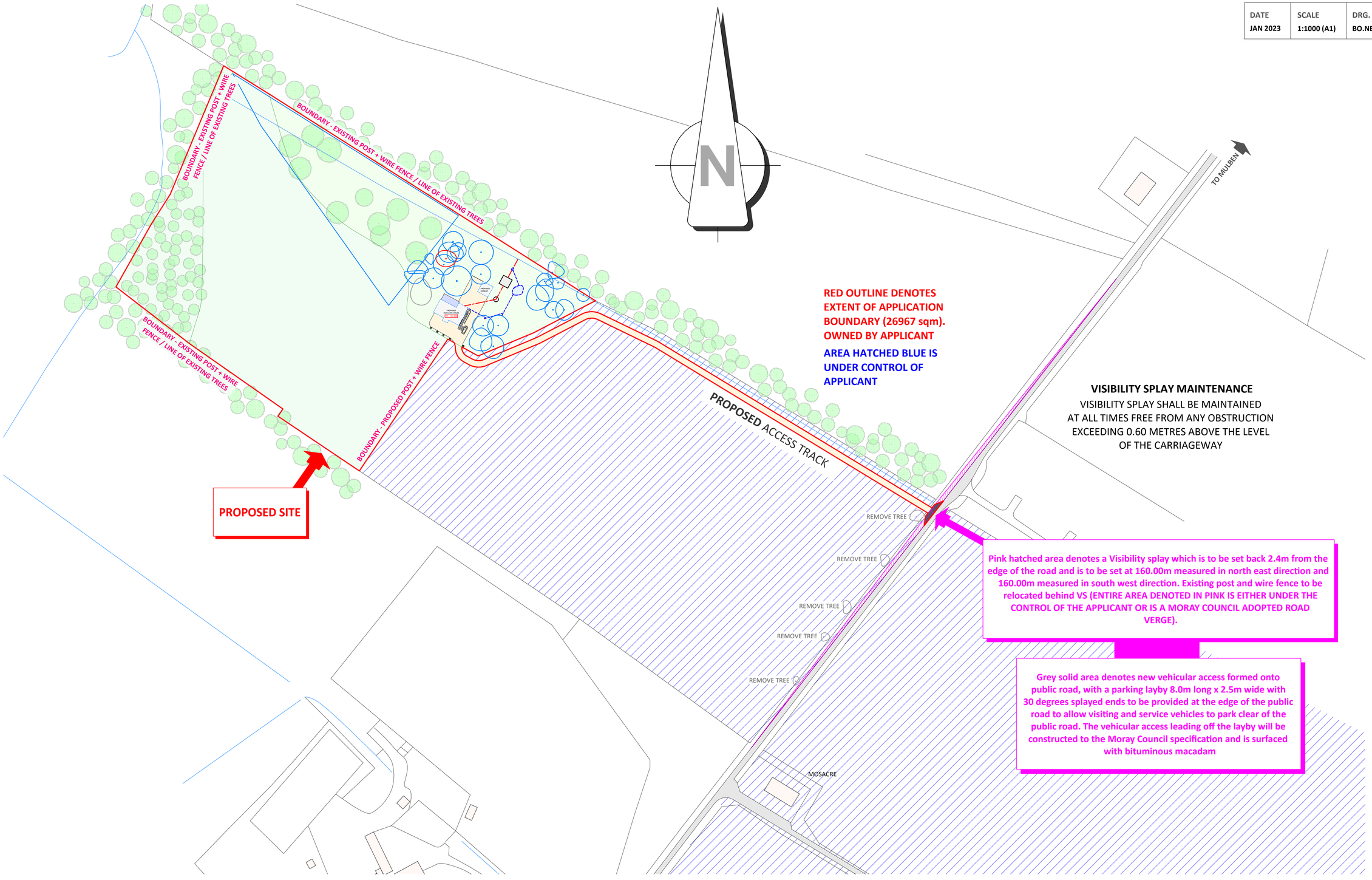
DATE	SCALE	DRG. NO.
JAN 2023	1:1000 (A1)	BO.NEUK / PIP / 02



Block Plan (scale 1:1000)

Proposed dwelling-house and detached garage at
Site at Boharm Neuk, Boharm, Craigellachie, Aberlour AB38 9RL
For Mr and Mrs Morrison

S Reid Design
CHARTERED ARCHITECTURAL DESIGN SERVICE

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gmcsurveys

Surveys, Setting-Out Civil Engineering Design

Site Investigation & Drainage Assessment

BOHARM NEUK

Gary Mackintosh BSc
gmcsurveys@gmail.com

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Planning Reference: 2

Date: 2

Job Number: 2

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Soil Conditions: 3

Percolation/Soakaway Testing: 3

Conclusion and Recommendations: 4

Client:

Mr and Mrs Morrison

Site Address:

Boharm Neuk
Boharm
By Craigellachie

Planning Reference:

TBC

Date:

1st March 2023

Job Number:

GMC23-024

Company Information:

Assessment completed by:

Gary Mackintosh Bsc
GMCSurveys
34 Castle Street
Forres
Moray
IV36 1PW
Email: gmcsurveys@gmail.com
Telephone: 07557 431 702

Site Description:

The proposals are to erect a new single dwelling and detached garage within land located at Boharm to the northeast of Craigellachie together with all associated infrastructure.

The SEPA Flood Maps have been consulted which confirm that the development lies out with any areas of fluvial and pluvial flooding during a 1:200year event. There is and area of surface water flooding shown to the southeast, downstream of the site associated with and existing ditch. In order to ensure that the development has no detrimental impact on the surrounding are, it is proposed that any surface water infrastructure is designed to manage flows up to and including a 1:200year event.

GMC Surveys were asked to carry out a site investigation and to provide a drainage solution for the proposals.

Soil Conditions:

Excavations were carried out on 21st February 2023 to assess the existing soils and the suitability for the use of sub surface soakaways as a method of foul and surface water management.

The trial pits were excavated to a depth of 1.6m.

300mm Topsoil overlying reddish/brown, firm to stiff, slightly silty, gravelly clays proved to the depth of the excavations. Some water ingress was noted at the base of the excavations.

The trial hole locations can be found in Appendix A.

There was no evidence of contamination within the trial pits.

The percolation and Infiltration testing within the pits was abandoned due to the water ingress.

Conclusion and Recommendations:

Based on the onsite investigations it can be confirmed that the underlying soils are not suitable for the use of standard stone filled soakaways as a drainage solution for both foul and surface waters.

Foul Water

There is an existing drainage ditch located along the northeast boundary of the proposed site. Ditch flows southeast, culverting the public road and entering the wider network of watercourses within the area.

Based on the above it is proposed that the foul waters are to discharge to the to the existing Drainage ditch as shown within Appendix A.

A Packaged sewage treatment plant will require to be installed, the final make and model are to be confirmed by the chosen supplier.

Prior to discharge SEPA require an additional level of treatment and storage in the form of a filter bed with a minimum base area of 25m².

The soakpit dimensions are therefore to be **5.0m x 5.0m with 1.0m** below the invert of the inlet. The 100mm outlet is to be set 300mm below the invert of the incoming pipe.

Alternative dimensions may be used for the soakpit in order to suit the layout of the site ensuring that the base area of **25m²** is maintained. Due to the presence of the water ingress encountered during the testing, the foul water soakpit is to be wrapped in an impermeable polypropylene membrane or similar approved to prevent water ingress into the foul water system.

It is recommended to install a Graff One2Clean packed sewage treatment plant with a minimum 6PE (4bed) which produces an effluent quality of: B.O.D – 7.0mg/l and Ammonia Nitrogen of 0.5mg/l however the final tank specification is to be determined by the applicant.

Surface Water Dispersal:

It is proposed that the surface water is also to discharge to the existing drainage ditch.

Prior to discharge the surface waters will require to be stored, treated and attenuated to a pre - determined rate in order to ensure the post development runoff does not exceed the pre - development rate.

In line with The Moray Council Flood Risk Management Teams current policy, it is proposed to discharge the surface waters to a rain garden providing a sustainable method of surface water management. The rain garden will have stone filled storage beneath sized to accommodate flows up to and including a 1:200year event with 37% allowance for climate change.

The calculation sheets below indicate a minimum storage of **8.80m³** based on a contributing area of 170m² (proposed house and garage roof area with extra over) with the discharge limited to 0.5l/s.

Allow for a depth of 1.0m maximum of 30% storage within 40mm Stone = 8.80 / 0.3 = **29.40m²**.

I can therefore confirm that there is adequate space available within the site to accommodate the proposed rain garden. The plan view of the rain garden will form an irregular shape ensuring that the depth remains as 1.0m of storage below the invert of the inlet and the overall area is equal to a minimum of 29.40m².

Typical details for the rain garden and the foul water soakpit have been included within Appendix B. Due to the presence of the water ingress encountered during the testing, raingarden structure is to be wrapped in an impermeable polypropylene membrane or similar approved to prevent water ingress into the system.

The design of the drainage features can be found in Appendix C.

SEPA consent will be required prior to installation of the proposed drainage.

References

1. Scottish Planning Policy 7: Planning and Flooding. Scottish Executive, Feb 2004.

2. Planning Advice Note 61: Planning and Sustainable Drainage Systems. Scottish Executive, July 2001.

3. CIRIA C521 Sustainable Urban Drainage Systems, Design Manual for Scotland and Northern Ireland, 2000.

4. CIRIA C697 Sustainable Urban Drainage Systems, Design Manual for Scotland and Northern Ireland 2007.

5. CIRIA C753 – The Suds Manual

6. Building Research Establishment. BRE Digest 365 – Soakaway Design, 1991.

7. CIRIA, Report 156, Infiltration Drainage – Manual of Good Practice, 1996.

8. Sewers for Scotland 3rd Edition

9. Water Assessment and Drainage Assessment Guide (WADAG) January 2016

10. Suds for Roads

MasterDrain SW

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Job No.	Sheet no.	Date
GMC23-024	1	01/03/23

Project: Boharm Neuk, Boharm, Craigellachie

Title: Surface Water Storage Requirements

By	Checked	Approved
GM		

Data:-

Location = CRAIGELLACHIE
M5-60 (mm) = 15.8
Soil index = 0.30
Return period = 200
UCWI = 0.0

Grid reference = NJ2844
r = 0.25
SAAR (mm/yr) = 800
WRAP = 2
Climate change = +37%

i) Very permeable soils with shallow ground water;
ii) Permeable soils over rock or fragipan, commonly on slopes in western Britain associated with smaller areas of less permeable wet soils; The layer is low in organic matter, mottled and (fragipan - a natural subsurface horizon having a higher bulk density than the solum above. Seemingly cemented when dry but showing moderate to weak brittleness when moist. Slowly or very slowly permeable to water. It is found in profiles of either cultivated or virgin soils but not in calcareous material).
iii) Moderately permeable soils, some with slowly permeable subsoils.

Percentage runoff = 95.0% (manual setting)

Imperv. area = 170 m²
Total area = 170 m²
Total runoff = 17.1 m³

Pervious area = 0 m²
Equiv area = 162 m² (Tot. area x % runoff).
Discharge rate = 0.500 l/s

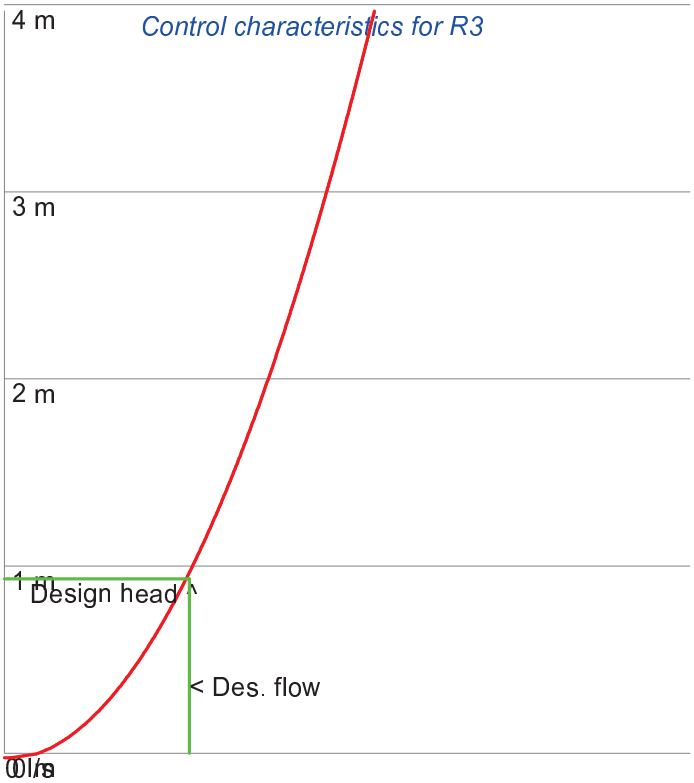
Design Head = 1.0m
Control device = R3
Max. calc. depth = 0.99 m

Peak flow = 0.50 l/s
Orifice diam = 19.8 mm
Available depth = 0.0 m³

Pipeline storage = 0.0 m³
Offline storage = 0.0 m³
Total storage = 8.8 m³

Available MH storage = 0.0 m³

Peak input flow =1.86 l/s



Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
0.01	0.02	2.01	0.71
0.05	0.11	2.05	0.72
0.10	0.16	2.10	0.72
0.15	0.19	2.15	0.73
0.20	0.22	2.20	0.74
0.25	0.25	2.25	0.75
0.30	0.27	2.30	0.76
0.35	0.30	2.35	0.77
0.40	0.32	2.40	0.77
0.45	0.34	2.45	0.78
0.50	0.35	2.50	0.79
0.55	0.37	2.55	0.80
0.60	0.39	2.60	0.81
0.65	0.40	2.65	0.81
0.70	0.42	2.70	0.82
0.75	0.43	2.75	0.83
0.80	0.45	2.80	0.84
0.85	0.46	2.85	0.84
0.90	0.47	2.90	0.85
0.95	0.49	2.95	0.86
1.00	0.50	3.00	0.87
1.05	0.51	3.05	0.87
1.10	0.52	3.10	0.88
1.15	0.54	3.15	0.89
1.20	0.55	3.20	0.89
1.25	0.56	3.25	0.90
1.30	0.57	3.30	0.91
1.35	0.58	3.35	0.92
1.40	0.59	3.40	0.92
1.45	0.60	3.45	0.93
1.50	0.61	3.50	0.94
1.55	0.62	3.55	0.94
1.60	0.63	3.60	0.95
1.65	0.64	3.65	0.96
1.70	0.65	3.70	0.96
1.75	0.66	3.75	0.97
1.80	0.67	3.80	0.97
1.85	0.68	3.85	0.98
1.90	0.69	3.90	0.99
1.95	0.70	3.95	0.99
2.00	0.71	4.00	1.00

MasterDrain SW

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Job No.	GMC23-024
Sheet no.	2
Date	01/03/23
Project	Boharm Neuk, Boharm, Craigellachie
Title	Surface Water Storage Requirements
By	GM
Checked	
Approved	

Storage curves for a 10 hours storm.

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Job No. GMC23-024			
Sheet no. 3			
Date 01/03/23			
Project Boharm Neuk, Boharm, Craigellachie	By GM	Checked	Approved
Title Surface Water Storage Requirements			

Incremental rainfall figures.

Storm Mins	Storage Depth mm	Control Flow l/s	Storm Mins	Storage Depth mm	Control Flow l/s
6.0	6.2	0.02	306.0	695.1	0.42
12.0	11.8	0.02	312.0	747.6	0.43
18.0	17.5	0.02	318.0	793.6	0.44
24.0	23.3	0.05	324.0	833.6	0.46
30.0	27.8	0.05	330.0	868.1	0.46
36.0	32.4	0.09	336.0	897.6	0.47
42.0	35.7	0.09	342.0	922.6	0.48
48.0	39.1	0.09	348.0	943.3	0.48
54.0	42.6	0.10	354.0	959.9	0.49
60.0	45.6	0.10	360.0	972.9	0.49
66.0	48.7	0.10	366.0	982.3	0.49
72.0	52.0	0.11	372.0	988.4	0.49
78.0	54.8	0.11	378.0	992.0	0.50
84.0	57.8	0.11	384.0	993.0	0.50
90.0	61.0	0.12	390.0	991.8	0.50
96.0	64.1	0.12	396.0	989.1	0.49
102.0	67.2	0.12	402.0	985.2	0.49
108.0	70.6	0.13	408.0	980.0	0.49
114.0	73.7	0.13	414.0	973.8	0.49
120.0	77.0	0.13	420.0	966.8	0.49
126.0	80.5	0.14	426.0	959.2	0.49
132.0	84.0	0.14	432.0	951.1	0.49
138.0	87.8	0.14	438.0	942.4	0.48
144.0	91.9	0.15	444.0	933.4	0.48
150.0	95.8	0.15	450.0	924.2	0.48
156.0	100.2	0.16	456.0	914.6	0.48
162.0	104.5	0.16	462.0	905.0	0.47
168.0	109.3	0.16	468.0	895.1	0.47
174.0	114.7	0.17	474.0	885.1	0.47
180.0	120.3	0.17	480.0	874.8	0.47
186.0	126.4	0.17	486.0	864.5	0.46
192.0	133.3	0.18	492.0	854.1	0.46
198.0	141.1	0.19	498.0	843.5	0.46
204.0	149.7	0.19	504.0	832.9	0.46
210.0	159.7	0.19	510.0	822.5	0.45
216.0	171.0	0.21	516.0	811.7	0.45
222.0	183.9	0.21	522.0	800.8	0.45
228.0	199.0	0.22	528.0	789.9	0.44
234.0	216.5	0.23	534.0	779.2	0.44
240.0	236.6	0.24	540.0	768.4	0.44
246.0	259.8	0.25	546.0	757.8	0.43
252.0	286.0	0.26	552.0	747.1	0.43
258.0	315.5	0.28	558.0	736.4	0.43
264.0	348.3	0.29	564.0	725.8	0.42
270.0	384.9	0.31	570.0	715.2	0.42
276.0	425.4	0.32	576.0	704.5	0.42
282.0	470.4	0.34	582.0	694.0	0.42
288.0	520.0	0.36	588.0	683.4	0.41
294.0	574.8	0.38	594.0	673.0	0.41
300.0	635.4	0.40	600.0	662.4	0.41

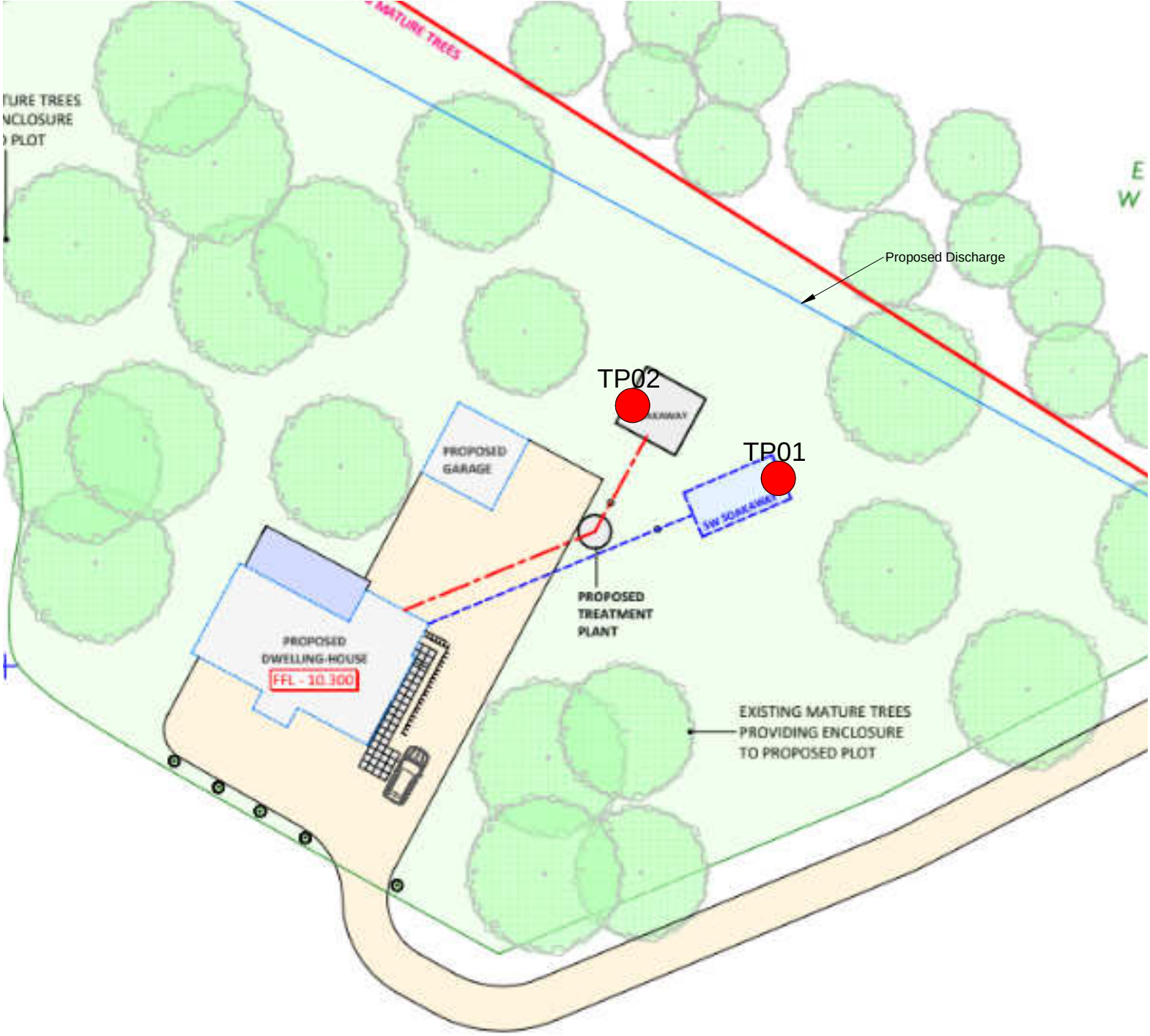
Using the Get Max button causes the program to step through a series of storm durations until a maximum volume is obtained.
Each duration is sampled 600 times and the results recorded. The storm durations (hrs) are:-

0.25, 0.5, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 18, 20, 24, 30, 36, 42, 48, 54, 60, 66, 72, 84, 96, 120, 150, 175, 200, 250, 300, 375, 500, 750, 1000, 1250, 1500, 1570, 2000, 2500, 3000, 3500, 4000

It should be noted that the six hour storm frequently requested rarely demonstrates the worst case for storage.

APPENDIX A

Site Layout/Test Hole Locations



REV:	DESCRIPTION:	BY:	DATE:

STATUS: ISSUE

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CLIENT: Mr and Mrs Morrison

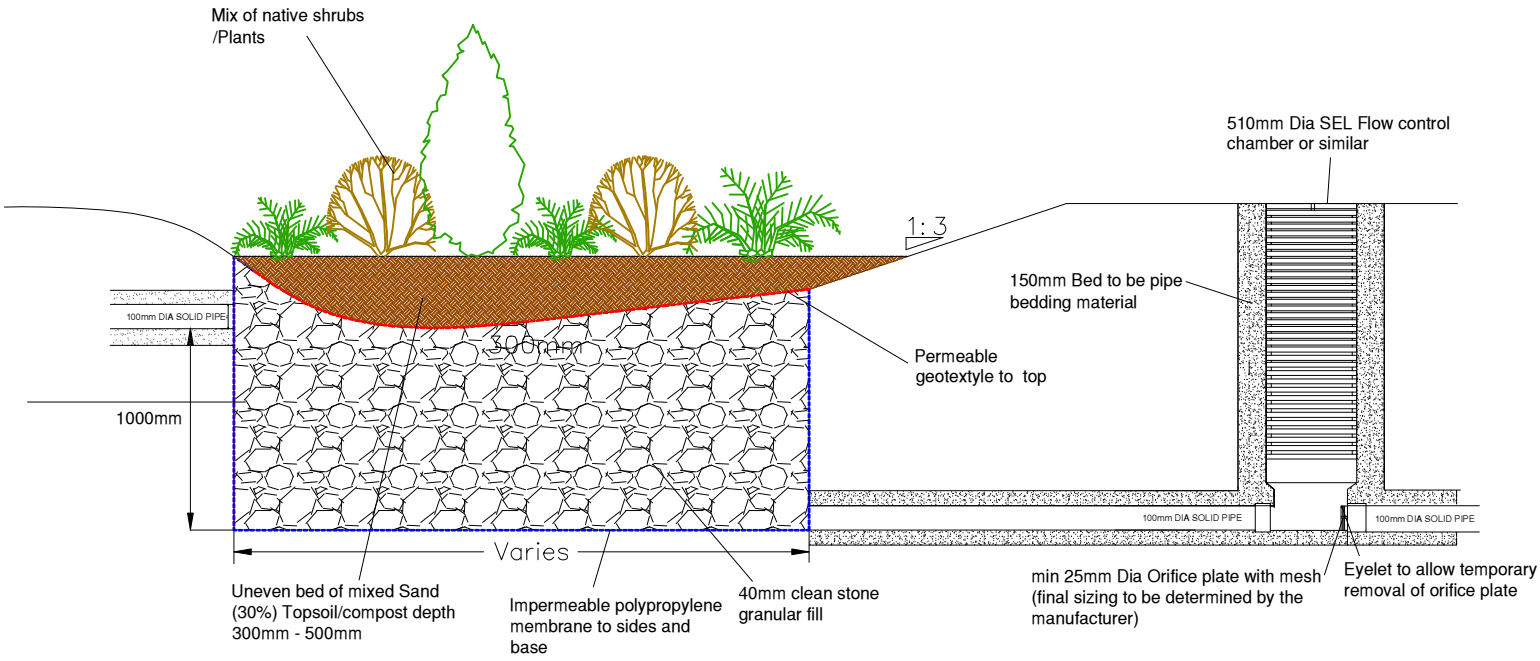
SITE: Boharm Neuk
Boharm, Craigellachie

TITLE: Test Hole Location

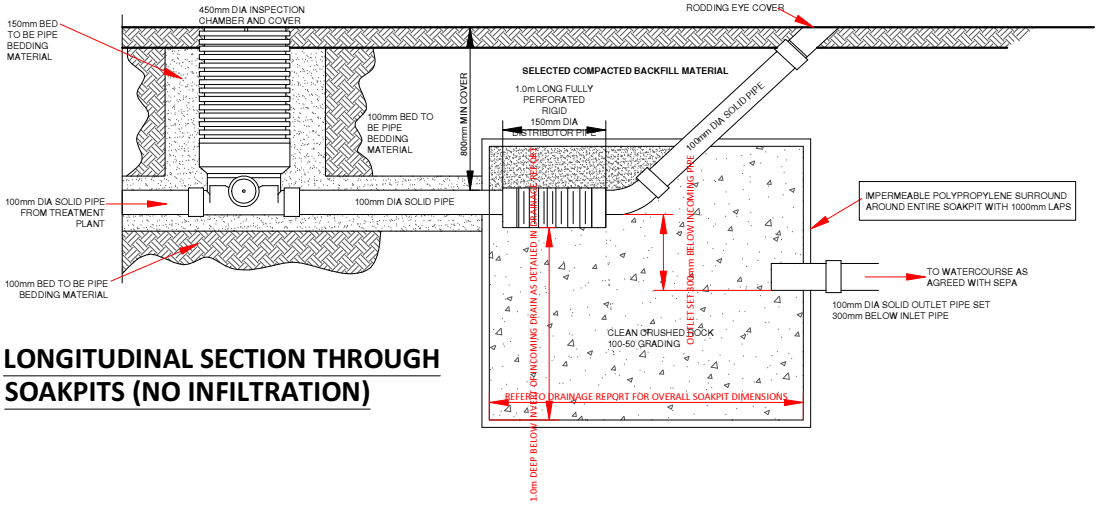
SCALE AT A4:	DATE:	DRAWN:	CHECKED:
NTS	MAR23	GM	
PROJECT NO:	DRAWING NO:		REVISION:
GMC23-024	Appendix A		-

APPENDIX B

Drainage Details



LONGITUDINAL SECTION THROUGH PROPOSED RAINGARDEN



LONGITUDINAL SECTION THROUGH SOAKPITS (NO INFILTRATION)

REV:	DESCRIPTION:	BY:	DATE:

STATUS: ISSUE

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CLIENT: Mr and Mrs Morrison

SITE: Boharm Neuk
Boharm, Craigellachie

TITLE: Foul and Surface Water Drainage Details

SCALE AT A4:	DATE:	DRAWN:	CHECKED:
NTS	MAR23	GM	

PROJECT NO:	DRAWING NO:	REVISION:
GMC23-024	Appendix B	

EST 1987

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Arboricultural Report

Proposed Site : Boharm Neuk, Boharm, Craigellachie

Contents

1. Introduction
2. Survey Methodology
3. Site Overview
4. Potential Constraints
5. Summary of Findings & Conclusion
6. Arboricultural Impact Assessment
7. Arboricultural Method Statement
8. References
9. Photographs
10. Appendices

Appendix One: Tree Survey Data
Appendix Two: Survey Headings
Appendix Three: Tree Survey Recommendations
Appendix Four: Tree Constraints Plan
Appendix Five: Tree Protection Plan

1.0 Introduction

1.1 The following pre-development tree survey has been carried out by Wakeley Tree Surgeons Ltd. to assess and identify the impact a proposed development may have on trees within and adjacent to a proposed plot at Boharm.

1.2 The survey has been carried out by Jonathan Boocock (PTI) of Wakeley Tree Surgeons, in accordance with British Standards 'Trees in relation to design, demolition and construction – Recommendations (BS5837:2012).

1.3 All trees have been inspected using Ground Visual Inspection techniques. No climbing inspections or below ground investigations have been undertaken. Should a more detailed inspection be deemed appropriate, this will be advised in recommendations. Trees are dynamic living organisms, whose health and condition can be subject to rapid change, depending upon internal and external factors. The conclusions and recommendations contained within this report relate to the trees only at the time of inspection and do not constitute a tree risk assessment report.

1.4 Inspection was undertaken on the 15th February 2023. The weather conditions at the time of inspection were a damp 6 degrees centigrade, clearing throughout the day.

1.5 The objective of this survey was to identify and gather information pertaining to the location of trees and hedgerows on the site and how they may be impacted by construction and development of the site. The survey will detail any constraints to the proposed development. An arboricultural impact assessment addresses the likely impact of the proposed development on trees within and adjacent to the site. Recommendations are made for tree works considered necessary for health and safety reasons or to facilitate the protection of trees during construction work in accordance with BS 3998:2010 Recommendation for tree works, and an arboricultural method statement is included to provide guidance in relation to tree protection during construction. If landscape planting recommendations are required, please do not hesitate to contact Wakeley Tree Surgeons Ltd. for further advice.

2.0 Survey Methodology

2.1 Unless otherwise stated tree inspections have been undertaken from ground level using non-invasive techniques only.

2.2 All trees, groups of trees and hedgerows surveyed have been given a number prefixed by a letter, T, G, H respectively and were assessed using the 'Cascade chart for tree quality assessment' as described in Table 1 of the BS 5837:2012. Where accessible and it was deemed necessary trees were physically tagged with an individual numbered identification tag. The locations of trees, groups of trees and hedgerows on and adjacent to the site are shown on the Tree Constraints Plan (TCP Appendix 4).

2.3 In accordance with BS 5837:2012 only trees with a stem diameter of 75mm or greater were surveyed and for these trees tree species, height, stem diameter and crown spread were recorded. Trees forming obvious groups were assessed as such.

2.4 The findings of the survey are given in tabular form in Appendix 1. A full explanation of survey headings is given in Appendix 2.

2.5 No information was provided or shared about the sites soil structure and no onsite assessment has taken place as part of this survey. BS 5837:2012 states that a soil assessment should be carried out by a competent person to establish the structure and clay content to assess its shrinkability, the pH and composition. A soil survey of this nature is considered outside the scope of this arboricultural assessment however British Geological Society Viewer has been used to gather some of this information.

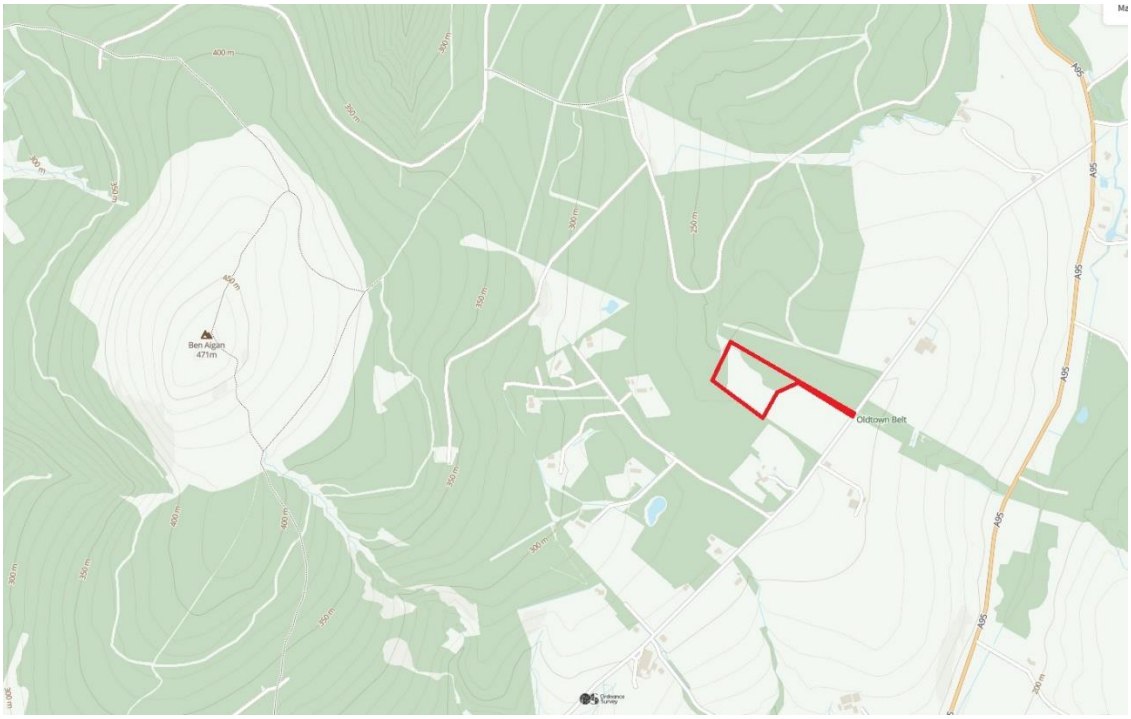
2.6 An arboricultural method statement is included to provide guidance in relation to tree protection during construction, however for soil structure in relation to construction advice should be sought from a Structural Engineer.

3.0 Site Overview

3.1 Location

Map 1

Map 2



3.1.1 The sites access is located just under a mile south from the A95 in Boharm. The proposed access will make use of an old field entrance currently serviced by an overgrown and unusable metal gate.

3.1.2 The field in which the plot is situated is surrounded by stock fencing on wooden posts. The proposed plot was not individually fenced or marked out at the time of this survey.

3.2 Topography

3.2.1 An accurate topographical survey of the site was not provided. During the survey tree locations were plotted using GPS or measured in relation to site boundaries and other known features and triangulated. The Tree Constraints Plan provides a good representation of tree location in relation to the site and proposed development however this information should be layered on to the accurate topographical survey whenever possible.

3.2.2 The site is reasonably level, dropping away towards the west. There are drainage channels throughout the trees on site and a running ditch alongside the proposed driveway.

3.3 Geology and Soils

3.3.1 British Geological society viewer indicates that the site consists of Findlater Flag Formation with and area of alluvium and river terrace deposits, of gravel, sand, silt and clay.

3.4 Climate

3.4.1 The climate of the locality is typical of much of the Highland region in having average summer temperatures for its relative UK latitude, combined with low rainfall totals and long daylight hours. The northerly latitude of the site has a direct bearing on winter conditions, with on average 15 days of the month having air frost from 1st December – 28th February. Winds are a prevailing westerly, but a desiccating north-north easterly wind can be a feature of the winter period.

4.0 Potential Constraints

4.1 Legal Constraints

4.1.1 Investigation with the Local Planning Authority has revealed that there are no Tree Preservation Orders (TPO) enforced upon the site, and the site is not within a designated Conservation Area. Permission should be sought from the relevant landowner.

4.1.2 As the site extent is less than 5ha, an Environmental Impact Assessment (EIA) is not required as defined by the forestry operations threshold (EU Directive 337 (1985).

4.1.3 Investigation with Historic Scotland has revealed that there are no Scheduled Monuments present within the site boundary.

4.2 Ecological Constraints

4.2.1 There were no direct sightings or evidence of protected species during the site visit, however the trees assessed constitute a limited but wholly integrated part of a much larger tree network. It is likely that species such as Red Squirrels may utilise the trees to varying degrees, although there is no evidence of permanent residence.

4.2.2 It should also be taken into consideration that nesting birds are protected by law (Section 1, Wildlife and Countryside Act (1981)), and reasonable measures should be taken to minimise disturbance and physical impacts. There were no signs of nesting birds at the time of the survey.

5.0 Summary of Findings and Conclusion

5.1 A total of 35 trees or groups have been surveyed. A breakdown of the number of trees in each retention category is shown in the Table 1 below;

Table One: Breakdown of Tree Categorisation

	Category A	Category B	Category C	Category U
Trees	0	24	6	1
Groups	0	4	0	0
Hedgerows	0	0	0	0

5.2 Category A trees are high quality trees with an estimated remaining life expectancy of at least 40 years and there would be a general presumption for retention of these trees.

5.3 Category B trees are trees of moderate quality with an estimated remaining life expectancy of at least 20 years

5.4 Category C trees are of low quality with an expected remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.

5.5 Category U trees are those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than ten years.

6.0 Arboricultural Impact Assessment

6.1 Based on the proposed site layout, from drawings provided, the arboricultural impact of the proposed development was assessed as follows:

6.1.1 The proposed dwellings will have limited impact to trees within the site. The footprint has intentionally been placed between the existing trees taking into account RPA's with the intention to retain all the trees.

6.1.2 Proposed plans indicate that a layby is to be positioned on the roadside at the start of the access driveway. Currently the access gateway is overgrown with a young willow tree (T27), this will need to be removed.

6.1.3 Removal of T31, T30, T29,T28 will be required to facilitate the required visibility splay. These are poor examples of tree due to repeat maintenance by flailing, in order to prevent them from growing across the highway.

6.1.4 There are multiple windblown trees within Group 4, some of which protrude onto the highway verge to the north of the proposed access track. It will be required that these fallen trees are taken back beyond the woodland fencing in order to not obstruct the view within the required visibility splay.

6.1.5 There is a drainage ditch running between the proposed driveway and G4. Due to the depth of this ditch and resultant distance between the trees and the driveway any required ground works will not impact these trees.

6.2 Replanting; No indication of how the site is to be landscaped has been discussed. Potentially removal of trees and scrub will be required to facilitate this build and as such replacement landscape planting should take account of any habitats lost onsite. The new planting scheme should include an assemblage of native species of local provenance, resulting in an uplift in the quality of trees onsite.

6.3 Tree Constraints Plan

Refer to the tree constraints Plan (TCP) for the location of trees and hedgerows on site (Appendix 3). The TCP has been produced as the basis for the assessment of the constraints imposed by existing trees on the proposed design.

6.4 Tree Protection Plan

The tree Protection plan (TPP: Appendix 4) shows the indicative position of the Root Protection Area (RPA) for the trees and hedgerows with a retention priority. **The RPA (as described in BS5837:2012 sec. 3.7) represents the minimum area around a tree in which the ground should remain undisturbed** and is shown as a yellow line on the TPP. Refer to Tree Survey Data: appendix 1 for accurate RPA radiuses).

7.0 Arboricultural Method Statement

The Arboricultural Method Statement provides information about how to protect trees and their root systems during the construction process. The steps described below should be used as reference by the main contractor in order to prepare a site specific method statement for the construction works. The method statement is to be used in conjunction with the TPP which details the extent of root protection areas.

7.1 Pre-Construction

The Developer will appoint an arboriculturalist to oversee tree protection measures for the duration of the project. The arboriculturalist should make regular visits to ensure continued compliance and deal with project specific issues as they arise.

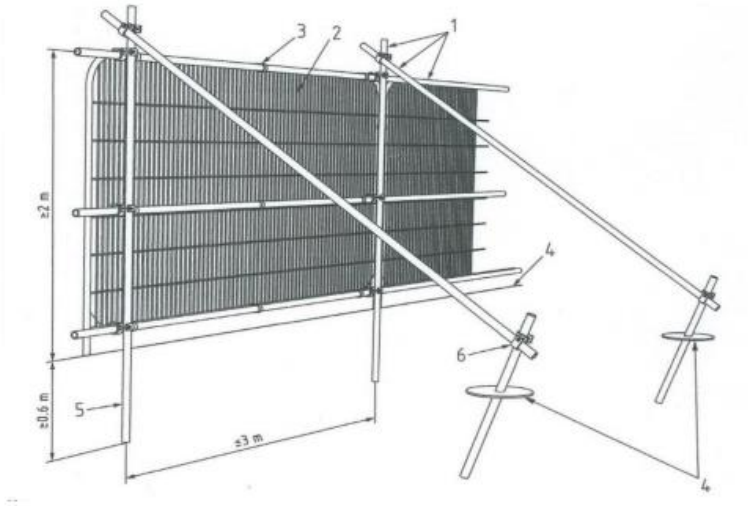
7.2 Tree Works

The developer will appoint qualified arborists to complete pruning and felling works as specified in the tree survey recommendations (Appendix 3). All works must be carried out must conform to BS3998:2010 Tree Work. Recommendations. Any damage caused to a tree during the construction phase should be reported immediately to the site manager so that inspection and/or remedial works can be undertaken.

7.3 Protective Fencing

On completion of tree works, protective fencing should be erected where required, as specified in the Tree Protection Plan, in accordance with BS 5837:2012 . Fencing is intended as a precautionary measure to prevent accidental damage to the rooting area of retained trees. This protective fencing must stay in place for the duration of construction works and remain intact and undamaged.

Figure 1: : Illustration of Default Specification Vertical Barrier (reproduced from BS5837:2012)



Key
1 Standard scaffold poles
2 Heavy gauge 2m tall, galvanised tube & welded mesh infill panels
3 Panels secured to uprights & cross members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6m)
6 Standard scaffold clamps

7.4 Ground Protection

Where construction working space or temporary construction access is justified within the RPA, this should be facilitated by a temporary set-back in the alignment of the tree protection barrier. Temporary ground

protection within the RPA must be capable of supporting any load without affecting or compacting the underlying soil. These operations must only take place after consultation, and with the supervision of the project arboriculturalist.

7.5 Post Construction

On completion of construction works, it is recommended that retained trees are re-inspected by an arborist in order to identify any additional remedial works required to ensure tree health and site safety.

8.0 References

http://www.rhs.org.uk

http://www.subsidencebureau.com

http://www.historic-scotland.gov.uk/

http://moray.gov.uk/

http://metoffice.gov.uk/

BS 5837:2012 Trees in relation to design, demolition and construction – recommendations.

BS 3998:2010 Tree work – recommendations.

British Geological Society Viewer

NatureScot SiteLink

9.0 Photographs

Photo 1: Roadside Rowans needing removed to facilitate visibility splay

Photo 2: T19 Silver Birch tree with Birch polypore fruiting body

Photo 3: T4 Scots pine; typical example of the pine trees within this site

Photo 4: G2 Young woodland at the northwest of the plot consisting mostly of planted Alder

10.0 Appendices

Appendix One: Tree Survey Data

Appendix Two: Survey Headings

Appendix Three: Tree Survey Recommendations

Appendix Four: Tree Constraints Plan

Appendix Five: Tree Protection Plan

Appendix One: Tree Survey Data

Ref.	Species	Structure	Measurements	General Observations	Retention Category	Spread	RPA
G1	Scots Pine x42 *(Pinus sylvestris)*	Group	Height (m): 12 42 stems, avg.(mm): 400 Spread (m): 7N, 7E, 7S, 7W	Group of 42 Mature Scots Pine trees, between 10 and 15m tall, with an average DBH of around 400mm. 2 standing dead trees within the group area.	B2	N:7 E:7 S:7 W:7	Area: 3700 sq m, plus a 1m buffer.
G2	Spruce *(Picea sp.)* Alder *(Alnus sp.)* Scots Pine *(Pinus sylvestris)*	Group	Height (m): 7 3 stems, avg.(mm): 100 Spread (m): 5N, 5E, 5S, 5W	Fenced area of younger planting. Mostly Alder planted with several self set spruce coming through There is a small group of mature Scots pine within the fenced area	B2	N:5 E:5 S:5 W:5	Area: 5614 sq m, plus a 1m buffer.
G3	Sitka Spruce *(Picea sitchensis)*	Group	Height (m): 20 Stem Diam (mm): 350 Spread (m): 5N, 5E, 5S, 5W	Sitka Spruce Plantation with 3x Rowan along fence line	B2	N:5 E:5 S:5 W:5	Area: 4696 sq m, plus a 1m buffer.

G4	Sitka Spruce *(Picea sitchensis)* European Larch *(Larix decidua)* Norway Spruce *(Picea abies)*	Group	Height (m): 20 3 stems, avg.(mm): 400 Spread (m): 6N, 6E, 6S, 6W Life Stage: Semi Mature Rem. Contrib.: 20+ Years	Plantation with areas of different species planting; Sitka, Norway Spruce and Larch	B2	N:6 E:6 S:6 W:6	Area: 50053 sq m, plus a 1m buffer.
T001	Silver Birch *(Betula pendula)*	Tree	Height (m): 6 Stem Diam (mm): 180 Spread (m): 3N, 3E, 3S, 3W Life Stage: Early Mature Rem. Contrib.: 30+ Years	Main union 2m	B2	N:3 E:3 S:3 W:3	Radius: 2.2m. Area: 15 sq m.
T002	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 10 Stem Diam (mm): 500 Spread (m): 5N, 5E, 5S, 4W Life Stage: Mature Rem. Contrib.: 30+ Years	Historic pruning stubs up trunk to 2m	B2	N:5 E:5 S:5 W:4	Radius: 6.0m. Area: 113 sq m.
T003	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 11 Stem Diam (mm): 450 Spread (m): 4N, 5E, 4S, 4W Life Stage: Mature Rem. Contrib.: 30+ Years	Concrete rubble within root plate	B2	N:4 E:5 S:4 W:4	Radius: 5.4m. Area: 92 sq m.

T004	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 10 Stem Diam (mm): 450 Spread (m): 2N, 3E, 3S, 6W Life Stage: Mature Rem. Contrib.: 30+ Years		B2	N:2 E:3 S:3 W:6	Radius: 5.4m. Area: 92 sq m.
T005	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 12 2 stems, avg.(mm): 350 Spread (m): 5N, 6E, 3S, 2W Life Stage: Mature Rem. Contrib.: 30+ Years	Bifocates at 1m above ground	B2	N:5 E:6 S:3 W:2	Radius: 5.9m. Area: 109 sq m.
T006	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 11 Stem Diam (mm): 450 Spread (m): 4N, 4E, 2S, 4W Life Stage: Mature Rem. Contrib.: 30+ Years	Hanging branch at 4m	B2	N:4 E:4 S:2 W:4	Radius: 5.4m. Area: 92 sq m.
T007	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 12 2 stems, avg.(mm): 400 Spread (m): 6N, 4E, 5S, 5W Life Stage: Mature Rem. Contrib.: 20+ Years	Forks near ground level	B2	N:6 E:4 S:5 W:5	Radius: 6.8m. Area: 145 sq m.
T008	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 11 Stem Diam (mm): 500 Spread (m): 7N, 6E, 5S, 5W Life Stage: Mature Rem. Contrib.: 30+ Years	Lowest branch below 1m	B2	N:7 E:6 S:5 W:5	Radius: 6.0m. Area: 113 sq m.

T009	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 10 Stem Diam (mm): 450 Spread (m): 5N, 5E, 6S, 6W Life Stage: Mature Rem. Contrib.: 30+ Years	Pruning stub to north at 2m	B2	N:5 E:5 S:6 W:6	Radius: 5.4m. Area: 92 sq m.
T010	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 8 Stem Diam (mm): 450 Spread (m): 7N, 5E, 4S, 6W Life Stage: Mature Rem. Contrib.: 30+ Years	Low branch to north at 1m	B2	N:7 E:5 S:4 W:6	Radius: 5.4m. Area: 92 sq m.
T011	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 10 Stem Diam (mm): 400 Spread (m): 5N, 5E, 5S, 5W Life Stage: Mature Rem. Contrib.: 30+ Years		B2	N:5 E:5 S:5 W:5	Radius: 4.8m. Area: 72 sq m.
T012	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 8 Stem Diam (mm): 500 Spread (m): 5N, 5E, 5S, 5W Life Stage: Mature Rem. Contrib.: 30+ Years	Multistemmed from 1m	B2	N:5 E:5 S:5 W:5	Radius: 6.0m. Area: 113 sq m.
T013	Silver Birch *(Betula pendula)*	Tree	Height (m): 6 Stem Diam (mm): 350 Spread (m): 5N, 5E, 5S, 5W Life Stage: Early Mature Rem. Contrib.: 30+ Years	Lean to north west	B2	N:5 E:5 S:5 W:5	Radius: 4.2m. Area: 55 sq m.

T014	Silver Birch *(Betula pendula)*	Tree	Height (m): 12 2 stems, avg.(mm): 450 Spread (m): 6N, 6E, 6S, 6W Life Stage: Mature Rem. Contrib.: 30+ Years	Forks at ground level	B2	N:6 E:6 S:6 W:6	Radius: 7.6m. Area: 181 sq m.
T015	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 10 Stem Diam (mm): 500 Spread (m): 8N, 8E, 8S, 8W Life Stage: Mature Rem. Contrib.: 30+ Years	Forks at ground	B2	N:8 E:8 S:8 W:8	Radius: 6.0m. Area: 113 sq m.
T016	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 12 Stem Diam (mm): 550 Spread (m): 8N, 5E, 5S, 5W Life Stage: Mature Rem. Contrib.: 30+ Years	Cavity at base with visible frass in bottom	C2	N:8 E:5 S:5 W:5	Radius: 6.6m. Area: 137 sq m.
T017	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 12 Stem Diam (mm): 500 Spread (m): 5N, 5E, 5S, 5W Life Stage: Mature Rem. Contrib.: 30+ Years		B2	N:5 E:5 S:5 W:5	Radius: 6.0m. Area: 113 sq m.
T018	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 10 Stem Diam (mm): 400 Spread (m): 5N, 5E, 5S, 5W Life Stage: Mature Rem. Contrib.: 20+ Years	Low branch at 1m to north	B2	N:5 E:5 S:5 W:5	Radius: 4.8m. Area: 72 sq m.

T019	Silver Birch *(Betula pendula)*	Tree	Height (m): 9 2 stems, avg.(mm): 250 Spread (m): 4N, 5E, 4S, 5W Life Stage: Mature Rem. Contrib.: <10 years	Polypore at 50cm	U	N:4 E:5 S:4 W:5	None - due to Retention Category of U.
T020	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 12 Stem Diam (mm): 450 Spread (m): 5N, 5E, 5S, 5W	Small suppressed secondary upright to north	B2	N:5 E:5 S:5 W:5	Radius: 5.4m. Area: 92 sq m.
T021	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 8 Stem Diam (mm): 400 Spread (m): 4N, 4E, 4S, 4W Life Stage: Mature Rem. Contrib.: 30+ Years	Low branch to north	B2	N:4 E:4 S:4 W:4	Radius: 4.8m. Area: 72 sq m.
T022	Silver Birch *(Betula pendula)*	Tree	Height (m): 9 Stem Diam (mm): 300 Spread (m): 4N, 4E, 4S, 4W	S shaped trunk in bottom 2m	B2	N:4 E:4 S:4 W:4	Radius: 3.6m. Area: 41 sq m.
T023	Silver Birch *(Betula pendula)*	Coppiced	Height (m): 8 Stem Diam (mm): 200 Spread (m): 5N, 5E, 5S, 5W		B2	N:5 E:5 S:5 W:5	Radius: 2.4m. Area: 18 sq m.
T024	Silver Birch *(Betula pendula)*	Tree	Height (m): 8 Stem Diam (mm): 200 Spread (m): 2N, 1E, 3S, 3W		B2	N:2 E:1 S:3 W:3	Radius: 2.4m. Area: 18 sq m.

T025	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 10 Stem Diam (mm): 400 Spread (m): 5N, 5E, 1S, 5W Life Stage: Mature Rem. Contrib.: 30+ Years		B2	N:5 E:5 S:1 W:5	Radius: 4.8m. Area: 72 sq m.
T026	Scots Pine *(Pinus sylvestris)*	Tree	Height (m): 10 Stem Diam (mm): 400 Spread (m): 1N, 5E, 5S, 5W Life Stage: Mature Rem. Contrib.: 30+ Years		B2	N:1 E:5 S:5 W:5	Radius: 4.8m. Area: 72 sq m.
T027	Goat Willow *(Salix caprea)*	Tree	Height (m): 5 4 stems, avg.(mm): 150 Spread (m): 4N, 4E, 2S, 4W Life Stage: Young Rem. Contrib.: 10+ Years	Previously flailed on roadside Rooted in ditch side bank	C2	N:4 E:4 S:2 W:4	Radius: 3.6m. Area: 41 sq m.
T028	Rowan *(Sorbus aucuparia)*	Tree	Height (m): 7 Stem Diam (mm): 100 Spread (m): 3N, 3E, 3S, 1W Life Stage: Semi Mature Rem. Contrib.: 10+ Years	Previously flailed on roadside Rooted in ditch side bank	C2	N:3 E:3 S:3 W:1	Radius: 1.2m. Area: 5 sq m.
T029	Rowan *(Sorbus aucuparia)*	Tree	Height (m): 7 Stem Diam (mm): 100 Spread (m): 3N, 3E, 3S, 1W Life Stage: Semi Mature Rem. Contrib.: 10+ Years	Previously flailed on roadside Rooted in ditch side bank	C2	N:3 E:3 S:3 W:1	Radius: 1.2m. Area: 5 sq m.
T030	Rowan *(Sorbus aucuparia)*	Tree	Height (m): 7 Stem Diam (mm): 100 Spread (m): 2N, 3E, 2S, 1W	Previously flailed on roadside Rooted in ditch side bank	C2	N:2 E:3 S:2 W:1	Radius: 1.2m. Area: 5 sq m.

T031	Rowan *(Sorbus aucuparia)*	Tree	Height (m): 6 Stem Diam (mm): 100 Spread (m): 2N, 2E, 2S, 1W	Previously flailed on roadside Rooted in ditch side bank	C2	N:2 E:2 S:2 W:1	Radius: 1.2m. Area: 5 sq m.

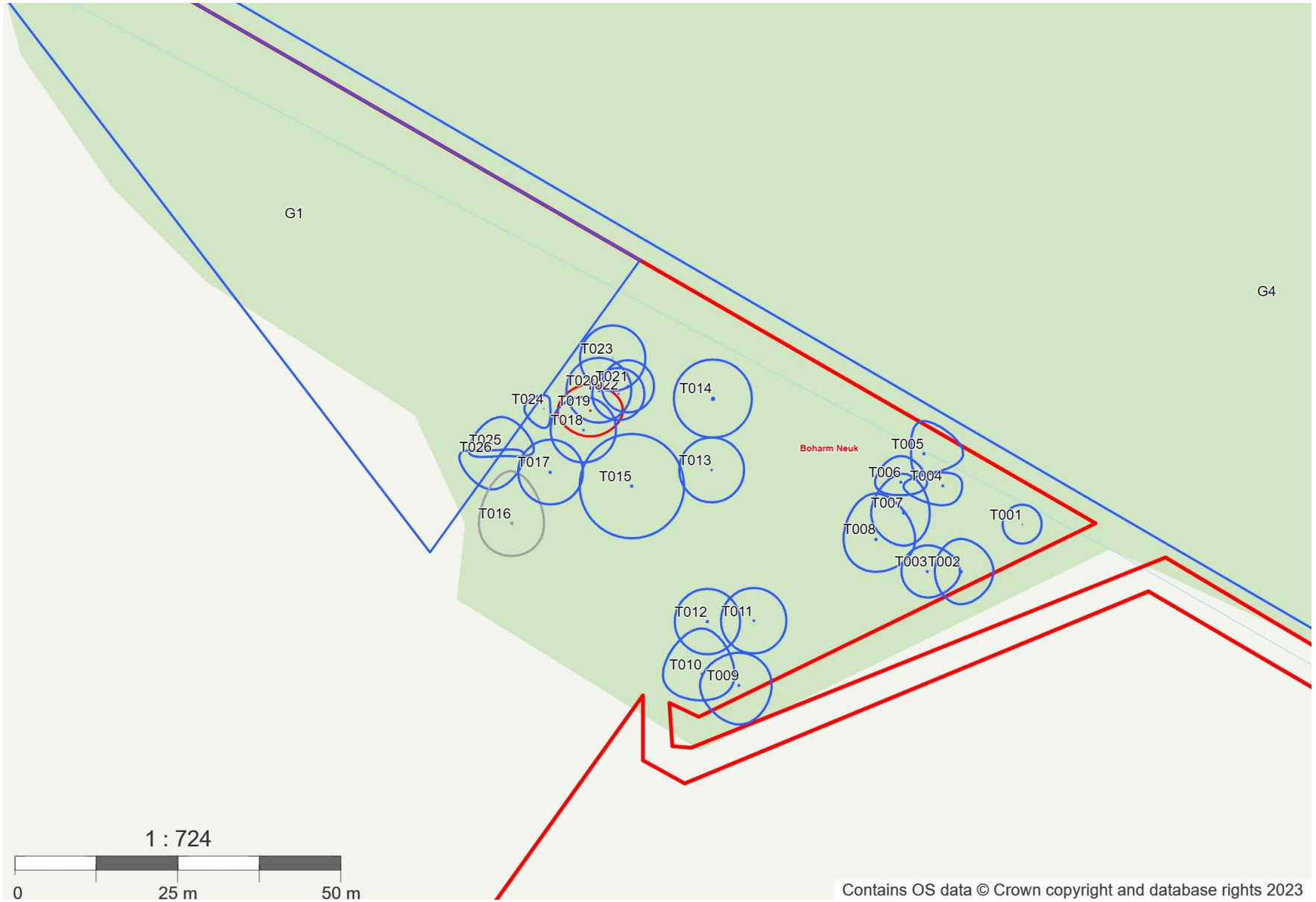
Appendix Two: Key to Tree Survey Schedule Criteria and Headings

Ref.	This number identifies the trees, and corresponds with the provided plans
Species	The Common and Scientific name is given for each tree
Structure	Identifies if it is a tree, group of trees, or hedge
Measurements	Gives details of the trees Height in meters, number of stems, crown spread, life stage and remaining contribution
General Observations	Gives specific identifying features about the tree
Retention Category	Retention Category in relation to BS5837:2012 ref. Table1
Spread	Distance of crown spread in meters across the cardinal points
RPA Radius	Minimum distance Tree Protection Barriers should be placed from the trunk of trees that are to be retained
RPA	Minimum area below a tree, or group of trees Tree Protection Barriers should enclose

Appendix Three: Tree Survey Recommendations

Ref.	Species	Measurements	Recommendation
G4	Sitka Spruce *(Picea sitchensis)* European Larch *(Larix decidua)* Norway Spruce *(Picea abies)*	Height (m): 20 3 stems, avg.(mm): 400 Spread (m): 6N, 6E, 6S, 6W Life Stage: Semi Mature Rem. Contrib.: 20+ Years	Remove protruding fallen tree tops from roadside verge to facilitate visibility splay
T027	Goat Willow *(Salix caprea)*	Height (m): 5 4 stems, avg.(mm): 150 Spread (m): 4N, 4E, 2S, 4W Life Stage: Young Rem. Contrib.: 10+ Years	Remove tree to facilitate visibility splay
T028	Rowan *(Sorbus aucuparia)*	Height (m): 7 Stem Diam (mm): 100 Spread (m): 3N, 3E, 3S, 1W Life Stage: Semi Mature Rem. Contrib.: 10+ Years	Remove tree to facilitate visibility splay
T029	Rowan *(Sorbus aucuparia)*	Height (m): 7 Stem Diam (mm): 100 Spread (m): 3N, 3E, 3S, 1W Life Stage: Semi Mature Rem. Contrib.: 10+ Years	Remove tree to facilitate visibility splay
T030	Rowan *(Sorbus aucuparia)*	Height (m): 7 Stem Diam (mm): 100 Spread (m): 2N, 3E, 2S, 1W	Remove tree to facilitate visibility splay
T031	Rowan *(Sorbus aucuparia)*	Height (m): 6 Stem Diam (mm): 100 Spread (m): 2N, 2E, 2S, 1W	Remove tree to facilitate visibility splay

Appendix Four: Tree Constraints Plan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Appendix Five: Tree Protection Plan