

21/00312/AMC
29/10/2021

Keith Renton
architect



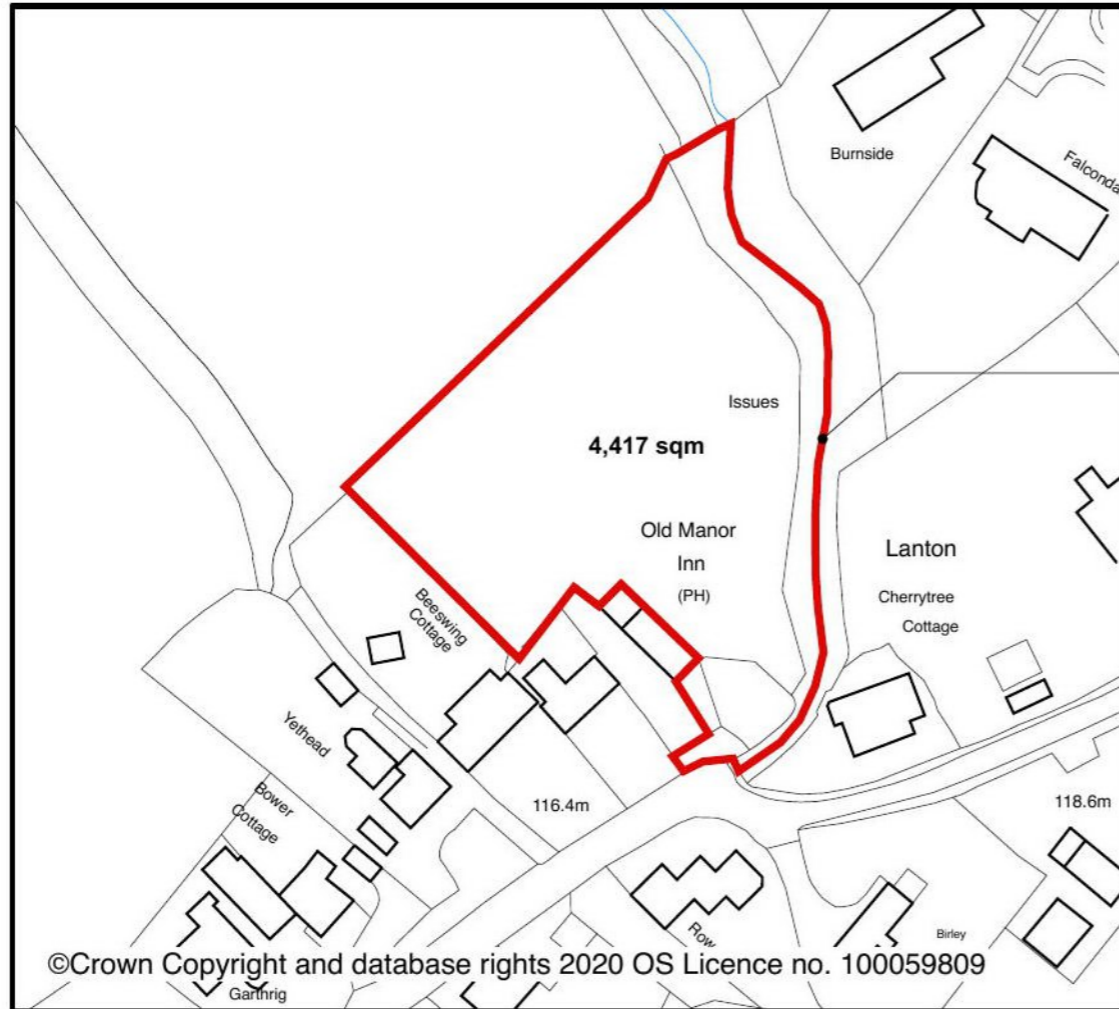
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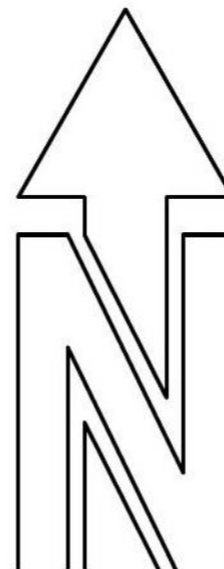
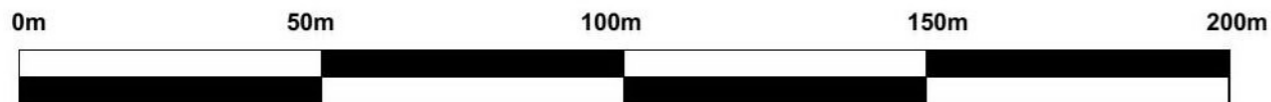
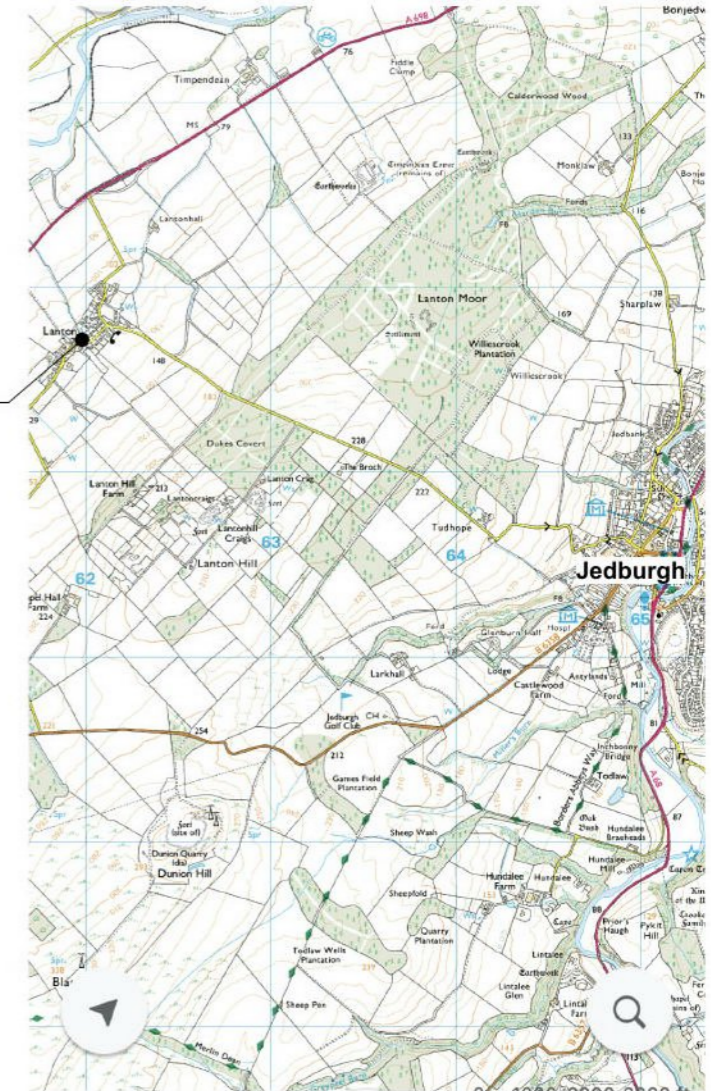
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associated Decision
Notice



Site boundary and extent
of Applicants land

site location



Drawing Title: PROPOSED LOCATION PLANS

Job Title: Proposed new house. Plot adjacent to Old Manor Inn,
Lanton, Jedburgh, EH8 6SU

Client: Richard and Alison Stables

Drawing Number: 857P-01

Drawing Scale: 1:1,250

Drawing Date: 19 February 2021

Drawn By: KR

Amendments:

none

21/00312/AMC
29/10/2021

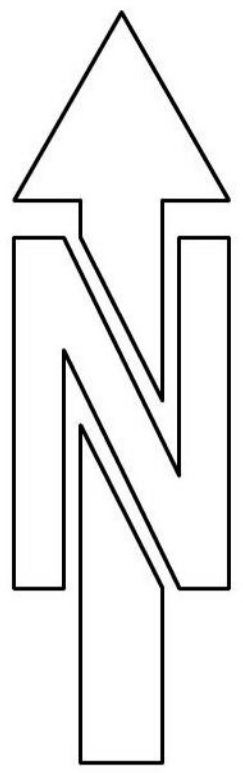
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existing boundary walls to NW and SW to be repaired and retained

overflow from pond taken to soakaway

Existing trees to backing retained and enhanced with additional planting of native species

Surface overflow from attenuation/soakaway trenches taken to burn

existing fence repaired and retained

Accoya timber edges and pegs at 600mm c/c supporting edges of drive and parking areas. Care to be taken to avoid roots with pegs

upfill material gently graded down to existing ground level and should NOT raise ground level at tree trunks

Bodpave 85 cells filled with 5-45mm mixed angular gravel

Terram geocell, 200mm deep with 4-45mm angular gravel. Geocell to be pinned at 1-2m centres to ensure cells are open before filling

50 - 100mm granular fill laid over geotextile sheet over existing topsoil with no compaction

Geotextile membrane laid over existing topsoil

SECTION THROUGH NEW ACCESS DRIVE

NOTES

Trees and Shrubs:

All trees are to be retained with the exception of a Holly Bush/tree and Apple tree both located closely to the proposed Garage position. Both trees have been neglected and overgrown by russian vine (now removed) are in a poor condition.

The existing trees to the banking leading down to the burn are to be retained and enhance with further planting of natives consisting of Silver Birch, Holly and Cherry.

New trees and shrubs elsewhere will consist of: Cotoneaster, variegated holly, Euonymus plus ornamentals consisting of Cherry Blossom, Plum, Acers, Cherry plum, Amelanchier, Phormium and cornus.

Planting at Pond:

Wetland natives, yellow flag iris, water lily, primula, rudbeckia, gunnera and hostas

Perennial and Grass Planting:

Perennials: Geum, geranium, Sedum, Achillea, Lavender, Roses, Helium, Dianthus, Heuchera, Euphorbia and bulbs

Grasses: Stipa Gigantea, Stip Tenuissima, Miscanthus, Anemanthele and Calamagrostis

Root Protection: Drive to be formed as per detail drawings and in accordance with manufactures details and instructions (https://terram.com/app/uploads/2020/07/GEOCELL_Design_Install_Guidance_Tree_Root_Protection.pdf) using a combination of terram Geocells and Biopave 85

Services:

Water: Water will be supplied from the mains supply adjacent to the site.

Power: Power will be from the existing overhead supply which crosses the site

Waste Water Disposal: To be taken to connect with public sewer which passes through the site at location shown.

Surface water: To be discharged through attenuation trenches/soakaways as shown with overflow to burn

Hard Landscaping

Paths: shall be formed with a combination of stone paving and decorative gravel

Drives and Parking Area: These shall be formed using gravel filled Biopave 85 trays to provide free draining/SUDS system (see note above regarding tree root zones)

Boundary Treatments:

NW and SW Boundaries, Existing stone walls are to be retained and re-built, where required)

NE and SE Boundary, existing fence line retained and repaired as necessary

Levels:

House Floor Level: 117.75m

Ridge Level at House: 123.74m

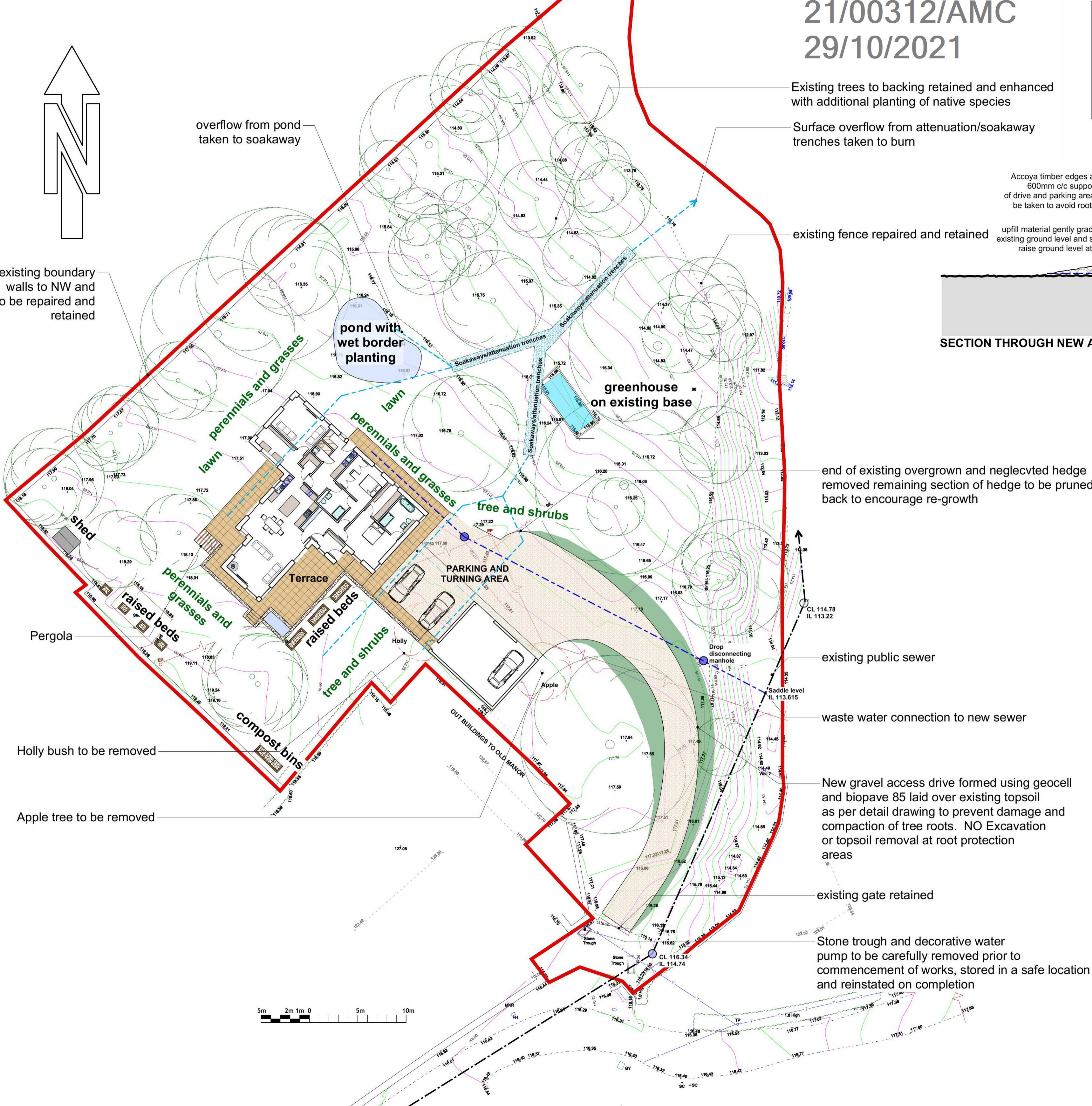
Path and Terrace Levels Adjacent to House: 117.6m

Garage Floor Level: 118.15m

Garage Ridge Level: 122.89

Ground Level Adjacent to Garage: 118.00m

Remaining Levels: Levels surrounding house, garage and drive will be graded in with existing surrounding levels



end of existing overgrown and neglected hedge removed remaining section of hedge to be pruned back to encourage re-growth

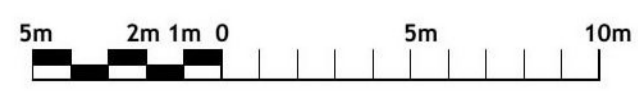
existing public sewer

waste water connection to new sewer

New gravel access drive formed using geocell and biopave 85 laid over existing topsoil as per detail drawing to prevent damage and compaction of tree roots. NO Excavation or topsoil removal at root protection areas

existing gate retained

Stone trough and decorative water pump to be carefully removed prior to commencement of works, stored in a safe location and reinstated on completion



Drawing Title: PROPOSED SITE PLAN

Job Title: Proposed New House, Plot adjacent to Old Manor Inn, Lanton, Jedburgh EH8 6SU

Client: Richard and Alison Stables

Drawing Number: 857P-03b

Drawing Scale: 1:200 & 1:10

Drawing Date: 19 February 2021

Drawn By: KR

Amendments:

- a) 22-02-21, notes and minor changes made
- b) 04-10-21, route of soakaways altered in accordance with Arboricultural Report

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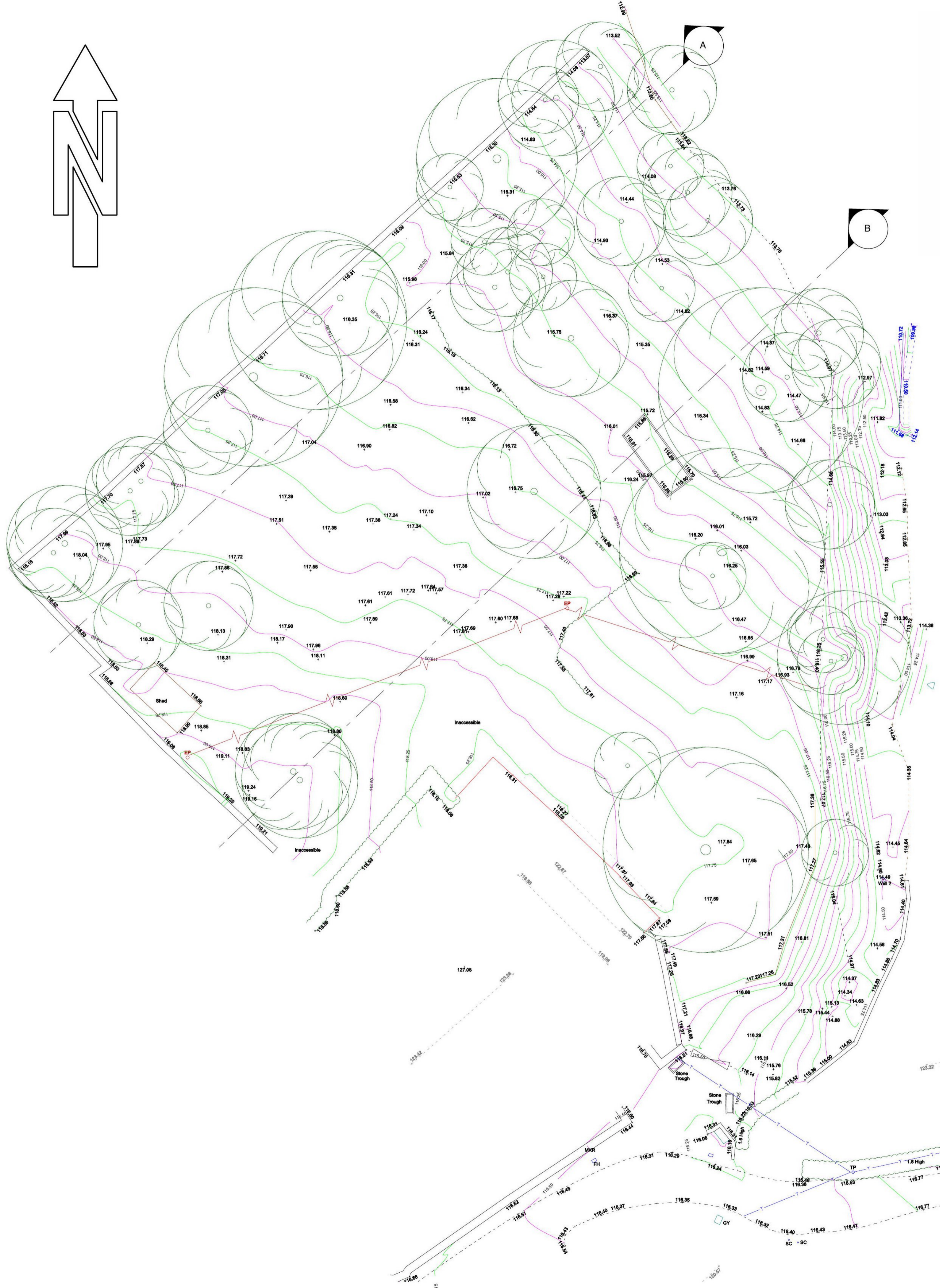
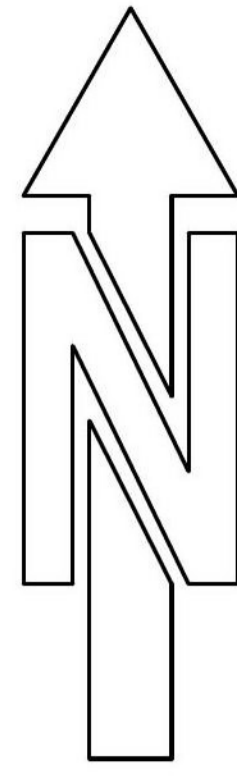
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Drawing Title: 3D images

Job Title: Proposed New House, Plot adjacent to Old Manor Inn,
Lanton, Jedburgh TD8 6SU

Client: Richard and Alison Stables
Drawing Number: 857P-06
Drawing Scale: n/a
Drawing Date: 19 February 2021
Drawn By: KR
Amendments:
none



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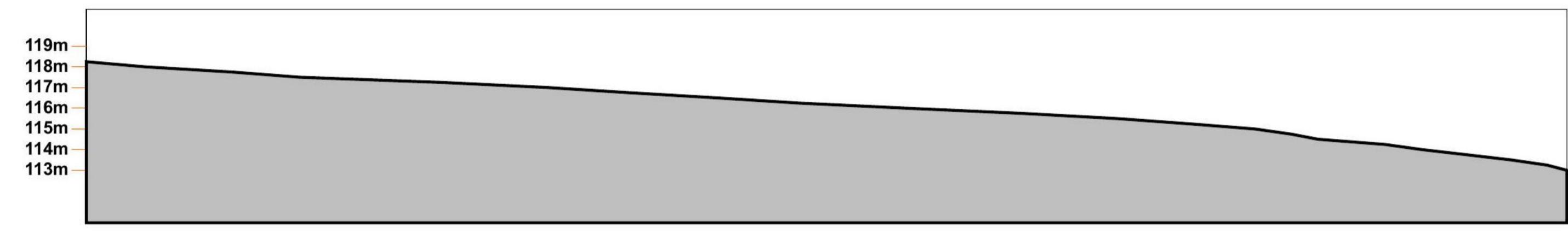
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Section B



Section A



Drawing Title: EXISTING SITE PLAN

Job Title: PROPOSED NEW HOUSE, Land NE of Old Manor Inn,
Lanton, Jedburgh, TD8 6SU

Client: Alison and Richard Stables
Drawing Number: 857P02-02
Drawing Scale: 1:200
Drawing Date: 19 February 2021
Drawn By: KR
Amendments:
none

21/00312/AMC
29/10/2021



SOUTH WEST ELEVATION

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NOTES:

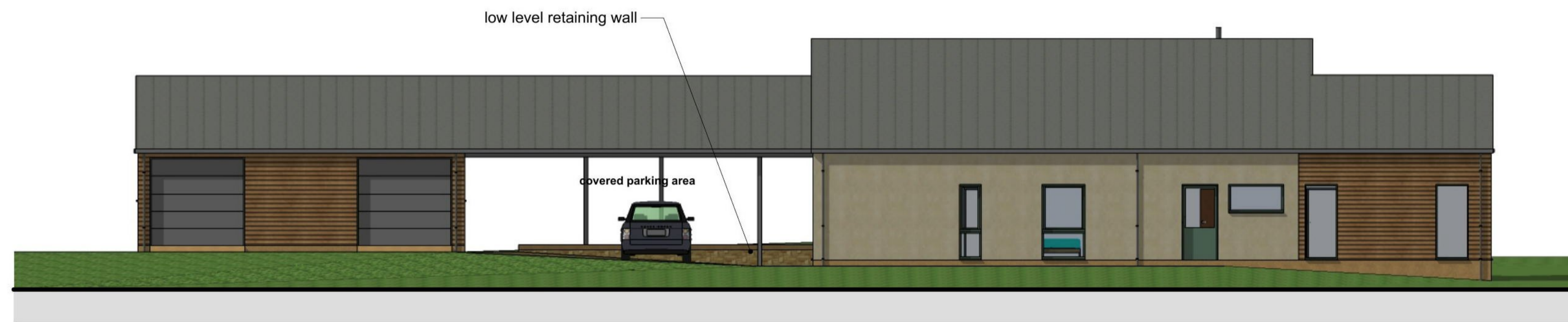
Roofing: All roofs shall be finished in standing seam metal at a pitch of 30 degrees

Walls: Shall be a combination of light texture (2mm grain size) render and timber cladding as shown at elevations.

Windows and Doors: Shall be timber triple glazed with external aluminium cladding.

Gutters and Downpipes: Shall be Lindab powercoated steel half round section gutters and round downpipes.

Base Course: Shall be either cast stone or rendered



NORTH EAST ELEVATION



SECTION D



NORTH EAST ELEVATION



SOUTH EAST ELEVATION

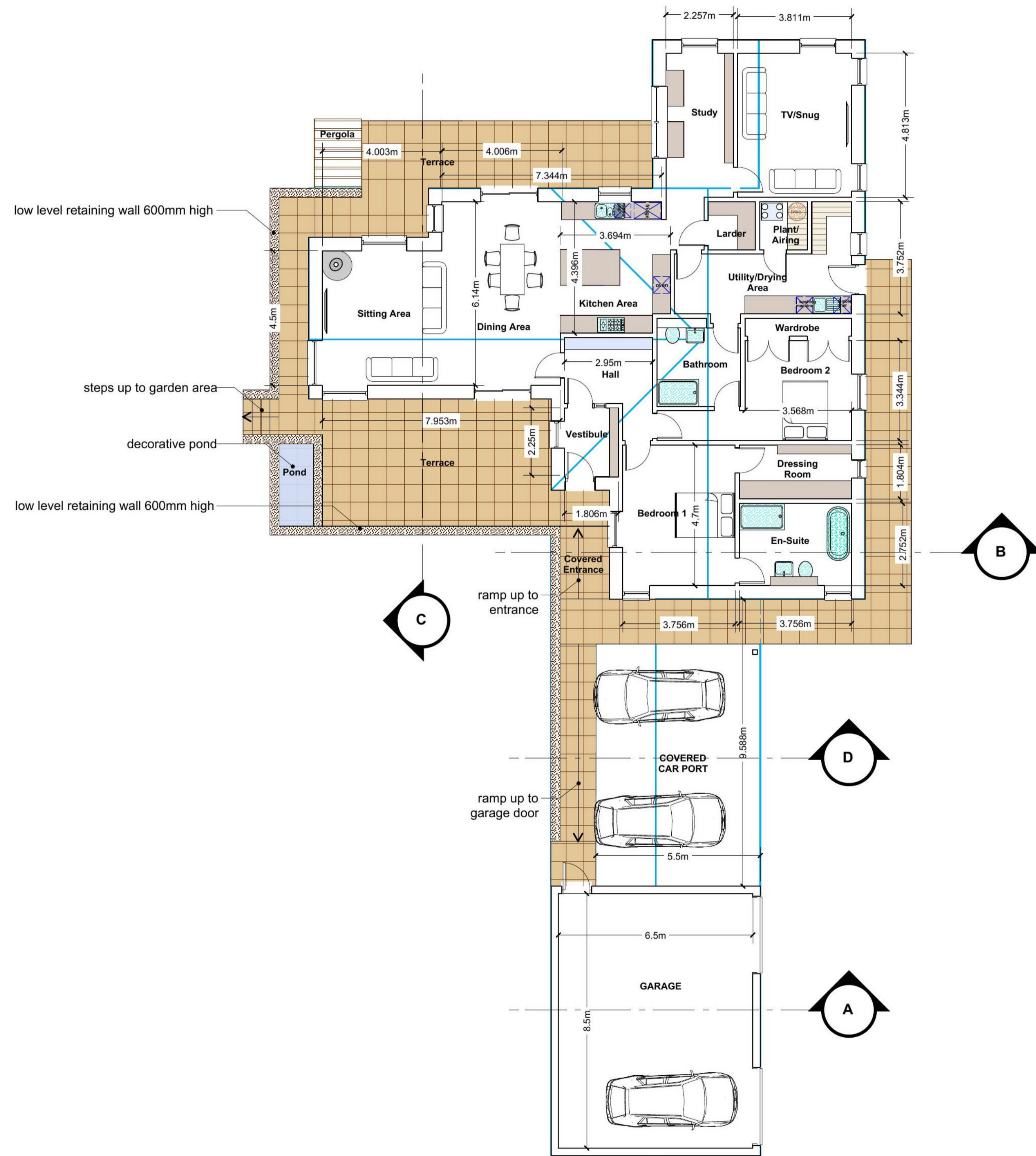


Drawing Title: PROPOSED ELEVATIONS AND SECTION D
Job Title: Proposed New House, Plot adjacent to Old Manor Inn, Lanton, Jedburgh TD8 6SU
Client: Richard and Alison Stables
Drawing Number: 857P-05
Drawing Scale: 1:100
Drawing Date: 19 February 2021
Drawn By: KR
Amendments: none

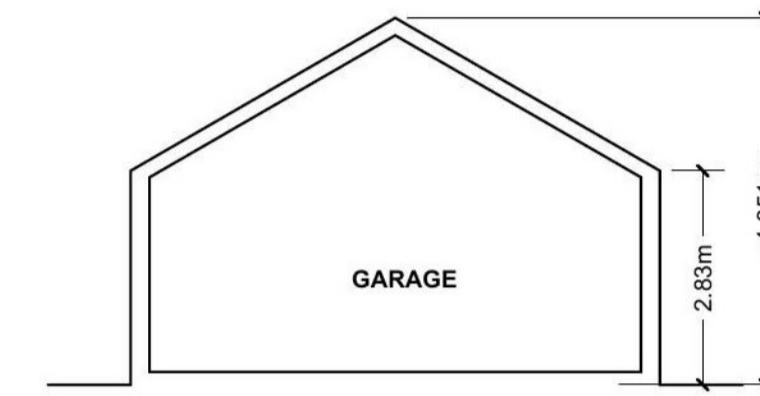
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1997

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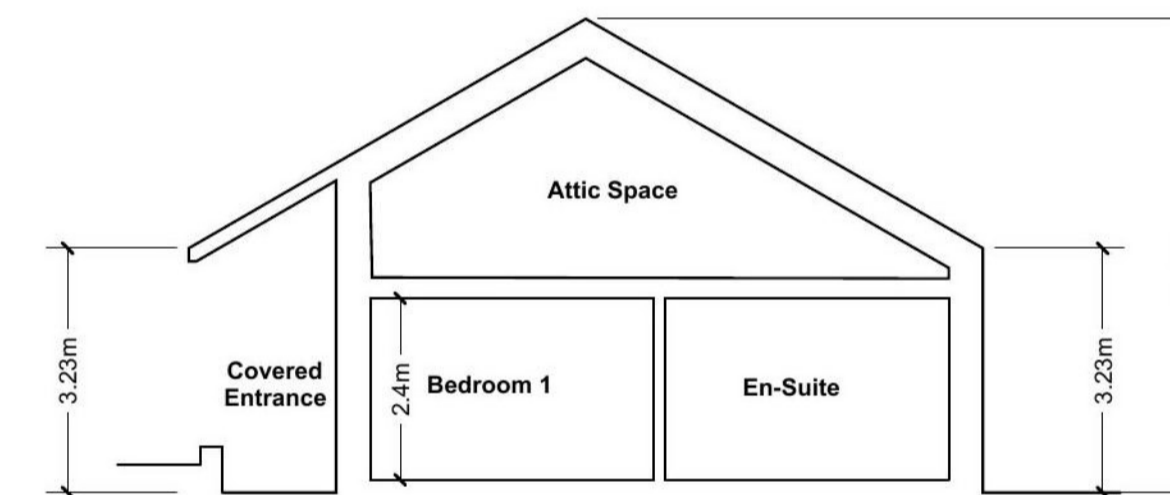
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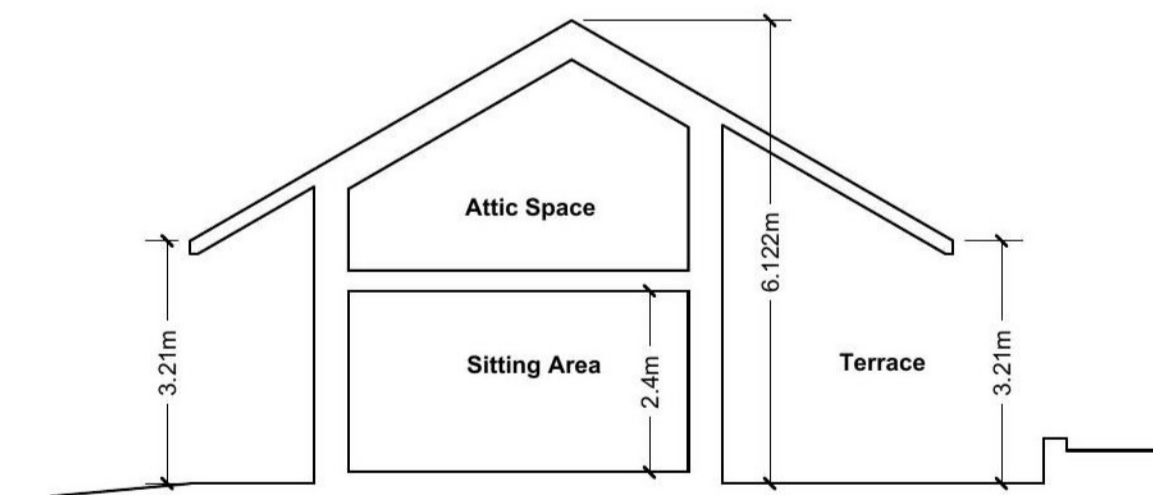
FLOOR PLAN



SECTION A



SECTION B



SECTION C



Drawing Title: PROPOSED PLANS AND SECTIONS A-C
Job Title: Proposed New House, Plot adjacent to Old Manor Inn, Lanton, Jedburgh EH8 6SU
Client: Richard and Alison Stables
Drawing Number: 857P-04
Drawing Scale: 1:100
Drawing Date: 19 February 2021
Drawn By: KR
Amendments: none

Robert Gray BSc(For)

FORESTRY & ARBORICULTURAL CONSULTANTS

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DEVELOPMENT OF SITE ADJACENT TO OLD MANOR INN, LANTON

ARBORICULTURAL REPORT

September 2021

1.0 Introduction

This report has been commissioned by architect Keith Renton on behalf of Mr and Mrs Stables who plan to erect a new house on the site. The aim of the report is to determine the health and condition of those trees that are likely to be affected by the development proposals.

A number of trees on the site were inspected in September 2021 but those that are unlikely to impact or be impacted by the proposals were not inspected. A plan showing the approximate location of trees on the site and a schedule with a brief description of each of the inspected trees are appended to the report.

2.0 General Description

The site is roughly triangular in shape and lies close to the northern edge of Lanton village. The north-west edge is adjacent to fields with open views over open countryside although partially screened by a row of trees standing along the site boundary. The east side of the site follows a watercourse in a steep-sided ravine that curves north-eastwards from the site entrance at the south corner before running northwards. The west edge of the site follows a garden boundary before cutting in eastwards around a neighbour's cottage just north of the entrance.

Access to the site at its southern corner is direct from the village street but most of the site is well screened from the road by trees and the neighbour's cottage on the west boundary.

The local topography undulates gently so whilst the site is well screened from the street, it is overlooked from one or two houses on the southern side. Surface drainage runs gently from the west side of the site to the ravine on the east side. A line of trees along the northern edge is exposed to winds from north-west through north to north-east but some shelter is occasioned by a shelterbelt to the north and groups of trees in the adjacent gardens. However the soil is sufficiently friable to allow adequate drainage and depth for tree roots and windblow does not appear to be an issue.

A small woodland runs along the west side of the ravine and tapers in width towards the southern corner of the site. The woodland consists of a mixture of broadleaves and conifers of differing ages but many of the younger trees have been suppressed by the larger and older trees. Although one or two trees have been removed in the recent past there are no open spaces of significance within the canopy.

The woodland connects directly beyond the site with a beech shelterbelt that runs roughly northwards along the same watercourse and so provides some shelter from that direction. Although Lanton has a well-wooded appearance provided by the wide spread of trees in gardens, the small woodland provides an important screen between the north-east and south-west parts of the village.

Other trees on the site consist of the row along the north-west edge and apple trees along the south-west edge north of the neighbour's cottage. Two trees stand as separate individuals, namely a large

apple tree roughly in the middle of the northern part of the site and a large Norway maple just north of the southern entrance.

3.0 Health and Condition of the Trees

Those trees standing on the site that would be most likely to be affected by the development were inspected from ground level and a schedule of the details is attached. The attached Plan A shows the position of each of the inspected trees which are numbered 1 to 23. Other trees deemed very likely to be unaffected by the proposals were not inspected but their positions are shown as unnumbered.

The site appears to have been used for horticulture in the past but only very lightly. None of the inspected trees appeared to have suffered any significant damage that might have been expected on a domestic site and all appeared to be in good health and condition. The point of most significance was the lack of any management within the woodland area where a lack of thinning in the past has led to the suppression of nearly all the younger trees to a point where many may not recover any future dominance in the canopy.

Ivy has begun to grow on five of the trees standing on the north-west side and can be detected as invading a few trees within the woodland area. However it has not yet become a serious problem.

One of the most significant trees, the large Norway maple (23) near the entrance, has a wide spreading crown which reaches and just overhangs the edge of the neighbouring cottage. Some crown reduction has been carried out in the past but some further overlap is developing which the neighbour may or may not perceive as a cause of concern.

4.0 The Effects of the Development Proposal

Any proposals for development should take account of the position of nearby trees and the area that these require for the growth of their roots and crowns. Local authorities require that developers follow the guidance given in BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations' which entails the preparation of a constraints plan of the site showing the trees to be retained and the areas of root and crown that should be protected from disturbance.

Each retained tree should have a defined Root Protection Area (RPA), the radius of which is related to the diameter of the main stem or stems. Excavation of any kind should be avoided within each RPA but if unavoidable, it should be carried out carefully by hand and only with the consent of the local authority. The RPAs for each of the inspected trees are shown on Plan A. No RPAs are shown for those trees unaffected by the development proposals or proposed for thinning out from the woodland area.

The crowns of the trees also require to be protected from damage. For all the inspected trees, the RPA extends well beyond the edge of each individual crown and so the outer edge of each RPA should be the recognised limit of protection.

BS 5837:2012 also requires that individual trees, groups of trees and woodlands should be graded into Categories A, B, C and U according to their life-expectancy, contribution to local landscape and amenity or other point of significance.

Cat A represents particularly significant trees that are in good condition with a high amenity and screening value and an expected future life of at least 40 years. Those in Cat B would be expected to have a life of at least 20 years and also be significant individuals or form an important screen whilst Cat C represents those still in good condition but which as individual trees either do not contribute greatly to screening or amenity, make only a limited or minor contribution or are expected to have a relatively short life of not much longer than about 10 years. Cat U represents those trees with a limited future either because of their declining health, poor condition or faults that dictate their early removal.

Where a group of trees matching Cat C status provide an important screen and contribute significantly to the local landscape, the group can be collectively considered worthy of a higher category. The woodland area on the Lanton site is an example where individual trees are unlikely to warrant a higher category than C but the woodland should be considered to be at least as Cat B.

Three trees, (10), (11) and (12), within the row of trees along the north-west edge of the site are worthy of Cat B status because of their future longevity and condition and the high screening value they provide. In contrast, the cherries (6a) to (9) can be only Cat C because they are now fully mature for the species and may now even be in decline. However the line of trees should be considered collectively as Cat B because of its important role as a screen between the village and the countryside to the north.

The large Norway maple (23) is equally important in providing a screen on the south side of the site and so should also warrant Cat B status.

5.0 Recommendations

5.1 Trees affected by the development proposal: The development proposals shown on the architect's drawing no.857P-03a RPAs do not appear to impose any significant incursion within any RPA other than that of the Norway maple (23). However to ensure that no excavation would be carried out within its RPA, provision has been made to construct the driveway on the surface of the ground.

The structured driveway should spread any loading longitudinally along the drive and should not be closer than 5m from the centre of the base of the tree. Although the RPAs of Sycamores (22) and (23) are close by, their location part way down the bank of the ravine should ensure that their RPAs remain unaffected. It would, of course, be essential that the driveway is completed in full before any construction traffic enters the site.

Sub-surface drainage is planned to run to the ravine between trees (15) and (16). This may well interfere with the edge of some RPAs but an alternative route may be possible as shown on Plan A. Whilst this route would still require some hand digging where it intercepts the RPAs of trees (15), (18), (19) and (20), the interference from the construction of the soakaway would be considerably less.

5.2 Protective measures: Any adjustment to the final layout for the development should take account of the RPAs of all retained trees so as to ensure that no excavation will be required within these protected areas.

It will be important also to ensure that any excavation for services or deposition of construction materials or the storage of plant and equipment does not take place within any RPA or under any crown of retained trees. Also the edge of each RPA should be clearly demarcated by secure protective fence such as 1.5m tall chespaie fencing or similar.

During the construction phase, any access route for heavy construction traffic should avoid RPAs, in particular by using the structured driveway past Norway maple (23).

5.3 Future Management: Within the next two years some thinning out of the woodland should be carried out to increase the spacing between individual trees and provide openings in the canopy for younger trees. The thinning should aim to remove any severely suppressed trees or trees with faults, infection or decay but also achieve a balance between the large-crowned trees and younger trees with more modest crowns. Thinning should be repeated periodically (about every 7-10 years) to encourage further crown development and stem growth,

The introduction of new species should be possible near the west edge of the woodland where light can reach the young trees. However to plant further into the woodland would require some selective felling of large individuals or groups of smaller trees. Particular care should be taken not to open the woodland to storm winds by removing the wind-firm trees on the north-west edge.

The trees along the north-west edge are all within falling distance of the proposed building so it would be prudent to monitor their condition every few years. For example, some minor reduction of new

growth in the mid or upper crown may be all that might be required in the future to reduce any wind stresses during storms. Also the owner of the site should monitor any groundworks on the north side of the boundary that might occur within the RPAs of these trees.

Robert Gray BSc(For)

Proposed Development at Lanton, Jedburgh

Schedule of Trees on site







September 2021

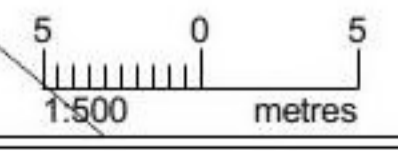
Ref No	Species	Ht (m)	Crown spread	BHD (cm)	Radius of RPA	Category	Nearest Building & Distance	Comments	Recommendation
1	Holly	9	4x4	22	2.64	C		Semi-mature. Leans SE. Stem forked at 2.6m. Suppressed by Apple (2).	
2	Apple	7	5x5	25 23	4.07	C		Semi-mature but crown removed on NE side. Main stem forked at 0.5m and west stem forked at 1m. Leans heavily to W and overhangs boundary wall	
3	Apple	7	7x5	26, 30	4.76	C		Semi-mature with full crown on E side. Some basal shoot growth. Stem forked 1m. Restricted crown W side. Base leans W.	
4	Apple	8	5x5	25, 28	4.50	C		Semi-mature with short restricted crown. Ivy growth from base.	Remove ivy
5	Norway spruce	17	4x3	40	4.80	C		Semi-mature with short restricted crown except for NW side.	
6	Norway spruce	19	5x3	47	5.64	C		Semi-mature with short restricted crown NE/SW sides. Very slight lean to NE. Ivy growth from base.	Remove ivy
6A	Cherry	12	9x5	39	4.68	B		Mature with short crown restricted on NE/SW sides. Ivy growth returning (old ivy removed). Crown raised to 4m.	Remove ivy
7	Cherry	12	8x4	41	4.92	B		Mature with short crown, restricted on NE/SW sides. Base to 1.2m leans strongly to NE but upper stem less so. Crown raised to 5m. Ivy growth at base.	Remove ivy
8	Cherry	12	8x3	39	4.68	B		Mature with short crown, restricted NE/SW but deeper on NW/SE sides. Base to 1.5m leans to E but NE above. Crown raised to 5m. Ivy growth at base.	Remove ivy
9	Cherry	12	9x6	44	5.28	B		Mature. Base leans E and tree slightly to E. Full crown NW side. Restricted and suppressed on NE side with part of crown lost.	
10	Sycamore	17	15x7	74	8.88	B		Semi-mature, one of dominant trees in row. Basal growth removed on W side. Stem forked at 3m. Full crown N and S sides.	
11	Sycamore		17x10	84	10.08	B		Semi-mature, one of two dominant trees in row. Some basal growth removed SW and N sides. Stem leans slightly E and forked into 3 at 4m. Full deep crown NW and SE sides also NE side except where interrupted by oak (12).	
12	Oak		9x3	43	5.16	B		Immature and suppressed by Sycamore (11) but with nearly all of crown on NW side. Very slight lean to E.	
13	Scots pine	19	5x5	43	5.16	C		Semi-mature with short restricted crown except on SW side. Very slight lean to E. Clear stem to 4m.	
14	Birch	12	6x4	23	2.76	C		Immature with short restricted crown on NE side. Leans NE. Forked 3.5m. Surface roots W side to 1m radius.	
15	Larch	11	9x4	45	5.40	C		Semi-mature with short suppressed crown. Leans slightly E. Upper stem bowed to S side with spreading branches from 3m upwards.	
16	Sycamore	17	4x4	27	3.24	C		Immature. Short restricted crown suppressed by neighbours.	
17	Ash	18	5x4	24, 25	3.00	C		Immature. Forked from base. Suppressed by Sycamore (18). Short restricted crown on NE side only.	
18	Sycamore	20	17x4	66, 63	10.90	C		Semi-mature. Forked from base with included bark to 1.6m. Full deep crown SW side but restricted crown on NE side.	
19	Sycamore	21	14x12	99	11.88	C		Semi-mature with full deep crown W/NW side. Restricted crown E side. Stem forked into 3 from 1m with included bark to 2m on SW and E stems and to 3.5m between E and N stems. Leans to N. Crossing branches at 4m N side.	
20	Apple	8	11x10	21, 24, 33, 39	7.23	C		Semi-mature with full deep crown. Stem forked into 4 at 1.3m.	

Ref No	Species	Ht (m)	Crown spread	BHD (cm)	Radius of RPA	Category	Nearest Building & Distance	Comments	Recommendation
21	Sycamore	18	5x2	20	2.40	C		Immature. Suppressed with narrow short crown. Stands in gully and base covered to about 1m with old garden refuse.	
22	Sycamore	18	3x2	28	3.36	C		Immature. Suppressed with narrow short crown. Stands in gully and base covered to about 1m with old garden refuse.	
23	Norway maple	20	20x16	96	11.52	B	Cottage - 7.3m	Mature with full deep crown except NE side. Forked into 7 at 4m. Crown reduced on SW side but more may be needed where it overlaps the cottage.	

Development Proposal, Lanton

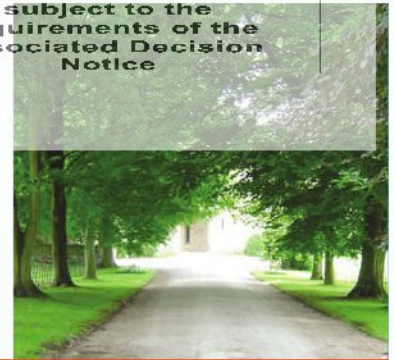
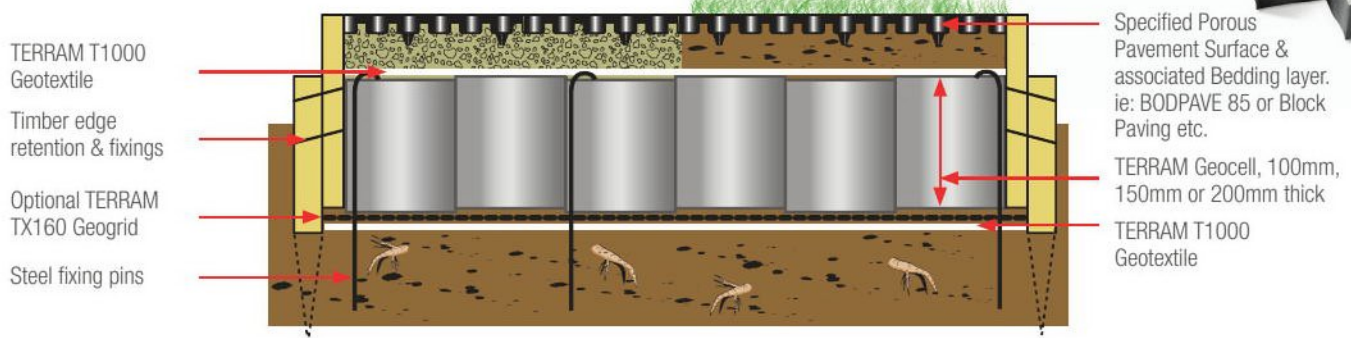
Plan A

-  Root Protection Area
-  Cat B Tree
-  Cat C Tree
-  Other trees outwith survey area and not inspected
-  Amended route for drainage and soakaway
-  Beech hedge



TERRAM GEOCELL**APPROVED****SPECIFICATION, DESIGN
& INSTALLATION
GUIDANCE**

For Tree Root Protection (TRP)

subject to the
requirements of the
associated Decision
Notice**Typical Construction Profile****Installation method for Geocells TRP for permanent access routes and car parks**

1. Obtain the approval of the Local Planning Department and Arboricultural Officer for the method of construction proposed and any imposed limitations on the use of mechanical equipment.
2. Remove all debris and reduce surface levels to the allowable reduced dig whilst strictly avoiding soil compaction and tree root damage. Build-up directly on the existing surface levels may be necessary.
3. Ensure that the prepared surface is reasonably even and fill any localised depressions with sharp sand to achieve an even surface profile. Do not roll or consolidate the area.
4. Install tanalised timber edging boards or other approved edge retention to the perimeter of the construction zone as appropriate to the total layer profile thickness. Avoid damage to tree roots when placing fixing posts and pegs.
5. Install a layer of Terram T1000 geotextile across the site, over lapping adjacent rolls by a minimum of 150mm. Lightly pin the geotextile in place until the overlying layers are installed as required.
6. A layer of TERRAM TX160 geogrid may be required depending upon the site soil strength, traffic loading intensity/frequency and any restrictions on build-up depth. Place the geogrid layer over the T1000 geotextile layer and fix down using steel pins to hold flat. Overlap adjacent rolls by minimum 150mm. Avoid tree root damage and soil compaction.
7. Open out the TERRAM Geocell layer and pin in place using steel fixing pins or similar approved between the edging boards. The pins hold the cells in an open and fully expanded position during the filling process. Pin spacing will vary according to the site conditions, generally 1m – 2m centres on flat surfaces around the perimeter and where panels join. Drive the pins in so that they are just touching the top of the cells but do not compress the fabric and avoid tree root damage. Cut the TERRAM Geocell to suit using a sharp knife/scissors or alternatively fold up against the edgings.
8. Fill the TERRAM Geocell with a clean, open graded angular aggregate (5mm - 45mm) working towards the tree from the furthest point away and using the filled TERRAM Geocell as a platform. (Single sized, rounded aggregate or DoT Type 1 should not be used). Do not roll the surface, a light vibratory compaction plate may be permitted to settle the stone into the cells; seek advice from the specifier or Arboricultural Officer. Do not contaminate the filled cells with site debris, soil or mud.
9. Install the permeable surface layer such as TERRAM BODPAVE 85, TERRAM Truckpave, permeable concrete block paving or porous asphalt on top of the TERRAM Geocell according to the manufacturer's recommendations. The type of bedding layer will depend upon the specification of the porous surface, an additional layer of TERRAM T1000 geotextile may be required over the filled Geocell to prevent loss of the bedding layer material into the voids. Please refer to Specification, Design and Installation Guidance for BODPAVE 85 and TERRAM Truckpave, or refer to the specific manufacturers' guidance for other surfacing materials.

Installation method for Geocells TRP for temporary haul road

In some applications a TERRAM Geocell may be installed as a temporary haul road base and completely removed after use. Alternatively a sacrificial stone layer may be installed on the filled Geocell which is removed and replaced with a permanent permeable pavement solution when use of the haul road is complete.

1. Apply all construction detail as for items 1 to 8 above for 'Permanent Access Routes'.
3. Place a separation layer of TERRAM geotextile onto the TERRAM Geocell surface. The geotextile grade will be determined by the specific site design criteria and degree of haul road traffic proposed. E.g. TERRAM T1000 or TERRAM T2000.
4. Place a minimum 100mm thick layer of either clean graded stone or DoT Type 1 sub-base stone onto the TERRAM geotextile.

General Design Overview for TERRAM Geocell TRP

TERRAM Geocell TRP is a three dimensional geocellular sub-base confinement system designed for the protection of tree roots where the construction of roads, car parks and access routes are required in the vicinity of trees and where Tree Preservation Orders (TPO) may be enforced. The structure confines and stabilises the sub-base stone ensuring that vehicle loads are dissipated, rutting and soil compaction is prevented and damage to tree roots is avoided. When installed as advised, TERRAM Geocell will also allow the continued passage and circulation of air, water and nutrients to tree roots to sustain a healthy growing environment as recommended by the following 2 documents:

- British Standard BS5837: 'Trees in Relation to Construction' (2012).
- Arboricultural Advisory and Information Services APN12– Driveways Close to Trees.

Design Notes for Geocell TRP

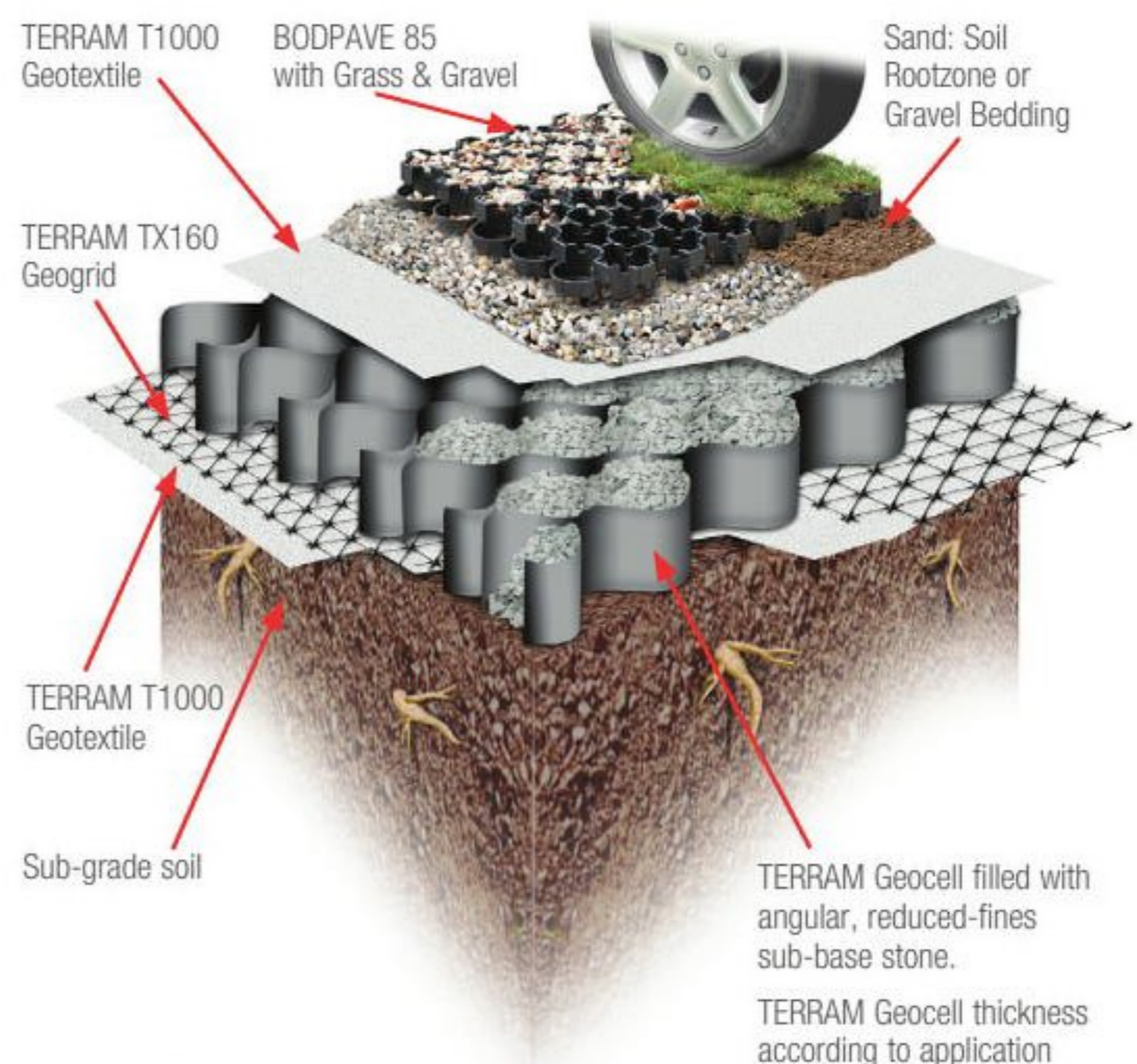
1. BS5837 advises that any new permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the TRP area.
2. Geocells must be filled with clean, open graded angular aggregate, normally in the particle size range of 5mm - 45mm. Clean 4/20 or 4/40 stone or a reduced-fines DoT Type 1X or Type 3 may be acceptable. Single sized, rounded aggregate or DoT Type 1 should not be used.
3. TERRAM Geocell layer thickness and inclusion of a geogrid will depend upon subgrade soil strength and proposed traffic loadings. See table 1 for further guidance.
4. Specific advice on CBR% strengths, ground conditions and construction over weak ground with a CBR less than 1% is available from TERRAM. CBR% = California Bearing Ratio, a measurement of subgrade soil strength.
5. Soil compaction will severely affect the trees ability to take up water and oxygen; similarly, raising soil levels around trees will deprive roots of oxygen and cause stress and dieback.
6. In most cases 80% - 90% of a trees root system are in the upper 1m of soil and the small fibrous tree roots are the most important to a tree's health. The fine roots enable transport of oxygen, water and nutrient to the tree via the larger roots which also anchor the tree and provide stability. Severing only a small proportion of the fine surface root structure can severely affect the tree, causing stress, die back and loss of stability.

5. Routinely check for erosion of the surface and repair with additional stone as required to avoid exposure of the separation geotextile.
6. After the haul road use is completed, remove the sacrificial layer of stone and geotextile and follow item 9 above for 'Permanent Access Routes'. Avoid contamination of the open-graded stone within the TERRAM Geocell during removal of the sacrificial stone layer. Alternatively remove the entire construction profile and return the site to its original status. At all times avoid damage to tree roots and soil compaction during removal and disposal of the construction layers.
7. Seek the specifiers' advice on renovation and restoration of the landscaped surfaces within the tree protection zone upon removal of the Geocell TRP system.

TERRAM Geocells are supplied flat packed and open to form a strong three dimensional geocellular structure. In this type of 'Reduced-Dig' or 'No-Dig' TRP application, TERRAM Geocell is intended for use in conjunction with a water and gas permeable SuDS (Sustainable Drainage System) compliant pavement surface product such as BODPAVE 85 or Truckpave cellular plastic paving, permeable concrete block paving or porous asphalt surfaces. Although TERRAM Geocell can be used by traffic in isolation for a very limited period when filled; it is not advised that TERRAM Geocell is used as the permanent surface finish for vehicle access routes.

Exceptions may arise where TERRAM Geocell is installed as a temporary haul road for example as a site access route and may be removed and disposed of or fully re-surfaced after use.

Typical Profile



Typical Profile showing various product layers.
Not all layers will apply to every application.

Table 1 Geocell TRP thickness

APPLICATION/LOAD	CBR (%) STRENGTH OF SUBGRADE SOIL (see Chart 1)	GEOCELL/Sub-base thickness (mm) (see notes 2-4)	GEOCELL GRADE	TERRAM GEOGRID reinforcement layer	TERRAM GEOTEXTILE filter/separator layer
Pedestrian/Cycles	3≤	100	25/10	TX160	T1000
	1<3	100	25/10		T1000
Cars/Light vehicle	3≤	150	25/15	TX160	T1000
	2<3	150	25/15		T1000
	1<2	200	22/20		T2000
HGV's	3≤	200	22/20	TX160	T1000
	2<3	200	22/20		T1000
	1<2	300	25/15	TX160	T2000
					25/15 (2 Layers)

Table 2 – Geocell specifications

GEOCELL GRADE	PANEL SIZE	CELL DIAMETER AND DEPTH	PANEL WEIGHT	MATERIAL	WALL PERMEABILITY (Li/m ² s)	JOINT BOND
25/10	5m x 7m	250mm x 100mm	17kg	Non-woven polypropylene	20	Chemical
25/15	5m x 7m	250mm x 150mm	25kg	Non-woven polypropylene	20	Chemical
22/20	6m x 3m	220mm x 200mm	20kg	Non-woven polypropylene	20	Chemical

Supplementary information

DESCRIPTION	DATA
GEOCELL fill material	4/40mm coarse graded aggregate (BS EN 13242 and 7533-13:2009)
Geotextile filter/separator layer(s)	TERRAM T1000 or T2000 (see table 1) geotextile
Geogrid reinforcement layer	TERRAM TX160 geogrid

Chart 1: Field guidance for estimating sub-grade strengths

CONSISTENCY	INDICATOR			STRENGTH	
	TACTILE (feel)	VISUAL (observation)	MECHANICAL (test) SRT	CBR (%)	CU (kN/sqm)
Very Soft	Hand sample squeezes through fingers	Man standing will sink >75mm	<2	<1	<25
Soft	Easily moulded by finger pressure	Man walking sinks 50-70mm	2-4	Around 1	Around 25
Medium	Moulded by moderate finger pressure	Man walking sinks 25mm	4-8	1-2	25-40
Firm	Moulded by strong finger pressure	Utility truck ruts 10-25mm	8-15	2-4	40-75
Stiff	Cannot be moulded but can be indented by thumb	Loaded construction vehicle ruts by 25mm	15-30	4-6	75-150

Further Reading

- British Standard: BS5837 (2012) – Trees in Relation to Construction - Recommendations.
- Arboricultural Advisory and Information Services Services APN12 (2007)– Driveways Close to Trees.
- 'Tree Root Systems'. (M. Dobson 1995) – Arboricultural Research Information Note 130/ARB/95.
- 'Driveways Close to Trees' (M. Dobson / D. Patch 1996). Arboricultural Practice Note 1.
- 'Guidance for Trees: Conflict or Compliment?'. (R. Nicholson 2001). Arboricultural Journal No. 25.

This field guide is provided as an aid to assessing the mechanical stabilisation requirements in commonly encountered site conditions. TERRAM accepts no responsibility for any loss or damage resulting from the use of this guide.

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