ARBORICULTURAL IMPACT ASSESSMENT
AT THE GROVE, CROMER ROAD, HOLT

Prepared for Lanpro

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TREE SURVEYS

Executive Summary

This assessment outlines the tree constraints that affect the construction two new dwellings and demonstrates how the retained trees can be protected throughout the development process.

The design has been developed with the benefit of arboricultural advice and only one C category tree will require removal.

All the retained trees will be provided with proper protection as set out in BS5837:2012 during the construction phase. Protection measures will include erecting temporary protective fencing, temporary ground protection, pre-emptive root pruning and careful surface removal and the use of No-Dig surfaces as appropriate.

This assessment forms an important stage in the process of managing and protecting the trees on site in relation to the proposed development. However, it will only ensure the protection of the trees on site if the tree protection measures in the Arboricultural Method Statement are implemented in full and the prescribed system of arboricultural supervision is followed. Tree protection works must be fully integrated into the construction process.

Provided that the recommended tree protection measures are put in place, it is likely that this development will have a minimal impact on the trees on site.

G.G. Robbie
AT Coombes Associates Ltd.
16 March 2018

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1. Terms of Reference

1.1 The aim of this assessment is to survey trees that may be affected by the construction of two new dwellings within the grounds of The Grove, Holt.

1.2 The assessment addresses the likely impact of the proposed development on surrounding trees and provides recommendations for the protection of retained trees during construction work based on BS 5837:2012 “Trees in relation to design, demolition and construction-Recommendations”.

1.3 A topographical survey of the site was available showing the accurate position of all trees and features on site. Also provided was the proposed layout for the development. These plans have been used to form the basis of the Tree Constraints Plan (TCP, Appendix 3) and Tree Protection Plan (TPP, Appendix 4).

1.4 This assessment is an update of a previous Arboricultural Impact Assessment completed in 2013 and has been prepared following the provision of a new design for the site. The new design for the site has been created with significant arboricultural input to minimise the impact of the development on the trees on site.

1.5 The trees on site are the subject of a Tree Preservation Order issued by North Norfolk District Council.

2. Site Description

2.1 The site is within the grounds of The Grove, a period property to the south of Cromer Road, Holt. The site was formerly under the ownership of the adjacent Gresham’s School, but was sold approximately 5 years ago after which a large amount of renovation works were carried out, including the installation of tennis courts and play areas to the south of the site, close to Grove Lane.

Fig 1: Tennis courts located to the south of The Grove

Fig 2: Woodland fringe, with mature beech trees dominating

2.2 The site is fringed by trees on all sides, with mature woodland and tree belt areas separating the property from Cromer Road to the north, Grove Lane to the south, and current residential building developments on other land formerly under the ownership of Gresham’s School to the east and west.

The proposed development area is concentrated at the southern end of the site where the tennis court is currently located (Fig 1).

2.3 The woodland fringe in this area consists mostly of beech, as well silver birch, lime, sycamore and some sweet chestnut (Fig 2). There are also elements of understory including laurel and holly.

3. Tree Survey Details

3.1 Appendix 1, the Tree Survey Schedule gives the survey findings in tabular form. The schedule contains all the information specified in section 4.4.2.5 of the British Standard. Appendix 2 gives a full explanation of the survey headings.

3.2 The trees were in initially surveyed in 2013, but the site was revisited on 26 February 2018 to assess any changes in condition or dimension; they were not climbed but surveyed from ground level.

3.3 The details recorded during the tree survey have been collected independently of any development proposals, and the categorisation of the quality and amenity value of the trees is made purely on arboricultural grounds.

3.4 No assessment of the soil has taken place as part of this report. The British Standard states that a soil assessment should be carried out by a competent person to establish the structure, clay content and potential for volume change of the soil. A survey of this nature is considered outside the scope of this Arboricultural Assessment. For guidance on soil structure in relation to construction advice should be sought from a Structural Engineer. Guidance on foundation depth in relation to building and trees can be found in NHBC Chapter 4.2.

4. Assessment of Tree Constraints

4.1 To facilitate the proper assessment of tree constraints a Tree Constraints Plan (TCP) has been prepared and forms Appendix 3. The plan has been produced as a basis for the assessment of the constraints imposed by existing trees on the proposed design.

4.2 Appendix 3 shows the position of trees marked by a coloured dot matching the retention category status and a reference number (as listed in Appendix 1). Heights (Ht) are marked in metres for each tree, together with the predicted ultimate heights (U/Hgt).

4.3 The plan deals with constraints that the trees may place on the development in two areas as follows:

Below ground Constraints

4.4 The Root Protection Areas (RPA) for the trees are shown as a coloured circle to match the retention category colour. The RPA will be used to help inform the closest positions of any future buildings. The RPA will be protected during any development work with temporary barriers as prescribed by the British Standard.

4.5 It is likely that the relatively recent construction of the tennis courts disturbed roots that may have been present, and therefore it is unlikely that significant roots are present within the courts footprint. However, as this can not be confirmed, no adjustement to the indicated RPAs has taken place.

Above Ground Constraints

4.6 The branch spreads were measured at the four cardinal compass points, with a shape drawn around these points to indicate approximate branch spread, represented by green broken lines on the plan. The ultimate crown spread has been shown with an orange dashed line. This is a predicted distance, and is based on personal experience of how far it is likely the crown will grow.

4.7 A shade pattern has been shown for each tree forming an arc from north west to due east. This gives an indication of the patterns of shadows created by the trees around mid-day in the summer. This is as recommended in BS5837:2012 (Section 5.2.2) but actual shade patterns throughout the year will vary widely. If shading is likely to be a serious constraint a more detailed analysis of shade pattern using proprietary software may be deemed necessary.

5. Arboricultural Impact Assessment

5.1 A total of eighteen individual trees and three tree groups were included in this report. The groups contain trees forming continuous features or clusters with similar characteristics and encompass the wooded belts around the site.

5.2 One tree (T18) and one tree group (G2) have been classed as Category A which is the highest category available under the British Standard 5837:2012. These trees form important parts of the local tree landscape, with T18 being a particularly prominent specimen within the grounds.

5.3 Twelve trees and one tree group have been classed as Category B. These trees are generally in good condition and confer landscape values. They are suitable for retention where possible in the context of a development.

5.4 Five individual trees and one group have been classified as Category C. These trees are small or in poorer condition and do not play such a significant role in the local landscape. C category trees are usually of such a quality that the Local Authority may consider it acceptable for them to be removed for development purposes, if required.

5.5 Any trees that are retained will be provided with their proper protection according to BS5837:2012 regardless of which category they have been placed in.

5.6 The tree constraints for each element of the development, are considered separately below:

Element	Detail
Demolition of Existing Buildings and Removal of Existing Surfaces	The tennis court is to be removed as both dwellings are situated within the current position of the surfaced area. The ground was disturbed when the tennis courts were constructed, and therefore the chances of any rooting from the adjacent trees being found within the footprint of the

Element	Detail
Demolition of Existing Buildings and Removal of Existing Surfaces cont.	tennis court is minimal. However, where surfaces are to be removed within the indicated RPA of these trees, this work must be carried out very carefully and under arboricultural supervision. Hand held tools, or appropriate machinery (such as an excavator fitted with a non-toothed ditching bucket) will be used, with due care and attention paid to any roots that may be underneath the surface. If roots are found, they must be covered with good quality topsoil to a depth no greater than 150mm within 24 hours.
Construction of Plots 1 and 2	The proposed dwelling is outside the RPA of all trees present on site and is situated within the footprint of the existing tennis court. Temporary ground protection will be used to minimise soil degradation and compaction where traffic is likely to require access during the construction process. This will be put in place once the tennis court surface has been removed as a precaution, although it is unlikely that significant roots are present in this area. This is shown on Appendix 4 – TPP as orange crosshatch and detailed further in Appendix 5 – AMS. The dwelling is close to the current branch spread of adjacent trees. However, the proposed dwellings are single storey units, and therefore there is unlikely to be any conflict between the buildings and the tree branches. This must be checked prior to construction works commencing. If there are any conflicts, any tree work required must be minimal and carried out prior to construction works commencing. The surrounding trees will cast shade over the plot. Due to their location, this was considered throughout the design process with the orientation of the dwellings and suitable fenestration.
New Car Parking Spaces	The two northern car parking spaces in the same position as C Category T2 which will need to be removed to facilitate this aspect of the development. The new car park will have a minor encroachment into the RPA of C category T1 amounting to less than 5% of the total RPA of the tree. Therefore pre-emptive root pruning will be carried out to minimise the damage caused to roots, should they be present. This will be carried out by excavating the foundations in the area shown on the TPP using hand tools or an airspade. Any roots found during this excavation will be severed using a sharp handsaw or secateurs. This will ensure that the roots are not ripped or torn, and will have a good point from which to regrow, and will have a chance to occlude and prevent fungal pathogens from entering. The southern section of the proposed new car parking area is within the RPA of adjacent trees. Therefore, it will need to be constructed using a No-Dig surface at or above ground level. The key point is that it will be constructed without excavation. The surface should be designed by an engineer to ensure it is suitable for the traffic and loading that will be experienced when it is in use, it is likely that a three-dimensional cellular confinement system will provide the best solution. There are several manufactures of cellular confinement systems including “Cellweb” by Geosyn, Geocell by Terram or another proprietary three-dimensional

Element	Detail
New Car Parking Spaces cont.	cellular confinement system. The areas in question have been marked with purple hatching on the Tree Protection Plan (TPP, Appendices 4). The surface can be no closer than 0.5m from the stem of any retained tree. Any design must be approved by the consulting arborist and the Local Authority Tree Preservation Officer. The construction of the no-dig surface must be supervised by the consulting Arboriculturist.
Services and Soakaways	No details of any new service runs have been provided. They should be routed to avoid the RPAs of trees. If this is not possible, special techniques must be employed to place the services within the RPA of the trees. The British Standard suggests a range of trenchless methods suitable for various applications including microtunnelling, surface launched directional drilling, Pipe ramming and Impact Moleing/thrust boring. It is important common ducts should be used where it is not possible to avoid the RPA. Further guidance on installing underground services adjacent to trees can be found in the NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Volume 4 Issue 2). This document outlines a number of techniques that may be used for trenching near trees, including trenchless techniques, discontinuous trenching and hand digging. It will be necessary to prepare detailed plans for any services that run thorough the RPA of retained trees. This should be produced in conjunction with an arboriculturist and include allowance for the space needed for access for the installations, and the levels across the proposed area. Any above-ground apparatus including CCTV cameras and lighting should also be positioned to avoid the need for any regular or detrimental pruning to the trees. Minor facilitative pruning is acceptable. However, positions that require repetitive and significant tree work must be avoided.

6. Tree Management and Replanting Proposals

6.1 Remedial tree work has been specified in column 12 of Appendix 1 for arboricultural and health and safety reasons. The work is not considered urgent but it is recommended that it is carried out within 12 months of the date of this report, or prior to the commencement of works, whichever is soonest.

6.2 This schedule does not refer to, and is superseded by, any requirements for tree felling for development purposes that may be required.

6.3 Please note that the inspection of trees on site was of a preliminary nature, gathering, as set out in the British Standard, only information needed to assess tree constraints. While any obvious tree defects that may constitute a risk have been recorded in the survey and appropriate remedial work specified this assessment does not constitute a full tree health and safety survey. In particular inaccessible trees, trees with heavy Ivy cover and trees within groups have not been inspected fully and dimensions estimated. However, any comments on the trees relating to health and safety remain valid for 12 months from the date of this report after which the trees will require re-inspection.

6.4 C category T1 will be removed for development purposes. Separate landscaping proposals have been submitted, but mitigation planting will include two standard trees and nine espaliered fruit trees. This will more than make up for the loss of T1.

6.5 The trees will be securely pit planted in holes which are excavated to at least 0.75m wider in all dimensions than the rootball of the tree, planted at a depth no deeper than the height of the root ball / root collar and back-filled with soil excavated from the tree pit. Each tree will supported with a treated softwood stake inserted at a 45 degree angle to the ground, avoiding the rootball. Adjustable rubber ties will secure the trees to the stakes. Spiral guards (60cm x 38mm) will be wrapped around the lower stem to prevent mammal damage. Mulch will be placed around each tree at depth of 50-100mm and at a diameter of 1m to reduce weed growth.

6.6 The trees will be maintained for a 5 year period. Work will include keeping a circular area with a 0.5m radius centred on the stem of the tree/s free from weed growth using either herbicide or much, checking supports and guards and replacing any failures during the period with trees of the same species and quality.

7. Further Arboricultural Input into the Design Process, Construction and Aftercare

7.1 A Tree Protection Plan (TPP), Arboricultural Method Statement (AMS) and Timetable for implementation of Tree Protection Works form Appendices 4, 5 and 6 respectively.

7.2 The AMS contains a timetable for implementation of the tree protection works. No work will commence until the protective fencing is in place.

7.3 If the proposed layout of the development changes it will be necessary to revise this report.

8. Permissions and Constraints

8.1 Trees on site are subject to a Tree Preservation Order. Therefore, written permission must be obtained from the Local Authority prior to commencing any work that may affect the condition of the protected trees, including any ground works adjacent to them.

8.2 To assist the planning process the LPA should be provided with a copy of this report and invited to comment on the proposals.

8.3 When dealing with developments close to trees, special attention should be paid to related legislation ensuring that the Wildlife and Countryside Act (1994), Conservation of Habitats and Species Regulations (2010) and the Countryside Rights of Way Act (2000) are adhered to. It must be ensured that nesting birds and protected species such as bats and reptiles are considered and protected.

9. Conclusions

9.1 This development has been designed with arboricultural input, and only one C category tree will require removal for development purposes.

9.2 All other trees on or adjacent to the site will be retained and protected according to BS5837: 2012 throughout the works.

9.3 The surface of the existing tennis courts is to be removed carefully, with it being lifted under arboricultural supervision. Due to previous disturbance when the courts were being constructed, it is unlikely that any significant roots are present in this area.

9.4 A section of the car parking area for the two dwellings will be constructed using No-Dig surfacing. Pre-emptive root pruning will also be carried out to the north of the car parking area to minimise damage to adjacent trees.

9.5 The two dwellings will experience shading cast by neighbouring trees. This has been noted throughout the design process, with the buildings orientated accordingly and adequate fenestration put in place.

9.6 Provided that the protective measures as outlined within this report are put in place, it is likely that this development will have a minimal impact on the trees present on the site.

9.7 The proposed new planting will more than make up the loss of the C category tree.

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A.T. Coombes Associates Ltd
16 March 2018

APPENDIX 1-
TREE SURVEY SCHEDULE

SITE: THE GROVE, CROMER ROAD, HOLT

SURVEY COMPLETED: FEBRUARY 2018

1	2	3	4	5	6				7	8	9	10	11	12	13	14	15	16
Tree No.	**Species**	**Ht (m)**	**Stem dia (mm)**	**No of Stems**	**Branch Spread**				**Height and Direction of First Branch (m)**	**Mean Canopy Ht**	**Life Stage**	**Physiological Condition**	**Structural Condition**	**Preliminary Tree work**	**Estimated remaining contribution (Yrs)**	**Cat grading**	**Radius of RPA (m)**	**RPA (sq m)**
					N	**E**	**S**	**W**										
T1	Silver Birch	12.0	250	1	3.0	3.0	3.0	3.0	2.0 E	2.0	M	Good	Good	No work	20+	C1	3.0	28
T2	Ash	8.0	285	1	3.5	3.5	3.5	3.5	2.0 N	1.5	Y	Good	Good	No work	20+	C2	3.4	36.8
T3	Sycamore	12.0	280	1	3.0	3.0	3.0	3.0	4.0 E	4.0	SM	Fair - Heavy ivy	Moderate - Forked at base.	No work required	20+	B1	3.4	35.5
T4	Sycamore	11.9	308	3	3.0	3.1	3.0	3.0	3.0 E	3.0	SM	Fair - Heavy ivy	Good	No work required	20+	B1	3.7	42.9
T5	Birch	10.0	280	1	3.0	3.0	3.0	3.0	3.0 N	3	M	Good	Good	No work	20+	B2	3.4	35.5
T6	Beech	12.0	280	1	2.8	2.8	2.8	2.8	2.2N	2.2	SM	Good	Good	No work	20+	B2	3.4	35.5
T7	Beech	11.0	230	1	2.5	2.5	2.5	2.5	4N	3	SM	Good	Good	No work	20+	B2	2.8	23.9
T8	Beech	14.0	300	1	5.0	2.0	2.0	5.0	2.8N	2.5	SM	Good	Good	No work	20+	C2	3.6	40.7
T9	Lime	17.0	310	6	6.0	3.5	4.0	3.5	2N	1	M	Good	Moderate-re-grown coppice stool	No work	20+	B2	3.7	43.5
T10	Sycamore	15	390	1	6.0	1.5	0.0	2.5	4N	4	SM	Fair-suppressed and ivy clad	Good	No work	10+	B2	4.7	68.8
T11	Sycamore	16.0	500	1	6.0	5.9	6.0	6.0	3.5 E	6.0	EM	Good	Good	No work required	20+	B1	6.0	113.1
T12	Beech	20	600	1	6.0	6.0	6.0	6.0	5N	7	M	Good	Good	No work	20+	C2	7.2	162.9
T13	Sycamore	17.5	620	1	6.5	6.5	6.5	6.5	3.5 E	3.5	M	Fair - Ivy cover	Good	No work required	20+	B1	7.4	173.9
T14	Beech	19.5	720	1	7.5	7.4	7.5	7.5	3.0 E	4.0	M	Fair - Competition with G4. Heavy ivy cover	Good	Sever ivy at base	20+	B1	8.6	234.5

SURVEYED BY A.T. COOMBES ASSOCIATES LTD

# denotes estimated dimensions due to lack of access to tree

APPENDIX 1-
TREE SURVEY SCHEDULE

SITE: THE GROVE, CROMER ROAD, HOLT

SURVEY COMPLETED: FEBRUARY 2018

1	2	3	4	5	6				7	8	9	10	11	12	13	14	15	16
Tree No.	**Species**	**Ht (m)**	**Stem dia (mm)**	**No of Stems**	**Branch Spread**				**Height and Direction of First Branch (m)**	**Mean Canopy Ht**	**Life Stage**	**Physiological Condition**	**Structural Condition**	**Preliminary Tree work**	**Estimated remaining contribution (Yrs)**	**Cat grading**	**Radius of RPA (m)**	**RPA (sq m)**
					N	**E**	**S**	**W**										
T15	Sycamore	19.0	700	1	6.5	6.3	6.5	6.5	4.0 E	4.0	M	Fair - Competition with G4. Heavy ivy cover	Good	Sever ivy at base	20+	B1	8.4	221.7
T16	Sweet Chestnut	17	400	1	3	1.5	2	6	5 W	5.0	M	Fair-thin crown	Mod-some large diameter dead wood in crown. Lost top	No work	20+	C2	4.8	72
T17	Beech	21	710	1	5.0	5.0	5.0	5.0	8 S	8.0	M	Good	Moderate-tight union at 6m	No work	20+	B2	8.5	228
T18	Beech	24	900	1	11.0	9.0	10.0	10.0	5 N	8.0	M	Good	Good	No work	40+	A2	10.8	366
G1	Tree Group	13.0	350	1	4.0	4.0	4.0	4.5	1.0 S	2.0	SM	Good	Good	No work required	20+	C1	4.2	55.4
G2	Mixed Woodland	18.0	650	1	8.0	8.0	8.0	8.0	3.0 S	3.0	M	Good	Good	No work required	20+	A2	7.8	191.2
G3	Smaller Woodland Trees	15.0	300	1	4.0	4.0	4.0	4.0	5.0 N	5.0	EM	Good	Good	No work required	20+	B2	3.6	40.7

SURVEYED BY A.T. COOMBES ASSOCIATES LTD

# denotes estimated dimensions due to lack of access to tree

Appendix 2: Notes on the Column Headings in Appendix 1

Col#	Title	Notes
1	Tree No.	Tree numbers to correspond with those shown on the TCP.
2	Species	Each tree has been identified and the common name given in each case.
3	Ht (m)	Height of the tree
4	Stem dia (mm)	The stem diameter measured in millimetres at 1.5 metres above ground. For multi-stemmed trees the stem diameter has been calculated according to the formula given in BS 5837:2012: For trees with up to 5 stems, each stem has been measured at 1.5m, squared and added together. The diameter shown is the square root of the total. For multi-stemmed trees with over 5 stems a sample of five diameters has been taken at 1.5m, averaged and squared, then multiplied by the total number of stems. The square root of this sum gives the stem diameter figure.
5	Number of Stems	Total number of stems on the tree.
6	Branch Spread	The branch spread measured in metres from the stem to the tip of the outer branches has been measured in four directions of the compass North, South, East and West.
7	Height and Direction of First Branch spread (m)	First significant branch and direction of growth (relative to the four cardinal compass points).
8	Canopy Ht	Mean height of the canopy above ground level.
9	Life Stage	The life stage of the tree has been assessed into one of the following categories: Y =Young, SM = Semi Mature, EM = Early Mature M = Mature, OM = Over mature and V=Veteran.
10 and 11	Condition	The British Standard recommends that a note is made of the structural and physical condition of the tree.

Col#	Title	Notes
12	Preliminary Management Recommendations	This column includes all work considered necessary to, as far as is practicable, ensure health and safety and for the good arboricultural management of the trees. These works are not associated with the development proposals. All work to be carried out to BS 3998: 2010 "Tree Work-Recommendations". Recommendations given in respect of Health and Safety remain current for 12 months from the date of this assessment after which further inspection is recommended. It should be noted that trees are dynamic structures subject to the forces of nature, which can fail without showing external symptoms.
13	Estimated remaining Contribution (Yrs)	The estimated remained contribution of each tree in years has been assessed, using personal experience, into the following groupings: < 10 = Less than 10 years 10+ years = More than 10 years 20+ years = More than 20 40+ years = More than 40 years
14	Category grading	U = Those in such a condition that any existing value would be lost within 10 years and which should in the current context, be removed for reasons of sound arboricultural management. (Trees that have serious, irremediable structural defects, such that their early loss is expected due to collapse or ill health including trees that will become at risk due to the loss of other U category trees). **A** = Those trees of high amenity quality and value in such a condition as to be able to make a substantial contribution (A minimum of 40 years is suggested) 1) Trees that are particularly good examples of their species if rare unusual or essential components of groups or formal or semi-formal arboricultural features 2) Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views in or out of the site, or those of particular visual importance. 3) Trees groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran tree or wood pasture)

Col#	Title	Notes
14 cont	Category grading cont	**B** = Those of Moderate quality and amenity value: those in such a condition as to be able to make a significant contribution (a minimum of 20 years is suggested) 1) Trees that might be included in the high category but are downgraded because of impaired condition (e.g. remediable defects) 2) Trees and woodland that form distinct landscape features but are not essential components. 3) Trees with clearly identifiable conservation or other cultural benefits. **C** = Those of low quality and amenity value currently in adequate condition to remain until new planting is established (minimum of 10 years is suggested) or trees under 150 mm stem diameter. 1) Tree not qualifying in higher categories 2) Trees present in groups or woodlands but not with a significantly higher landscape value and or offering low or temporary screening benefit. 3) Trees with very limited conservation or other cultural benefits. Note: Category C trees are the least suitable for retention, where they would impose a significant constraint on the development their removal for development purposes may be considered acceptable by the LPA. Trees with a stem diameter under 150mm could be considered for relocation.
15	Radius of RPA (m)	The distance that would form the radius of a circular protection zone is given in metres calculated by multiplying the stem diameter given in column 4 by 12. The methods for calculating the stem diameter of multi-stemmed trees is given in section 4 above.
16	RPA (m^2)	The area of the RPA is given in square metres calculated by the following formula: Single Stemmed Trees; $$RPA\ m^2 = \left(\frac{(stem\ diameter\ mm\ @\ 1.5m \times 12)}{1000}\right)^2 \times 3.142$$ The methods for arriving at the stem diameter for multiple stemmed trees are described above in the notes for column 4.

Drawing Title:

Appendix 3 - Tree Constraints Plan

Site:

The Grove, Cromer Road, Holt

Client:

Lanpro

NORTH

To Scale 1:500 at A3

KEY

- A Category RPA
- B Category RPA
- C Category RPA
- U Category Tree
- Current Crown Spreads
- Ultimate Branch Spreads
- Shade Patterns

Drawn By: GR	Date: 13/03/18

TREE SURVEYS

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Drawing Title:

Appendix 4 - Tree Protection Plan

Site:

The Grove, Cromer Road, Holt

Client:

Lanpro

NORTH

To Scale 1:500 at A3

KEY

Construction Exclusion Zone	CEZ
Line of Temporary Protective Barriers	
Temporary Ground Protection	
No-Dig Surface	
Line of Pre-emptive Root Pruning	
Tree to be Removed	

Drawn By: GR | Date: 13/03/18

TREE SURVEYS

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Appendix 5: Arboricultural Method Statement for a Proposed Development at The Grove, Cromer Road, Holt

1. Scope of the Works

1.1 The document provides a methodology for protection of trees during the removal of a tennis court surface and construction of two new dwellings and associated car parking spaces at the above site and should be read in conjunction with the Tree Protection Plan Appendix 4 and Timetable for Protection Works Appendix 6.

1.2 The main features in the protection of the retained trees on site are as follows:

- Careful removal of existing surfaces
- Provision of temporary protective barriers
- Provision of temporary ground protection
- Pre-emptive root pruning
- Use of No-Dig surfaces
- Audited arboricultural site monitoring

1.3 A meeting between the site manager/main contractor and a consulting arboriculturist must take place prior to construction work commencing so that the above protection measures set out in this document can be discussed and agreed. At this point a list of contact details for all relevant parties will be produced and circulated including the Tree Officer of the Local Planning Authority.

1.4 Protective measures must be in place prior to any ground or construction works take place.

2. Timing of Works

2.1 Tree protection works will be completed as detailed below according to the attached timetable Appendix 6.

2.2 The exact commencement date is not known. However, the timetable provided gives the order that the works need to be implemented to ensure the trees are fully protected and states when specific arboricultural input will be required.

3. Tree Protection Barriers

3.1 Remaining trees will be protected by forming Construction Exclusion Zones (CEZ) as shown on Appendix 4 the Tree Protection Plan (TPP).

3.2 Temporary barriers will be erected as shown by the thick green lines on the TPP to form the Construction Exclusion Zone (CEZ). The barriers will consist of 2m tall welded mesh panels (Heras) supported on rubber or concrete feet. The fence panels should be joined together using a minimum

of two anti-tamper couplers installed so they can be removed from the inside of the fence. The distance between couplers should be at least 1m and be uniform throughout the fence.

3.3 Panels should be supported on the inner side by stabilizer struts which should normally be attached to a base plate and secured with ground pins. Where the fence will be erected on hard surfacing or it is otherwise unfeasible to use ground pins the struts should be mounted on a block tray.

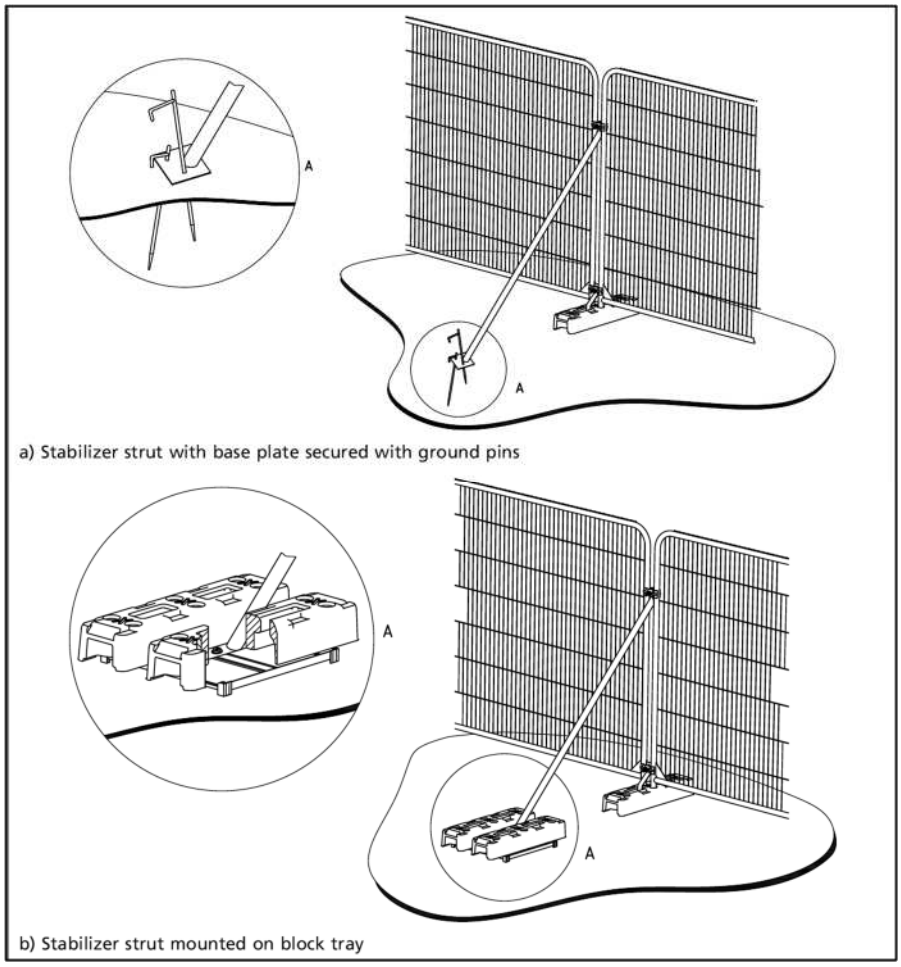

Fig 1: Temporary protective fencing as recommended by the British Standards (2012).

3.4 Figure 1 is an extract from BS5837:2012 showing the method of supporting the panels with ground pins and a block mounted tray for use on hard surfaces. Stabiliser struts should be fitted at each panel junction.

3.5 At least 15 all-weather notices should be erected on the barriers forming each CEZ stating "Construction Exclusion Zone – No Access ". These should face outwards towards the work area. Signs must be maintained in good condition and remain in place until completion of the works.

3.6 Barriers will be maintained throughout the duration of the works, ensuring that access is denied to the CEZ throughout the process.

4. Removal of Existing Surfaces

4.1 The existing tennis court surface will be removed prior to the development. Protective fencing, as set out in the AMS, will be put in place prior to the commencement of works to protect retained trees.

4.2 The surface removal work must be carried out very carefully and under arboricultural supervision. Hand held tools, or appropriate machinery (Such as an excavator fitted with a non-toothed ditching bucket) will be used, with due care and attention paid to any roots that may be underneath the surface. If roots are found, they must be covered with good quality topsoil to a depth no greater than 150mm within 24 hours.

4.3 Once the tennis court removal works have been completed, temporary ground protection (as outlined in section 5 below) will be put in place.

5. Temporary Ground Protection

5.1 Temporary ground protection will be required as shown on the TPP with orange crosshatching. The ground protection should be constructed as follows depending on the type of traffic that will use it:

- Pedestrian traffic only – a single thickness of scaffold boards on top of a driven scaffold frame to form a suspended walkway, or on top of a compression resistant layer (100mm woodchip) laid on top of a geotextile membrane.
- Light plant up to a gross weight of 2t, proprietary ground protection boards linked to one another on top of a compression resistant layer (150mm woodchip) laid on a geotextile membrane.
- Plant exceeding gross weight of 2t, a specification devised by an engineer will be designed in conjunction with the arboricultural consultant to support the loading that the ground will be subjected to.

5.2 Compaction of the soil can occur from a single pass of a heavy vehicle, especially in wet conditions, and therefore the ground protection must be put in place before any access is allowed.

6. Pre-emptive Root Pruning

6.1 Pre-emptive root pruning will take place just outside the edge of the new car parking area to minimise injurious damage to the root system of the neighbouring trees whilst excavating. The position of this work has been shown as a thick light blue line on Appendix 4 – TPP.

6.2 This will be carried out by excavating a trench at most 500mm outside the line of the road edge in the area shown on the TPP using hand tools or an airspade. Any roots found during this excavation will be severed using a sharp handsaw or secateurs. This will ensure that the roots are not ripped or torn, and will have a good point from which to re-grow, and will have a chance to occlude and prevent fungal pathogens from entering.

6.3 This work will be carried out by a suitably trained operative or under arboricultural supervision.

7. Hard Surfacing within the RPA of Retained Trees

7.1 The areas for hard surfacing shown cross hatched in purple on the Tree Protection Plan Appendix 4 require a No-Dig method of construction. Within the hatched zone no excavation is allowed.

7.2 A hard surface should be designed to avoid localized compaction by evenly distributing the load over the path or car parking space. The proper source of advice on a finished design are the structural engineers for the project to ensure it is fit for the intended loading and ground conditions. The design must also take full account of arboricultural advice. Appropriate methods include three dimensional cellular confinement systems or in some circumstances engineered solutions. The key element is that there will be no excavation.

7.3 In this situation it is likely that a three dimensional cellular confinement system constructed without excavation will be the best solution. Figure 2, below, shows a typical construction method of such a No-Dig surface using Cellweb produced by Geosynthetics. It should be noted that there are other manufacturers of cellular confinement systems.

7.4 It will be important ensure that the surface design merges with the level of the other sections of the road. An appropriate depth of confinement system should be chosen and if necessary ramps to smooth out level changes should be constructed.

7.5 Figure 2 shows a typical construction of a No-Dig surface using Cellweb. This example has block paving as the top surface but gravel and a range of other permeable surfaces can be used.

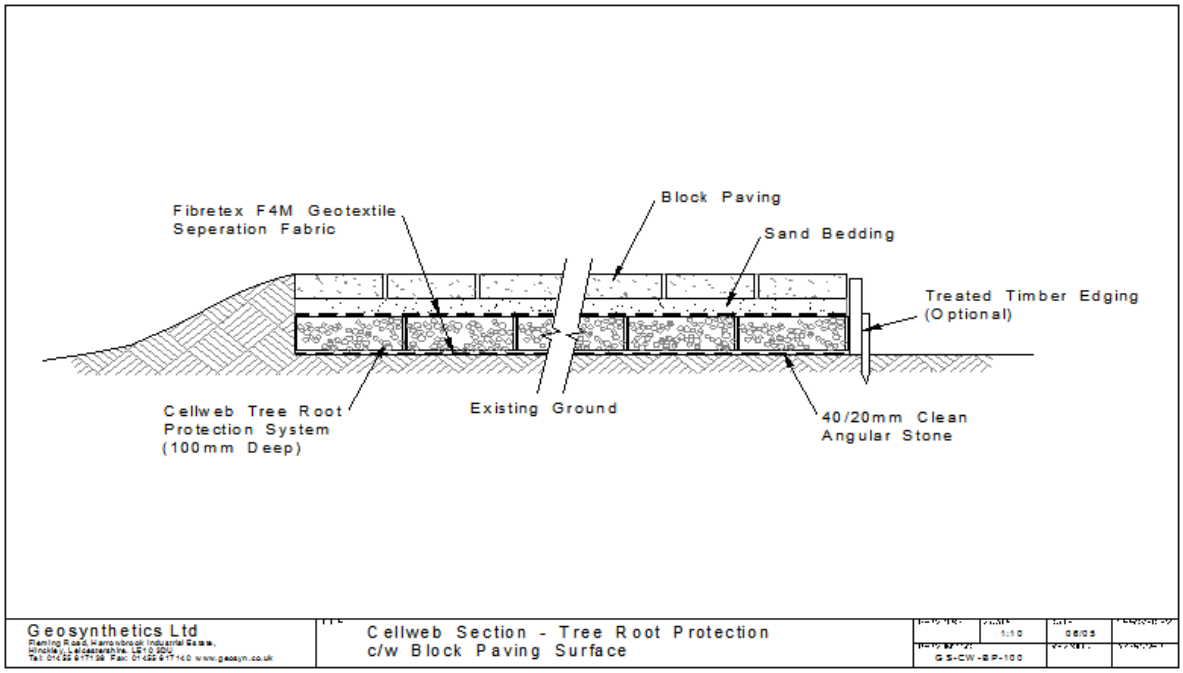

Fig 2: Example of No-Dig surfacing as illustrated by Geosynthetics Ltd.

7.6 The following methodology should be used for the installation of a No-Dig Surface.

a) The construction must be undertaken in dry weather. There will be no machine movement within the RPA of the trees before the ground is protected by a load spreader and sub-base.

b) Any major protrusions such as flints will be removed prior to commencement. Any hollows will be filled with clean sharp sand prior to laying a fibretex F4M separating geotextile.

c) The Cellweb panels will be extended to the full length and pinned into place with staking pins to anchor the cells open. Adjacent panels will be stapled together to form a continuous mattress. The surface must be located at least 0.5m from the base of the retained trees.

d) The mattress will be edged with treated softwood edging boards of sufficient width to accommodate the infill material and held in place with pegs at a minimum spacing of 500mm.

e) The cells will be filled with a minimum of 100mm of no fines angular granular fill (40 to 20mm). The infill material to be piled at the end of the extended web and pushed over the expanded cells working off the infill material. No machinery will encroach on the ground unless supported by the infill material.

f) It is recommended that the No-Dig surface is not used for construction traffic. If it is, a sacrificial layer of stone should be laid on another geotextile membrane and scraped off at the end of the construction to form the final surface.

g) To lay the final surface a second layer of Fibretex F4M Geotextile separation fabric will be laid over the in filled Cellweb sections. Then a layer of sharp sand will be laid and compacted with a vibro-compactor plate prior to laying block paver or concrete blocks dry jointed. A range of other surface finishes can be used. However the final surface must be permeable to allow continued water and gaseous diffusion.

8. Site Huts and Temporary Buildings

8.1 All site huts and temporary buildings will be sited outside the CEZ.

9. Additional Precautions

9.1 The movement of plant in proximity to retained trees should be conducted under the supervision of a banksman to ensure adequate clearance from the branches of the trees. Hydraulic cranes, forklifts, excavators or piling rigs (other than small rigs used for mini piling) must be avoided in the immediate vicinity the crown of the trees.

9.2 Cement, oil, bitumen or any other products which spillage would be likely to be detrimental to tree growth should be stored well away from the outer edge of the RPA of retained trees. Precautions should include ensuring all toxic liquids are stored in fully bunded containers. Equipment such as barriers or sandbags must be available on site to deal with any accidental spillages that may occur.

9.3 Lighting of fires on site should be avoided. Where they are unavoidable they must be at such a distance from retained trees that there is no risk of the heat causing fire damage to the trunk or branches. Full account must be taken of wind direction. Fires must be attended at all times until they are completely extinguished.

10. Service Trenches

10.1 No details of new service runs have been provided at this stage. They should be routed to avoid the RPAs of trees. If this is not possible, special techniques must be employed to place the services within the RPA of the trees. The British Standard suggests a range of trenchless methods suitable for various applications including microtunnelling, surface launched directional drilling, Pipe ramming and Impact Moleing/thrust boring. It is important common ducts should be used where it is not possible to avoid the RPA. Further guidance on installing underground services adjacent to trees can be found in the NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Volume 4 Issue 2). This document outlines a number of techniques that may be used for trenching near trees, including trenchless techniques, discontinuous trenching and hand digging.

10.2 It will be necessary to prepare detailed plans for these services that should be produced in conjunction with an arboriculturist, and include allowance for the space needed for access for the installations, and the levels across the proposed area.

10.3 Any overground services including CCTV must also be positioned to avoid the need for any regular or detrimental pruning to the trees.

11. Arboricultural Supervision and Aftercare

11.1 Arboricultural/site monitoring will be carried out throughout the construction phase by a nominated arborist who will be responsible for consultation with the Local Authority's Tree Officer.

11.2 The arborist will complete regular site visits to check that the tree protection measures are being carried out. The frequency of the visits will be dictated by the level of activity and degree to which the tree protection measures are being respected. A note of the date of each visit and a summary of the findings will be forwarded to both the Tree Officer and the Main Contractor to provide an audit trail enabling the proper implementation of the tree protection measures to be checked and verified.

11.3 There are five key stages where on-site arboricultural advice will be needed

- Prior to commencement, to review the contents of the AMS, and deal with any queries the main contractor may have.
- To confirm that the protective fencing and ground protection is in place.
- To supervise the removal of the tennis court surface
- To carry out pre-emptive root pruning
- To ensure the No-Dig surface is put in place satisfactorily.

11.4 On completion of the works the trees will be inspected by the arborist to check the condition of the trees and advise if any remedial work is necessary.

A.T. Coombes Associates Ltd
16 March 2018

Appendix 6: Timetable for Tree Protection Works at The Grove, Cromer Road, Holt

Item	Operation *	Before Commencing Construction Works	During Construction Works	On Completion
1.	Carry out a pre-commencement site meeting to discuss any tree protection matters arising, including identifying those trees to be removed	X		
2.	Carry out tree work as detailed in Appendix 1.	X		
3.	Erect temporary protective fencing (thick green line) on edge of the CEZ as specified in the AMS and TPP.	X		
4.	Erect warning signs on fencing around each CEZ stating “Construction Exclusion Zone - Keep Out”.	X		
5.	Maintain Protective fences and signs in good condition.		X	
6.	Carefully remove tennis court surface		X	
7.	Put temporary ground protection in place		X	
8.	Carry out pre-emptive root pruning			
9.	Construct No-Dig surface		X	
10.	Arboricultural supervision and advice including site visits during the course of the works to check the CEZ and liaison with the Local Authority.	X	X	X
11.	Remove protective fencing			X
12.	Check condition of the protected trees and consider if remedial works are necessary.			X
	** All work to comply with the attached Arboricultural Method Statement and BS5837: 2012 Trees in relation to design, demolition and construction - Recommendations"*			