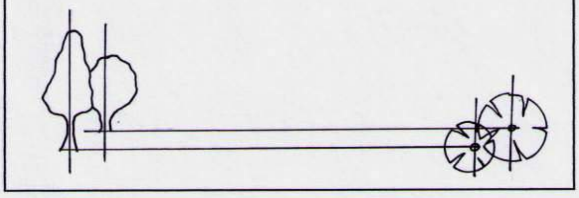
Arboricultural Impact Assessment, Tree Protection Plan and Method Statement Site at Terrington Distribution Centre, Benns Lane, Terrington St Clement (for new roadside footway)

C. J. Yardley, Landscape Survey, Design and Management.

Thorpe Cloud, Creake Road, Burnham Thorpe, Kings Lynn, PE31 8HW 01328 738705

chris.yardley@cjyardley.co.uk



July 2015. Rev A

Contents

1. Introduction

1.1. This report is intended to assess the implications for existing trees and hedges within and surrounding an area of roadside verge between the Terrington Distribution centre and Benns Lane in Terrington St Clement. The development concerns the construction of a new roadside footway located as shown on the plans. The development proposals are as indicated on the plans 1538/Arb with arboricultural information added July 2015 and developed from plans by Create Consulting Engineers Ltd. The survey area concerns only the verge area and those trees and hedging plants which are adjacent to it and which might be affected by the proposed development of a new footway. The report was commissioned by Terrington Distribution Centre (Messer's Sutton).

N. B. This survey is not intended to be a tree condition survey and should not be used to identify tree hazard/risk or provide information for risk indemnity purposes.

1.2. This report is based upon the recommended procedure outlined in the revised version of the British Standard (5837:2012) and is compliant with the scope and requirements of the Hedgerow Regulations 1997. The procedure requires that a survey of all the trees on the site is conducted which includes consideration of the following:

- The location, species, height, crown spread, condition, likely future development and projected lifespan (where appropriate) of all the trees on or adjacent to (and thereby potentially impacted on by any proposed development) the proposal site.

1.3. This data is then used to produce plans and document showing;

1. The Root Protection Area (RPA) for each tree based upon a formula (Diameter of trunk at 1.5m height in mm x 12 shown as a radiused circle from the base of the tree with or as a formula based on trunk diameter x number of trunks in the case of multiple trunked trees. The RPA may be offset or altered only for certain existing physiological issues within the growth area of the tree. The area of the rooting zone will not be less than that calculated.

2. The Tree Constraints Plan (TCP) - showing the RPA + any relevant other information such as tree shading issues / future growth potential of the trees.

3. The factors contained in the TCP are intended to inform the layout of the development proposals. The TCP is not a development exclusion zone, but imposes certain constraints and restrictions (in order to achieve the BS) on what can and cannot be constructed within the zones.

4. From the TCP and any submitted development layout, the arboriculturalist is intended to produce an Arboricultural Implications Assessment. This document uses the data produced to assess the risk of damage to the trees both during construction and into the future. Liveability issues should also be considered within this survey.

5. A Tree Protection Plan (TPP) will then be drawn up to show the finalised layout of the site development plan together with the location of all the trees to be removed / retained and the location and nature of any protective fencing. This will be in plan form and will constitute part of any future Arboricultural Method Statement.

6. Finally an Arboricultural Method Statement (AMS) may be required to be produced to say how any works which may impact on tree health will be undertaken to ensure that they minimise damage and comply with the standards set in the BS.

The survey was carried out on 2nd July 2015 by C.J Yardley and represents a consideration of the condition of the site and trees at that time.

1. 4. Site Description.

1.4.1. The site is located to the north eastern side of the extended village of Terrington St Clement. The property stands within a large enclosed area and comprises a range of buildings which are set well back from the roadway. The site which is the focus of this survey is located on the eastern side of the main Centre site and forms the eastern boundary zone to the property adjacent to Benns Lane.

1.4.2. The roadside verge area comprises a grassed verge which varies considerably in width from approx 1.2m to over 7m and which is separated from the site by at times; a dry ditch approx 2m wide and 1m deep, a mixed hedge, a conifer hedge and mixed hedge and strands of barbed wire. Beyond the hedge and fencing wire area is a zone of dense vegetation containing other mixed shrubs and some trees. Tall ruderal vegetation is present where there is no shading both on the verge and within the site

1.4.3. The area of Benns Lane comprises a small rural lane which has been partly upgraded in the area near the Centre for the development of local authority type housing which is positioned to the eastern side of the Lane. There is an existing footway on the eastern side of the Lane which extends to the north and connects to other footways in the roadway to the north of the site, but ends at the southern end of the housing land (approximately opposite to the end of the Centre site).

1.4.4. The site is shown in the photograph overleaf (from Google Earth) dated 2007. The Green Line shows the survey area extent of Benns Lane

Site in 2007.

1.5. Development Proposal for Site

1.5.1. The development concerns the construction of a 1.5m wide footway alongside the area of Benns Lane. The development is as shown on the plans by Create Consulting Engineers Ltd.

1.5.2. The works are assumed to be limited to an excavation of approx 150mm depth of the existing verge and the installation of new drop kerbing (the roadway edge has an existing kerb) where necessary, together with the culverting of the existing ditch and or a combination of this process and setting back the ditch into the site by digging a new ditch slightly further to the west, and construction of a pathway over this feature, where the width of the verge necessitates this. A new post and rail fence is to be erected on the line of the ditch and or site boundary as necessary for safety

1.6. Current Ground Cover and Boundary Treatments

1.6.1. The site comprises a grassed verge with tall ruderal herbs and at various points, a ditch (dry) containing ruderal herbs and bare earth. The edge of the roadway has an existing kerb. The boundary varies between informal hedging and more formal hedge and wire strand type fencing.

1.7. Levels

1.7.1. The site is more or less level

1.8. Soil Type

1.8.1. The soil type across the site is deep silts and is likely to be shrinkable. Development structures close to trees will need to take the potential of the land to heave or shrink into account in the design of relevant footings / features.

1.9. Trees on/adjacent to the Site

1.9.1. There are 31 trees and six hedge types / groups on and adjacent to the site, some of which are proposed to be protected by suitable protective fencing or construction methodology over their rooting area during the construction process to the requirements of BS5837:2012.

1.9.2. As far as can be ascertained, the trees are not within a Tree Preservation Order (at present). The site is not within a Conservation Area and therefore is not subject to the Conservation Area Regulations as affecting trees. It is not known if the trees are subject to any residual Planning Condition affecting their retention or management. These factors are not fixed and may be liable to change, and it is therefore recommended that prior to any works commencing on trees on the site above or below ground (including excavating trenching for services or installing surfacing) that reference is made to the Council to ascertain if consents are required.

1.9.4. The boundary hedges adjacent to the eastern boundary of the site have been assessed in relation to the Hedgerow Regulations 1997. The northern sections of the boundary adjacent to an existing house are part of or adjacent to domestic curtillages and are therefore exempt from the Regulations. The southern sections of boundary are more ambiguous and we would suspect that unless a formal change of use of the land from agriculture to other usage has been made, this hedge would be considered relevant for the Regulations. Application to remove the hedge would therefore require notification to be made to the Borough Council (the submission of this report as part of a Planning Application constitutes such notice) and the Council may require appropriate assessment of the hedge in relation to the Regulations.

Local Policies

1.9.5. The Borough Council has planning policies in place to protect important trees as part of the planning process (by the serving of Tree Preservation Orders or placing of Planning Conditions on Permissions) as part of planning policy within the emerging Local Plan (formerly LDF) Development Control policy structure.

1.9.6. Normally accepted scope of inclusion of trees to 15m from the site boundaries have been included in this survey unless otherwise agreed due to relevance.

2. Tabulated Assessment of the Trees on the Site - Tree Constraints Details

2.1. The trees on the site have been assessed in relation to the provisions in the BS and the information is presented in tabular format. The tables include all the relevant data required to asses the constraints (in construction terms) that the trees present and this data has been used to develop the Tree Protection Plan which accompanies this document. Details of the features included in the data collection and assessment are set out below in the Notes.

Notes on Tables

- All measurements are given in metres.

- 'DBH' is the diameter of the trunk/s at breast height (1.5m)

- Crown Spread is the limit of the crown of the tree at its maximum and is recorded as a diameter. On the plans the crown spread is shown in its actual form i.e. frequently asymmetrical.

- Age Class is assessed and described as set out in BS 5837 Table 1, where; Young Trees are aged less than 1/4 life expectancy; semi-Mature Trees are between ¼ and ½ life expectancy; Early Mature Trees are over ½ life expectancy, Mature trees are over 2/3ds life expectancy and Over Mature are effectively in decline.

- Tree Vigour is assessed as being either Good, Fair, Poor or Dead as set out in BS 5837

- Root Protection Distance (as shown as a dashed and dotted line on accompanying plans) is assessed based on the BS 5837 section 4.6 based on the diameter of the trunk at 1.5m height in mm x 12 and shown as an area based on the premise that the distance - diameter x 12 = radius of circle of RPA area. Trees with more than one stem are calculated differently. Trees with 2 - 5 stems are calculated as the square root of the combined (added) stem diameters all of which are individually squared. For more than five stems, the result is the square root of the mean stem diameter squared which has been multiplied by the number of stems.

- Canopy Spread is shown at the four cardinal points and is also shown as a constraint (continuous or repeated line on accompanying plans).

- Shading issues (as described in Section 5.3.1) are shown on accompanying plans as a 'segment with its centre at the centre of the tree and radiating outwards as straight lines to the north west and east with the area between them radiused with a dashed line.

- The Useful Life Expectancy of the tree is shown in periods ranging between <10 yrs, 10+, 20+, 40+yrs (in accordance with Section 4.4.2)

- Where any work that may, in the opinion of the surveyor, be required to the tree in order to enable the proposed development to take place, or where changes to the use of the land (i.e. to garden) may change the risk posed by the tree/s, such work is indicated in the Comments section of the table. All work recommended will accord to BS 3998:2010, and be based on the principle that the tree takes primacy over the proposed development (unless it is adjudged to be of poor amenity value), and works will only be recommended that accord with the retention of the tree in good health.

- Tree Retention Category this is the product of the surveyor's opinion of the importance of the tree in terms of its individual features. The assessment is made on the basis of the criteria set out in BS5837:2012 and is described in the Table 1 summarised from the British Standard on the following page;

Table 1 **Cascade chart for tree quality assessment**

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U 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 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see **4.5.7**.*			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

Table 1 -

How to read the tree table -

The tree table below is split into sections which detail the height, spread and form of the tree together with other important information relating to the diameter of the trunk - DBH - (which provides the data for determining the root protection area (RPA)), age class of the tree (what stage of its development it has reached); its condition and the amenity contribution that it makes together with its formally assessed 'retention category' or amenity rating (see table 1) as assessed using the BS criteria. These factors are used to provide the data which is transposed onto the development plan and which provides the 'Tree Constraints' on this plan. The data is then used to help determine our assessment of the impacts of development, the location of any tree protection and any remedial measures which will help to protect and ensure the health and retention of those trees which are shown to be retained after the development is completed

Tree No. The number given to each tree on the plan	**Species** Given as the common name unless the Latin name only is known	**Height Metres** The height of the tree	**Crown Spread metres** The spread of the tree either as a radius from the centre (to each cardinal point N, S, E or W) or as a diameter where this is acceptable	**DBH mm /Radius RPA m** The 'diameter of the trunk at breast height' - this is used to work out the radius of the root protection area (in metres)	**Vigour / Age Class** The vigour is either low or normal. The age class varies from Young to Over Mature in five more or less equal sections relating to the five 'stages' of development of the tree - varies with the species as to how many years this may be.	**Condition / amenity contribution / under crown clearance** A broad guide to the condition of the tree from a superficial ground level inspection. The condition rating is not to be used for health and safety purposes and is not a substitute for a detailed tree condition survey but will indicate the approximate condition of the tree and highlight any major faults if clearly visible. Where these are not visible (ivy obscuring the trunk) this may be highlighted. It is always advisable to have a formal tree condition survey for indemnity purposes. Amenity contribution highlights any special amenity value that the tree/s may present Under crown clearance is intended to provide a guide to allow assessment of whether or not crown lifting would be needed to gain access beneath the tree for development or other purposes	**Retention category** The formal British standard amenity classification which ranges from 'A to U' see Table 1

Terrington Distribution Centre - roadside footway on Benns Lane.

Tree No.	Species	Height metres	Crown Spread metres	DBH in mm	Vigour / Age Class	Condition / first main branches (N, S, E, W) and minor bough outer canopy clearance	Retention category
T1	Willow	12	12	400	N/M	Set back from road – kerbed edge to road. CC 5m.	B2
G2	Leylandii	5	2	Av. 100	N/SM	Hedge with barbed wire attached.	
G3	Hazel/ Field Maple	6	4	200	N/SM	Set back 4m from road. Appears to form a second line behind conifers. CC 4m.	B2
T4	Willow	12	12	350	N/M	Set back from road – kerbed edge to road. CC 5m.	B2
T5	Willow	12	12	350	N/M	Set back from road – kerbed edge to road. CC 5m.	B2
T6	Willow	12	10	400	N/M	Set back from road – kerbed edge to road. CC 5m.	B2
T7	Willow	12	12	400	N/M	Set back from road – kerbed edge to road. CC 5m.	B2
G8	Hawthorn/ Blackthorn/ Hazel	5	3-4	Av 150	N/SM	Mixed hedge. CC 1-3m over ditch.	B2
T9	Willow	12	12	400	N/M	Set back from road – kerbed edge to road. Just on edge of ditch. CC 4m.	B2
T10	Willow	6	6	200	N/Y	Fair – growing in bottom of ditch.	C2
T11	Willow	12	12	400	N/M	Fair. CC 6m.	B2
T12	Willow	12	12	3 x 250	N/M	Set back from road – kerbed edge to road. CC 5m.	B2
T13	Willow	12	12	400	N/M	Set back from road – kerbed edge to road. CC 7m.	B2
T14	Willow	12	12	400	N/M	Set back from road – kerbed edge to road. CC 7m.	B2
T15	Willow	12	8	300	N/M	Set back from road – kerbed edge to road. CC 7m.	B2
T16	Willow	12	10	2 x 300	N/M	Set back from road – kerbed edge to road. CC 5m.	B2
T17	Willow	12	10	400	N/M	Fair – grown leaning SE over ditch and road. CC 5m.	
T18	Willow	11	10	400	N/M	Fair – grown leaning E over ditch and road. Recommend pollard. CC 4m.	
T19	Willow	11	8	300	N/M	Set back from road – kerbed edge to road. CC 5m.	B2
T20	Willow	11	9	300	N/M	Set back from road – kerbed edge to road. Planted on edge of ditch. CC 5m.	B2
T21	Willow	12	10	400	N/M	Set back from road – kerbed edge to road. Planted on edge of ditch. CC 4m.	B2
T22	Willow	10	8	300	N/M	Set back from road – kerbed edge to road. CC 5m.	B2
T23	Willow	12	8	300	N/M	Set back from road – kerbed edge to road. CC 5m.	B2
T24	Willow	12	10	400	N/M	Set back from road – kerbed edge to road. CC 4m.	B2
T25	Willow	12	12	600	N/M	Set back from road – kerbed edge to road. CC 4-5m.	B2
T26	Willow	12	10	400	N/M	Set back from road – kerbed edge to road. CC 7m.	B2
T27	Willow	12	10	400	N/M	Set back from road – kerbed edge to road. Large SE lateral bough over road – reduce back to prevent failure. CC 5m.	B2
T28	Willow	12	10	400	N/M	Set back from road – kerbed edge to road. Bough at 1.5m cut	B2

Tree No.	Species	Height metres	Crown Spread metres	DBH in mm	Vigour / Age Class	Condition / first main branches (N, S, E, W) and minor bough outer canopy clearance	Retention category
						back to ditch (250mm dia.) edge. CC 5m.	
T29	Field Maple	8	8	250	N/M	Reasonable. CC 4m	B2
T30	Willow	10	8	300	N/SM	Fair. CC 6m	C1
T31	Willow	12	12	500	N/M	Set back from road – kerbed edge to road. CC 4m.	B2
T32	Willow	10	8	300	N/SM	Fair. CC 6m	C1
G33	Hawthorn	6-7	4-6	250+	N/M	An older section of hedge containing much older plants set at 2-3m intervals on W side of ditch but coming towards road edge by approx. 3m off road edge at 264m. Ditch no longer present. Some crown lifting needed over verge for footway – minor work only to lift it to 2.5m (crown clearance currently 1-2m) from 264m on – ends 272m.	B2
G34	Hawthorn 1 or 2 plants	6	5	250	N/M	Located on bank 1.5m from road – will need to be removed for path.	B2
T35	White Willow	12	10	Est. 500	N/M	Reasonable. CC 2.5m.	B2
T36	White Willow	12	10	500	N/M	Reasonable. CC 5m.	B2
G37	Hawthorn & Elder	5-7	4-6	Est. 300	N/M	An older hedge line set about 4m off road edge – no ditch. Ivy and Elder has developed up to read edge with crown clearance <1m. Hawthorn is set back at 2-3m off with the plants at 4m road edge. Does not appear to have ditch – but dumped rubbish. G37 ends at 377m where drive entrance located.	B2

Condition Key (Vigour / Maturity)

Vigour:	L	Low
	N	Normal
Maturity:	Y	Young
	EM	Early Mature
	SM	Semi Mature
	M	Mature
	OM	Over Mature

- Good condition – no obvious faults which would reduce the life expectancy of the tree, a good form with a full canopy.
- Reasonable condition. Some minor to moderate faults which will reduce the life expectancy of the tree or a tree with some degree of decline but which has good form and reasonable canopy density for the species.
- Fair condition. A tree with significant faults which will reduce the life expectancy. Probably with faults that require surgery and which will reduce the amenity of the tree. A tree with poor form and thin canopy.
- Poor condition. A tree near the end of its life or one with sever faults which may be correctable with surgery or may not but which will probably leave the tree in a form which is poorly structured.

3. Arboricultural Implications Assessment of trees on the site from the details contained in Table 2 above

3.0.1. The trees and hedges on and adjacent to the site are distributed along the eastern boundary of a house and the Terrington Distribution Centre with Benns Lane. The main tree features are those associated with a random planting of Crack Willow trees which are set either just within or well within the boundary area of the site and between 3.5 and 7-8m off the edge of the roadway. These trees are fairly large and mature and form a strong feature to the Lane. They are accompanied by an existing range of hedging which forms (in part) the boundary to the site and which is set back from a roadside ditch (where this is present) and accompanied by fencing which may be attached to the plants. The boundary tends to wander between the edge of the roadway and further into the site. Where necessary, and due to the specific nature of the trees and constraints / development imposed, interpretation within the British Standard (5837:2012) Guidance has been made.

3.0.2. Development proposals contained on the plans 1538/Arb developed from plans by Create Consulting Engineers Ltd with arboricultural information added July 2015 shows the indicative route of the new pathway. The exact location of different features such as culverting and setting back of the ditch into the site are not indicated and therefore precise indications of the impacts of the development on trees and hedging cannot be assessed. The report therefore considers the potential likely impacts and indicates the scope of the impacts dependent upon the method of alteration fo the ditch (culvert or setting back) and the installation fo the path (width and construction method) used. The principle arboricultural issues concern to following main features

- The requirement to construct parts of the footway within the root protection areas of both the boundary hedging and nearby boundary trees

- The proposals have been identified as probably requiring partial infill and culverting parts of the ditch to allow the construction of a new footway to the appropriate width and these works to be within the root protection areas of trees and hedging as above.

- Alternatively and possibly in tandem with the culverting proposals, setting back of the ditch into the site may be an alternative solution and this is similarly discussed below

- The need to remove approx 3 Hawthorn plans near the southern end of the boundary to provide enough width to construct the new footway within the verge.

- The need to cut back some of the hedging to provide enough width to construct the new footway.

- A requirement to fence the new footway on the western side to prevent access to the site and or to provide safety to any unculverted sections of ditch.

3.0.3. These features have all been considered in detail in the following assessment process and have been used to develop protection and mitigation strategies which are included in the final chapter of the report ‘Tree Protection Plan and Method Statement’

3.0.4. The plan 1538/Arb developed from plans by Create Consulting Engineers Ltd with arboricultural information added July 2015 indicates the location and extent of

proposed development of the site. The location and canopy spread of the trees is also indicated together with the Root Protection Area. Additional information is added in the form of the location of protective fencing around the trees and special measures areas (for certain construction processes). This additional information forms the elements of the Tree Constraints Plan and Method Statement.

3.1. Overall Conclusions of the Amenity Value of the Trees on the Site/ Tree Constraints

3.1.1. Some indication of the relative amenity value of the trees on and adjacent to the site has been discussed above, this section provides additional detailed assessment of the site and the area.

3.1.2. The individual British Standard amenity classification value of the trees is appended to each tree in Table 2 and varies between tree/s / hedging which are of a high amenity value (as individuals) and shown as A1; moderate amenity value as individuals/members of groups of trees in a landscape context B1/2 and C2, trees which are of low amenity value. There are no unclassified 'U' value trees which are likely to be lost in the short term due to factors other than the proposed development.

3.1.3. The overall feature of the trees and hedging on the western side of Benns Lane and separating the site from the Lane forms a strong and important feature to the roadway. Within the local context, the overall effect of the whole feature is that of high amenity value. However, within this context, the individual components are only of moderate or low amenity value depending on their size and importance within the visual aspects of the boundary feature as a whole. Generally the larger Willow trees and better more mature sections of hawthorn hedge are classified as Moderate amenity value, and all other plants are low amenity value. The removal of some of these moderate amenity features would not significantly adversely affect the 'high' amenity of the feature as a whole but the removal of a large area would have an adverse impact. If a larger area were to be removed for the construction of other features (such as realignment of the ditch), it would be preferable to be able to replant new hedge and tree features nearby in order to maintain the overall continuity of the 'green' structure of this boundary area. If this were to be done then the impact on the amenity value of the feature would be largely retained and could in places be improved.

3.2. Future Development of the Trees.

3.2.1. This assessment has only considered those trees which in the opinion of the surveyor may be impacted upon by the proposed development (constrained).

3.2.2. The willow trees which are set back along the roadway are all mature but have future growth potential. They are approx 35 - 40 years old and will be likely to enlarge to increase in height from around 10 - 12m to around 15m over the next 30 years. Similarly, their spread will increase from a radius of 4 - 6m to over 8m if left to develop naturally. The development of a new roadside footpath will have little or no impact on these trees as their canopies are sufficiently high to avoid conflict with pedestrians and are clearly maintained to give a clearance of 5m over the roadway. The effect of the development on the future growth potential of the trees is therefore assessed as being NEUTRAL.

3.2.3. The hedging alongside the verge is again mostly mature but will tend to increase in spread over time. Regular maintenance is already being carried out to limit this spread and the construction of the new footway will reduce the width that this

spread can form before it impedes the footway by approx 2m. In most cases this will have a Neutral impact on the hedging but in a few places it will have a Minor Adverse impact where it restricts the development back to the trunks of the plants.

3.2.4. Overall, the impacts of the new footway on future growth of trees and hedging will be Negligible

3.3. Tree / hedge Removals and Replacements

Culverting Operations

3.3.1. If the development proposals were to include culverting the necessary areas of ditching which are too close to the roadway edge to allow construction of the new footway along the verge, this would require the infilling of the existing ditch area within the root protection area of the hedge / trees (which we assess as not requiring removal of any hedge or tree features) apart from the ones mentioned below;

1. T10 Willow - classified as low amenity value and which is growing in the ditch (will need to be removed to culvert the ditch) but would need to be removed anyway.

2. Parts of G33 where Elder plants which have self seeded within the verge and off the line of the hedge are impeding the construction of the new footway

3. G34 - approx 3 older Hawthorn plants which are growing within 1m of the edge of the roadway and which need to be removed to facilitate the development of the new pathway. The plants are classified as moderate amenity value but are replaceable further into the site.

Ditch Realignment Operations

3.3.2. If as an alternative in part or whole to the culverting operations for the spanning of the ditch areas which are too near to the roadway to allow the new footway to be installed on the existing verge width, the current ditch were to be moved back into the site, the impacts on trees and hedging would be different. These are discussed below.

1. The current location of the trees and hedge line along most of the route of the roadway is close to the western side of the current ditch. The current ditch provides a verge width between it and the roadway for approx 40 - 50% of its length (which is about 200m). Setting the ditch back into the site would require the removal of all of the hedge and trees located to the west of the ditch section to be set back, for a distance of approx 3m in the case fo the hedge (all of it) and those trees located within 4m of the ditch edge as formed (most of the willows). If space were to be provided to the west of the ditch feature which was sufficient to allow for replanting of the hedge and trees this would in time compensate for the loss of the tree and hedge features. A sufficient distance for such features is not able to be foretold without knowing the development type which may be located further to the west into the site.

3.3.3. There is also some opportunity to provide additional hedging planting to the few parts of the boundary where this is lacking but the degree of removals proposed for the new footway do not necessitate compensatory planting

3.4. Canopy Spread and Canopy Clearance Issues

3.4.1. The canopies of parts of the hedge (particularly the northern stretch of G2 - mostly Leylandii, parts of the hedge G8 which have developed a sub-structure on the eastern side of the ditch and effectively arch over the ditch and parts of G33 where canopies will need to be cut back to allow access. All the works are fairly minor in extent and will have no significant adverse impact on the main hedge features or plants.

3.5. Root Protection Area

3.5.1. The root protection area of trees is shown as a dotted and dashed circle around trees on the plan. The British Standard allows for some works to be undertaken within the RPA of trees subject to the assessment of a suitably qualified arboricultural surveyor but generally assumes that these will be minimal, peripheral and localised, and that the area of the RPA will be part of an exclusion zone (construction exclusion zone CEZ) around the trees which will be fenced off from all access during construction. Therefore, usually such an area will be closed off from works until any which are deemed acceptable (such as driveway constructions) actually need to take place and preferably at the conclusion of other developments on the site.

3.5.2. The development has considered the RPA of the trees and hedging on and adjacent to the site, and provided relevant guidance on the location of development features in order to avoid, where possible, intrusions into the RPA of trees, or where there are intrusions, to consider a suitable construction methodology to avoid unacceptable harm. The key points which are considered relevant are;

1. The development of the new footway will, in a number of locations, require excavation and installation of surfacing for the footway within the RPA of trees and hedging - this is discussed below. A suitable methodology for the installation of these features will avoid any undue damage to them.

2. The culverting of the existing ditch will be undertaken largely within the root protection areas of trees and hedging and this is discussed in more detail below

3. The construction of boundary fencing will need to be installed with suitable care to avoid damage to tree roots. A detailed installation method is included in Section 4 below.

4. The provision of protective fencing around areas which contain trees and hedging to be retained (principally the western and eastern boundary areas) will be required to prevent accidental damage to these features during the development process.

3.5.3. Impacts of proposed development on root protection areas - appraisal.

1. The proposed development as shown on the plans provided has been identified as introducing a number of minor to moderate root protection area intrusions as listed above. The nature and scope of these developments and their likely impacts upon tree and hedge plant health / stability is discussed below

3.5.4. Construction of Footway Surfacing

2. The new footway surfacing will need to be constructed within the root protection area of some tree and hedge plants along the route chosen. The locations are primarily where there is no drain between the verge and the hedge / tree (e. g. near the northern end of the site adjacent to G2 and G3 and G33 after 264m from the northern end of the site where the hedge comes closer to the road). In other locations where there is a drain present, the drain feature effectively provides a semi-root barrier to the development of roots in the upper part of the verge (but there are likely to be larger roots which extend under the verge at a greater depth having travelled beneath the ditch - probably under the road in some instances). In these areas, the work to install the surface will not impact on tree and hedge roots although nominally, the root protection areas 'extend' well over the verge zone.

3. The degree of excavation for the new footway will be approx 150mm to install a base of compacted TYPE1 road stone with an asphalt surface and a standard concrete flush kerb edge to the western side. The amount of root removed by this type of operation in areas where the ditch is not present will be moderate to significant (mainly for the hedge as the trees are located sufficiently far back from the roadway edge and the amount of the root protection area affected and the proximity to the base of the tree/s will all have reduced the impacts). Therefore, our assessment of the impacts of the works if carried out in a standard construction manner would be that they will have a moderate adverse impact on the hedge features (where there is no intervening ditch) and a minor adverse impact on the tree features. In both cases the impacts could be reduced to more acceptable levels by suitable working practices (both to Minor adverse) and in all cases we would assess that the longer term impact on the trees and hedges would be Negligible and that none would need to be removed or would demonstrate significant harm as a result of the works.

4. Section 4 (method statement) provides details of the suitable working method to be employed to avoid undue damage.

3.5.5. Culverting of the Drain

1. Where it is necessary to provide a culvert to the existing drain we are assuming that the works will be of the following type;

2. Provision of a sub-base using a TYPE 1 Washed road stone to bed the culvert pipe
3. Provision of a large diameter plastic culvert pipe in the base of the ditch and back fill over this with soil which will be compacted as necessary to provide a base for the footway (or which might be largely backfilled with TYPE1 road stone

4. Whilst this work will take place entirely within the root protection area of trees and hedging adjacent (in most places), the intrusion into the rooting area will be relatively minor. The ditch clearly wets and dries out regularly and this degree of moisture change affects the soil ecology significantly. Roots will be used to rapid changes of this type in this area and the change to a more stable (if more restricted and weighty) ground type will be relatively minor IF the infill sub base material is inert and does not contain salts and fine particles (the road stone will need to be WASHED as a matter of great importance)

5. The construction of a new footway on this raised and infilled ditch would raise no further impacts on the tree roots. It is likely that the sub base area will remain wet and that only a portion of the water will be carried by the plastic drain - this will retain the 'moist' ground conditions that the trees are no doubt used to.

3.5.6. Fencing

1. Fencing is unlikely to have a significant adverse impact but the works should be undertaken with due care to avoid undue harm where possible. A suitable methodology for its installation is set out in Section 4 below and mainly relates to choosing hole locations which do not remove large roots and lining holes with plastic DPM to prevent cement leechate contaminating the rooting zone.

3.6. Shading Issues

3.6.1. The issue of liveability - particularly shading and perceived tree hazard - to occupants' resident within the properties should be considered carefully. Whist these are not physical constraints to development of the properties, they should inform the nature of the development. The BRE have produced a considerable amount of guidance upon shading related issues which is distilled in two booklets (Environmental Site Layout Planning – Littlefair P. J. et al 2000; and Site Layout Planning for Daylight and Sunlight – a guide to good practice; Littlefair P. J 1991. The BS 5837:2012 makes reference to seeking guidance from these sources. However it remains as 'guidance' and does not confer rules even to the same degree as that for root protection areas, nevertheless they are good starting points for considering the relationship between housing, gardens and peoples reaction to trees within their proximity.

3.6.2. The main issues that tend to present with liveability of trees in relation to property are;

- Shading – direct and indirect light obstruction by trees.
- Overbearing and the 'fear' of trees falling or being 'close'

3.6.3. There are no shading or overbearing issues presented by this development proposal

4. Method Statement and Tree Protection Plan

4.0. The tree protection plan details set out below provide information on how to protect and avoid damage to trees on and adjacent to the site during and after the development of the proposed development to install the development. Damage to trees occurs in several main ways from this type of development and these are set out below.

- Tracking of vehicles over root protection areas
- Excavating within root protection areas
- Storage of materials within root protection areas
- Leakage of toxic chemicals within root protection areas - or near to them

- Physical damage to above ground parts of the trees by collision with vehicles or equipment

4.0.1. The tree protection plan therefore sets out to provide information which can be followed to avoid the risk of damage occurring, and / or where damage is inevitable (such as where vehicles have to cross over a root protection area of a tree) minimise the amount of damage occurring.

4.0.2. The tree protection operations below relate to specific items on the site in specific locations and this should therefore be read with the plans, as each area within the site is unique and presents different tree protection requirements.

4.0.3. These physical constraints have been taken into account as far as practicable, the relevant sections of the Tree Protection / Method Statement recommendations below. To a large extent, the constraints actively militate to assist in protecting trees by restricting the size and type of vehicle and construction process that can be used. The development requires a number of specific procedures and these have been considered in relation to the tree protection issues discussed in Section 3 above. The main points are set out in the summary below with each point being expanded upon in the following text;

4.1. Summary of Construction Method Processes in relation to Trees on and Adjacent to the Site

1. Prior to any other development commencing on the site, the existing trees and hedging proposed to be removed or cut back will be felled/reduced and cleared in accordance with the details below. This is to ensure that the removal of trees / hedging adjacent to other trees and hedging to be retained does not cause damage to the retained features.

2. On completion of the hedge / tree removals and prior to any other development commencing on the site - including site level changes and site clearance, protective fencing and or ground protection will be erected as a mobile feature which will protect those sections of trees / hedging which may be affected by development of the pathway at the point/s where the pathway construction is actually taking place (rather than providing a full length area of fencing along the full length of the pathway route when only part of that route is being developed at any one time.). This will ensure that the trees/hedging are protected adequately from accidental damage. The construction of the ground protection and fencing is detailed below.

3. The new footings, kerbing and parking areas which are to be constructed using conventional means will be installed as set out below.

4. The culverting of the existing drainage ditch (where required) will be carried out as set out below

5. New fencing will be installed as set out below

6. Finally landscaping will be carried out as described below

4.2. Trees and Hedge works and removals

4.2.1. Where hedging (sections of hedge which are growing within the line of the new proposed footway including plants associated with G8, G33 where these are on the

eastern side of the ditch or have developed outside the line of the main hedge, and G34 where these hawthorns are growing too close to the roadway to allow for the construction of a new footway) is shown to be removed will be undertaken as set out below;

1. The areas of plants shown to be removed will be dug out with care using a digger equipped with a toothless bucket (to avoid snagging roots) and a banksman will attend the site after removals to prune back exposed roots.

4.2.2. Areas of hedging to be cut back to allow space for the new footway will be cut back in accordance with BS3998:2010 by suitably qualified arborists or horticulturalists. The works will be limited to that which his necessary to give a 2.5m clearance to the height over the path and a 0.5m clearance beside the path

4.3. Protective Fencing/ Construction Exclusion Zone site Access.

4.3.1. At the completion of the works to reduce and remove trees and shrubs above but prior to the commencement of any development on the site including site clearance or demolition, ground protection and or temporary protective fencing will be installed on a 'roll out' basis for a distance of 10m either side of the working area developing the line of the footpath. This might include several 'working heads' or just one depending on the method employed. The fencing should be located no more than 0.5m west of the line of the new pathway. The ground protection should be adequate for the type of traffic it will be expected to accommodate. The fencing shall be either the existing boundary fencing (where this is in a suitable location/of a suitable type already) or to a specification as indicated in BS 5837:2012 and shall comprise weldmesh (Herras type) fencing attached to the ground by posts driven into it to hold the fence rigidly and semi-permanently during construction. Notices shall be attached to the fencing stating that no access, machinery, equipment or materials will be allowed within the fenced off area during the construction period..

4.3.2. The fencing must be retained for the full duration of the construction works (for the working area being worked upon at that time) with the following exceptions;

If works are necessary within the CEZs as part of the site clearance operations / other construction works WHICH ARE SPECIFICALLY REFERRED TO IN SECTIONS BELOW, then fencing can be removed temporarily for these operations to be carried out. The fencing must be replaced at the locations shown on the plans after the works are completed and retained for the remainder of the construction period.

4.3.3. No materials, chemicals, machinery or access shall be stored or gained within this fenced off area during the entire period of the subsequent development of the site.

4.3.4. All chemicals including cement, together with the mixing of cement, must be located on ground protection matting (plywood) with a plastic sheet beneath the matting to prevent cement or oil leechate contaminating the rooting areas of trees.

4.3.5. All construction access will be via the Benns Lane side of the site.

4.4. Construction of New Footings for Pathway

Footings Construction

4.1.1. Where shown to be constructed near tree roots, the footings for the new path will be installed as set out below

2. The footings will be dug using a mini-digger (only due to weight issues) equipped with a toothless bucket to a maximum depth of 150mm. A banksman will be on hand outside the digger to monitor the works and to stop them if roots are encountered.

3. The banksman will then sever the roots cleanly to the edge of the trench using a lopper or saw

4. Immediately following the completion of the excavation, the base and outer sides of the trench will be lined with an impermeable plastic membrane to prevent roots drying and to prevent cement leechate contaminating the rooting area.

5. The edges of the surfaced area will be demarcated by wooden edge boards held in place with wooden or steel pegs only. No other kerbing or similar will be used

6. A geotextile will be laid over the existing ground level and the area filled to the required depth for the surface with a WASHED TYPE 1 aggregate (to remove fine particles and salts which are toxic to roots) to provide a sub-base. The base may be lightly compacted with a hand held whacker plate.

7. Asphalt/block paving will then be laid over the surface in the conventional manner (with bedding layer of aggregate for block paving).

4.5. Installation of new Services

4.5.1. If new lighting or other services are to be located within the verge area then they should be installed to conform to the details below;

4.5.2. Prior to the commencement of development, the route, nature and depth of the services and any lamp posts etc, should be shown on a plan and submitted to the Borough Council to obtain written agreement of the location of installation and working methods to be employed in their construction. The details set out below indicate normal standards of excavation and installation which are likely to be required and which may form the basis of agreed methods of installation with the Council. These conform to the National Joint Utilities Group NJUG Publication No. 4 ‘Guidelines for the Planning and Installation and Maintenance of Utility Services in Proximity to Trees’ a summary of which is contained below and a copy of which is contained in the Appendix.

- All works within RPAs will be carried out by a suitably qualified persons experienced using hand excavation processes. (where works may require longer runs within more important tree root protection areas rather than as in this instance, close to them, an air spade will be used by suitably qualified Arboricultural Contractors to undertake the excavation works).

- Where possible, all roots over 10mm to be retained. No root over 20mm to be removed unless absolutely unavoidable. Where roots have to be removed, they shall be cut back flush with the sides of the trench. Where roots are retained and the trench to be left open for more than 7 hours, the roots shall be wrapped in either wet sacking or polythene to reduce moisture loss. The trench shall be infilled as soon as possible thereafter with the removed topsoil or a WASHED aggregate with no fines.

4.6. Fencing Installation

4.6.1. Where new fencing is to be located to the western side of the new footway and within the RPA of trees / hedging, it will be installed as set out below;

1. All fence posts will be hand dug. If roots over 20mm dia are encountered these will be retained and the fence post hole moved. Roots under 20mm dia may be severed cleanly with a lopper or saw

2. On completion of the digging of the holes, all holes will be lined with an impermeable plastic membrane prior to the pouring of concrete for the posts (a rubble sack is suitable)

4.7. Post Construction Landscaping Procedures

4.7.1. Following the completion of the construction of the development, when landscaping to the site is undertaken, special procedures will be carried out where these might conflict with trees. Where landscaping impinges within the Root Protection Area of trees to be retained, the following procedures will be adopted;

4.7.2. Only glyphosate based weed killers will be used on any surface vegetation. All use of weed killers will be restricted to pre-physical clearance of the area within the RPAs of trees to be retained in order to prevent spray contacting exposed tree roots.

4.7.3. All removals of existing landscaping, hedging etc will be carried out by hand operated machinery and tools only. The use of backactors etc to remove items will not be used. No excavation beyond that absolutely necessary to remove existing plants and structures (fence posts etc) will be used.

4.7.4. Following removals of existing landscaping, **no use of rotorvators will be undertaken within the RPA of trees, all levelling and tilthing will be carried out by hand to a maximum depth of 100mm.** Any importation of topsoil will be restricted to a maximum of 150mm above previous ground levels. No topsoil to be made up within 500mm radius of the base of any tree (to prevent ‘rotting off’)

Appendix

Inc;

Photographs of site trees

Schematic of protective fencing to BS 5837:2012 Type 2 versions as necessary

NJUG Guidance Note 4 - Installation of Services near trees

Arboricultural Impact Assessment Plan / Tree Protection Plan / Development Plan shown superimposed on plan 1538/Arb with arboricultural information added July 2015 Developed from plans by Create Consulting Engineers Ltd

Photographs of site features

Figure 1 - G2 and G3 near northern end of Benns Lane with no ditch feature - note also size and nature of Willows which are planted behind the hedge

Figure 2 - Detail of G2 showing kerb and verge and indicating how canopy of hedge will need to be cut back for pathway

Figure 4 - Area of trees (T17 and T18) which need canopies reducing on south east side. Ditch is present in verge area and will need to be culverted for normal path width construction

Figure 5 - Detail of ditch near above site

Figure Locations near T31 looking south - showing wider verge area

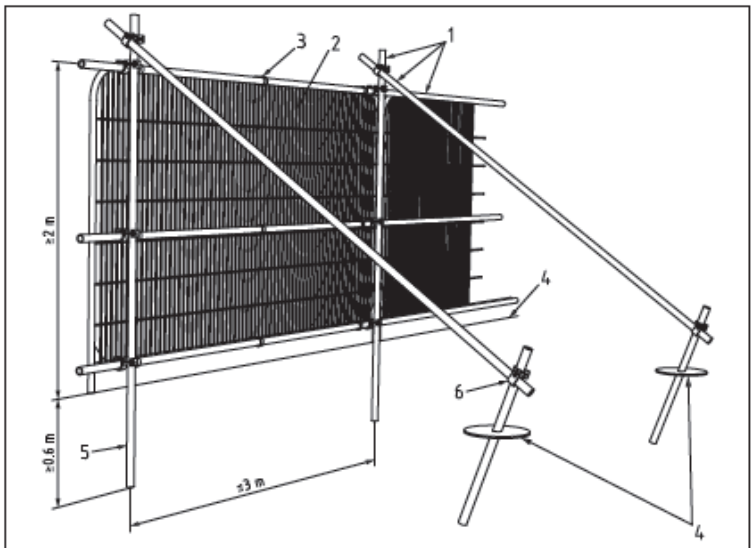
Figure 8 - As above - approx 40m south showing wide verge

Figure 9 - G34 to be removed

Figure 10 - G37 to be cut back and the canopies lifted. There is no ditch in this area and plants are large and older, so care will be required with footway installation as set out in Method Statement

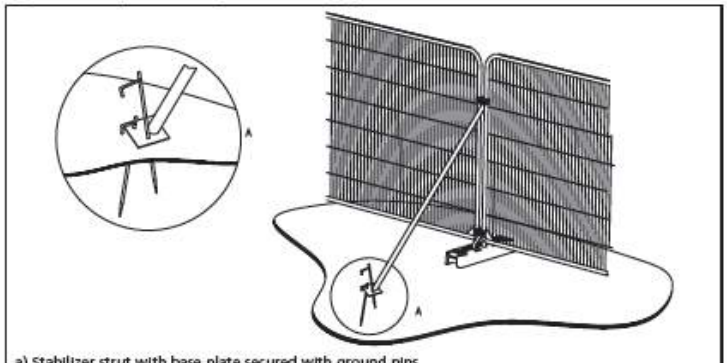
Tree Protection Barriers - Type 1 designs

The standard design which BS5837:2012 now requires as the ‘default’ design is shown below. In certain circumstances (where there is hard surfacing or other physical features which prevent the use of this type)

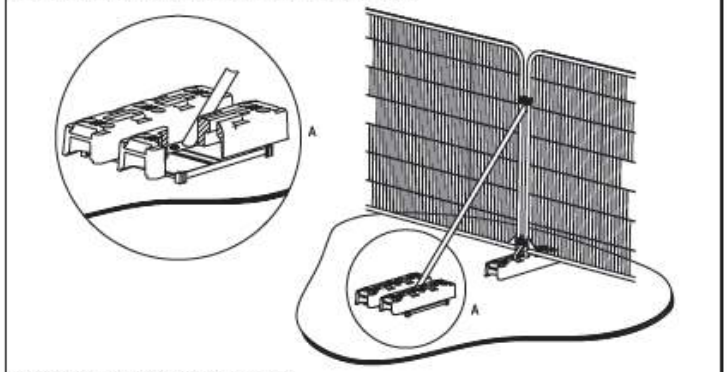


Key

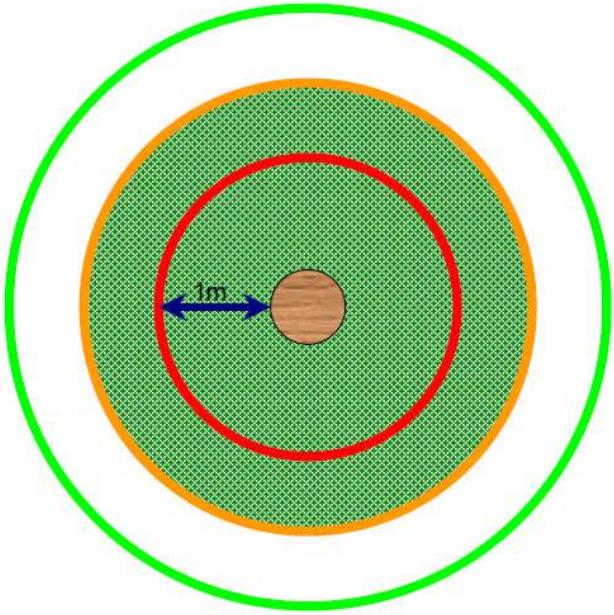
1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps



a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray



TREE PROTECTION ZONE

Key to Diagram

Trunk of Tree

Spread of canopy or branches

PROHIBITED ZONE – 1m from trunk. Excavations of any kind must not be undertaken within this zone unless full consultation with Local Authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.

PRECAUTIONARY ZONE – 4 x tree circumference. Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with Local Authority Tree Officer if in any doubt.

PERMITTED ZONE – outside of precautionary zone. Excavation works may be undertaken within this zone however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.

DAMAGE TO TREES

Tree roots keep a tree healthy and upright. Most roots are found in the top 600mm of soil and often grow out further than the tree's height. The majority of these roots are very fine; even close to a tree few will be thicker than a pencil. Most street tree roots grow under the footway but may also extend under the carriageway. If roots are damaged the tree may suffer irreversible harm and eventually die.

PROTECTING ROOTS - DO'S and DON'TS

There are three designated zones around a tree each of which has its own criteria for working practices.

THE PROHIBITED ZONE

Don't excavate within this zone.

Don't use any form of mechanical plant within this zone

Don't store materials, plant or equipment within this zone.

Don't move plant or vehicles within this zone.

Don't lean materials against, or chain plant to, the trunk.

Do contact the local authority tree officer or owner of the tree if excavation within this zone is unavoidable.

Do protect any exposed roots uncovered within this zone with dry sacking.

Do backfill with a suitable inert granular and top soil material mix as soon as possible on completion of works.

Do notify the local authority tree officer or the tree's owner of any damage.

THE PRECAUTIONARY ZONE

Don't excavate with machinery. Where excavation is unavoidable within this zone excavate only by hand or use trenchless techniques.

Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

Don't repeatedly move / use heavy mechanical plant except on hard standing.

Don't store spoil or building material, including chemicals and fuels, within this zone.

Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

Do backfill the trench with an inert granular material and top soil mix. Compact the backfill with care around the retained roots. On non highway sites backfill only with excavated soil.

Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.

Do notify the local authority tree officer or the tree's owner of any damage.

THE PERMITTED ZONE

Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

Do use caution if it is absolutely necessary to operate mechanical plant within this zone.

Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.

Do notify the local authority tree officer or the tree's owner of any damage.