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Arboricultural Implication Assessment (AIA)

Prepared by

Arbconsultants Ltd

Consultants in Urban Forestry, Arboriculture and Environmental Sciences

Address	Nelthorpec Arms 1 Bridge Street Brigg		
Client	Phillip Harrison	**Client Ref**	
ARB Ref	EMB0317 / 4588	**Consultant**	Christopher Raper
Report Date	28th September 2018	**Quality Checked**	JG
Technical Arboriculture Approved			

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Table of Contents

1. Scope and Limitations of Report

1.1 This report has been commissioned by Mr Phillip Harrison and the scope of the report reflects her instructions.

1.2 The scope of the report is limited to a visual inspection of the trees (VTA Visual Tree Assessment).

1.3 This report was prepared as a report of work instructed by client (as specified). Neither Arbconsultants Ltd nor any associated company, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the report and its findings. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favouring by Arbconsultants Ltd or any associated company. The views and opinions of authors expressed herein do not necessarily state or reflect those of Arbconsultants Ltd or any associated company. The content, layout and any supporting digital files associated with this report are subject to copyright owned by Arbconsultants Ltd. Exceptions to this are present where that copyright has been legally assigned to us by another party/ organisation. In addition Arbconsultants Ltd may utilise content generated under license. Reproduction, scanning, copying or distribution of this report in any form is prohibited without prior written agreement. Neither Arbconsultants Ltd nor any of its associated companies, sub-contractors or suppliers will be responsible or liable for any claim of loss or damage resulting from the third party use of the information contained within this report.

1.4 The brief is to appraise the trees in relation to the proposed development of the site in accordance with British Standard 5837:2012 'Trees in relation to Construction – Recommendations'. To prepare a clear set of report recommendations with supporting plans and data to facilitate consideration of the Arboricultural implications by the Local Planning Authority.

1.5 To consider the development proposals and identify areas where there are arboricultural issues and to recommend possible solutions.

1.6 To consider additional information supplied and identify arboricultural issues arising from this information and to recommend possible solutions.

1.7 This report is not a Tree Risk Management or a Hazard Analysis Report and its use as such is invalid.

1.8 The report refers to the condition of the trees and an assessment of the site on the day that the evaluation was undertaken. All tree inspections, unless specified, have been undertaken from ground level and using non-invasive techniques. Comments contained within the report on the condition and risk associated with any tree relate to the condition of the tree at the date and time of survey. Please note that the condition of trees is subject to change. This change may occur, but is not limited to biological and non-biological factors as well as mechanical/ physical changes to conditions in the proximity of the tree. Trees should be inspected at intervals relative to identified site risks and in accordance with best Industry practice and guidance. Arbconsultants Ltd can provide further information on this matter if required.

1.9 Please note no statutory control checks have been undertaken (unless specified). Where tree surgery works have been identified these works are based on the assumption that planning is approved, no tree works should be undertaken prior to determination of this application without up to date confirmation of the Tree Preservation Order / Conservation Area Status of the vegetation. All works should be undertaken in accordance with the appropriate Duty of Care. This should include, for example, site specific risk assessments and due diligence inspections for the presence of protected species. Any comment relating to 3rd party trees has been made without full access to the tree(s). Should these trees have any detrimental impact on the proposed development we would advise you to instruct us to contact the 3rd party and undertake further inspection work. Due to the changing nature of trees and their site circumstances this report and any recommendations made are limited to a 1 year period. Any alteration to the application site or any development proposals could change the current circumstances and may invalidate this report and any recommendations made. Should this be the case this report will require revision to reflect the development proposals.

1.10 Trees are dynamic structures that can never be guaranteed 100% safe; even those in good condition can suffer damage under average conditions. Regular inspections can help to identify potential problems before they become acute.

1.11 A lack of recommended work does not imply that a tree is safe and likewise it should not be inferred that a tree will be made safe following the completion of any recommended work.

1.12 Trees dimensions were measured using a combination of a Haglof digital Clinometer, a Leica Disto Laser Rangefinder and a Fujikura Diameter tape. All instruments were used in accordance with appropriate user guides.

1.13 Decay detection if requested and used is undertaken using an IML Resistograph.

1.14 All data provided by the testing equipment has been verified according to the equipment manufacturer's instructions.

1.15 No soil samples were taken and no soils analysis was undertaken. Clay soils are prone to compaction during development with damage to soil structure potentially having a serious impact on tree health. The design of foundations near problematic tree species will also need to take into consideration subsidence risk. Further advice from the relevant experts on the specific soil properties can be sought as necessary.

1.16 Any legal description or information given to Arbconsultants Ltd is believed to be accurate.

1.17 Where solutions to arboricultural problems are specified which require the usage of a third party product e.g. no dig roadway construction. No liability is assumed for the performance or suitability of the product and specialist advice as to the suitability or installation of the product should be sought from the manufacturer or other specialist.

1.18 This report is primarily an arboricultural report. Whilst comments relating to matters involving built structures or soil data may appear, any opinion thus expressed should be viewed as qualified, and confirmation from an appropriately qualified professional sought. Such points are usually clearly identified within the body of the report. It is not a full safety survey or subsidence risk assessment survey. These services can be provided but a further fee would be payable. Where matters of tree condition with a safety implication are noted during a survey they will of course appear in the report. No responsibility is assumed by Arbconsultants Ltd for legal matters that may arise from this report, and the Consultant shall not be required to give testimony or to attend court unless additional contractual arrangements are made.

1.19 Any alteration or deletion from this report shall invalidate it as a whole.

2. Qualifications and Experience

2.1 My name is Christopher Raper and I am a Consultant practising through Arbconsultants Limited, which is an Arboricultural Consultancy Practice based at Myerscough College, Preston, Lancashire. The Practice Specialises in Arboriculture, Urban Forestry, Biological Sciences and Project Management.

2.2 I am a Consultant specialising in tree failure, hazard evaluation, risk assessment related to trees, planning and development where trees are involved and insurance claims where tree failure is involved and/or building damage occurs which may be attributed to the activity of trees. I have received extensive training in relation to trees, clay soils and subsidence of low-rise buildings. I am a specialist in the field of trees/vegetation and special construction engineering methodologies. I am familiar with different Tree Hazard Evaluation systems and conversant in Visual Tree Assessments (VTA) techniques.

2.3 I have a 1st class honours degree in Arboriculture awarded by Myerscough College in conjunction with the University of Central Lancashire. I have over 15 years experience in the Arboricultural industry ranging from Tree Officer with a Local Authority through to Senior Consulting level with an Arboricultural Consultancy. I have provided guest lectures on Arboricultural Consultancy to the MSc course on Arboriculture and Urban Forestry run by the University of Central Lancashire and Myerscough College. I have attended formal and informal public inquiries and have supplied consultancy advice as part of design, project management and consultant/legal teams.

3. Summary

3.1 Arbconsultants Ltd have been appointed byMr Phillip Harrison to provide advice on the arboricultural issues relating to the proposed development at 11 Bridge Street, Brigg.

3.2 We have not been supplied with detailed drawings showing foundation types therefore we have made certain assumptions and have supplied method - statements that will cover most contingencies whereby the development may impact upon the trees. If necessary these method statements can be modified once full technical drawings have been produced.

3.3 We undertook a Pre-Development Tree Condition Survey (see Appendix 2), in September 2018. This survey assessed the condition of the tree resource, categorised the trees and provided the Root Protection Area (RPA) information according to the BS5837:2012 "Trees in relation to design, demolition and construction – Recommendations".

3.4 The tree numbers used in this report refer to the tree numbers used in our Tree Survey at appendix 2, 3, 4, 5, 6 and 7.

4. BS: 5837:2012 'Trees in relation to construction – Recommendations'

4.1 The trees on site have been surveyed in accordance with BS5837:2012 'Trees in relation to construction – Recommendations'.

4.2 The survey lists all the trees or groups of trees (excluding those trees already scheduled for removal) that may be impacted upon by the development and will include the following information.

- Reference number (to be recorded on the tree survey plan)
- Species
- Height in metres.
- Stem diameter at 1.5m above adjacent ground level (on sloping ground to be taken on the upslope side of the tree base) as per annex D of the Standard or

  a) For trees with two to five stems, the combined stem diameter should be calculated as follows: $\sqrt{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 + (\text{stem diameter 5})^2}$

  b) For trees with more than five stems (not illustrated in Annex C), the combined stem diameter should be calculated as follows: $\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$

- Branch spread in meters taken at the four cardinal points to derive an accurate representation of the crown (to be recorded on the tree survey plan).
- Existing height above ground level of first significant branch and direction of growth (e.g. 2.4-N) of the canopy,to inform on ground clearance, crown/stem ratio and shading;
- Life stage (e.g. young, semi-mature, early mature, mature, over-mature).
- General observations, particularly of structural and/or physiological condition (e.g. the presence of any decay and physical defect), and/or preliminary management recommendations;
- Estimated remaining contribution, in years (<10, 10+, 20+, 40+).
- Category U or A to C grading (see 4.5 and Tables 1 and 2), to be recorded on the tree survey plan.

4.3 The survey is attached at **Appendix 2** of this report.

4.4 The British Standard at 5.5.6 states that the following factors need to be considered -

a) **site construction access;** this will be via the existing access from the highway.

b) **the intensity and nature of the construction activity;** the construction will be of medium intensity. The site compound should be outside all root protection areas.

c) **contractors' parking;** Contractors will be expected to use off-street parking close to the development.

d) **phasing of construction works;** all tree works will be completed and protective barriers will be in place prior to any construction work -

5.0 Grading Category and Recommended Tree Works

5.1 Trees that have the potential to be affected by the development have been classified according to BS5837 2012 and the data and categorisation relating to trees that may affect the development is contained at Appendix 2. The site is a residential development that will generally be sub-surface in its implementation. The trees on the site and adjacent to the site can be separated into two distinct categories in terms of their age. The two most important trees in terms of amenity and presence are located at number 17 Tregunter Road adjacent to the subject property. The other trees surveyed are within the curtilage of number 19 and with the exception of tree number T10 all the remaining trees are very young. It would be our recommendation that the young trees are replaced like for like once development is complete. Tree T10 should be removed using ether an air-spade or tree spade and stored for the duration of the development and re-planted once the development is complete.

5.2 Category "A" Trees are classified as high quality and value in such condition as to make a substantial contribution for a minimum of 40 years. No tree surveyed would be categorised as A.

5.3 Category "B" i.e. those of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested). Category B Trees are defined as trees that might be included in the high category, but are downgraded because of impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage). Trees T3, T4 and T5 would be categorised as B1.

5.4 Trees that have been classified as Category "C" are of lower quality and value; currently in adequate condition which could if necessary remain until new planting is established, trees present in groups or woodlands, but without this conferring on them significantly greater landscape value. Trees T1, T2, T6, S1 and S2 are categorised as C1.

5.5 Category "U" trees are 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. Examples include…

- 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 R category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning).

- Trees that are dead or 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 (e.g. Dutch Elm Disease), or very low quality trees suppressing adjacent trees of better quality.

5.6 The trees on site that would fall into the U category are all saplings growing out of the watercourse wall.

5.7 Trees T5 and T6 should have their crowns raised to 2.5m and should also be reduced away from adjacent buildings. It is recommended that the above works are undertaken prior to development commencement.

Impact	Reason	A	B	C	U
Trees to be removed	To facilitate the development or due to their condition (U cat)	N/A	T3,T4,	T1,T2,S1, S2	TG1
Trees with RPA encroachment of standard definition radii	To facilitate construction	N/A	T3 T4	T1,T2,S1, S2	N/A
Retained Trees to be pruned	To address identified defects/ facilitate construction	N/A	T5	T6	N/A

5.8 Permissions: Under no circumstances is any tree work to be instigated without having first checked with the Local Planning Authority that no statutory controls apply in respect of the trees. All tree workers shall have the relevant NPTC qualifications and shall submit completed risk assessments to the project manager prior to commencement of tree-work.

5.9 All pruning shall be done in accordance with the principles of 'Natural Target Pruning' and in accordance with the current relevant British Standard, **BS3998: 2010** 'Recommendations for Tree Work'. All pruned sections shall be lowered to the ground in a controlled manner such that no damage is done to other trees or vegetation and structures beneath. The implication of tree works must have regard to the presence of any nesting Birds or Bats and their roosts, which are protected under the Wildlife and Countryside Act 1981

6.0 Tree Constraints – Calculated Root Protection Area (RPA)

6.1 BS5837 (2012) requires that the root protection area is calculated for each of the trees on the development. The root protection area is the minimum area in m^2 which should be left undisturbed around each retained tree. The RPA should be calculated using Annex D of the Standard as an area equivalent to a circle with a radius 12 times the diameter calculated for the stem of the tree.

6.2 The standard calculated RPA's and the protection zone radii are detailed at Appendix 6 of this report.

6.3 The RPA, for each tree as determined in Table 2 of the standard, should be plotted on the **Tree Constraints Plan** (Appendix 4) taking full account of the following factors, as assessed by an arboriculturalist, which may change its shape but not reduce its area whilst still providing adequate protection for the root system (Appendix 5).

a) The likely tolerance of the tree to root disturbance or damage, based on factors such as species, age and condition and presence of other trees.

b) The morphology and disposition of the roots, when known to be influenced by past or existing site conditions (e.g. the presence of roads, structures and underground services).

c) The soil type and structure.

d) Topography and drainage.

6.4 All machinery necessary to undertake the excavations shall operate from areas of retained hard surface or areas of ground protection.

6.5 Removal of spoil shall be via the front access.

7.0 Arboricultural Method Statement - Tree Protection Plan (TPP) Barriers

7.1 The exclusion zones (Construction Free Zone) as defined in this report will be protected with fencing. The fencing is to be strong enough to resist impacts and suitable to the degree of construction activity on the site.

7.2 All fencing will be in place prior to any other development work (with the exception of necessary tree works) commencing on site. Such fencing will therefore be erected before any materials or machinery is brought onto site. Once erected the fences will not be moved or altered in any way without prior consultation with the Local Planning Authority other than for operations detailed in this report. If the fencing is damaged in any way it will be re-instated to its original condition before construction work can re-commence Notices will be erected on the fencing stating Protected Area – No Operations within Fenced Area. Protective fences shall be maintained in situ until all equipment, machinery and surplus materials have been removed from the site. No vehicle shall access shall be allowed within the construction free zone. Nothing will be stored or placed in any area fenced in accordance with this condition and the ground levels within those areas shall not be altered, nor shall any excavation be made other than those detailed in this report, without the written consent of the Local Planning Authority.

7.3 The total exclusion zones are marked on the accompanying drawing in Appendix 5 (**Tree Protection Plan**). British Standard 5837:2012 (Appendix 7) indicates the recommended areas for the Root Protection Areas (RPA) which should be enforced with protective fencing. Specifications within BS5837-2012 inform our recommendations for both the fencing type as detailed below in figure 2 and the location of this fencing.

7.4 Barriers should be fit for purpose and appropriate to the degree of activity and proximity of work to the retained trees. – Figures 1, 2 and 3 specification reproduced below.

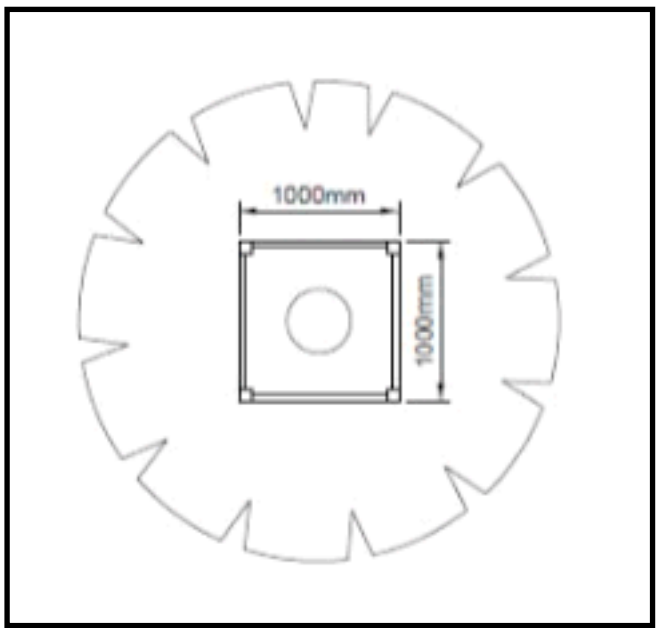

Figure 1 Aerial schematic

Figure 2 Plywood Protection

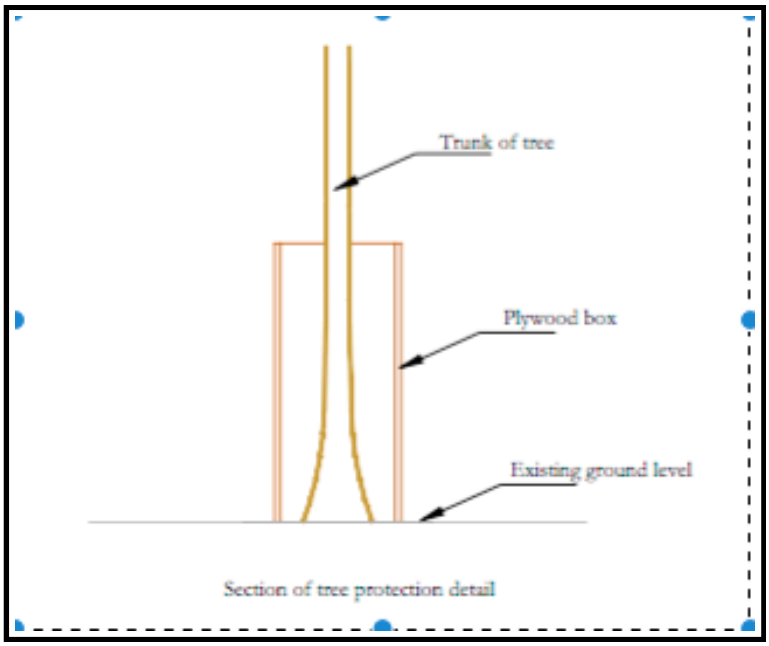

Figure 3 Sectional Schematic

8.0 Installation of Services (Underground and above ground services)

8.1 Trenching for the installation of underground services severs any roots present and may change the local soil hydrology in a way that adversely affects the health of the tree. For this reason particular care should be taken in the routing and methods of installation of underground services and where possible routing the services outside the specified RPA's

8.2 At all times where services are to pass within the RPA, detailed plans showing the proposed routing should be drawn up in conjunction with an Arboriculturist. Such plans should also show the levels and access space needed for installing the services. A decision on either directional drilling / micro-tunnelling / impact moling should be taken using Table 3 of BS5837 2012 as a guide.

Table 3 Trenchless solutions for differing utility apparatus installation requirements

Method	Accuracy	Bore dia. [A)]	Max. sub. [B)] length	Applications	Not suitable for
	mm	mm	m		
Microtunnelling	<20	100 to 300	40	Gravity-fall pipes, deep apparatus, watercourse/ roadway undercrossings	Low-cost projects due to relative expense
Surface-launched directional drilling	~100	25 to 1 200	150	Pressure pipes, cables including fibre optic	Gravity-fall pipes, e.g. drains and sewers [C)]
Pipe ramming	~150	150 to 2 000	70	Any large-bore pipes and ducts	Rocky and other heavily obstructed soils
Impact moling [D)]	~50 [E)]	30 to 180 [E)]	40	Gas, water and cable connections, e.g. from street to property	Any application that requires accuracy over distances in excess of 5 m

8.3 In this instance it is envisaged that there should be no necessity for any services to enter the root protection areas .

8.4 If it is found that there is a need for services to pass through Root Protection Areas Micro-tunnelling is the preferred method although it may be acceptable (where services need to pass through the RPA and a mole is unsuitable) to install the services in conjunction with the specification of NJUG 10. All excavations that are done in conjunction with the NJUG specification shall take place with an air-spade and any root pruning necessary will be undertaken by a qualified tree surgeon in accordance with both NUG 10 and BS3998 2010. The timing and extent of pruning (especially regarding the number and size of wounds; should be determined by both the management objectives and an assessment of the likely effects on the tree and its surroundings. The assessment should take account of species tolerances, the tree's age and condition and any implications for the safety of other trees. Any damaged roots should be cut so that the final wound is as small as possible and free from ragged torn ends. In the interests of clarity we only recommend this method of installing the cable if micro tunnelling, Impact moling or directional drilling cannot be accommodated.

8.5 Any roots which are to be left exposed for more than three hours should be covered in damp straw and/or hessian covers. Also note that if temperatures exceed 16C the time should be reduced to one hour before roots should be protected.

- No pruning of roots over a diameter of 25mm should be undertaken unless permission of the Local Authority tree officer is given. *Any damaged roots should be cleaned and pruned back to an appropriate place*

- The existing top soil is to be retained where possible. Any voids or depressions within the ground surface are to be filled with sharp sand (not builders sand) to maintain levels.

8.6 Consideration will be given to the routing of above ground services in order to avoid the need for detrimental and repetitive pruning. In this regard the current and future crown size of the tree should be assessed.

8.7 Additional precautions outside the exclusion zone :-

8.8 Once the exclusion zone has been protected by barriers and/or ground protection, construction work can commence. All weather notices should be erected on the barrier with words such as: "**Construction exclusion zone — Keep Out**".

8.9 In addition the following should be addressed or avoided.

a) Care should be taken when planning site operations to ensure that wide or tall loads, or plant with booms, jibs and counterweights can operate without coming into contact with retained trees. Such contact can result in serious damage to them and might make their safe retention impossible. Consequently, any transit or traverse of plant in close proximity to trees should be conducted under the supervision of a banks-man to ensure that adequate clearance from trees is maintained at all times. In some circumstances it may be impossible to maintain adequate clearance thus necessitating access facilitation pruning.

b) Material which will contaminate the soil, e.g. concrete mixings, diesel oil and vehicle washings, should not be discharged within 10 metres of the tree stem.

c) Fires should not be lit in a position where their flames can extend to within 5 m of foliage, branches of trunk. This will depend on the size of the fire and the wind direction.

d) Notice boards, telephone cables or other services should not be attached to any part of the tree.

e) It is essential that allowance should be made for the slope of the ground so that damaging materials such as concrete washings, mortar or diesel oil cannot run towards trees.

9.0 Supervision

9.1 Most damage to trees on developments sites is caused inadvertently and to ensure continued protection during development a system of site monitoring is proposed.

9.2 Basic checks will ensure that protective fencing remains intact. Any unforeseen issues can also be identified and discussed before damage to the tree(s) occurs.

9.3 The Local Planning Authority may secure the following schedule by way of Planning Condition. To be effective the Local Planning Authority must provide us with a copy of the formal Decision Notice to ensure we can then contact and follow up the proposed monitoring. A copy of the Decision Notice should be emailed to enquiries@arbconsultants.-co.uk The number of proposed visits is driven by the scale of the proposal

9.4 A more detailed explanation of what will be assessed during the proposed monitoring visits is contained in Appendix

Visit	Date	Status
Pre-commencement Inspections Attend site to inspect type and location of tree protection and any temporary ground protection prior to development commencing and discuss any issues associated with demolition/ enabling works	**TBC**	**Incomplete**
Site Inspection Attend site to confirm fencing remains in place and supervise etc.	**TBC**	**Incomplete**
Site Inspection Attend site to confirm fencing remains in place and supervise etc.	**TBC**	**Incomplete**
Site Inspection Attend site to confirm fencing remains in place and supervise etc.	**TBC**	**Incomplete**
Site Inspection Final site visit to confirm that no damage has been done to retained trees/ identify any remedial actions in the event damage has occurred. Assess any required tree surgery following construction	**TBC**	**Incomplete**

10.0 Conclusion and Impact Statement

10.1 Trees within and adjacent to the proposed site and compliant with the scope of the development have been assessed in accordance with BS:5837:2012.

10.2 The trees in general do not provide significant amenity and the tree mostly visible from public spaces (T1 Willow) is problematic in terms of its placement on the side of the watercourse.

10.3 Six individual trees, two shrubs and one group of saplings have been assessed in response to the proposed development.

10.4 It is suggested that trees T1, T2, T3, T4, shrubs S1, S2 and tree group TG1 should be removed to facilitate development.

10.5 The impact of the proposed development has been assessed and in our professional opinion provided that the works take place in accordance with the method statements specified and replanting appropriately, the works will not be detrimental to the retained trees and the overall arboricultural population will remain stable.

10.6 No work shall commence on site until such time as this method statement has been submitted to and approved in writing by the Local Planning Authority. All retained trees on the site shall be protected from damage as a result of the works on site, to the satisfaction of the Local Planning Authority in accordance with its guidance notes and relevant British Standards (e.g. BS5837:2005) or the duration of the development. In the event that trees become damaged during construction, the Local Planning Authority shall be notified and remedial action agreed and implemented. In the event that any tree(s) dies or is removed without the prior consent of the Local Planning Authority, it shall be replaced within the first available planting season, in accordance with details agreed with the Local Planning Authority.

10.7 All technical issues relating to arboriculture should be addressed to Arbconsultants Ltd in the first instance. Arbconsultants Ltd will liaise between the Local Planning Authority and any interested parties. It is suggested that the development proceeds in accordance with the above recommendations.

Appendix 1

Site Location

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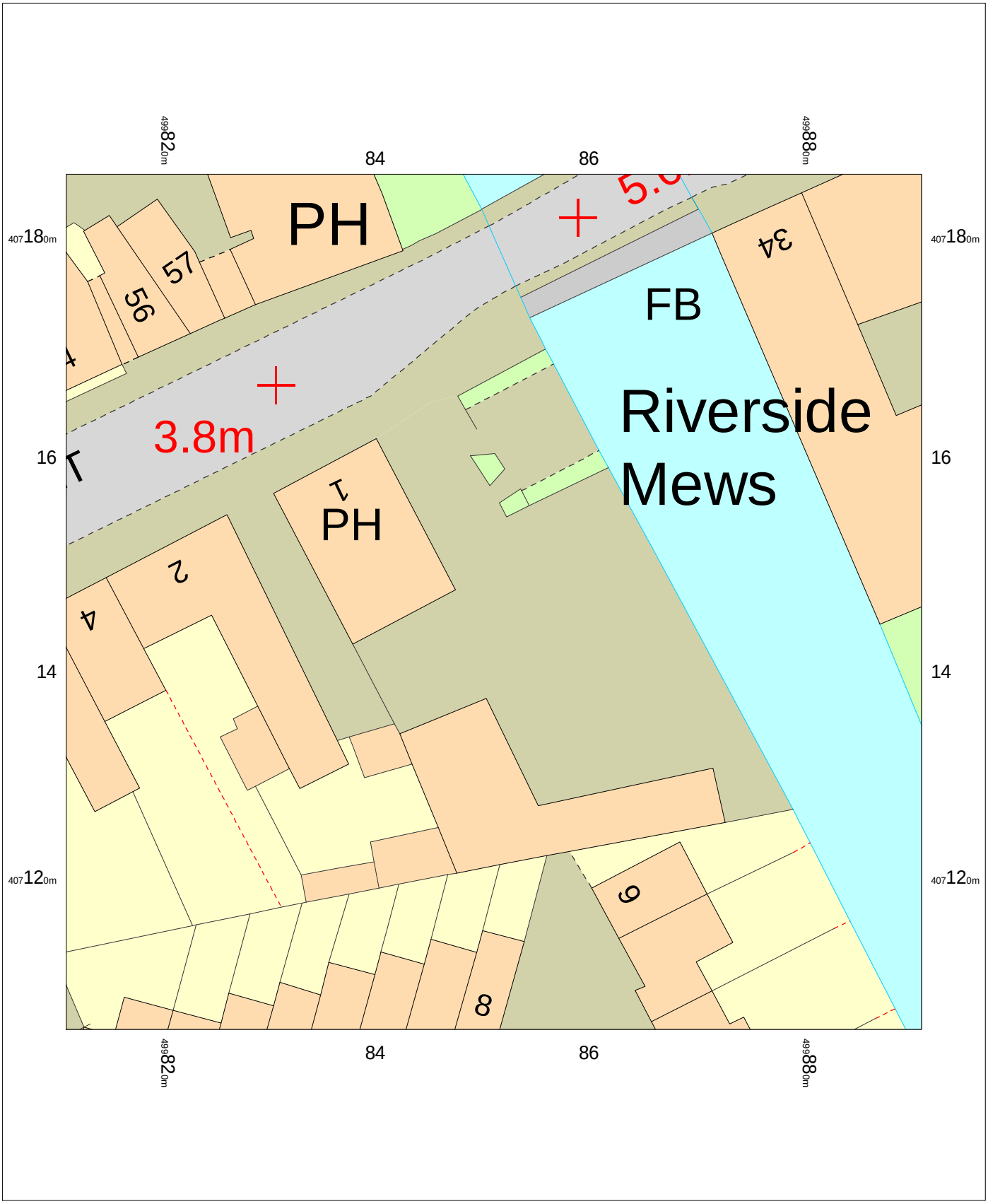

0 2 4 6 8 10 12 14 16 18 20
m

N

Monday, March 5, 2018, ID: BW1-00694879
maps.blackwell.co.uk

1:500 scale print at A4, Centre: 499851 E, 407146 N

Data

BLACKWELL'S
www.blackwellmapping.co.uk
TEL: 0113 245 2623
comments@maps.blackwell.co.uk

Appendix 2

Tree Survey Data Tables

arbconsultants ltd
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Tel: 07887 601123 Email: enquiries@arbconsultants.co.uk
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BS5837 2012 Trees in Relation to Construction

Tree number	Species	Diameter (mm)	Height	Spread North	Spread East	Spread South	Spread West	Height above ground of first branch over field	Life stage	General observations	Safe useful life	BS category	Recommendation
1	Weeping Willow	650	13	7	7	4	6	1	M	Mature ornamental tree with low crown over adjacent path and road. Currently not complying with Section 154 of the Highways Act 1980. The tree is located in the corner of site close to canal / river retaining wall. May be undermining bank. Hard-standing in root zone lifting. Slightly asymmetric crown.	10-20	C1	Fell to Facilitate Development
2	Magnolia	60	4	2	2	2	2	1.5	SM	Small ornamental tree twin stemmed at ~0.2m. Slightly asymmetric crown. Tree small enough to potentially transplant.	20-40	C1	Fell to Facilitate Development
3	Birch	420	14	5	4	3	5	1.5	M	Ornamental tree planted in car park 2m from canal retaining wall. Tree stem has a slight lean and low crown. Some hard-standing lifted in root zone. Slightly asymmetric crown.	20-40	B1	Fell to Facilitate Development
4	Birch	350	13	5	5	4.5	5	1.5	M	Ornamental tree planted in car park 2m from canal retaining wall. Tree stem has a slight lean and low crown. Some hard-standing lifted in root zone. Slightly asymmetric crown.	20-40	B1	Fell to Facilitate Development
5	Birch	510	14	5	5	4	5	1.5	M	Ornamental tree planted in car park 2m from canal retaining wall. Branches rubbing wall. Tree stem has a slight lean and low crown. Some hard-standing lifted in root zone. Slightly asymmetric crown.	20-40	B1	Crown lift to 2.5m - reduce from building to give 1m clearance and Protect with Barriers
6	Ornamental Plum	240	5	2	3	3	4	1.5	M	Ornamental tree planted close to building, branches touching roof. Ivy into crown. Asymmetric crown. Poor form.	10 to 20	C1	Crown lift to 2.5m - reduce from building to give 1m clearance and Protect with Barriers
S1	Cherry Laurel	150	2	2	2	2	2	1	M	Ornamental shrub with slightly asymmetric crown.	10 to 20	C1	Fell to Facilitate Development
S2	Bay Laurel	120	3	1	1.5	1	1.5	1	M	Suppressed shrub growing under canopy of T1.	10 to 20	C1	Fell to Facilitate Development
TG1	Ash and Birch	20	3	1	1	1	1	0.5	Y	Self set trees growing from wall. These will need to be removed as wall is integral part of adjacent canal.	10 to 20	U	Fell to Facilitate Development

Appendix 3

Tree Survey Plan

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Tel: 07887 601123 Email: enquiries@arbconsultants.co.uk
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No.	Date	Appr	Revision Notes
			Category U Retained
			Category U Removed
			Category A Retained
			Category A Removed
			Category B Retained
			Category B Removed
			Category C Retained
			Category C Removed
			Ground Protection
			Barrier Protection
			Cellular Confinement System
			Specialist foundation
			Root Protection Area Retained
			Root Protection Area Felled

No.	Date	Issue Notes

Design Firm

Arbconsultants Ltd
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Myerscough College
Bilsborrow
PR3 0RY

Consultant

Project Title

BS5837 2012 AIA

Sheet Title

Appendix 3 Tree Survey Plan

Project Manager	Project ID: Nelthorpe Arms Brigg
Drawn By: CR	Scale: 1:200 @ A1
Reviewed By: JG	Sheet No.: Sht-1 of 4
Date: Date	
CAD File Name: Phillip Harrison	

Appendix 4

Tree Constraints Plan Radii (TCP)

arbconsultants ltd
The Rural Business Centre, Myerscough College, Bilsborrow, Preston, Lancashire PR3 0RY
Tel: 07887 601123 Email: enquiries@arbconsultants.co.uk
Web: www.arbconsultants.co.uk

4.6.1 For single stem trees, the RPA (see **3.7**) should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter. For trees with more than one stem, one of the two calculation methods below should be used. In all cases, the stem diameter(s) should be measured in accordance with Annex C, and the RPA should be determined from Annex D. The calculated RPA for each tree should be capped to 707 m².

a) For trees with two to five stems, the combined stem diameter should be calculated as follows:

$$\sqrt{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 \ldots + (\text{stem diameter 5})^2}$$

No.	Date	Appr	Revision Notes
			Category U Retained
			Category U Removed
			Category A Retained
			Category A Removed
			Category B Retained
			Category B Removed
			Category C Retained
			Category C Removed
			Ground Protection
			Barrier Protection
			Cellular Confinement System
			Specialist foundation
			Root Protection Area Retained
			Root Protection Area Felled

No.	Date	Issue Notes

Design Firm

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BS5837 2012 AIA

Sheet Title

Tree Constraints Plan

Project Manager	Project ID: Nelthorpe Arms Brigg
Drawn By: CR	Scale: 1:200 @ A1
Reviewed By: JG	Sheet No.: Sht-2 of 4
Date: Date	
CAD File Name: Phillip Harrison	

Appendix 5

Tree Protection Plan (TPP)

arbconsultants ltd
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Tel: 07887 601123 Email: enquiries@arbconsultants.co.uk
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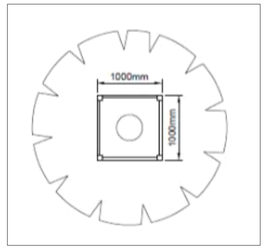
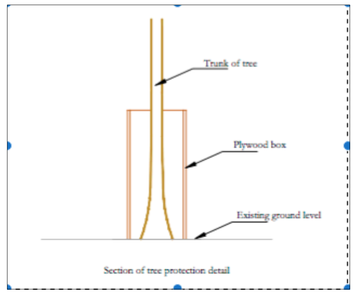
4.6.1 For single stem trees, the RPA (see **3.7**) should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter. For trees with more than one stem, one of the two calculation methods below should be used. In all cases, the stem diameter(s) should be measured in accordance with Annex C, and the RPA should be determined from Annex D. The calculated RPA for each tree should be capped to 707 m².

a) For trees with two to five stems, the combined stem diameter should be calculated as follows:

$$\sqrt{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 \ldots + (\text{stem diameter 5})^2}$$





No.	Date	Appr	Revision Notes
			Category U Retained
			Category U Removed
			Category A Retained
			Category A Removed
			Category B Retained
			Category B Removed
			Category C Retained
			Category C Removed
			Ground Protection
			Barrier Protection
			Cellular Confinement System
			Specialist foundation
			Root Protection Area Retained
			Root Protection Area Felled

No.	Date	Issue Notes

Design Firm

Arbconsultants Ltd
The Rural Business Centre
Myerscough College
Bilsborrow
PR3 0RY

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Project Title

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Sheet Title

Appendix 5 Tree Protection Plan

Project Manager	Project ID: Nelthorpe Arms Brigg
Drawn By: CR	Scale: 1:200 @ A1
Reviewed By: JG	Sheet No.: Sht-3
Date: Date	of 4
CAD File Name: Phillip Harrison	

Appendix 6

Root Protection Area (RPA) Calculations

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	September 2018			Bridge Street Brigg	
Tree ID	Single stem Diameter at 1.5m above ground level	No of stems (2-5)	No of stems 5 +	Root Protection Area (See Note)	Equivalent to a circle with a radius of
1	650			7.8	191
2	60			0.9	3
3	420			5.1	81
4	350			4.2	55
5	510			6	113
6	240			3	28
S1	150			1.8	10
S2	120			1.5	7
TG1	20			0.9	3
Note					
The calculated RPA should be capped to 707m sq, equivalent to a circle with a radius of 15m or a square with approximately 26m sides					

Root Protection Area (RPA) Calculator

arbconsultants

BS 5837:2012 Trees in relation to construction – Recommendations

Appendix 7

Proposed / Combined

arbconsultants ltd
The Rural Business Centre, Myerscough College, Bilsborrow, Preston, Lancashire PR3 0RY
Tel: 07887 601123 Email: enquiries@arbconsultants.co.uk
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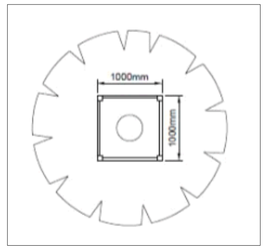
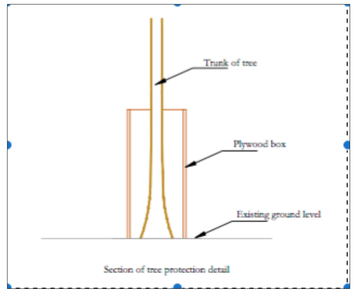
4.6.1 For single stem trees, the RPA (see **3.7**) should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter. For trees with more than one stem, one of the two calculation methods below should be used. In all cases, the stem diameter(s) should be measured in accordance with Annex C, and the RPA should be determined from Annex D. The calculated RPA for each tree should be capped to 707 m^2.

a) For trees with two to five stems, the combined stem diameter should be calculated as follows:

$$\sqrt{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 \ldots + (\text{stem diameter 5})^2}$$





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			Ground Protection
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			Specialist foundation
			Root Protection Area Retained
			Root Protection Area Felled

No.	Date	Issue Notes

Design Firm

Arbconsultants Ltd
The Rural Business Centre
Myerscough College
Bilsborrow
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Appendix 7 Combined Proposed

Project Manager	Project ID
	Nelthorpe Arms Brigg
Drawn By: CR	Scale: 1:200 @ A1
Reviewed By: JG	Sheet No.
Date: Date	Sht-4 of 4
CAD File Name: Phillip Harrison	