

16th January 2014

Ref:ha/ms3/rev_a/dg/a14bunds

Your Ref:

Mr A Halford
Bedwells
Bidwell House
Trumpington Road
Cambridge
CB2 9LD

Dear Mr Halford

**Tree Assessment and Protection in relation to Construction at:
Darwin Green, Landscaped Bund adjacent to A14**

Please find attached our amended arboricultural report and associated plan, prepared to assist with the planning application.

I hope that this is clear and helpful but if I can be of any further assistance, please do not hesitate to contact me.

Yours sincerely

Hal Appleyard
Dip. Arb. (RFS), F.Arbor.A, MICFor.
Arboricultural Association Registered Consultant



enc.

cc Mr M Sperrin



Arboricultural Implication Assessment – Tree Protection Methods

Site: Darwin Green – A14 Landscaped Bund

Date: 16th January 2014

Prepared by: Hal Appleyard Dip. Arb. (RFS), F.Arbor.A, MICFor.

Ref: ha/ms01/dg/A14bunds

Appendices:

1. Tree Survey Schedule (BS5837:2012)
2. Tree Protection Plan TPP1-3_DG_03 Rev A
3. Recommended example of tree protection fencing
4. Example of site monitoring record

1.0 Introduction and Scope

- 1.1 Planning applications for a new housing development scheme with public open spaces and associated infrastructure are under consideration by Cambridge City Council and South Cambridge District Council. Planning conditions, relating to the assessment of trees and their protection methods have been applied to existing approvals and additional details are required to support new applications.
- 1.2 The proposals include the construction of a single landscaped mound which is to be undertaken in the vicinity of retained trees and a stretch of hedgerow including small trees is to be removed. The implications of the proposals upon the trees and hedges are set out here together with methods for their protection.
- 1.3 I have assessed the trees and hedges in accordance with the guidance set out in BS 5837:2012 'Trees in relation to design, demolition and construction- Recommendations' (the BS) and an extract from that guidance is appended herewith. This was carried out in April 2012 and reviewed and added to in September 2013.

2.0 The Site and Trees

- 2.1 The site comprises existing arable fields formerly used for agricultural research. The area is adjoined by an existing track, some of which is covered with concrete.

Fig. 1 View of off-site trees adjacent to the A14 and site of the proposed western bund.



- 2.2 I have provided the BS details of the hedges in the tree/hedge survey schedule at **Appendix 1** and their corresponding positions are shown on the tree removal and protection plan at included at **Appendix 2**.
- 2.3 I have provided a breakdown of the tree quality by BS grade (which is explained more fully in the Appendix 1 extract).

Table 1 Tree survey by BS quality grade (in site area)

Total Records 68 (inc. groups and hedges)	A	B	C	U
Total in site area 7	0	5	2	0
% of total	-	70%	30%	-

- 2.4 The main trees and tree groups are growing at the boundary (and just off site) to the A14 (G18.2) together with G66, which is a mixture of maturing Corsican Pine

trees with a number of Hybrid Black Poplars. The self-set Ash and Hawthorn trees comprising G22 form an effective screen boundary along the existing field and roadway.

- 2.5 The only individual tree includes a but large but dead Oak (noted on the plan only).

Proposed Construction

- 2.6 The proposals include the construction of one landscaped mound adjacent to the A14, west and east of the northern part of the site.
- 2.7 The tree identified for removal is included upon the attached plans at **Appendix 1**. For clarity, these trees and hedges are listed below.

Table 2 **Proposed Tree and Hedge Removal Works**

Tree Works (Spec.)	Id Nos	Visual Landscape Impact of Works*	Available Replacement Planting(Y/N)	Comments
Fell and remove stumps to prevent regrowth (Sp6)	1 x dead oak	None	Y	Refer to Appendix 1 plans for tree removals
Total		None		

*This is a preliminary visual appraisal based upon the opinion of the author having inspected the trees in the context of their current surroundings. – None (no change or beneficial impact) Negligible or indiscernible difference to treed landscape; Low – Noticeable but mitigated by retention of other landscape trees and features; Medium – Obvious but temporary alteration to the treed landscape; High – Obvious and permanent alteration to the landscape.

Visual receptors include the public or community at large, residents, visitors or other groups of viewers together with the visual amenity of potentially affected people.

Specifications for recommended tree works:

General

All work is to conform to BS 3998:2010 'Tree work – Recommendations' and with current arboricultural best practice. Tree works are to be undertaken by a professional and specialist arboricultural contractor, who carries the appropriate experience and insurance cover, equipment and PPE. All works and processes are to comply with all relevant Planning Wildlife, Environmental, Conservation and Health and Safety legislation.

Sp6. Felling involves the careful removal of a tree to ground level (or other specified height), either in sections or in one unit (straight felling). The method of felling will be suited to the constraints of the site and judged by the competent operator undertaking the task. Removing the stump may be part of the requirements and this will be carried out using a mechanical stump grinder where accessible.

Table 2 Summary of Implications of Construction on Trees*

Tree Ident.	Landscape Contribution	Implications/Impact	Mitigation measures	Impact Assessment**
Dead oak	Medium to Low	Construction of landscape bund requires removal	1. Establish new trees upon and near to the mound	Neutral

* Main trees selected for comment included above. Refer to previous notes on other trees.

** Negative – adverse impact upon trees and landscape; Neutral – no material impact (negative or positive); Positive – improvement (potential) to tree quality and landscape

3.0 Recommended Construction Precautions (trees)

3.1 In order to afford protection from general construction processes associated with infrastructure works and landscaped mound creation, it will be prudent to identify those trees and hedges for retention and erect robust tree protection fences/hoarding (normally either wire mesh panels or 2.4m OSB hoarding where this may be necessary), in the positions indicated on the Tree Protection Plans at **Appendix 2** (TPP1-3_DG_03 A). A recommended example of the type BS grade tree protection fencing is included at **Appendix 3** and which is shown on the tree protection plan.

3.2 Prior to commencing work upon the new landscaped bund, the TPO area of trees will be afforded effective protection by erecting the tree protection barriers as shown.

Service Excavations near Trees and Hedgerows

3.3 The proposed locations of drainage systems have been detailed by Woods Hardwick. Where services are proposed within the canopy of retained trees, the following methods will be adopted:

- i) First mark out the area to be excavated with marker spray paint
- ii) Using hand tools remove the existing surfaces e.g. grass sward/spoil
- iii) Carefully remove the soil from the proposed trench/junction pit to the required depth. All roots over 20mm diameter should be retained for inspection.
- iv) Place the spoil beyond the RPA of the tree in question.

- v) Arboricultural supervisor will inspect the roots/soil and advise upon root pruning. Any root pruning will be carried out using sharp and specialised pruning tools (not spades or mattocks).
- vi) The exposed face of the trench (tree side) is to be covered with a sacking-type material, which can be dampened with water and fixed in position with small stakes or weighted down along the upper ridge of the trench until backfilling.
- vii) The soil within the immediate area of the trunk and within the remaining RPA or any tree protection fencing, is to be dressed in a depth of rotted wood chip mulch, and regularly irrigated during the course of the construction period, sufficient to retain moist but not water-logged soil.
- viii) The tree in question is to be monitored for condition and any changes are to be noted and acted upon where appropriate.

NOTE: THE APPOINTED ARBORICULTURAL SUPERVISOR IS TO BE CONSULTED BEFORE ANY WORK, EITHER SCHEDULED OR UNSCHEDULED, IS UNDERTAKEN WITHIN THE EXCLUSION ZONE OR ROOT PROTECTION AREAS OF ANY RETAINED TREE. FAILURE TO DO SO MAY LEAD TO ENFORCEMENT ACTION.

3.4 In order to ensure that the tree/hedge protection measures are implemented effectively, it will be important to undertake a pre-commencement site meeting with the appointed arboriculturist and project site agents and ground works contractors in order to confirm:

- i) That the proposed tree/and hedge protection is installed correctly
- ii) The tree(s) and hedges necessary for removal are clearly marked and understood

Following the initial start-up meeting an appointed arboriculturist will monitor the site for tree/hedge protection by undertaking site monitoring visits and recording findings with advice and recommendations where these are necessary/prudent in the interests of tree and hedge preservation. This will manage:

- iii) The efficacy and accuracy of the tree and hedge protection
- iv) The continued efficacy of the tree protection during the project works.

3.6 An example of a site record (tree protection) is provided at **Appendix 4**. In this case, the form will be used as confirmation that all practical precautions have been undertaken in accordance with this method statement.

3.7 A copy of this method statement is to be retained on site for the duration of the build process together with a scaled, colour copy of the Tree Protection Plan.

3.8 Key times for site supervision include:

1. Completion of agreed/necessary tree works
2. Erection of tree protection fencing
3. Installation of new haul roads and bunds
4. Works within or near to RPAs of retained trees/hedges
5. Soft landscaping

3.9 Site monitoring will be at appropriate intervals, which may be more frequent at the outset of the development work but which become less intense during periods where no material changes to the landscape are underway. (This program may alter dependent upon site circumstances or by agreement.)

Table 3 Preliminary site supervision schedule

Stage	Action	Arboricultural Supervisor (AS) (Required – Y/N)	Notes
1	<i>Pre-commencement meeting</i>	Y	<i>Site Agents(SA) and ground works contractors to attend</i>
2	<i>Tree/hedge works</i>	Y	<i>Prior to and following completion of tree works</i>
3	<i>Installation of all necessary tree/hedge protection fencing</i>	Y	<i>PRIOR to commencement of any ground works</i>
4	<i>Ground works including installation of drainage systems</i>	Y	<i>AS to monitor construction works at agreed intervals</i>
5	<i>Installation of new haul roads and bunds</i>	Y	<i>SA to advise AS prior to commencement</i>
6	<i>Remove tree protection fencing</i>	Y	<i>SA to advise AS of stage timing and the need for protection modification</i>
7	<i>Tree planting/landscaping</i>	Y	<i>Brief landscape company</i>

Contact List (to be completed **PRIOR** to commencement)

Interested Party	Name	Company/LPA	Contact Number(s)	Comment
Site Agent				TBA
Main Contractor				TBA
Arb. Supervisor				TBA
LPA Tree Officer	Ms R Richardson	SCDC	01954 713405	
Site Engineers		Woods Hardwick	01234 268862	
Architects		Woods Hardwick	01234 268862	

TBA – to be advised

4.0 Precautions during Landscape Work

4.1 The following steps (both general and site specific), are advisable in relation to implementing any landscape works, which may have the potential to affect retained and or protected trees:

1. Advise arboricultural supervisor of intended time frame of landscape work in advance of commencement.
2. Re-locate existing tree protection to enable landscape work to proceed.
3. With bio-degradable spray paint or site pins with plastic tape, mark out the position of the relevant tree root protection areas (RPA) as per the tree protection plan.
4. Within the RPAs of retained trees, avoid using any mechanical tools or vehicles (e.g. tracked or wheeled machinery).
5. Spread any mulch or top soil manually, with the use of wheel barrows and hand tools. It will be acceptable to use of the back actor of a tracked excavator to spread piled top soil or mulch into the RPAs of protected trees provided the bucket does not come in contact with the ground and that the power unit is positioned outside of the RPAs at all times.
6. Any planting pits are to be excavated manually within the RPAs of any retained trees.
7. Multiple passes within the RPAs along one route, pedestrian and with wheel barrows will require some ground protection to be installed prior to working. Ground protection can be scaffold boards over wood chip for example.
8. A record of the landscape working method is to be made and provided to the Council for their file.
9. Hard landscaping features will be constructed under supervision within the RPA of retained trees and will avoid, where possible, the re-grading of soil.

5.0 General site care (trees)

- 5.1 No fires will be lit on site within 20m of any retained tree or hedge.
- 5.2 No access will be permitted to within the fenced or otherwise protected areas (unless for site accommodation or Authorised agreement) at any stage during construction.
- 5.3 No materials, equipment or debris will be stored within the fenced areas unless agreed with the arboricultural supervisor.
- 5.4 Areas for mixing are to be located beyond RPAs of trees and contained to prevent leaching into the soil.
- 5.5 A copy of this report and the Tree Protection Plan is to remain on site at all times.

Liability Limitation

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Please note that all relevant planning approvals and approval to planning conditions must first have been issued by the relevant planning authority in order for this report to become effective. We strongly advise that you consult your planning advisors before implementing any recommendations set out in this report.

Hal Appleyard *Dip. Arb. (RFS), F.Arbor.A, MICFor.*
Chartered Arboriculturist & Arb. Assoc. Registered Consultant

January 2014

APPENDIX 1

Site: NIAB1, Huntingdon Road, Cambridge

Date: 12th April 2012 (reviewed Sept. 2013)

Surveyor: H. Appleyard

Ref: ts1/niab1/a

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
G66	Corsican Pine/Hybrid Black Poplar group	18	5 5 5	1/W2	Mature	500	12	6.0	Normal	Good	Medium	B	2	>40	Boundary screen group Poplar trees with 900mm diameter part of wooded screen; some failed branches
G67	Alder x 13	10	4 4 4	1/W1	Mature	300a	12	3.6	Normal	Fair	Medium	B	2	20-40	Boundary tree (group) Ivy covered trunk and branches on 5 trees; 3 x suppressed trees
T68	Alder x 8	10	4 3 3	1.5/N1. 5	Mature	270a	12	3.2	Normal	Fair	Medium	B	2	20-40	Planted screen tree group Unremarkable but part of wooded cover by road
G69	Ash, Common x 2	16	4 4 3	4/N3	Mature	550	12	6.6	Poor	Poor	Low	C	1,3	10-20	Dying back Deadwood throughout crown Some ecological value
T70	Ash, Common	16	6 6 6	3/N3	Mature	500	12	6.0	Normal	Fair	Medium	B	1,2	20-40	Self sown One of a group Within hedgeline
T71	Willow, Crack	15	5 3 5	2.5	Mature	750	12	9.0	Poor	Poor	Low	U	1	<10	Extensive decay in wound/cavity Hazardous tree
T72	Ash, Common	16	6 6 6	3/N3	Mature	500	12	6.0	Normal	Fair	Medium	C	1,2	20-40	Self sown One of a group Within hedgeline

Notes:

1. Height describes the approximate height of the tree in meters from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is shown above on each of the four compass points (i.e. N, E, S, W) clockwise.
3. Ground Clearance is the height in meters of crown clearance above adjacent ground level.
4. Stem Diameter is the diameter of the stem measured in millimetres at 1.5m from ground level or just above ground level for multi stemmed trees. The diameter may be estimated (e), where access is restricted. An average (a) may be taken for tree groups. A full inspection is always recommended.
5. Protection Multiplier is 12 for single stemmed and 10 for multi-stemmed trees.

6. Protection Radius is a radial distance measured from the trunk centre and is used to calculate the BS RPA.
7. Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak), Dead (dead or dying tree).
8. Structural Condition - Good (no or only minor defects), Fair (remediable defects), Poor - Major defects present or suspected.
9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
10. B.S. Cat. refers to British Standard 5837:2005 Table 1 category and refers to tree/group quality and value; 'A' - High, 'B' - Moderate, 'C' - Low, 'R' - Remove or very poor quality.
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservation/ecological, historic and commemorative.
12. Useful Life is the tree's estimated remaining effective contribution in years.

Site: NIAB1, Huntingdon Road, Cambridge

Date: 12th April 2012 (reviewed Sept. 2013)

Surveyor: H. Appleyard

Ref: ts1/niab1/a

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
T73	Oak, Common	16	6 6 6	3/N3	Mature	500	12	6.0	Normal	Fair	Medium	B	1	20-40	Dense canopy Ivy covered trunk and branches Within hedgeline
T74	Ash, Common	25	6 6 6	3/N4	Mature	1000	12	12.0	Normal	Good	Medium	B	1,3	20-40	Root pattern affected by ditch Ivy covered trunk and branches Some ecological merit
G75	Oak/Ash	13	4 3 5	1.5	Mature	400a	12	4.8	Moderate	Fair	Medium	C	1,3	20-40	Neglected coppice trees; woodland edge trees
T76	Willow, Crack	9	4 5 5	1.5	Mature	450	12	5.4	Normal	Fair	Medium	C	1,2	20-40	Self sown; woodland edge tree with weakened unions Dense canopy

Notes:

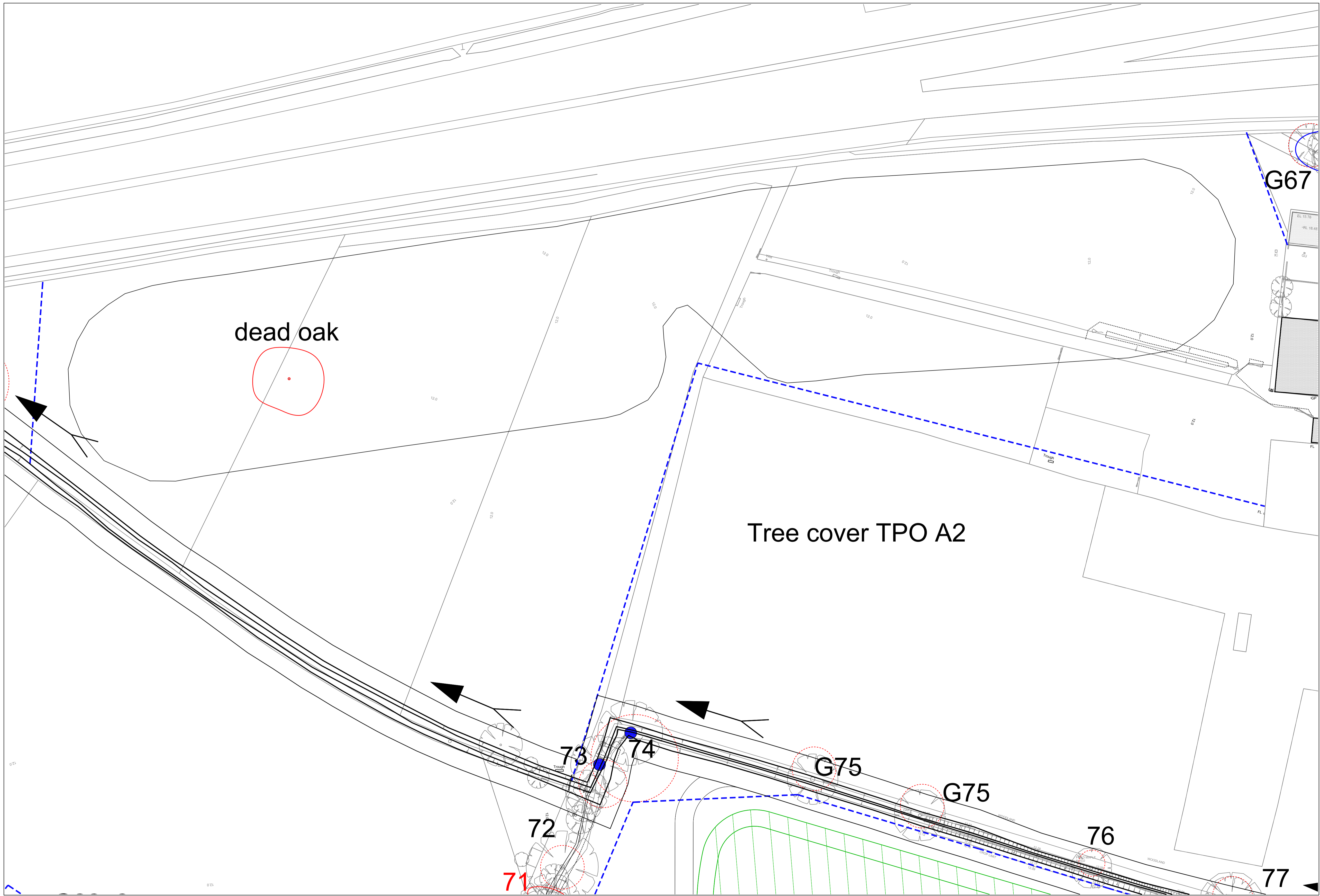
1. Height describes the approximate height of the tree in meters from ground level.
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11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservation/ecological, historic and commemorative.
12. Useful Life is the tree's estimated remaining effective contribution in years.

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	<ul style="list-style-type: none"> 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 <p><i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i></p>	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
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, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)
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 with material conservation or other cultural value
		Trees with no material conservation or other cultural value

APPENDIX 2



ACS CONSULTING LEGEND

BS Root Protection Area (RPA) shown uniform (above left) but site features such as roadways, retaining walls and foundations, may modify root patterns and therefore the RPA shape (left).

A grade trees (green circle) C grade trees (clear) (grey circle)
 B grade trees (blue circle) U grade trees (red circle)

Trees to be removed (red circle with red dot)

Recommended position for fixed tree protection fencing (blue dashed line)

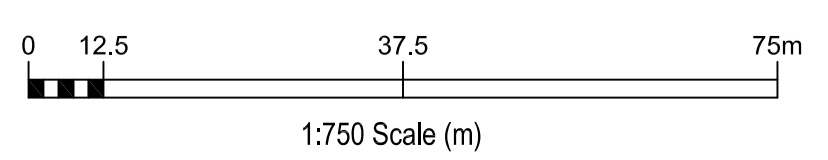
Hedge to be removed (red hatched area)

BS-grade Tree Protection Fencing

Wire mesh panels affixed to scaffold framework and posts with clamps

Scaffold poles/wooden posts firmly into the ground

Angled supporting struts firmly into the ground and fixed with short scaffold poles; cross-bracing at top middle and base for additional rigidity.



Client : Bidwells		
Project : Darwin Green A14 landscaped bunds & haul roads		
Title : Tree Survey & Protection Plan		
Scale : 1:750	Dwg No : TPP1_DG_03	Rev : A
Date : Oct 2013		

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Do not scale from this drawing. Any discrepancies are to be reported to ACS Consulting. This drawing is to be used when printed to scale & in colour.

APPENDIX 3

Tree Protection Fencing

Specifications (specifically identified by outline box)

2.4m Hoarding

3.0m 100 X 100mm square wooden posts

3 X 38 X 87mm wooden rails affixed to posts

2.4m X 1200 outside grade ply panels (12mm) affixed to rails.

50 X 100mm angled supporting struts affixed internally (quantity as required).

(Supporting posts fixed into position using concrete. All post holes to be hand excavated. Post holes to be no larger than 300 X 300mm.)

Heras Fencing

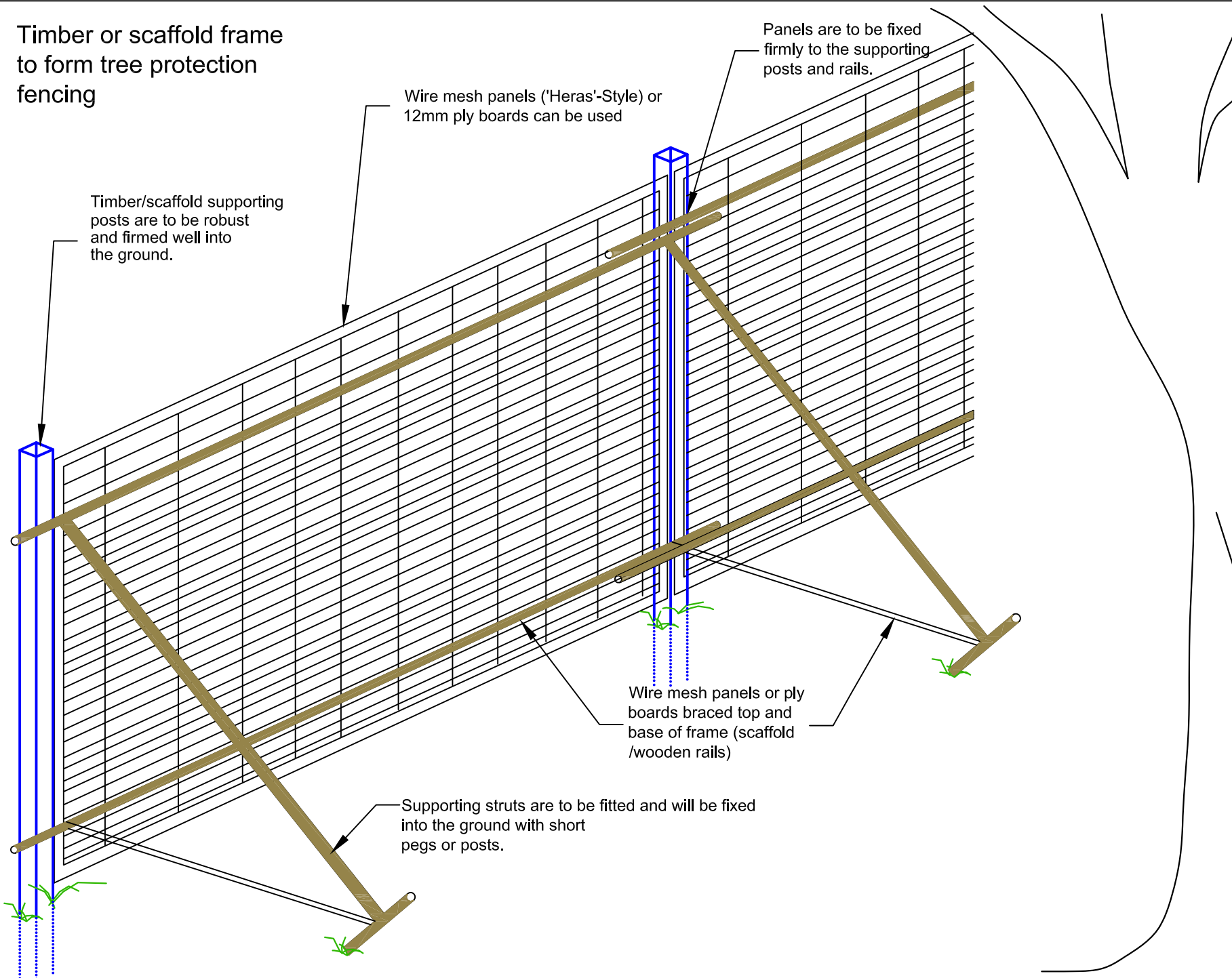
Heras fencing describes the 2.4m galvanised steel mesh panelled fencing normally supplied with pre-cast concrete bases. **Bases are to be replaced with a fixed frame to which panels are clamped/ firmly fixed.** For extra stability, scaffold poles/4x4 wooden posts are to be firmed into the ground as supporting posts and supporting struts are to be attached at a 45 degree angle on the 'tree-side' of the fencing and fixed into the ground. Supporting posts will be braced at the top and base for added support.

Timber or scaffold frame to form tree protection fencing

Wire mesh panels ('Heras'-Style) or 12mm ply boards can be used

Panels are to be fixed firmly to the supporting posts and rails.

Timber/scaffold supporting posts are to be robust and firmed well into the ground.



Wire mesh panels or ply boards braced top and base of frame (scaffold /wooden rails)

Supporting struts are to be fitted and will be fixed into the ground with short pegs or posts.

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Title:

Example of Tree Protection Fencing

Note:

Steel scaffold or timber can be used to support boards or wire mesh panels

Date: Jan. 07

Ref:

Note: Sketch Plan Only - Not to Scale

Tree Protection Fencing

Scaffold Framework supporting 'Heras' type panels with signs attached.



Wooden Framework with 'Heras' type panels attached.



APPENDIX 4

Arboricultural Site Supervision

Site: 1 Hyde Park, London
Inspected By: H .Appleyard
Client: RPC
Site Agent: Shaun Clark

Date of Inspection: 15/02/2007
Time of Inspection: 3:30pm

Tree Protective Fencing

Tree protection in correct location

Comments/Action

No action at this time



Effective fencing in position

Agreed Construction Exclusion Zone

No debris within construction exclusion zone

Comments/Action

No action at this time



Fencing with signs

Amendments to Documentation Required

No amendments required

Comments/Action

Building works outside scope of Method Statement

Remedial Works

General Comments

Tree protection and on-site supervision effective and understood.