ARBORICULTURAL IMPACT ASSESSMENT
Including Provisional Method Statement

Marble Hill Play Centre, Marble Hill Park, Twickenham

- prepared on behalf of ***Terra Firma Consultancy*** *–*

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1.0 INTRODUCTION & CLIENTS BRIEF

1.1 I am instructed on this project by **Terra Firma Landscape Consultancy.**

1.2 The owners of the site seek to obtain planning approval to demolish existing structures and redevelop the site with a bespoke building and revised Play Facilities and landscaping.

1.3 There are on and off site trees which will need to be catered for and protected during this process.

1.4 I have been commissioned to prepare a report to satisfy the arboricultural aspects of this project to meet planning requirements.

1.5 My work is to be compiled in accordance with the recommendations contained within BS5837:2012.

2.0 DOCUMENT DISCLOSURE STATEMENT

I have been provided with a copy of the Landscape Strategy Plans which are based on the Topographical Plan and Planning Layout drawings as prepared by the project Architects :-

- **Marble Hill Landscape Proposals – 2070 – TF-00-00-DR-L-1001 – 1:125 @ A0**

- this drawing has been provided to me for the purposes of my work and I rely totally on its accuracy in terms of tree location; applying crown spreads and setting out protective fencing and tree protection measures.

3.0 TREE SURVEY & ROOT PROTECTION SCHEDULES & IMPACT ASSESSMENT

3.1 I visited the site on **22nd April 2021** and carried out a tree survey exercise in accordance with BS5837:2012 recommendations (see also the explanatory tree survey notes **at appendix BH1**).

Tree No.	Species	Ht m	Diam mm	Brch Sprd m	GC m	LS	Comments	Preliminary Management Recommendations	Rem Con yrs	Cat
1	Broad Leaved Lime *Tilia platyphyllos*	16.5	605	N 7 E 5 S 5 W6	2	M	Epicormics on trunk-previously heavily topped out-cavities in old pruning wounds-crown composed entirely of regrowth- large diameter deadwood	Remove deadwood and stubs for safety reasons	20-30	C1
2	Holm Oak *Quercus ilex*	10	355 253	N 6 E 6 S 6 W7	0	SM	Bifurcated 0.5m above ground level-low branching habit down to the ground-branches scraping on roof of Toilet Block to west side-branches engulf a light column – has been hard pruned back on west side to accommodate the Toilet Block.	Crown lift to clear car park /Play Centre & Toilet Block	>40	B1
Grp 1	Elderberry *Sambucus nigra x 2 of*	4.5	Av 154	N 1 E 4.5 S 2 W0	1	Y	Heavily suppressed-crown weighted east-self sown trees- low branching habit	No work required at time of survey	10-20	C2
3	Elderberry *Sambucus nigra*	5.5	186 x 2 123 x 5	N 6 E 6 S 4 W3	1.5	EM	Multi stemmed at ground level-leans east-suppressed-crown weighted east -low branching habit- small diameter deadwood throughout.	Crown lift to clear from Play Centre equipment	10-20	C1
4	Hornbeam *Carpinus betulus*	5	404	N 1 E 1 S 1 W1	1	EM	Has been cut down to leave a 4.5m stump -crown comprised entirely of regrowth-poor quality tree.	Consider removal	<10	**U**
5	Purple Beech *Fagus sylvatica 'Purpurea'*	12	685	N 6 E 6 S 6 W6	2	M	Roots exposed-ground compacted around base of tree-low branching habit to west side-has been heavily reduced and reshaped and crown lifted.	No work required at time of survey	20-30	B1
6	Red Oak *Quercus rubra*	16.5	430	N 6 E 4 S 6 W7	4	M	Epicormics on trunk-bifurcated in upper reaches-open form with no central leader-suppressed to north and east-crown shape dictated by group pressure-merged crowns-low vigour and vitality and low crown density-significant dieback throughout-epicormic response on trunk and through branch work-small and major deadwood throughout-previously reduced and reshaped probably as a result of previous dieback-the tree is struggling	Re-inspect the tree this summer and assess its true condition and amount of live crown area to determine its future.	<10	**U**
7	Purple Sycamore *Acer pseudoplatanus 'Purpureum'*	16.5	520	N 5 E 7.5 S 8 W5	3	M	Multi stemmed 4m above ground level-suppressed-crown shape dictated by group pressure-major deadwood and stubs-low branching habit on east side only.	Remove deadwood and stubs for safety reasons	>40	B1

8	Common Sycamore *Acer pseudoplatanus*	21	955	N 8.5 E 8.5 S 8.5 W8.5	3	M	Major deadwood and stubs-good shape and form	Remove deadwood and stubs for safety reasons	>40	A1
9	Horse Chestnut *Aesculus hippocastanum*	19.5	1005	N 6 E 6 S 6 W6	1	M	Epicormics throughout down to ground level-has been reduced and reshaped.	No work required at time of survey	>40	B1
10	Horse Chestnut *Aesculus hippocastanum*	19.5	1000	N 10 E 11 S 11 W6	2	M	Previously crown lifted-previously heavily reduced and reshaped-good shape and form-epicormics on trunk.	No work required at time of survey	>40	A1
11	Horse Chestnut *Aesculus hippocastanum*	17.5	880	N 10 E 10 S 11.5 W7.5	4	M	Cavities in old pruning wounds on main trunk-previously heavily reduced and reshaped-epicormics on trunk-deadwood and stubs.	Remove deadwood and stubs for safety reasons	>40	A1
12	Corsican Pine *Pinus nigra 'Calabrica'*	17.5	412	N 5.25 E 5.25 S 4 W2.5	6	M	Small diameter deadwood-fair shape and form	No work required at time of survey	30-40	B1
13	Corsican Pine *Pinus nigra 'Calabrica'*	17.5	603	N 6.5 E 3 S 6 W7.5	8	M	Small diameter deadwood-fair shape and form	No work required at time of survey	30-40	B1
14	Common Sycamore *Acer pseudoplatanus*	18.5	584	N 8.5 E 10 S 8 W4	3	M	Suppressed to west side-low crown density-dieback-major deadwood and stubs	Remove deadwood and stubs for safety reasons	20-30	C1
Grp 2	Ash *(Fraxinus)* Persian Ironwood *(Parrotia)* Blue Cedar *(Cedrus)*	4 to 8	205 to 335	N - E - S - W-	1	SM	Crown shapes dictated by group pressure-merged crowns-ornamental grouping – deadwood throughout. **Ash** – low crown density-may have Ash Dieback-check in Summer **Cedar**-has been heavily topped out leaving torn stubs	Remove deadwood where it overhangs path for safety reasons and crownlift to clear same	10-20	C2
15	Horse Chestnut *Aesculus hippocastanum*	17	980	N 10 E 11 S 5 W8	2	M	Epicormics on main trunk-suppressed to the south-crown shape dictated by group pressure-merged crowns-significant dieback over Play Centre-small and large diameter deadwood-low branching habit-weep points indicative of Bleeding Canker	Remove deadwood and stubs for safety reasons	>40	B1
16	Horse Chestnut *Aesculus hippocastanum*	17	1100	N 4 E 10 S 12 W9	2	M	Multi stemmed at 2m above ground level-suppressed to the north-crown shape dictated by group pressure-merged crowns-major deadwood and stubs- low branching habit-previously reduced and reshaped-weep points indicative of Bleeding Canker	Remove deadwood and stubs for safety reasons	>40	B1

17	Sweet Chestnut *Castanea sativa*	5.5	235	N 4 E 4 S 4 W4	1	Y	Low branching habit-good shape and form	No work required at time of survey	>40	A1
18	Hornbeam *Carpinus betulus*	6	175	N 3 E 3 S 3 W3	0	Y	Low branching habit-good shape and form	No work required at time of survey	>40	A1
19	Walnut *Juglans regia*	11	464	N 8.5 E 6.5 S 7 W7	1.5	EM	Low branching habit-good shape and form	No work required at time of survey	>40	A1
20	Common Lime *Tilia europaea*	17	652	N 8.5 E 9 S 9 W8	2	EM	Roots exposed and mower damaged-compacted ground-low branching habit over play centre and foot path	No work required at time of survey	>40	A1
21	Hornbeam *Carpinus betulus*	4.75	175	N 3.7 E 3.7 S 3.7 W3.7	0	Y	Fair shape and form-low branching habit.	No work required at time of survey	>40	B1
22	Common Lime *Tilia europaea*	16	554	N 5 E 7.5 S 7.5 W3	3	EM	Epicormics throughout-suppressed west side-crown shape dictated by group pressure-merged crowns with partner Lime to the west side-major deadwood and stubs-previously reduced and reshaped-cavities in old pruning wounds-low branching habit.	Remove deadwood and stubs for safety reasons Crown lift over footpath	>40	B1
23	Crab Apple *Malus spp.*	3	95	N 1 E 1.5 S 1.5 W0.5	1.5	Y	Suppressed and dominated by the Holm Oak	Consider removal to benefit Holm Oak	10-20	C1
24	Crab Apple *Malus spp.*	3	224	N 5.3 E 1 S 1 W2.3	1.5	Y	Suppressed and dominated by the Holm Oak-has been pruned back heavily on the west side to accommodate the Toilet Block-poor quality tree.	Consider removal to benefit Holm Oak	10-20	C1
25	Crab Apple *Malus spp.*	5	233	N 3 E 4.3 S 3 W4.3	0	Y	Epicormics-low branching habit overhanging fence line to east side	Prune to clear Play Centre	20-30	B1
26	Crab Apple *Malus spp.*	3.5	184	N 2.5 E 2 S 4 W2.5	1	Y	Low branching habit overhanging fence line to east side	Prune to clear Play Centre-remove dieback	20-30	B1

3.2 A Tree Root Protection Schedule has been prepared in accordance with BS5837:2012 recommendations (see Plans BJH 01 & 02 at **appendix BH2**)

Tree No.	Tree Species	Cat	Diam mm	BS5837:2012 Table D1 Radial Protect. Zone m	BS5837:2012 Table D1 Root Protect. Area m^2	Is An Offset Required To Cater For Existing Rooting Pattern Restrictions
1	Broad Leaved Lime *Tilia platyphyllos*	C1	605	7.3	166	NO – fairly free rooting to all directions
2	Holm Oak *Quercus ilex*	B1	355 253	5.2	86	NO – fairly free rooting to all directions
Group 1	Elderberry *Sambucus nigra x 2 of*	C2	Av 154	1.8	11	NO – fairly free rooting to all directions
3	Elderberry *Sambucus nigra*	C1	186 x 2 123 x 5	4.5	63	NO – fairly free rooting to all directions
4	Hornbeam *Carpinus betulus*	**U**	404	4.8	74	NO – fairly free rooting to all directions
5	Purple Beech *Fagus sylvatica 'purpurea'*	B1	685	8.2	213	NO – fairly free rooting to all directions
6	Red Oak *Quercus rubra*	**U**	430	5.2	84	NO – fairly free rooting to all directions
7	Purple Sycamore *Acer pseudoplatanus 'Purpureum'*	B1	520	6.2	122	NO – fairly free rooting to all directions
8	Common Sycamore *Acer pseudoplatanus*	A1	955	11.5	413	NO – fairly free rooting to all directions
9	Horse Chestnut *Aesculus hippocastanum*	B1	1005	12.1	457	NO – fairly free rooting to all directions
10	Horse Chestnut *Aesculus hippocastanum*	A1	1000	12.0	453	NO – fairly free rooting to all directions
11	Horse Chestnut *Aesculus hippocastanum*	A1	880	10.6	351	NO – fairly free rooting to all directions

12	Corsican Pine *Pinus nigra 'Calabrica'*	B1	412	4.9	77	NO – fairly free rooting to all directions
13	Corsican Pine *Pinus nigra 'Calabrica'*	B1	603	7.2	165	NO – fairly free rooting to all directions
14	Common Sycamore *Acer pseudoplatanus*	C1	584	7.0	154	NO – fairly free rooting to all directions
Group 2	Ash *(Fraxinus)* Persian Ironwood *(Parrotia)* Blue Cedar *(Cedrus)*	C2	205 to 335	2.5 4.3	19 57	NO – fairly free rooting to all directions
15	Horse Chestnut *Aesculus hippocastanum*	B1	980	11.8	435	NO – fairly free rooting to all directions
16	Horse Chestnut *Aesculus hippocastanum*	B1	1100	13.2	548	NO – fairly free rooting to all directions
17	Sweet Chestnut *Castanea sativa*	A1	235	2.8	25	NO – fairly free rooting to all directions
18	Hornbeam *Carpinus betulus*	A1	175	2.1	14	NO – fairly free rooting to all directions
19	Walnut *Juglans regia*	A1	464	5.6	98	NO – fairly free rooting to all directions
20	Common Lime *Tilia europaea*	A1	652	7.8	183	NO – fairly free rooting to all directions
21	Hornbeam *Carpinus betulus*	B1	175	2.1	14	NO – fairly free rooting to all directions
22	Common Lime *Tilia europaea*	B1	554	6.6	139	NO – fairly free rooting to all directions
23	Crab Apple *Malus spp.*	C1	95	1.1	4	NO – fairly free rooting to all directions
24	Crab Apple *Malus spp.*	C1	224	2.7	23	NO – fairly free rooting to all directions

25	Crab Apple *Malus spp.*	B1	233	2.8	25	NO – fairly free rooting to all directions
26	Crab Apple *Malus spp.*	B1	184	2.2	15	NO – fairly free rooting to all directions

4.0 IMPACT ASSESSMENT & TREE PROTECTION MEASURES RECOMMENDED

4.1 The finalised planning layout drawing has been provided to me and an assessment made as to the viability of retaining trees as part of this layout in order that they meet the RPA requirements of BS5837 - the data is presented here in tabular format :-

Key: **NO-RSAM** = Remove for sound arboricultural management reasons **NO-RTFD** = Remove to facilitate development **UF** = under footprint of proposed development

YES = Yes can be retained and fully protected **YES (1) =** Yes can be retained subject to mitigation measures being applied

Tree No	Species	Cat	Stem Diam mm	BS5837:2012 Radial Protection Area m	BS5837:2012 Table D1 Root Protect. Area m^2	Distance from Site Features (see key above)	Can Tree Be Retained
1	Broad Leaved Lime *Tilia platyphyllos*	C1	605	7.3	166	The RPA overlaps the Zip Wire but this is existing	**YES**
2	Holm Oak *Quercus ilex*	B1	355 253	5.2	86	The RPA extends only as far as the existing Zip Wire	**YES**
Grp 1	Elderberry *Sambucus nigra* *x 2 of*	C2	Av 154	1.8	11	Consider removal as these are very poor quality self sown trees that interfere with the full development of the Holm Oak	**NO-RSAM**
3	Elderberry *Sambucus nigra*	C1	186 x 2 123 x 5	4.5	63	Consider removal as this is a very poor quality self sown tree that interferes with the full development of the Holm Oak	**NO-RSAM**
4	Hornbeam *Carpinus betulus*	**U**	404	4.8	74	To be removed to facilitate the new layout	**NO-RTFD**
5	Purple Beech *Fagus sylvatica* *'purpurea'*	B1	685	8.2	213	Unaffected by the main building works but hard and soft landscaping works will be carried out within its RPA so hand digging and where appropriate 'No Dig' porous surfacing detail will need to be applied.	**YES (1)**
6	Red Oak *Quercus rubra*	**U**	430	5.2	84	Unaffected by the main building works but hard and soft landscaping works will be carried out within its RPA so hand digging and where appropriate 'No Dig' porous surfacing detail will need to be applied.	**YES (1)**

Tree No	Species	Cat	Stem Diam mm	BS5837:2012 Radial Protection Area m	BS5837:2012 Table D1 Root Protect. Area m^2	Distance from Site Features (see key above)	Can Tree Be Retained
7	Purple Sycamore *Acer pseudoplatanus 'Purpureum'*	B1	520	6.2	122	Unaffected by the main building works but hard and soft landscaping works will be carried out within its RPA so hand digging and where appropriate 'No Dig' porous surfacing detail will need to be applied.	**YES (1)**
8	Common Sycamore *Acer pseudoplatanus*	A1	955	11.5	413	The RPA overlaps the new building footprint as does the crown spread – mitigation measures will therefore need to be applied to protect this tree during the construction works phase of development	**YES (1)**
9	Horse Chestnut *Aesculus hippocastanum*	B1	1005	12.1	457	The RPA overlaps the new building footprint as does the crown spread – mitigation measures will therefore need to be applied to protect this tree during the construction works phase of development	**YES (1)**
10	Horse Chestnut *Aesculus hippocastanum*	A1	1000	12.0	453	The RPA overlaps the new building footprint as does the crown spread – mitigation measures will therefore need to be applied to protect this tree during the construction works phase of development	**YES (1)**
11	Horse Chestnut *Aesculus hippocastanum*	A1	880	10.6	351	Unaffected by the redevelopment proposals	**YES**
12	Corsican Pine *Pinus nigra 'Calabrica'*	B1	412	4.9	77	Unaffected by the redevelopment proposals	**YES**
13	Corsican Pine *Pinus nigra 'Calabrica'*	B1	603	7.2	165	Unaffected by the redevelopment proposals	**YES**
14	Common Sycamore *Acer pseudoplatanus*	C1	584	7.0	154	Unaffected by the redevelopment proposals	**YES**
Grp 2	Ash *(Fraxinus)* Persian Ironwood *(Parrotia)* Blue Cedar *(Cedrus)*	C2	205 to 335	2.5 4.3	19 57	Unaffected by the redevelopment proposals	**YES**
15	Horse Chestnut *Aesculus hippocastanum*	B1	980	11.8	435	The RPA overlaps the new proposals for a Pond and other landscape features - the final design will need to show any features that require excavation to be moved outside of this trees RPA. In addition all hard and soft landscaping that will be within its RPA will either have to be outside of same or hand digging and where appropriate 'No Dig' porous surfacing detail will need to be applied.	**YES (1)**
16	Horse Chestnut *Aesculus hippocastanum*	B1	1100	13.2	548	The RPA overlaps the new proposals for a Pond and other landscape features - the final design will need to show any features that require excavation to be moved outside of this trees RPA. In addition all hard and soft landscaping that will be within its RPA will either have to be outside of same or hand digging and where appropriate 'No Dig' porous surfacing detail will need to be applied.	**YES (1)**

Tree No	Species	Cat	Stem Diam mm	BS5837:2012 Radial Protection Area m	BS5837:2012 Table D1 Root Protect. Area m^2	Distance from Site Features (see key above)	Can Tree Be Retained
17	Sweet Chestnut *Castanea sativa*	A1	235	2.8	25	Unaffected by the redevelopment proposals	**YES**
18	Hornbeam *Carpinus betulus*	A1	175	2.1	14	Unaffected by the redevelopment proposals	**YES**
19	Walnut *Juglans regia*	A1	464	5.6	98	The RPA will abut the new building so protective fencing will need to be erected but set back to allow for ground protection measures and standard working practices.	**YES (1)**
20	Common Lime *Tilia europaea*	A1	652	7.8	183	The RPA overlaps the Swing but this is existing	**YES**
21	Hornbeam *Carpinus betulus*	B1	175	2.1	14	Unaffected by the redevelopment proposals	**YES**
22	Common Lime *Tilia europaea*	B1	554	6.6	139	Unaffected by the redevelopment proposals	**YES**
23	Crab Apple *Malus spp.*	C1	95	1.1	4	Consider removal as this is a very poor quality self sown tree that interferes with the full development of the Holm Oak	**NO-RSAM**
24	Crab Apple *Malus spp.*	C1	224	2.7	23	Unaffected by the redevelopment proposals but completely dominated by the Holm Oak	**NO-RSAM**
25	Crab Apple *Malus spp.*	B1	233	2.8	25	There will be a temporary access footpath laid between this and the adjacent Crab Apple so ground protection measures will need to be applied here	**YES (1)**
26	Crab Apple *Malus spp.*	B1	184	2.2	15	There will be a temporary access footpath laid between this and the adjacent Crab Apple so ground protection measures will need to be applied here	**YES (1)**

4.2 SUMMARY

	YES Can be retained and fully protected in accordance with BS5837 recommendations - see **Tree Protection Plan BJH.03/04 at appendix BH3**	YES (1) Can be retained and protected in accordance with BS5837 recommendations (see **Tree Protection Plan BJH.03/04** at **appendix BH3**) - subject to adherence to the methodology prescribed in this report – see Section 6 for full details.	NO-RTFD Recommended for removal in order to facilitate development proposals	NO-RSAM Recommended for removal on sound arboricultural management grounds [health and safety grounds] regardless of any redevelopment proposals
A	**11 H.Chestnut; 17 Sw.Chestnut; 18 Hornbeam & 20 Lime**	**8 Sycamore; 10 H.Chestnut & 19 Walnut**	-	-
B	**2 Holm Oak; 12 Pine; 13 Pine; 21 Hornbeam & 22 Lime**	**5 Beech; 7 Sycamore; 9 H.Chestnut; 15 H.Chestnut; 16 H.Chestnut; 25 Crab Apple & 26 Crab Apple**	-	-
C	**1 Lime; 14 Sycamore & Grp 2 Mixed**	-	-	**Grp 1 Elder; 3 Elder; 23 Crab Apple & 24 Crab Apple**
U	-	**6 Red Oak**	**4 Hornbeam**	-

5.0 RECOMMENDED TREE WORKS

No	Species	Tree Works Recommended
1	Broad Leaved Lime *Tilia platyphyllos*	• Remove deadwood and stubs for safety reasons
2	Holm Oak *Quercus ilex*	• Crown lift to clear the car park and zip wire and Toilet Block
Grp 1	Elderberry *Sambucus nigra* *x 2 of*	• Advise removal and stump grinding
3	Elderberry *Sambucus nigra*	• Advise removal and stump grinding
4	Hornbeam *Carpinus betulus*	• Remove and stump grind
5	Purple Beech *Fagus sylvatica 'purpurea'*	• No works required at this time

6	Red Oak *Quercus rubra*	• Remove deadwood and dieback for safety reasons
7	Purple Sycamore *Acer pseudoplatanus 'Purpureum'*	• Remove deadwood and stubs for safety reasons
8	Common Sycamore *Acer pseudoplatanus*	• Remove deadwood and stubs for safety reasons • Crown lift to allow for the new Awning and shorten back lateral spread to the south side as necessary
9	Horse Chestnut *Aesculus hippocastanum*	• Remove deadwood and stubs for safety reasons • Crown lift to allow for the new Awning and shorten back lateral spread to the south side as necessary
10	Horse Chestnut *Aesculus hippocastanum*	• Remove deadwood and stubs for safety reasons • Crown lift to allow for the new Awning and shorten back lateral spread to the south side as necessary
11	Horse Chestnut *Aesculus hippocastanum*	• Remove deadwood and stubs for safety reasons
12	Corsican Pine *Pinus nigra 'Calabrica'*	• No works required at this time
13	Corsican Pine *Pinus nigra 'Calabrica'*	• No works required at this time
14	Common Sycamore *Acer pseudoplatanus*	• Remove deadwood and stubs for safety reasons
Grp 2	Ash Persian Ironwood Blue Cedar	• Tidy the storm damage and repair torn wounds and reshape as necessary
15	Horse Chestnut *Aesculus hippocastanum*	• Remove deadwood and stubs for safety reasons
16	Horse Chestnut *Aesculus hippocastanum*	• Remove deadwood and stubs for safety reasons
17	Sweet Chestnut *Castanea sativa*	• No works required at this time
18	Hornbeam *Carpinus betulus*	• No works required at this time

19	Walnut *Juglans regia*	• No works required at this time
20	Common Lime *Tilia europaea*	• No works required at this time
21	Hornbeam *Carpinus betulus*	• No works required at this time
22	Common Lime *Tilia europaea*	• Remove deadwood and stubs for safety reasons • Crown lift to provide a safe clearance above footpath
23	Crab Apple *Malus spp.*	• Advise removal and stump grinding
24	Crab Apple *Malus spp.*	• Advise removal and stump grinding
25	Crab Apple *Malus spp.*	• No works required at this time
26	Crab Apple *Malus spp.*	• No works required at this time

6.0 PROVISIONAL METHOD STATEMENT – the principles of tree protection for the demolition and construction phases

Generic Measures

It is anticipated that the Method Statement & Tree Protection Plan will follow once the building and landscaping layout have been fully developed.Thus the following describes the principles that would need to be adopted in the Site Specific Method Statement & Tree Protection Plan. Full details to be supplied and approved in writing prior to construction.

6.1 It is recommended that **ALL** of the above recommended tree works are completed prior to demolition contractors being allowed to access the site. This work should be carried out by a fully qualified professional tree surgery company in accordance with current BS3998 recommendations.

6.2 Prior to demolition contractors being allowed to access the site first erect the protective fencing in the locations which are to be shown on the **Tree Protection Plan (*once a fixed layout has been decided upon*)**. Barriers are to be 'Fit For Purpose' to exclude construction activity and must be maintained to ensure that they remain rigid and complete and in the original setting out positions. These checks will need to be incorporated into a schedule of site monitoring visits to be agreed with the clients subject to phased development operations and subsequently copies of these site visit reports will need to be copied in to the Council.

6.3 On completion of the Demolition works and prior to the Construction works commencing the protective fencing is to be re-aligned and located as shown on the **Tree Protection Plan (*once a fixed layout has been decided upon*)**. Barriers are to be 'Fit For Purpose' to exclude construction activity and must be maintained to ensure that they remain rigid and complete and in the original setting out positions. These checks will need to be incorporated into a schedule of site monitoring visits to be agreed with the clients subject to phased development operations and subsequently copies of these site visit reports will need to be copied in to the Council.

6.4 In addition ALL ground protection measures specified are also to be installed prior to any work being started out on site - as shown on the **Tree Protection Plan (*once a fixed layout has been decided upon*) *in accordance with BS5837:2012 Section 6.2.3.3.***

6.5 A copy of the Tree Protection Plan is to be pinned up in the offices/mess hut on site for all site staff to see. The area within the fenced off exclusion zone is to be regarded as **sacrosanct** and the fencing shall not be taken down or relocated at any time without the prior written approval of the monitoring arboriculturist or local authority tree officer, unless this has already been agreed as part of the planning application consent process and is detailed in writing and shown on a plan.

The following prohibitions shall apply within the area enclosed by the Tree Protection Fencing [**Construction Exclusion Zone**]:-

- **No** mechanical digging or scraping once the initial ground cover vegetation has been cleared and the site fenced off.
- **No** storage of plant, equipment or materials
- **No** vehicular or plant access
- **No** fire lighting
- **No** handling, discharge or spillage of any chemical substance, including cement washings
- **No** action likely to cause localised water-logging
- **No** change in ground levels

6.6 All site works storage areas and compounds/welfare units/toilet blocks and any mixing areas are to be located outside of and well clear of retained trees and positioned over impervious surfaces or over special catchment areas such that any leakage will be captured and cannot leak into the soil causing contamination. These details are to be shown on a Construction Management Plan to accompany the planning application.

6.7 The details of the proposed utility service links have not been made available to me at this time but it should be possible to link in to existing or lay new services without impinging on the RPA's of retained trees. In the unlikely event that some incursion is necessary then a separate Mini-Method Statement can be provided to satisfy a Planning Condition.

6.8 **Augered Piled Foundations or Cantilevered Building Footprint**

Applicable for trees ***8 Sycamore; T9 Horse Chestnut & 10 Horse Chestnut***

- *Their RPA's overlap the building line which necessitates mitigation measures be applied to ensure the safe and healthy retention of these trees.*
- *A Structural Engineer will need to assess the loadings of the building and design an appropriate size and spacing for the augered piles.*
- *A Mini Tracked Piling Rig can be brought to site to auger the pile holes and reinforced rods inserted (at depths specified by the Structural Engineer) and then backfilled with concrete – the Piling Rig to work outside the tree RPA's at all times.*
- *To prevent soil contamination from the concrete it will be necessary to line the holes with an appropriate insulating material.*
- *Caps will need to be formed over the concrete piles and these can be set into the ground by up to 100mm without adversely impacting on tree roots – provide that the excavation work is carried out with hand tools ONLY and no machinery is involved.*

- *Reinforced lintels will then be laid to connect between the pile caps and these will need to support a suspended reinforced floor to avoid any excavation work and potential adverse impact on tree roots.*
- *This will then form a stable base for the new structure.*

6.9 **Ground Protection**

Applicable to trees ***8 Sycamore; 9 H.Chestnut; 10 H.Chestnut; 19 Walnut; 25 Crab Apple & 26 Crab Apple***

- *Access will be required around the outside perimeter of the new building and also to allow for the erection of scaffolding – therefore mitigation measures will need to be applied here.*
- *Lay the ground protection in accordance with BS5837 Section 6.2.3.3 recommendations (**see attached at Appendix BH3).** Only pedestrian access is required as all machinery can access from alternative locations where they do not affect trees.*
- *This ground protection is to be in situ from the outset and before any building contractors enter the site and work commences - it will need to remain in situ until all construction work has been completed.*

6.10 **'No Dig' Porous Sub Base and Surfacing Detail for Footpaths and Hard Landscaping Features**

Applicable to trees ***5 Beech; 6 Red Oak; 7 Sycamore; 8 H.Chestnut; 9 H.Chestnut; 10 H.Chestnut; 15 H.Chestnut & 16 H.Chestnut***

- *Any new footpaths will need to be constructed in accordance with the examples provided at **Appendix BH3** using proprietary materials designed for the purpose e.g. **CellWeb or GeoCell and Porous Geotextile Membranes.***
- *Hard landscape features will need to be built along 'No Dig' principles by preference but if this is not practical then 'Hand Digging' only and no machinery access will be the way forward.*

6.11 **New Boundary Fencing**

Applicable to trees ***1 Lime; 5 Beech; 6 Red Oak; 7 Sycamore; 8 H.Chestnut; 9 H.Chestnut & 10 H.Chestnut***

- *The close boarded fencing support posts [be they wooden or concrete] will need to be set out on the ground where they are to be positioned.*
- *Then probe the locations to receive these support posts with a metal ground auger to ensure that there are no major roots at these locations – in the event that one is encountered then the post hole must be moved to one side to avoid them.*
- *IF the posts are to be driven in by machine then proceed to do so once the location has been proved to be clear of major roots.*

- *IF the post holes are to be hand dug - any roots of 25mm diameter or less that are encountered in the dig may be cleanly severed with secateurs [if roots larger than this are encountered then an Arboricultural expert must be called in to advise, or the holes must be abandoned and new ones excavated to one side to avoid the roots.]*

- *If the holes are to be filled with concrete then they must first be lined with a thick polythene bag before the posts are centrally positioned in the hole and then concrete inserted around them– this is to avoid soil contamination. Alternatively pack the area around the posts with washed aggregate.*

6.12 **New Section of Wall**

Applicable to trees ***7 Sycamore & 8 H.Chestnut***

- *Either use a Pile and above ground reinforced Beam foundation or a Hand Dig concrete pad foundation as appropriate.*

- *Full details to be supplied and approved in writing prior to construction.*

7.0 SITE MONITORING & SUPERVISION

BS5837 recommends that wherever trees on or adjacent to a site have been identified on the Tree Protection Plan as requiring special protection measures, there should be an auditable system of arboricultural site monitoring. This should extend to direct arboricultural monitoring whenever demolition/construction and development activity is to take place within or adjacent to any RPA.

7.1 A Pre-commencement site meeting is to take place between the development teams arboricultural consultant and the site manager and client representative where the protective fencing will be inspected to verify that it is 'Fit For Purpose' as shown on the **Tree Protection Plan.**

7.2 Lines of communication will be established with the Site Manager and a contact sheet prepared so that in the event that an incident occurs involving the retained trees that requires urgent advice and guidance from the project Arboricultural Expert this can be easily organised.

7.3 The details of the PCSM works will be photographed by the Arboricultural Expert and the following reporting procedure will be adopted. This is an example of the format for the **Site Monitoring Schedule** that would be prepared. :-

Schedule Of Site Monitoring & Supervision for – Marble Hill Play Centre, Twickenham

- **In accordance with the Arboricultural Method Statement Report - 1080.bjh.May21 [and Tree Protection Plan once layout has been fixed and finalised]**

Date of Inspection	Item	In Attendance	Notes/Observations From Inspection	Details Of Any Follow Up Action Required
tba	**Pre-Commencement Meeting**	Project Arb Consultant & Site Construction Manager	• A joint site inspection was conducted and agreement reached that the protection measures are in place and that everyone understands their responsibilities…….	•
tba	**Further Site Monitoring Visits –** **AS REQUIRED**	Project Arb Consultant & Site Construction Manager [invite Council Tree Officer to attend]	•	•

8.0 CONCLUSIONS

- This development can be completed with minimal tree loss –
    1. **T4 Hornbeam –** a very poor quality tree that has suffered decline in vigour and vitality and been very heavily reduced as a consequence to leave a trunk with regrowth.
    2. **Grp 1 Elderberry; T3 Elderberry; T23 Crab Apple & T24 Crab Apple –** all are poor quality trees that either adversely impact on the development of the Holm Oak or are suppressed by same and will never be able to develop to their full potential.

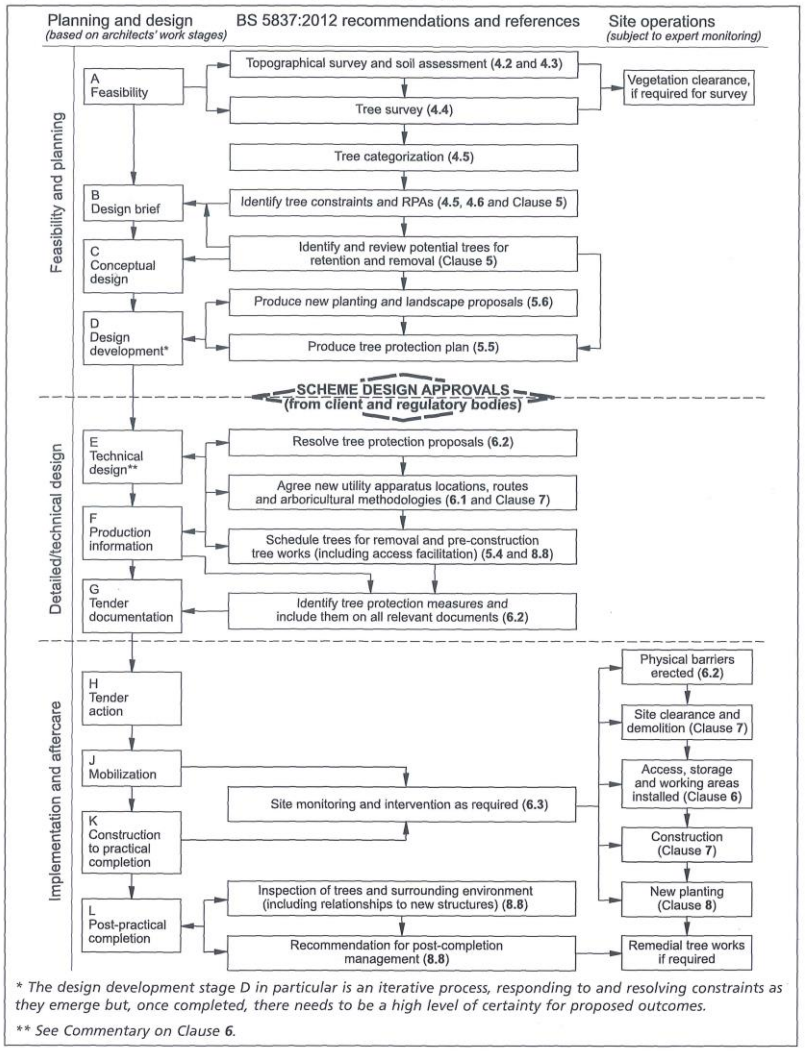
  A significant amount of new tree planting is proposed as part of the Landscaping Proposals which will more than adequately mitigate the loss of these small trees.
- All of the remaining trees on and off site can be retained and with the mitigation measures specified under Section 6 Method Statement above the impact on tree roots can be kept to minimal and acceptable levels within the framework recommendations of BS5837:2012.
- Overall, provided that the above methodology is strictly adhered to in the carefully considered and phased and supervised manner prescribed then I would not foresee any detrimental impact taking place that might undermine the ongoing health and stability or visual amenity value of those trees shown for retention both on and off this site.

Bernie Harverson
arboricultural consultant

BH 1

Figure 1 - Flow Diagram
& Tree Survey Notes

Figure 1 **The design and construction process and tree care**



TREE SURVEY NOTES

These Tree Survey Notes have been prepared in accordance with the recommendations of **British Standard 5837:2012** and they define the criteria for pre –development tree surveys.

- Each tree/group/hedge/shelterbelt/woodland has been allocated a unique number (**No.**). where specifically requested and appropriate fees are agreed small durable numbered metal tags can be applied to each tree/group surveyed.
- The tree species (**Species)** is provided in both English and Latin name formats.
- Height assessments (**Ht**) are estimated in metres. This will be adequate for the majority of cases, but where accurate heights become a critical issue it may be necessary to return to site, as a separately commissioned exercise, to collect accurate measurements with the aid of optical instruments.
- Trunk/stem diameters (**Diam**) are measured in millimetres **at 1.5m above ground level** – where the tree is inaccessible the diameter is estimated as indicated by suffix **#**
- Radial crown spread assessments (**Brch Sprd**) are estimated in metres from the centre of the trunk/group to each of the four primary points of the compass (**N**-north**; E**-east**; S**-south and **W**-west**)** in order to achieve a representation of the crown shape which will be shown on the accompanying tree survey plan. These provide a general guide as to the main bulk outline of a tree/groups crown but **are not tape measured dimensions.** These would only be undertaken as part of a separately commissioned exercise, where precise dimensions are critical to the project at hand.
- Both the canopy ground clearance (**GC**) and the height & compass direction of the lowest major branch (**LMB**) are estimated and shown in metres
- An assessment of a tree/groups 'life stage' (**LS)** is made in terms of its site specific maturity as part of the surrounding landscape, taking into account its overall shape and form in that setting, and is recorded thus :-
  Y - Young tree/group; **SM - Semi**-Mature tree/group; **EM -** Early-Mature tree/group;
  M – Mature tree/group; **OM -** Over – mature tree/group
- Data on the structural condition (**Condition Comments)** of the tree/group is provided to give its visual appearance and any significant health and safety issues.
- Details of any recommended tree works required at the time of survey is given under the heading – **Preliminary Management Recommendations.**
- An estimate of a tree/groups remaining contribution in years (**RC)** is made and is recorded thus :- **0-5; 5-10; 10-20; 20-30; 30-40** or **>40** years**.**
- The category grading (**Cat)** for each tree/group is assessed according to the criteria provided within **BS5837:2012.** The assessment is made of the tree/group in its current condition and within the environment encountered bearing in mind its suitability for retention as part of any future proposed development; although the exact layout detail of any specific scheme will not be known at the time of surveying. The trees have been classified into one of four categories and colour coded as BS5837 recommends :- **U** (dark red); **A** (light green); **B** (mid-blue) and **C** (grey).Please note that suffixed numerical sub-categories are also applied for guidance only and do not carry any cumulative or increased value for the tree/group. This colour coding scheme will be applied to all drawings provided.

Table 1 – Cascade chart for tree quality assessment

Category and definition	Criteria			Colour on plan
Trees unsuitable for retention				
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 (i.e. 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.			**Dark Red**
Trees to be considered for retention				
	Criteria – Subcategories			
	1	**2**	**3**	
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)	**Light Green**
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in the 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	**Mid Blue**
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 150mm	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	**Grey**

Bernie Harverson
arboricultural consultant

BH 2

Tree Survey & Root Protection Plans

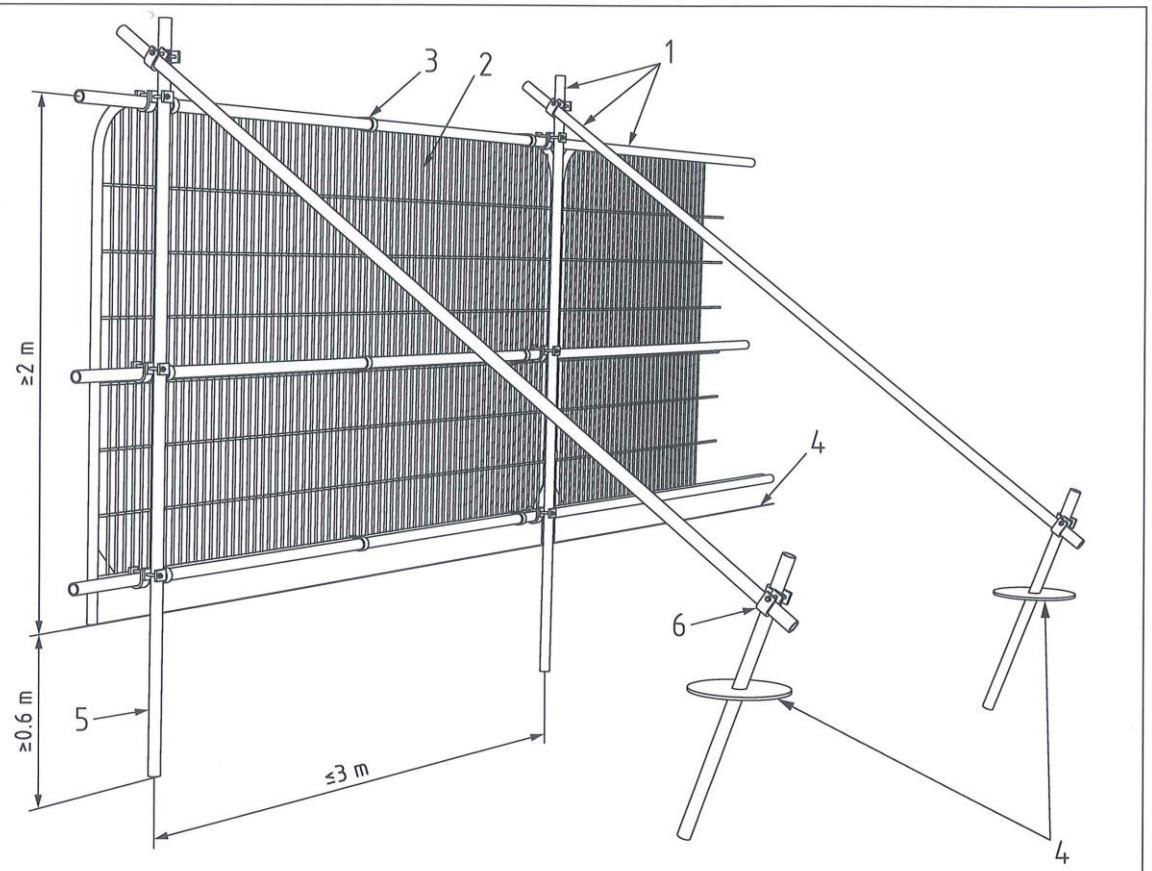
BJH 01/02

Bernie Harverson
arboricultural consultant

BH 3

BS5837:2012 – Figure 2
+ BS5837:2012 – Section 6.2.3.3
+ Examples of ‘No Dig’ Porous Surfacing Details
+ Illustration of a Mini Piling Rig

Figure 2 **Default specification for protective barrier**



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

BS5837:2012 – Section 6.2.3.3 - New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.

Note The ground protection might comprise one of the following:

a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100mm depth of woodchip), laid onto a geotextile membrane;

b) for pedestrian –operated plant up to a gross weight of 2t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150mm depth of woodchip), laid onto a geotextile membrane;

c) for wheeled or tracked construction traffic exceeding 2t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

Bernie Harverson
arboricultural consultant

BH 4

Qualifications & Experience

Bernie Harverson
arboricultural consultant

QUALIFICATIONS AND EXPERIENCE

- My name is Bernie Harverson and I am a self employed independent arboricultural consultant in private practice. I take instructions primarily in the South of England but also on occasions work nationwide and abroad and have offices at : –

The Granary, White Chimney Row, Westbourne PO10 8RS

- I hold the following arboricultural qualification – **National Diploma in Arboriculture** (***Royal Forestry Society – 1976***)
- I have **fifty (50)** years of practical and managerial experience in the arboricultural industry including periods in both the public and private sectors.
- My Local Government sector experience comprises one year as a tree surgeon with Brighton Parks and nine years spent in Arboricultural Officer posts with both Westminster City Council and Portsmouth City Council.
- My past practical experience in the private sector includes two years at Tilhill Forest Nursery and over ten years for various companies as a Climbing Arborist/Tree Surgeon.
- Managerial work in the private sector includes two years as manager of Beechings Tree Surgeons and twelve years with CBA Trees as Managing Director & Senior Arboricultural Consultant.
- As an independent self employed Arboricultural Consultant I now provide a comprehensive range of services including :-
  tree surveys, appraisals, assessments and inspections with particular reference to planning and development and tree safety audits with a service offered as a climber to undertake full climbing inspections to better understand the condition of a given tree before prescribing a management strategy.
- I also undertake litigation work appearing as an Expert Witness in Court Actions and at Planning Appeals, Hearings and Public Local Inquiries.

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