

Arboricultural Impact Assessment
Chandlers BMW
Water Lane
Angmering
West Sussex
BN16 4EH

Report compiled by:
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PJC CONSULTANCY LTD

PJC Ref No: PJC/3040/12

Summary

This report was commissioned to satisfy the requirements of arboricultural issues defined by planning policy, at the request of Marshall Clark.

The proposed project should not affect existing and/or retained trees on the site as long as protection measures set out in BS5837: 2012 *Trees in relation to design, demolition and construction* and outlined in this report are followed.

Objectives of this report

My involvement in this project can be defined by the following objectives:

To provide a schedule of the existing trees that are situated in areas that are likely to be potentially affected by the proposed construction project.

To classify the existing trees using the process defined by BS5837: 2012 '*Trees in relation to design, demolition and construction – Recommendations*'.

To provide arboricultural guidance on protection measures to be implemented during the construction process, and prevent future conflict between trees and structures.

To promote the retention of trees wherever feasible and appropriate.

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1 INTRODUCTION

1.1 **Brief:** I have been commissioned by Bob Stoye of Marshall Clark, to provide a tree survey and arboricultural impact assessment related to the proposed development at Chandlers BMW in Angmering, West Sussex.

1.2 **Documents and information provided:** I was provided with the following documents relating to the site:

- Drawing ref. 10410812 – Topographical Site Survey
- Drawing ref. 5841 002 – Site Plan (Proposed)

1.3 **Scope of this report:** This report is only concerned with the trees within the property boundaries of the site, or in areas that have the potential to be affected by construction works.

1.4 **Background information:** A proposal has been outlined to construct twenty two residential dwellings at the site of Chandlers BMW in Angmering. PJC Consultancy has been commissioned to undertake a tree survey and provide an arboricultural impact assessment following the guidelines set out in BS5837: 2012 '*Trees in relation to design, demolition and construction – Recommendations*'.

1.5 **Qualifications:** I have a Foundation Degree in Arboriculture and am a member of the Arboricultural Association at Technician Level. I have seven years experience in the arboricultural industry, originally working as a groundsman and feller, and progressing into consultancy.

2 SITE VISIT AND OBSERVATIONS

2.1 **Site visit:** I carried out a site visit on 20th September 2012. The weather conditions at the time were clear and dry with a light breeze. The visibility was good.

2.2 **Brief site description:** The site is situated on the junction between Water Lane and High Street in Angmering. The surrounding land use is comprised of residential properties with a public house and a number of shops to the south. The site itself is comprised of several commercial sales buildings and car workshops with forecourts. Located on the southern site boundary are two residential properties that are included within the survey area. Trees are located in the gardens of the residential properties and on the southern site boundary.

2.3 **Identification and location of trees:** The trees are not number tagged but their locations are marked on the Tree Constraints Plan in Appendix 1.

2.4 **Tree observations:** I visually inspected the trees from within the boundaries of the property. The survey methodology was restricted to a visual assessment. The height, crown spread and crown clearance for each tree was estimated to the nearest metre. The DBH (stem diameter at breast height) was measured to the nearest millimetre.

2.5 **Limitations of the Survey:** Access was not available to measure a number of the trees at this site. Stem diameters that have been estimated have been noted on the Tree Survey Schedule.

3 APPRAISAL

3.1 The trees were assessed and categorised using the cascade chart in BS5837: 2012 *Trees in relation to design, demolition and construction – Recommendations*. Their dimensions were recorded, and their positions plotted on the Tree Constraints Plan in Appendix 1. The Tree Survey Schedule in Appendix 2 contains more detailed information for each tree.

3.2 The categorisation of trees is based on a number of factors. The initial category is U for trees that are in such a condition that they cannot realistically be retained as living trees in the context of the current land use for more than ten years. Category U trees do not necessarily need to be removed if they do not conflict with the proposed development or are not dangerous. The remaining trees are then assessed for their arboricultural, landscape and historical, (or cultural) contribution. This assessment takes into account defects and previous pruning to put the trees into A, B and C categories. The highest categorisation is category A, with the lowest being category C. Category C trees are not normally retained if they pose a constraint to development. The cascade chart further explaining the above is included in Appendix 3.

3.3 A total of twelve trees were surveyed and included in the Tree Survey Schedule. No trees were categorised as A with two categorised as B and eight categorised as C. The predicted contribution of two trees is less than ten years, leading to their categorisation as U.

3.4 All trees situated within the survey area are located at the southern section of the site, adjacent to the residential buildings and are protected by the Angmering Conservation Area.

3.5 Tree T1 is a semi mature Scots pine (*Pinus sylvestris*) situated in a garden on the southern site boundary (Photograph 4, Appendix 7). This tree is of good condition and provides visual amenity to the site. It is however located directly below overhead services. As a result, there is limited potential for the tree to mature without remedial pruning works, leading to its categorisation as C2.

3.6 Also located in this garden is a semi mature ash (*Fraxinus excelsior*). This tree does not form a prominent landscape feature, though it does contribute visual amenity to the site. Due to the trees small size, it is not of significant arboricultural value so is categorised as C1.

3.7 Tree T3 is an early mature macrocarpa (*Cupressus macrocarpa*). This tree is situated adjacent to a flint boundary wall and the High Street. On the date of the site visit there was an open excavation in the road below the tree, in close proximity to the site. Although the excavation was relatively small, there was no root growth present. This suggests that the boundary wall is acting as a root barrier. The actual rooting area of this tree will therefore be concentrated within the site boundary.

3.8 Situated east of the macrocarpa are trees T8 and T9, two cherry plums (*Prunus cerasifera*). These two multi-stemmed trees have previously been heavily reduced back over a vehicle forecourt, likely to eliminate the nuisance of leaf drop onto cars (Photograph 3, Appendix 7). As a result of the reductions, the trees are of poor form and have been categorised as C1. It can be assumed that root growth from these trees will not extend into the car forecourt due to the presence of a retaining wall above a non-porous surface.

3.9 Situated on opposite sides of the car forecourt's entrance are trees T7 and T4, two sycamores (*Acer pseudoplatanus*). T7 is of an early mature age class. It's stem is enclosed by fences and bramble, preventing a structural assessment or accurate measurement of stem girth. Tree T4 is a larger and more established tree (Photograph 1, Appendix 7). It is situated on a small embankment adjacent to the forecourt. The rooting area of this tree is likely to be located along the open embankment rather than beneath the non-porous surface.

3.10 Situated north of T4 are trees T5, a mature Leyland cypress (*Cupressocyparis leylandii*), and group G6, two hawthorns (*Crataegus monogyna*). The hawthorns are of poor condition with one dead stem and one stem exhibiting sparse foliage as it is smothered by ivy. G6 is categorised as U. T5 and G6 are situated on top of a tall retaining wall (Photograph 2, Appendix 7). As a result, there will be no roots from these trees located within the site boundary.

4 ARBORICULTURAL IMPACT ASSESSMENT

4.1 To facilitate the proposed development, a number of category C trees require removal from the southern boundary and the centre of the site. Trees requiring removal are shown on the Tree Protection Plan in Appendix 1. The proposed layout incorporates retention of the Scots pine, which is the most important landscape tree. By retaining tree T4, the proposed layout also maintains a mature tree presence along the High Street.

4.2 The house named Edgeways will be retained during the proposed development. Trees T1 and T2 will therefore be unaffected by construction works, as will T12 which is located on a road junction. Additionally, tree T5, the Leyland cypress and the woody shrubs on the high retaining wall along the eastern site boundary will be unaffected by the proposed development.

4.3 Construction of the proposed property number seventeen will encroach the root protection area of tree T4. The encroachment will occur beneath the existing concrete forecourt of the BMW garage where there is low potential for root growth to be found.

4.4 Tree T4 will need to be formatively pruned to avoid conflict with the proposed residential dwelling, both during and post construction. Removing structural branches from the north side of the crown (provided the pruning wounds are not greater than a third of the diameter of the parent branch) will provide suitable clearance for scaffolding and will reduce the need for cyclical pruning in the future. The south side of the canopy will not require any pruning works so the view along the High Street should not be affected.

4.5 Tree T4 will shade proposed dwelling seventeen. Shade will affect the property in the morning but light will be available in the afternoon (refer to Tree Shadow Plan in Appendix 1). There will be suitable light available over the course of the average day to allow reasonable enjoyment of the property without significant pressure to remove the tree in the future.

5 TREE PROTECTION RECOMMENDATIONS

5.1 Each tree's DBH was recorded, and applied to the formula found in Appendix 4. The resulting dimensions equal each tree's Root Protection Areas that are plotted on to the Tree Constraints Plan in Appendix 1, and added to the Tree Survey Schedule in Appendix 2. These are represented as a circle on the plan, and are colour coded depending on the category they were classed in using the cascade chart in Appendix 3.

5.2 The disturbance of a tree's root system can result in crown dieback and even death of the tree. Roots are used to support the tree structurally and act as transport for water and nutrients. Direct damage such as root severance can lead to ill health, as can compaction of the soil by construction traffic, heavy plant and storage of materials. Changing the nature of the surface above growing medium, i.e. from porous to non-porous can alter the resources available to the tree, which in turn can lead to its decline.

5.3 Trees T1 and T2 are located in the garden of Edgeways. The existing wall and tarmac surface adjacent to these trees are to be retained during development and will provide adequate protection for these trees.

5.4 Tree protection fencing shall be installed along the edge of the existing concrete forecourt adjacent to T4 to protect the bare earth area surrounding the tree (refer to Tree Protection Plan in Appendix 1). Specification for tree protection fencing is shown in Appendix 5 of this report. Tree protection fencing shall be installed prior to any demolition or site clearance works commencing and will remain in place until the soft landscaping phase of construction.

5.5 Tree T5 is located above a high retaining wall. It will be unaffected by construction works so will not require any tree protection fencing.

5.6 Any final design must show service locations and their routing. These must be located outside of the trees RPA's where they are underground and outside of the anticipated area of mature crown spread where above ground.

5.7 A pre-commencement meeting with all parties and the Local Authority Arboricultural Officer is recommended to agree working methods before any works are undertaken. All contractors should be briefed about tree related site factors as part of the site safety briefing.

5.8 A system and programme of onsite monitoring by the appointed arboricultural consultant should be agreed with the Local Authority Arboricultural Officer, if it is deemed necessary. Record sheets of monitoring site visits should be available for inspection by all parties, and forwarded to a designated employee of the Local Authority.

5.9 If significant root growth is disturbed during construction activities that are not within the scope of this report all work should cease and a suitably qualified arboriculturalist consulted. It should be remembered that whilst root protection areas are part of industry best practice, tree root growth is influenced by a number of factors and may not conform to expected ideals.

6 CONCLUSIONS

6.1 Although a number of small trees have been recommended for removal as they pose a constraint to development, their loss should not be detrimental to wider landscape or have an adverse impact on local visual amenity. Their loss could be mitigated by replanting with suitable species in appropriate locations during the soft landscaping phase of construction. If this is carried out consideration should be given to their location to avoid conflict with the proposed buildings and associated services.

6.2 Based on the above assessment, trees recommended for retention in this report can be protected during the proposed construction and fully supported following completion of the development.

7 OTHER CONSIDERATIONS

7.1 Tree Preservation Order (TPO) ref TPO/A/1/03 protects a number of trees on the site, as does the Angmering Conservation Area. Any persons proposing to undertake tree works must check the status of these trees with the local authority, and gain necessary consent before works are undertaken

7.2 Financial penalties and/or criminal proceedings can result if tree works are carried out on a protected tree without consent. The entirety of the tree is protected, both above and below ground.

7.3 Trees should be checked for protected species before works are undertaken. It is against the law to disturb bats or their roosts under the Conservation of Habitat and Species Regulations. Nesting birds are protected by the Wildlife and Countryside Act. If protected species are discovered, Natural England should be contacted for advice.

7.4 The trees at this site were assessed for their condition and safety in relation to the average range of weather conditions that the region experiences. Any weather events that exceed the average norm cannot be predicted, and so their effects are not considered within this report.

7.5 The views and opinions contained within this report are entirely those of the author.

8 IMPLEMENTATION OF WORKS

8.1 The contractors should carry out all tree works to BS 3998 *Recommendations for Tree Works* (2010) as modified by research that is more recent. They should also carry relevant, adequate and up to date insurance.

8.2 It is also recommended that all tree works are carried out by an Arboricultural Association approved contractor. Approved contractors are expected to work to industry best standards, and the Arboricultural Association website contains contact details and information on engaging a suitable contractor.

Contact details

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Author: Peter Davies

Date: 30th November 2012

APPENDIX 1 Tree Constraints Plan, Tree Protection Plan And Tree Shadow Plan

Key:

-  RPA for CAT B Tree*
-  RPA for CAT C Tree*
-  RPA for CAT U Tree*
-  Tree canopy

*** Tree categorised in accordance with BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations'.**

Appendix 2, (Tree Survey Schedule) contained within the arboricultural report ref. no. PJC/3040/12 contains further information for each tree.

This drawing should be viewed in colour.



Site: Chandlers BMW, Water Lane, Angmering, West Sussex, BN16 4EH

Client: Marshall Clark

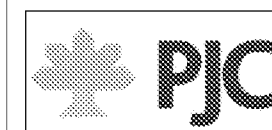
Surveyor: Peter Davies

Date Drawn: 19/09/12

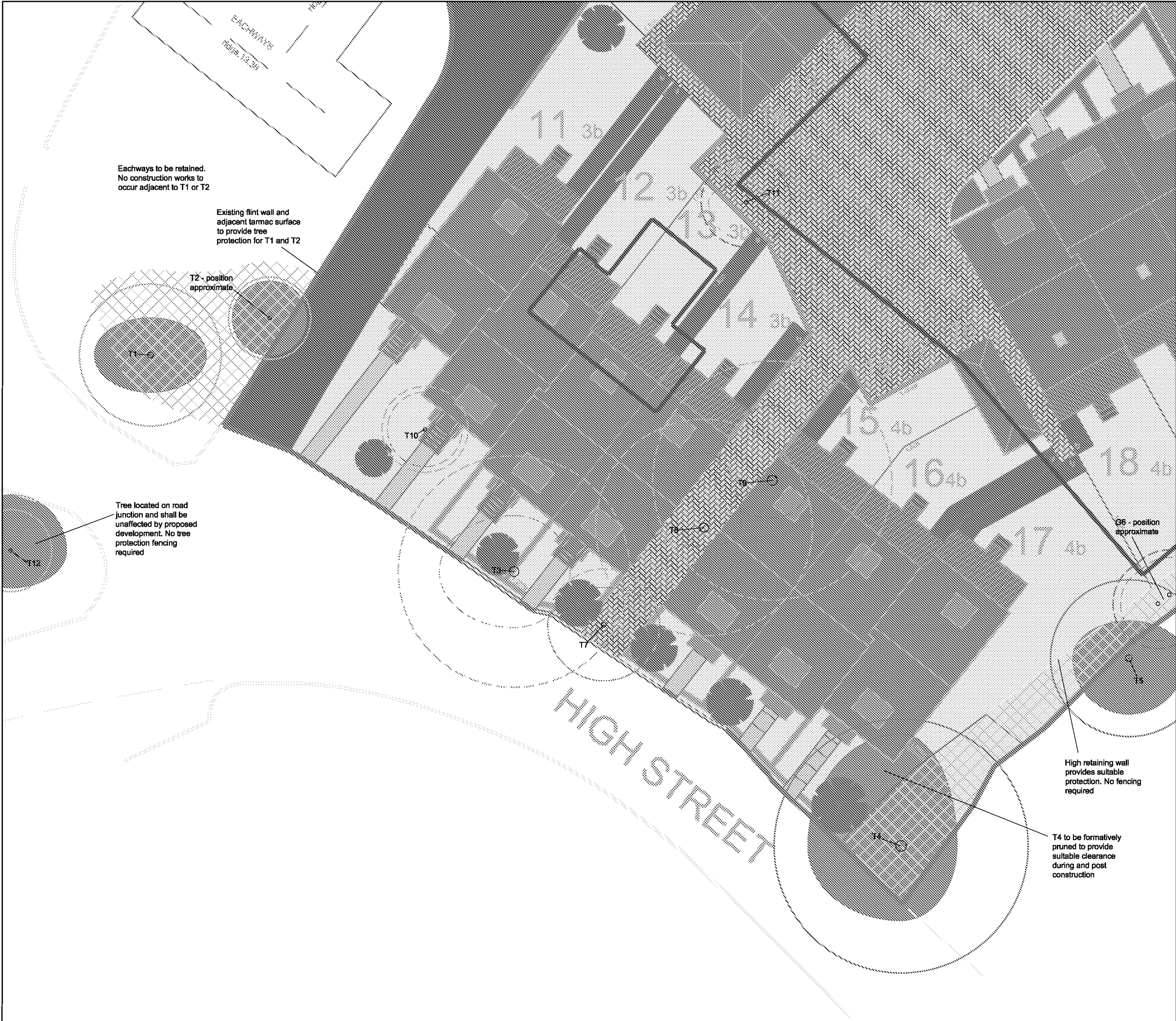
Scale: 1:200 at A3

Drawing Number: PJC/3040/12/A

Drawing Title: Tree Constraints Plan



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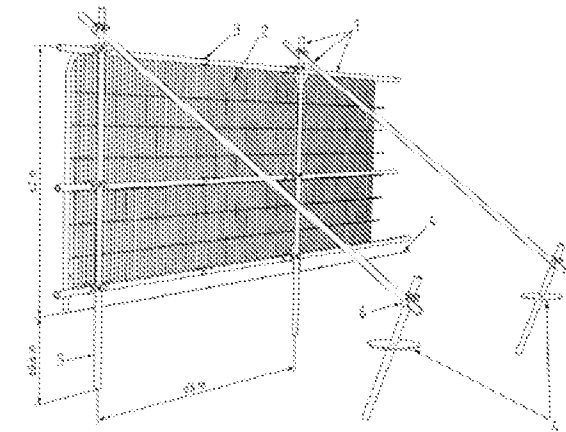
- Key:**
- RPA for CAT B Tree* to be retained
 - RPA for CAT C Tree* to be retained
 - Canopy of tree to be retained
 - RPA for CAT C Tree* to be removed
 - RPA for CAT U Tree* to be removed
 - Canopy of tree to be removed
 - Construction exclusion zone
 - Tree protection fencing

*** Tree categorised in accordance with BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations'.**

Appendix 2, (Tree Survey Schedule) contained within the arboricultural report ref. no. PJC/3040/12 contains further information for each tree.

This drawing should be viewed in colour.

Specification for Tree Protection Fencing:



- Key**
- 1 Standard acorned poles
 - 2 Heavy gauge 2 in tall galvanised tube and welded mesh with panels
 - 3 Panels secured to uprights and cross members with wire ties
 - 4 Smooth foot
 - 5 Members driven into the ground until secure (minimum depth: 0.6m)
 - 6 Standard smooth cap

Site: Chandlers BMW, Water Lane, Angmering, West Sussex, BN16 4EH

Client: Marshall Clark

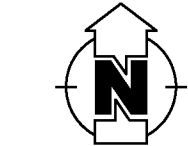
Surveyor: Peter Davies

Date Drawn: 30/11/12

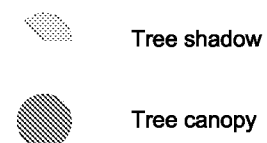
Scale: 1:200 at A3

Drawing Number: PJC/3040/12/B

Drawing Title: Tree Protection Plan



Key:

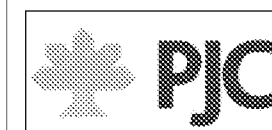
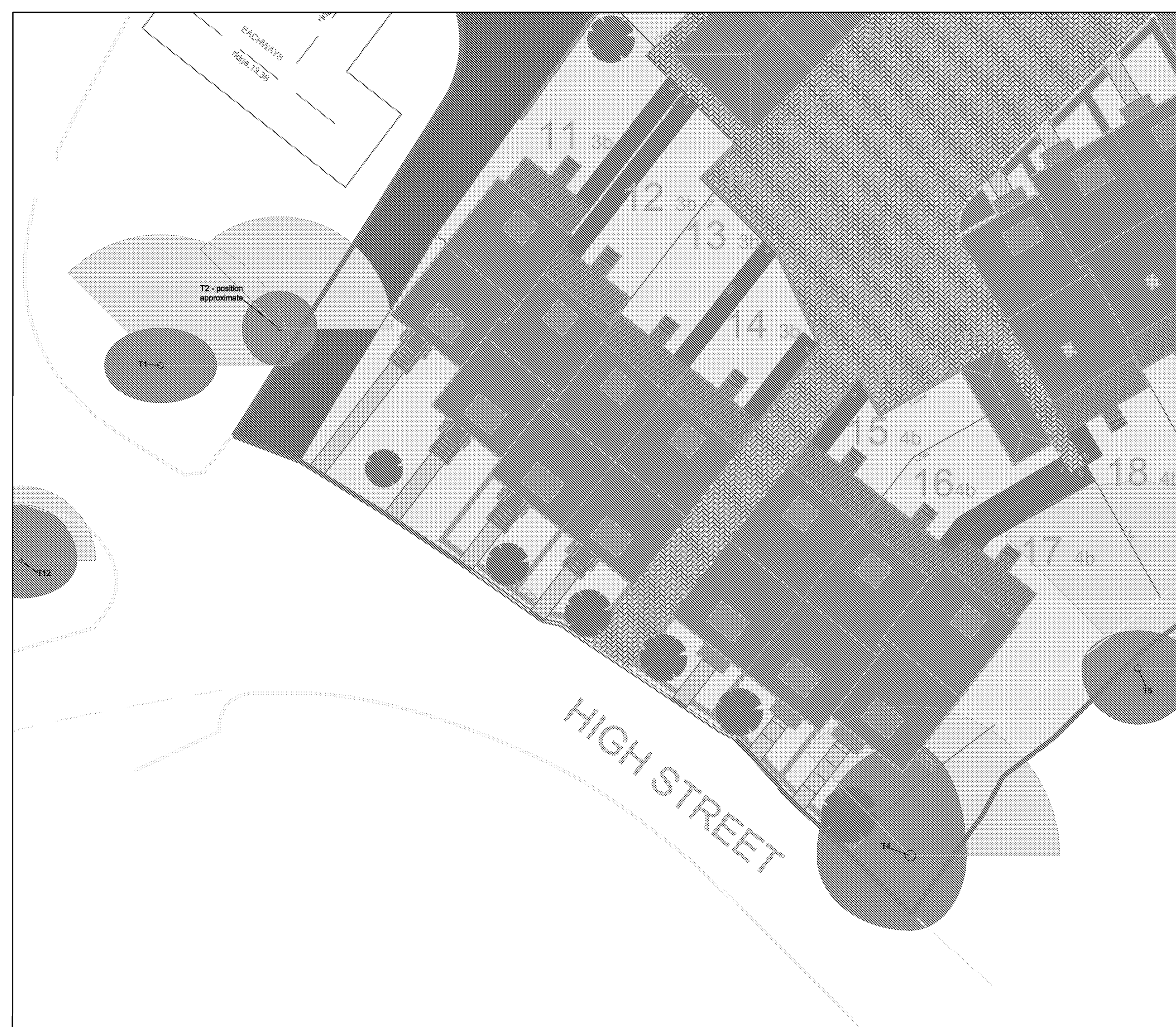


Appendix 2, (Tree survey Schedule) contained within arboricultural report ref. PJC/3040/12 contains further information for each tree.

Tree shadows plotted using guidance set out in BS5837: 2012 - Trees in relation to design, demolition and construction - Recommendations. The trees existing height is used to calculate the radius of the shadow segment, plotted from north west to east as an arc.

Please note the plotted shadows represent shadow cast throughout the typical day, and not the total shadow cast at a given moment.

This drawing should be viewed in colour.



Site: Chandlers BMW, Water Lane, Angmering, West Sussex, BN16 4EH

Client: Marshall Clark

Surveyor: Peter Davies

Date Drawn: 30/11/12

Scale: 1:200 at A3

Drawing Number: PJC/3040/12/C

Drawing Title: Tree Shadow Plan

APPENDIX 2 Tree Survey Schedule

Tree Survey Schedule

				Client: Marshall Clark Site: Chandler BMW Angmering Date: 19/09/2012 Surveyor: Peter Davies						Green - Category A Tree Blue - Category B Tree Grey - Category C Tree Red - Category U Tree		
Tree ref. no.	Species	Height (m)	Stem diameter (mm)	Branch spread (m)	Height of crown clearance (m)	Age class	Physiological condition	Structural condition	Management recommendation	Category grading	Root Protection Area (m2)	Root Protection Radius (m)
T1	Scots pine (<i>Pinus sylvestris</i>)	7	320	N2 E3 S2 W3	2 west	Semi-mature	Good vigour, dense foliage, no evidence of pest or disease	Fair, service pass directly above stem, no potential for tree to mature	No action required	C2	46.3	3.8
T2	Ash (<i>Fraxinus excelsior</i>)	6	180	N2 E2 S2 W2	2 south	Semi-mature	Good vigour, dense foliage, no evidence of pest or disease	Good, services pass through crown, no major visible defects	No action required	C1	14.7	2.2
T3	Macrocarpa (<i>Cupressus macrocarpa</i>)	6	519.6 combined diameter estimate	N3 E3 S3 W4	2 north	Mature	Good vigour, dense foliage, no evidence of pest or disease	Fair, ivy clad, previously crown lifted over High Street	Remove to facilitate development	C2	122.1	6.2
T4	Sycamore (<i>Acer pseudoplatanus</i>)	8	570.1 combined stem diameter	N6 E3 S4 W5	3 north	Mature	Good vigour, dense foliage, no evidence of pest or disease	Good, multi-stemmed form, ivy clad, no major visible defects	Sever ivy, access facilitation pruning	B2	147	6.8
T5	Leyland cypress (<i>Cupressocyparis leylandii</i>)	10	350 estimate	N2 E3 S3 W3	2 west (at stem)	Mature	Good vigour, dense foliage, no evidence of pest or disease	Fair, ivy clad, only viewed from below high retaining wall	No action required	B2	55.4	4.2
G6	Hawthorn (<i>Crataegus monogyna</i>)	6 average	200 average estimate	2 average	2 west (at stem)	Mature	Poor vigour, significant crown dieback, ivy smother, 1x dead tree	Poor, ivy clad, 1x dead stem	Fell to ground level	U	18.1 average	2.4 average
T7	Sycamore (<i>Acer pseudoplatanus</i>)	7	250 estimate	N2 E3 S3 W3	2 south	Early mature	Good vigour, dense foliage, no evidence of pest or disease	Fair, no access to survey base of stem	Remove to facilitate development	C2	28.3	3

Tree Survey Schedule

				Client: Marshall Clark Site: Chandler BMW Angmering Date: 19/09/2012 Surveyor: Peter Davies						Green - Category A Tree Blue - Category B Tree Grey - Category C Tree Red - Category U Tree		
Tree ref. no.	Species	Height (m)	Stem diameter (mm)	Branch spread (m)	Height of crown clearance (m)	Age class	Physiological condition	Structural condition	Management recommendation	Category grading	Root Protection Area (m ²)	Root Protection Radius (m)
T8	Cherry plum (Prunus cerasifera)	5	455.6 combined stem diameter	N4 E2 S1 W3	3 north	Over mature	Fair vigour, adequate foliage cover, no evidence of pest or disease	Fair, Ivy clad, low forking habit, poor form due to previous heavy crown reduction	Remove to facilitate development	C1	106.7	5.8
T9	Cherry plum (Prunus cerasifera)	5	537.1 combined stem diameter	N4 E2 S2 W3	2 west	Over mature	Fair vigour, adequate foliage cover, no evidence of pest or disease	Fair, Ivy clad, low forking habit, poor form due to previous heavy crown reduction	Remove to facilitate development	C1	100.5	6.4
T10	Sycamore (Acer pseudoplatanus)	3	190	N2 E2 S2 W2	2 north	Semi mature	Fair vigour, adequate foliage cover, no evidence of pest or disease	Good, typical growth habit for species, no major visible defects	Remove to facilitate development	C1	15.3	2.3
T11	Rowan (Sorbus aucuparia)	5	200	N1 E1 S2 W2	2 south	Semi mature	Standing dead tree	Standing dead tree, not dangerous due to small size	Fell to ground level	U	18.1	2.4
T12	Lime (Tilia x europae)	4	180	N3 E3 S2 W2	1 north	Semi mature	Fair, minor crown dieback, adequate foliage to support tree	Fair, minor deadwood, no major visible defects	No action required (third party tree)	C2	14.7	2.2

APPENDIX 3 Cascade Chart for Tree Quality Assessment



Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification 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 their 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 the 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 <i>Note Category U trees can have existing or potential conservation value which it might be desirable to preserve</i>			Red
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Green
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 remedial 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	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 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	Grey

APPENDIX 4 Root Protection Area Formulas

CALCULATING THE RPA

For single stemmed trees

$$\text{RPA(m}^2\text{)} = \frac{(\text{stem diameter (mm) @ 1.5 m x 12})^2 \times 3.142}{1000}$$

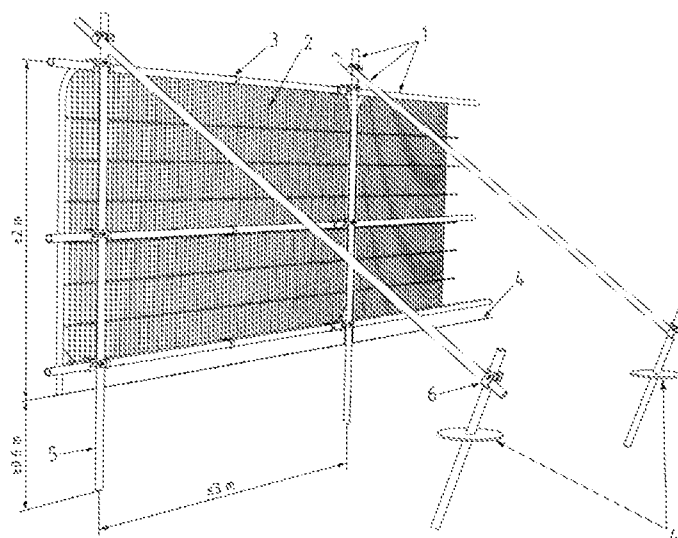
For trees with two to five stems, a combined stem diameter is calculated as follows:

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

For trees with more than five stems, the combine stem diameter is calculated as follows:

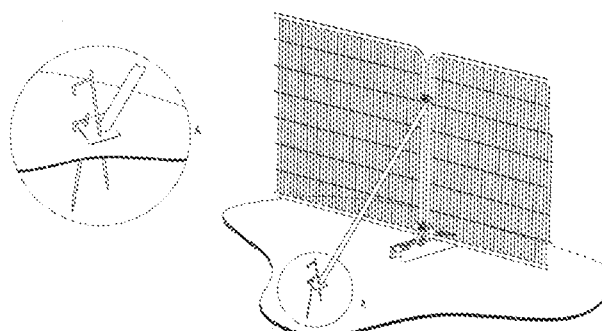
$$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$$

APPENDIX 5 Tree Protection Fencing Specification

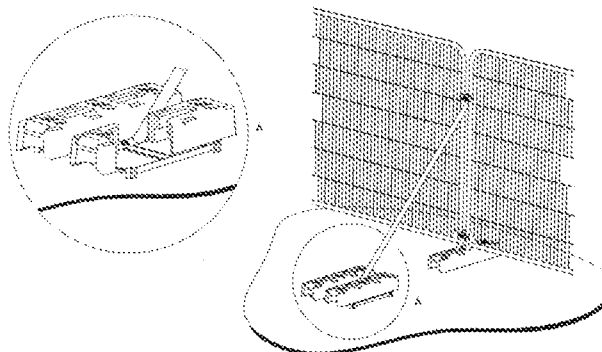


Key

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



a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

APPENDIX 6 Example Protective Fencing Signs



APPENDIX 7 Photographs



Photograph 1 – Tree T4



Photograph 2 – Trees T5 and G6



Photograph 3 – Tree T9



Photograph 4 – Tree T1