Presenting tree information on plans

TreeAZ Information Note 2 (Australia and New Zealand)

www.TreeAZ.com
Preface

This Information Note describes emerging best practice in the UK that may be suitable for presenting tree information on plans in the planning systems of Australia and New Zealand. It is published as a download for both councils and consultants seeking guidance on the detail of putting tree information on plans. Its content is not subject to copyright and can be copied freely for use, with or without modification, but its source should be acknowledged.

It has been produced by Barrell Tree Consultancy (BTC) (www.barrelltreecare.co.uk) and is distributed through their tree assessment website (www.TreeAZ.com). The BTC business is based in the UK, although it does have a background of training and development in other countries. BTC has no direct income through the publication of its planning guidance and finances the development of its tree assessment methods through its UK business. The objective of these endeavors is to enhance the international dissemination of best practice guidance through the BTC websites.
INTRODUCTION

Plans are an important graphic interface between tree experts and all the other professionals involved in the planning system. Effective plans communicate large amounts of information to the viewers, reliably and quickly. Ease of viewing is enhanced by removing non-essential information, minimizing the use of text and designing intuitive graphics. Good tree plans are free from clutter, easy for non-tree experts to understand and quickly convey important information. Plans perform different functions at the various stages in the planning process; the most useful plans are the ones where the content is tailored to meet the specific needs of each stage. It is not practical for one plan to display all the information needed in all the stages. In practice, four different plan types are useful: the arboricultural constraints plan, the arboricultural impact appraisal plan, the landscape impact plan and the arboricultural method statement plan. In addition to these, working drawings based on the site plans are often helpful for focusing on specific tree management requirements during the construction phase.

Background information on tree assessment

The purpose of tree assessment is to identify important trees that are worthy of being a material constraint on the design of new developments. This process is just one small part of the much broader planning system, which involves professionals from many disciplines. Although the process of making the assessment is complicated, the most challenging aspect in the broader planning system is presenting that information in a way that other professionals, who are not tree experts, can easily understand and use. Tree assessment is an evolving discipline, with a selection of methods available. Each method has advantages and disadvantages, and it would be inappropriate to presume that any one is better than the others. It is up to the individual practitioners to decide which method they prefer and feel is most suited to a specific set of circumstances. Commonly used methods include:

- **BS 5837 (2005)**: This is a relatively new method of tree assessment proposed for the first time in BS 5837 (2005): *Trees in relation to construction – Recommendations*. It is published by BSI (www.bsi.gov.co.uk) in the UK and the method is copyrighted so it cannot be copied or distributed without the appropriate permission. It advocates four categories (A, B, C and R), which are assessed according to arboricultural, landscape and cultural attributes.
- **SRIV**: This is an Australian method published by the Institute of Australian Consulting Arboriculturists (IACA) (www.iaca.org.au) in 2005. It advocates six vigor and condition classes (NVG, NVF, NVP, LVG, LVF and LVP) set against three age classes and 10 Index Values (0, 1, 2, 3, 4, 5, 6, 8, 9 and 10), which are assessed objectively according to defined variables for age, vigor and condition.
- **SULE**: Safe Useful Life Expectancy (SULE) is a method developed by Jeremy Barrell (www.barrelltreecare.co.uk) in the 1980s and published as a scientific paper in 1993. SULE advocates five categories (1–5), which are based on the length of time a tree can be safely and usefully retained.
- **TreeAZ**: TreeAZ was released in the UK in 2002 by Barrell Tree Consultancy, and is an evolution of the SULE and BS methods. There is an Australia and New Zealand version that has emerged from an analysis of its use within those planning systems. There is also a North American version currently under development. It can be downloaded freely from www.TreeAZ.com and used without copyright restrictions. It advocates two main categories (A and Z), which are based on the potential of a tree to provide benefits to its surroundings.

For the purposes of this guidance, TreeAZ is used to illustrate the plan examples, but that does not preclude the use of other methods. Throughout the planning process, the same principles of presenting tree information on plans and in reports apply, irrespective of which tree assessment method is used.

Annotating tree details

Before progressing to each plan type, designing a simple but sufficiently extensive annotation set to illustrate commonly used tree information is helpful. Essential information on most tree plans includes trunk location, category and number. Reviewing
and extracting this information easily and quickly is enhanced by using the following intuitive combinations of symbols and colors:

- **Two main categories**: An essential feature of all effective tree assessment methods is the clear identification of two separate categories, i.e. trees that are important and should be a material constraint, and trees that are not. Keeping the number of main categories to a minimum is very helpful for non-tree experts because they simply need to know whether a tree is important or not important, with no ambiguity. Using TreeAZ as an example, all category A trees (A and AA) are important and all category Z trees (Z and ZZ) are less important. The intuitive concept of ‘A is important, AA is really important, Z is unimportant, ZZ is really unimportant’ is simple for non-tree experts to understand and use. If you prefer the BS method, then categories A and B are the important trees and categories C and R are the unimportant trees.

- **Two colors**: The identification number text and symbol for each tree is highlighted in color to help review the distribution of tree categories over the plan at a glance. It is a helpful convention to use green for important trees and blue for unimportant trees, because the colors contrast well.

- **Two symbols**: To enhance the capacity to review at a glance, each tree number has a shaped surround; important tree identification numbers are set within green triangles and unimportant are set within blue rectangles. Rectangles and triangles are distinct at a glance, and the contrasting colors add a second layer of cues for the viewer.

- **Two extremes**: The very best trees are denoted with double triangles, one inside the other; intuitively, a tree symbolized with a double triangle is more important than a tree with one triangle. At the other extreme, the worst trees are denoted with double rectangles, one inside the other; a tree symbolized with a double rectangle is intuitively worse than a tree with one rectangle.

The reason for not using the traditional colors of green for good and red for bad is because color-blind people find it hard to differentiate between those colors. In contrast, green and blue are easier to tell apart and the convention of green = important and blue = unimportant solves this problem. Colored tree number text and the surrounding category symbol on the plan, reinforced with the colored highlighting in the tree schedule of the supporting report, is consistent and useful. Color and shape are two separate, but obvious, visual cues that help differentiate tree categories at a glance, making it easier and quicker to extract information from plans and tree schedules.

**ARBORICULTURAL CONSTRAINTS PLAN**

The arboricultural constraints plan is an essential part of a formal arboricultural constraints report that is prepared before any significant design work is done. Its role is to inform the design process by identifying the space available for layout designers to locate new development, i.e. the developable area. These plans are the visual interface between the tree experts, who have the complicated task of assessing tree quality, and the designers who generally know less about the technical aspects of tree assessment. Complicated constraints make it difficult for designers to interpret, whereas too much simplification can limit design flexibility through lack of information. An effective balance between these extremes is likely to include:

- Only the important trees, denoted with green triangles, are material constraints (Figures 1 and 2). All the unimportant trees, denoted with blue rectangles, are shown on the plan, but no constraints are associated with them.

- For each important tree, two active constraints zones are identified that are differentiated by black diagonal hatching and orange cross-hatching. All the area outside these zones is available to the designers without any tree constraints. Limiting the constraints to two zones is simple enough for the designers to understand but sufficiently detailed to allow essential tree protection information to inform the design. Further zones are possible, but increased complication often results in communication-breakdown between the tree experts and the other professionals who have to use the information.

- Zone 1 (black diagonal hatching on Figure 3) is the estimated rooting area in need of protection, i.e. the root protection zone (RPZ), where any disturbance is likely to have an adverse impact on the tree. Building activity is not forbidden in this
area, but any disturbance must be strictly planned and controlled if tree damage is to be avoided. It is an obvious no-go area for designers, which is easy to understand and effective for minimizing any impact on important trees.

- Zone 2 (orange cross-hatching on Figure 3) is a less rigorous constraint that identifies the area where problems may arise during construction, or through future tree growth that may adversely affect occupants because the tree is too close. These are areas where occupied buildings should be avoided, but sheds, garages, services and surfacing may be acceptable. More detail on estimating the extent of this zone can be found in the downloads at www.TreeAZ.com.

Figure 1: Key example illustrating that combining colors and shapes makes it easier for viewers to differentiate tree quality at a glance without reading any words.

Figure 2: When displayed on a plan, colors and shapes make it easier to quickly identify the best and the worst trees, and their distribution around the site. Green triangles show the better trees and blue rectangles show the less important trees.
ARBORICULTURAL IMPACT APPRAISAL PLAN

Arboricultural impact appraisal plans (Figure 4) are an essential part of the formal arboricultural impact appraisal report that is submitted as supporting information with a planning application. This plan should be considered as illustrative because consent has not yet been given. The nature of the modern development process is that changes frequently occur between submission, consent and when the construction activity starts. At the submission stage of the process, the purpose of the report and plan is to provide the council with enough tree information to assess the impact of the proposal and decide whether it sufficiently complies with policy guidance to make it suitable for consent. Essential information to be shown on the plan includes:

1. Base land survey showing relevant existing site detail including levels, boundaries, structures, surfacing and natural features
2. Location, number, crown spread and category of all existing trees
3. The footprint of proposed structures, surfacing and services, superimposed on the land survey so it is obvious how the new layout relates to existing features
4. Existing levels (as spot heights) and proposed floor levels of new structures (figures in boxes) to allow an assessment of how the finished levels will compare to the existing levels
5. Identification of trees to be removed
6. Location of preliminary protection proposals for trees to be retained, which can include
7. Location of areas where special precautions are anticipated to limit any adverse impact on trees, i.e. custom designed surfacing, service runs that require careful excavation, etc.

8. Structural landscaping proposals

Figure 4 – Arboricultural impact appraisal plan with a magnified key on the left: Note the differences between this plan and the constraints plan (Figure 3) include:

- the hatched constraints are not marked in full because the design phase is over and leaving them out reduces excess clutter on the plan
- the outer extent of the RPZ (Zone 1) boundaries are shown on the plan as the light grey double-dashed line without any hatching so areas of potential conflict can be quickly identified
- the proposed layout with levels (figures in rectangular boxes) shows how the development levels will relate to existing levels
- the trees to be removed with the red dashed outline identify the anticipated tree losses
- the protective measures show how the retained trees will be kept unharmed
LANDSCAPE IMPACT PLAN

Where the impact of the proposed development on local landscape character is likely to be an issue, it can be helpful to provide a plan showing the extent of tree retention and the anticipated mitigation in terms of new planting (Figure 5). The positive attributes of the retained trees and the benefits of new tree planting as it matures are often difficult to assess without some graphic guide to enhance the visualization. A landscape impact plan clearly identifies the trees to be retained and illustrates future growth of new planting. It is not an essential plan in the process, but it can be very useful if it demonstrates a landscape enhancement directly resulting from the development proposal. It is often helpful, although not essential, to include images of the proposed tree species at the size they are proposed for planting.

Figure 5 – landscape impact plan: The extent of the retained trees (dark green hatching) can be assessed at a glance and it is easy to review the benefits of the new planting through the illustrated anticipated spread as the new trees grow (light green hatched circles). Images illustrating the potential of the new planting are often useful.
ARBORICULTURAL METHOD STATEMENT PLAN

Once the consent has been given and all the minor amendments have been agreed, the final tree protection plan can be prepared (Figure 6). With all the negotiations done, its purpose is to describe tree protection measures so that the council can check and enforce if necessary, and that the operatives on the ground can install and carry out the practical protection measures, as intended by the design team.

The final tree protection plan is subtly different from the illustrative version in the arboricultural impact appraisal report (Figure 4) because it no longer needs to show tree categorizations. Categories are only important when assessing the impact of a proposal; once it has been consented, then the focus moves from the potential impact to the practicality of tree protection. The emphasis of the final tree protection plan is on identifying trees to be removed and the protective measures for those to be retained. Removing the tree category annotation makes it easier to use on site because it is one less complication for the site operatives to deal with. Once a tree has been allocated for removal or retention, the category becomes irrelevant in the context of installing and supervising tree protective measures. All trees to be retained must be properly protected, irrespective of category.

Figure 6 – arboricultural method statement plan: Note the main difference between this plan and the impact appraisal plan (Figure 4) is tree categorizations are not shown because they are no longer necessary. Leaving them out simplifies the plan.
WORKING DRAWINGS

Working drawings are produced after the planning consent is given and would not normally be part of the formal planning submission. Their purpose is to clarify the tree management requirements and enhance the interpretation of those requirements by the site operatives.

Graphic based information in the form of plans and diagrammatic specifications is easier to manage on construction sites than long and complicated text-based reports. Construction site operatives are familiar with plans and drawings, which makes including relevant specifications on the plan a very effective means of improving the comprehension of important tree protection information.

Furthermore, working drawings specifically relating to tree issues make it easier for tendering for the various specialist work operations. Keeping it simple and easy to understand minimizes the opportunities for mistakes, which is an essential aspect of effective site management. It is often helpful to create a number of working drawings to separate out the various tree management activities that are planned at different stages in the construction process and carried out by different people. Some typical working drawings include the tree works drawing (Figure 7), the tree protection drawing (Figure 8), the special tree protection drawing (Figure 9) and the structural landscape drawing (Figure 10).

Figure 7 - tree works drawing: Tree removal and pruning is usually carried out by arborists before any other workers arrive on site. Putting the schedule of works on the plan with clear tree identification helps tendering and minimizes the risk of mistakes. All the other tree protection information is left off this drawing because it will be installed after this work is completed.
Figure 8 - tree protection drawing: The installation of fencing and ground protection is usually carried out by fencing contractors after the tree works have been completed. This plan shows the location of both types of protection and has the specifications for each on the plan as one working document for the contractor. Note that the trees to be felled are not on this drawing as they will have already been removed by the time this work is carried out.
Figure 9 - special tree protection drawing: Not all sites have special tree protection requirement, but where they do, then a separate drawing for each operation is often helpful. This example shows the areas where special precautions must be taken when removing existing surfacing and replacing with a new permeable and load-spreading product to sustain the rooting conditions for the existing trees.
Figure 10 - structural landscaping drawing: New tree planting to mitigate the loss of existing trees is an essential element of sustainable urban design. Showing the location, species, size and establishment requirements on a plan is an effective way of ensuring that the promised landscaping is installed as anticipated and the risk of damage to existing trees through unauthorized landscaping activities in RPZs is minimized.