ArborSafe
TREE CONSULTANCY AND MANAGEMENT SYSTEMS

21 May 2019 Ref: C91429

Ashleigh Smith
Associate
Willow Tree Planning
Suite 4, Level 7, 100 Walker Street
North Sydney, NSW, 2060

St Aloysius College - T60 Crown Reduction Pruning

Dear Ashleigh,

Please find the following information in response to the increased pruning percentage recommended in relation to the reduction pruning requirement for Tree 60 (T60) as part of the St Aloysius College SSDA building application.

The following is a brief summary of the information provided in the original ArborSafe AIA Report, dated 11th March 2019, on T60. This tree is a mature *Liquidambar styraciflua* (Liquidambar) in good health and fair structure. The tree is situated in the rear garden of the adjacent residential property and has part of its canopy extending over the school boundary line. The boundary line is demarcated by a level drop into the existing school courtyard and a large sandstone block boundary wall. A large raised garden bed was situated opposite the tree on the school side of the boundary fence.

Considerable effort and expense were expended to identify and mitigate potential negative impacts to the tree during the planning phase as its retention was viewed as beneficial to all concerned. Root penetration coming through the boundary wall, into the raised garden bed, was identified as the major potential health impact to the tree from the proposed building project. The impact was from the proposed removal of the garden bed due to it being within the Tree Protection Zone (TPZ), and possibly the Structural Root Zone (SRZ), of T60 as specified within AS 4970 2009 *Protection of Trees on Development Sites*. A root investigation was undertaken with the results concluding that the garden bed removal would have negligible health impacts due to minimal root encroachment through the wall.

Reduction pruning of T60 on the western, school side, of the canopy, was considered a reasonable option to accommodate the development along with retaining the tree for its amenity and screening value. This option was specified after review of the following points: tree species, branching structure, maturity, size, current health status and the likelihood of minimal health impact from the proposed development, and is in line with expectations outlined in section 4 '*Considerations before Pruning'* of *AS 4373 Pruning of Amenity Trees 2007*. Liquidambar is an exotic deciduous species which would be considered widely as well suited for reduction pruning due to their branching structure, tolerance of pruning and vigorous growth.

The definition of Reduction Pruning within section 3.38 of *AS 4373 Pruning of Amenity Trees 2007* states that it is '*The removal of the ends of branches to lower internal lateral branches or stems in order to reduce the height and or spread of the tree'*. In section 7 *Pruning Classes,* of the same Standard, reduction pruning is described as crown modification and in section 7.3.2 it gives a further description of '*For reduction pruning the ends of branches are removed to internal branches or stems. The extent of crown or limb reduction shall be specified at the time assessment'*.

The original ArborSafe report pruning specification follows the protocol of the standard by specifying the reduction extent as well as stating various additional points for the working arborist to work by while allowing them the freedom to make judgement calls of final cut placement based on ultimate branch assessment while in the tree. These were '*smaller diameter branches*', '*no greater than 10%' total', 'no greater than 50mm diameter'* and a final chance to refer back to the Project Arborist for determination if unsure. When reduction pruning is undertaken the 10% should be viewed as a guide to the extent and intent due to the variable nature of trees as a whole and the requirements the pruning itself imposes on the tree worker, hence the additional points raised in the specification. In some pruning specifications a marked photo or diagram will be submitted for use by the working arborist but in the case of reduction pruning a multi-branched Liquid Amber in full leaf this was found to be impractical. An excerpt of the original ArborSafe pruning specification is shown below:

8.3.2 Reduction pruning should focus on smaller diameter branches overhanging the property boundary and remove no greater than 10% of the total crown. Branches no greater than 50mm diameter are to be removed unless approved by the relevant Consent Authority and specified by the project arborist.

Following a request for further clarification of the required pruning, and after additional review of aerial imagery of the asymmetrical, non-concentric nature of the tree crown and the proposed building plans, a Crown Impact Analysis Plan has been submitted (Refer Appendix A). This further analysis refines, and raises, the pruning percentage from the original 10% to between 14.6 to 21.9% depending on building practices.

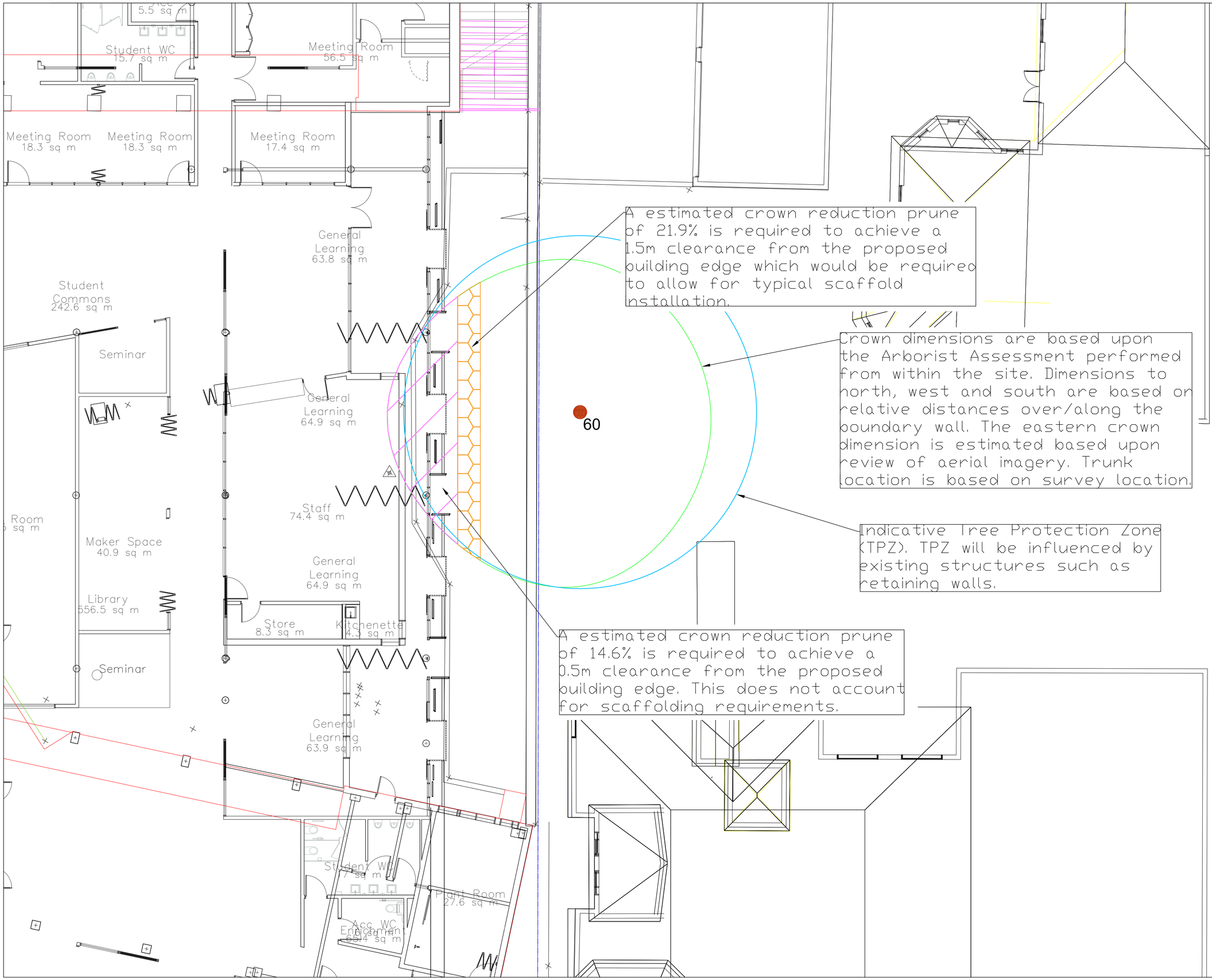
While the 21% would be considered at the top end of any one pruning event, and after again reviewing the tree species, branching structure, maturity, size, current health status and minimal root impact the pruning, it is still considered it would have minimal impact on the trees ULE, ongoing health or amenity.

Going back to the original intent, which is to retain the tree and the amenity and screening it provides to both the school and the owner, the additional levels of reduction pruning is considered the most appropriate and reasonable course of action.

Regards

Andy Clark
Consulting Arborist
Dip. Hort. (Arb.), AQF Level 5

Appendix A – Crown Impact Analysis Plan



LEGEND

Tree trunk & number:	1	Cat. B TPZ:	
Crown spread:		Crown reduction (building):	
Crown reduction (scaffold):			

Tree Retention Value

Trees have been categorised to allow an accurate account of which should and should not be a constraint. Tree categories are determined according to their health condition, quality and value.

Cat. U:- Trees to be removed irrespective of devt.
Cat. A:- Trees of high quality and value
Cat. B:- Trees of moderate quality and value
Cat. C:- Trees of low quality and value

Cat. A retention value trees should be retained, planned around and be protected from damage.

Cat. B retention value trees should be retained if possible.

Cat. C retention value trees will not be retained where they impose a significant constraint on development.

Cat. U retention value trees are unretainable for the forseeable future and typically recommended for removal irrespective of site development.

Tree Protection Zones (TPZs)

A model is used to assist in the prediction of the likely impact of development on retained trees. This model is based on the Diameter of Trunk at Breast Height (DBH) for an individual specimen.

TPZ = DBH x 12
(DBH measured at 1.5m on trunk)

It is recommended that an area around each retained tree should be protected from disturbance "in order to avoid (unacceptable) damage to the roots or rooting environment" (as a result of root severance or damage, or compaction or pollution of the soil).

These Tree Protection Zones ('TPZs') have been calculated for all retained trees and are shown as areas bordered in green, blue or grey according to tree category. These zones are normally portrayed as a circle of a fixed radius from the centre of the trunk.

The Structural Root Zone (SRZ) is the area required for tree stability. A larger area is required to maintain a viable tree. The SRZ only needs to be calculated when major encroachment into a TPZ is proposed. There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil molsture). The SRZ may also be influenced by natural or built structures, such as rocks and footings. An indicative SRZ radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula:

SRZ radius = $(D \times 50)^{0.42} \times 0.64$

Permissible Encroachment in TPZs

As per the Australian Standard AS4970-2009 *Protection of Trees on Development Sites* a major encroachment into the TPZ of any tree is considered to occur when it is beyond 10% of the total TPZ area. A minor encroachment is determined as being less than 10% of the total TPZ area. If the proposed encroachment is minor and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. If the proposed encroachment is major or inside the SRZ, the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should also be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors.

Arborist Supervision

An Arborist experienced in tree protection on construction sites shall be engaged prior to the commencement of work on the site. The Arborists tasks will be to monitor and report regularly on the condition of the retained trees. The site Arborist shall be present to supervise any excavation, trenching or tunneling within the TPZ of any retained trees.

The schedule of works for the development shall acknowledge the role of the site Arborist and the need to protect the retained trees. Sufficient notice shall be given to the Arborist where his/her attendance is required. Should the proposed design change from that reviewed, additional arboricultural assessment will be required.

Areas on site where the supervision of a consulting arborist are:

1. Location of protective fencing and ground boarding.
2. Lifting/excavation of existing hard surfacing within TPZs
3. Construction of above-ground hard surfacing.

PROJECT:	St Aloysius College SSDA		
CLIENT:	St Aloysius College		
DRAWING:	Crown Impact Analysis		
DRAWING NO.:	C91429	Rev. 1	03.05.19
BASED ON:	Upper Pitt Street Plan, LV1, DAU125 Revision C, PMDL, Feb 2019		
SCALE:	Do not scale		
DRAWN BY:	ArborSafe		

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