NSW GOVERNMENT Education

Darlington Public School – SSDA Condition C21

Condition	Condition requirements	Document reference
21 -	Prior to the commencement of works that would encroach into the tree protection zones of trees numbered 4, 5, 9, 10 and 11 in the Arboricultural Report dated May 2020 and prepared by Moore Trees, the Applicant must:	Refer SSDA Condition C21 Satisfaction Report, AW Edwards, Rev. A
21 (a)	(a) undertake further investigations to determine the landscape design changes and measures and methods required to retain the trees. These investigations are to incorporate advice from a Level 5 (Australian Qualification Framework) qualified arborist, and include non-destructive root investigations undertaken in accordance with Australian Standard AS 4970-2009 Protection of Trees on Development Sites (AS4970), where required to inform the landscape design changes;	Refer SSDA Condition C21 Satisfaction Report, AW Edwards, Rev. A Pages 3-29, Refer Appendix A, Moore Trees Response to SSDA Regarding Trees 4, 5, 9, 10, 11 Refer Appendix C, Paul Vezgoff Moore Trees Arborist Curriculum Vitae
21 (b)	(b) submit a report documenting the findings of the investigations for the approval of the Planning Secretary that details the design changes and methods and measures to retain the trees. Where it has been concluded that the retention of a tree would prevent the objectives of the landscape design and/or project overall being achieved, sufficient details must be provided to support the conclusions, including: (i) alternative landscape design options considered; (ii) details of levels or other critical factors; (iii) advice from appropriately qualified persons; and	(b) Refer SSDA Condition C21 Satisfaction Report, AW Edwards, Rev. A Pages 3-29 (i) Refer Landscape Design responses, and current, proposed, and previous design response for Trees 4, 5, 9, 10 and 11 (SSDA Condition C21 Satisfaction Report, AW Edwards, Rev. A Pg 13 – 24) (ii) Refer Section 1.2.3 Levels and Section 1.2.4 Accessible Circulation (SSDA Condition C21 Satisfaction Report, AW Edwards, Rev. A Pg 7 – 8)

		(iii) Refer Appendix A – Moore Trees Response to SSDA Regarding Trees 4, 5, 9, 10, 11
21 (c)	(c) submit an updated Tree Protection Plan (scaled drawing) to the Planning Secretary that reflects the outcome of the investigations and shows the tree protection zones, structural root zones and canopies for trees affected by the proposed development.	Refer Appendix B – Tree Management Plan – Stage 2, Zone 3

AW EDWARDS

Darlington Public School

SSDA Condition C21 Satisfaction Report

A W EDWARDS PTY LIMITED

CONTENTS

1 TREES 4, 5, 9 10 AND 11 RESPONSE TO SSDA ITEM C21

1.1 INTRODUCTION

This report has been prepared as a response to SSD Consent Condition C21 of the SSDA requirements in order to summarise landscape design exploration and investigations undertaken during the design development phase of the project to determine if the retention of existing trees numbered T4, T5, T9, T10 and T11 is possible.

Design investigations and recommendations are summarised in the detailed design response section of the report. Recommendations highlight the technical reasoning why specific considerations to retain or remove existing trees meet the landscape site wide principles and objectives.

- The landscape response report is to be read in conjunction with Moore Trees response to SSDA regarding trees 4, 5, 9, 10 and 11 report.
- Trees 4 and 5 are located within an existing courtyard space between existing buildings and the eastern boundary fence (Photo 1).
- Tree 9 is located in an existing garden terrace planting area within the school playground (Photo 2)
- Trees 10 and 11 are located in same existing garden terrace planting area as tree 9 (Photo 3)

(Photo 1) Image showing Tree 4 and 5.

(Photo 2) Image showing Tree 9

(Photo 3) Image showing Trees 10 and 11.

SSDA C21 Conditions Table Extract

C	21	-	**Arboricultural investigations**	Prior to the commencement of works that would encroach into the tree protection zones of trees numbered 4, 5, 9, 10 and 11 in the Arboricultural Report dated May 2020 and prepared by Moore Trees, the Applicant must:
C	21	a	**Arboricultural investigations**	(a) undertake further investigations to determine the landscape design changes and measures and methods required to retain the trees. These investigations are to incorporate advice from a Level 5 (Australian Qualification Framework) qualified arborist, and include non-destructive root investigations undertaken in accordance with Australian Standard AS 4970-2009 Protection of Trees on Development Sites (AS4970), where required to inform the landscape design changes;
C	21	b	**Arboricultural investigations**	(b) submit a report documenting the findings of the investigations for the approval of the Planning Secretary that details the design changes and methods and measures to retain the trees. Where it has been concluded that the retention of a tree would prevent the objectives of the landscape design and/or project overall being achieved, sufficient details must be provided to support the conclusions, including: (i) alternative landscape design options considered; (ii) details of levels or other critical factors; (iii) advice from appropriately qualified persons; and
C	21	c	**Arboricultural investigations**	(c) submit an updated Tree Protection Plan (scaled drawing) to the Planning Secretary that reflects the outcome of the investigations and shows the tree protection zones, structural root zones and canopies for trees affected by the proposed development.

1.2 SITE WIDE LANDSCAPE DESIGN PRINCIPLES

1.2.1 GUIDING LANDSCAPE PRINCIPLES

Schools have a vital civic role, and form an important part of the community.

A schools' primary role is to deliver educational outcomes, however, they also have opportunities to engage more broadly with their communities.

The following design principles summarise the landscape master plan framework and have guided and direct the development of the detail design solution.

They offer a high level of aspiration and quality control which will be used to test options to ensure they align with the Master Plan's intent.

The Design Principles have been grouped under the over-arching EFSG and Educational Space Planning Principles as developed by New Learning Environments and the school community.

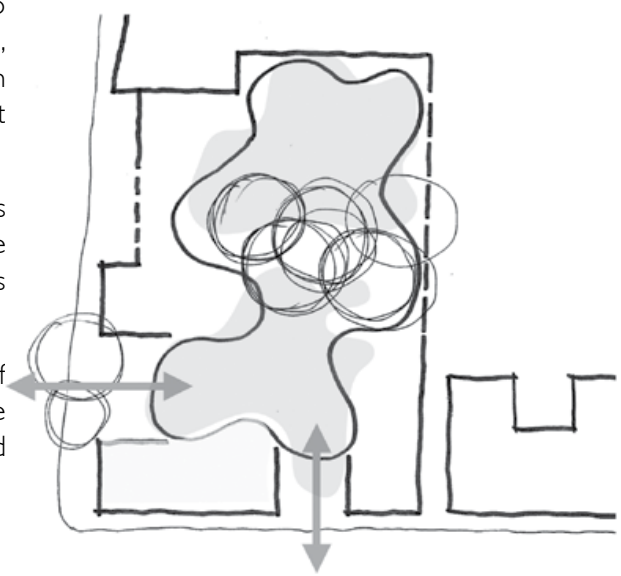
The design philosophy for the Darlington Public School playground centres around creating an "Urban Backyard" for the students that provides diverse series of play spaces with a variety of landscape types that maximises functionality and experience through a variety of active and passive uses that enhance the play and educational experience.

The topography and grading of the site creates challenges and opportunities for the landscape design. Pedestrian movement and wheelchair access have been important drivers in creating a series of connected and functional spaces while retaining the existing mature natural assets of the site where possible.

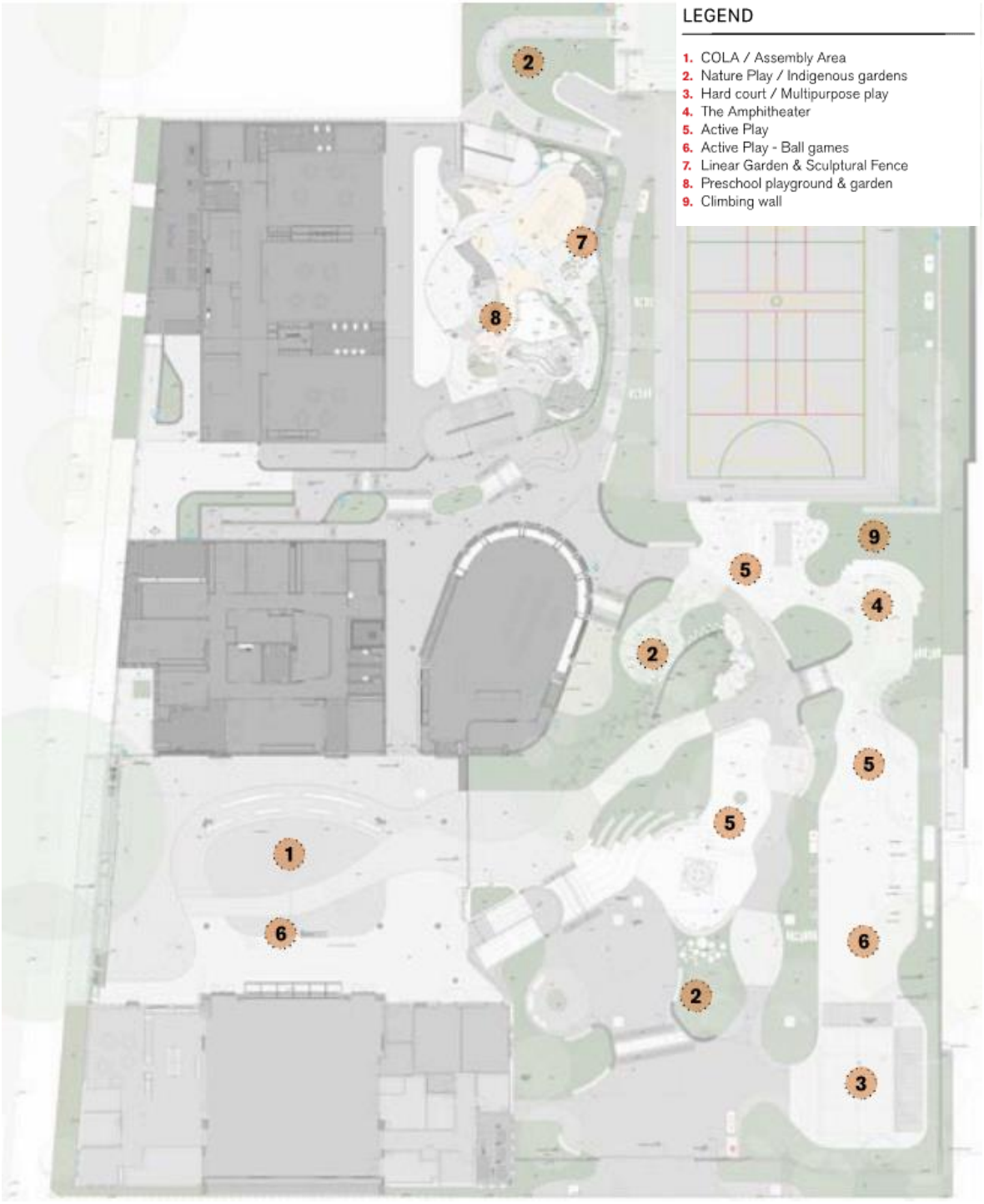
The playground spaces embrace opportunities to create learning spaces, where areas of active, imaginative and quiet play are discovered through the use accessible and connected paths that navigate the challenging landforms.

Each play space is linked to learning opportunities through different tactile materials and landscape types, featuring water, sand, rock, climbing, balls games, lines and decks, pathways and shortcuts.

The design also embraces the indigenous culture of Darlington Public School by enhancing the indigenous Blackwattle Creek landscape and enhancing the rich artistic heritage of the school.



1.2.2 LANDSCAPE CHARACTER AREAS



1.2.3 LEVELS

The following Levels diagram highlights critical finished surface levels (FSL) within the schools open space areas to highlight site wide level transitions between the various outdoor play spaces.

Note: 6m level change from top to bottom of the site and a 3m level change between the COLA and the Abercrombie Street Entry.

LEGEND

+30.80 ex	EXISTING LEVEL
FFL33.650	BUILDING FINISH FLOOR LEVEL
+30.80	KEY DESIGN FINISHED SURFACE LEVEL (FSL)
DL	DIFFERENCE IN LEVEL BETWEEN PATHWAY CONNECTIONS (DL=m)

1.2.4 ACCESSIBLE CIRCULATION

The following Accessible circulation diagram highlights critical pathway transitions in order to achieve equitable DDA and EFSG compliant pathways.

LEGEND

- 1:20 (Max) ACCESSIBLE WALKWAY CONNECTIONS
- 1:14 DDA WHEELCHAIR CONNECTIONS
- STEPPED/ STAIRWAY CONNECTIONS
- PRIMARY SCHOOL ENTRANCE
- BUILDING ENTRANCE

1.2.5 CONTAMINATION AND REMEDIATION

The project is under a site wide Remediation Action Plan (RAP) which details the capping layer requirements for the project. Typically the capping layer requires a marker layer to distinguish clean from dirty, with landscaping area's requiring a minimum of 500mm of clean soil above and in concrete area's a build up of 300mm. On the project we have the following approved capping layer build up's

Generally:

- 500mm Soil (typical detail 1 below)
- 300mm build up in concrete area's (120-180mm concrete + 180-120mm road base)

Around Structural Tree Root zones

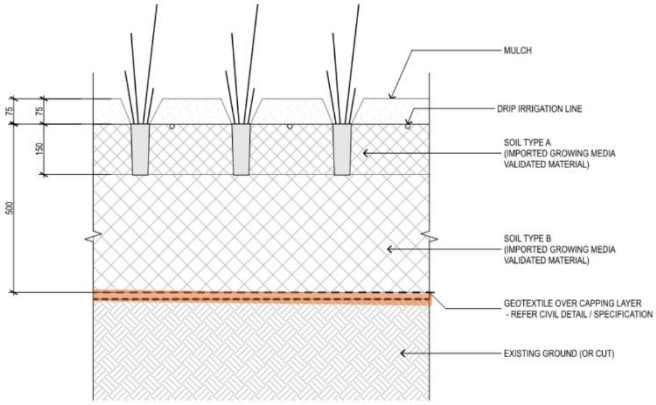
- Timber decking (typical detail 2 below)
- Rock mulch (typical detail 3 below)

Where existing trees are to be retained no change to existing soil level is possible within the Structural Root Zone (SRZ) of the tree. Contamination remediation around existing trees is achieved by placing either fitted sandstone boulders around the existing tree Structural Root Zones as Detailed in Typical Detail 3 or through constructing a timber deck supported

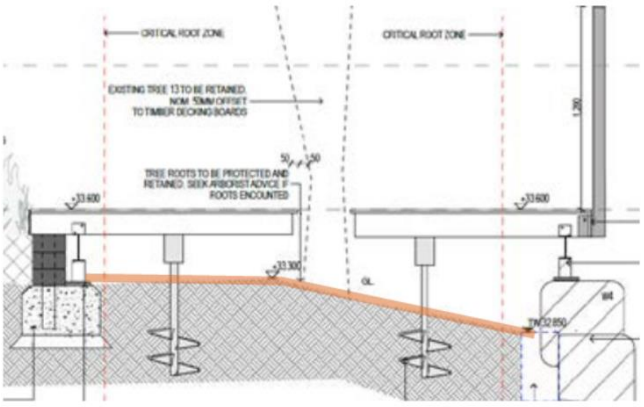
1.2.6 CONTAMINATION REMEDIATION DETAILS

Below detail 1 is only applicable where existing trees do not exist.

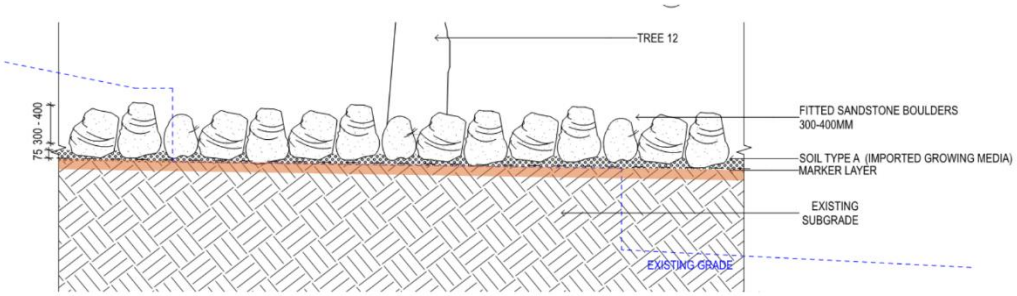
Below details 2 and 3 are approved solutions where existing trees are to be retained.



1) Typical Detail – Garden bed and contamination marker layer for proposed garden beds where existing trees don't exist



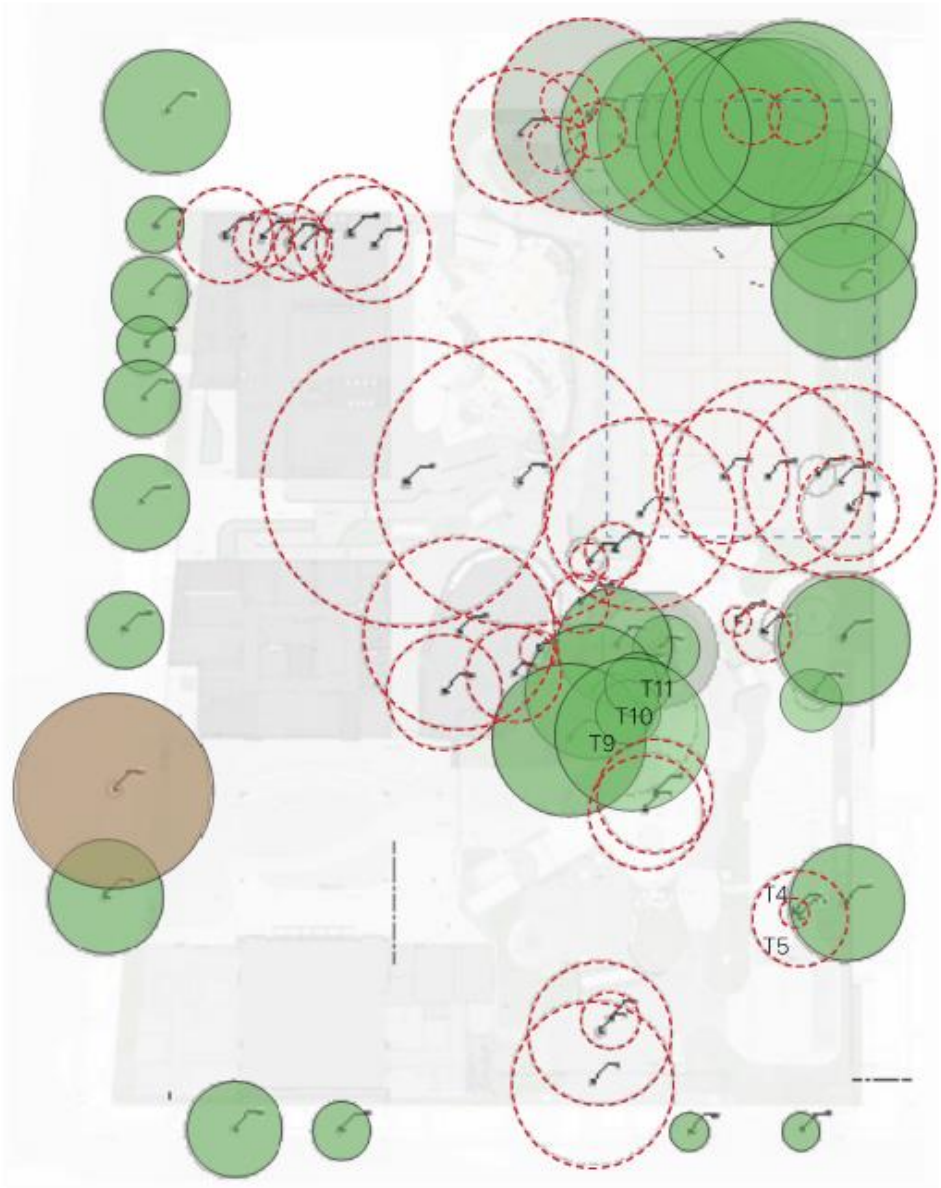
2) Typical Detail – Timber Decking and contamination marker layer surrounding existing trees to be retained



3) Typical Detail – Fitted Sandstone boulder mulch and contamination marker layer surrounding existing trees to be retained

1.2.7 TREE MANAGEMENT PLAN

Refer Landscape Plans and Tree Management Plan for trees to be removed and retained.



LEGEND

- EXISTING TREE TO BE RETAINED
- EXISTING STREET TREE TO BE RETAINED SUBJECT TO FOOT-PATH LEVELS / ARBORIST ADVICE
- EXISTING TREE TO BE REMOVED

TOTAL TREE TO BE RETAINED:	34 TREES
TOTAL TREE TO BE REMOVED:	30 TREES
TOTAL TREE PRE-DEVELOPMENT:	64 TREES

1.2.8 PROPOSED TREES

Refer Landscape Plans for proposed Tree planting

LEGEND

PROPOSED TREE

PROPOSED TREES:	44 TREES
TREES TO BE RETAINED:	34 TREES
TOTAL TREES POST-DEVELOPMENT:	78 TREES

1.3 LANDSCAPE DESIGN RESPONSE – TREE LOCATION PLAN

The following design summary is structured to provide insight into current design explorations and technical investigations undertaken by the landscape design team during the projects design development phase in order to retain existing trees where possible.

Design outcomes and recommendations to remove trees numbered T4 and T5 and save trees numbered T9, T10 and T11 have been summarised to highlight how the overall landscape design objectives and principles for the site as a whole are being achieved.

Location Plan for Trees 4, 5, 9, 10 and 11

1.4 DETAILED LANDSCAPE DESIGN RESPONSE – TREE 4 AND 5

The recommendation is to remove the existing Livistona Australis and Eucalyptus Robusta numbered Tree 4 and Tree 5 respectively as a result of advice received from the project arborist.

A combination of existing growing conditions, building and concrete pavement demolition, and EFSG m2 provision for active play space per child have contributed to the necessity to remove trees 4 and 5.

Previous design investigations explored the possibility of implementing a large garden bed as a design strategy if the trees were able to be protected and saved during the demolition phases. The open space requirement highlighted in the EFSG for active play space / child has also played a significant role in the decision making to remove the existing trees.

The following summary highlights the main issues in the site wide landscape design if the trees are retained:

- Encumbered existing root system due to growing conditions within courtyard concrete hardstand.
- Demolition of existing buildings and hardstand areas likely to impact greatly on existing trees and root system during demolition phase of the project.

Post demolition design response.

- A garden bed surrounding the existing trees would significantly reduce the active play space area potentially creates a non-compliance with EFSG play space m2 requirements / student.
- A garden bed surrounding the existing trees would disrupt the continuous play opportunity and cause poor visual connections between the play spaces.
- A garden bed around the trees creates less usable site wide active play space opposed to active continuous play zones.

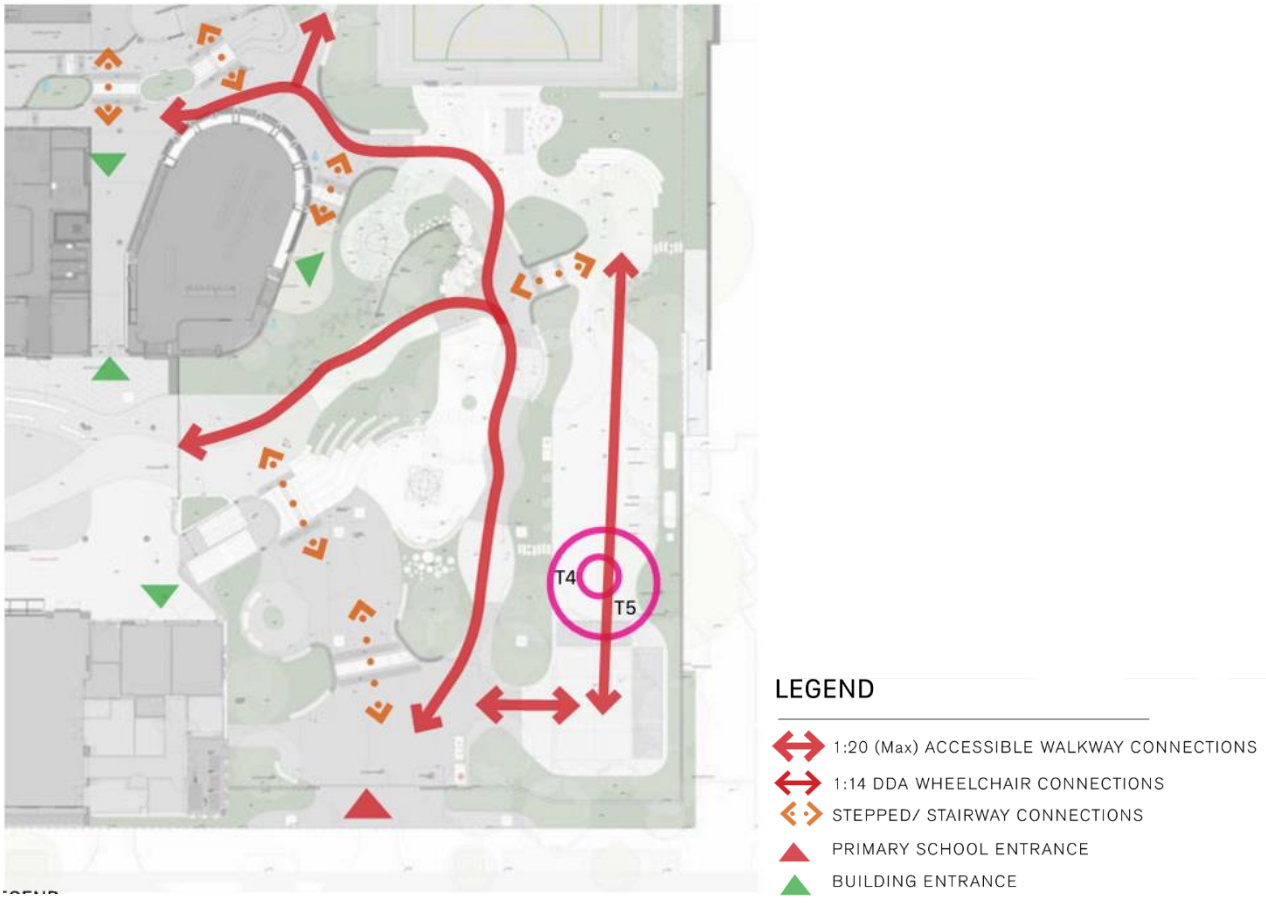
Please refer to the following design summary and detailed design options which highlight previous design explorations and investigations undertaken to determine if the trees could possibly be retained.

1.5 DETAILED DESIGN RESPONSE OPTIONS – TREES 4 AND 5

1.5.1 CURRENT DESIGN APPROACH

The following response highlights how the site wide design principles are addressed:

- Accessible and clear site wide way finding between main arrival plazas, pathway nodes and active play spaces.
- Equitable access site wide with 1:20 max gradients to all walkways.
- Allowance for large accessible active play space meets EFSG requirements.
- Maximise active and passive play space m^2 areas to ensure EFSG requirements.
- Provides generous hand ball area with shade structure over.
- All pathways, stairs and play areas sit within a lush landscape setting.
- Remove existing trees 4 and 5 due to expected fatal impacts on trees during demolition phase of project.
- Significant new tree planting in adjacent proposed softscape areas provides good compensation for the removal of existing trees in this area.
- Contamination remediation for existing trees has been agreed to with project arborist and site Hygienist.

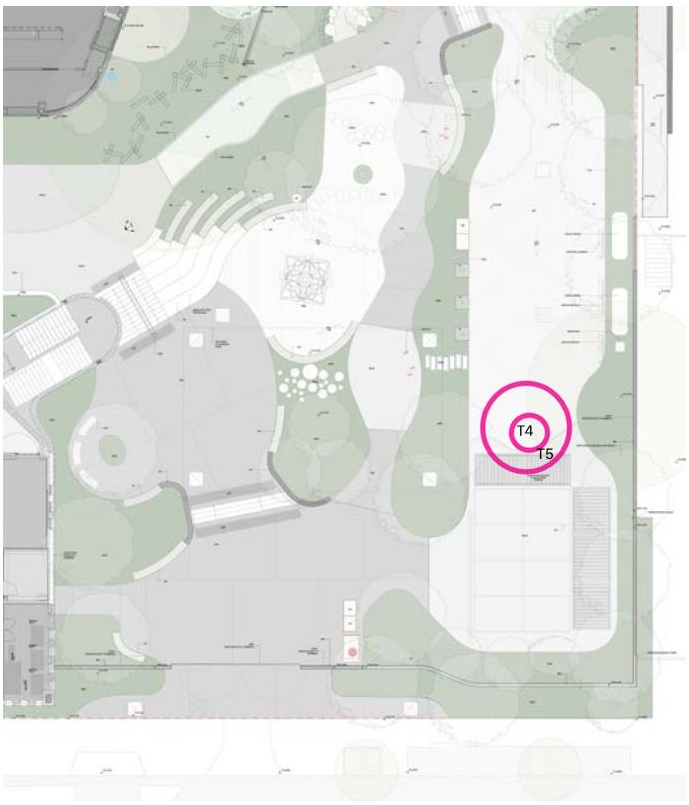


1.5.2 ABORICULTURAL SUMMARY – TREE 4 AND TREE 5

The consulting arborist report highlights unknown condition of the root system under the existing courtyard concrete slabs to be demolished. Demolition of the existing buildings surrounding the two trees have a very high likely-hood damaging the existing root system having grown into the underside of the existing concrete pavement. At present, the existing concrete pavement covers the entire Structural Root Zone area of the two trees.

The extensive and raised root systems sitting above the existing concrete can be seen in photo 4 below. The Arborist recommends Trees 4 and 5 are to be removed to achieve contamination capping/marker layer which can't be installed without destabilizing the trees.

In summary the demolition of existing built fabric around existing trees will impact heavily on short term survival of trees. The arborist report confirms that the Tree Protection Plan has been updated to show the removal of Trees 4 and 5.



(Photo 4) Image showing exposed tree 4 and 5 roots above the pavement.

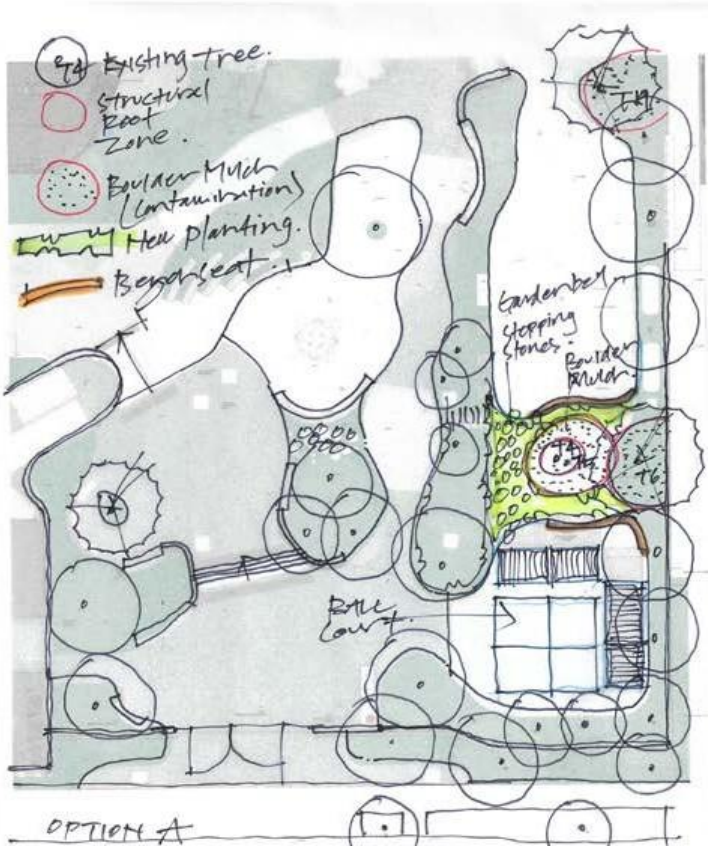
1.5.3 OPTION A – RAISED PLANTER WITH STEPPING STONE PATHWAY

PROS

- Garden bed surrounded by a low retaining wall provides understory planting opportunity with integrated bench seating.
- Space for new trees planting in adjacent garden beds to offset trees removal and maximise tree planting within the active play area.

CONS

- Infill planter provides minimal understory planting opportunity due to contamination remediation/ boulder mulch requirements under existing trees.
- Demolition of existing buildings and hardstand around existing trees has potential to impact heavily on short term survival of trees.
- Reduced active play space doesn't meet EFSG requirements m2 / child. Refer EFSG PS610.12
- Segregated active play spaces not desirable under EFSG requirements.
- Reduced connectivity / accessibility between active play areas through garden bed.
- Handball court area and shade structure is reduced in size which provides less shade and play amenity.
- Sight lines between play spaces are potentially disrupted between the separated active play spaces and adjacent circulation spaces.



Plan – Design Option A

1.6 LANDSCAPE DESIGN RESPONSE – TREE 9, 10 AND 11

The recommendation is to retain the existing Casuarina cunninghamiana numbered Tree 9, 10 and 11. Design development explorations have shown the design can altered slightly with the benefit of saving the existing trees.

Pedestrian circulation through the external outdoor play areas is comprised of a series of plazas, teaching spaces, pathways and circulation nodes which are designed to work together to access open space areas and meet DDA / EFSG.

access requirements. The primary walkways from the main arrival gateways into the heart of the playground are designed at a maximum walkway gradient of 1:20 to ensure equitable DDA access is achieved site wide.

In the previous design the proposed path and boardwalk alignment from the COLA into the outdoor play spaces collides with the existing Tree 9 location. Trees 10, 11, 12, 13, 14 and 15 are highlighted to be retained and are located with the existing garden terrace within close proximity the proposed boardwalk.

Further design investigations have shown that Tree 9 can also be retained with a slight adjustment to the proposed boardwalk alignment.

Subsequently the exiting retaining walls to the garden terrace will require minimal demolition. The proposed sandstone retaining walls between the nature play area and the dry creek bed have been designed to protect the existing structural root zone (SRZ) with minimal to no impact on the existing trees to ensure trees 9, 10 and 11 are retained on protected.

The following summary highlights the main objectives in the current landscape design that highlights the importance of retaining existing trees where possible:

- Realignment of the main pathway and timber boardwalk to avoid direct impacts tree 9. A revised pathway alignment ensures a direct access to the heart of the playground is maintained at the previously proposed 1:20 accessible gradient.
- The revised boardwalk alignment maintains uninterrupted sight-lines between the main arrival/COLA and the heart of the playground.
- The Structural Root Zone (SRZ) of Tree 9 and 15 will see minimal construction impact due to the proposed lightweight structure of the boardwalk. Proposed use of screw piles provide flexibility in the design to avoid tree roots within the SRZ.

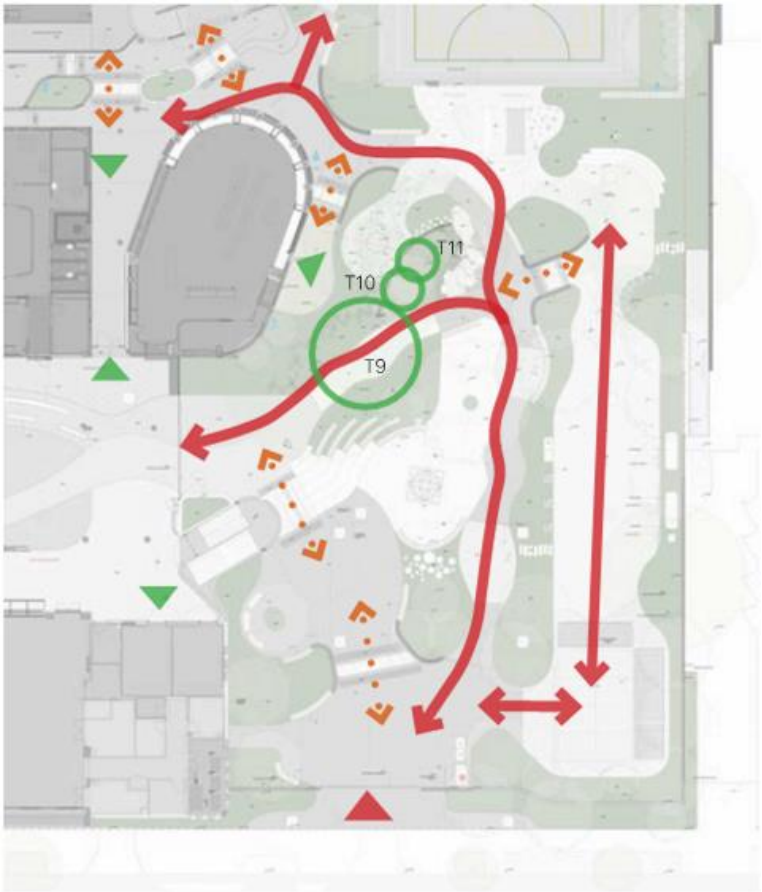
Please refer to the following design summary and detailed design option which highlight the design exploration and evolution that ensured tree 9, 10 and 11 can be retained and protected.

Location Plan for Trees 9, 10, 11, 12, 13, 14 and 15

1.6.1 PROPOSED DESIGN RESPONSE

The following response highlights how the site wide design principles are addressed:

- Accessible and clear site wide way finding between arrival plazas, nodes and active play spaces.
- Legible pedestrian flow between COLA and active playground.
- Equitable access with 1:20 max gradients to all walkways.
- Avoid over use of 1:14 ramps.
- All pathways, stairs and play areas sit within a lush landscape setting.
- Timber decks and boardwalks allow for minimal impact on existing trees highlighted to be retained.
- Minimal Rock mulch requirement cover contaminated soil.
- Path arrangement and site planning enhances active and passive play space m2 areas to ensuring EFSG play space requirements are achieved.
- Look to realign boardwalk to retain Tree 9 while maintaining 1:20 max accessible gradient along the main path alignment.
- Retain existing trees 10 and 11 if possible (avoid damage within SRZ during demolition construction phase.)
- Plant new native trees and understory to further develop a biodiversity response relevant to the Blackwattle Creek ecology.



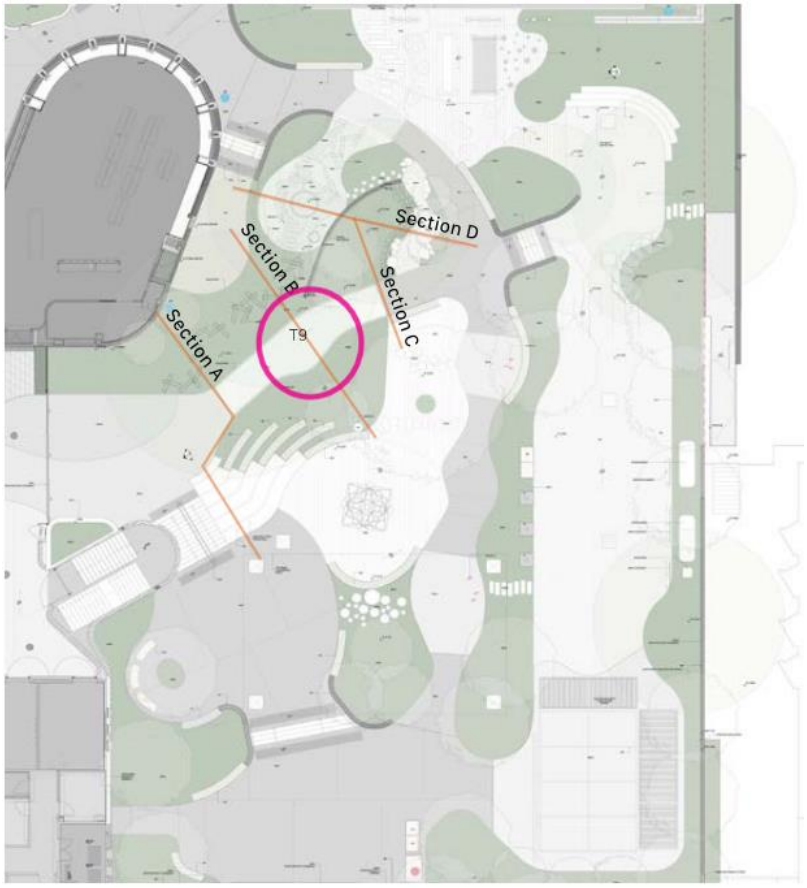
LEGEND

- 1:20 (Max) ACCESSIBLE WALKWAY CONNECTIONS
- 1:14 DDA WHEELCHAIR CONNECTIONS
- STEPPED/ STAIRWAY CONNECTIONS
- PRIMARY SCHOOL ENTRANCE
- BUILDING ENTRANCE

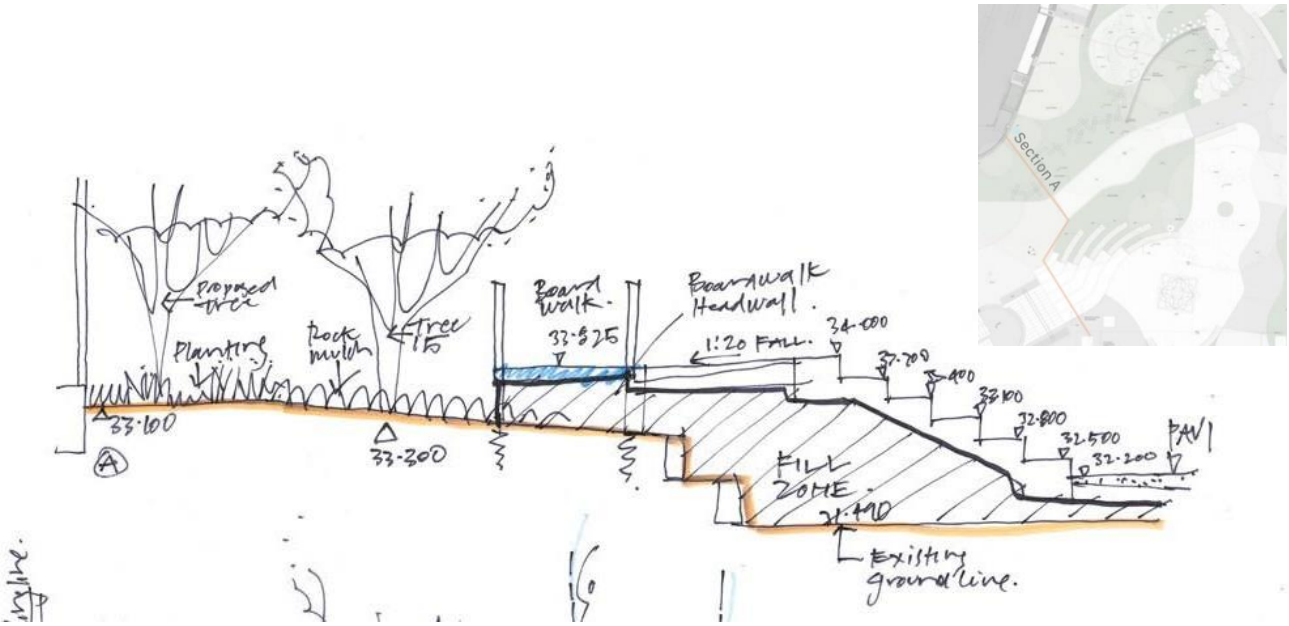
1.6.2 PREVIOUS DESIGN RESPONSE

- Accessible and clear site wide way finding between arrival plazas, nodes and active play spaces.
- Legible pedestrian flow between COLA and the heart of the active play spaces.
- Equitable access with 1:20 max gradients to all walkways.
- Avoid over use of 1:14 ramps
- All pathways, stairs and play areas sit within a lush landscape setting.
- Timber decks and boardwalks ensure minimal impact on existing trees highlighted to be retained.
- Minimal contamination remediation Rock mulch requirement cover contaminated soil.
- Path arrangement and site planning enhances active and passive play space m2 areas to ensuring EFSG play space requirements are achieved.
- Removes Tree 9 in order to achieve sight lines and 1:20max accessible gradient along the main path alignment.
- Retain existing trees 10 and 11 if possible (avoid damage within SRZ during demolition construction phase.)
- Plant new native trees and understory to further develop a biodiversity response relevant to the Blackwattle Creek ecology.

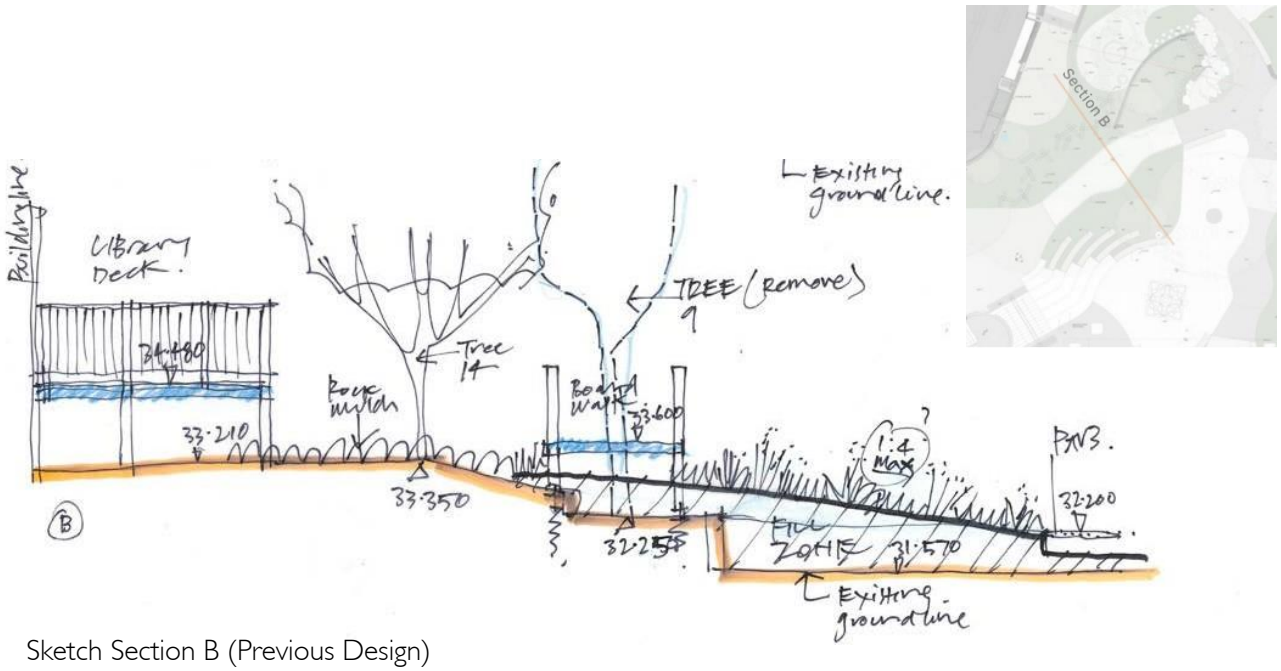
The following landscape sketch sections have been prepared as part of the design development exploration in order to highlight the accessibility and levels complexity between the COLA arrival plaza and the lower open space terrace and the active play spaces.



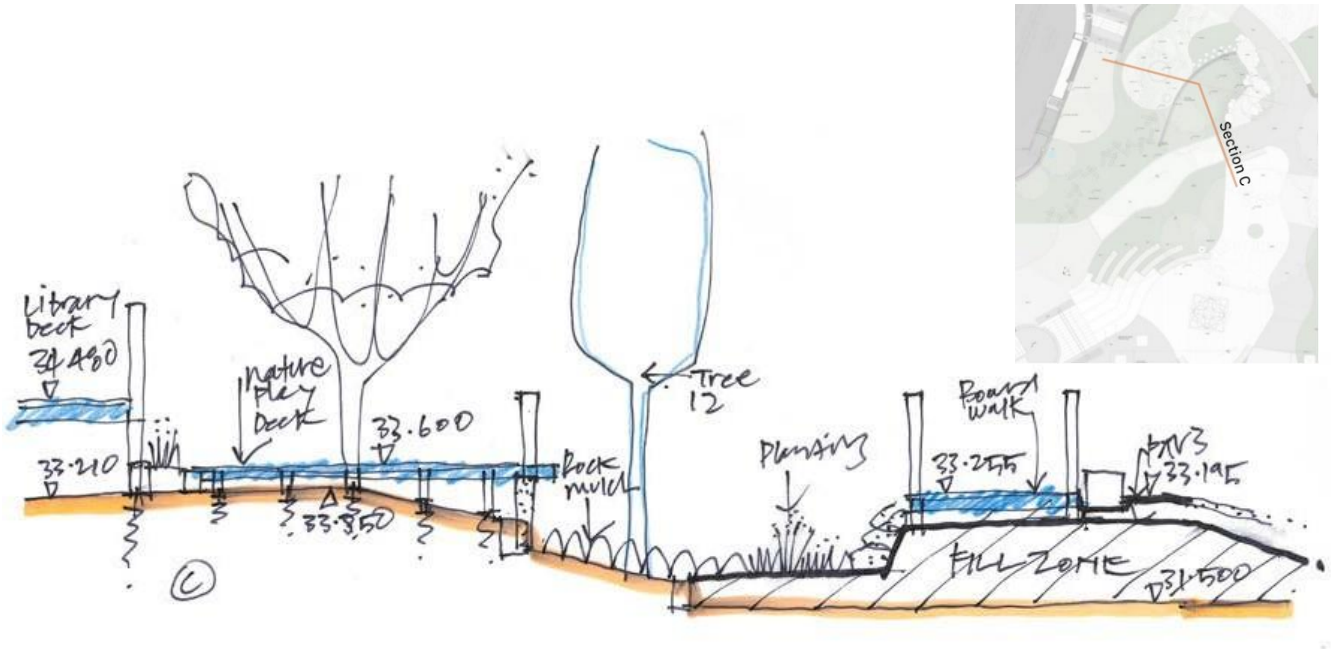
Sketch Section Key Plan



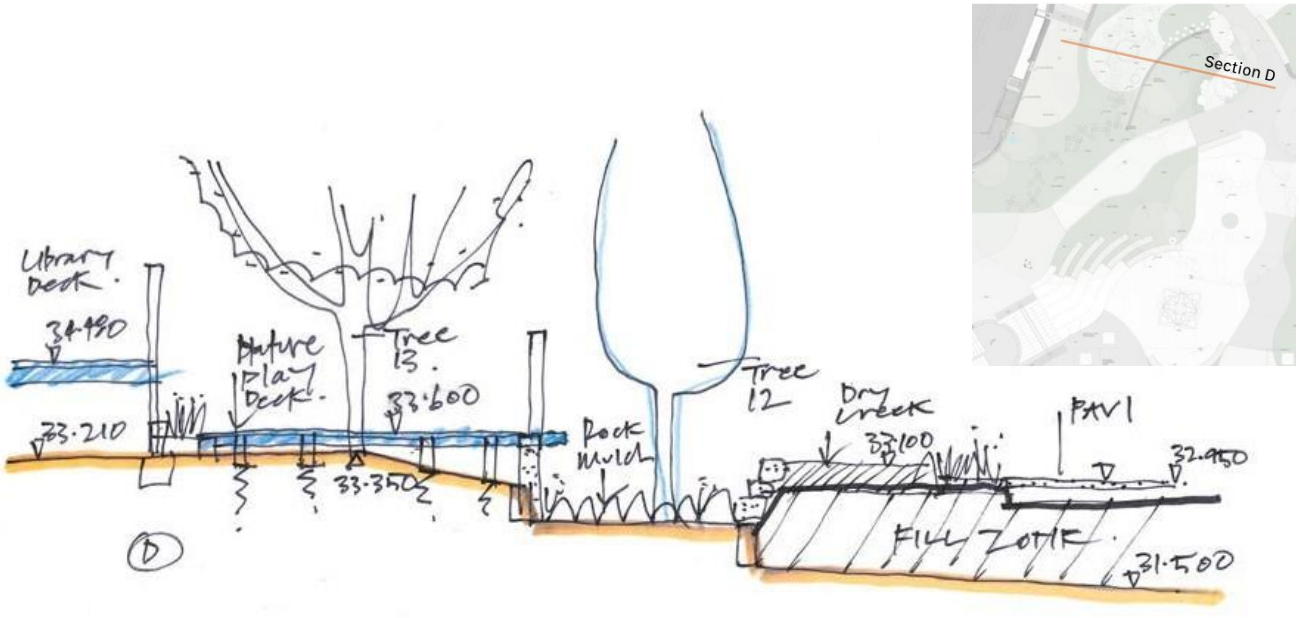
Sketch Section A (Previous Design)



Sketch Section B (Previous Design)



Sketch Section C (Previous Design)



Sketch Section D (Previous Design)

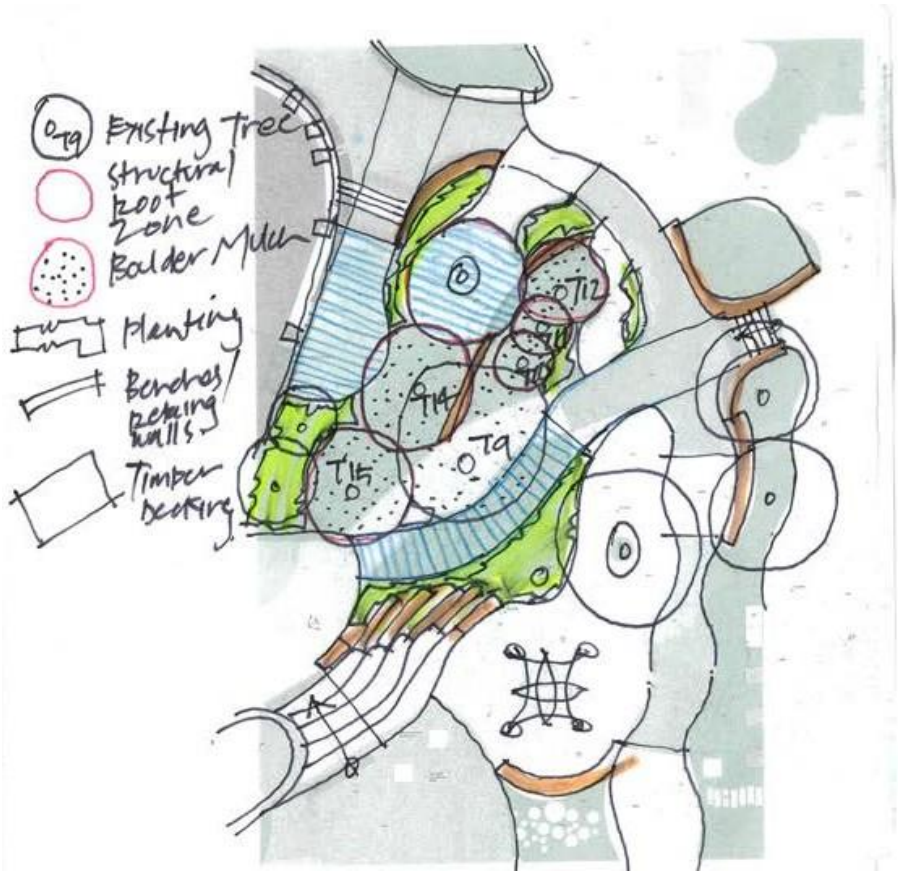
1.6.3 SKETCH OPTION – REALIGNED TIMBER BOARDWALK TO AVOID TREE 9

PROS

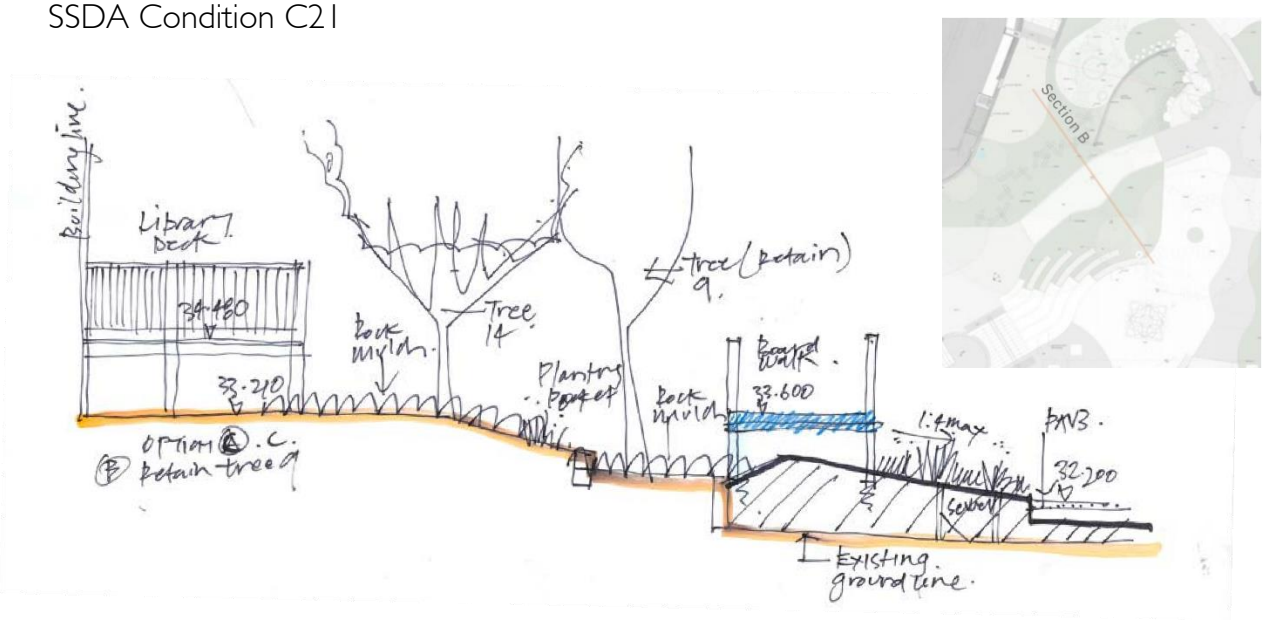
- Retain Tree 9
- Retain Tree 10 and 11
- Less demolition and disturbance of existing terrace garden walls
- Retain existing site ecology / tree canopy / Biodiversity
- Installation of new understory planting
- Ease of installation of rock mulch remediation
- No impact on active play space m^2 area
- Circulation remains at max 1:20 gradient to ensure DDA compliance from COLA and Abercrombie Street Entrance

CONS

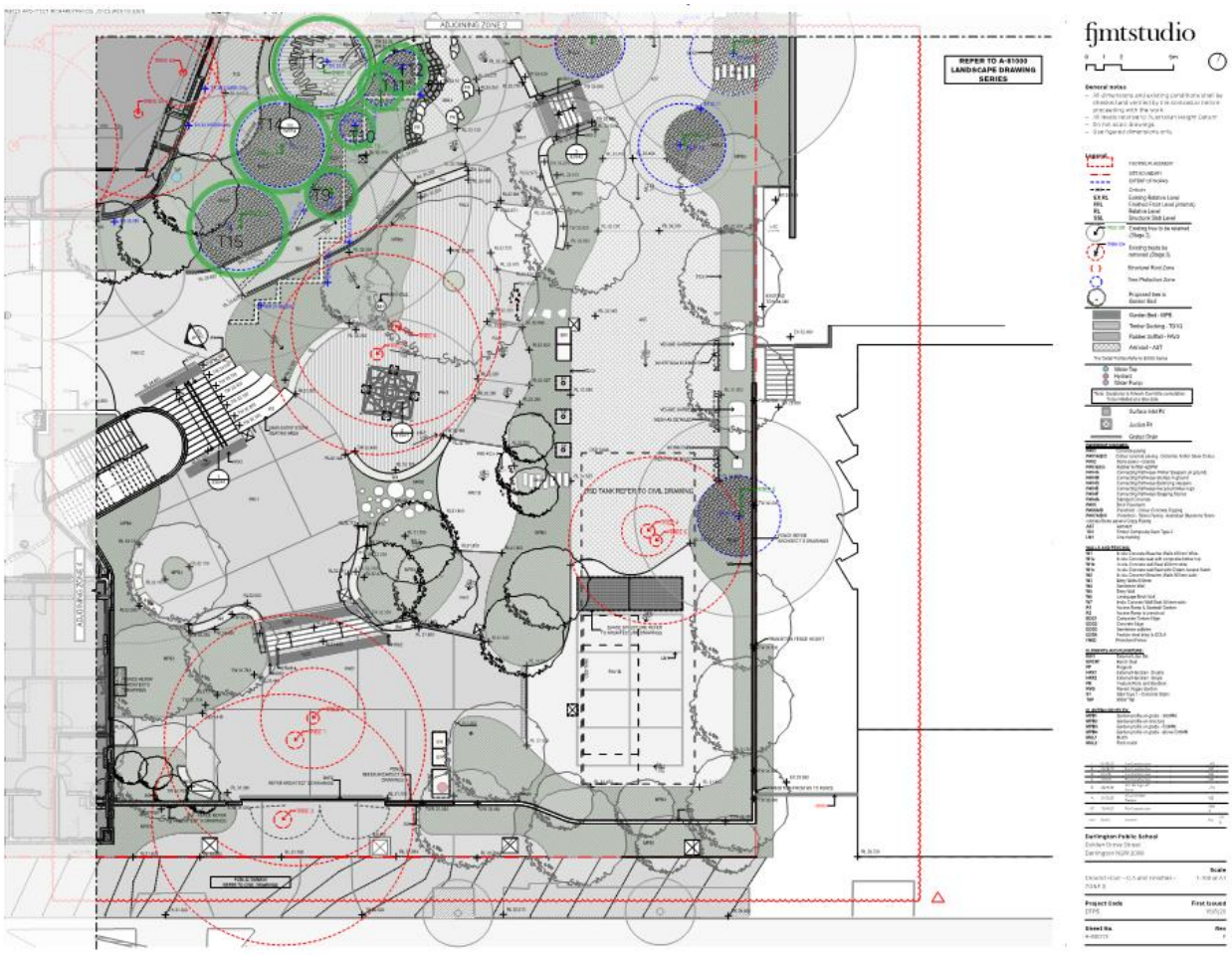
- Slight impact on Trees 9 and 15 Structural Root Zone SRZ from lightweight board walk substructure and screw piles.



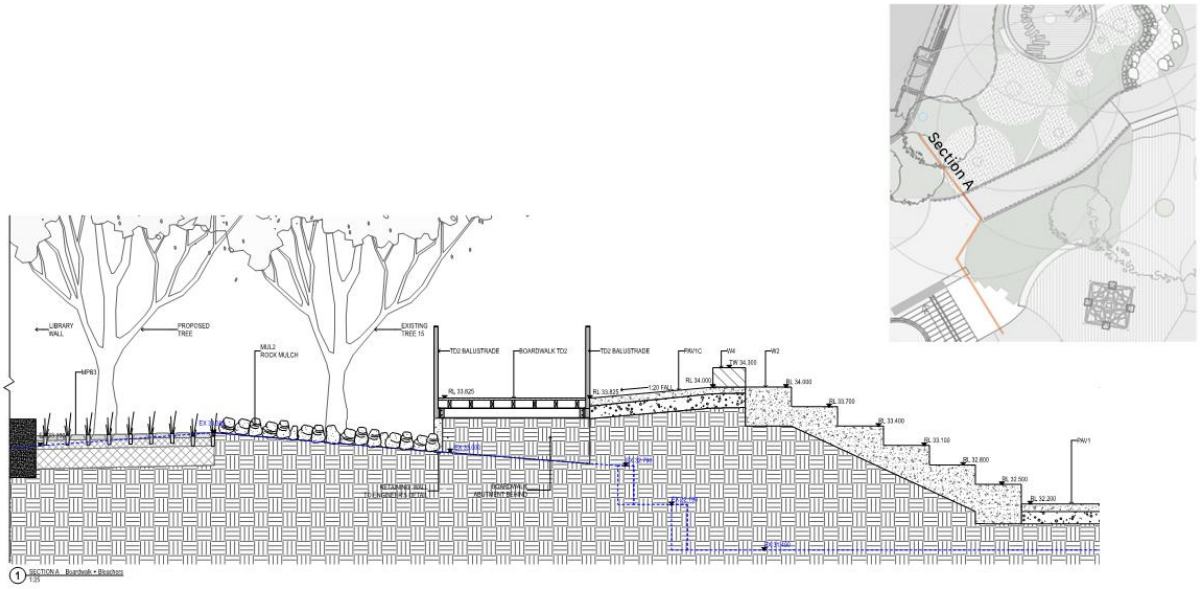
Proposed Sketch Option – Realigned timber boardwalk to retain Tree 9



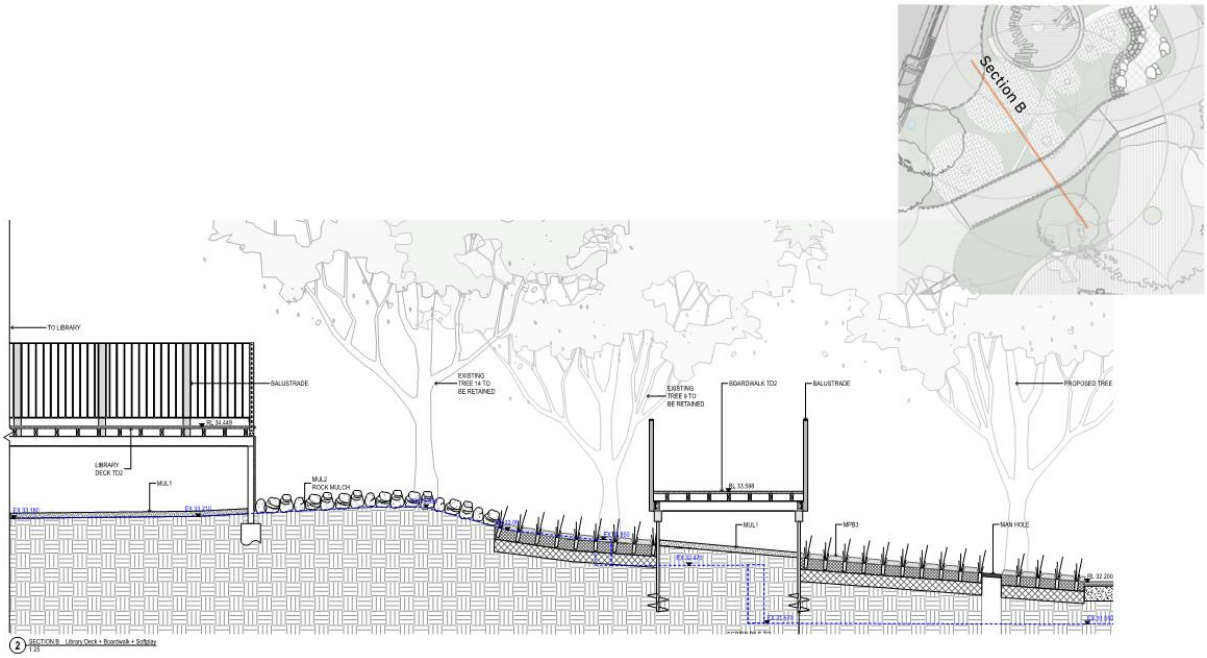
Sketch Option – Section Realigned Timber Boardwalk to Avoid Tree 9



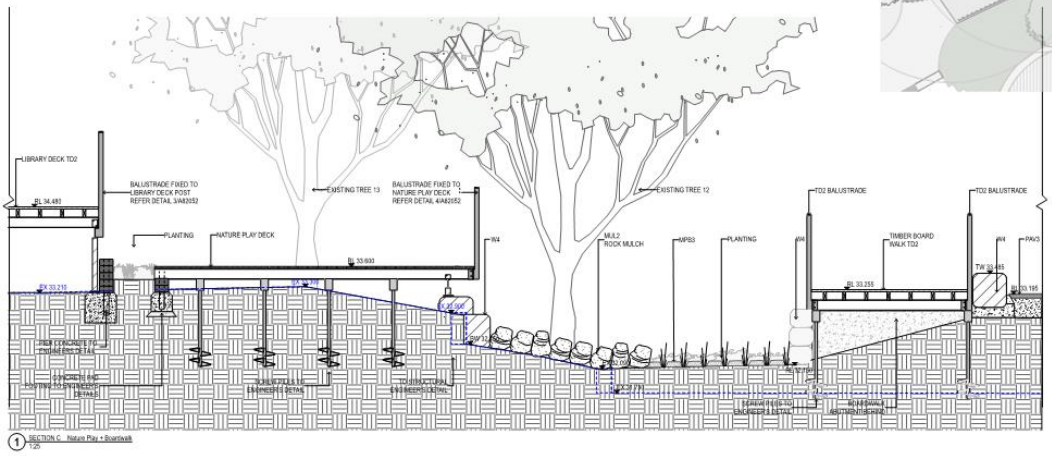
Revised Landscape Plan – Realigned Timber Boardwalk to Retain Trees 9, 10 and 11



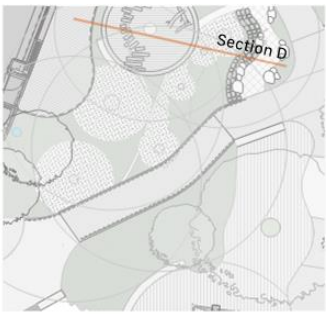
Revised Section A - Realigned Timber Boardwalk to Avoid Tree 9, 10 and 11

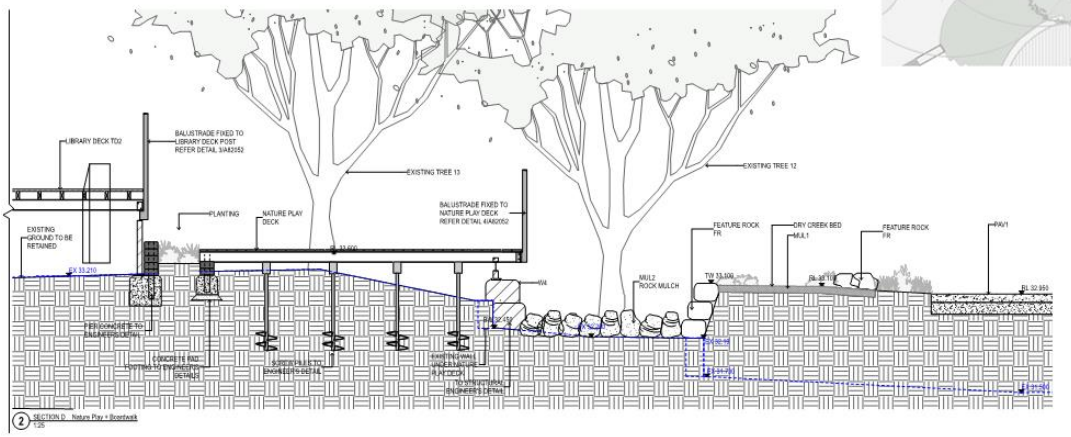


Revised Section B - Realigned Timber Boardwalk to Avoid Tree 9, 10 and 11

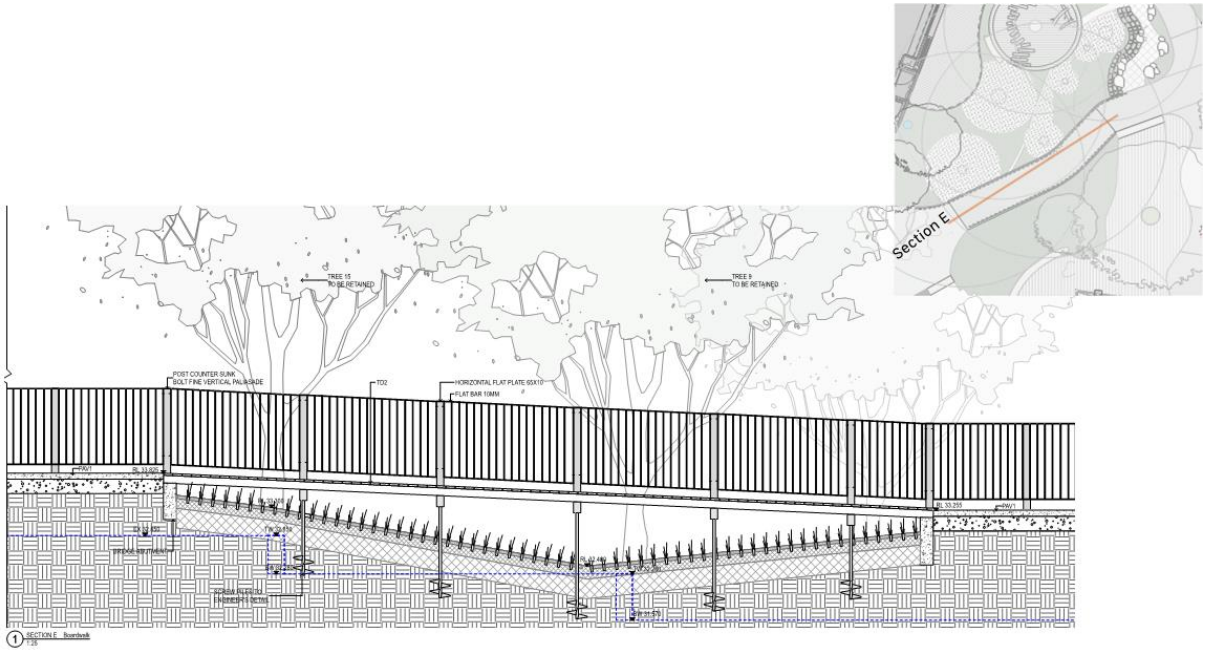


Revised Section C - Realigned Timber Boardwalk to Avoid Tree 9, 10 and 11





Revised Section D - Realigned Timber Boardwalk to Avoid Tree 9, 10 and 11



Revised Section D - Realigned Timber Boardwalk to Avoid Tree 9, 10 and 11

1.7 CONCLUSION

The following conclusions and recommendations have been made to address the C21 - SSDA requirements as follows:

(a) Further design investigations have been undertaken to determine if landscape design changes and landscape methods are viable in order to retain trees where possible. Design investigations incorporate landscape design development and specific advice received from the project Consulting Aborist and the project Hygienist in terms of contamination remediation.

It's recommended to remove the existing Livistona Australis and Eucalyptus Robusta due to the encumbered existing root system and the highly likely impacts on the existing root system during the demolition of the surrounding courtyard buildings and concrete hardstand area. Demolition will greatly impact the potential short term survival of Trees 4 and 5.

Its recommended to retain the existing Casuarina Cunninghamiana Tree 9, 10 and 11.

The previous landscape design approach has been reviewed and adjusted to ensure the timber boardwalk site arrangement avoids any impact on trees 9 in particular.

The recommendation is to retain Trees 9, 10, and 11 as the agreed site wide landscape design principles are maintained and further enhanced.

(b) This SSDA Tree Report documents relevant findings, design investigations and design options in order to provide alternative design solution which highlight design factors to ensure the site wide design principles are maintained and enhanced where possible. Landscape plans, sections and details provided in the report highlight design changes and construction methods in order to retain the Trees 9, 10 and 11.

(c) Updated Landscape Plans capture the design outcome of the design investigations. The landscape plans show existing trees to be retained with the associated contamination remediation requirements to the structural root zones of trees affected by the proposed landscape works.

2 APPENDICES

2.1 APPENDIX A – MOORE TREES REPONSE TO SSDA REGARDING TREES 4, 5, 9, 10, 11

MOORE TREES
Consulting Arborist

18th August 2021 **Ref:** Darlington,08062021

A W Edwards Pty Limited
Level 1, 131 Sailors Bay Rd,
Northbridge NSW 2063
FAO: Cameron Williams

Site Address: Darlington Public School

Re: Response to SSDA regarding Trees 4, 5, 9, 10, 11

A site inspection was undertaken on 8th June 2021 at the abovementioned site to inspect trees numbered as 4, 5, 9, 10 and 11. These trees have been highlighted for additional information regarding the design impacts.

Trees 4 and 5 are located within the courtyard area (Plate 1). Trees 9, 10 and 11 are located in the playground area (Plate 3).

Table 1 lists the relevant SSDA issues relating to these trees. Table 2 lists the response to the extract from SSDA.

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21	**Arboricultural investigations**	Prior to the commencement of works that would encroach into the tree protection zones of trees numbered **4, 5, 9, 10 and 11** in the Arboricultural Report dated May 2020 and prepared by Moore Trees, the Applicant must:	Ongoing
21a	**Arboricultural investigations**	**(a) undertake further investigations to determine the landscape design changes and measures and methods required to retain the trees.** These investigations are to incorporate advice from a Level 5 (Australian Qualification Framework) qualified arborist, and include non-destructive root investigations undertaken in accordance with Australian Standard AS 4970-2009 Protection of Trees on Development Sites (AS4970), where required to inform the landscape design changes;	Ongoing
21b	**Arboricultural investigations**	(b) **submit a report documenting the findings** of the investigations for the approval of the Planning Secretary that details the design changes and methods and measures to retain the trees. Where it has been concluded that the retention of a tree would prevent the objectives of the landscape design and/or project overall being achieved, sufficient details must be provided to support the conclusions, including: (i) alternative landscape design options considered; (ii) details of levels or other critical factors; (iii) advice from appropriately qualified persons; and	Ongoing
21c	**Arboricultural investigations**	(c) **submit an updated Tree Protection Plan** (scaled drawing) to the Planning Secretary that reflects the outcome of the investigations and shows the tree protection zones, structural root zones and canopies for trees affected by the proposed development.	Ongoing

Table 1: extract from SSDA.

Item	Response	Recommendation
21a	**Trees 4 and 5:** Unknown condition of roots under the concrete slabs that surround these two trees. It is more than likely that roots will be damaged during demolition having grown into the underside of the concrete. At present, the concrete covers the entire TPZ area for these two trees. The extensive root systems can be seen in Plate 1. **Trees 9, 10 and 11:** Trees 9-11 are located within the center of a pedestrian path and as such cannot be retained without major design changes. To retain these trees impacts on the accessibility & functionality of the play spaces and path network. Accessible pathways are required site wide. The design has maintained smooth even grades at a max 1:20 grade in the current design to ensure access and accessibility to the heart of the play area from the main arrival / COLA. The length and positioning of pathway gradients in the proposed pathways and play spaces are critical to deliver compliant grades for EFSG and DAA equitable access. A number of design options were tested to re-locate and rearrange the accessible paths around the play elements.	Trees 4 and 5 to be removed to achieve capping layer. (Plate 1) Root mapping not possible. Trees 9-11 to be removed. (Plate 2)

Item	Response	Recommendation
	Root mapping is very disruptive in terms of the work space required. Most Root mapping contractors will not work on sites that uncover or where known contamination may be. The school is currently operational. For these reasons Root mapping is not a viable option for this project. The current alignment in the proposed design represents the most desirable outcome in terms of play space functionality, direct accessible routes through the playground, with the boardwalk crossing the TPZ of the trees to be retained. Design tried to move the nature play, dry creek bed play zone and boardwalk to retain the casuarinas however each option impacted heavily on the functionality of the play spaces. Also worth noting the level differences of the adjacent accessible footpath ways and play spaces are greater than one (1) metre higher than the existing levels at the base of the trees being retained in or adjacent the nature play area (T13, T14, and T15). Please note removal of trees due to leaf drop is not an acceptable reason to remove trees as accepted and as viewed by the Land and Environment Court.	
21b	The landscape design requires a specific area of play space and access to the play space area. The removal of these trees appears to be collateral damage in the requirement for design legislation compliance. The required capping layer cannot be achieved below Trees 4 and 5 without destabilizing them. Tree 11 is very close to Tree 12 however Tree 12 is the better tree between these two specimens. They both cannot be retained for the reason above being that a specified play space area is required and in keeping both trees that play space area will not be achieved.	Trees 4 and 5 to be removed. Tree 9-11 to be removed.
21c	The Tree Protection Plan has been updated to show the removal of Trees 4, 5 and 9-11. Near Trees 12-15 the wall will have to be carefully dismantled so as not to damage the trunks and woody root structure. No excavations or level changes shall occur within the TPZ of Trees 12-15. Construction and landscape plans be amended to reflect this.	Tree Protection Plan has been updated and included within this report. Sent as separate document.

Item	Response	Recommendation
	Landscape design to address the removal and transition of grades with the removal of the sandstone wall located between and along Trees 12-15.	

Table 2: Response to the extract from SSDA.

Another option for suspending walkways and decking over TPZ areas is ground screws Australia that have a product that can perform a similar task in terms of minimizing excavations, concrete use and overall cost. The screw design and specification can be seen in Plates A and B (Appendix 1).

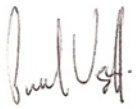
The proposed AstroTurf will be acceptable for the outdoor play area within the TPZ of the site trees however the final depth required for subsurface preparation will require further assessment in relation to possible impacts to roots. It will be required that roots are not severed for this preparation. There may have to be an allowance for the subbase requirement to be varied where a large woody root is encountered.

Individual trunk protection: All trees to be retained will require trunk protection. This is achieved by attaching lengths of timber (75mm x 50mm x 2000mm) fastened around the trunk. Geotextile fabric or carpet underlay shall be wrapped around the trunk prior to the timbers being attached. These timbers are to be fastened with hoop iron strapping and not attached directly into the bark of the tree. These timbers are only to be removed when all construction is complete. See Plate 3 for an example of trunk protection.

Root Zone Protection: Existing concrete to be retained until the capping layer works are to be completed. This will reduce compaction over the root zone whilst works are occurring. The area for existing concrete to be left in place for the demolition period can be seen in the Tree Protection Plan.

If you have any questions in this regard, please do not hesitate to contact me.

Yours sincerely,



Paul Vezgoff
Consulting Arborist
Dip Arb (Dist), Arb III, Hort cert, AA, ISA
0411 712 887

Appendix 1

GROUND SCREWS AUSTRALIA

FCA-1

FCA 76x1600-1	FCA 76x1300-1	FCA 76x1000-1
Nominal length (mm)		
1600	1300	1000
Tube diameter (mm)		
76.10	76.10	76.10
Weight (kg)		
10.9	8.80	5.80
Thread count		
20	15	7.5
Wall thickness (mm)		
3.2	3.2	3.2
Material		
Steel C350	Steel C350	Steel C350
Item number		
25124	25122	25120

Plate A: Image showing the Ground Screws Australia pile design. P. Vezgoff.

Technical Data

	FCA 76x1600-1	FCA 76x1300-1	FCA 76x1000-1
a	Length (mm) (±25 mm)		
	1575	1275	975
b	Shaft outer diameter (mm)		
	76.10	76.10	76.10
c	Inner diameter (mm)		
	69.70	69.70	69.70
d	Galvanizing drain hole (mm)		
	20	20	20
e	Pitch circle diameter (mm)		
	120	120	120
f	Pitch circle holes (mm)		
	6 x Ø 11	6 x Ø 11	6 x Ø 11
g	Flange wrench size (mm)		
	130	130	130
h	Flange outer diameter (mm)		
	150	150	150
i	Flange thickness (mm)		
	5	5	5

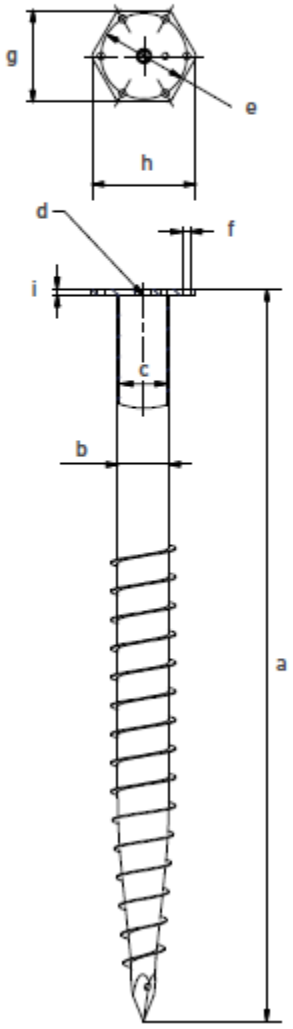


Plate B: Image showing the Ground Screws Australia pile specifications. P. Vezgoff.

Plate 1: Image showing Tree 4 and 5. Tree 6 at the rear growing against the wall. P. Vezgoff

Plate 2: Image showing Trees 9, 10, 11 and 12. P. Vezgoff

Plate 3: Example of trunk protection with sign attached, recommended for Trees to retained. P. Vezgoff.

2.2 APPENDIX B – TREE MANAGEMENT PLAN – STAGE 2, ZONE 3

0 1 2 5m

GENERAL NOTES

- ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING WITH THE WORK.
- ALL LEVELS RELATIVE TO 'AUSTRALIAN HEIGHT DATUM'.
- DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY.

legend

TREE ID#
EXISTING TREE TO BE RETAINED IN ACCORDANCE WITH ARBORICULTURAL ASSESSMENT

TREE ID#
EXISTING TREES TO BE REMOVED

STRUCTURAL ROOT ZONE

TREE PROTECTION ZONE

TREE PROTECTION FENCE

TREE PROTECTION

In order to ensure the retention of the trees to be retained the following measures are to be taken:

All detailed architectural, building, engineering (structural, stormwater and drainage, services) and landscape documentation submitted for the construction certificate application shall show the retention of these trees, with the position of their trunks and full diameter of their canopies clearly shown on all drawings.

All detailed documentation submitted for the construction certificate application shall show no alteration in the existing soil levels, cutting or battering of the existing soil profile as per the Arboricultural Assessment. A qualified site arborist is to be engaged for the duration of the works to administer compliance with those conditions relating to trees on the site, with all the site staff to adhere to the arborists instructions.

The trees are to be physically protected by the installation of a steel mesh/chainwire as specified by the site arborist. This fencing shall be installed prior to the commencement of construction works, and shall remain in place until all works are completed, with signage containing the following words: 'tree protection zone, do not enter, clearly displayed and permanently attached. Within this zone there is to be no storage of materials or machinery or site office/sheds, nor is cement to be mixed or chemicals spilt/disposed of and no stockpiling of soil or rubble. Any works required within this zone (only as approved on the construction certificate) shall be under the direction of, and to the satisfaction of, the site arborist.

All site services shall be located as far as practically possible from the trunks of all these trees, with any excavations within 5 metres of either trunk for footings, structures, services, pipes, stormwater infiltration systems etc. to be performed by hand, with any roots encountered to be cut cleanly by hand and the affected area backfilled as soon as practically possible. Composted organic material (vilagrow landcure or similar equivalent) shall be provided to a depth of 100mm within the fenced off protection area, and shall be maintained for the duration of the works.

Irrigation shall be supplied to the trees, within the fenced off area, for the duration of the works to ensure adequate moisture levels are maintained.

NOTE

Arboricultural Assessment - refer report by Moore Trees Arboricultural Services 03/ 2020

CONTRACTOR TO PREPARE A REPURPOSING PLAN FOR EACH NATIVE HARDWOOD TREE TO BE REMOVED.
COORDINATE WITH TREE LOPPER TO DURING TREE REMOVAL TO IDENTIFY LENGTHS OF TIMBER SUITABLE FOR REMOVAL AND REUSE FOR THE ITEMS LISTED BELOW.

-MILLING (OFF SITE) FOR INTERNAL FURNITURE ITEMS INCLUDING:
-STOOLS-430mm H
-COFEE TABLES NOM. 720mm H
-WORK BENCHES
-VERTICAL TIMBER ELEMENTS AND BALANCING BEAMS - FN4 AND FN3 AS PER LANDSCAPE DRAWINGS.
-ART PIECES (TBC WITH LOCAL ARTIST INVOLVEMENT).
-LOGS FOR BALANCING BEAMS (CIRCULAR AND IRREGULAR, SIZE AND SHAPE AS PER LANDSCAPE DETAILS).

CONTRACTOR TO ALLOW TO:
- REMOVE TIMBER FROM SITE & TRANSPORT TO TIMBER MILL FOR PROCESSING & TO FURNITURE MAKER & / OR
- STORE IRREGULAR PIECES FOR FUTURE REUSE IN THE LANDSCAPE

rev	date	name	by	chk
01	13/1/22	For Construction	AQL	AL

fjmt studio architecture interiors landscape urban community
sydney melbourne uk
Level 5, 70 King Street t +61 2 9251 7077 fjmtstudio.com

project

Darlington Public School
Golden Grove Street
Darlington NSW 2008

title

Tree Management Plan - Stage 2, Zone 3

scale	1:100 @ A1	first issued	13/1/22
project code		sheet no.	revision
DTPS		A-80015	01

2.3 APPENDIX C – PAUL VEZGOFF MOORE TREES ABORIST CURRICULUM VITAE

MOORE TREES

Consulting Arborist

Paul Vezgoff is the Principal Consulting Arborist of Moore Trees. Paul holds AQF Level 5 qualifications in Arboriculture. Paul has extensive experience in arboriculture and horticulture fields, together with his work in Local Government in a technical capacity.

Moore Trees was established in 2005 to meet a need for effective, proactive management of trees in the urban forest. Moore Trees is a business that prides itself on fresh ideas and contemporary thinking.

Moore Trees is committed to best practice in the management of trees in the urban forest and to deliver high quality, professional advice, reports and management plans.

Moore Trees have successfully been appointed to the Arboricultural Consultancy panel for the City of Sydney Council for 8 years. Moore Trees also currently provide arborist services to Wollongong City Council as a member of the Consultancy panel and have worked for many other local government offices. Moore Trees have worked on many large-scale projects for BuildCorp, Stocklands, Lend Lease, Health Infrastructure, Sydney Water, and undertake annual risk assessments of trees and vegetation along the M4 and M5 Motorway for Interlink Roads.

Moore Trees have undertaken annual tree risk assessments for many New South Wales public schools since commencement of this program through the Department of Education in 2014.

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Curriculum Vitae

PAUL VEZGOFF

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Email: enquiries@mooretrees.com.au Website: www.mooretrees.com.au

EDUCATION and QUALIFICATIONS

- 2018 / 2013- Tree Risk Assessment (TRAQ) Training and qualification, Auckland NZ / Sydney
- 2016 – Quantified Tree Risk Assessment (QTRA) Training and qualification, Sydney
- 2007 – Diploma of Arboriculture (AQF Cert V) Ryde TAFE (Distinction)
- 1997 – Completed Certificate in Crane and Plant Electrical Safety
- 1996 – Attained Tree Surgeon Certificate (AQF Cert II) at Ryde TAFE
- 1990 – Completed two month intensive course on garden design at the Inchbald School of Design, London, United Kingdom
- 1990 – Completed patio, window box and balcony garden design course at Brighton College of Technology, United Kingdom
- 1989 – Awarded the Big Brother Movement Award for Horticulture (a grant by Lady Peggy Pagan to enable horticulture training in the United Kingdom)
- 1989 – Attained Certificate of Horticulture (AQF Cert IV) at Wollongong TAFE

INDUSTRY EXPERIENCE

Moore Trees Arboricultural Services **January 2006 to date**

Arboricultural Consultancy and tree ultrasound. Tree hazard and risk assessment, Arborist development application reports, tree protection plans, Tree management plans.

Woollahra Municipal Council **Oct 1995 to February 2008**

ARBORICULTURE TECHNICAL OFFICER
August 2005 – February 2008
Tree asset management, programmed inspection, inventory and condition surveys of council trees, hazard and risk appraisal, Tree root damage investigation and reporting, assessment of impacts of capital works projects on council trees.
ACTING COORDINATOR OF TREES MAINTENANCE
June – July 2005, 2006
Responsible for all duties concerning park and street trees. Prioritising work duties, delegation of work and staff supervision.
TEAM LEADER
September 2000 – June 2005
HORTICULTURALIST
October 1995 – September 2000

Northern Landscape Services **July to Oct 1995**

Tradesman for Landscape Construction business

Paul Vezgoff Garden Maintenance (London, UK) **Sept 1991 to April 1995**

CONFERENCES AND WORKSHOPS ATTENDED

- TRAQ Conference, Auckland NZ / Sydney (2013 / 2018)
- International Arboriculture Australia Conference, Canberra (May 2017)
- QTRA Conference, Sydney (Nov 2016)
- International Society of Arboriculture Conference (Brisbane 2008)
- Tree related hazards: recognition and assessment by Dr David Londsdale (Brisbane 2008)
- Tree risk management: requirements for a defensible system by Dr David Londsdale (Brisbane 2008)
- Tree dynamics and wind forces by Ken James (Brisbane 2008)
- Wood decay and fungal strategies by Dr F.W.M.R. Schwarze (Brisbane 2008)
- Tree Disputes in the Land & Environment Court – The Law Society (Sydney 2007)
- Barrell Tree Care Workshop- Trees on construction sites (Sydney 2005)
- Tree Logic Seminar- Urban tree risk management (Sydney 2005)
- Tree Pathology and Wood Decay Seminar presented by Dr F.W.M.R. Schwarze (Sydney 2004)
- Inaugural National Arborist Association of Australia (NAAA) tree management workshop- Assessing hazardous trees and their Safe Useful Life Expectancy (SULE) (Sydney 1997)