APPLICATION ON NOTIFICATION – CROWN DEVELOPMENT

Applicant:	St Dominic's Priory College
Development Number:	020/V058/17
Nature of Development:	Educational Establishment – Year 12 Study Centre and Early Learning Centre
Type of development:	Public Infrastructure
Zone / Policy Area:	North Adelaide Historic (Conservation) Zone, Hill Street Policy Area 1
Subject Land:	74 Hill Street, North Adelaide and 112 Barnard Street, North Adelaide
Contact Officer:	Ben Scholes
Phone Number:	8402 1861
Start Date:	5 October 2017
Close Date:	25 October 2017

During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours.

Application documentation may also be viewed during normal business hours at the City of Adelaide Council office (Colonel Light Centre, 25 Pirie Street, Adelaide).

Written representations must be received by the close date (indicated above) and can either be posted, hand-delivered, faxed or emailed to the State Commission Assessment Panel (SCAP). A representation form is provided as part of this PDF document.

Any representations received after the close date will not be considered.

Postal Address:
The Secretary
State Commission Assessment Panel
GPO Box 1815
ADELAIDE SA 5001

Street Address:
Development Division
Department of Planning, Transport and Infrastructure
Level 5, 50 Flinders Street
ADELAIDE

Email Address: scapadmin@sa.gov.au
Fax Number: (08) 8303 0753

SECTION 49 & 49A – CROWN DEVELOPMENT
DEVELOPMENT APPLICATION FORM

PLEASE USE BLOCK LETTERS

COUNCIL: City of Adelaide

APPLICANT: St Dominics Priory College

ADDRESS: 139 Molesworth Street North Adelaide SA 5006

CROWN AGENCY: Department of Planning Transport and Infrastructure

CONTACT PERSON FOR FURTHER INFORMATION

Name: David Hutchison

Telephone: 81307222

Email: dhutchison@accessplanning.com.au

FOR OFFICE USE

DEVELOPMENT No: _____

PREVIOUS DEVELOPMENT No:_____

DATE RECEIVED: / /

❒ Complying ❒ Merit ❒ Public Notification ❒ Referrals	Decision: _____ Type: _____ Finalised: / /

NOTE TO APPLICANTS:

(1) All sections of this form must be completed. The site of the development must be accurately identified and the nature of the proposal adequately described. If the expected development cost of this Section 49 or Section 49A application exceeds $100,000 (excl. fit-out) or the development involves the division of land (with the creation of additional allotments) it will be subject to those fees as outlined in Item 1 of Schedule 6 of the *Development Regulations 2008.* Proposals over $4 million (excl. fit-out) will be subject to public notification and advertising fees.

(2) Three copies of the application should also be provided.

	Decision required	Fees	Receipt No	Date
Planning:	_____	_____	_____	_____
Land Division:	_____	_____	_____	_____
Additional:	_____	_____	_____	_____
Minister's Approval				

EXISTING USE: 74 Hill Street, Consulting Room; 112 Barnard Street, Dwelling

DESCRIPTION OF PROPOSED DEVELOPMENT Educational Establishment **-** 74 Hill Street (Year 12 Study Centre); 112 Barnard Street (Early Learning Centre)

LOCATION OF PROPOSED DEVELOPMENT:

House No: 74 Hill Street and 112 Barnard Street
Town/Suburb: North Adelaide

Lot No: Lot 774 in FP 183236 & Lot 5 in FP 138164

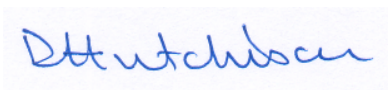
74 Hill Street Volume: 5773 Folio: 314

112 Barnard Street Volume: 5254 Folio793

DEVELOPMENT COST [do not include any fit-out costs]**:** $4.1million

POWERLINE SETBACKS: Pursuant to Schedule 5 (2a)(1) of the *Development Regulations 2008,* if this application is for a building it will be forwarded to the Office of the Technical Regulator for comment unless the applicant provides a declaration to confirm that the building meets the required setback distances from existing powerlines. The declaration form and further information on electricity infrastructure and clearance distances can be downloaded from the DPLG website (www.dac.sa.gov.au).

I acknowledge that copies of this application and supporting documentation may be provided to interested persons in accordance with the *Development Act 1993.*

SIGNATURE: 

Dated: 7/09/2017

Government of South Australia

Department of Planning, Transport and Infrastructure

DEVELOPMENT ACT 1993

NOTICE OF APPLICATION FOR CONSENT TO DEVELOPMENT

SECTION 49 – PUBLIC INFRASTRUCTURE

Notice is hereby given that an application has been made by **St Dominic's Priory College** for consent to develop an **Educational Establishment – Year 12 Study Centre and Early Learning Centre** (Development Number: **020/V058/17**).

The subject land is situated at **74 Hill Street, North Adelaide** being Certificate of Title: Volume **5773** Folio **314**, and **112 Barnard Street, North Adelaide** being Certificate of Title: Volume **5254** Folio **793**.

The subject land is located within **North Adelaide Historic (Conservation) Zone, Hill Street Policy Area 1 of the Adelaide (City) Council Development Plan Consolidated 20 June 2017.**

The application may be examined during normal office hours at the office of the State Commission Assessment Panel, Level 5, 50 Flinders Street and at the office of the City of Adelaide Council. Application documentation may also be viewed on the State Commission Assessment Panel (SCAP) website: www.saplanningcommission.sa.gov.au/scap/public_notices.

Any person or body who desires to do so may make representations concerning the application by notice in writing delivered to the Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide 5001 **NOT LATER THAN 25 OCTOBER 2017.**

Each person or body making a representation should state the reason for the representation and whether that person or body wishes to be given the opportunity to appear before the SCAP to further explain the representation.

Submissions may be made available for public inspection. Please indicate in writing if you object to your submission being made available in this way.

Should you wish to discuss the application and the public notification procedure please contact **Ben Scholes** on 8402 1861.

Alison Gill
SECRETARY
STATE COMMISSION ASSESSMENT PANEL
www.saplanningcommission.sa.gov.au/scap

PN2159

PN2159
19x2 (63mm)
Adelaide Advertiser, City Messenger
4 October 2017

DEVELOPMENT ACT, 1993
S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	St Dominic's Priory College
Development Number:	020/V058/17
Nature of Development:	Educational Establishment – Year 12 Study Centre and Early Learning Centre
Zone / Policy Area:	North Adelaide Historic (Conservation) Zone, Hill Street Policy Area 1
Subject Land:	74 Hill Street, North Adelaide and 112 Barnard Street, North Adelaide
Contact Officer:	Ben Scholes
Phone Number:	8402 1861
Close Date:	25 October 2017

My name:_____

My phone number: _____

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address:_____

_____Postcode_____

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
[ ] owner of local property
[ ] occupier of local property
[ ] a representative of a company/other organisation affected by the proposal
[ ] a private citizen

The address of the property affected is .....Postcode.....

The specific aspects of the application to which I make comment on are: .....

.....

.....

.....

.....

.....

.....

.....

I
[ ] wish to be heard in support of my submission
[ ] do not wish to be heard in support of my submission
(Please tick one)

by
[ ] appearing personally
[ ] being represented by the following person : .....
(Cross out whichever does not apply)

Date: ..... Signature: .....

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapadmin@sa.gov.au

DEVELOPMENT REGULATIONS 2008

Declaration of Applicant
(*Pursuant to clause 2A(1) of Schedule 5)*

To: City of Adelaide

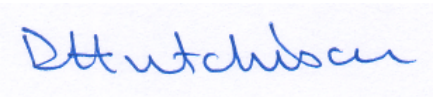
From: David Hutchison

Date of Application: 20/06/17

Location of Proposed Development: 112 Barnard Street North Adelaide

Nature of Proposed Development:

I David Hutchison **on behalf of** St Dominics Priory College, **being the applicant for the development described above declare that the proposed development will involve the construction of buildings which would, if constructed in accordance with the plans submitted, not be contrary to the regulations prescribed for the purposes of section 86 of the *Electricity Act 1996*. I make this declaration under Clause 2A(1) of Schedule 5 of the *Development Regulations 2008.***

Signed:  **Date: 20/06/17**

DEVELOPMENT REGULATIONS 2008

Declaration of Applicant
(*Pursuant to clause 2A(1) of Schedule 5)*

To: City of Adelaide

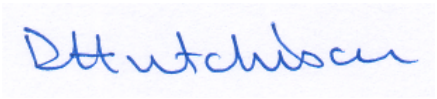
From: David Hutchison

Date of Application: 20/06/17

Location of Proposed Development: 72 Hill Street North Adelaide

Nature of Proposed Development:

I David Hutchison **on behalf of** St Dominics Priory College, **being the applicant for the development described above declare that the proposed development will involve the construction of buildings which would, if constructed in accordance with the plans submitted, not be contrary to the regulations prescribed for the purposes of section 86 of the *Electricity Act 1996*. I make this declaration under Clause 2A(1) of Schedule 5 of the *Development Regulations 2008.***

Signed:  **Date: 20/06/17**

Government of South Australia
Department of Planning, Transport and Infrastructure

Product	Register Search
Date/Time	19/05/2016 01:56PM
Customer Reference	st dominics
Order ID	20160519007334
Cost	$27.25

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

Registrar-General

Certificate of Title - Volume 5773 Folio 314

REAL PROPERTY ACT, 1886
South Australia

Parent Title(s)	CT 1277/175
Dealing(s) Creating Title	CONVERTED TITLE
Title Issued	11/05/2000
Edition	6
Edition Issued	01/03/2016

Estate Type

FEE SIMPLE

Registered Proprietor

ST DOMINIC'S PRIORY COLLEGE INC.
OF 139 MOLESWORTH STREET NORTH ADELAIDE SA 5006

Description of Land

ALLOTMENT 774 FILED PLAN 183236
IN THE AREA NAMED NORTH ADELAIDE
HUNDRED OF YATALA

Easements

NIL

Schedule of Dealings

NIL

Notations

Dealings Affecting Title

NIL

Priority Notices

NIL

Notations on Plan

Government of South Australia
Department of Planning, Transport and Infrastructure

Product	Register Search
Date/Time	19/05/2016 01:57PM
Customer Reference	st dominics
Order ID	20160519007348
Cost	$27.25

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

Registrar-General

Certificate of Title - Volume 5254 Folio 793

REAL PROPERTY ACT, 1886
South Australia

Parent Title(s)	CT 4213/948
Dealing(s) Creating Title	CONVERTED TITLE
Title Issued	15/03/1995
Edition	5
Edition Issued	21/09/2010

Estate Type

FEE SIMPLE

Registered Proprietor

ST.DOMINIC'S PRIORY COLLEGE INC.
OF 119 MOLESWORTH STREET NORTH ADELAIDE SA 5006

Description of Land

ALLOTMENT 5 FILED PLAN 138164
IN THE AREA NAMED NORTH ADELAIDE
HUNDRED OF YATALA

Easements

NIL

Schedule of Dealings

NIL

Notations

Dealings Affecting Title

NIL

Priority Notices

NIL

Notations on Plan

NIL

Registrar-General's Notes

NIL

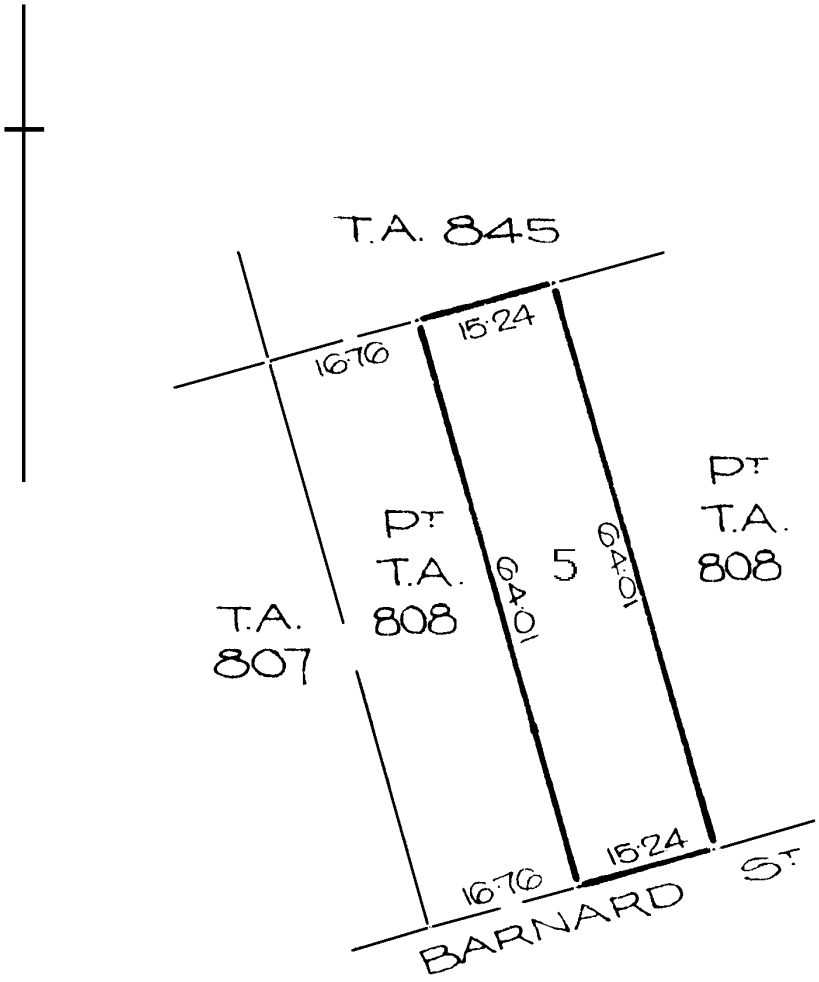
Administrative Interests

NIL

* Denotes the dealing has been re-lodged.

Product	Register Search
Date/Time	19/05/2016 01:57PM
Customer Reference	st dominics
Order ID	20160519007348
Cost	$27.25

This plan is scanned for Certificate of Title 4213/948



Note : Subject to all lawfully existing plans of division

NIL

Registrar-General's Notes

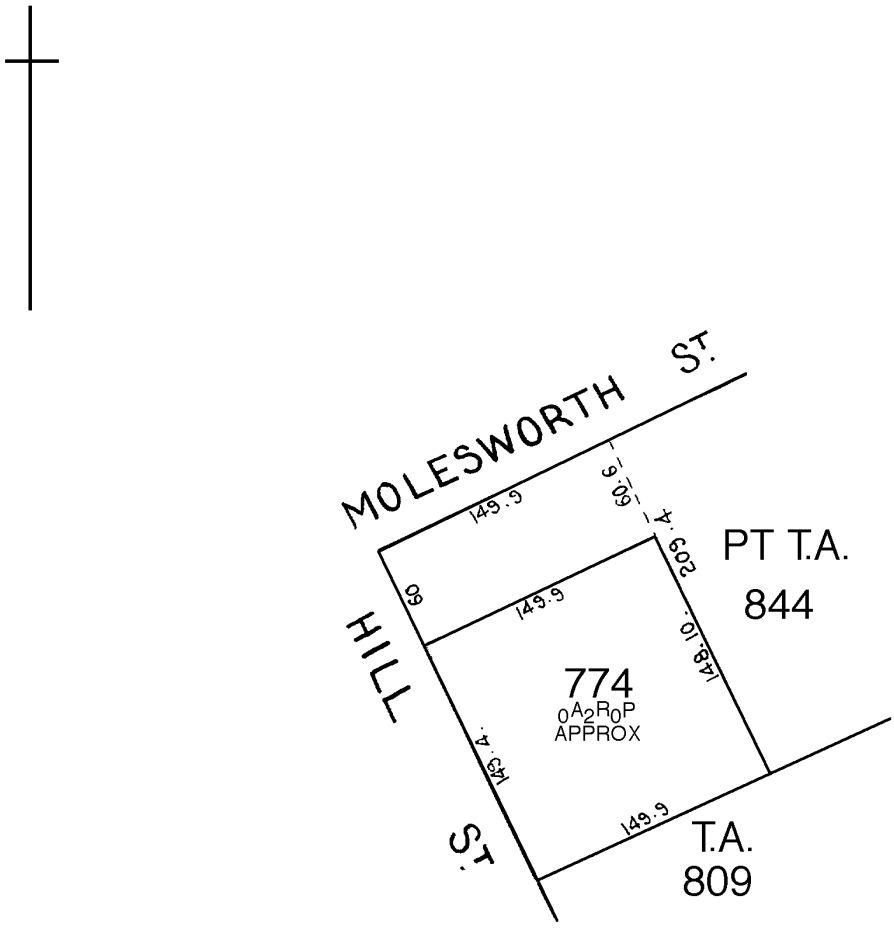
NIL

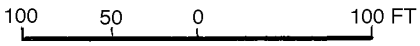
Administrative Interests

NIL

* Denotes the dealing has been re-lodged.

THIS PLAN IS SCANNED FOR CERTIFICATE OF TITLE 1277/175





FOR METRIC CONVERSION	
1 FOOT	= 0·3048 METRES
1 INCH	= 0·0254 METRES
1 ACRE	= 0·404686 HECTARES
1 ROOD	= 1011·7m²
1 PERCH	= 25·29 m²

NOTE: SUBJECT TO ALL LAWFULLY EXISTING PLANS OF DIVISION

ACCESS PLANNING

Access Planning (SA) Pty Ltd
ABN 57 089 702 241

235 Henley Beach Road
Torrensville SA 5031

Telephone 08 8130 7222
Facsimile 08 8130 7299
admin@accessplanning.com.au

www.accessplanning.com.au

9th September 2017

Ref: 6599 Section49submission

Mr. Ben Scholes
Project Officer
Strategic Development Assessment
Planning and Development
Department of Planning, Transport and Infrastructure
GPO Box 1815,
ADELAIDE SA 5000

Dear Ben

Re: **ST DOMINIC'S PRIORY COLLEGE, SECTION 49 APPLICATION**

Please find herewith a completed Section 49 Development Application form, proposal plans, relevant Certificates of Title and supporting documentation for extension to St Dominic's Priory College comprising a Year 12 Centre at 74 Hill Street, North Adelaide and an Early Learning centre at 112 Barnard Street, North Adelaide.

In addition to this submission, the supporting documents include;

- Proposal plans prepared by Swanbury Penglase Architects;
- Traffic and Parking Reports prepared by Phil Weaver and Associates;
- Heritage Assessment prepared by Andrew Stevens Heritage Architect;
- Stormwater Management Plan for 74 Hill Street by CPR Consulting Engineers;
- ESD Assessment prepared by BCA Engineers;
- Site History Reports prepared by FMG Engineering.

In summary, the project involves a change of use of the existing development at 74 Hill Street from consulting rooms to a Year 12 Centre, involving minor internal alterations to the existing building to adapt it for educational purposes; and single storey additions to the building to provide classrooms, breakout spaces & amenities together with staff carparking for 7 vehicles.

At 112 Barnard Street, the proposal is to convert the existing dwelling into an Early Learning Centre (pre-school) which will involve minor internal alterations to the existing Local Heritage listed building to adapt it for its intended purpose.

The proposed Early Learning Centre forms stage two of the development and it is not envisaged that this development will commence until late 2018 or early 2019. As a consequence, approval is sought for this development to have an extended start date of 2 years and an extended completion date of 5 years.

1.0 ST. DOMINIC'S PRIORY COLLEGE - BACKGROUND INFORMATION

St. Dominic's Priory College was established in North Adelaide 122 years ago in 1884. The College has been serving the City and the State continuously for this period.

The College has served country boarders, junior boys and girls reception to 12.

It has a very inclusive enrolment policy and its fee base enables it to serve a wide cross section of the population.

Today it is an all-girl's College of some 635 students. It is a high performing College on all criteria and has a very strong reputation within the community for the quality of its graduates.

The Dominican Religious Sisters who founded the College were well educated women who purchased property in Molesworth Street North Adelaide a few months after their arrival in the colony.

Property purchased in Molesworth Street became the site for the building of the State Heritage Chapel and class rooms which were originally housed in former residential dwellings.

St. Dominic's Priory College was a welcome addition to the services provided in the early days of the colony.

Around 1900 property was purchased in Barnard Street and a College for children whose parents could not afford fees was opened. By the early 1940s that had merged with St Dominic's Priory to become one College.

In the 1950s the Dominican Sisters purchased adjacent property in Barnard Street and the house purchased became a residence for Boarders. Today the site is one of the tennis court facilities.

In the early 1960s the Council gave permission for the building of new secondary classrooms in Barnard Street.

In the mid-1960s a vacant block in Hill Street, used by a neighbour to graze horses, was purchased and became the current Hill Street wing which is planned for future upgrading.

In the 1970s two significant developments took place in Molesworth Street. The first was the building of additional classrooms and staff offices in the place of what had been the boarding College. The second was the building of a library made possible by Government grants.

All developments to this point were necessary and ongoing improvement of property legitimately acquired and needed for educational purposes.

St. Dominic's has always been on a restricted site and the purchase of houses in the 1970s and 80s in the Hill Street precinct, most of them dilapidated, was intended to accommodate a multi arts centre.

An application to build a multi arts centre on the corner of Molesworth and Hill Street, while gaining initial support was ultimately rejected by Council.

The College has been in the fortunate position of being able to re-arrange some activities on site, most particularly the Dominican Sisters made the generous decision to leave their convent home and enable its spaces to be converted for Music, Drama Staff and Year 12.

These buildings are old and parts of them are in need of demolition and upgrading to meet contemporary standards.

Buildings otherwise on the existing campus vary in age from the significant, State Heritage listed Chapel (Church of the Perpetual Adoration and Chapter House), through to structures developed in the period 1920 through the 1960's, to some of the more recent buildings constructed in the 1970's. Many of these buildings have dilapidated building fabric that require replacement and/or significant refurbishment to meet College's future needs.

As part of a review of the College's infrastructure it engaged Swanbury Penglase Architects to assist in the preparation of a 5-10-year school masterplan.

That review identified that the limitations imposed on the existing campus severely constrained the ability of the College to effectively deliver the required 21st Century educational outcomes, and to ensure the College meets the current guidelines for the changing curriculum set by the Federal Government.

Expansion of the College beyond the current campus site was deemed a necessity to provide the required usable and effective educational spaces, including speciality support spaces, and enough quality green space for adequate external learning & play environments for its student's well-being.

The ability to develop the properties at 74 Hill Street and 112 Barnard Terrace will not only provide the opportunity for the College to meet its goals in providing the required educational outcomes for its students, but are a vital precursor to enable the College to progressively redevelop and upgrade buildings in the existing campus.

3.0 THE PROPOSED DEVELOPMENT

3.1 74 Hill Street (Proposed Year 12 Centre)

The property at 74 Hill Street is a regularly shaped land parcel with a 45.36 metre frontage to Hill Street and a depth of 45.64 metres and an area of 2,077m^2. The land is unencumbered by easements or other constraints.

The land is more particularly identified as allotment 774 in FP 183236, as detailed in Certificate of Title Volume 5773 Folio 314; a copy of which is attached to this submission.

It is located directly to the east of the present College campus from which it is separated by the alignment of Hill Street. The land is accessed from the College grounds by a pedestrian crossing with pedestrian activated lights.

Current improvements on the land include a single-storey detached dwelling circa 1920, adapted to and previously used as consulting rooms and still retaining existing land use rights for this purpose.

Until 2012 the property was leased by the Drug and Alcohol Services SA for drug and alcohol counselling under the name of the Elura Clinic.

Services provided at the Clinic included:

- Counselling, assessment and referral for people from any age group with alcohol and other drug related problems
- Counselling and support for family members and friends
- Specific services for Aboriginal and young people
- Consultation, education and training for other professionals on alcohol and other drug issues

The Clinic's operating hours extended into the evenings on a number of days during the week with training sessions (for example, Responsible Service of Alcohol and Liquor Licensing Laws Training) also scheduled over Saturdays and Sundays.

The land was sold to a private buyer and was substantially renovated for ongoing use as consulting rooms prior to the sale of the land to St Dominic's Priory College.

The intention is to undertake minor internal alterations to the existing building to create a student lounge, meeting rooms, a tutorial room, office and staff rooms, first aid room and ablutions. Single storey additions to the southern side of the existing building will accommodate a glazed link, 3 classrooms, a study lounge and student amenities. An additional 2 car parking spaces will be created as an extension to the existing 5 car parks, one of which is a disabled space and all of which will be used for staff parking.

The location of this new facility makes use of an existing and long standing non-residential site with ease of access back to the College grounds via the existing road crossing.

The site will enable the College to create a Senior School precinct to meet the education needs some 80 year 12 students.

Currently the Year 12's are located separately on level 1 on the western side of the College campus with limited support facilities. Restricted connectivity & egress concerns together with limited, modern educational spaces make the need for a contemporary educational space an essential outcome of this development.

There are no predicted increases to student numbers as a consequence of this development, rather it will involve a shift of this senior cohort to the proposed site to assist in the required upgrades of the existing school campus.

The subject land is shown in more detail in the aerial image and photo in Figures 1 and 2 below.

Figure 1: Aerial View of 74 Hill Street (shown as recently upgraded) Source: Location SA Viewer

Figure 2: The subject land viewed from Hill Street looking south and showing the pedestrian crossing linking the land to the College. Source: Google Streetview

3.2 112 Barnard Street, North Adelaide. (Proposed Early Learning Centre)

112 Barnard Street is a rectangular shaped property with a frontage to Barnard Street of 15.24 metres and a depth of 64.01 metres, all enclosing an area of 973m^2.

The land contains a Local Heritage listed bluestone bungalow. The Heritage listing includes the house frontage and side wall returns visible from the street.

There is a swimming pool and a significant tree (Jacaranda) in the rear yard.

The rear boundary of the land directly abuts the College property.

The College proposes to use the building as an early learning centre. Such a use would preserve the front of the building with minor alterations (including the removal of the pool) at the rear of the property to accommodate 35 students of pre-school age and up to 4 staff. It is expected that the majority of students using this facility would be siblings of students already at the school.

The site adjoins a consulting room facility (Local Heritage listed) on its western boundary and a State Heritage listed dwelling at its eastern boundary. Noting that the outdoor play space adjoins an elevated tennis Court to its eastern boundary resulting in a 2-3metre high retaining wall on the boundary.

The inclusion of an Early Learning Centre will help achieve a long-time goal for the College to ensure they can deliver the required early child development established through respected educational programs (i.e. Reggio Emilia) to ensure the College's overarching educational model can be delivered.

Early Learning Centres are well established in many Colleges and Schools throughout the State and Australia.

An Early Learning Centre cannot be located within the confines of the existing campus given the specific requirements for indoor and outdoor play spaces and the need for play spaces to be secure and separate from other school facilities, but sufficiently connected to the school campus to meet staff and parent needs.

Rear landscape upgrades of the new ELC site will include infilling of an existing swimming pool to help create a new secure nature play environment, with a connecting ground floor link through the existing adjacent Classroom / Science Block (i.e. existing Hill St. Building) for added connectivity for all staff and families.

The property and its relationship to adjoining development is shown more particularly in Figure 3.

Figure 3: Aerial image of 112 Barnard Street, North Adelaide. Existing College campus to the immediate north of the rear boundary. Source: Location SA Viewer

Figure 4: 112 Barnard Street Source: Google Streetview

The centre will be open from Monday to Friday (excluding public holidays) from 6.30 am to 6.30 pm.

Garbage collection will be accommodated via the Colleges current contractual arrangements as will gardening and site maintenance.

Child pick-up and set down are normally short-term stops of less than 5 minutes duration and invariably by parents/caregivers on their journey to and from work. Some parents will drop off more than one child as it is expected that the vast majority of children attending at the ELC will be siblings of children already enrolled at the College.

Many of the children will be dropped off between 7.00 am and 9.00 am, but with a spread of arrivals that extend from 6.30 am to as late as 2.00 pm. Children are picked up as early as midday, but primarily from 3.30 pm to 6 pm.

After school hours children will generally arrive at 3.30 pm with pick up times to 6.30 pm.

Peak periods generally coincide with school drop off and pick up times.

The use of the outdoor play areas is strictly supervised and not all of the children are in the outdoor play space at any one time.

Play times are spread out over the day and include both indoor and outdoor activities.

Activity associated with the proposed child care facility is limited to normal waking hours, with no weekend or late-night activity other than that associated with administration.

For the safety and welfare of its children both the building and adjacent play areas are secure once children are inside. Existing boundary fencing will be retained with new access gates where the ELC adjoins the school grounds. A passage will be created through the adjoining classroom to provide a link between the ELC and school grounds proper.

Children are always escorted into the centre by their parents or care givers who are required to sign their child in to the care of centre staff before they leave the facility. A similar procedure is adopted when children are collected.

It is envisaged that most parents will drop their children off at the Barnard Street frontage of the property.

4.0 THE CURRENT PLANNING ENVIRONMENT

The Adelaide (City) Development Plan consolidated 30 May 2017 locates the subject properties in the North Adelaide Historic Conservation Zone, Policy Area 1 – Hill Street Policy Area.

Figure 5: Zoning and Policy area plans (subject land shown red, existing College campus shown yellow)

An Educational establishment is a consent use in the zone where it is directly associated with the St Dominic's Priory College site on Fig HS/2.

An Educational establishment is defined in the Development Regulations 2008 as;

Educational establishment means a secondary school, college, university or technical institute, and includes an associated pre-school, primary school or institution for the care and maintenance of children;

A child care centre is defined in the Development Regulations 2008 as a "pre-school" as follows;

"pre-school - a place primarily for the care and instruction of children of less than primary school age not resident on the site, and includes a nursery, kindergarten or child care centre".

As the development of both the year 12 centre and early learning centre are directly associated with the St Dominic's Priory College, they are, consequently, consent land uses.

5.0 DEVELOPMENT PLAN ASSESSMENT

I have assessed the application against the relevant provisions of the Development Plan and have identified those listed below as being most relevant to the application.

I have not reproduced or addressed each individual provision as there is significant repetition in the intent of many of the policies.

Rather, I have addressed in detail the relevant zone and policy area provisions and noted where these relate to Council wide (General Section) Development Plan policies.

North Adelaide Historic (Conservation) Zone
Statement of Heritage Value
Objectives 1, 2, 3 and 4.
Principles 1, 2, 3, 4, 5, 6, 7, 9, 11, 14, 16, 20 and 27

Hill Street Policy Area 1
Desired Character
Objectives 1, 2, 3,
Principles 1, 3, 4(a), 8, 9 and 11

Council Wide

Living Culture
Objective 3

Community Facilities
Objectives 4 and 5
Principles 2, 4

Environmental
Crime Prevention Through Urban Design
Objective 24
Principles 82, 84,100

Noise emissions
Objectives 26
Principles 89, 93, 94

Waste Management
Objective 28
Principles 101, 102

Energy Efficiency
Objective 30
Principles 106, 107, 108, 109, 112

Micro-climate and Sunlight
Objectives 33 and 34
Principles 119, 120, 121, 122, 124

Stormwater Management
Objectives 35, 36,
Principles 128, 129, 131

Infrastructure
Objectives 40
Principles 132, 133,

Heritage Conservation
Objectives 43 and 44
Principles 136, 137, 138, 142, 145, 149, 151, 153, 158, 162,

Built form and Townscape
Objectives 47, 48, 49, 50, 51
Principles 169, 176, 179, 181, 186, 187, 188, 189, 191, 192, 193, 194, 195, 203, 206, 208, 209

Transport and Access
Objectives 60, 63, 64, 65, 70, 71,
Principles 223, 224, 231, 232, 233, 234, 236, 240, 250, 251, 252, 253, 262, 263,

Economic Growth and Land Use
Objectives 73, 75, 76
Principles 265, 270

Significant Trees
Objective 108
Principles 298, 300, 303, 304

The planning assessment below is to be read in conjunction with the more detailed reports submitted with and forming part of the application.

North Adelaide Historic (Conservation) Zone	
Development Plan provisions	**Comment**
Objectives 1 to 4 Principles 1 - 9, 11, 14 and 16 Hill Street Policy Area Desired Character Objectives 1 to 3 Principles 1, 3, 7 and 8 See also Built Form and Townscape Objectives 47, 48, 50, 55	The intent of the Objectives for the zone and Policy Area are met by the retention of the streetscape appearance of both buildings, and in particular the local heritage listed building at 112 Barnard Street, which will remain largely unaltered by the proposed change of use to an Early Learning Centre. In respect to the land 74 Hill Street, an existing character building, with a long history on non-residential use will be retained and upgraded. Additions to the rear and side of the building are modest, single storey and well setback from the road and behind the main building line of the existing building. A lightweight, transparent glazed link connects the

Principles 169, 170, 177, 178, 180, 182, 187, 188, 189, 190, 191, 195, 196, 207, 208	existing building to the new addition, which together with verandahs and site landscaping successfully combine the two buildings. The additional building form at 74 Hill Street is contemporary, but has been designed to complement the character of the existing building and adopts design and building material elements from development more generally in locality; as depicted on plans SK10 & SK20. The combination of complimentary building form and scale, articulated in both a horizontal and vertical plane, together with the development setback, retention of fencing and site landscaping maintains the continuity of the streetscape of this section of Hill Street. The activities to be undertaken on each of the sites will not compromise the existing level of residential amenity in the locality. Firstly, the present activities of St Dominic's Priory College are a significant feature of the locality, but moreover the development does not seek to increase student numbers (other than via additional enrolments at the ELC), but merely seeks to rehouse year 12 students to the new facility. The activities undertaken in each of the developments involve quiet, supervised activity, with limited out of hours use associated with either site. Notably, schools and child care facilities are common features of residential areas and are, for the most part, envisaged land uses in Residential zones. Whilst the Development Plan encourages residential development over other land use (zone principle 2, Policy Area Objective 2; and still seeks to confine non-residential development to institutional uses within existing sites), it does not do so to the exclusion of complimentary development or in fact the expansion of St Domenic's outside of the present campus. As sought by Objective 4; the proposed developments are an integral part of and support the long established educational role of St Dominic's. In this regard, the development uses land at 74 Hill Street that has a long history of non-residential use, and adapts a heritage building at 112 Barnard Street for a small scale early learning centre in such a way that neither development will have an adverse impact on the character or amenity of the locality. Landscaping is an integral part of each development but more so in respect to the public realm of Hill Street, where significant site landscaping is proposed to the street frontage, but also to the common boundaries to the south and east where landscaping includes plantings intended to break up the mass of buildings located adjacent to these property boundaries. Landscaping will be maintained by the College in line with other landscaped spaces on the College grounds. Articulation to the rear (eastern) elevation of the building includes a tapered roof form that assists in managing the visual impact of the proposed development from the adjoining tennis court, together with recessed zinc panels that divide the building horizontally to provide a building form reminiscent in scale and articulation of a residential development comprising 3 single storey row dwellings.
Fencing Principles 14, 16	Boundary fencing will be largely unchanged with existing colorbond fencing to the southern and eastern boundaries being retained. Similarly, the existing rendered and picket fence to Hill Street is to be retained with the addition of a new pedestrian entry located adjacent to the main entry to the building. On Barnard Street, the existing fence and front landscaping will be preserved as is. Fencing as a means of managing noise from the development is not required. As identified above both land uses involve quiet, supervised,

	educational pursuits with limited outdoor activity other then in regard to the Early Learning Centre, where outdoor activity is limited to small groups of children in a highly supervised environment. The high walls on the boundary to the eastern side of this site and location of a commercial land use to the west further limit the impacts of any noise arising from this land use.
Access and Car Parking Principle 17,	No alterations are proposed to the existing vehicular access points at either site. Two additional car parks are proposed at the Hill Street site and limited staff parking, in stacked format is proposed in the existing driveway if the Barnard Street property. Both sites have been assessed by a traffic engineer and found to have limited impacts in terms of parking and additional traffic generation within the locality, noting that the Early Learning Centre may give rise to some additional short term on street parking in Barnard Street during the AM and PM (drop off and pick up periods). Parking surveys show that adequate space is available on street in the locality to accommodate short term parking suitable for parents / carers dropping off and collecting children from the child care centre. Staff parking for up to 3 vehicles will be available in sacked format in the driveway of the Early Learning Centre whilst the development at 74 Hill Street will provide an additional 7 car parks for staff parking.
Council Wide	
Community Facilities Objectives 4 & 5 Principles 2 and 4	These provisions recognise the importance of Community facilities and seeks that they be located for convenient access by residents, workers and visitors. In this regard, the College has contributed to the fabric and community of North Adelaide for over 100 years and predates the vast majority of residential development that has occurred since the inception of the College. Expansion of the College is necessary to meet modern educational standards and needs, and the College is planning for its future by implementing a masterplan, part of which necessitates expansion beyond its present campus. Expansion of the College is significantly constrained by the pattern of development in the locality and the extensive number of heritage listed building on sites adjoining the current school grounds. Development of sites in close proximity to the existing facilities available within the present campus is the only sensible solution, and the two sites proposed for development are admirably suited to the uses proposed. I have already addressed the manner in which the development of the sites accords with those provisions relating to the heritage character of the locality. The land in addition either adjoins the College campus or is adjacent to it and connected by a pedestrian activated crossing which allows safe communication between the Year 12 Centre and the College proper. As sought by principle 2, the proposed land uses are conveniently located for use by the existing school population, meet the needs of the school in providing an opportunity for future planning for the redevelopment of the present College campus to meet current and emerging educational outcomes, and student and staff welfare. The provision of the Early Learning Centre in association with College is consistent with the outcomes sought in principle 4, that seeks to incorporate child care services with higher education facilities.
Environmental	Security and protection of both sites and the students using both facilities is a particular priority of the College. The Year 12 Centre has

Crime Prevention Through Urban Design Objective 24 Principles 82, 84,100	been designed with views across the publicly accessible spaces at the front of the site, with security gates limiting access to the sides and rear of the building. Limited openings in areas not under casual observation assist in managing anti-social behaviour and general school security measures including regular patrols by security guards further assist in this regard. The College is fortunate in that has not had any significant issues with vandalism in the past, and even though the building at 74 Hill Street has now been vacant for some time, it has not been the target for anti-social activities. The site at 112 Barnard Street similarly has limited access from the road and benefits for the wider school security measures. Building alarms will be a feature of both developments.
Noise Emissions Objectives 26 Principles 93	Activities on both sites will have little impact beyond the boundaries of the respective properties. Both land uses are highly supervised by teachers/ care givers, and the older students who will occupy the Year 12 Centre are responsible young adults who respect the school and are conscious of its standing in the community. Activity in around the Year 12 Centre is largely confined to the street frontage of the site and involves mainly students socialising or arriving at and leaving the site. More active activities are undertaken on main College Campus. Plant associated with both developments will be acoustically screened. The Early Learning Centre involves a combination of indoor and outdoor play and learning areas. The centre is small in scale in terms of student numbers. Play and learning activities outdoors are supervised for the most part not all students are in any once space at any one time. The play areas are adjoined by a high retaining wall and fencing to the eastern boundary and commercial development to the west, and as such noise from any activity in the rear yard of the ELC will be limited in its impact. More particularly, both facilities will be largely vacant outside of school hours when it is expected that most neighbours will be at home.
Waste Management Objective 28 Principle 101	Waste storage facilities are provided on site as is a service yard for the various activities associated with maintaining the property. The College actively encourages recycling and as such there will be the usual range of rubbish and recycling bins which will be picked up by as part of the usual Council service. Grounds will be maintained by College maintenance contractors, with green waste to be taken off site by them. Waste from the ELC will be similarly managed.
Contaminated Sites Objective 29 Principle 105	Site history reports have been prepared by FMG Engineering to determine if site contamination is an issue. In relation to the site at 112 Barnard Street the site history report did not identify a concern with site contamination impacting on the proposed land use. The site history report for the land at 74 Hill Street identified some matter that they considered require further investigation, these included; • Unknown activities associated with the structure historically located in the north-eastern portion of the site;

	• Potential importation of fill material visible at the surface of the site; • Maintenance of grassed/unsealed areas, including the use of herbicides; • Potential importation of contaminated fill material for use as sub base of bitumen and as footings of building; and • Sealing of the asphalt with bitumen. Preliminary soil investigation has been recommended and is being undertaken but the author of the report considers the risk of soil contamination on human health to low.
Energy Efficiency Objective 30 Principle 106, 107, 108, 109, 112 Renewable Energy Objective 31 Principles 116 Micro-climate and Sunlight Objectives 33, 34 Principles 119, 120, 121 Stormwater Management Objective 35 Principles 126, 128	Year 12 Centre Energy efficiency is a particular feature of the development, and in this regard the building is designed with minimal openings in its east facing elevation, shade to openings and glazing in the west facing elevation, south facing clerestory windows to allow light penetration into the study, lounge and studio areas. Cross ventilation is provided via the clerestory windows which will allow heat to dissipate in summer time. Roof water will be collected in a large underground tank for use in flushing toilets and for landscaping irrigation. Shade trees will be provided to the development with deciduous species used to allow light penetration in winter and shade in summer. The building otherwise will meet 5-star energy ratings/design. The proposed roof design provided for the inclusion of solar panels oriented to achieve maximum benefit year-round. The panels will be flush mounted to the roof to avoid visual impact. The design, scale and siting of the building seeks to minimise overshadowing impacts over development to the east and south, with the worst impacts from overshadowing occurring at the winter solstice when cloudy conditions prevail and discernible shadow is rare. Even then the extent of overshadowing is minimal and affects mainly the driveway of the adjoining development to the south, extending to impact the rear yard and wall of the dwelling to the south east only around 3pm and thereafter in the afternoon. Early Learning Centre The Early Learning Centre makes use of an existing Local Heritage Building and as such opportunities to maximise energy efficiency are limited. Nonetheless the development includes large opening windows/doors in the rear elevation, use of deciduous trees for shade in the play areas, shade structures and retention of a large Jacaranda Tree at the rear of the site. In addition to the above, both sites will be provided with; • Auto off air conditioning controls; • Energy recovery ventilation; • Use of zero ozone depleting refrigerants; • CO^2 monitoring of large spaces to minimise fresh air intake; • Use of LED lighting throughout; • Smart control of lighting; • Solar panels and solar water heating; • 4 star tapware to minimise water consumption. These initiatives are dealt with in more detail in the Ecologically Sustainable Design Initiatives report prepared by BCA Engineers.

Heritage and Conservation Objectives 43, 44 Principles 136, 137,	The building at 112 Barnard Street is listed as a local heritage item. Both sites are within a Historic (Conservation) zone. A Heritage assessment of both development has been undertaken by Andrew Stevens of Stevens Architects. In summary, the assessment finds as follows: 74 Hill Street • the impact of the proposed development on the streetscape character of the locality is acceptable because: • the existing circa 1920s building on the site is retained. • the proposed new building is well setback from the front of the site and behind reasonably substantial landscaping, maintaining the prominence of historic buildings adjacent and nearby. • the proposed new building is modest in scale and is not bulky, with its massing broken down into three principal elements. • the façade of the proposed new building is well-modulated and includes canopies that are compatible with verandahs on historic buildings nearby. • proposed material suitably reference the materials used in historic buildings nearby without imitating historic detail. • the roof form of the proposed building, although different to the roof forms of historic buildings nearby, is low in scale and refined in detail with large overhangs providing shadow. It is discreetly sited and not prominent in the streetscape. • the proposed new building is well setback from the front boundary and, with a darker palette of colours, will maintain the prominence of historic buildings adjacent and nearby. 112 Barnard Street • none of the proposed works will impact on significant historic fabric nor the parts of the building mentioned in the extent of listing. • adaptation of the building provides an on-going use and helps to ensure its care and maintenance into the future. • the proposed development is compatible with the heritage value of the place, consistent with relevant development plan provisions relating to impact on heritage value and will not adversely impact on the prevailing historic character of the streetscape.
Transport and Access Objectives 60, 61, 63, 64, 70, 71, Principles 224, 225, 232, 234, 241, 248, 252, 253	The present College campus is well placed in respect to access by road and public transport. Other than the additional 35 students to be enrolled in the ELC, the development will not increase student numbers and as such should not contribute to additional long term parking demand. The development at Hill Street will provide an additional 7 car parking spaces for long term staff use and the development at Barnard Street will provide up to 3 on site carparks in stacked format in the driveway. (The traffic report prepared by Phil Weaver and Assoc. notes that up to 4 spaces can be accommodated in the driveway but it would most likely be used for not more than 2 car parks). The ELC will have up to 35 students and 4 staff. The ELC differs from other educational institutions in that it operates over longer hours, with operating hours extending from 6.30am to 6.30pm. It is expected that most of the children enrolled at the ELC will be siblings of students already attending the College. Entry to the ELC will mainly be from Barnard Street, but access is also available from the

	College campus, with pedestrian access from Hill Street and, less likely, from Molesworth Street. As such, short term parking associated with the ELC can be expected to be spread over all three of the roads adjoining the College campus. The traffic and parking report for the ELC notes a potential peak parking demand of up to 9 spaces, noting that long term parking requirements will be limited to staff parking, with drop off parking limited to short term stays not exceeding a few minutes. The report concludes that there is sufficient on street parking in the locality of the development to accommodate the short-term parking needs of parents/care givers. Longer terms staff parking, if required can be accommodated in the additional 7 staff car parks provided on the site at 74 Hill Street. Pedestrian linkages between the College campus and the Year 12 Centre is safely accommodated by the pedestrian activated crossing on Hill Street.
Economic Growth and Land Use Objectives 73, 74, 75, 76 Principle 271	The proposed development builds on the contribution to the community by the existing school campus. It represents a substantial investment in site and building works leading to a development that will have minimal impacts on the locality, but which will contribute further to the successful educational outcomes achieved by the College. As such, the development enhances the role of the City as a centre for Education.
Regulated Trees Objectives 106 Principles 296	There are no Regulated Trees on the land at 74 Hill Street. There is a large Washington Date Palm at the front of the land that has been considered worthy of retention because of its height and contribution to the streetscape. This tree will be retained and measures put in place to ensure it protection during construction works. There is a Jacaranda Tree at the rear of 112 Barnard Street. Its legal status as a regulated tree is in question as although Policy Area Map Adel/38 identifies a regulated tree on the land, it is no so listed in Table Adel/5. Nonetheless, the tree is to be retained. Works on the site include the infilling of a swimming pool that is located some 5.0m from the tree. The arborists report on the tree provides recommendations to be adopted when works around the tree are to be carried out. These will be adhered to. some pruning of the tree is required. This will be carried out in accordance with the recommendations of the arborist.

6.0 CONCLUSION

The proposed development is for the development of a Year 12 Centre and Early Learning Centre both associated with St Dominic's Priory College. It involves the adaptive re-use of buildings at 74 Hill Street and 112 Barnard Street, North Adelaide.

At 74 Hill Street, the development makes use of land with a long history of non-residential use.

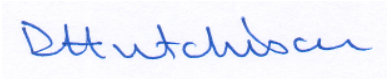
The activities on both of the sites are confined largely to normal working hours and involve activities that are not intrusive on the amenity of the locality. The development in respect to 74 Hill Street is modest, set in landscaped grounds and well back from the road. New building works adopt elements of development in the locality but do not seek to replicate the heritage architecture which forms only a small element of the locality in any event. Its form and scale is similar to that of a residential development that might otherwise occur on the land. As such, the development is not expected to have an adverse impact on the character of the locality, rather it will be a quality, responsive development that will assist in achieving the design goals set out in the Development Plan.

The development provides up to 10 additional car parking spaces to accommodate staff needs, with minor, short term peaks in parking associated with the Early Learning Centre readily able to be accommodated by kerbside parking.

Building works and design are based on sustainable development initiatives and by any measure, the proposed development shows a high degree of compliance with the Development Plan.

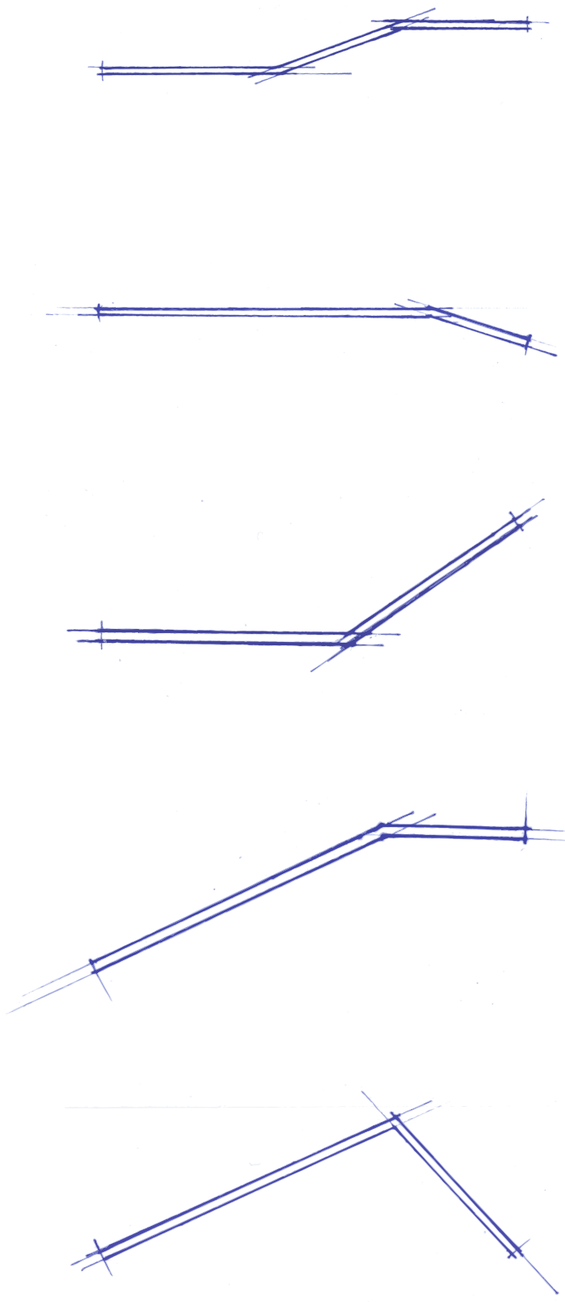
Finally, the development forms a logical and sustainable extension of the Colleges activities, and allows it to meet its educational, health, safety and welfare goals for next generation of students.

Yours sincerely



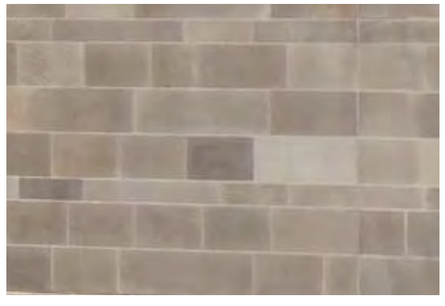
David Hutchison BA CPP PIA
ACCESS PLANNING (SA) PTY LTD

Concept forms



Context

Materiality



St Dominics Priory College - Yr 12 Centre
Preliminary Concepts and Materiality

22 Nov 2016
16038 SK10

Winter - 9am

Winter - 12pm

Winter - 3pm

Summer - 9am

Summer - 12pm

Summer - 3pm

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St Dominics Priory College - Yr 12 Centre
Shadow Study

23 Nov 2016
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ST DOMINICS PRIORY COLLEGE REDEVELOPMENT - CONTEXT ANALYSIS

PROPOSED YEAR 12 CENTRE

04th Apr. 2017

16038 SK20

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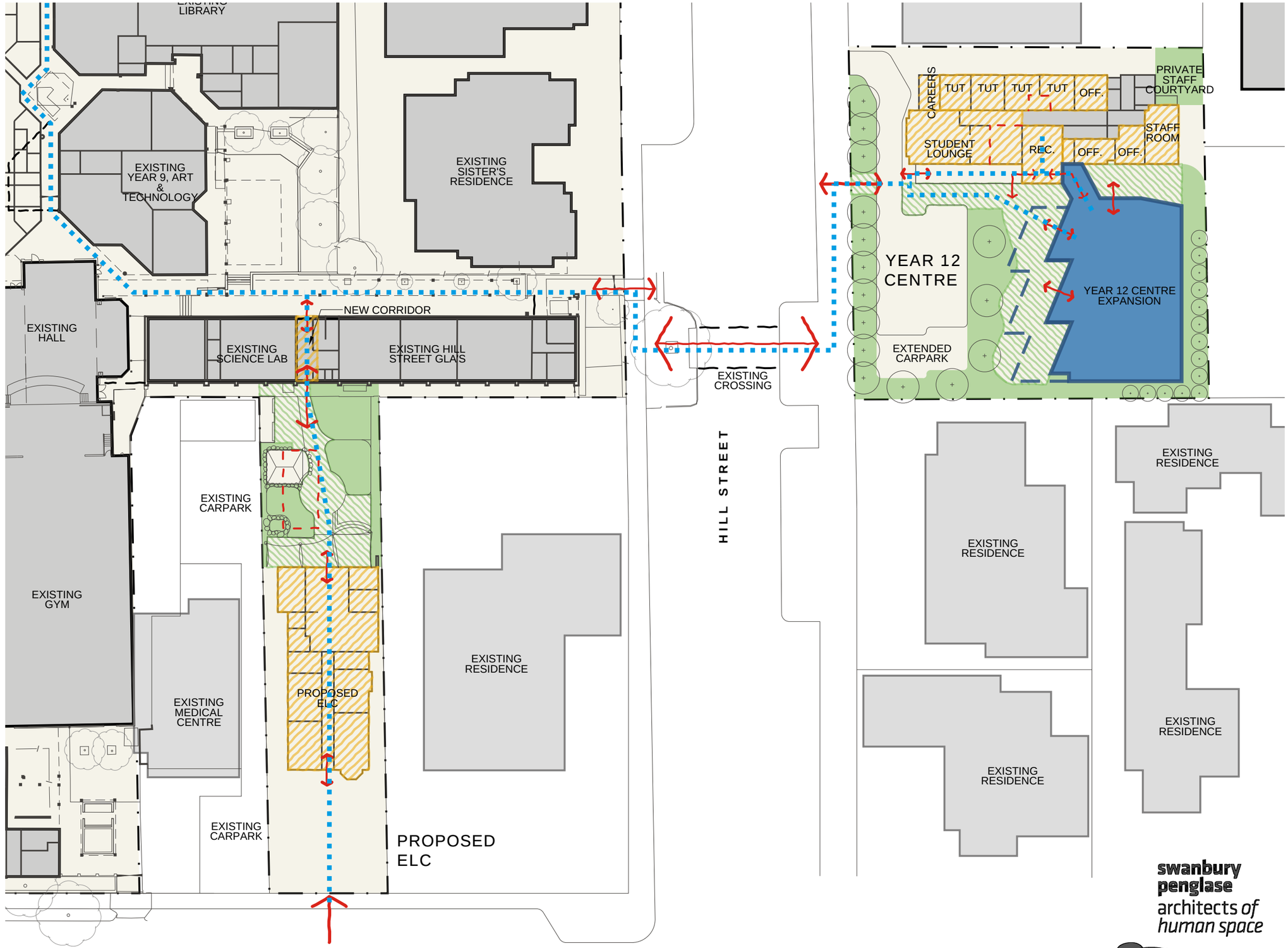

LEGEND

- EXISTING INTERNAL SPACE
- NEW BUILDINGS
- CHANGE OF INTERNAL PROGRAM
- EXTERNAL GREEN SPACE UPGRADES
- EXTERNAL HARD SPACE UPGRADES
- NEW CANOPY
- ACCESS POINT
- PEDESTRIAN LINK

SITE PLAN - PEDESTRIAN LINKWAYS
SCALE 1:500 @ A3

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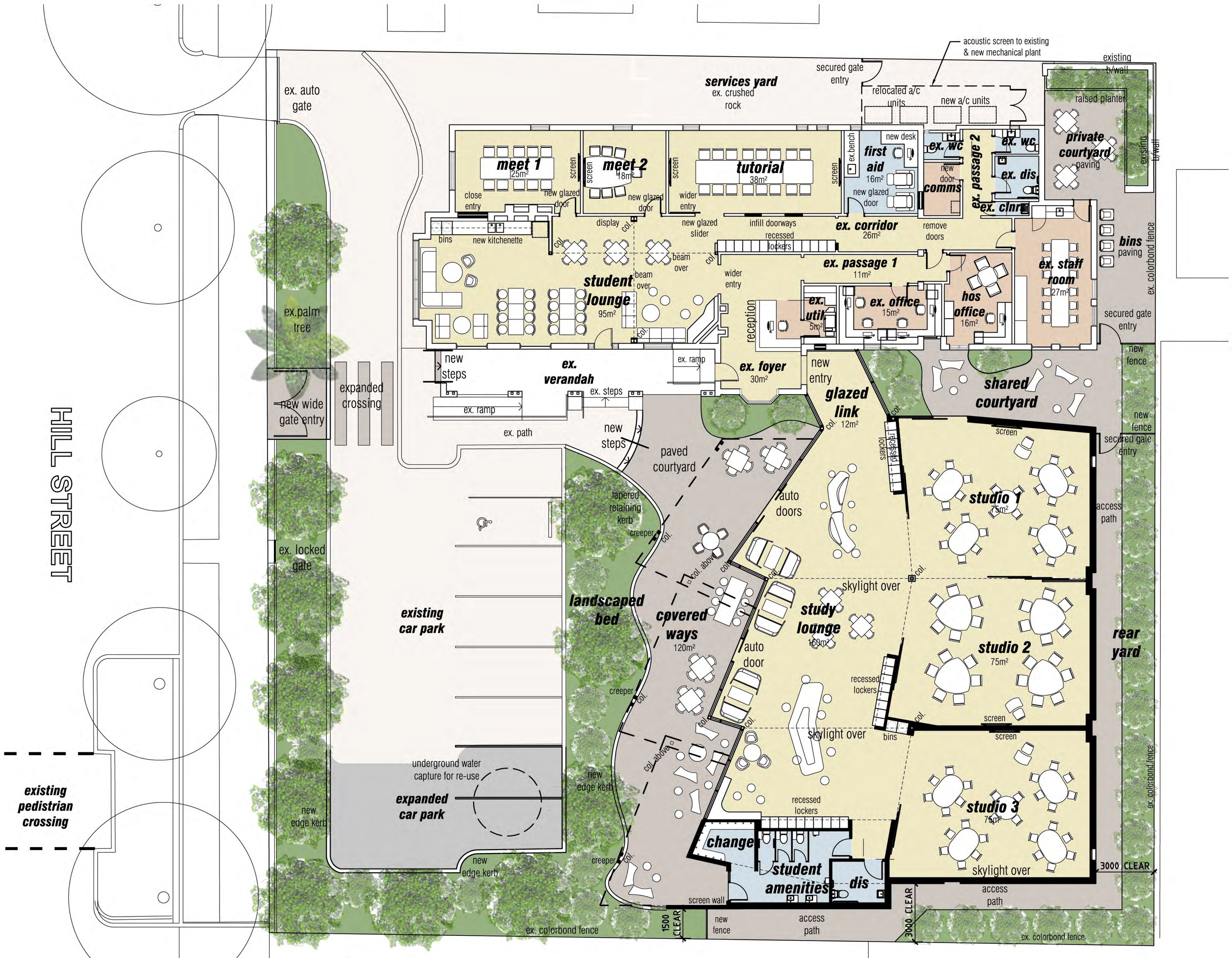
ST DOMINICS PRIORY COLLEGE REDEVELOPMENT
PROPOSED YEAR 12 CENTRE

0 5 10 20 50 M

21st Mar. 2017

16038 SK26


services yard
ex. crushed rock
secured gate entry
acoustic screen to existing & new mechanical plant
relocated a/c units
new a/c units
existing b/wall
raised planter
private courtyard
paving
existing b/wall
ex. auto gate
meet 1
25m²
meet 2
18m²
tutorial
38m²
first aid
16m²
ex. wc
ex. passage 2
ex. wc
ex. dis
comms
ex. clnr
new desk
ex.bench
close entry
new glazed door
new glazed door
wider entry
new glazed door
screen
display
new glazed slider
infill doorways
recessed lockers
ex. corridor
26m²
remove doors
bins
bins
paving
new kitchenette
beam over
student lounge
95m²
wider entry
ex. passage 1
11m²
ex. staff room
27m²
hos office
16m²
ex. office
15m²
ex. util
5m²
reception
ex. colorbond fence
secured gate entry
ex.palm tree
new steps
ex. verandah
ex. ramp
ex. foyer
30m²
ex. steps
ex. ramp
new entry
glazed link
12m²
shared courtyard
new fence
new fence
secured gate entry
expanded crossing
new wide gate entry
ex. path
new steps
paved courtyard
lockers
screen
studio 1
75m²
access path
HILL STREET
tapered retaining kerb
creeper
auto doors
col.
ex. locked gate
landscaped bed
covered ways
120m²
skylight over
study lounge
150m²
studio 2
75m²
rear yard
existing car park
auto door
recessed lockers
screen
screen
bins
skylight over
underground water capture for re-use
expanded car park
new edge kerb
new edge kerb
new edge kerb
existing pedestrian crossing
recessed lockers
studio 3
75m²
change
student amenities
dis
skylight over
3000 CLEAR
access path
screen wall
1500 CLEAR
new fence
access path
3000 CLEAR
ex. colorbond fence
ex. colorbond fence
ex. colorbond fence

FLOOR PLAN
SCALE 1:200 @ A3

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0 5 10 20 M

ST DOMINICS PRIORY COLLEGE REDEVELOPMENT
PROPOSED YEAR 12 CENTRE

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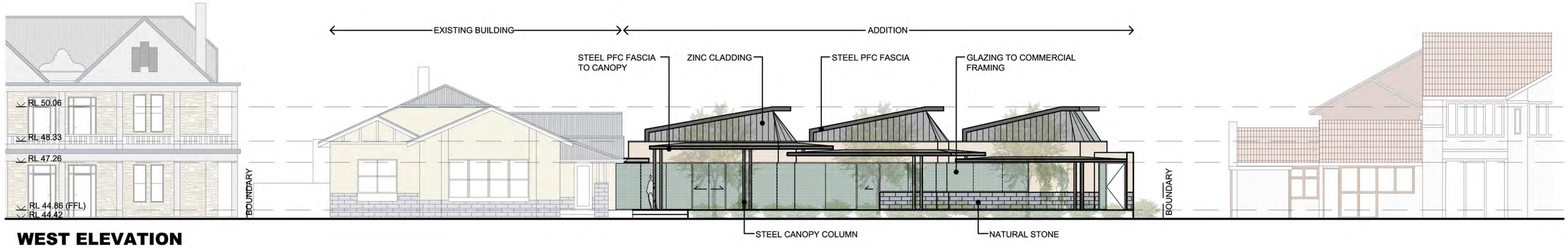
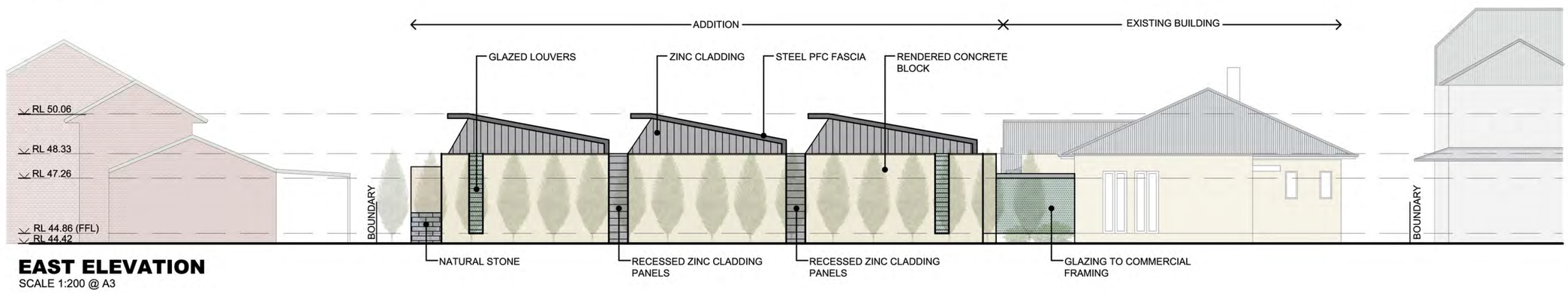
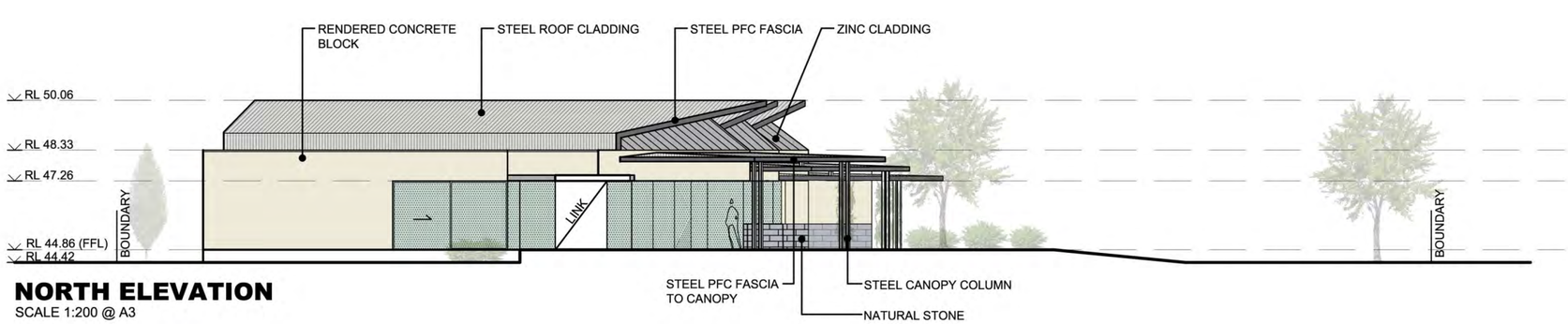


WEST ELEVATION
SCALE 1:200 @ A3



EAST ELEVATION
SCALE 1:200 @ A3



NORTH ELEVATION
SCALE 1:200 @ A3

SOUTH ELEVATION
SCALE 1:200 @ A3

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ST DOMINICS PRIORY COLLEGE REDEVELOPMENT
PROPOSED YEAR 12 CENTRE

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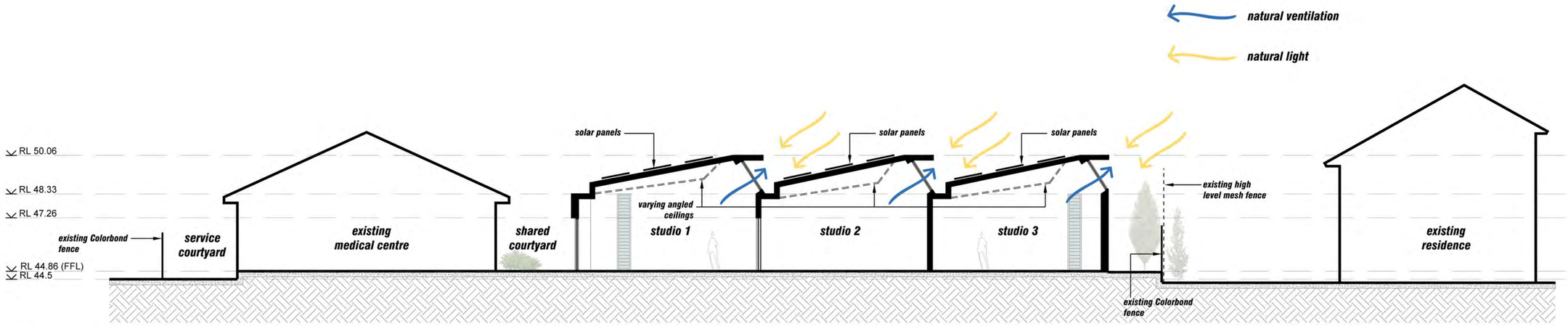
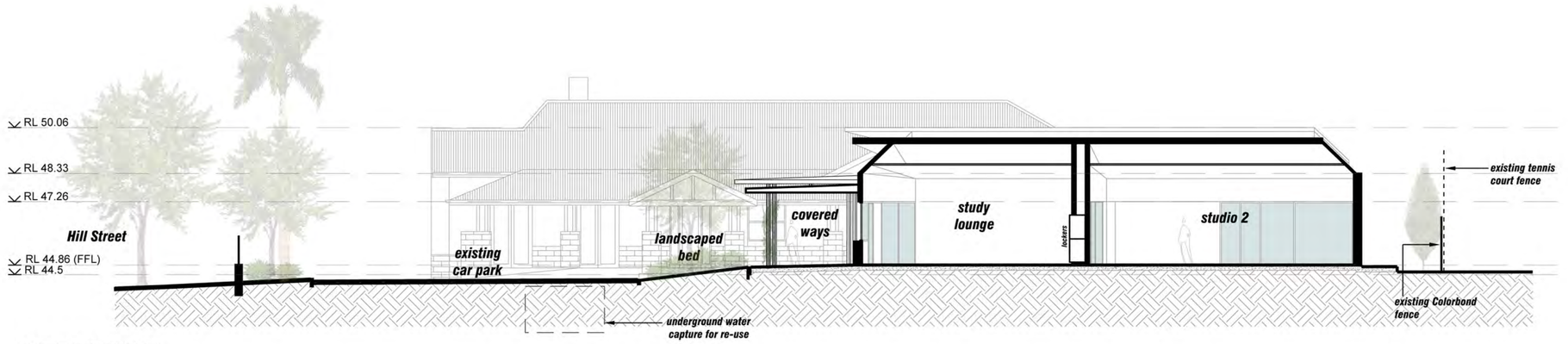


SECTION A
SCALE 1:200 @ A3



SECTION B
SCALE 1:200 @ A3

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ST DOMINICS PRIORY COLLEGE REDEVELOPMENT
PROPOSED YEAR 12 CENTRE

0 5 10 20 M

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16038 SK29

north west perspective along hill street

south west perspective along hill street

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ST DOMINICS PRIORY COLLEGE REDEVELOPMENT
PROPOSED YEAR 12 CENTRE

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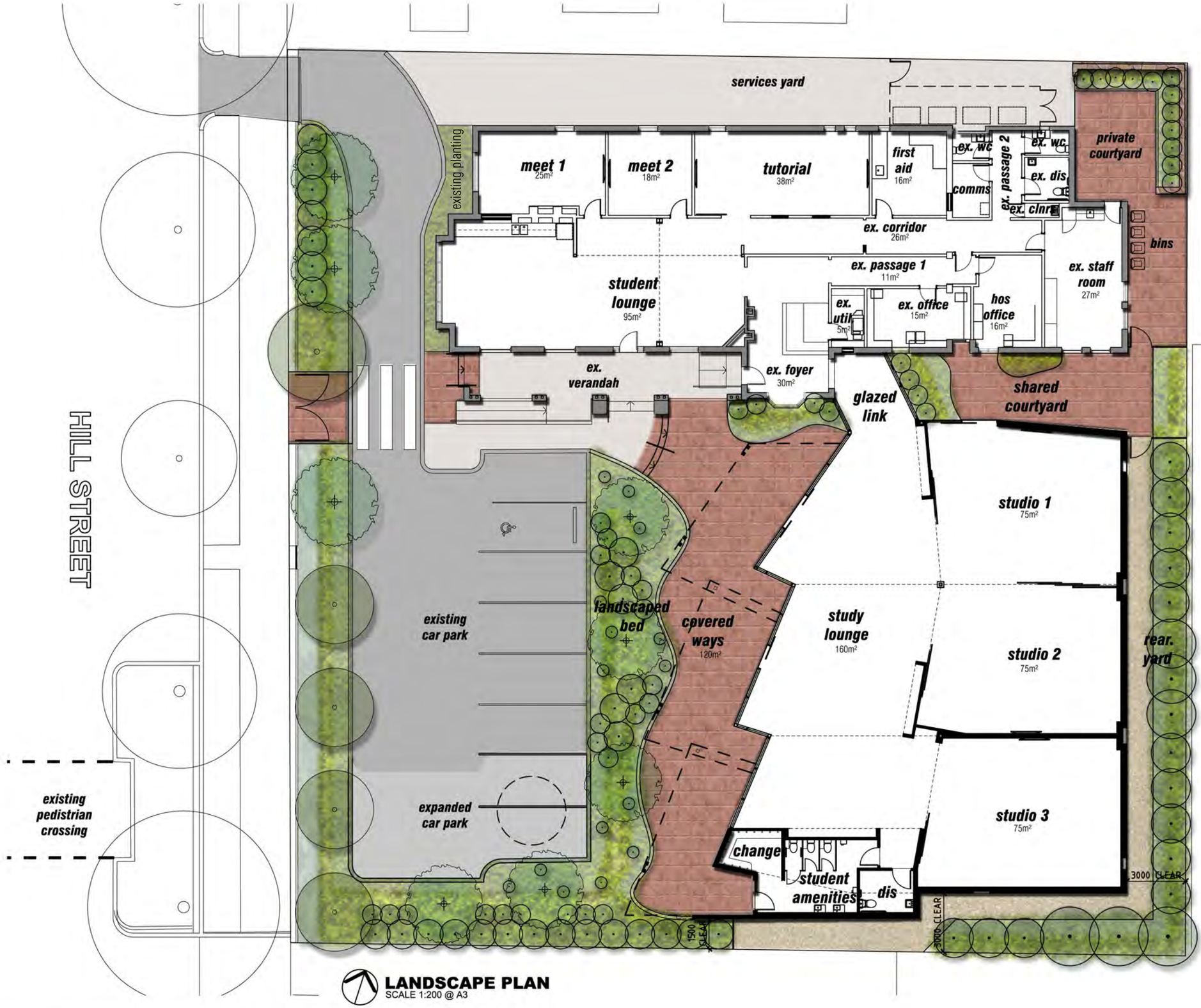

LANDSCAPE PLAN
SCALE 1:200 @ A3

LEGEND

- EXISTING TREE TO BE RETAINED
- PROPOSED TREE
- PROPOSED SHRUBS
- EXISTING PLANTING TO BE RETAINED
- PROPOSED GROUNDCOVER PLANTING
- EXISTING BITUMEN TO BE RETAINED
- EXISTING PAVING TO BE RETAINED
- PROPOSED UNIT PAVING
- PROPOSED CONCRETE PAVING

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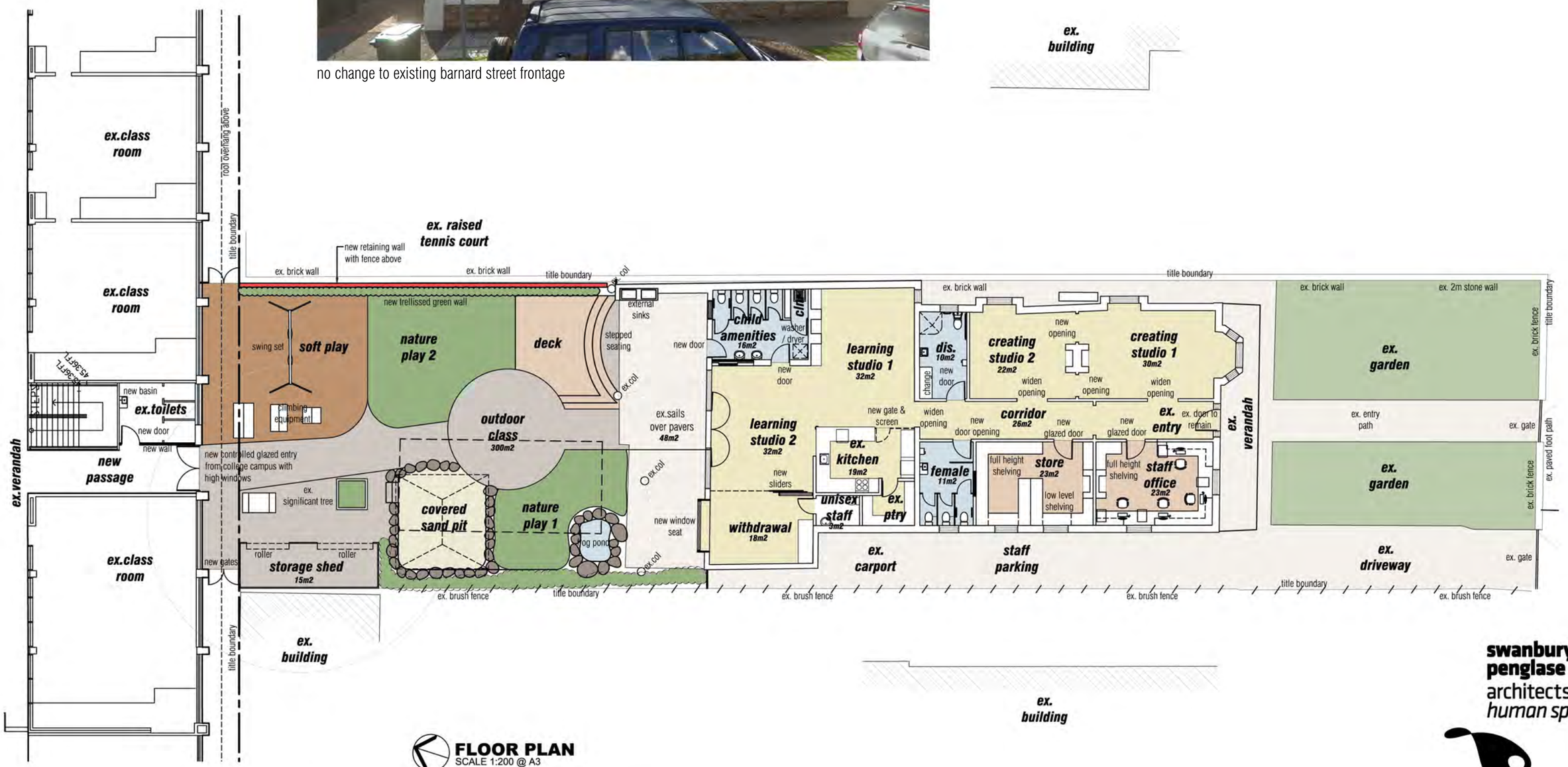
ST DOMINICS PRIORY COLLEGE REDEVELOPMENT
PROPOSED YEAR 12 CENTRE

0 5 10 20 M

21st Mar. 2017
16038 SK31

no change to existing barnard street frontage



FLOOR PLAN
SCALE 1:200 @ A3

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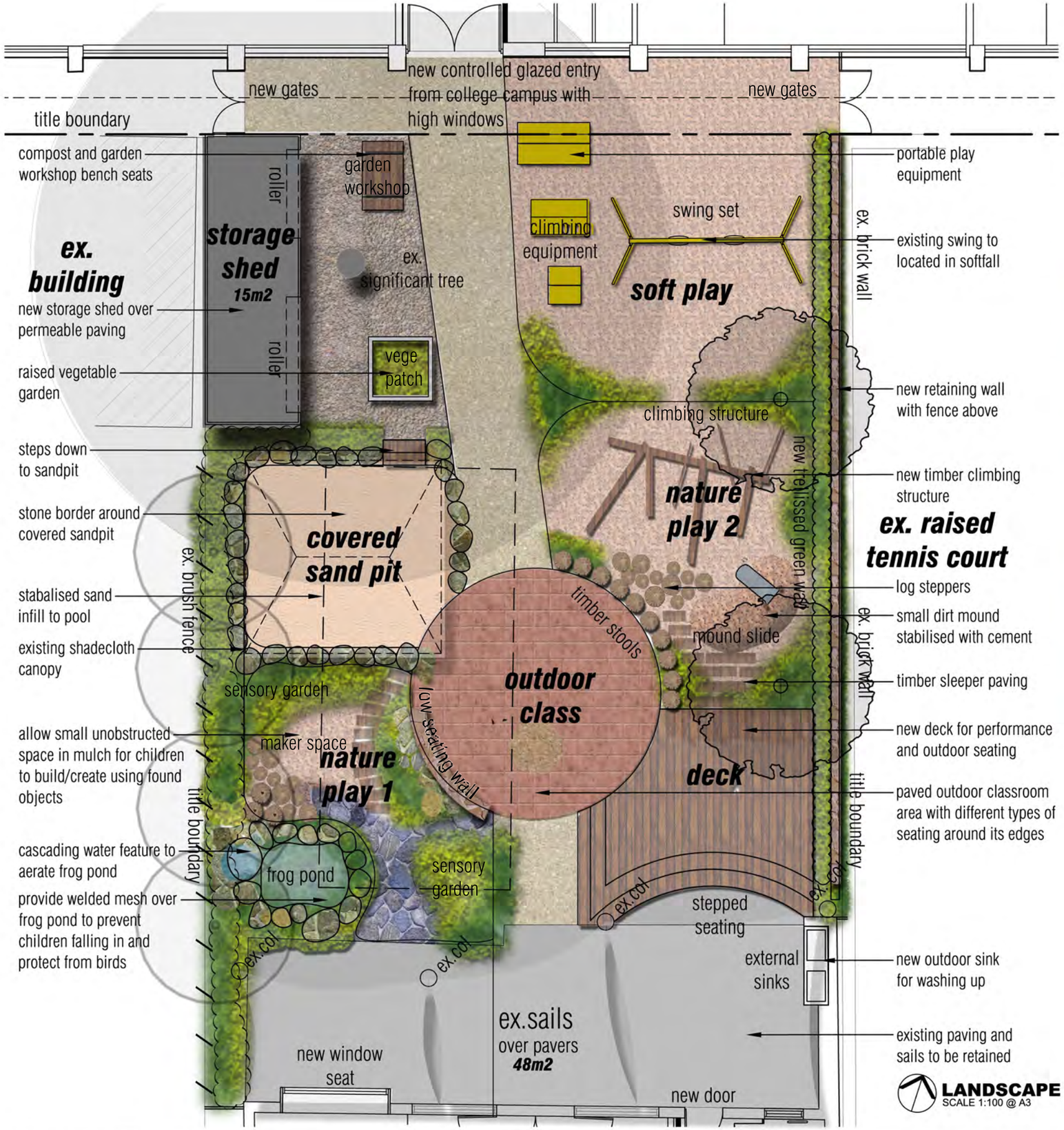
ST DOMINICS PRIORY COLLEGE REDEVELOPMENT
PROPOSED EARLY LEARNING CENTRE

0 5 10 20 M

04th Apr. 2017
16168 SK04



LANDSCAPE PLAN
SCALE 1:100 @ A3

Legend

- Existing Trees
- New Trees
- Planting
- Mulched Paving
- Ex. Paving
- Rubber Softfall
- Gravel Paving
- Random Stone Paving
- Sand Pit
- Timber
- Accent Paving
- Timber Log Paving
- Walls

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ST DOMINICS PRIORY COLLEGE REDEVELOPMENT
PROPOSED EARLY LEARNING CENTRE

0 5 10

24th Mar. 2017
16168 SK05

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File: 183-16

21 April 2017

Mr Kon Michael
Swanbury Penglase Architects
244 Gilbert Street
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Dear Kon,

PROPOSED CHANGE OF USE AND ADDITIONS TO 74 HILL STREET, NORTH ADELAIDE - TRAFFIC AND PARKING ASSESSMENT

I refer to our discussions relating to a proposed change of use of the existing building on the above site from the previous use as a medical centre to a Year 12 Centre associated with St Dominic's Priory College.

The proposal will include alterations and extensions to the existing building to accommodate Year 12 students currently attending St Dominic's Priory College. This school is located on the southern side of Molesworth Street, North Adelaide, and includes a frontage to the western side of Hill Street, directly opposite the subject land.

As requested I have undertaken the following review of the traffic and parking related aspects of the subject development.

EXISTING SITUATION

The subject site is located on the eastern side of Hill Street, approximately 20m to the south-east of the intersection of this road with Molesworth Street, North Adelaide.

The subject site was most recently approved for use as a medical centre (Elura Clinic) and was leased by the Drug and Alcohol Services SA for drug and alcohol counselling.

The Clinic's operating hours extended into the evenings on a number of days during the week with training sessions also scheduled on Saturdays and Sundays.

The subject site provides a frontage of approximately 45m to Hill Street and a depth of approximately 46m.

The subject site has an existing vehicular access point off Hill Street located adjacent to the northern boundary of the site. This access point is approximately 3.5m in width and provides access to a small car parking area of 5 spaces including a disability space with an adjacent shared area.

Hill Street, adjacent to the subject site, provides a single traffic lane and a bicycle lane in each direction with angled parking provided on both sides of this roadway.

A Pedestrian Actuated Crossing (PAC) is located approximately 4m to the north of the southern boundary of the site.

Parking is provided on both sides of Hill Street between the street trees within the vicinity of the site. Parking within the spaces directly in front of the site is generally unrestricted apart from a 2 hour time limit applying during event parking.

No Stopping restrictions apply between 7.30am and 6.00pm Monday to Friday in the following areas:-

- A 12m section on the eastern side of this roadway, immediately to the north of the PAC, and

- 12m sections on the western side of this road, to the north and south of the PAC.

PROPOSED DEVELOPMENT

The proposed development is identified on a series of plans prepared by your office including a Landscape Plan (Drawing No. 16038 SK31).

I note that the proposed development includes:-

- Refurbishment of the existing building to provide:-
  - Meeting rooms,
  - A tutorial room,
  - A staff room,
  - A student lounge, and
  - A first aid room.
- Construction of an extension of approximately 385m² to the south-east of the existing building, which includes:-

- Three studios,
- A study lounge,
- A glazed link through to the existing building, and
- An additional two car parking spaces at the southern end of the car park i.e. an increase from 5 existing spaces to a total of 7 spaces, including one space allocated for use by the disabled.

The design of the two additional car parking spaces will be consistent with that of the existing spaces and will provide:-

- Car parking spaces of 2.6m in width,
- Car parking spaces of 5.4m in length, and
- An aisle width of approximately 6m.

The design will also provide an aisle extension of 1.0m at the end of the aisle.

As such, I consider that the design of the on-site car parking spaces would conform to the requirements of the relevant off-street car parking standards (AS/NZS 2890.1:2004 and AS/NZS 2890.6:2009).

PARKING ASSESSMENT

The subject site is located within the North Adelaide Historic (Conservation) Zone.

Table Adel/7 within the Adelaide (City) Development Plan identifies car parking provisions relating to City Living and Adelaide Historic (Conservation) Zones.

There is no specific car parking requirement within the above Table which specifically relates to a school use.

However, I note that the above Table includes a minimum rate for car parking associated with a non-residential development of 5 spaces per 100m² of gross leasable floor area.

Based upon an existing floor area of approximately 385m² (to be confirmed) there would be a requirement for approximately 19 car parking spaces associated with the approved land use.

The proposed use of the subject development is a Year 12 Centre. More particularly, this facility will accommodate the existing Year 12 cohort from the school site on the western side of Hill Street onto the subject land.

The proposed Year 12 centre will accommodate approximately 80 Year 12 students as well as a total of approximately 7 teaching / administration staff directly related to the Year 12 cohort. There will be no increase in the number of these staff or the Year 12 cohort as a result of the relocation.

Hence, there should be no increase in car parking demand associated with the proposed development. However, the provision of up to 7 spaces on the subject site would accommodate the anticipated staff car parking demands associated directly with the Year 12 cohort. Hence, there will be a reduction in the existing on-street car parking demand by staff of the school, who would use the on-site car parking.

Given that the existing use of the subject site generates a requirement for approximately 19 car parking spaces and accommodates only 5 spaces on site, it is considered that there is an existing shortfall equivalent to approximately 12 spaces associated with car parking provided on site in respect to the car parking requirements of the existing land use.

Therefore, I consider that the proposed development will:-

- Not generate any increase in the overall car parking demand associated with the school,

- Provide an opportunity for the car parking demand generated by teaching / administration staff associated with Year 12 to be relocated onto the subject site, thereby reducing an existing reliance for on-street parking, and

- Replace an approved land use which has an existing shortfall in car parking demand equivalent to approximately 12 spaces based upon the relevant Development Plan provisions (approximately 19 spaces) compared to the current on-site car parking provision (5 spaces) on site.

On the above basis, I consider that the subject development will result in a significant decrease in the level of car parking demand within the subject locality compared to that of the previous use of the subject site.

TRAFFIC ASSESSMENT

The proposed development will generate only a low level of traffic movements to and from the adjoining road network, given that car parking on site will be allocated to teaching / administration staff associated with the Year 12 cohort.

I anticipate that there will be a maximum of 7 trips generated in any one hour period, with this likely to occur typically in the morning and late afternoon periods. These movements will relate to staff arriving and departing in these periods, respectively.

Hence, the anticipated traffic flows would be essentially tidal in nature with staff arriving in the morning period and departing in late afternoon / evening periods.

The subject car park will not be accessed by the general public. As a result, there would not be a requirement to provide a turnaround area within the car park.

Given the largely tidal nature of traffic entering and exiting the site, I consider that there should not be a requirement to widen the existing access point associated with the proposed development.

Since the occupants of the building are currently employed or enrolled (students) at the school, there should be no overall increase in traffic movements on the adjoining road network.

There would also be minimal servicing requirements associated with the subject development. In terms of refuse / recycling generated by the proposed development, this should be similar in volume to that of the approved land use. It is anticipated that waste / recycling bins would be placed on Hill Street on bin collection days.

While there will be movement of pedestrians between the subject land and the existing school site throughout school periods, I note that safe and convenient parking pedestrian access is provided between these two sites by the existing PAC located directly in front of the subject site.

SUMMARY AND CONCLUSIONS

The proposed development will include alterations and extensions to the existing building to accommodate Year 12 students currently attending St Dominic's Priory College.

The proposed development will include refurbishment of the existing building and construction of an extension on the south-eastern side of the building.

The proposed development will provide for a minor increase in the on-site parking area of the existing development on the subject site with the addition of two spaces. The additional parking spaces on-site will conform to the requirements of the relevant off-street car parking standards (AS/NZS 2890.1:2004 and AS/NZS 2890.6:2009).

The subject development will accommodate a Year 12 Centre which will consist of the existing Year 12 cohort being relocated from the school on the western side of Hill Street.

There will be no increase in the number of staff or students as a result of this relocation. Hence, there should be no increase in car parking demand associated with the proposed development. It is anticipated that the provision of 7 spaces on the subject site will fully accommodate the staff parking demands directly associated with the Year 12 Centre.

I therefore consider that the proposed development will:-

- Not generate any increase in the overall car parking demand associated with the school,

- Provide an opportunity for the car parking demand generated by teaching / administration staff associated with Year 12 to be relocated onto the subject site, thereby reducing an existing reliance for on-street parking, and

- Replace an approved land use which has an existing shortfall in car parking demand based upon the relevant Development Plan provisions (approximately 19 spaces) compared to the current on-site car parking provision (5 spaces) on site.

On the above basis, I consider that the parking demand in the locality will be reduced as a result of the proposed development.

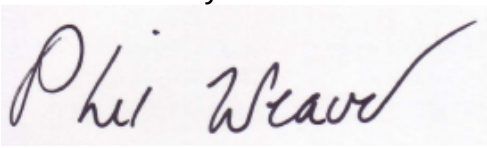
In conclusion, I consider that the proposed development will:-

- Provide a total of 7 car parking spaces including one space for use by the disabled and an adjacent shared area and would meet the level of staff car parking demand associated with the proposed land use,

- Not result in adverse traffic impacts on the adjacent road network, and

- Provide a design standard which is appropriate and meets the intent of the relevant Australian / New Zealand Standard for off-street car parking areas.

Yours sincerely



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21 April 2017

Mr Kon Michael
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Dear Kon,

PROPOSED CHILD CARE CENTRE - 112 BARNARD STREET, NORTH ADELAIDE - TRAFFIC AND PARKING ASSESSMENT

I refer to our discussions relating to a change of use of the existing building on the above site from a residential dwelling to an Early Learning (long stay childcare) Centre to be operated by St Dominic's Priory College.

The proposed development will include refurbishment of the existing building on the site and provision of outdoor play areas at the rear of the building to accommodate up to 35 children.

As requested I have undertaken the following review of the traffic and parking related aspects of the subject development.

EXISTING SITUATION

The subject site is located on the northern side of Barnard Street, approximately 35m to the south-west of the intersection of this road with Hill Street, North Adelaide.

The subject site currently accommodates:-

- A residential dwelling,
- A car port,
- A driveway along the of the site with a length of approximately 25m, and
- A swimming pool at the rear of the dwelling.

The subject site has a frontage of approximately 15m to Barnard Street. There is a single vehicular access point into the subject site off Barnard Street. This access point is approximately 3m in width and is located adjacent to the western boundary of the site.

Barnard Street, adjacent to the subject site, provides a single traffic lane in each direction. Parallel parking is provided on both sides of this roadway with car parking provided as follows between Hill Street and the western boundary of the school, including: -

Northern side

- A section of kerbside accommodating three hour parking between 9.00 am and 5.30 pm Monday to Friday on the northern side of Barnard Street, for a distance of approximately 40m from the intersection of this road with Hill Street i.e. a point adjacent to the western boundary of the subject site (capacity equivalent to 6 car spaces),

- Sections of parking extending from the western boundary of the subject site to an area in front of the school which are restricted to one hour periods between 9.00 am and 5.30 pm Monday to Friday (capacity equivalent to 4 car spaces),

- A section of unrestricted parking in front of the school (capacity equivalent to 5 car parking spaces), and

- A section of kerbside extending in front of the school providing two (2) minute parking (passenger loading) between 8.00 am and 9.00 am and between 3.00 pm and 4.00 pm School days site (capacity equivalent to 5 car spaces).

Southern side

Parking is restricted to three hour periods between 8.00 am and 6.00 pm Monday to Friday on the southern side of Barnard Street between Hill Street and Steuart Place (approximate capacity equivalent to 19 car spaces).

PARKING SURVEYS

In order to determine the level of available unused car parking in the locality, surveys of car parking demand were conducted over the following periods:-

- Between 2.30 pm and 5.30 pm on Monday 27th February 2017, and

- Between 7.00 am and 9.30 am on Tuesday 28th February 2017.

The above parking surveys were undertaken in the following areas:-

- Both sides of Hill Street between Molesworth Street and Barnard Street, and

- Both sides of Barnard Street between the access roadway on the western side of the school and the intersection with Hill Street (as described in detail above).

In summary the survey area provides the following mix of parking areas:-

- Short term parking in the periods between 9.00 am and 5.30 - 6.00 pm Monday to Friday (36 spaces),

- Unrestricted parking (17 spaces),

- An area on the eastern side of Hill Street designated as No Stopping between 7.30 am - 6.00 pm Monday to Friday (4 spaces) but which is otherwise unrestricted, and

- 2 minute parking (passenger loading) 8.00 am - 9.00 am and 3.00 pm - 4.00 pm School Days (5 spaces).

While some of the above areas within Hill Street provide for 2 hour event parking, such parking controls would not be relevant during weekday periods.

The results of the above surveys identified that:-

- The maximum number of cars parked in the am survey period was 47 cars. This peak parking demand occurred at 8.30 am. Based on a capacity of 62 spaces within the survey area, there were at least 15 vacant spaces, throughout the morning survey period and

- The maximum number of cars parked in the pm survey period was 51 cars which occurred at 3.00 pm. Based on a capacity of 62 spaces within the survey area, there were at least 11 vacant spaces in the near locality to the subject site in the afternoon collection period.

PROPOSED DEVELOPMENT

The proposed development is identified on a series of plans prepared by your office including a Floor Plan (Drawing No. 16038 SK04).

I note that the proposed development includes:-

- Refurbishment of the existing building to provide:-
  - Two creating studios,
  - Two learning studios,
  - A withdrawal room,
  - An office,
  - Toilet and amenity areas, and
  - A store room,

- Provision of outdoor play areas at the rear of the building, and

- A potential for up to 4 staff vehicles to park within the existing driveway in tandem or stacked arrangement. However, in reality it is considered that there would be no more than 2 staff who would park in this area.

The opening hours of the proposed child care centre will be 6.30 am to 6.30 pm Monday to Friday. The centre will be closed on weekends and public holidays.

PARKING ASSESSMENT

I understand that there is no specific car parking requirement for a child care centre within the Adelaide (City) Development Plan.

However, the **Planning Bulletin: Parking Provisions for Selected Land uses (Suburban Metropolitan Adelaide)** prepared by Planning SA identifies a car parking requirement for 1 space for every 4 children in attendance at a child care centre. This same car parking ratio has also been identified within the **"Guide to Traffic Generating Developments"** prepared by the Roads and Traffic Authority of NSW.

The above standards provide for both staff parking and parking by parents / carers attending the site. Consequently, there would be a requirement for 9 spaces associated with the subject development based on these requirements. This is inclusive of both staff parking and short term parking associated with children being brought o and collected form the proposed child care centre.

Hence, there would be a theoretical demand for 9 car parking spaces associated with the proposed development based on a capacity to accommodate 35 children on site.

The results of the parking surveys undertaken in the locality have identified that there were at least 11 spaces available at all times to meet such a requirement.

However, I consider that the anticipated level of additional car parking demand associated with the proposed development would be significantly less, given that it is likely that a significant proportion of children attending the proposed child care centre will have older siblings attending St Dominic's Priory College and would therefore not generate additional car parking demand within the locality.

I therefore anticipate that there would be of the order of 5 to 6 additional cars parking on-street at any one time when set down / collection of children occurs associated with the proposed child care centre. This takes into account the potential for yup to 2 staff to park within the driveway on site and also the potential for shared trips to be made by families with siblings attending both the school and the subject child care centre.

Notwithstanding this, the results of the car parking surveys undertaken by this firm clearly identify that there is sufficient car parking available within the near locality to accommodate a demand for at least 9 cars during both the school arrival and collection periods.

TRAFFIC ASSESSMENT

The "**Guide to Traffic Generating Developments**" report identifies traffic generation rates associated with child care centres, including the following peak hour rates associated with all day child care facilities as proposed on site, namely:-

- A rate of 0.8 trips per child in the am peak period (7.00 am to 9.00 am),
- A rate of 0.3 trips per child in the period between 2.30 pm and 4.00 pm, and
- A rate of 0.7 trips per child in the pm peak period (4.00 pm to 6.00 pm).

On the above basis, I estimate that the proposed child care centre would, in theory, generate 28 trips (14 in / 14 out) in the am peak hour period, 11 trips in any one hour between 2.30 pm and 4.00 pm and 24 trips (12 in / 12 out) in the pm peak hour period.

However, given the potential for shared trips to be generated by the child care centre and older children currently attending St Dominic's Priory College, the additional volume of traffic would be less than forecast above.

There will be only a small number of service movements relating to the proposed child care centre. I anticipate that these would typically be undertaken by vehicles currently servicing the existing school.

I therefore consider that the proposed development should not result in any significant increase in traffic volumes associated with the proposed child care centre. I also consider that there is more than adequate capacity on the adjacent road network to accommodate the forecast traffic generation of the subject development.

SUMMARY AND CONCLUSIONS

The proposed development relates to a change of use of the existing building on the subject site to accommodate a 35 place child care centre to be operated by St Dominic's Priory College.

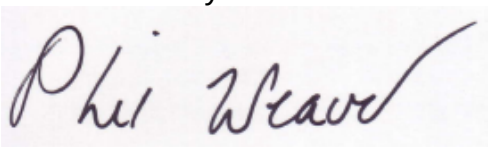
In theory, there should be a potential car parking demand for up to 9 spaces associated with the proposed development. However, given that a significant proportion of children likely to attend this facility would have older siblings attending the school, there would be an opportunity for shared use trips to occur. Hence, both the volume of traffic and the car parking demand to be generated by the subject development is anticipated to be significantly less than that of a comparable stand-alone facility.

Reviews within the locality have identified that unused on-street car parking within close proximity to the proposed development site is available. Such parking would provide short term parking suitable for parents / carers dropping off and collecting children from the child care centre. There is also an opportunity to accommodate staff parking on site which would further reduce any additional demand for on-street parking.

I also consider that the inner-city location of the subject development would reduce dependence on cars to travel to the centre.

In the event that children attending the proposed child care have siblings who also attend the school, this would provide an opportunity potential for shared trips to occur.

Yours sincerely



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ST DOMINICS PRIORY COLLEGE, NORTH ADELAIDE – PROPOSED YEAR 12 CENTRE AT 74 HILL STREET, NORTH ADELAIDE AND PROPOSED EARLY LEARNING CENTRE AT 112 BARNARD STREET, NORTH ADELAIDE

Introduction

The following report has been prepared by Andrew Stevens B. Arch., RAIA at the request of Swanbury Penglase Architects.

The purpose of the report is to provide an assessment of the heritage impact of the proposed development at 74 Hill Street, North Adelaide and 112 Barnard Street, North Adelaide.

In order to prepare the report I have reviewed relevant documentation including the following:

Swanbury Penglase Architects drawings:

- 16168 SK04, 04 Apr 2017
- 16168 SK05, 24 Mar 2017
- 16038 SK10, 22 Nov 2016
- 16038 SK11, 23 Nov 2016
- 16038 SK20, 04 Apr 2017
- 16038 SK26, 21 Mar 2017
- 16038 SK27, 21 Mar 2017
- 16038 SK28, 21 Mar 2017
- 16038 SK29, 21 Mar 2017
- 16038 SK30, 21 Mar 2017
- 16038 SK31, 21 Mar 2017

Adelaide (City) Development Plan.

State Heritage Unit file extracts:

- 110 Barnard Street, North Adelaide
- City Land Investment Company Subdivision, including 76-78 Hill Street, North Adelaide
- St Dominics Priory College (Church of the Perpetual Adoration and Chapter House, 127-129 Molesworth Street, North Adelaide

Local Heritage Assessment Sheets:

- 92-100 Barnard Street, North Adelaide
- 112-116 Barnard Street, North Adelaide
- 118-120 Barnard Street, North Adelaide
- 52-60 Hill Street, North Adelaide
- 76-79 Hill Street, North Adelaide
- 79-85 Molesworth Street (known as 81), North Adelaide

Proposed development
The proposed development at 74 Hill Street, North Adelaide involves altering, adding to and changing the use of the existing building from consulting rooms to a year 12 Student Study Centre for St Dominics Priory College. The proposed development includes associated carparking and landscaping.

The proposed development at 112 Barnard Street, North Adelaide involves the change of use of the existing building from a dwelling to an Early Learning Centre for St Dominics Priory College.

Relevant development plan provisions – 74 Hill Street, North Adelaide
I have considered the heritage impact of the proposed development at 74 Hill Street, North Adelaide against relevant provisions of the Adelaide (City) development plan consolidated 24 September 2015.

The subject site is located in the Hill Street Policy Area 1 of the North Adelaide Historic (Conservation) Zone of the Adelaide (City) development plan.

In my opinion development plan provisions of most relevance to assessment of the proposed development are as follows:

Council Wide
- Heritage and Conservation
    - Objective 43

Heritage and Conservation – North Adelaide
- Development on Land Adjacent to a Heritage Place
- PDCs 162 and 165

North Adelaide Historic (Conservation) Zone
- Introduction
- Statement of Heritage Value
- Upper North Adelaide
- Objectives 1 and 2
- PDCs 1, 3, 4, 5, 6, 7, 9 and 11

Hill Street Policy Area 1
- Introduction
- Desired Character
- Objective 1
- PDCs 1, 3 and 8

The subject site – 74 Hill Street, North Adelaide
The subject site is located on the eastern side of Hill Street, between Barnard Street and Molesworth Street.

The site is approximately 2000 square metres in area and roughly square, approximately 45 metres by 45 metres.

There is an existing building on the northern part of the site, while the southern part of the site comprises a carpark and an area of open landscaping.

The existing building is single storey, built of rendered and painted masonry with a brick and bluestone plinth and a corrugated steel roof. It is a former dwelling, adapted to consultancy rooms in recent times. Based on its construction and appearance, it was probably built in the 1920s.

The site is relatively flat. The western (front) boundary is fenced with a relatively recent fence comprising a rendered masonry plinth with metalwork above. The other boundaries are fenced with colorbond steel fencing with high chain mesh fencing to an adjacent tennis court to the east and a 1970s residential development to the south-east.

The prevailing character of the area – 74 Hill Street, North Adelaide

The prevailing character of the area, within which the subject site is located, is principally derived from a predominance of historic buildings dating from the late 1800s; the period of initial establishment and growth of Upper North Adelaide. Most are dwellings but the historic buildings of St Dominics Priory College and St Laurences Church and Priory are prominent in the area.

The buildings that date from the late 1800s are interspersed with later infill development, much of which occurred in the Inter-War period, particularly the 1920s. Subsequently, there has been further infill and replacement of buildings, in particular, during the 1960s and 1970s.

The grid pattern of land division of North Adelaide, designed by Colonel William Light, survives, albeit diluted by subsequent sub-division. The block of land bordered by Hill Street, Barnard Street, Wellington Square and Molesworth Street, within which the subject site is located, is of particular historical interest. During the late 1870s to mid 1880s boom period in Adelaide it was the subject of a substantial speculative residential building development in which the City Land Investment Company built a series of substantial two storey dwellings. The City Land Investment Company dwellings are State Heritage places. Today, there are thirteen of the detached and semi-detached villas within the block including the building at 76-78 Hill Street, adjacent and to the north of the subject site.

The semi-detached dwellings at 76-78 Hill Street were built of stone walls with rendered embellishments and corrugated iron roof cladding. They originally had a two-storey, timber-framed, tiered verandah/balcony but at some time this was removed and replaced with a two-storey, classically influenced verandah/balcony with masonry columns and balustrades. This alteration may have been carried out in the Inter-War period.

The existing building on the subject site is an early 1920s bungalow style dwelling. It has undergone some change to its roof form and main gable element where it appears that the main roof has been extended forward and the front return verandah enclosed. Apart from this alteration it retains much of its early form and fabric and, although not a heritage place, it makes a positive contribution to the prevailing historic character of the streetscape.

Adjacent to the south of the subject site is a driveway which I understand accesses a circa 1970s residential development in Barnard Street.

To the south of the driveway, at 52 Hill Street, there is a large, Bungalow-style, two-storey dwelling of white rendered masonry with a brick plinth and tiled roof. It is a local heritage place. According to the summary

accompanying photograph B4881 in the State Library collection it was built in 1927 and replaced a single storey dwelling. It retains reasonably high integrity although the verandahs have been enclosed and the garage on the northern side has been modified and extended.

Further to the south, at the corner of Buxton Street, is a single storey dwelling built of stone and brick with a tiled roof. It is a local heritage place. According to the heritage assessment sheet that underpinned its listing, it was built in 1913. It is of high integrity and a good example of Federation architecture with Queen Anne stylistic influences. The dwelling has a large and prominent garage in a style similar to the dwelling facing Hill Street.

Directly opposite the subject site are dwellings and school buildings of relatively recent origins. There is a single-storey late 1800s former dwelling, diagonally opposite the subject site, on the south-western corner of the intersection of Hill and Molesworth Streets. It is a local heritage place. At the north-western corner of Hill and Barnard Streets there is a two-storey dwelling which faces Barnard Street. Built in 1867, it is a State heritage place.

To the north of Molesworth Street, along Hill Street, there is a predominance of dwellings of high integrity dating from the late 1800s.

To the south of Barnard Street, along Hill Street, streetscape character is diffuse, influenced primarily by the red brick buildings of Calvary Hospital and a substantial amount of relatively recent development.

Assessment of heritage impact – 74 Hill Street, North Adelaide

The Statement of Heritage Value for the North Adelaide Historic (Conservation) Zone emphasises the significance of Colonel Light's Plan and the fact that the early pattern of land division has survived despite subsequent development over time. It also emphasises the significance of the surviving early development dating from the mid to late 1800s but recognises the diversity of scale and integrity of the remaining historic built form as "a microcosm of development periods and traditional housing styles in the State as a whole".

The heritage value of Upper North Adelaide is recognised as lying in the late 1800s (mostly post 1878) development and, in the subject locality, the historic buildings of St Laurences Church and St Dominics Priory College and the early dwellings including those of the City Land Investment Company.

Consistent with the Statements of Heritage Value and Zone Objectives 1 and 2, the proposed development does not seek to divide the land nor directly impact on the historic buildings that contribute most to the prevailing historic character.

Furthermore, the proposed development is a continuation of the process of infill and redevelopment that has occurred over time and which is clearly evident in the streetscape character of the area. The buildings dating from the late 1800s are interspersed with buildings from the 1910s and 1920s as well as the 1960s and 1970s and later, providing the "microcosm of development periods" referred to in the Statement of Heritage Value.

The proposed development retains the existing building on the site, a former dwelling dating from around the 1920s which, although altered and not a heritage place, contributes positively to streetscape character and assists in maintaining the prominence of the City Land Investment Company semi-detached dwelling adjacent and to the north of the subject site.

Zone PDC 1 (a) seeks new development that retains and conserves Heritage Places. The proposed development is sufficiently distant from, discreetly sited and of a scale such that it will not directly impact on the heritage value of nearby State or local heritage places. This also accords with Council-Wide Objective 43 which seeks development that retains the heritage value and setting of a heritage place and its built form contribution to the locality.

Hill Street Policy Area 1 Desired Character states, amongst other things, that the area "should be protected and enhanced as one of the most historically intact residential areas in South Australia".

It goes on to say that:

> *The variety of dwelling types should be retained by the conservation of Heritage Places characterised by nineteenth and early twentieth century elegant and finely detailed mansions and other large villas set on large allotments, together with low and medium density cottages, villas and terrace houses of one and two storeys.*
>
> *Development should respect the scale, environmental quality and character of the Policy Area, incorporating high standards of design, materials and landscaping.*

Hill Street is described as "*an attractive townscape*", "*formed by the many one storey local heritage places and several two storey State Heritage Places comprising large detached and semi-detached dwellings, as well as other prominent corner sites containing St. Lawrence's Church and Calvary Hospital*".

Zone PDC 1 (b) seeks new development that reflects "*the historic built form and its visual character*". Council Wide PDCs 162 and 165 provide more specific guidance in regard to new development and state respectively:

162 *Development on land adjacent to land containing a Heritage Place should demonstrate design consideration of the relationship with the Heritage Place (without necessarily replicating its historic detailing) by establishing compatible:*

> *(a) scale, bulk and setbacks;*
>
> *(b) proportion and composition of design elements;*
>
> *(c) form and visual interest (as determined by play of light and shade, treatments of openings and depths of reveals, roofline and silhouette, colour and texture of materials and details, landscaping and fencing);*
>
> *(d) width of frontage and boundary set-back patterns; and*
>
> *(e) vehicle access and carparking arrangements.*

And:

165 *Development that is visible from the street should match the building levels and storey heights of adjacent Heritage Places.*

In considering the implications of this policy it is important to consider the context relating to the proposed development and the streetscape character of the immediate locality. This can be summarised as follows:

Hill Street, East Side-

North of Molesworth Street:

- Single storey, late 1800s cottages and villas

Between Molesworth Street and Barnard Street, (from north to south):

- Two-storey, semi-detached late 1800s villas of the City Land Investment Company development with non-original, possibly 1920s verandah/balcony.
- Single storey 1920s Bungalow, altered roof form, converted to consulting rooms, (subject site).
- Vacant land, (subject site).
- Two-storey 1920s Bungalow with verandah infill.
- Single-storey 1910s Queen Anne Style Edwardian villa.

South of Barnard Street

- Two-storey (and higher) red brick and rendered buildings of Calvary Hospital circa 1920s-2000s.

Hill Street, West Side-

North of Molesworth Street:

- Single-storey late 1800s villa, two-storey circa 1970s and 1980s semi-detached dwellings.

Between Molesworth Street and Barnard Street, (from north to south):

- Single-storey late 1800s cottage.
- Two-storey late 1900s dwellings and school buildings.
- Two-storey late 1800s dwelling.

South of Barnard Street:

- Single-storey early 1900s dwelling, two-storey late 1900s dwellings.

This group of buildings, dating from a variety of eras, exhibit a range of architectural styles each with their own peculiarities in form, proportion and scale.

In response to the policy mentioned above, design of the proposed development does not seek to specifically reference a particular building or style. Rather, the existing circa 1920s building is retained, maintaining streetscape character and providing separation between the new building and the State heritage place, (City Land Investment Company dwellings).

The proposed new building is discreetly sited, well setback from the front of the site and behind the existing fence, a proposed upgraded carpark and reasonably substantial landscaping.

It adopts a recessive presence in the streetscape which assists in maintaining the prominence of historic buildings and is consistent with Zone PDC 9.

The proposed low-scale glazed link provides visual separation between the existing building on the site and the proposed building.

The southern side setback, although relatively small, is not of substantial consequence because the proposed new building is well setback on the site and is separated from the local heritage place to the south by a driveway and a modified garage.

It is also relevant that Zone PDC 3 contemplates "new buildings or building additions of innovative and contemporary design". It states:

3 *Development of new buildings or building additions of innovative and contemporary design should demonstrate a compatible visual relationship with adjacent Heritage Places and other buildings prevailing in the Policy Area that reinforce the desired character by compatible:*

(a) bulk and scale;

(b) width of frontage and the front and side boundary building set-back patterns;

(c) proportions and vertical and/or horizontal emphasis, exhibiting vertical openings and a high solid to void ratio in the composition of the principal building facade and other elevations presenting to a public road; and

(d) form and level of visual interest as determined by length and size of unbroken walling, treatment of openings and depths of reveals, roofline and silhouette, colour and texture of materials used, as well as detailing (without excessive use or mimicry of decorative elements and ornamentation) and design elements such as porches, verandahs and balconies where appropriate.

The design of the proposed new building is innovative and contemporary. It achieves a compatible visual relationship with Heritage Places and other relevant buildings through a number of means. Consistent with Zone PDC 3 (a), the proposed new building is single-storey and modest in bulk and scale. The massing is broken down into three principal elements, further reducing bulk and scale. The proposed new building is visually separate to the existing building on the site and is linked to the existing building by a small, simple glazed element.

The façade of the proposed new building is well-modulated with projecting elements that provide visual interest and an interplay of light and shade on the walls.

Three simple, overlapping canopies on the western side reflect the scale of the verandah of the existing building and relate to the proportions of verandahs on historic buildings nearby. The twin posts and pitched roof of the proposed canopies reference the verandah of the existing building without seeking to replicate historic detail.

The roof form of the proposed new building is unusual. It could be described as three separate cranked skillion roof forms with relatively large eave overhangs and sloping zinc cladding on the sides. Zone PDC 3 (d) seeks compatibility with adjacent Heritage Places in roofline and silhouette and Zone PDC 11. It states:

11 *Appropriately pitched roofs to visibly reinforce the prevailing character of historic roof forms in the Zone should be incorporated in development rather than mono-pitch or flat roof forms falling to the street frontage or asymmetrically to a side boundary.*

Despite this, there are roof forms that are similar to what is proposed on the circa 1970s group dwellings to the south and south-east of the subject site and a relatively recent outbuilding to the east of the subject site.

Furthermore the roof forms, pitches, spans and bulk of adjacent heritage buildings differ as a consequence of their design and stylistic influences. There is therefore, no substantial consistency in roof form amongst existing buildings nearby.

I understand that the intent of the roof design is to provide quality south light into learning spaces. The roof form therefore serves a practical purpose. The roof design and canopy design of the proposed new building have been amended during design development to maintain the level of lighting amenity sought while achieving greater compatibility with the appearance of adjacent buildings. The proposed roof forms are well modulated with substantial overhangs, they are low in bulk and will have relatively low streetscape impact because of the substantial front setback of the proposed new building. For these reasons, the roof forms are considered to be sufficiently compatible with prevailing character given the discreet siting of the proposed new building.

The principal materials in the proposed new building are bluestone, render, glass and zinc. Stone and render are specifically mentioned in Zone PDC 4 as being appropriate. The dark grey zinc with its matte finish, bluestone, render, and grey glazing will tend to recede in the streetscape, deferring to the lighter colours of historic buildings nearby. The bluestone also reference the bluestone plinth of the existing circa 1920s building. Glazing maintains vertical fenestration patterns in accordance with Zone PDC 3 (c).

Conclusion – 74 Hill Street, North Adelaide

In my opinion, the impact of the proposed development on the heritage values of adjacent and nearby heritage places is acceptable because it is sufficiently distant from, discreetly sited and of a scale such that it will not adversely impact on the heritage places or their setting.

The impact of the proposed development on the streetscape character of the locality is acceptable because:

- the existing circa 1920s building on the site is retained.
- the proposed new building is well setback from the front of the site and behind reasonably substantial landscaping, maintaining the prominence of historic buildings adjacent and nearby.
- the proposed new building is modest in scale and is not bulky, with its massing broken down into three principal elements.
- the façade of the proposed new building is well-modulated and includes canopies that are compatible with verandahs on historic buildings nearby.
- proposed material suitably reference the materials used in historic buildings nearby without imitating historic detail.
- the roof form of the proposed building, although different to the roof forms of historic buildings nearby, is low in scale and refined in detail with large overhangs providing shadow. It is discreetly sited and not prominent in the streetscape.
- the proposed new building is well setback from the front boundary and, with a darker palette of colours, will maintain the prominence of historic buildings adjacent and nearby.

For these reasons, I believe that the proposed development is supportable in terms of heritage impact.

Assessment of heritage impact – 112 Barnard Street, North Adelaide

The existing building at 112 Barnard Street, North Adelaide is a late Victorian symmetrical cottage dating from the 1870s-1880s. It is built of bluestone walls with rendered embellishments and a corrugated steel roof and has a timber-framed, concave profile verandah.

It is of high integrity, retaining much of its early form and fabric.

It is listed as a local heritage place in the Adelaide (City) development plan. The extent of listing is described as: "House-Frontage and side wall returns visible from the street".

The proposed development seeks to change the use of the building from a dwelling to an Early Learning Centre for St Dominics Priory College and to link the site to the school grounds at the rear.

Necessary works to achieve this include internal alterations and fit-out and construction of a play area and access to the school at the rear.

None of the proposed works will impact on significant historic fabric nor the parts of the building mentioned in the extent of listing.

Adaptation of the building provides an on-going use and helps to ensure its care and maintenance into the future.

In these respects the proposed development is compatible with the heritage value of the place, consistent with relevant development plan provisions relating to impact on heritage value and will not adversely impact on the prevailing historic character of the streetscape.

Stevens Architects Pty Ltd
Andrew Stevens RAIA (Director)

10 April 2017

ST DOMINICS PRIORY COLLEGE
PROPOSED YEAR 12 CENTRE
74 HILL STREET, NORTH ADELAIDE

STORMWATER MANAGEMENT PLAN

INTRODUCTION

The following outlines the proposed plan to manage the disposal of stormwater from the post development site at 74 Hills Street, North Adelaide.

The stormwater concept has been based upon the architectural Site Plan prepared by Swanbury Penglase and dated 17 February 2017.

The proposed development includes the following:

- Alterations to existing single storey building
- New Year 12 Centre expansion
- Small increase in existing car parking to 8 cars total

This Stormwater Management Plan addresses the following issues:

- general stormwater management
- stormwater detention
- quality of water

This plan has been prepared following discussions with Andrew Smith from the City of Adelaide.

GENERAL STORMWATER MANAGEMENT

The new works will be designed for the following stormwater criteria:

- Piped underground systems for 1 in 20 year event
- Overland flow for 1 in 100 year event

Roof water from the new building will be collected and will discharge to an underground retention tank. Overflow will run to the Hill Street kerb & watertable. Surface water will be collected and will also run to the street.

It is necessary to ensure that the maximum discharge at each discharge point to the kerb & watertable shall not exceed 15 L/s under the 1 in 20 year storm event

Refer to the attached indicative Concept Stormwater Sketch 160235-SK01.

Note also that the City of Adelaide has advised that this site is not affected by the 1 in 100 year flood level.

STORMWATER DETENTION

The City of Adelaide has advised that there is no formal requirement for stormwater detention on this site.

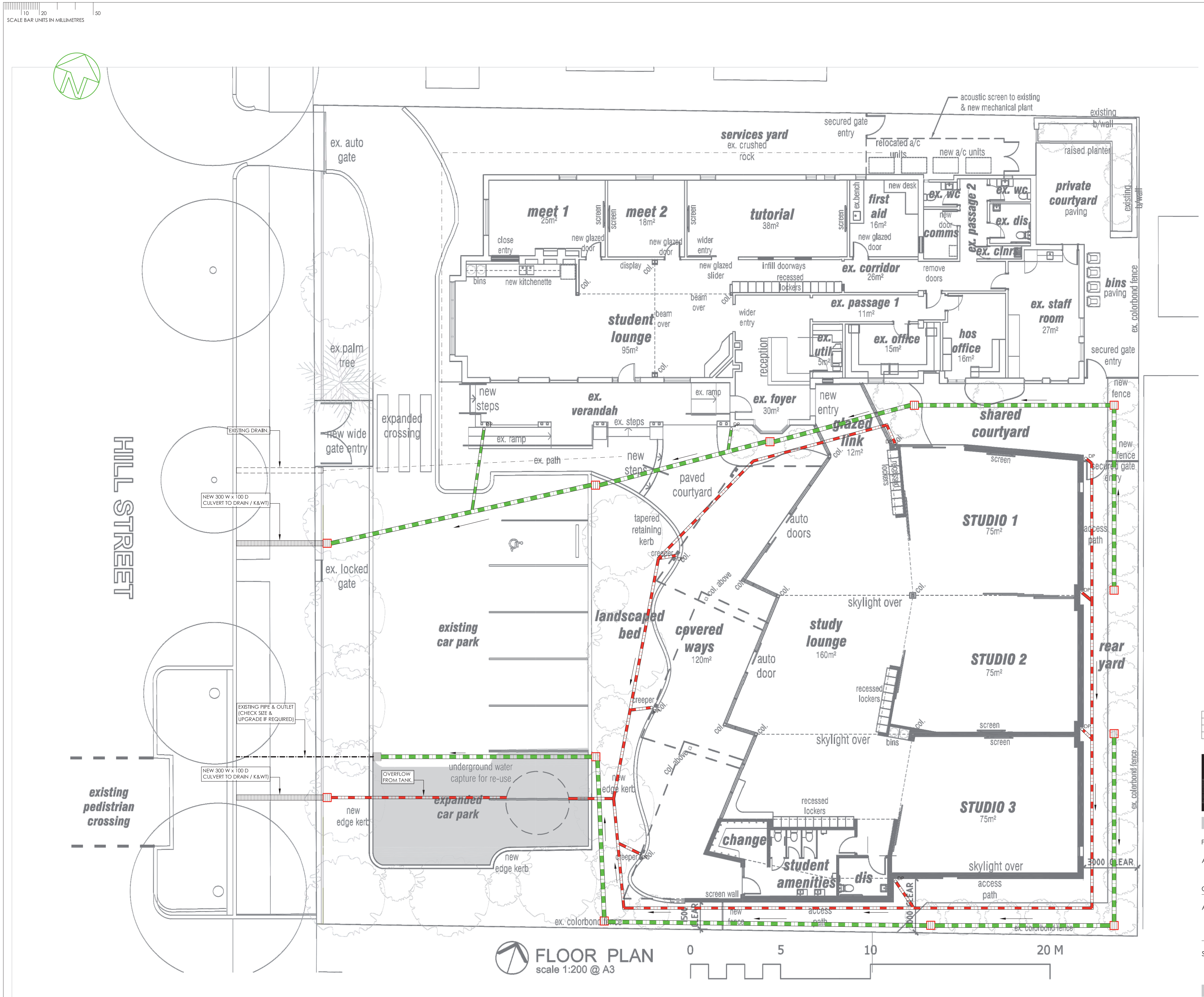
Note though that an underground retention tank is proposed and the stored water will be pumped back into the building for use in flushing toilets.

QUALITY OF WATER

The City of Adelaide has advised that treatment of the stormwater runoff from the small car parking area is not required on this project.

Prepared by

Neil Pearson
COMBE PEARSON REYNOLDS PTY LTD



SCALE BAR UNITS IN MILLIMETRES
HILL STREET
ex. auto gate
services yard
ex. crushed rock
secured gate entry
acoustic screen to existing & new mechanical plant
relocated a/c units
new a/c units
existing b/wall
raised planter
private courtyard paving
meet 1
25m²
meet 2
18m²
tutorial
38m²
first aid
16m²
ex. wc
ex. dis
ex. passage 2
comms
ex. clnr
close entry
new glazed door
wider entry
new kitchenette
bins
display
new glazed slider
infill doorways
recessed lockers
ex. corridor
26m²
remove doors
student lounge
95m²
beam over
wider entry
ex. passage 1
11m²
ex. staff room
27m²
bins paving
ex. colorbond fence
reception
ex. util
5m²
ex. office
15m²
hos office
16m²
secured gate entry
ex. palm tree
new wide gate entry
expanded crossing
EXISTING DRAIN.
new steps
ex. verandah
ex. ramp
ex. steps
ex. foyer
30m²
new entry
glazed link
12m²
shared courtyard
new fence
ex. path
paved courtyard
NEW 300 W x 100 D CULVERT TO DRAIN / K&WT
tapered retaining kerb
creeper
auto doors
STUDIO 1
75m²
access path
ex. locked gate
existing car park
landscaped bed
covered ways
120m²
skylight over
study lounge
160m²
auto door
recessed lockers
STUDIO 2
75m²
rear yard
EXISTING PIPE & OUTLET (CHECK SIZE & UPGRADE IF REQUIRED)
underground water capture for re-use
OVERFLOW FROM TANK
expanded car park
new edge kerb
existing pedestrian crossing
change
student amenities
dis
STUDIO 3
75m²
screen wall
3000 CLEAR
ex. colorbond fence
new fence
access path
PRELIMINARY
24/02/2017
FLOOR PLAN
scale 1:200 @ A3
0
5
10
20 M

LEGEND

- NEW STORMWATER PIPE
- NEW STORMWATER PIPE.
- STORMWATER PIPE EXISTING.
- GRATED INLET PIT
- DP — DOWN PIPES.

Revision	Date	Details	Eng\Dft
A	24-02-17	ISSUED FOR APPROVAL.	N.P.\M.N.S.

cpr COMBE PEARSON REYNOLDS CONSULTING ENGINEERS
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Phone: 08 8332 1344
e-mail: plans@cprengineers.com.au

Project: PROPOSED REDEVELOPMENT Y12 CENTRE
Address: 74 HILL STREET, NORTH ADELAIDE
Client: ST. DOMINICS PRIORY COLLEGE
Architect: SWANBURY PENGLASE, 244 GILBERT ST, ADELAIDE 5000, Phone 8212 2679
Sheet Title: CONCEPT STORMWATER PLAN

Designed	Drawn	Checked	Date	Sheets in Set
N.P.	M.N.S.	-	Feb-17	1 of 1
Scale 1:100 @ A1	Drawing No. 160235-SK1			Rev. A

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PO BOX 2620, Kent Town SA 5071
T +61 8 8132 1700
enquiry@bcaengineers.com
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Ecologically Sustainable Design Initiatives

Date: 20th March 2017

Project ref.: 3397.170320.G.1

Project name: St. Dominic's Priory College

The new Early Learning Centre and Year 12 Centre for St Dominic's Priory College incorporates the following passive and active Ecologically Sustainable Design (ESD) initiatives. These will be further developed during the detailed design and documentation phase of the project.

Early Learning Centre

Active Design Initiatives

Auto 'off' HVAC controls through sensors to improve energy efficiency by ensuring that only occupied areas are conditioned. Controls will be programmed to ensure that the HVAC systems are not functioning outside of the intended operational hours.

Individualised zone control of separate spaces for better management of air conditioning resources. Zones left uninhabited can be left off for additional energy saving.

Energy Recovery Ventilation (ERV) to exchange the energy contained in normally exhausted building air and use it to precondition the incoming outdoor ventilation air in HVAC systems.

Use of VRF/VRV heat recovery technology providing heat recovery energy savings between indoor units.

Use of Zero Ozone Depleting (ODP = 0) refrigerants as they represent the best practice approach in modern systems.

Maximise the use of controlled fresh air intake, including the use of CO_2 monitoring in large spaces to limit energy use.

LED luminaires selected with a high luminous efficacy to reduce the amount of power and luminaires required to sufficiently illuminate the building.

Smart lighting controls, including motion sensors and photo-electric sensors, for switching and/or dimming of lighting to provide reduction in electrical consumption.

10 kW solar photovoltaic system for educational purposes to generate electricity to offset the building's energy consumption. Includes a display of system information for student educational purposes regarding green energy.

Installation of electricity meters in distribution boards for monitoring of electricity consumption. The user can review this information and develop strategies for reducing building electricity consumption.

Solar hot water system to utilise renewable resources (the sun) to directly heat water via solar panels.

Fixtures and tapware selected with a minimum 4 star WELS rating to reduce the overall water consumption of the building.

HDPE drainage pipework in lieu of PVC, as it is manufactured in a more environmentally friendly manner.

Interactive LED touchscreens throughout the new building to benchmark performance of the building and promote learning amongst the students and staff.

Webcam recording of the new building construction, to show site progress for the purpose of student learning.

Year 12 Centre

Active Design Initiatives

Auto 'off' HVAC controls through sensors to improve energy efficiency by ensuring that only occupied areas are conditioned. Controls will be programmed to ensure that the HVAC systems are not functioning outside of the intended operational hours.

Individualised zone control of separate spaces for better management of air conditioning resources. Zones left uninhabited can be left off for additional energy saving.

Energy Recovery Ventilation (ERV) to exchange the energy contained in normally exhausted building air and use it to precondition the incoming outdoor ventilation air in HVAC systems.

Use of VRF/VRV heat recovery technology providing heat recovery energy savings between indoor units.

Use of Zero Ozone Depleting (ODP = 0) refrigerants as they represent the best practice approach in modern systems.

Maximise the use of controlled fresh air intake, including the use of CO_2 monitoring in large spaces to limit energy use.

Acoustic screening to the outdoor mechanical plant, to reduce the noise pollution from the plant area.

LED luminaires selected with a high luminous efficacy to reduce the amount of power and luminaires required to sufficiently illuminate the building.

Smart lighting controls, including motion sensors and photo-electric sensors, for switching and/or dimming of lighting to provide reduction in electrical consumption.

15 kW solar photovoltaic system for educational purposes to generate electricity to offset the building's energy consumption. Includes a display of system information for student educational purposes regarding green energy.

Installation of electricity meters in distribution boards for monitoring of electricity consumption. The user can review this information and develop strategies for reducing building electricity consumption.

Solar hot water system to utilise renewable resources (the sun) to directly heat water via solar panels.

Fixtures and tapware selected with a minimum 4 star WELS rating to reduce the overall water consumption of the building.

An 11,000 litre rainwater collection tank for reuse in the toilet flushing in new student amenities.

HDPE drainage pipework in lieu of PVC, as it is manufactured in a more environmentally friendly manner.

Interactive LED touchscreens throughout the new building to benchmark performance of the building and promote learning amongst the students and staff.

Webcam recording of the new building construction, to show site progress for the purpose of student learning.

Regards

Frank Langone
Electrical Engineer

tree environs

managing trees in the urban landscape

TREE REPORT
Assessment of 5 trees in relation to a development at 74 Hill Street North Adelaide

Prepared for:
Kon Michael
Associate
Swanbury Penglase
244 Gilbert St
Adelaide SA 5000

5 February 2017

Prepared by:
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ABN 755 2046 6731

Introduction

I carried out an assessment of 5 trees at 112 Barnard Street, North Adelaide on the 21st January 2017 following a request from Kon Michael, Associate at Swanbury Penglase.

Swanbury Penglase are preparing plans to develop a new Year 12 Centre **for** St Dominic's Priory College at 74 Hill Street North Adelaide. I understand that four of these trees are to be removed to construct a new Year 12 Centre, and the existing palm tree is to be retained on site if possible.

I was requested to assess the legal status of the trees and to recommend strategies to minimise possible impacts on the existing palm tree which is to be retained on site.

Qualifications

I have twenty five years' experience in the field of landscape architecture. A summary of my qualifications includes:

- Bachelor of Architecture, University of Adelaide 1991
- PhD, School of Earth and Environmental Sciences, University of Adelaide 2010. '*Integrating Trees into the Design of the City: Developing More Sustainable Practices for Planting Street Trees in Australian Cities'*
- Dip. Horticulture (Arboriculture)
- Member Australian Institute of Landscape Architects (AILA)
- Registered landscape Architect

Documents and information provided

I was provided with the following documents to assist me in the preparation of this report;

- *Detail Survey* Ref 16255 sheets 1-2 by State Surveys dated 11/04/13.
- *Architectural drawings St Dominics Priory College Redevelopment - Proposed ELC Centre and Year 12 Centre* : *SK16038 06A-09* (dated 28 July 2016 Rev B) by Swanbury.

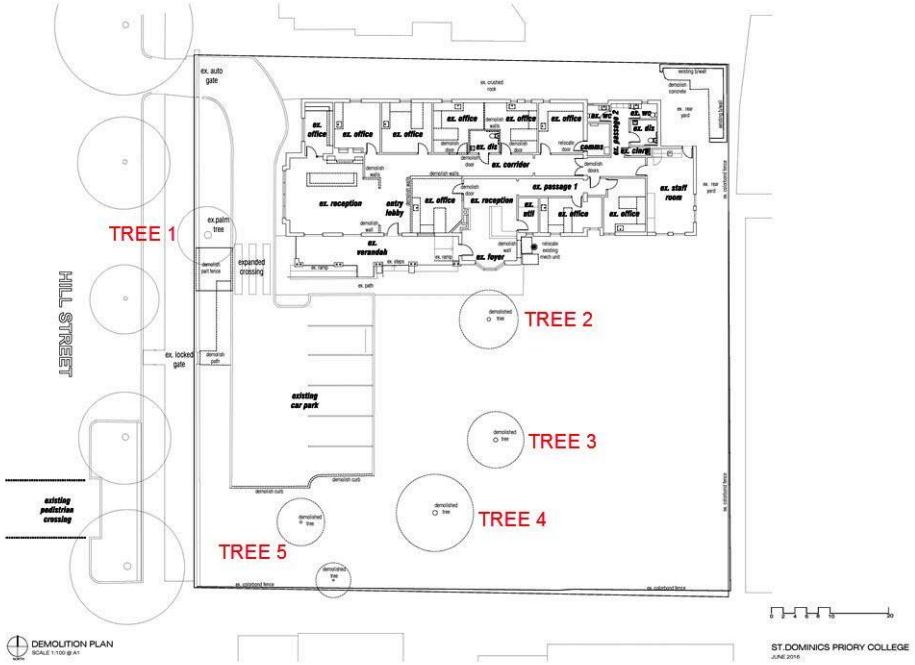
Scope of this report

This report is concerned with the 5 trees and drawings provided by Swanbury Penglase architects only.

Observations & appraisal

Site and subject trees

The site comprises a large allotment occupied by a vacant building, car park and open garden area (Please refer to the existing site drawing below).



Five larger sized trees are located on the site. Details of each tree is provided in the table below.

Tree No.	Tree species	Circ. @1.0m	Legal status
1	*Washingtonia robusta* (Washington Date Palm)	1.7m	Non-regulated
2	*Fraxinus sp.(*Ash)	0.95m	Non-regulated
3	*Prunus sp.* (Prunus)	1.65m	Non-regulated
4	*Ulmus parvifolia* (Chinese Elm)	1.20m	Non-regulated
5	*Fraxinus sp.(*Ash)	0.60m	Non-regulated

None of the trees qualify as a regulated[a] or significant tree under the *Development Act 1993*.

Under the *Adelaide (City) Development Plan (Consolidated 24 September 2015)* trees or groups of trees (identified in Table Adel/5) may also be declared as significant. None of the trees are listed in Table Adel/5.

As non-regulated trees, they may be removed without council consent if required.

Photo showing tree 1

Tree 1 is a tall palm in average health and contributes to the local streetscape. It is a ***Phoenix canariensis*** or **Canary Island Date Palm** which is a stout, woody, thick trunked, single stemmed palm that reaches ~20m with a crown of long, pinnate fronds with large spines at the base of each leaf. The palm is dioecious, in that there are separate male and female plants. The female has clusters of large orange fruits that readily germinate. This palm is very frost tolerant, heat tolerant and grows well in poor soils (except where drainage is poor). It naturally occurs in the Canary Islands off the west coast of North Africa where there is a hot climate and low annual rainfall of 230mm, falling mainly in the winter. It is not indigenous to the Adelaide region, but performs well in the local climate.

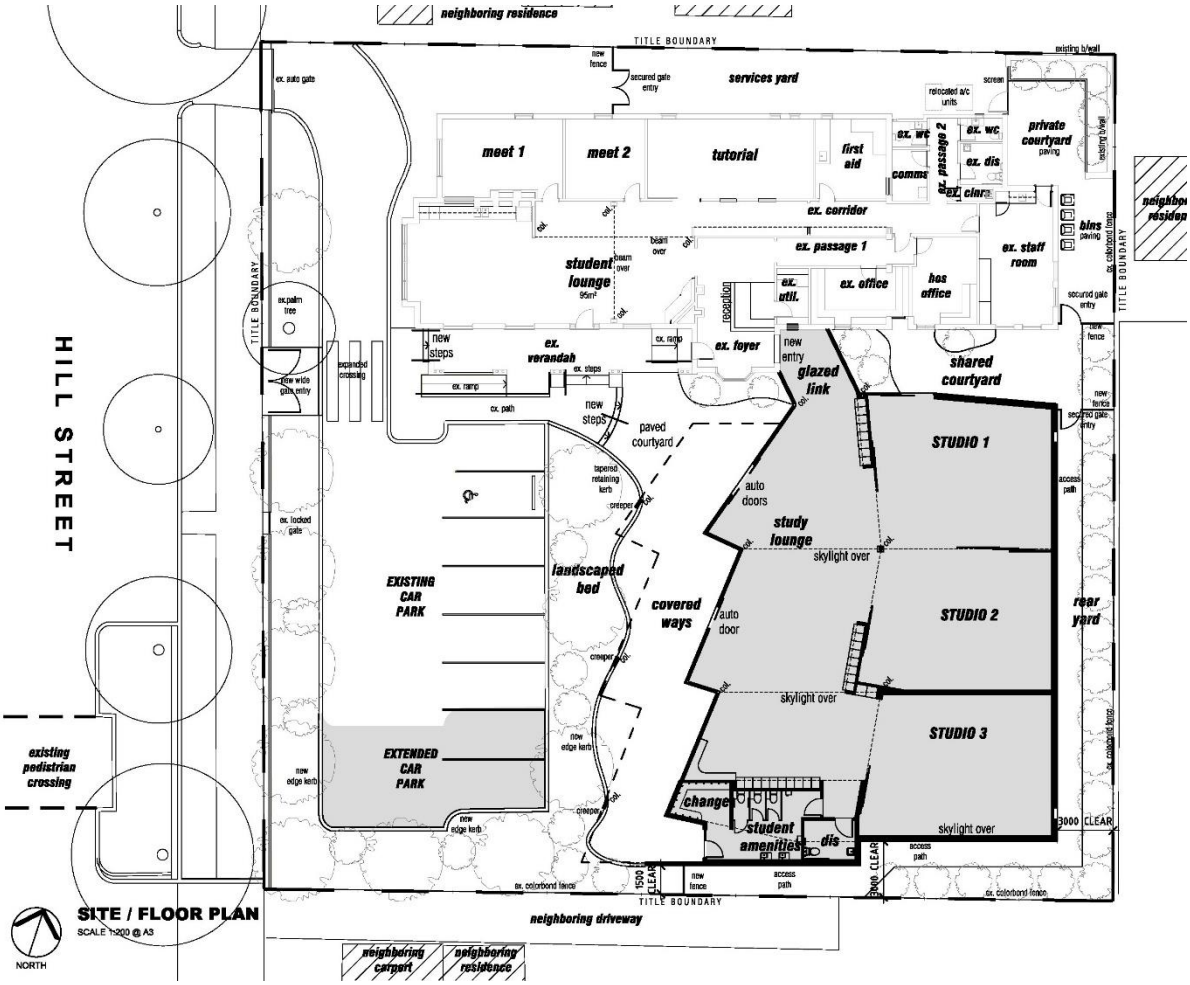
Trees 2-5 are small stature exotic trees with average health and poor structure, and provided only limited benefits to the site and locality.

Photo showing trees 2, 3 and 4

Photo showing trees 4 and 5

Proposed development

I was advised that trees 2-5 are to be removed as part of the proposed development, and tree 1 is to be retained on the site (Refer to drawing below). Some site works are proposed near tree 1, including widening of the existing entry and entry gate. Construction details for the proposed works were not available at the time of the assessment.



Tree protection zone

To protect a tree from the possible adverse impacts of development activities, a tree protection zone[b] (TPZ) is required[c].

AS4970-2009 *Protection of trees on development sites* states that the TPZ of palms, other monocots, cycads and tree ferns should not be less than 1m outside the crown projection (for the purposes of protecting the fronds from building damage). It also states that the tree protection zones in general shall range between 2m and 15m.

The tree protection zone for tree is calculated as follows (Refer to TPZ plan below);

- The TPZ radius[d] from the centre of the trunk = 2.5m (1.5m frond length + 1m)
- The TPZ area for the palm is 20m².

Please note that this radius considers building works adjacent to the fronds. This is not occurring at this site, as the fronds of both palms are located well above the proposed single storey roof line. A lesser TPZ radius of 2m is adequate to protect the root system (see discussion on palm root morphology below).

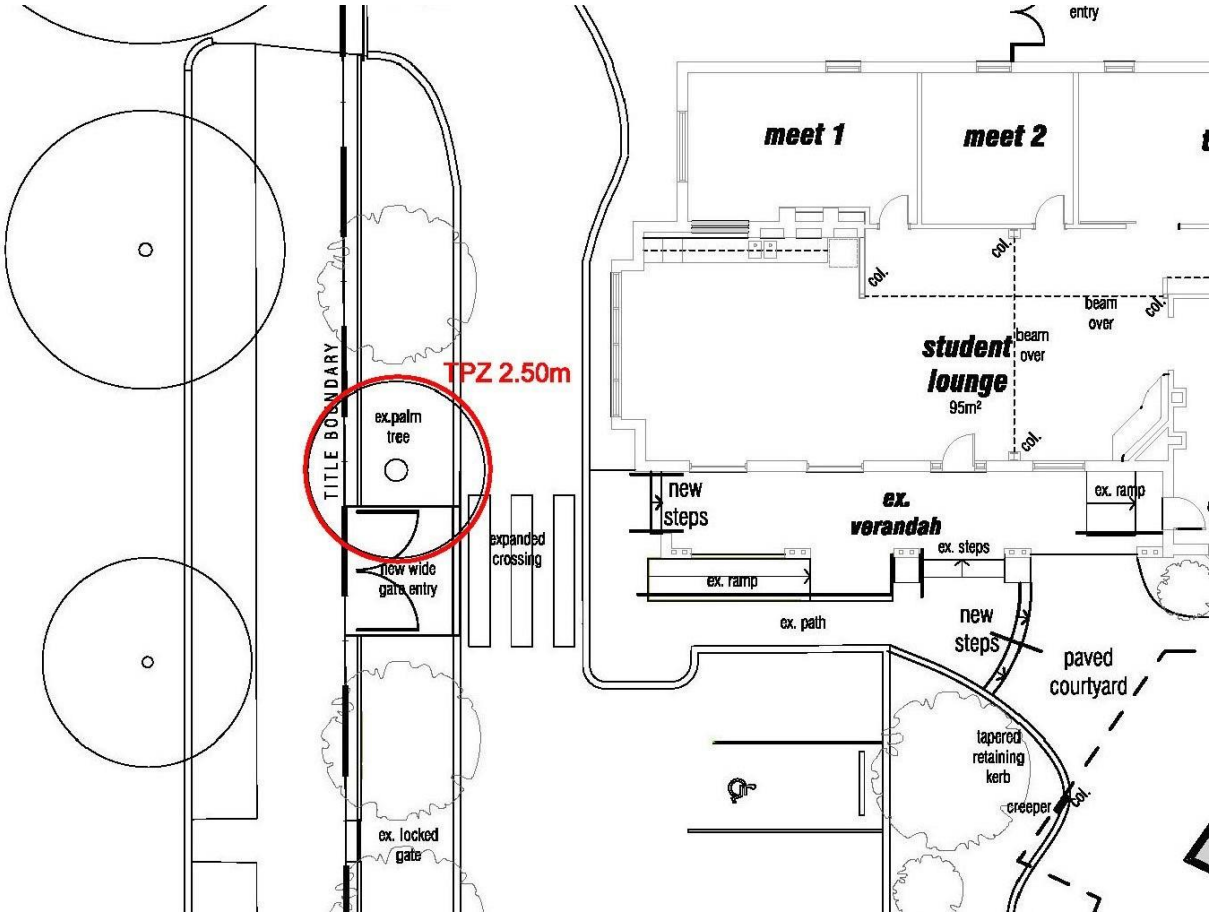
Trees can tolerate some encroachment into their standard TPZ[e].

- The proposed building encroaches into the 2.5m TPZ of tree 1 by ~4.0m² (20%). It encroaches into the lesser TPZ of 2m by ~2.0m² (10%).

The total level of encroachment in this situation is minor and considered acceptable and can be adequately offset by the remaining area around the palms which will remain undisturbed and the TPZ area will remain intact with a modified shape.

Consideration has been given to the morphology of palm roots. The root system of palms consists of adventitious single strands growing out of the base of the trunk. These are continuously being replaced by new roots arising from the root initiation zone at the base of the trunk. Roots of many species generally live for about 3 years but can be much older.

Supplementary roots may be visible at the base of the trunk above the soil surface. They arise from a basal swelling and break through the outer bark in clusters, particularly in older palms.



Tree Protection Zone Plan

Consideration must be given to protecting the palm during the construction works.

Protective fencing is recommended at the full TPZ radius (2m) around the palm. However protective fencing is not practical around the entire TPZ and the fence should follow the edge of the proposed works, the edge of the existing driveway and continue to the existing boundary.

The soil around the palms should be mulched to a depth of 50-100mm using organic material out to ~2m where possible.

Once erected, protective fencing must not be removed or altered without approval by the project arborist. The fencing should be secured to restrict access. Appropriate signage must be placed on the TPZ fence.

Conclusion

On the basis of my observations and discussion, I summarise my conclusions as follows:

- Five trees were assessed none of which qualifies as a regulated or significant tree.
- Four of the trees provide limited benefits and are to be removed as part of the proposed development.
- The existing palm tree contributes to the local streetscape and is to be retained on the site.
- The total level of encroachment on the palm was assessed to be minor and is considered to be acceptable.
- Tree protection measures for the palm are required during the construction phase at the site.

If you have any further queries regarding the information contained in this report please feel free to contact our office.

Yours sincerely

Dr. Martin Ely AILA
B.Arch.
PhD.
Registered Landscape Architect

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Preservation of trees on development sites

Impacts from development activities

Development includes a wide range of activities. These include but are not limited to:

- Demolition of existing structures, surfaces, underground services and vegetation.
- Preparation of the site including earthworks, levelling, battering, trenching and retaining walls.
- Construction activities.
- Installation of underground services.
- Landscaping.
- Paving.
- Fencing.

These activities can affect trees in a number of ways including:

(From the Australian Standard: AS 4970 – 2009, *Protection of trees on development sites*)

- Branch damage from incorrect pruning practices.
- Branch and trunk damage from mechanical injury from trucks, cranes, excavators etc.
- Root damage. (The most common cause of tree damage on development sites)
    - The removal of fine feeder roots reduces the trees ability to assimilate moisture and nutrients for the soil, thereby affecting tree health.
    - Severing roots increases the incidence of fungal, pathogen and insect invasion into the tree, thereby affecting tree health.
    - Lowering of grade, excavation, trenching.
    - Mechanically wounded, crushed or torn.
    - Soil compaction by machinery, storage of materials, and installation of work sheds.
    - Soil builds up.
    - Laying of pavements.
    - Chemical contamination from solvents, fuels, oil, diesel, herbicide, cement, waste etc.
    - Changes in air levels through changes in drainage patterns.
    - Changes in available water.
    - Potential loss of tree stability.
- Soil compaction leads to a range of possible problems including:
    - Reduced soil aeration.
    - Reduced water infiltration.
    - Reduction in soil biodiversity.
    - Reduced uptake of water and nutrients.

A range of strategies are required to minimise these potentially harmful impacts. Certain activities are restricted within the TPZ including, but not limited to:

- Machine excavation and trenching.
- Cultivation.
- Storage.
- Preparation of chemicals and cement products.
- Parking of vehicles and plant.
- Refuelling.
- Dumping of waste.
- Wash down and cleaning of equipment.
- Placement of fill.
- Lighting of fires.
- Soil level changes.
- Temporary or permanent installation of utilities and signs.
- Physical damage to the tree.

A range of specifications to guide the wide variety of development activities that can occur on development sites is set out on the following pages.

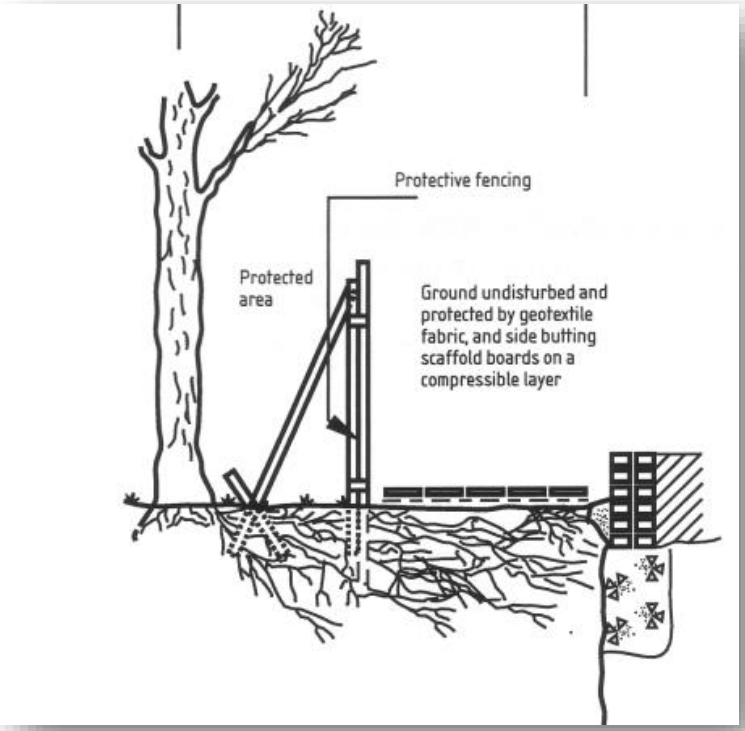
Wherever relevant, these specifications must be followed.

Tree protection zone fencing

1. Allowances should be made in the project budget and program for tree protection measures and costs. This should include site visits, monitoring and certification by the project arborist.

2. Prior to any works occurring, the project manager and construction supervisors must meet on site with the project arborist to review work procedures, access routes, storage areas, parking and tree protection measures.

3. The TPZs of all regulated trees remaining on a site must be marked out and fenced off prior to any works commencing on the site. Some predevelopment work may be undertaken before TPZ fencing is erected in consultation and agreement with the project arborist and local Council. This may include the removal of surrounding trees and the demolition of structures and surfaces within the tree protection zones.



4. Protective fencing must be erected according to the drawings that accompany this tree report.

5. The TPZ fence shall consist of a sturdy 1.8 - 2m high chain mesh, ring-lock, colour bond fence or similar.

    a. If mobile fence panels are used, they must be securely fixed in place so they cannot be moved or the fence easily opened for access.

    b. The fencing must be braced to prevent them from being knocked over.

    c. The use of orange safety bunting is not acceptable as a TPZ barrier unless it is attached to a more substantial, fully secured fence as described above.

6. Weather-proof signage must be displayed on all sides of the protective fencing visible to the construction work. The signage must show the following information. Access to the area within the TPZ is restricted. It requires Arboricultural and Council approval.

7. The entire area within the TPZ fence shall have a 75-100mm layer of organic mulch applied. The mulch should have a mixture course and fine particle sizes. This must be spread by hand, not machinery. This mulch can be retained on site if not contaminated. Alternatively it can be removed from the site at completion of the project.

8. Ground Protection: Pedestrians.

    a. Sufficient space must be allocated between the TPZ fence and site development to allow for any construction work carried out by workmen without shifting the fence or working inside of the protection zone.

    b. Where a TPZ fence has been permitted to be reduced to allow pedestrian construction activities, ground protection measures are required between the TPZ fence and building area.

        I. Install a layer of geotextile fabric on top of the natural ground. Peg to the ground as required

        II. Cover the geotextile with a 100mm thick layer of organic mulch.

        III. Load bearing timber boards (such as scaffold boards) can be placed on top of the mulch to make walking/wheelbarrowing easier if required.

        IV. Remove ground protection materials at completion of the project.

9. Ground Protection: Vehicles.

    a. If the access point for any construction vehicle or machinery passes over the TPZ, a temporary protective roadway will be required. Refer to separate section on temporary access roadways in these specifications.

10. A defined storage area for building materials and hazardous chemicals should be marked out well away from any TPZ as required. If a storage area is to be set up within a TPZ (due to site limitations), then ground protection measures are required.

11. A car parking area for contractors should be marked out well away from the TPZ.

12. A defined wash out area should be marked out well away from any TPZ and waste appropriately managed.

    a. These should be outside of the TPZ and/or 10m from the trunk of any tree, whichever is greater.

b. Contaminated water must not be allowed to drain into the TPZ area.

13. Any variations to these guidelines must not occur without consulting the project arborist and gaining the appropriate approvals from local Council.

Endnotes

[a]**Regulated tree means— (as defined in Section 4 Interpretation (1) of the Development (Regulated Trees) Amendment Act 2009)**

(a) a tree, or a tree within a class of trees, declared to be regulated by the regulations (whether or not the tree also constitutes a significant tree under the regulations); or
(b) a tree declared to be a significant tree, or a tree within a stand of trees declared to be significant trees, by a Development Plan (whether or not the tree is also declared to be a regulated tree, or also falls within a class of trees declared to be regulated trees, by the regulations);

Section 6A—Regulated and significant trees (as defined in the *Development (Regulated Trees) Variation Regulations 2011*)

(1) Subject to this regulation, the following are declared to constitute classes of regulated trees for the purposes of paragraph (a) of the definition of ***regulated tree*** in section 4(1) of the Act, namely trees within the designated area under subregulation (3) that have a trunk with a circumference of 2 metres or more or, in the case of trees with multiple trunks, that have trunks with a total circumference of 2 metres or more and an average circumference of 625 millimetres or more, measured at a point 1 metre above natural ground level.

[b] Tree Protection Zones are areas designated by Arborists for the preservation trees on development sites. TPZs preserve tree root systems and the immediate soil environs as well as protecting the above ground parts of the tree from inadvertent crown or trunk damage. The zone within the TPZ must be monitored and managed by qualified Arborists to avoid the many potentially adverse consequences of uncontrolled development. Management of the crown and improvements to the growing conditions within this zone should occur for several reasons, including compensation for root loss, to reduce plant stress, improve tree form and safety, to improve the growing conditions generally and to extend tree longevity.

[c] The Australian Standard: AS 4970 – 2009, *Protection of trees on development sites* provides guidelines to protecting trees in and around development.

[d] The Tree Protection Zone (TPZ) radius is calculated by multiplying the trunk diameter at 1.4m by a factor of 12. The radius is measured from the centre of the trunk at ground level. A TPZ should not be less than 2m nor greater than 15m (except where crown protection is required). This method is outlined in the Australian Standard AS 4970 – 2009 *Protection of trees on development sites.*

[e] It may be possible to encroach into or make variations to the standard Tree Protection Zone (TPZ). Encroachment includes excavation, compacted fill and machine trenching. **Minor encroachment -** If the encroachment is less than 10% of the TPZ area and is outside the Structural Root Zone (SRZ), detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. Variations must be made by the project arborist considering relevant factors listed on section 3.3.4 of the standard. **Major encroachment -** If the proposed encroachment is greater than 10% of the TPZ area or inside the SRZ, the project arborist must demonstrate that the tree would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors including: location and distribution of roots, the potential number and size of root loss, tree species and tolerance to root disturbance, age, vigour and size of tree, lean and stability of the tree, soil characteristics, volume, topography and drainage, the presence of existing or past structures or obstacles and design factors. From Australian Standard AS 4970 – 2009 *Protection of trees on development sites,* section 3.3.

tree environs

managing trees in the urban landscape

TREE REPORT
Assessment of a Jacaranda tree in relation to a development at 112 Barnard Street North Adelaide

Prepared for:
Kon Michael
Associate
Swanbury Penglase
244 Gilbert St
Adelaide SA 5000

30 January 2017

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Summary

The legal status of the *Jacaranda mimosifolia* is to be confirmed. The tree provides a range of benefits and should be retained on the site if possible. The tree is in good health and is not considered to have a short life expectancy. The tree exhibits sound structure and does not pose an unacceptable risk to public or private safety at this point in time. The proposed landscaping works have the potential to impact on tree health and stability. The development in relation to the tree is considered acceptable provided that a range of 'tree sensitive' construction methods are adopted. A range of tree protection measures will be required during the construction phase at the site.

Introduction

Brief

I carried out an assessment of a Jacaranda tree at 112 Barnard Street, North Adelaide on the 21st January 2017 following a request from Kon Michael, Associate at Swanbury Penglase

I was requested to assess the legal status of the tree, tree condition, tree retention suitability and tree management requirements. I am also to assess the possible impacts of the proposed development activities at the site on the tree and to recommend strategies to minimise these possible impacts.

Qualifications

I have twenty five years' experience in the field of landscape architecture. A summary of my qualifications includes:

- Bachelor of Architecture, University of Adelaide 1991
- PhD, School of Earth and Environmental Sciences, University of Adelaide 2010. '*Integrating Trees into the Design of the City: Developing More Sustainable Practices for Planting Street Trees in Australian Cities'*
- Dip. Horticulture (Arboriculture)
- Member Australian Institute of Landscape Architects (AILA)
- Registered landscape Architect

Documents and information provided

I was provided with the following documents to assist me in the preparation of this report;

- *Detail Survey* Ref 16255 sheets 1-2 by State Surveys dated 11/04/13.
- *Architectural drawings St Dominics Priory College Redevelopment - Proposed ELC Centre and Year 12 Centre* : *SK16038 06A-09* (dated 28 July 2016 Rev B) by Swanbury.

Relevant background information

Swanbury Penglase are preparing plans to convert an existing residential dwelling and garden into an Early Learning Centre and outdoor nature play space. A Jacaranda tree is located in the rear yard of the property adjacent to an existing in-ground swimming pool. The existing St Dominincs Priory College adjoins the development site to the north.

Scope of this report

This report is concerned with the subject tree and drawings provided by Swanbury Penglase architects only.

Observations

Site visit

I carried out the assessment at the site on the 21st January 2017.

I had full access to the tree in question and observations were from what was visible from within and around the property boundaries. I carried out a level 2 assessment of the tree[a] and all my observations were visual from ground level[b]. All dimensions marked (~) are estimates.

Site description

The site comprises a residential allotment occupied by a single storey dwelling. A Jacaranda tree is located in the rear yard of the property adjacent to an existing in-ground swimming pool. The existing St Dominincs Priory College adjoins the development site to the north (Please refer to the aerial photo below).

Identification of tree

Jacaranda mimosifolia or **Jacaranda**. The Jacaranda is a deciduous, moderately fast growing tree from Brazil. It grows 12-15m tall and approximately the same in diameter, but often less on unfavourable sites. This species requires pruning to ensure there is only a single main stem and develops a rounded crown of large side branches tapering to dense, twiggy extremities. The foliage comprises compound, opposite, bi-pinnate leaves to 30-40cm's long, with up to 20 pairs of pinnae, each with 30-50 or more leaflets 1-1.5mm long and 3-4mm wide. The leaves fall in August September after changing to a deep yellow, regrowing in late November to early December. The large terminal panicles of purple to lavender flowers occur spectacularly from late October to early December. The species is tolerant of most soil types and pH's and is moderately drought tolerant. Used extensively as a street tree in many parts of the world, the Jacaranda is also a common garden tree. It has a moderate tolerance to disturbance within the root zone. Jacarandas tend to produce water sprouts, vigorous upright shoots that grow straight up out of the branches. These should be thinned out if possible because they damage overall branch structure of the tree and are often weakly attached.

The tree is located on the site as follows (Refer to survey plan below):

- ~4.8m from the existing in ground swimming pool to the south.
- ~19.5m from the dwelling to the south.
- ~3.0m from the two storey masonry wall of the school building to the north.
- ~3.5m from the site boundary and brick building wall to the west.
- ~11.0m from the site boundary and masonry wall to the east.
- ~1.2m from an area of open jointed paving to the east.
- The tree is located in a generally permeable environment in an area of irrigated lawn.

Photo showing tree location and growing environment.

Tree dimensions

Height	~12m
Crown spread	~12m
Trunk circumference 1m above ground level	3.92m (3 stems)
Diameter at breast height (DBH) [c]	920mm
Diameter above root flare	670mm

Legal requirements

Trees with a trunk circumference greater than 3.0m qualify as a significant tree[d] under the *Development Act 1993.*

Certain trees are exempt from being a regulated tree under the *Development Regulations 2008* (17.11.2011) as follows:

6A—Regulated and significant trees

(5) Subregulations (1) and (2) do not apply—

(a) to a tree located within 10 metres of an existing dwelling or an existing in-ground swimming pool, other than a tree within 1 of the following species of trees:

Agonis flexuosa (Willow Myrtle)
Eucalyptus (any tree of the species)

The subject tree is located ~4.8m from the existing in ground swimming pool and is not one of the above species and would not therefore qualify as a significant tree.

Under the *Adelaide (City) Development Plan (Consolidated 24 September 2015)* however trees or groups of trees (identified in Table Adel/5) may also be declared as significant.

The subject tree appears to be identified as a significant tree in the Policy Areas Map Adel/38 however it does not appear to be listed in Table Adel/5 for properties in Barnard Street North Adelaide. The legal status of the tree requires clarification with council.

I understand that the swimming pool is to be removed as part of the proposed development, in which case the tree would no longer qualify as an exempt tree under the *Development Regulations 2008.*

In the following assessment the tree is assumed to be a significant tree.

The Principle of Development Control 299 of the *Adelaide (City) Development Plan (Consolidated 24 September 2015)* states:

Where a significant tree or group of trees has one or more of the following attributes, development should preserve these attributes.

The following table indicates my opinion on how the significant tree at the site relate to these attributes.

(a) Does the tree make an important contribution to the character or amenity of the local area[e]?	Yes	This tree makes a contribution to the amenity of the site and the adjacent properties. The tree species is also part of the existing character of the local area.
(b) Is the tree indigenous to the local area and its species is listed under the National Parks and Wildlife Act as a rare or endangered native species?	No	An exotic tree species.
(c) Does the tree represent an important habitat for native fauna[f]?	No.	An exotic tree species.
(d) Is the tree part of a wildlife corridor of a	No.	An exotic tree species.

remnant area of native vegetation?		
(f) Is the tree important to the maintenance of biodiversity in the local environment?	No.	An exotic tree species.
(g) Does the tree form a notable visual element to the landscape of the local area?	No.	This medium sized tree is located at the rear of the allotment adjacent to a two storey wall and is not visible over a wide area.

In my opinion, this tree possesses an attribute worthy of preservation.

Tree health

This tree is in good health with good foliage colour, distribution and density. The foliage is free of notable pests.

Tree structure

This tree's structure consists of a single trunk, dividing to three primary branches at ~1.0m height, supporting an upright crown. Stem unions throughout the crown appear to be sound. There is evidence of past pruning to provide clearances to the two storey building to the north and over the swimming pool. There are a large number of epicormics stems in the crown as a result of past pruning. Good wound wood[g] development is occurring around the margins of these pruning cuts. Most of the epicormics stems appear to be well attached. I found no evidence of recent branch failure from the crown of the tree. I found no notable defects in the crown

.

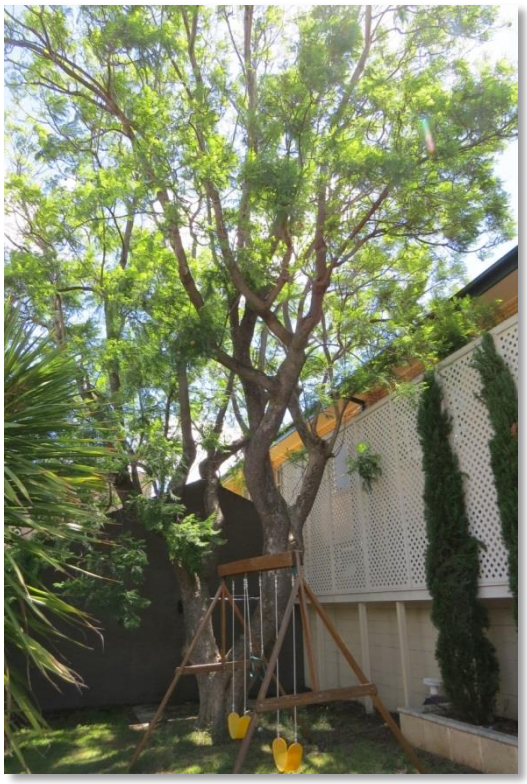


Photo showing tree structure.

Proposed development activities

The proposed development activities at the site include the following:

- Demolition of the existing swimming pool located ~4.8m from the tree and filling of the excavation.
- Construction of a new pathway connecting to the existing school building on the adjacent allotment, located ~1.3m from the tree.
- Construction of a new shed structure adjacent to the existing boundary wall to the west of the tree. The edge of the shed is located ~1.3m from the tree. I was advised that the shed is to be of lightweight construction and installed on open jointed pavers laid at ground level with footing limited to tie downs for the structure.
- Construction of a new covered sand pit in part of the area where the pool is located ~4.8m from the tree.
- Construction of a range of outdoor surfaces and structures around the tree including a soft play area, nature play areas and deck.
- Construction details and specifications for the proposed landscaping works were not available at the time of the assessment.

Photo showing location of proposed shed structure.

Appraisal

Tree attributes

The legal status of this tree is to be confirmed; however it provides a range of benefits to the site and would be an asset if integrated into the proposed outdoor play area.

Tree health

This tree is in good health and does not have a short life expectancy. If the growing environment is protected from the potentially adverse impacts of the entire development process and well maintained in the future, this tree will remain an asset at the site for many years. Improvements to the growing environment should include the application of organic mulch. Landscaping activities should be low impact and keep the requirements of the tree in mind.

Tree structure

The tree is free of notable structural defects at this point in time. With the new development, the area around the tree may be used for a larger part of the day. Excessive pruning of the tree is to be discouraged and should be limited to the removal of deadwood and removal of the large epicormics stem at the pruning cut on the western side of the tree (see photo below).

This pruning must not remove tree parts excessively and must not be performed by building contractors. All pruning must conform to the Australian Standard AS 4373 – 2007 *Pruning of Amenity Trees.* All pruning should be carried out or supervised by appropriately qualified and experienced arborists.

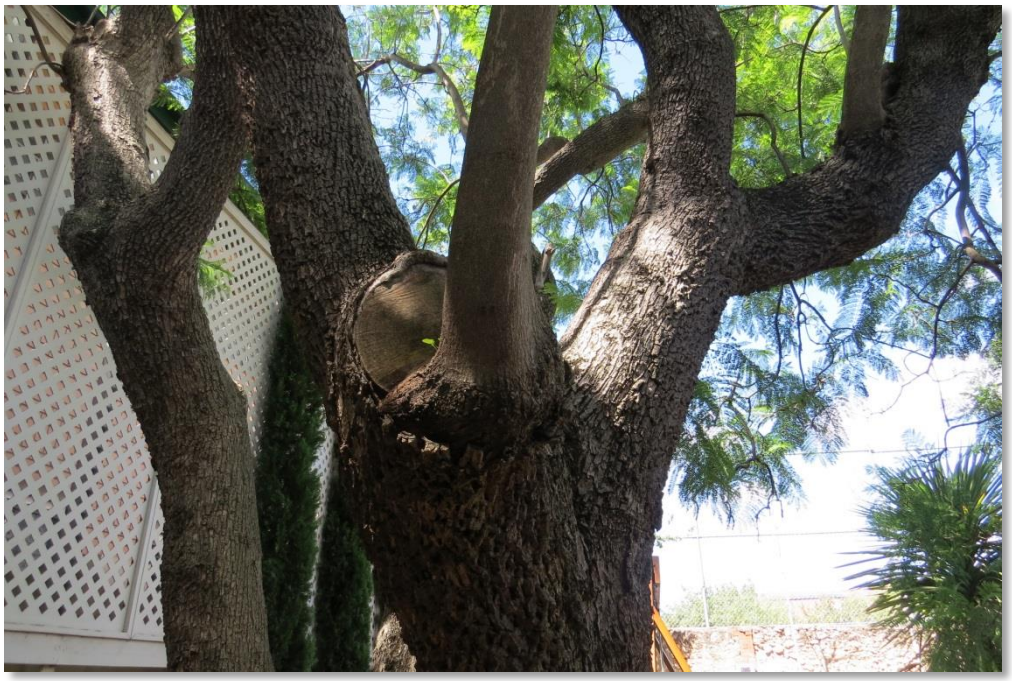


Photo showing epicormic stem recommended for removal.

Damage to structures

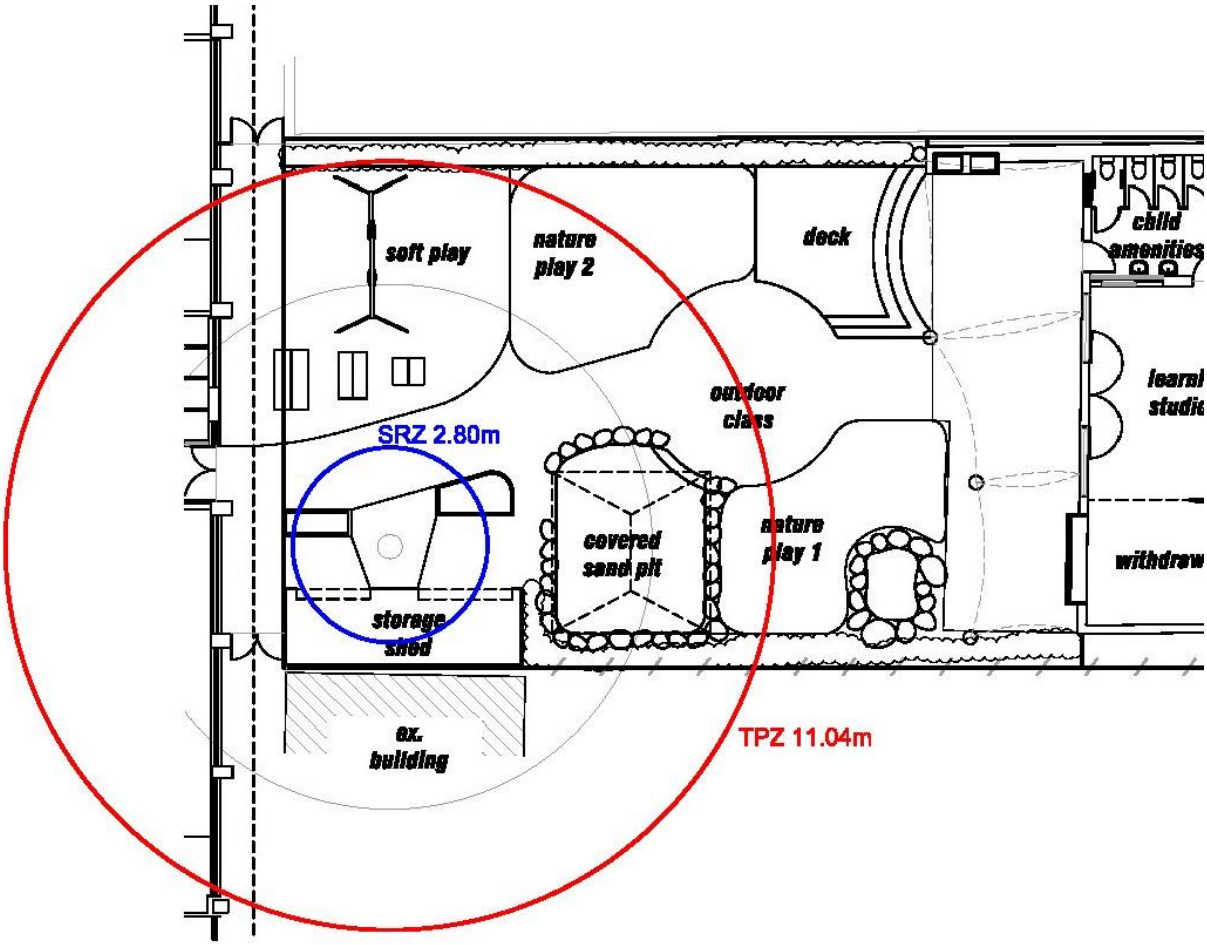
I was not advised of any evidence that the tree is causing or threatening to cause substantial damage to surrounding substantial structures of value.

Tree Protection Zone

To protect a tree from the possible adverse impacts of development activities, a tree protection zone[h] (TPZ) is required.

The tree protection zone for this tree is calculated as follows (refer to TPZ plan below);

- The TPZ radius[i] from the centre of the trunk = 11.04m
- The TPZ area[j] around tree = 382m²
- The Structural Root Zone[k] (SRZ) radius from the centre of the trunk = 2.80m



Trees can tolerate some encroachment into their standard TPZ[I]. The tree species *Jacaranda mimosifolia* is considered to have a moderate tolerance to root disturbance and development activities.

In assessing potential development impacts, consideration has been given to existing site occupancy within the TPZ.

- The existing school building on the adjacent allotment encroaches into the TPZ by ~81.0m² (21.0%). This building has been established for some period of time and the tree would have adapted to its presence.
- The existing in ground pool encroaches into the TPZ by ~28.0m² (7.4%). As the pool is to be removed as part of the development, this area will become available to the trees root system and will offset any new encroachments to some extent. This will depend on the installation of an appropriate type of fill in the excavated area.

The new works within the TPZ have the potential to impact on tree health. Any works within the SRZ also have the potential to impact on tree stability. These impacts can be offset by the adoption of 'tree sensitive' construction methods for the proposed works as outlined in section 3.3.4 TPZ encroachment considerations in Australian Standard AS 4970-2009 *Protection of trees on development sites.*

The following guidelines are provided for the design team in the detailed design of the proposed landscaping works.

TPZ fencing

- Protective fencing must be erected around the tree prior to any development activities commencing. Ideally the TPZ fence should be set up at the standard TPZ radius. This is not practical at this site and the TPZ fencing should follow the SRZ of the tree. Once erected, protective fencing must not be removed or altered without approval by the project arborist. The fencing should be secured to restrict access. Appropriate signage must be placed on the TPZ fence.

- Mulching within the protective fencing should occur prior to the fencing being erected. Mulches should be organic in origin, contain a mixture of coarse and fine particles and should be slightly aged. Mulches should be 75-100mm thick and applied out to the TPZ fence.

- The fence may be removed at the later stages in the project to allow completion of the landscaping works.

- This fence shall be set up according to the guidelines for TPZ fencing attached.

Demolition works

- The demolition of the existing pool will require heavy machinery to move about on the site. If they work within the TPZ area, they can potentially compact the soil and damage tree roots, trunks and branches. Demolition works should proceed with care and under the supervision of the project arborist. Any machinery must work with caution adjacent to the tree by removing material in a retreating fashion, starting at the tree and working away from the tree.

- The area occupied by the existing pool should be filled in an appropriate manner to encourage root colonization by the tree. The base material should be of an appropriate soil material and the top 600mm of soil should comprise an uncompacted, light textured sandy loam.

- Demolition activities must adhere to the guidelines attached.

Works within the SRZ

- Any excavation or sealing of surfaces should be avoided within the SRZ. Ideally the area of the SRZ should comprise mulched garden bed to promote tree health. Consideration should be given to modifications to the design to locate the proposed shed and pathway further from the tree. If this is not feasible then 'tree sensitive' construction methods must be adopted.

- The proposed shed should be constructed without any continuous trenching for footings within the TPZ. Any footings should comprise pier footings. These should be located outside of the SRZ. The base for the proposed shed should comprise open jointed pavers laid above ground to avoid sealing of surface and to avoid excavation.

Works within the TPZ

- Storage, waste disposal, mixing and wash out areas must be clearly defined, well away from the tree protection zone.

- Any new surfaces within the TPZ should maintain soil porosity and should be installed using a 'no-dig' method where possible. This would include the use of surface such as porous softfall, playground mulch or open jointed pavers laid on a sand base.

- Any new structures within the TPZ should use pier and beam flooring rather than continuous trenching.

- Any underground services should be routed outside of the TPZ area. If underground services must pass through a TPZ, they must utilise underground boring methods, hydro excavation or manually excavated trenches where tree roots are left intact and undamaged.

- Landscaping activities must avoid disturbance to the root system. Refer to landscaping guidelines attached.

If all of these strategies to minimise the impacts on the tree are observed, there will be a minimal impact on the long term health of the tree. These guidelines should form part of the Conditions of approval for the development of the site.

Conclusion

On the basis of my observations and discussion, I summarise my conclusions as follows:

- The legal status of the *Jacaranda mimosifolia* is to be confirmed.
- The tree provides a range of benefits and should be retained on the site if possible.
- The tree is in good health and is not considered to have a short life expectancy.
- The tree exhibits sound structure and does not pose an unacceptable risk to public or private safety at this point in time.
- The proposed landscaping works have the potential to impact on tree health and stability.
- The development in relation to the tree is considered acceptable provided that a range of 'tree sensitive' construction methods are adopted.
- A range of tree protection measures will be required during the construction phase at the site.

As this tree qualifies as a significant tree, an application must be made to your local council to approve this development in relation to this tree. While I believe the recommendations made above are the most appropriate to minimise the impacts on the tree, Council may take an alternative point of view and refuse consent. Development activities cannot occur until appropriate planning approvals have been granted from your local Council. These approvals must be shown to all contractors prior to commencement of works.

If you have any further queries regarding the information contained in this report please feel free to contact our office.

Yours sincerely

Dr. Martin Ely AILA
B.Arch.
PhD.
Registered Landscape Architect

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Preservation of trees on development sites

Impacts from development activities

Development includes a wide range of activities. These include but are not limited to:

- Demolition of existing structures, surfaces, underground services and vegetation.
- Preparation of the site including earthworks, levelling, battering, trenching and retaining walls.
- Construction activities.
- Installation of underground services.
- Landscaping.
- Paving.
- Fencing.

These activities can affect trees in a number of ways including:

(From the Australian Standard: AS 4970 – 2009, *Protection of trees on development sites*)

- Branch damage from incorrect pruning practices.
- Branch and trunk damage from mechanical injury from trucks, cranes, excavators etc.
- Root damage. (The most common cause of tree damage on development sites)
    - The removal of fine feeder roots reduces the trees ability to assimilate moisture and nutrients for the soil, thereby affecting tree health.
    - Severing roots increases the incidence of fungal, pathogen and insect invasion into the tree, thereby affecting tree health.
    - Lowering of grade, excavation, trenching.
    - Mechanically wounded, crushed or torn.
    - Soil compaction by machinery, storage of materials, and installation of work sheds.
    - Soil builds up.
    - Laying of pavements.
    - Chemical contamination from solvents, fuels, oil, diesel, herbicide, cement, waste etc.
    - Changes in air levels through changes in drainage patterns.
    - Changes in available water.
    - Potential loss of tree stability.
- Soil compaction leads to a range of possible problems including:
    - Reduced soil aeration.
    - Reduced water infiltration.
    - Reduction in soil biodiversity.
    - Reduced uptake of water and nutrients.

A range of strategies are required to minimise these potentially harmful impacts. Certain activities are restricted within the TPZ including, but not limited to:

- Machine excavation and trenching.
- Cultivation.
- Storage.
- Preparation of chemicals and cement products.
- Parking of vehicles and plant.
- Refuelling.
- Dumping of waste.
- Wash down and cleaning of equipment.
- Placement of fill.
- Lighting of fires.
- Soil level changes.
- Temporary or permanent installation of utilities and signs.
- Physical damage to the tree.

A range of specifications to guide the wide variety of development activities that can occur on development sites is set out on the following pages.

Wherever relevant, these specifications must be followed.

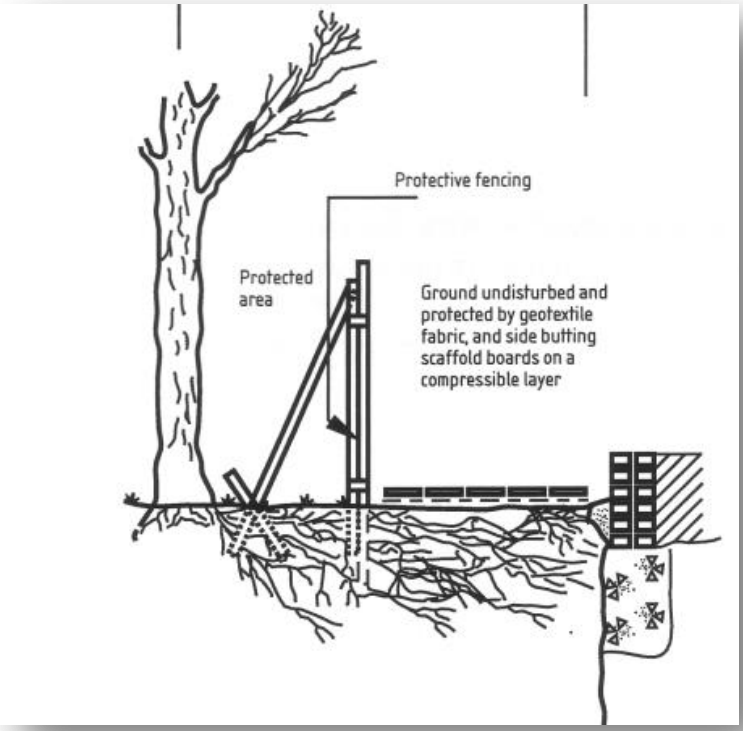
Failure to follow the required specifications may result in damage to the tree which could constitute a tree damaging activity[m]. Such damage is a breach of the *Development Act 1993.*

Tree protection zone fencing

1. Allowances should be made in the project budget and program for tree protection measures and costs. This should include site visits, monitoring and certification by the project arborist.

2. Prior to any works occurring, the project manager and construction supervisors must meet on site with the project arborist to review work procedures, access routes, storage areas, parking and tree protection measures.

3. The TPZs of all regulated trees remaining on a site must be marked out and fenced off prior to any works commencing on the site. Some predevelopment work may be undertaken before TPZ fencing is erected in consultation and agreement with the project arborist and local Council. This may include the removal of surrounding trees and the demolition of structures and surfaces within the tree protection zones.



4. Protective fencing must be erected according to the drawings that accompany this tree report.

5. The TPZ fence shall consist of a sturdy 1.8 - 2m high chain mesh, ring-lock, colour bond fence or similar.

    a. If mobile fence panels are used, they must be securely fixed in place so they cannot be moved or the fence easily opened for access.

    b. The fencing must be braced to prevent them from being knocked over.

    c. The use of orange safety bunting is not acceptable as a TPZ barrier unless it is attached to a more substantial, fully secured fence as described above.

6. Weather-proof signage must be displayed on all sides of the protective fencing visible to the construction work. The signage must show the following information. Access to the

area within the TPZ is restricted. It requires Arboricultural and Council approval.

7. The entire area within the TPZ fence shall have a 75-100mm layer of organic mulch applied. The mulch should have a mixture course and fine particle sizes. This must be spread by hand, not machinery. This mulch can be retained on site if not contaminated. Alternatively it can be removed from the site at completion of the project.

8. Ground Protection: Pedestrians.

    a. Sufficient space must be allocated between the TPZ fence and site development to allow for any construction work carried out by workmen without shifting the fence or working inside of the protection zone.

    b. Where a TPZ fence has been permitted to be reduced to allow pedestrian construction activities, ground protection measures are required between the TPZ fence and building area.

        I. Install a layer of geotextile fabric on top of the natural ground. Peg to the ground as required

        II. Cover the geotextile with a 100mm thick layer of organic mulch.

        III. Load bearing timber boards (such as scaffold boards) can be placed on top of the mulch to make walking/wheelbarrowing easier if required.

        IV. Remove ground protection materials at completion of the project.

9. Ground Protection: Vehicles.

    a. If the access point for any construction vehicle or machinery passes over the TPZ, a temporary protective roadway will be required. Refer to separate section on temporary access roadways in these specifications.

10. A defined storage area for building materials and hazardous chemicals should be marked out well away from any TPZ as required. If a storage area is to be set up within a TPZ (due to site limitations), then ground protection measures are required.

11. A car parking area for contractors should be marked out well away from the TPZ.

12. A defined wash out area should be marked out well away from any TPZ and waste appropriately managed.

    a. These should be outside of the TPZ and/or 10m from the trunk of any tree, whichever is greater.

    b. Contaminated water must not be allowed to drain into the TPZ area.

13. Any variations to these guidelines must not occur without consulting the project arborist and gaining the appropriate approvals from local Council.

Demolition and site clearing activities

1. Allowances should be made in the project budget and program for tree protection measures and costs. This should include site visits, monitoring and certification by the project arborist.
2. The relevant contractors should meet with the project arborist on the site prior to works proceeding to discuss all work procedures, access routes and tree protection measures.
3. Tree Protection Zone fencing and suitable ground protection shall be established at this point in time prior to any further demolition activities occurring. Refer to TPZ fencing guidelines.
4. Existing underground services should not be removed within a TPZ. These should be sealed off and left intact. If they must be removed, please consult with the project arborist.
5. Mini excavators and hand tools (such as Kangas, mini-jackhammers, crowbars, shovels and spades) can to be used to remove hard surfaces within the TPZ. Heavy machinery must be avoided.
6. When removing concrete/paved surfaces within a TPZ, it is expected that there will be a proliferation of fine roots on the soil surface.
    a. Hand tools should be used to remove these hard surfaces. Hand tools should be used to remove these hard surfaces. Alternatively, lightweight machinery can be used to pull up these hard surfaces. The wheels of the machinery should be standing on the hard surface away from the tree. The material can be lifted up carefully and pulled back away from the tree. The works should proceed in a retreating manner, away from the tree.
    b. Exposed roots shall be irrigated by hand and covered with a 75-100mm layer of mulch as soon as possible after being exposed.
    c. Alternatively, exposed roots could be protected from desiccation by placing Hessian cloth (or similar) on top that is kept moist by periodic wetting.
    d. This must remain in place until the new surfaces are put into place.
7. No stockpiling of debris, soil or any other material within the TPZ.
    a. Debris must be piled outside of the TPZ area or removed from site immediately.
8. Lowering or raising of the grade within the TPZ is not acceptable without specific Council approvals. Suitable measures are required minimise the potentially adverse impact on affected parts of the root system.

Site preparation and earthworks

1. Allowances should be made in the project budget and program for tree protection measures and costs. This should include site visits, monitoring and certification by the project arborist.
2. The building contractor and associated sub contractors should meet with the project arborist on the site prior to works proceeding to discuss all work procedures, access routes and tree protection measures.
3. TPZ fencing and ground protection shall be established prior to any site preparation or construction activities occurring. Refer to TPZ fencing guidelines.
4. Any permitted earthwork activities within and adjacent to the TPZ shall be carried out by machinery as carefully as possible to avoid damage to surrounding trees. The wheels of heavy machinery should be placed outside the TPZ to avoid soil compaction where possible, or suitable ground protection measures put into place. The project arborist must be on site during these activities within a TPZ.
5. No stockpiling of debris, soil or any other material within the TPZ. These materials are to be stockpiled outside the area or removed from the site immediately.
6. No lowering of grade within a TPZ. The soil surface can be skimmed by removing loose organic matter, turf or old gravel surfaces carefully using hand tools or with a trimming bucket of a small excavator standing off the TPZ to establish new levels. Skimming of the surface should cease when fine tree roots are encountered and should not exceed 50-80mm below the original level.
7. Continuous trenching activities for footings or underground services must not occur within a TPZ unless the level of encroachment is deemed to be acceptable by the project arborist and approved by Council. Alternative footing designs should be considered such as pier and beam, screw piles, suspended slabs, radial strip footings, or cantilevered sections, all above natural ground level.
8. Underground services must not be installed using a continuous open trench within the TPZ unless the level of encroachment is deemed to be acceptable.
    a. Alternative methods for installing underground services should be considered, such as underground directional boring, manual excavation or similar where tree roots are left intact.
9. Any excavations that must be undertaken within a TPZ should be undertaken carefully by hand, avoiding damage to the protective bark covering larger roots.
    a. Roots smaller than 30mmØ may be pruned back (preferably to a side branching root) using sharp pruning tools (such as secateurs or handsaws).
    b. Roots larger than 30mmØ should only be pruned after consultation with the project arborist.

Construction activities

1. Scaffolding for construction activities should not interfere with trees to be retained on site.

    a. Minor pruning may be permitted to facilitate the installation of scaffolding.

    b. Any pruning required to set up scaffolding must be approved by Council and performed by qualified arborists, not building staff.

2. Trees must be well protected with fencing and other suitable ground protection during all phases of the construction process. (Refer to TPZ fencing guidelines).

3. Parking areas for building staff and sub contractor vehicles must be clearly defined, well away from tree protection zones.

4. A defined delivery and storage area for building materials and hazardous chemicals should be marked out well away from any TPZ as required. If a storage area is to be set up within a TPZ (due to site limitations), then ground protection measures are required.

5. Areas for waste disposal and skip bins must be clearly defined, well away from the tree protection zone. If skips are to be set up within a TPZ (due to site limitations), then ground protection measures are required.

6. Areas for mixing and wash out areas must be clearly defined, well away from the tree protection zone.

Sustainable paving systems

Development in proximity to urban trees, including engineering infrastructure such as road pavements, can impact on tree health and stability. This includes impacts on the tree's root system due to:

Grade Changes: Pavement preparation often involves grade changes to obtain a level surface.

- Lowering of the soil level (cut) can remove tree roots, including fine non woody feeding roots that may not be clearly visible. This reduces root function which may adversely affect tree health.
- Severing of larger tree roots can encourage pathogens to enter a tree which may adversely affect tree health. Pathogens include fungi, bacteria, termites and other insects.
- Severing large roots close to a tree (within the structural root zone) has the potential to adversely affect tree stability which may result in whole tree failure.
- Increasing the grade (fill) can reduce soil oxygen levels in the existing root zone. This can affect root function and may result in root death. This in turn may have an adverse impact on tree health.
- The depth of base course preparations will vary depending on the intended load. Trafficable areas will require a deeper preparation while pedestrian areas can be shallower. This must be taken into account when preparing for paved areas.

Soil Compaction: Excessive soil compaction increases soil bulk density, reduces soil pore spaces, reduces moisture infiltration and reduces gaseous exchange. This occurs in the installation stage, and subsequently from regular vehicle movement.

Tree roots require soil with adequate pore spaces to allow the free movement of moisture, oxygen and other gasses in and out of the root zone. Soil compaction reduces gaseous exchange, affecting long term tree health.

Surface Sealing: Impervious paving materials seal the surface above a root system reducing moisture infiltration and gaseous exchange between the atmosphere and root zone. Depending on the total area of the root zone affected, there may be an adverse impact tree health.

Tree roots may cause movement of non-engineered surfaces as the root system enlarges. The design of the paved surface should take the possibility of root disturbance into consideration. All surface structures should be appropriately engineered where possible and be located at suitable distances from trees.

Damage to concrete generally requires large areas to be repaired which can be more disruptive and expensive. Unit paved surfaces undergo similar disruption as a result of root growth. Removal and replacement of only the affected sections facilitates easier and less costly repair work.

Strategies to minimise impacts:

Where development within the tree's root zone is unavoidable, a 'tree literate' or 'tree friendly' approach should be adopted. This aims to meet both the necessary engineering requirements, while at the same time creating an environment which meets the needs of the tree for healthy root growth and subsequent tree health. In recent years there have been two significant innovations in 'tree friendly' design: 'permeable pavements, and 'structural soils'.

Permeable paving

Permeable paving systems allow infiltration into the soil while still supporting pedestrian and vehicle loads. These systems have Water Sensitive Urban Design benefits including reducing runoff (volumes and timing) and the associated demands on stormwater systems, increased infiltration into local soils, opportunities for stormwater harvesting and reuse, and improving water quality. They also have potential benefits for trees through increased infiltration and exhange of gases and nutrients. Permeable pavements also allow multiple use of valuable urban space (e.g. car parking and flood control). There are two main types of permeable 'eco-paving' systems:

1) Systems in which the paver is made of porous material, and water initrates through the paver itself and the joints between pavers (e.g. HydroSTON).
2) Systems in which the pavers are made of impervious materials, but with water infiltrating through enlarged gravel filled gaps (e.g.Ecotrihex) or joints (e.g. Hydrapave) between the pavers

Systems using impervious pavers with drainage joints, such as Ecotrihex, have been used extensively in recent years. Porous concrete pavers such as HydroSTON have been found to have poor abrasion resistance with vehicle loads. Hyrdapave with 5mm gaps is currently the preferred option.

The profile for such a system will depend upon to the specific site conditions but typically comprise:

- 50mm or 80mm (80mm pavers are required if vehicle loads are to be supported) with joints filled with 2-5mm clean aggregate.
- A 30-50mm deep 'bedding layer' of 2-5mm clean aggregate. A single-size (e.g. 5mm) bedding material may result in uneven pavers.10mm gravel is not recommended as it is very difficult to compact.
- Sand should not be used in the bedding layer or in any part of the permeable paving profile due to its very high clogging potential.
- A base course/drainage layer which allows stormwater runoff to drain freely from the paved surface, and infiltrate into the sub-base. The drainage layer is generally 100-300mm deep and comprised of 20mm washed crushed aggregate (no fines).
- A optional geotextile layer may be required between the basecourse and the subgrade, depending on the subgrade material (i.e. clay soils) to prevent clay particles migrating up from below.
- A geofabric layer is not recommended between the bedding and basecourse layers, as it can generate a slip plane and can also lead to accelerated clogging.
- All layers are to be compacted as per AS1289 MDD, however it is not always necessary to compact the sub-base, except in 'weak' bearing capacity soils such as marshland.

It should be noted that the above guidelines are indicative only and require civil engineering input, especially with trafficable pavements.

Structural soils

Structural soils are designed to meet both engineering requirements (including compaction to the required standards to support vehicle loads) while also providing a soil environment friendly to tree root growth. There are a number of options available, including those based on the Cornell University structural soil specification, or SPACE structural soil, developed by David Lawry of TREENET in South Australia. SPACE soil has the attibutes of:

- Low Bulk Density (0.9 t/m^3 uncompacted, 1.0 t/m3 at >95% standard compaction).
- Low penetration resistance for roots.
- High structural strength (CBR 15 -35).
- High Air Filled Porosity > 30% at field capacity.
- High Cation Exchange.

Design Options

While engineering requirements must still be met, design should be adapted where possible to accommodate existing tree roots, in terms of drainage layer thickness, excavation depth, and grades. Permeable paving allows some increased flexibility as surface runoff can be reduced, thereby lessening the need for traditional surface runoff issues. Two design opions are proposed, both of which will require:

- Civil engineering design, to meet required vehicle loads.
- Tree root investiagtions to be conducted prior to construction.

Option 1-Permeable paving on aggregate base

The following profile is recommended.

- 80 mm pavers with 2-5mm aggregate filled joints.
- 30 mm bedding layer (2-5 mm aggregate).
- 200 mm drainage layer of 20mm washed crushed aggregate (100 mm minimum if structural roots present in the top layers of soil).
- Optional geotextile fabric layer (in clay soils).

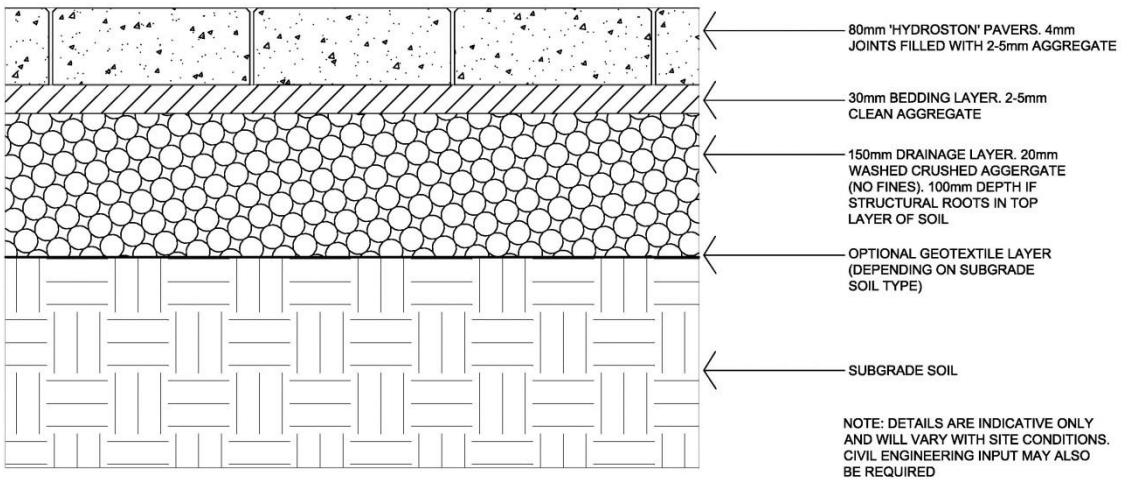
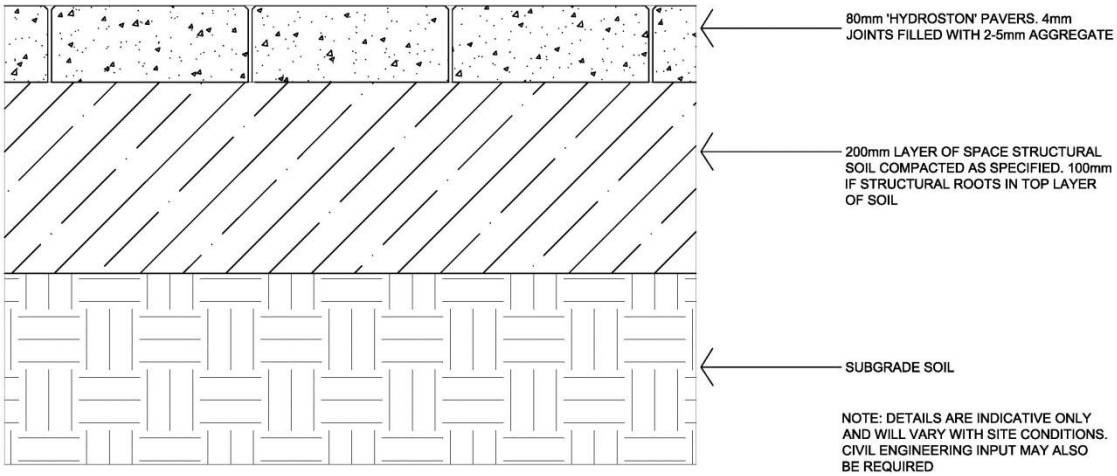


Figure 1: Indicative profile-permeable paving on aggregate drainage layer.

Option 2-Permeable paving on SPACE structural soil base

The following profile is recommended.

- 80 mm pavers with gravel filled with 2-5mm aggregate.
- No bedding layer or geotextile fabric.
- 200 mm drainage layer of SPACE structural soil compacted as specified (100 mm minimum if structural roots present in the top layers of soil).



Pavement installation practices

Prior to the design and installation of paving systems around existing trees, the following should be consideered:

- Installation of the new pavement may require detailed root investigations, especially where work is to be undertaken within the Structural Root Zone. Investigations should be undertaken with non-destructive tools (e.g. Air-Spade/Hydro-Vac) to look for buttressing of the trunk base, and to explore for roots in the top 300 mm of soil.

- Considering the finished paving levels in the design phase of the project. Aim to have the finished pavement level (and levels of surrounding structures) and all base course and bedding course preparations installed using the 'no dig' method. The finished floor levels of any structure may need to be adjusted to accommodate this.

- Levels, cross-falls and excavation depths should be adapted to the presence of structural roots.

- Preserve the soil structure at a suitable bulk density for root growth and function. Avoid excessive soil compaction.

- Prevent physical damage to the roots during construction of the surface. Wherever possible this is achieved by employing a 'no dig' method by avoiding the lowering of the grade within the TPZ.

- Anticipate and cater for potential future growth of the trees root system wherever possible. Paving works very close to a tree are likely to be disrupted as tree roots enlarge.

Specifications: Permeable Paving

1. The project arborist should supervise any pavement work within TPZs.
2. Permeable paving systems should be installed by contractors with experience in installing these systems. They should be supervised or briefed by the project arborist.
3. In some situations, consideration should be given to constructing the final surface prior to the main building works to provide protection for the roots during the construction phase.
4. The soil surface should be carefully skimmed to establish a base for new paved surfaces.
    a. Existing surface coverings should be removed carefully to avoid damage to roots just below the surface (such as existing paving and concrete).
    b. The use of hand tools and lightweight machinery is required within the TPZ.
    c. Heavy machinery is not permitted within a TPZ for the removal of existing pavement. They should work carefully from outside the TPZ, or have ground protection in place when working within the TPZ.
    d. Loose organic matter should be removed carefully using hand tools when working inside of the protection zone.
    e. The natural soil level should not be lowered any more than 50-80mm.
    f. Lowering of grade should cease when any tree roots are encountered, including fine diameter non woody roots.
5. Any excavations which must be undertaken within the TPZ must be carried out carefully by hand or non-destructive excavation tools (Air-Spade or HydroVac).
    a. Prevent damage to the protective bark on larger roots by exposing them and hand cutting where necessary with sharp tools rather than breaking them with machinery.
    b. Exposed roots and the surrounding soil must be protected from desiccation by hand irrigation or protection with hessian cloth (or similar) that is kept moist.
    c. Roots smaller than 30mm in diameter may be pruned back using sharp pruning tools such as secateurs or tree pruning handsaws.
    d. Roots larger than this should only be pruned in consultation with the project arborist.
6. The natural soil structure within the TPZ should be protected from compaction throughout the construction phase. The natural soils below paved surfaces should not be compacted unless absolutely necessary (e.g. carrying heavy vehicle loads). Compaction of natural soils is not

normally necessary for pedestrian or light traffic paving applications. Compaction levels will need to be determined by an engineer in consultation with the project arborist.

7. A geotextile fabric layer can be placed on the prepared natural ground level prior to applying the base course material. Geotextiles act as a filter between layers and prevent the fine particles from the natural ground soils moving up into the base layers, causing them to clog.

8. Level surfaces should be established above the existing natural ground level using porous base course materials where required. If ground levels must be raised, it should be kept to a minimum using the porous materials as described above.

9. It may be necessary to install a Three-dimensional load spreading products (Cellular Confinement Systems) such as 'EcoCell' or 'Geoweb'. This is a system of cells into which the base material is placed. By confining aggregate infill, the system improves load distribution characteristics.

10. This base course material should then be compacted to suit the intended load according to the design specifications. Compaction should be to the minimum level required to support the intended load.

11. The bedding course should be applied directly on top of the base course. Geo-textile fabrics are no longer recommended between these two layers. The bedding course should use a single-graded aggregate to provide good porosity and permeability. Regular paving sand is not suitable for this application and can defeat the purpose of the permeable system.

12. Permeable paving systems should have suitable permeability with open joints or gaps between pavers to allow moisture and gas exchange *between* pavers (preferred). Pavers with a porous material can also be used which allow water to move *through* the material. Some suitable permeable and porous pavers are listed below.

13. The unit pavers should have a single-graded aggregate swept in to fill in the gaps between pavers to ensure adequate air and moisture movement. Regular paving sand is not suitable for this application.

Suppliers and further information for permeable pavements

Hydrapave - http://www.boral.com.au/productcatalogue/product.aspx?product=2240

Ecotrihex and Ecoloc permeable pavers – Adbri Masonry – http://www.adbrimasonry.com.au/design-professional/paving/industrial-paving/ecotrihex-2

Eco Cell™ cellular confinement systems – Geofabrics (Adelaide) Edwardstown. 8293 3613 or www.geofabrics.com.au

Geotextile Fabrics – Geofabrics (Adelaide) Edwardstown. 8293 3613 or www.geofabrics.com.au

Concrete Masonry Association of Australia – Information on permeable paving systems.- http://www.cmaa.com.au/paving_permeable.html

*SPACE. Structurally permeable Aerated Compactable Earth. This material is a by-product of the water filtration industry. The prepared product is available locally through David Lawry on 0418806803. The gravel like material can be compacted to a CBR of 25, yet retains pore space for aeration and water movement. SPACE provides an excellent surface for the laying of unit pavers or other suitable surfaces. It can be used as a growing medium, although the nutrient status and moisture levels of the material require careful management.

Landscaping guidelines around established trees

Established trees may be damaged by a range of landscaping activities that encroach into their tree protection zone. Damage to a regulated tree caused by landscaping may constitute 'tree damaging activity' and constitute a breach of the *Development Act 1993.* These activities may include but are not limited to;

- **Soil compaction** from driving vehicles and/or machinery over the root zone, stockpiling of landscaping materials such as soils, pavers and other materials within the root zone will damage the growing environment and impede root growth.
- **Mechanical damage** from machinery operation or other landscaping activities in the vicinity of trees can damage tree roots, trunk, bark and branches.
- **Soil contamination** from careless use of cement products, herbicides, chemical spills etc.
- **Trenching** for footings, retaining walls, fencing, or underground services may sever tree roots, affecting tree health and stability.
- **Grade changes** for levelling garden and lawn areas and paved or concreted surfaces. The removal of roots by reducing grade can adversely affect tree health and tree stability. Adding soil can smother roots, reduce oxygen availability and reduce root function. Grade changes must be avoided.
- **Driveways, roadways or formed pathways** in the vicinity of trees can degrade the growing environment through sealing of the soil surface, and/or causing soil compaction. Materials used can contaminate the root zone. Careless installation can damage trunks, branches and root systems generally.
- **Tree damage** may result from machinery or people not experienced during tree pruning operations.

Strategies to minimise impacts

To minimise the possible adverse impacts from these activities during landscaping activities, a tree protection zone (TPZ) is required. The TPZ roughly equates to the drip line of the tree, but is accurately calculated in the body of the tree report. All potentially adverse activities must not occur within this zone or must be modified to minimise the impacts. Below is a range of strategies to minimise the impacts on a tree when landscaping the area within the TPZ.

Landscaping guidelines

1. Ideally, the area beneath a tree should have minimal hard landscaping. The landscape design should aim to provide the trees with ideal growing conditions so the trees remain a valuable asset at the site for many years. The root system requires access to air, moisture organic matter and minimal disturbance over as much of the root system as possible.

2. Prior to any works occurring, the landscaping team should meet on site with the project arborist to review the land scape design, work procedures, access routes, storage areas, parking areas and tree protection measures.

3. The removal of existing unwanted vegetation in the vicinity of established trees should be carried out manually with hand tools, not heavy machinery. Removal of larger trees should be carefully dismantled by qualified arborists.

4. The area under each tree should have a 75-100mm layer of coarse structured well composted mulch applied. Mulches should have a mixture of particle sizes such as wood chip and leaf. Fine textured highly processed mulches should be avoided. Mulches generated by tree removals on site could be used. This must be spread by hand, not machinery. Mulches should extend out to the edge of the drip line if possible. If not, consider mulching as large an area as possible. This mulch will add organic matter to the soil, add nutrients, help to improve soil moisture retention, encourage beneficial soil micro-organisms, reduce soil moisture evaporation and help to suppress weeds. Mulch should be topped up every 1-2 years or as required.

5. Supplementary irrigation should be set up as follows;

    a. Use in line drip irrigation (We recommend Netafim AS Techline) with emitters at .3m spacing's connected to a reliable, filtered, pressure reduced water source. Arrange the dripper hose in concentric circles, spiral or grid pattern as best suited to the shape of the area being irrigated with .3 (preferred) -.5m between the lines. Other irrigation arrangements can be considered.

    b. Observe all current water restriction guidelines.

    c. Apply on deep soaking of water, (minimum 3 hours operation) once per week during dry weather. Irrigation should be reduced during cooler wetter periods.

    d. Irrigate in the early morning. Avoid watering during the middle of the day. An electronic water timer should be used to ensure reliability.

    e. Irrigation requirements should be adjusted according to species, soil type and climatic conditions.

    f. Irrigation main lines should be radially arranged in relation to the root system (like spokes of a wheel) rather than traversing the root system. Deep trenching within the drip line of trees must be avoided.

6. Paving works should be kept to a bare minimum within any TPZ. If paving must occur, it must utilize a no dig method, use permeable sub base preparations to minimum soil compaction requirements and utilise permeable unit pavers such as EcoPavers, Permapave or similar.

7. Cultivation of the area under the tree should be kept to a minimum and undertaken with hand tools. Changes in ground level within the root area of established trees should be avoided. Do not build up soil levels by more than 100mm in the vicinity of established trees.

8. Avoid soil compaction within the tree protection zone. Prevent heavy machinery, compactors and vehicles from accessing the area. If they must access the area, ground protection measures are required.

9. Take extreme care when using herbicides in the vicinity of established trees. Target the undesirable plants carefully and follow manufacturer's recommendations. Avoid using herbicides where rain or wind is expected.

10. Under-planting of competitive plants should be kept to a minimum. Minimise the use of turf, dense groundcovers etc.

11. The future size of larger plants and trees should be considered carefully. Plants should be well spaced considering their future growth habit and size.

12. The use of locally indigenous plants should be considered for their habitat, biodiversity and wildlife corridor value.

13. A defined storage area for landscaping materials should be marked out well away from any TPZ.

14. A car parking area for contractors should be marked out well away from any TPZ.

15. If an access point passes over the TPZ a temporary protective roadway is required. This is achieved by placing a layer of geotextile fabric on the natural ground, then a 100mm+ thick layer of mulch with load bearing timbers/steel plates placed on top.

16. All tree pruning should be carried out by qualified arborists.

17. Underground services should be installed outside the TPZ. If they must pass through a TPZ, underground directional boring or manual trenching is required. Tree roots larger than 30mmØ should be left intact.

18. Fences and retaining walls must not use continuous strip footings. Pier and beam, post and pad methods or similar must be used to bridge across the root system.

Endnotes

[a] Tree and risk assessments can be conducted at different levels and may employ various methods and tools. The level of assessment applied should be appropriate for the circumstances.

Level 1 - Limited visual assessment.

- A visual assessment from a specified perspective, near specified targets.
- The aim is to identify obvious defects or specified conditions.
- Typically identifies trees with imminent or probable likelihood of failure.
- This is the fastest and least thorough form of assessment intended for larger populations of trees.
- This can be carried out as a walkover, drive-by or fly-over inspection.

Level 2 - Standard assessment.

- A level 2 assessment is a detailed ground based visual tree inspection of a tree and its surroundings.
- The use of simple tools (mallet, binoculars, probes, spades), may be required.
- In some instances only limited information may be gained on specific internal, below ground or upper crown factors.
- For the majority of tree assessments the standard assessment provides adequate information to guide tree management.

Level 3 - Advanced assessment.

- A level 3 assessment is performed to provide detailed information about specific tree parts, defects, targets or site conditions.
- This assessment is usually conducted after a standard assessment has undertaken if additional information is required and with the approval of the client.
- Specialised equipment is often required for advanced assessment.
- The assessments are generally more time intensive and expensive.
- Advanced assessment techniques may include; aerial inspection, detailed target analysis, detailed site evaluation, decay testing, health evaluation, root inspection, tree stability monitoring and load testing.

NOTE: If tree condition cannot be adequately assessed at the specified level a higher level of assessment may be required.

[b] A visual tree assessment (VTA) is an analytical process undertaken by a qualified Arborist or other suitably trained person to determine the structural soundness of a tree. Biological and mechanical components of trees are assessed, including tree health; presence of pests and diseases, die-back, foliage density and distribution, and vitality; growth rate, wound wood development, capacity to respond to improved conditions. Mechanical components include trunk lean, crown bias, bark inclusions, wounds, hollowing, trunk bulges, ribs, cracks, branch form, failure history, pruning history, condition of trunk flare, and other existing defects. All these factors are examined to determine if internal weaknesses may be present. If abnormalities are detected, we may conduct further investigations using a range of tools. These include sounding mallets, long thin drill bits, Resistograph, Sonic Tomograph, Air spade and other tools as required. Ref: Mattheck. Claus & Breloer, Helga. *The Body Language of Trees. A Handbook for Failure Analysis*. Department of the Environment. London 1997.

[c] Diameter at Breast Height (DBH) is the diameter of the trunk measured at breast height. This measurement is taken at 1.40m above ground level. This is the nominal point measured to determine Tree Protection Zones using the Australia Standard method AS 4970-2009 *Protection of trees on development sites*. When calculating a DBH for a tree with multiple trunks, the combined DBH do not accurately represent the root volume or area and the TPZ becomes exaggerated. Combining DBH in the following formula results in a revised total DBH that better represents the total stem cross sectional area as if it were 1 stem. From this a more proportional TPZ can then be calculated.

Combined DBH = √ ($A^2 + B^2 + C^2$ etc.)

(A, B and C etc. are the DBH of each individual stem)

[d] ***Significant tree*** means **(as defined in Section 4 Interpretation (1) of the *Development (Regulated Trees) Amendment Act 2009*)**

(a)a tree declared to be a significant tree, or a tree within a stand of trees declared to be significant trees, by a Development Plan (whether or not the tree is also declared to be a regulated tree, or also falls within a class of trees declared to be regulated trees, by the regulations); or

(b)a tree declared to be a regulated tree by the regulations, or a tree within a class of trees declared to be regulated trees by the regulations that, by virtue of the application of prescribed criteria, is to be taken to be a significant tree for the purposes of this Act;
6A—Regulated and significant trees (as defined in the *Development (Regulated Trees) Variation Regulations 2011*)

(1) Subject to this regulation, the following are declared to constitute classes of regulated trees for the purposes of paragraph (a) of the definition of ***regulated tree*** in section 4(1) of the Act, namely trees within the designated area under subregulation (3) that have a trunk with a circumference of 2 metres or more or, in the case of trees with multiple trunks, that have trunks with a total circumference of 2 metres or more and an average circumference of 625 millimetres or more, measured at a point 1 metre above natural ground level.

(2) Subject to this regulation—
  (a) a prescribed criterion for the purposes of paragraph (b) of the definition of ***significant tree*** in section 4(1) of the Act is that a regulated tree under subregulation (1) has a trunk with a circumference of 3 metres or more or, in the case of a tree with multiple trunks, has trunks with a total circumference of 3 metres or more and an average circumference of 625 millimetres or more, measured at a point 1 metre above natural ground level; and
  (b) regulated trees under subregulation (1) that are within the prescribed criterion under paragraph (a) are to be taken to be significant trees for the purposes of the Act.

[e] Trees and shrubs are proven to provide a range of social, environmental, economic and psychological benefits that improve the pleasantness of a local area that positively affect human wellbeing. The amenity value of trees include gaseous and particulate pollution mitigation, amelioration of climatic extremes (shading, cooling and wind speed reduction), mitigation of heat islands, attenuation of noise pollution, store and sequester carbon (reducing greenhouse gasses), improve air quality, improve water quality, stormwater mitigation and erosion control, visual screening of undesirable views, aesthetically enhance local areas, aesthetically enhance urban structures, improve property values, reduce urban glare, improve human health, wellbeing and relaxation, reduce stress and anxiety, reduce crime and improve healing rates of patients. In addition, locally indigenous plants provide further benefits including; provide important habitat for local fauna, maintain biodiversity in the local environment, provide wildlife corridor links with areas of native and indigenous vegetation.

[f] Important habitat and biodiversity value is considered to be present when the tree is indigenous to the local area and provides an opportunity for native animals to perch, nest, breed, feed and shelter in the tree. Animals that may use the tree include native birds, mammals, insects and other invertebrates, lizards and other reptiles. Australian native trees will also provide some of these benefits, but are not considered to be as important as locally indigenous trees. Exotic trees can also provide some of these benefits, but are considered to provide limited habitat and biodiversity value.

[g] Lignified, partially differentiated tissue which develops from the callus (undifferentiated tissues) around wound margins. Woundwood comprises wood, cambium & bark. Woundwood is an occluding tissue, sometimes completely covering wounds over time. Very rapid woundwood development may turn into a 'rams-horn' whereby new tissues turn over upon themselves, potentially resulting in mechanical stresses.

[h] Tree Protection Zones are areas designated by Arborists for the preservation trees on development sites. TPZs preserve tree root systems and the immediate soil environs as well as protecting the above ground parts of the tree from inadvertent crown or trunk damage. The zone within the TPZ must be monitored and managed by qualified Arborists to avoid the many potentially adverse consequences of uncontrolled development.

Management of the crown and improvements to the growing conditions within this zone should occur for several reasons, including compensation for root loss, to reduce plant stress, improve tree form and safety, to improve the growing conditions generally and to extend tree longevity.

[i] The Tree Protection Zone (TPZ) radius is calculated by multiplying the trunk diameter at 1.4m by a factor of 12. The radius is measured from the centre of the trunk at ground level. A TPZ should not be less than 2m nor greater than 15m (except where crown protection is required). This method is outlined in the Australian Standard AS 4970 – 2009 *Protection of trees on development sites.*

[j] TPZ area = πr^2

[k] The Structural Root Zone (SRZ) is the area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold a tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed as a radius in metres. This zone considers the tree's structural stability only, not the root zone required for the tree's vigour and long-term viability, which will usually be a much larger area. There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). 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 following formula. Root investigations may provide more information on the extent of these roots. From AS 4970-2009 *Protection of Trees on Development Sites.*

$$\text{SRZ radius} = (Dx50)^{0.42} \times 0.64$$

(D= trunk diameter in metres when measured above the root buttress)

Any work within the SRZ should be avoided. Where no alternative exists, the work must be supervised by a qualified Arborist and approved by Local Council. Tree removal may be required depending upon the size and number of roots affected.

[l] It may be possible to encroach into or make variations to the standard Tree Protection Zone (TPZ). Encroachment includes excavation, compacted fill and machine trenching. **Minor encroachment -** If the encroachment is less than 10% of the TPZ area and is outside the Structural Root Zone (SRZ), detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. Variations must be made by the project arborist considering relevant factors listed on section 3.3.4 of the standard. **Major encroachment -** If the proposed encroachment is greater than 10% of the TPZ area or inside the SRZ, the project arborist must demonstrate that the tree would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors including: location and distribution of roots, the potential number and size of root loss, tree species and tolerance to root disturbance, age, vigour and size of tree, lean and stability of the tree, soil characteristics, volume, topography and drainage, the presence of existing or past structures or obstacles and design factors. From Australian Standard AS 4970 – 2009 *Protection of trees on development sites,* section 3.3.

[m] ***tree-damaging activity*** means—**(As defined in section 4 - Interpretation of the *Development (Regulated Trees) Amendment Act 2009.*)**

(a)the killing or destruction of a tree; or
(b)the removal of a tree; or
(c)the severing of branches, limbs, stems or trunk of a tree; or
(d)the ringbarking, topping or lopping of a tree; or
(e)any other substantial damage to a tree,

and includes any other act or activity that causes any of the foregoing to occur but does not include maintenance pruning that is not likely to affect adversely the general health and appearance of a tree or that is excluded by regulation from the ambit of this definition;

(the following is as defined in the *Development (Regulated Trees) Variation Regulations 2011*)

(8)For the purposes of the definition of ***tree damaging activity*** in section 4(1) of the Act, pruning—

(a) that does not remove more than 30% of the crown of the tree; and
(b) that is required to remove—
(i) dead or diseased wood; or

(ii) branches that pose a material risk to a building; or
(iii) branches to a tree that is located in an area frequently used by people and the branches pose a material risk to such people, is excluded from the ambit of that definition.