Review of Environmental Factors

BORONIA PARK -NEW SPORTS PAVILION, EPPING

Prepared by: Think Planners Pty Ltd
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QUALITY ASSURANCE

PROJECT:	Review of Environmental Factors
ADDRESS:	Lot 341 in DP 914533 – 37A Bridge Street, Epping
COUNCIL LGA:	City of Parramatta
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Qualifications:	B. Urban Regional Planning	B. Urban Regional Planning

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29 May 2020	Update to add Appendices	Update	BD	BD
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1 July 2020	Update for further feedback	Update	BD	BD
14 July 2020	Update for flooding and tree removal	Update	BD	BD
24 July 2020	Update from further Council feedback	Update	BD/RF	BD

Table of Contents

Executive Summary

Think Planners was commissioned by the City of Parramatta Council and Nimbus Architecture and Heritage to prepare a Review of Environmental Factors (REF) for the proposed demolition of a sporting pavilion and the construction of a new sporting pavilion and associated works.

Boronia Park is a Crown reserve managed by the City of Parramatta Council and is located within an established residential area of Epping, adjacent to the western edge of the Epping CBD. The park contains a single sporting field that is currently utilised for both cricket and soccer. The existing sporting pavilion and associated storage building is aged and no longer caters for the demand generated by the sporting field. The park also contains pathways that connect to the Epping CBD and a pedestrian pathway towards the Epping train and bus interchange.

The pavilion is located in an area containing landscaping and this development requires the removal of six trees. This has been offset by the proposed planting of seven trees, capable of growing to a height of between 9m and 35m, with a recommendation in the ecology report requiring a further five trees to be planted. The area of works is identified as potentially containing a Blue Gum High Forest, however the ecology report, in Appendix H, confirms that the development will not have an unacceptable impact on this Threatened Ecological Community.

The works that are being considered under this Review of Environmental Factors are primarily illustrated on plans prepared by Nimbus Architecture and Heritage, Project No. 1914, dated 19 May 2020 and include:

- Demolition of an existing single storey sports pavilion containing:
    - change rooms
    - public amenities
    - a meeting room
    - a kiosk, as well as a separate detached storage shed
- Construction of a new single storey sports pavilion containing:
    - two x changerooms for sporting teams containing two showers, a WC and benches
    - two x referees/ alternate changerooms containing a WC and shower
    - four x public toilets including an accessible toilet
    - storage space for sporting clubs
    - a meeting room
    - a kiosk that will be utilised in conjunction with activities on the adjacent sports field
    - a council storeroom and lunch room that will predominantly be used by on-site maintenance staff

- Construction of new bleachers and stairs to the north of the sports pavilion to provide additional spectator seating
- Construction of new 1.5m wide pedestrian access paths from Kent Street
- Relocation of an arbour and a park sign on the Kent Street frontage of the site
- Removal and replacement of six trees

The facility will be utilised by sporting groups between 7am and 10pm, 7 days with the majority of use occurring on weekday afternoons between 3pm and 9pm and on weekends between 8am and 6pm.

The public toilets will be available to the wider public when the pavilion is open for sports club use only.

Council staff will typically utilise their facilities between 6am and 4pm weekdays.

Other facilities in the park that are not altered by this upgrade work include:

- Public toilets that are available to the public between 6am and 8pm
- Children's playground
- Outdoor exercise equipment
- Illuminated sports field
- Picnic areas and BBQ

The existing facility is ageing and does not provide the internal space that the sporting clubs and Council require to meet increasing demand. The new facility will appropriately assist sporting clubs better utilise the sports ground as well as provide an improved amenity and level of accessibility for users. The new building will also provide an improved facility for Council's permanent on-site grounds keeper who undertakes daily maintenance.

The proposal will contribute towards significantly improving the useability of the park, particularly by sporting groups. This will promote and encourage a range of social and passive recreational opportunities to cater for the rapidly growing population of Epping, many of whom live in apartments. It will ultimately encourage a wider spectrum of the community to utilise and enjoy this valuable public space.

A development application is not required as the proposed works fall under Part 3 – Division 12 Parks, Clause 65(3)(a)(i)(ii)(v)(vi) and (c) of State Environmental Planning Policy (Infrastructure) 2007 which permits development carried out by or on behalf of a council without consent on a public reserve under the control of or vested in the council.

Given that the works can occur without development consent being obtained, a part 5 assessment, a Review of Environmental Factors, is required to be conducted under the Environmental Planning and Assessment Act 1979.

Pursuant to Clause 227 of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation), the City of Parramatta is prescribed as a 'public authority' for the purpose of being a 'determining authority' within the meaning of Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act). This is only where development is permitted without consent (by State Environmental Planning Policy (Infrastructure) on land vested in, leased by or otherwise under the control or management of the City Of Parramatta. Therefore, for the purposes of the proposed works, the City of Parramatta is the determining authority.

This Review of Environmental Factors has been prepared in accordance with the relevant provisions under Part 5 of the Environmental Planning and Assessment Act 1979 and the Environmental Planning and Assessment Regulation 2000. This Review of Environmental Factors provides an assessment of the environmental impact of the proposed activity, including a description of all mitigation measures to be implemented.

The purpose of this Review of Environmental Factors is to assist the City of Parramatta to fulfil its obligations as a determining authority for the proposed works in accordance with Part 5 of the EP&A Act and Part 14 and in particular Clause 228 of the EP&A Regulation.

Overall the project will have a long-term positive impact through improved functionality and useability. However, there are temporary minor adverse impacts that would be generated by the proposal and these can be adequately mitigated. These key impacts relate to noise generation, air quality and waste disposal and are to be mitigated as detailed in this Review of Environmental Factors.

The Review of Environmental Factors has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity and concluded the following:

- The proposal will be unlikely to cause a significant impact on the environment and an Environmental Impact Statement is not required.
- Subject to implementation of recommended mitigation measures, the activity will not have any significant adverse impact on the environment.
- The proposal will not have any effect on matters of national significance and approval of the activity under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* is not required.
- The proposal will not have unacceptable impacts on threatened species, ecological communities or their habitats under the NSW Biodiversity Act 2016.

- There are no separate approvals, authorisations or notifications required in relation to the proposed development activity prior to determination under Part 5 of the EP&A Act 1979 or under any other acts.

1. Site Context

The subject site is legally described as Lot 341 in DP 914533 but commonly known as 37A Bridge Street, Epping. It is also legally known as Crown land (R88719) reserved for 'public recreation' under the Crown Land Management Act 2016 for which Council has been appointed as Crown land manager.

The portion of the reserve to be redeveloped is located closer to Kent Street. The public reserve is located within an established residential area of Epping and adjacent to the western edge of the Epping CBD. The area of works adjoins residential flat buildings on its southern edge, townhouses on its northern edge and is adjacent to low density residential dwellings on its western edge.

The reserve contains a single sporting field that experiences a high level of use during both winter (Soccer) and summer (Cricket) seasons.

The existing buildings are aged and no longer cater for the demand generated by the regular use of the sporting field or increasingly diverse needs of user groups. The park also contains pathways that connect to the Epping CBD and a highly utilised pedestrian pathway towards the Epping train and bus interchange.

Other facilities in the park that are not altered by the proposed upgrade work include:

- Public toilets that are available to the public between 6am and 8pm
- Children's playground
- Outdoor exercise equipment
- Picnic areas and BBQ

The site is identified as potentially containing remnant Blue Gum High Forest, that is a critically endangered ecological community. The potential impact of the development on this community is considered in this review.

An aerial map extract overleaf illustrates the development site and its immediate context below.

Figure 1: Aerial Map of Subject Site (Source: Six Map 2020)

The photographs below and on the following pages illustrate the site and existing context in proximity to the proposed works.

Photograph 1: Shows the existing sports pavilion as viewed from Kent Street, Epping.

Photograph 2: Shows the existing sports pavilion as viewed from the cricket pitch.

Photograph 3: Shows a view of the rear of the facility to be demolished.

Photograph 4: Shows the existing storage shed to be demolished.

Photograph 5: Shows the existing public toilets within the sports pavilion that faces Kent Street, Epping.

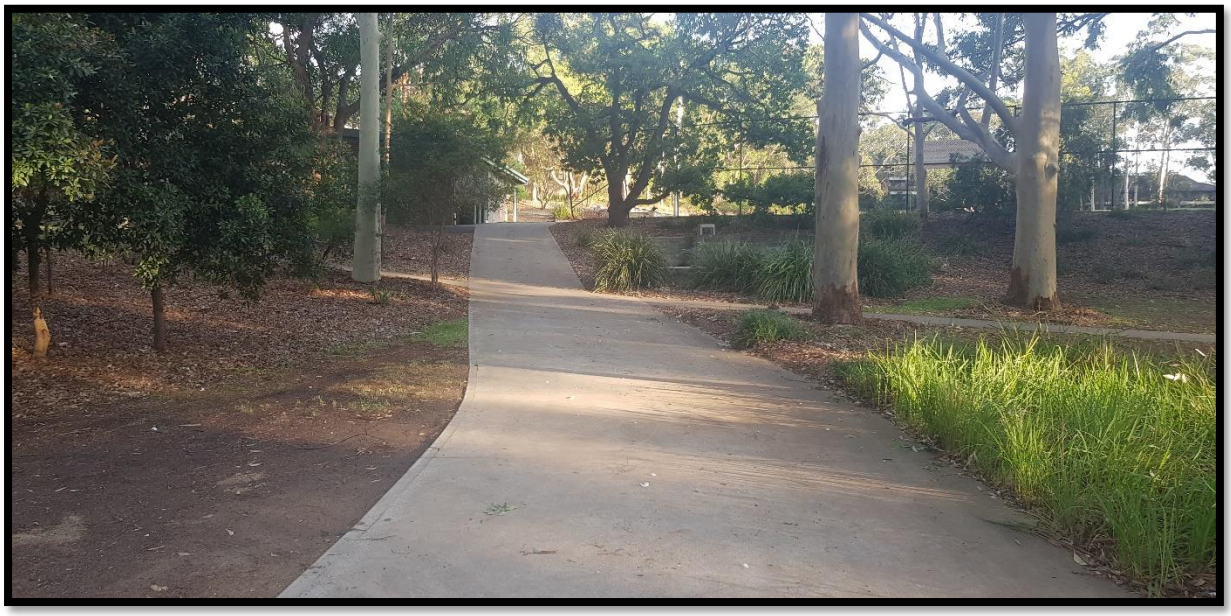
Photograph 6: Shows the southern elevation of the existing sports pavilion that is to be demolished.

Photograph 7: Shows the area of the proposed additional seating.

Photograph 8: Shows the view from in front of the existing pavilion towards Kent Street.

Photograph 9: Shows the view from in front of the existing public toilets towards townhouses at 28 Kent Street, Epping.

Photograph 10: Shows the view of the existing maintenance vehicular access driveway to the sports pavilion.



Photograph 11: Shows the view of the existing maintenance vehicular access driveway cross over from Kent Street, Epping.

2. Proposal

This Review of Environmental Factors (REF) aims to assess all matters affecting or likely to affect the environment by the proposed demolition of the existing sports pavilion and the construction of a new replacement sports pavilion and associated works within Boronia Park in accordance with Part 5 of the Environmental Planning an Assessment Act 1979.

The works that are being considered under this Review of Environmental Factors are primarily illustrated on plans prepared by Nimbus Architecture and Heritage, Project No.1914 dated 6 April 2020 and include:

- Demolition of an existing single storey sports pavilion containing:
    - change rooms
    - public amenities
    - a meeting room
    - a kiosk, as well as a separate detached storage shed
- Construction of a new single storey sports pavilion containing:
    - two x changerooms for sporting teams containing two showers, a WC and benches
    - two x referees/ alternate changerooms containing a WC and shower
    - four x public toilets including an accessible toilet
    - storage space for sporting clubs
    - a meeting room
    - a kiosk that will be utilised in conjunction with activities on the adjacent sports field
    - a council storeroom and lunch room that will predominantly be used by on-site maintenance staff
- Construction of new bleachers and stairs to the north of the sports pavilion to provide additional spectator seating
- Construction of new 1.5m wide pedestrian access paths from Kent Street
- Relocation of an arbour and a park sign on the Kent Street frontage of the site
- Removal and replacement of six trees

The facility will be utilised by sporting groups between 7am and 10pm, 7 days with the majority of use occurring on weekday afternoons between 3pm and 9pm and on weekends between 8am and 6pm.

The public toilets will be available to the wider public when the pavilion is open for sports club use only.

Council staff will typically utilise their facilities between 6am and 4pm weekdays.

The following table outlines anticipated construction activity:

Personnel	Anticipated maximum number of personnel onsite during construction is up to 10 per day as well as: - Site Supervisor - nominated personnel from City of Parramatta Council - Inspectors and testing personnel
Timing	The construction works are anticipated to commence in early 2021 and are expected to take 6-8 months to complete.
Construction Hours of Operation	Construction activities will adhere to the requirements of the *Interim Noise Guidelines* (DECC, 2009) and the *NSW Industrial Noise Policy* (EPA, 2000). Construction activity will occur between 7am and 5pm Monday to Friday and 8am to 5pm on Saturdays. No construction works will occur on Sundays and Public Holidays.
Traffic Management and Pedestrian access	A contractor will be appointed to define control measures in a Construction Traffic Management Plan, prepared in accordance with Council's and RMS requirements.

The following plans and technical reports are utilised and relied upon as part of this Review of Environmental Factors.

DOCUMENT	PREPARED BY
Architectural Drawings	Nimbus Architecture and Heritage Project No.1914 dated 19 May 2020
Landscape Plan	Andrew Pawsey Landscape Architecture Job No.18.018 Revision C, dated 8 July 2020
Stormwater Plans	Partridge Hydraulic Services Job No. 2019H0041 dated 15 May 2020 Revision P1
Design Safety Assessment	Nimbus Architecture and Heritage dated 19 May 2020.
BCA Report	NW Building Certification Revision 2 dated 3 April 2020
Concept Stage Accessibility Report	NW Access Consultancy Revision 2 dated 3 April 2020
Arborist Report	Susan Stratton Arboricultural Consultant Version 4 dated 3 July 2020
Ecological Assessment	Travers Bushfire and Ecology dated 8 July 2020
Tender Documentation including detailed schedule of works	City of Parramatta Council
Geotechnical Report	AW Geotechnics Revision A dated 3 April 2019

The proposed works will be carried out in accordance with the requirements and specifications referred to in the above plans and documents. Where necessary revised documentation will be prepared before commencement of construction activities.

The proposed works will improve the useability and operation of Boronia Park and will not impact on the ongoing function and role of the park in providing valuable passive and recreational opportunities to the local community.

The scheduled works being effectively the replacement of an existing sporting pavilion in nature will have limited impact on neighbouring properties, provided suitable mitigation measures are implemented during construction.

A detailed breakdown of the proposed works is provided at Section 5 and in the attached plans and documentation.

3. Planning Framework

3.1 Relationship to Planning Framework and Legislation

3.1.1 Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act 1979 (EP & A Act) provides the statutory context for the assessment of development in NSW.

Duty to consider environmental impact [Section 5.5]

The City of Parramatta is the proponent and determining authority for the proposed works under Part 5 the EP&A Act. As a public authority, the proposed works are permitted to be undertaken 'without consent' and are subject to an assessment in accordance with Section 5.5. This requires that the Council examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason the activity.

This Review of Environmental Factors report addresses the assessment requirements of Part 5.

The table below demonstrates the effect of the proposed development activity on the matters listed for consideration in subsections 2-4 of Section 5.5.

Matters for consideration under sub-sections 2, 3 and 4 of Section 5.5 of the EP&A Act	
Matter for consideration	**Effect of Activity**
Sub-section 2 - Repealed	N/A
Sub-section 3	

Matters for consideration under sub-sections 2, 3 and 4 of Section 5.5 of the EP&A Act	
Matter for consideration	**Effect of Activity**
Without limiting subsection (1), a determining authority shall consider the effect of an activity on any wilderness area (within the meaning of the Wilderness Act 1987) in the locality in which the activity is intended to be carried on.	No effect, as the activity is not a wilderness area (within the meaning of the *Wilderness Act 1987*) within the locality in which the activity is intended to be carried on.
Sub-section 4 - Repealed	N/A

Prescribed Determining Authority [Section 5.6]

Pursuant to Clause 227 of the Environmental Planning and Assessment Regulation 2000, The City of Parramatta is prescribed as a 'public authority' for the purpose of being a 'determining authority' within the meaning of Part 5.6 of the Environmental Planning and Assessment Act 1979.

This is only where development is permitted without consent (by State Environmental Planning Policy (Infrastructure) on land vested in, leased by or otherwise under the control or management of the City Of Parramatta. Therefore, for the purposes of the proposed works, the City of Parramatta is the determining authority.

Threatened species concurrence [Section 5.7]

Under Section 5.7 of the EP&A Act a determining authority (not being a Minister) must not carry out, or grant an approval to carry out, an activity:

(a) that is to be carried out in respect of land that is, or is part of, critical habitat, or

(b) that is likely to significantly affect a threatened species, population or ecological community or its habitat, without the concurrence of the Director-General of National Parks and Wildlife.

The proposed works are to occur within a highly urbanised environment and no critical habitat is present. A Test of Significance has been undertaken and identified that there will not be likely significant impact to threatened species, populations, ecological communities or their habitats (Refer Ecological Report).

3.1.2 Environmental Planning and Assessment Regulation 2000

Clause 228(2) of the *Environmental Planning and Assessment Regulation 2000* identifies the factors that must be taken into account when consideration is being given to the likely environmental impact of an activity. A summary of the matters relevant to this proposal and Clause 228 can be found below.

An assessment of the level of impact of the proposed works on each of these factors and recommended mitigation measures is outlined in the below table to determine the likely overall level of impact on the environment.

The table overleaf provides a summary of the environmental impacts of the proposed activity. A detailed assessment of impacts and associated mitigation measures is discussed in Section 6.2.

Factors to be taken into account concerning the impact of an activity on the environment.	**Nil /NA**	**Temporary**	**Minor**	**Significant** [**Note 1**]
Is the activity of a kind for which specific guidelines are in force? If so the factors to be taken into account when considering the likely impact of the activity on the environment are those referred to in the guidelines. [**Note 2**]	x			
Is the activity of any other kind for which general guidelines are in force? If so the factors to be taken into account when considering the likely impact of the activity on the environment are those referred to in those guidelines. [**Note 2**]	x			

If no guidelines are in force, will the activity cause:

(a) any environmental impact on the community?	x			
(b) any transformation of a locality?	x			
(c) any environmental impact on the ecosystems of the locality?	x			
(d) any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?		x	x	**Note 4**
(e) any effect on a locality, place or building having aesthetic, anthropological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?	x			
(f) any impact on the habitat of protected animals (within the meaning of the Biodiversity Conservation Act 2016)?	x			
(g) any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	x			
(h) any long-term effects on the environment?	x			
(i) any degradation of the quality of the environment?	x			
(j) any risk to the safety of the environment?	x			
(k) any reduction in the range of beneficial uses of the environment?	x			
(l) any pollution of the environment?	x			
(m) any environmental problems associated with the disposal of waste?	x			
(n) any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?	x			
(o) any cumulative environmental effect with other existing or likely future activities?	x			

(p) any impact on coastal processes and coastal hazards, including those under projected climate change conditions? [**Note 3**]	x			

Note 1: A 'significant' impact will trigger the need for an Environmental Impact Statement.

Note 2: This means guidelines in force under Clause 228, not guidelines such as the *Seniors Living Urban Design Guidelines* that are in force under other legislation or instruments.

Note 3: The *NSW Coastal Planning Guideline: Adapting to Sea Level Rise* provides guidance on considering projected climate change conditions such as sea level rise.

Note 4: Environmental Impact on a Community – The local community will benefit from improved amenities within the park that will incorporate accessible facilities. Temporary noise and dust impacts during demolition and construction are to be managed through limited hours of work and implementing appropriate dust suppression controls. The short term visual impact of fencing and the construction site is considered a minimal impact.

3.1.3 Environmental Planning Instruments

State Environmental Planning Policy 55 (Remediation of Land)

Clause 7 of SEPP 55 provides:

> *(1) A consent authority must not consent to the carrying out of any development on land unless:*
>
> *a) it has considered whether the land is contaminated, and*
> *b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and*
> *c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.*

The site has historically been utilised for recreational purposes since, with no known potentially contaminating activities being conducted on the site.

If any contaminated material, suspected contaminated materials or any asbestos are discovered/unearthed during the proposed works, then appropriate actions, treatment and removal will be undertaken in accordance with legislation, best-practice guidelines and the requirement of this SEPP.

State Environmental Planning Policy (Infrastructure) 2007

This State Environmental Planning Policy permits the proposed works to be undertaken by or on behalf of a council without consent on a public reserve under the control of or vested in the council as per Clause 65(3):

(a) development of any of the following purposes:

i. roads, **pedestrian pathways**, cycleways, single storey car parks, ticketing facilities, viewing platforms and pedestrian bridges,

ii. **recreation areas and recreation facilities** (outdoor), but not including grandstands**,**
iii. visitor information centers, information boards and other information facilities.
iv. **lighting, if light spill and artificial sky glow is minimised in accordance with the Lighting for Roads and Public Spaces Standards**,
v. landscaping, including landscape structures or features (such as artwork) and irrigation systems,
vi. amenities for people using the reserve, including toilets and change rooms,
vii. food preparation and related facilities for people using the reserve,
viii. **maintenance depots**,
ix. portable lifeguard towers,

(b) environmental management works,

(c) demolition of buildings (other than any building that is, or is part of, a State or local heritage item or is within a heritage conservation area)**.**

The works outlined previously in this Review of Environmental Factors are bolded above. All the proposed works are consistent with these definitions.

Clause 66 also permits the following exempt development:

(a) construction or maintenance of:

i. waking tracks, raised walking paths (including boardwalks), ramps, stairways or gates, or
ii. bicycle-related storage facilities, including bicycle racks and other bicycle parking facilities (except for bicycle paths), or
iii. handrail barriers or vehicle barriers, or
iv. ticketing machines or park entry booths, or
v. viewing platforms with an area not exceeding 100m^2, or
vi. sporting facilities, including goal posts, sight screens and fences, if the visual impact of the development on surrounding land uses is minimal, or
vii. play equipment if adequate safety measures (including soft landing surfaces) are provided and, in the case of the construction of such equipment, so long as the equipment is situated at least 1.2m away from any fence, or
viii. seats, picnic tables, barbecues, bins (including frames and screening), shelters or shade structures or
ix. portable lifeguard towers if the footprint of the tower covers an area no greater than 20 square metres.

The proposed works do not require consent through the Development Application process (Part 4); rather a Review of Environmental Factors is to be completed in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979*.

This Review of Environmental Factors ensures that Council has complied with the environmental assessment requirements of Part 5 of the EP&A Act, taking into account

to the fullest extent possible the matters affecting or likely to affect the environment. It will assist Council in determining whether the proposed activity should proceed and whether conditions (if any) should be imposed as mitigation measures to minimise potential impacts.

The following table discussed the potential requirement to discuss the proposed works with Council or other public authorities.

ISEPP Public consultation with Council and Public authorities	Comment
Clause 13 (1) This clause applies to development carried out by or on behalf of a public authority that this Policy provides may be carried out without consent if, in the opinion of the public authority, the development—	
a) will have a substantial impact on stormwater management services provided by a council, or	The development will not have substantial impact on stormwater management services provided by Council.
b) is likely to generate traffic to an extent that will strain the capacity of the road system in a local government area, or	The replacement of the sporting pavilion with a new pavilion is not considered to increase traffic and accordingly is not considered to strain the capacity of the surrounding road network.
c) involves connection to, and a substantial impact on the capacity of, any part of a sewerage system owned by a council, or	The Sewage system is managed by Sydney Water.
d) involves connection to, and use of a substantial volume of water from, any part of a water supply system owned by a council,	The Water supply system is not managed by Council.
e) involves the installation of a temporary structure on, or the enclosing of, a public place that is under a council's management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential, or	The temporary structures are considered to be minor and inconsequential within the context of the reserve.
(f) involves excavation that is not minor or inconsequential of the surface of, or a footpath adjacent to, a road for which a council is the roads authority under the *Roads Act 1993* (if the public authority that is	The proposal does not result in any excavation within a road reserve.

carrying out the development, or on whose behalf it is being carried out, is not responsible for the maintenance of the road or footpath). (2) A public authority, or a person acting on behalf of a public authority, must not carry out development to which this clause applies unless the authority or the person has: (a) given written notice of the intention to carry out the development (together with a scope of works) to the council for the area in which the land is located, and (b) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.	Not applicable as the development does not trigger the thresholds in clauses 1(a) to 1(f)
Consultation with councils - development with impacts on local heritage (1) This clause applies to development carried out by or on behalf of a public authority if the development: (a) is likely to affect the heritage significance of a local heritage item, or of a heritage conservation area, that is not also a State heritage item, in a way that is more than minor or inconsequential, and (b) is development that this Policy provides may be carried out without consent.	The development is not considered to effect the heritage significance of nearly locally listed heritage items in a way that is more than minor or inconsequential.
Consultation with councils - development with impacts on flood liable land (1) In this clause, flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled Floodplain Development Manual: the management of flood liable land published by the New South Wales Government and as in force from time to time. (2) A public authority, or a person acting on behalf of a public authority, must not	The areas of work are potentially susceptible to flooding in a PMF event. The key aspect of this clause is that works that change flood patterns by more than a minor extent are required to be referred to Council. The projects stormwater engineers have reviewed this clause and advise: *The proposed building footprint is located away from the 100 year ARI overland flow flood*

carry out, on flood liable land, development that this Policy provides may be carried out without consent and that will change flood patterns other than to a minor extent unless the authority or person has: (a) given written notice of the intention to carry out the development (together with a scope of works) to the council for the area in which the land is located, and (b) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.	*extents, which is approximately 40m to the south and flows west to east before changing direction; heading north easterly. The modelled 100 year ARI flood level has been provided in the Council Flood Enquiry report and has been set at 87.65m AHD. Due to the locality of the proposed development and the lowest floor level set at 90.70m AHD, the future works are not impacted by the 100 year ARI flood event. This has been confirmed by the Council Engineer.* *With regards to the Probable Maximum Flood (PMF), at the time of receiving the Council Flood Enquiry Report, Council could not provide any PMF flood information since it had not been modelled or had been made public. However, given that the proposed footprint extends only 5m towards the overland low path to the south and there are only minor changes to existing levels, it can likely be assumed that the development will not alter flooding patterns in events up to the PMF. However this should be confirmed by Council who may have preliminary PMF modelling information available, to be viewed in house* Council staff have confirmed that PMF data is not available for the site at present. Given this and the advice provided above that considers that the development will not change flood patterns in events up to the PMF,, then formal notification to Council is not required by this clause.
AA Consultation with State Emergency Service - development with impacts on flood liable land (1) A public authority, or a person acting on behalf of a public authority, must not carry out development on flood liable land that may be carried out without development consent under a relevant provision unless the authority or person has— (a) given written notice of the intention to carry out the development (together with a scope of works) to the State Emergency Service, and (b) taken into consideration any response to the notice that is received from the State Emergency	Although the area of works is located within flood liable land, the scope of works is carried out under Division 12 which is not called up by part 2 of this clause.

Service within 21 days after the notice is given. (2) Any of the following provisions in Part 3 is a ***relevant provision:*** (a) Division 1 (Air transport facilities), (b) Division 2 (Correctional centres and correctional complexes), (c) Division 6 (Emergency services facilities and bush fire hazard reduction), (d) Division 10 (Health services facilities), (e) Division 14 (Public administration buildings and buildings of the Crown), (f) Division 15 (Railways), (g) Division 16 (Research and monitoring stations), (h) Division 17 (Roads and traffic), (i) Division 20 (Stormwater management systems). (3) This clause does not apply in relation to the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance. In this clause, ***flood liable land*** means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled *Floodplain Development Manual: the management of flood liable land* published by the New South Wales Government and as in force from time to time.	
15A Consultation with councils - development with impacts on certain land within the coastal zone (1) This clause applies to development on land that is within a coastal vulnerability area and is inconsistent with a certified coastal management program that applies to that land. (2) A public authority, or a person acting on behalf of a public authority, must not carry out development to which this clause applies, which this Policy provides may be carried out without development consent, unless the authority or person has: (a) given written notice of the intention to carry out the development to the	The site is not located within a Coast vulnerability area

council for the local government area in which the land is located, and (b) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given. In this clause ***certified coastal management program*** has the same meaning as in *State Environmental Planning Policy (Coastal Management) 2018*. ***Coastal vulnerability area*** has the same meaning as in the *Coastal Management Act 2016*	
16 Consultation with public authorities other than councils (1) A public authority, or a person acting on behalf of a public authority, must not carry out specified development that this Policy provides may be carried out without consent unless the authority or person has: (a) given written notice of the intention to carry out the development (together with a scope of works) to the specified authority in relation to the development, and (b) taken into consideration any response to the notice that is received from that authority within 21 days after the notice is given. (2) For the purposes of subclause (1), the following development is ***specified development*** and the following authorities are ***specified authorities*** in relation to that development: (a) development adjacent to land reserved under the *National Parks and Wildlife Act 1974* or to land acquired under Part 11 of that Act - the Office of Environment and Heritage, (b) development on land in Zone E1 National Parks and Nature Reserves or in a land use zone that is equivalent to that zone - the Office of Environment and Heritage, (c) development adjacent to an aquatic reserve or a marine park declared under the *Marine Estate Management Act 2014* - the Department of Industry,	The development does not trigger these requirements as it is not specified development.

(d) development in the foreshore area within the meaning of the *Sydney Harbour Foreshore Authority Act 1998* - the Sydney Harbour Foreshore Authority, (e) development comprising a fixed or floating structure in or over navigable waters - Roads and Maritime Services, (f) development for the purposes of a health services facility, correctional centre or group home, or for residential purposes, in an area that is bush fire prone land (as defined by the Act) - the NSW Rural Fire Service, **Note -** The Act defines ***bush fire prone land***, in relation to an area, as land recorded for the time being as bush fire prone land on a map certified as referred to in section 10.3(2) of the Act. **Note -** When carrying out development of a kind referred to in paragraph (f), consideration should be given to the publication of the NSW Rural Fire Service *Planning for Bush Fire Protection 2019*. (g) development that may increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map—the Director of the Observatory, **Note -** The dark sky region is land within 200 kilometres of the Siding Spring Observatory. (h) development on defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument—the Secretary of the Commonwealth Department of Defence, **Note -** Defence communications facility buffer land is located around the defence communications facility near Morundah. See the *Defence Communications Facility Buffer Map* referred to in clause 5.15 of *Lockhart Local Environmental Plan 2012*, *Narrandera Local Environmental Plan 2013* and *Urana Local Environmental Plan 2011*.	

(i) development on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*—the Mine Subsidence Board. In this clause ***dark sky region map*** means the map marked "*Dark Sky Region Map*" held in the head office of the Department of Planning and Environment.	

Given the above, the proposal does not trigger any additional public authority consultation requirements pursuant to Part 2 of ISEPP.
Hence, the ISEPP consultation requirements are satisfied

State Environmental Planning Policy (Vegetation in Non-Rural Areas 2017)

State Environmental Planning Policy (Vegetation in Non-Rural Areas) was introduced in August 2017. This SEPP seeks to protect the biodiversity values of trees and other vegetation in non-rural areas of the state, and to preserve the amenity of non-rural areas of the State through the appropriate preservation of trees and other vegetation.

The replacement of the sporting pavilion and associated works will result in the loss of some existing vegetation including six trees as outlined in the attached arborist report, however appropriate landscape embellishment works is to be undertaken in accordance with the attached Landscape Plan and recommendations of the Ecology Report.

As the site contains extensive native vegetation an Ecological Assessment of the site of the proposed works was carried out by Travers Bushfire and Ecology. This review indicates that the site predominantly comprises canopy trees comprising of young to moderately aged plated trees 7m – 20m in height with remnant trees closer to 35m in height. The report notes that vegetation on the site is equivalent to the critically endangered ecological community, being the Blue Gum High Forest. The report considers the impact on this community and concludes:

- *0.09 ha of planted BHGF may be impacted, which includes a 5m buffer to any building to account for egress, access and impacts on tree protection zones,*
- *The impacts are upon planted vegetation which contributes little to the retained gene pool of BGHF as only a small proportion of species occur naturally within this TEC,*
- *It will not contribute to fragmentation or isolation considering all remnants in the local area are small fragments,*
- *The remnant does not host nor is likely to host threatened flora species, and*
- *The remnant provides no breeding habitat for threatened fauna species.*

The report then recommends that:

The loss of the BGHF trees are recommended to be compensated by the replanting of BGHF either as individual trees or part of landscaped beds containing BGHF species in the ground layer, shrub and canopy. Given the proposal will likely remove six (6) trees, this could be compensated by replacement at a 2:1 ratio with local provenance stock.

State Environmental Planning Policy (Coastal Management) 2018

This SEPP ensures that coastal wetlands are preserved and protected for environmental and economic reasons. It identifies over 1,300 wetlands of high natural value.

There are no coastal wetlands within the footprints of the proposed works.

Rural Fire Act 1997

The site is not identified as potentially containing bushfire prone land. Not applicable.

Water Management Act 2000

The proposal does not trigger the requirements of the Water Management Act 2000 as the nearby watercourse is a concrete channel. Not applicable.

Heritage Act 1977

There are no state listed heritage items in the immediate vicinity of the works.
The site adjoins and is adjacent to items of local heritage items and a conservation area. Given the location of works on the site and noting it is predominantly a replacement of an existing sporting pavilion, the proposed works are not considered to unduly impact on the setting of these local heritage items.

Roads Act 1993

The works do not result in additional crossovers to public roads and will not require temporary road closures during works. Accordingly, the proposal does not trigger the requirements of the Roads Act 1993. Not applicable.

Parramatta Local Environmental Plan 2011

Under the Parramatta Local environmental Plan 2011 the portion of the park where works are proposed site is zoned Public Recreation (RE1).

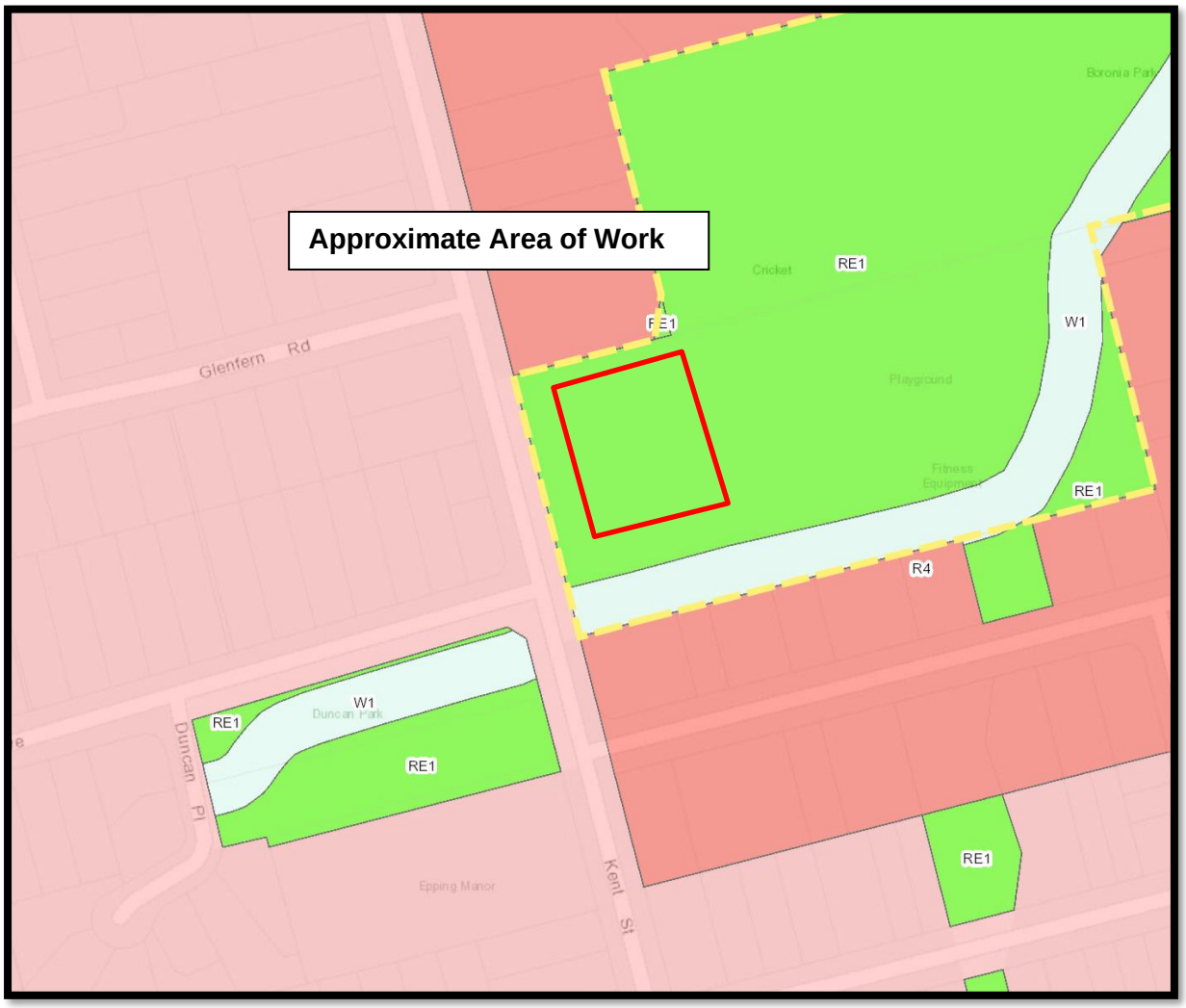


Figure 2: LEP Zoning Map Extract (Source: Parramatta LEP 2011)

The objectives of the RE1 zone are listed below:

- *To enable land to be used for public open space or recreational purposes.*
- *To provide a range of recreational settings and activities and compatible land uses.*
- *To protect and enhance the natural environment for recreational purposes.*
- *To conserve, enhance and promote the natural assets and cultural heritage significance of Parramatta Park.*
- *To create a riverfront recreational opportunity that enables a high quality relationship between the built and natural environment.*

The proposed development is categorised as a *'recreation area"* and *'recreational facility (outdoor)'* which are defined under the LEP as follows:

> ***recreational area*** *means* a place used for outdoor recreation that is normally open to the public, and includes:
>
> (a) a children's playground, or
> (b) an area used for community sporting activities, or

(c) a public park, reserve or garden or the like and any ancillary buildings, but does not include a recreation facility (indoor), recreational facility (major) or recreation facility (outdoor).

recreation facility (outdoor) *means a building or place (other than a recreation area) used predominantly for outdoor recreation, whether or not operated for the purposes of gain, including a golf course, golf driving range, mini-golf centre, tennis court, paint-ball centre, lawn bowling green, outdoor swimming pool, equestrian centre, skate board ramp, go-kart track, rifle range, water-ski centre or any other building or place of a like character used for outdoor recreation (including any ancillary buildings), but does not include an entertainment facility or a recreation facility (major).*

'Recreation Areas' and *'Recreational Facility (outdoor)'* are permissible within the RE1 zone, and the proposed replacement of the sporting pavilion and ancillary works is consistent with the intent of the zoning.

5.10 Heritage

The subject site is not identified as a containing a heritage listed item or as being within a heritage conservation area under Parramatta Local Environmental Plan 2011, as shown by the heritage map below:

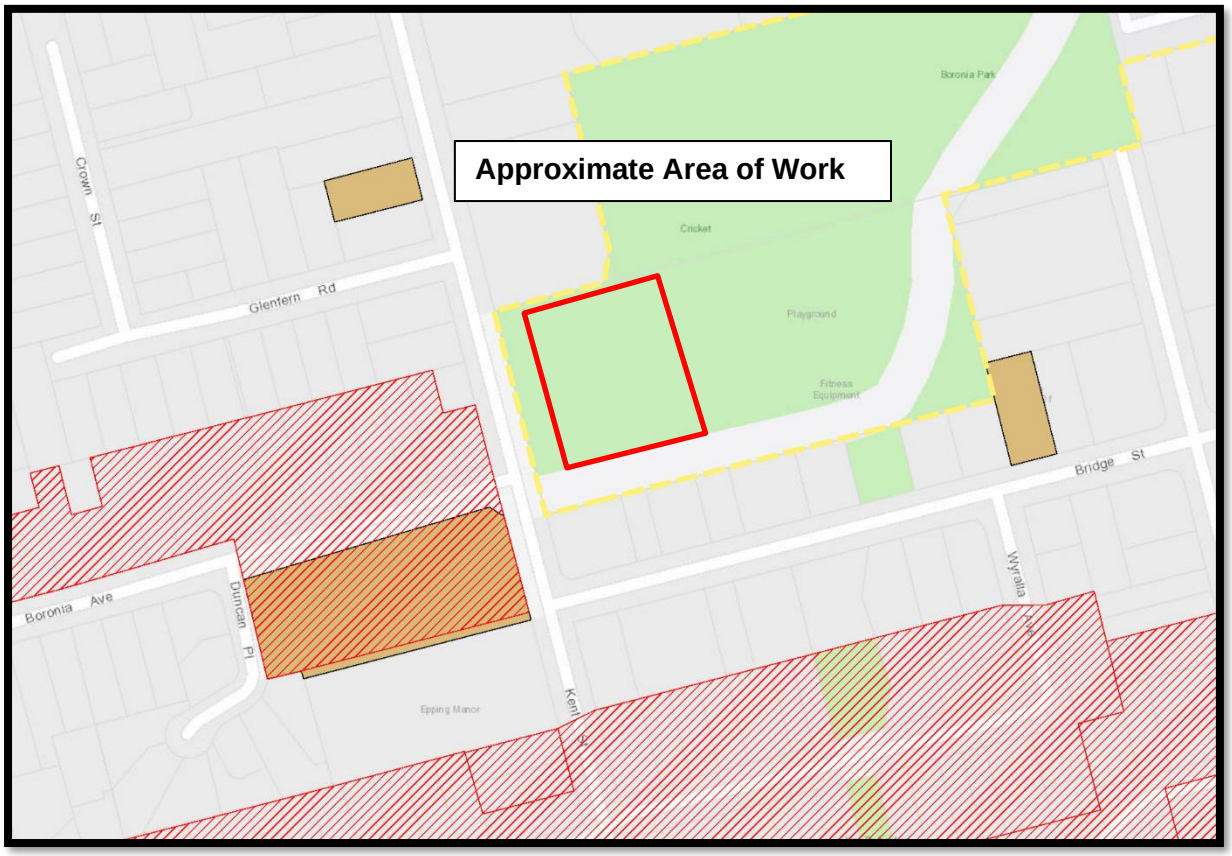


Figure 3: LEP Heritage Map Sheet (Source: Parramatta LEP 2011)

The park adjoins and is adjacent to local heritage items and heritage conservations areas. Given the location of works on the site and noting it is predominantly a

replacement of an existing sporting pavilion, the proposed works are not considered to unduly impact on the setting of these local heritage items or conservation area.

Further an AHIMS search confirms no identified Aboriginal Archaeological objects on the site or in the immediate vicinity of the site.

Parramatta Development Control Plan 2011

All relevant Council controls have been considered in the following compliance table, noting the majority of the provisions are not relevant to the proposal given the nature of the works.

Parramatta Development Control Plan 2011 – Compliance Table			
Clause	**Controls**	**Comment**	**Complies**
2. Site Planning			
2.1	Design in Context in the Parramatta City	The proposal will have minimal adverse environmental or amenity impacts and provides an appropriate outcome on site in an appropriate location. The proposal will increase employment opportunities during the construction phase.	YES
2.3	Site Analysis	A Site Analysis has been prepared and is attached as part of this application. The site analysis identifies the unique opportunities and constraints of the site that have informed the design of the development proposal.	YES
2.4.1	Views and Vistas	The proposed development will not impact on significant views due to the location of the proposal which sits outside a nominated view corridor. The proposed development is to be appropriately landscaped and is of a form and style that will positively contribute to the cohesiveness and visual appreciation of the park.	YES
2.4.2.1	Site Considerations - Water Management - Flooding	A Flood Enquiry form provided by Council and dated 4 May, 2020 confirms that the proposed sports pavilion is located outside the portion of the site identified as being subject to flooding during a 1:100 ARI event.	Yes

		Existing pathways that provide access to the pavilion are located within flood prone land. Existing arrangements for managing this risk would need to continue.	
2.4.2.2	Site Considerations – Water Management – Protection of Waterways	The subject site is not located within proximity to the Parramatta River. The new buildings will be connected to the parks stormwater system and toilets and basins will be connected to the sewer.	YES
2.4.2.3	Site Considerations – Water Management – Protection of Groundwater	The proposed development is to be for a recreational use within an established park and involves minimal excavation. It is therefore considered that the risk of groundwater contamination occurring during construction and future use of the site is low. All stormwater is to be appropriately managed and is able to be directed via gravity flow to an existing piped network that discharges to the concrete stormwater within the reserve. A Stormwater Management Plan has been prepared for the project.	YES
2.4.3.1	Site Considerations – Soil Management – Sedimentation	The proposal will result in the excavation of the site as per the attached plans. It is considered that the proposed excavations, will have minimal adverse environmental or amenity impact given that erosion and sedimentation controls will be installed as outlined In the stormwater management plans.	YES
2.4.3.2	Soil Management- Acid Sulfate Soils	The subject site is identified as being affected by Class 5 Acid Sulfate Soils under Parramatta Local Environmental Plan 2011 Acid Sulfate Soils Map Sheet. Notwithstanding this although the proposal is located within 500m of adjacent Class 1, 2, 3 or 4 Acid Sulphate Soils, given the minimal excavation the proposal will not result in the water table being lowered and the risk remains negligible.	YES

2.4.3.3	Soil Management- Salinity	Due to the nature and location of the site it is not likely to be affected by Saline Soils.	N/A
2.4.4	Land Contamination	The site was previously used for recreational purposes. Nothing on site indicates the presence of land contamination.	YES
2.4.5	Air Quality	It is considered that the proposal will not significantly contribute to air pollution, odours or the release of atmospheric pollutants. Appropriate management of the site during the demolition and construction phases will limit the potential for air pollution.	YES
2.4.6	Development on Sloping Land	The site is relatively flat and the building responds to this and is not unnecessarily elevated out of the ground.	YES
2.4.7	Biodiversity	The proposed development is located in a landscaped park with vegetation predominantly consisting indigenous and native canopy trees. It will not impact on any significant flora and fauna. The potential impact on Biodiversity is considered in the attached ecology report prepared by Travers Bushfire and Ecology and found to be satisfactory subject to the planting of 12 native trees.	YES
2.4.7.2	Site Considerations – Biodiversity – Development on Land Abutting the E2 Environmental Protection Zone and W1 Natural Waterways Zone	The work site does not directly abut W1 zoned land but a portion of the site that adjoins a concrete creek is zoned W1. With the appropriate management of sediment during construction this development will not impact on the W1 zoned land.	N/A
2.4.8	Public Domain	It is considered that the proposal positively contributes to the public domain and proposes a development that is consistent with the objectives of its zone and will contribute towards	YES

		improving the amenity and activation of the park. See attached architectural plans for detail. The proposal assists with activating the park and will contribute to casual surveillance, increasing safety in the area.	
3. Development Principles			
3.1.1	Height	The height of the building is appropriate having regards to its setting.	YES
3.1.2	Height Transition	Not applicable.	N/A
3.1.3	Preliminary Building Envelope Table – FSR – No min	No FSR	N/A
3.1.3	Preliminary Building Envelope – Preliminary Building Envelope Tables – Minimum Site Frontage – No min		N/A
3.1.3	Preliminary Building Envelope – Preliminary Building Envelope Tables – Front, Side and Rear Setbacks – No min	The development involves the placement of a sporting pavilion that is substantially setback from the street and provides an appropriate buffer to adjoining residential properties.	YES
3.2.1	Building Elements – Building Form and Massing	The building is recessed on the site and will be partially screened by landscaping. The proposal does not result in any adverse environmental or amenity impacts on site or on adjoining properties.	YES
3.2.2	Building Elements – Building Facades and Articulation	The new sports pavilion that will be partially visible from Kent Street is appropriately articulated and will present as a building in a landscaped setting.	YES
3.2.3	Building Elements – Roof Design	The proposed flat and skillion roof are consistent with the rhythm of roofs in the area and given the modest nature of the building are consistent with the style of roofs throughout the precinct	YES

		and accordingly is consistent with the surrounding built form.	
3.2.5	Building Elements – Streetscape	The building responds appropriately to its context and will provide an appropriate streetscape presentation to Kent Street.	YES
3.2.6	Building Elements – Fences	No new fencing proposed.	N/A
3.3.1	Environmental Amenity – Landscaping	The proposal is located within an existing park and the extent of landscaping in front of the building ensures that the building is located in a landscaped setting.	YES
3.3.3	Environmental Amenity – Visual Privacy	The development provides passive surveillance of the park without providing overlooking opportunities into the rear yards of residential properties adjoining the park.	YES
3.3.4	Environmental Amenity – Acoustic Amenity	The continued use of the park for recreational activities is not considered likely to unduly disturb the amenity of surrounding residential properties. The replacement of an existing sporting pavilion with a new sporting pavilion is not considered to lead to an increase in ongoing noise generation after construction.	YES
3.3.6.1	Environmental Amenity – Water Sensitive Urban Design – Stormwater Drainage	A Stormwater Management Plan is attached as part of this application. This outlines how the development will continue to harvest water from the site and that natural vegetation on the site will assist with maintaining stormwater quality.	YES
3.3.7	Environmental Amenity – Waste Management	A Waste Management Plan will be prepared by the successful tender for the project. The plan will require sustainable resource management and waste minimisation to be incorporated into the project in accordance with waste minimisation hierarchy being:	YES

		- avoiding unnecessary resource consumption; - recovering resources for reuse; - recovering resources for recycling or reprocessing; and - disposing of residual waste (as a last resort).	
3.4.2	Social Amenity – Access for People with Disabilities	Appropriate access is provided to, from and within the site for those with a disability. This is outlined in the attached access report prepared by NW Access Consultants.	YES
3.4.4	Social Amenity – Safety and Security	The proposal incorporates open space and landscaped areas that will contribute to increased activity and natural surveillance of the area. The proposal incorporates design elements including clearly defined access points as well as clearly defined public and private spaces in order to minimise opportunity for criminal activity. The proposed built elements, landscaping and design features are consistent with CPTED principles.	YES
3.5.1	Heritage – General	The site is not identified as containing a heritage item or as being within a heritage conservation area. The proposed works is in the vicinity of heritage items and this has been discussed previously in this Review of Environmental Factors.	YES
3.5.2	Heritage – Archaeology	The site is not identified as potentially containing European archaeology. It is further noted that the proposal results in minimal excavation. Accordingly, it is not considered that this development will result in the disturbance of European Archaeology.	YES

3.5.3	Heritage – Aboriginal Cultural Heritage	The works area is not identified as potentially containing Aboriginal relics.	N/A
3.6.1	Movement and Circulation – Sustainable Transport	Not applicable.	N/A
3.6.2	Movement and Circulation – Parking and Vehicular Access	The proposal involves the replacement of a sporting pavilion that services a sporting field that is not increased in area or capacity. Accordingly the new sporting facility is not considered to increase demand for on-street parking beyond what occurs currently. The availability of on-street parking in the immediate vicinity of the site is considered appropriate and will satisfactorily service the parking needs of the proposal.	YES
3.6.3	Movement and Circulation – Accessibility and Connectivity	The proposal provides for the safe and efficient movement of pedestrian and vehicular traffic within the site. Vehicle and pedestrian routes are clearly indicated and accessible.	YES
Part 5 Other Provisions			
5.5	Signage	The proposal includes the relocation of a single sign. The sign will provide appropriate information for patrons without impacting on the amenity of the area.	YES

Parramatta Community Land Plan of Management 2014

The proposal is consistent with this Plan of Management that was prepared in accordance with the requirements of the Local Government Act 1993 and the relevant material contained within including the management strategy, objectives and action plan.

Further the proposed sports pavilion replacement and associated works are in accordance with the Boronia Park and Duncan Park Master Plan Report that was adopted by Council (formerly Parramatta City Council) on 12 October 2015.

3.2 Other Legislative Requirements

3.2.1 Crown Land Management Act 2016

The reserve is owned by the Crown and is managed by the City of Parramatta.

The principles of the act are stated as:

> *For the purposes of this Act, the principles of Crown land management are:*
>
> *(a) that environmental protection principles be observed in relation to the management and administration of Crown land, and*
> *(b) that the natural resources of Crown land (including water, soil, flora, fauna and scenic quality) be conserved wherever possible, and*
> *(c) that public use and enjoyment of appropriate Crown land be encouraged, and*
> *(d) that, where appropriate, multiple use of Crown land be encouraged, and*
> *(e) that, where appropriate, Crown land should be used and managed in such a way that both the land and its resources are sustained in perpetuity, and*
> *(f) that Crown land be occupied, used, sold, leased, licensed or otherwise dealt with in the best interests of the State consistent with the above principle.*

The development is consistent with the above principles as:

- The development incorporates environmental protection principles to minimise the impact on the natural environment;
- The development incorporates water harvesting, minimises vegetation removal and incorporates water efficient devices such as taps and showers;
- It encourages the increased use and enjoyment of Crown land;
- The development better facilitates multiple use of Crown Land through the provision of an expanded multi purpose sports pavilion that better meets the needs of user groups;
- The redevelopment of the sport pavilion appropriately assists with increasing passive and active recreational opportunities within this Crown Reserve; and
- The continued use of Crown land for recreational opportunities is in the best interest of the state as it promotes a healthy and active community.

3.2.2 Local Government Act 1993

The reserve is categorised as Community Land (Park) under this act.

The act identifies that the core objectives for park land are:

> *The core objectives for management of community land categorised as a park are—*
> *(a) to encourage, promote and facilitate recreational, cultural, social and educational pastimes and activities, and*
> *(b) to provide for passive recreational activities or pastimes and for the casual playing of games, and*

(c) to improve the land in such a way as to promote and facilitate its use to achieve the other core objectives for its management

The proposal is consistent with these objectives and the Parramatta Community Land Plan of Management 2014 and the relevant material contained therein including the management strategy, objectives and action plan.

3.2.3 Roads Act 1993

N/A, upgrade works to Boronia Park to be contained within the subject land parcel.

3.2.4 Disability Discrimination Act 1992

The provision of a replacement sports pavilion and associated works within Boronia Park will ensure that the reserve will provide equitable access to people with a disability in accordance with the Act and includes accessible pathways and accessible toilets.

3.2.5 Biodiversity Conservation Act 2016

The potential impacts on an Endangered Ecological Community (Blue Gum High Forest) was considered in an ecology report prepared by Travers Bushfire and Ecology and found to be satisfactory subject to the provision of offset planting.

No threatened fauna species would be significantly impacted upon by the Activity with the adoption of the safeguards prescribed.

The Activity would incrementally contribute to the Key Threatening Process Anthropogenic Climate Change, through the generation of carbon dioxide during operation of machinery and vehicles and associated fuel consumption however the impact is not considered significant. No other Key Threatening Process would be noticeably contributed to by the Activity.

3.2.6 Heritage Act 1977

N/A noting that the site is not identified as containing a heritage item under the State Heritage Register.

3.2.7 Contaminated Land Management Act 1997

There is nothing in the works area that indicates a previous contaminating land use and no reason to suspect contamination of the works area.

3.2.8 Protection of the Environment Operations Act 1997

There are no Protection of the Environment Policies (PEPs) that are relevant to the Proposal. No licenses would be required pursuant to the Protection of the Environment

Operations Act 1997. The proponent is required to notify the EPA if a 'pollution incident' occurs that is likely to impact upon the environment.

It is an offence to negligently dispose of waste in a manner that harms the environment. Waste would be managed in accordance with the Waste Avoidance and Resource Recovery Act 2001. The Activity would aim to reduce the environmental impact of dumping waste and include mechanisms to recover resources and reduce the production of waste where possible.

It is an offence to pollute any waters of the State. This Review of Environmental Factors includes safeguard and mitigations measures to ensure that the Activity does not result in pollution of waters.

3.2.9 National Parks and Wildlife Act 1974

The Office of the Environment and Heritage AHIMS Web Service have indicated that no Aboriginal sites are recorded in or near Boronia Park nor have any Aboriginal places been declared in or near the subject reserve. Furthermore, in relation to modern alterations to the landscape, previous buildings and previous large scale clearing and use of the site for recreational purposes are expected to have impact upon the archaeological value of the site. Natural factors such as erosion would have impacted on the archaeological record, all of which would have displaced potential cultural materials and the likelihood of in situ cultural materials is very low.

3.2.10 Biosecurity Act 2015

The DPI biosecurity risk weed declarations for the City of Parramatta lists numerous weed species. None of these weed species were identified on site.

3.2.11 Waste Avoidance and Resource Recovery Act 2001

A Waste Management Plan will be prepared by the successful tender for the project.

The plan will require sustainable resource management and waste minimisation to be incorporated into the project in accordance with waste minimisation hierarchy being:

- avoiding unnecessary resource consumption;
- recovering resources for reuse;
- recovering resources for recycling or reprocessing; and
- disposing of residual waste (as a last resort).

4. Concept Development

4.1 Objectives of the Proposal

The primary objective of the proposal is to undertake the replacement of the sporting pavilion within Boronia Park to better cater for the existing and expanding users of the adjacent oval. It includes important facilities such as change rooms and toilets to encourage a range of diverse active and passive recreational opportunities, and

ultimately encourage a greater diversity of the community to utilise and enjoy valuable public space.

4.1.1 Concept Options Considered

There were two (2) key options considered in the formulation of the proposal:

1. Do nothing: This approach is not acceptable as it does not align with the desire to replace the ageing sports pavilion and provide a new facility that will improve its functionality noting the rapid growth in Epping's population.

2. Provision of a new pavilion: Improve the function, performance and operation of the pavilion to permit better utilisation of high demand and valuable public space.

4.1.2 Preferred Option for Detailed Design

The 2nd option was assessed as most appropriate in achieving the objectives of the proposal.

5. Demolition/Construction Activities

5.1 Scope of Demolition

The scope of construction work is reflected on the submitted plans and tender documents that are attachments to this Review of Environmental Factors.

5.2 Work to Commence and Period of Construction

Works are scheduled to commence in early 2021 after obtaining relevant sign-offs.

Given the nature and extent of works it is anticipated that the period of construction would be approximately 25-35 weeks from commencement to completion.

5.3 Environmental Management Plan - Construction Phase Activities

During construction appropriate environmental safeguards shall be implemented. The proponent /contractor, prior to the commencement of construction, shall prepare an Environmental Construction Management Plan (ECMP) covering the construction phase.

The ECMP for the construction phase will be structured as follows: -

Chapter 1 - Introduction.
A description of the project and the objectives of the ECMP will be provided.

Chapter 2 - Environmental Management Planning.
Environmental issues and aspects summarised in Section 6.2.1 of this Review of Environmental Factors.

Chapter 3 - Management Strategies and Implementation.

The environmental protection measures will be documented, when and how they are to be implemented and who is ultimately responsible for undertaking particular actions. Awareness, training and emergency response requirements will also be addressed in this chapter.

Chapter 4 - Monitoring & Measuring Environmental Impacts.
The process for monitoring the performance and compliance with the CMP will be documented. The process for reporting and managing breaches of the plan will be specified.

Chapter 5 - Communication Strategy.
The process for addressing public complaints or concerns will be detailed. Methods for communicating with interested stakeholders as may be required from time to time, will also be addressed.

A copy of the prepared ECMP will be provided to the proponent and site owner prior to works commencing.

6. Consideration of Environmental Factors

6.1 Authority and Stakeholder Consultation

Authority Consultation
Due to the scope and scale of the proposal and considering that The City of Parramatta are the proponent, consultation with public authorities other than Council is not required by legislation. It is recommended that the proponent consult with service authorities.

Stakeholder Consultation
Prior to the preparation of the detailed plans and documentation that accompany this Review of Environmental Factors, stakeholder consultation has occurred as follows:

a. Project Initiation Meeting with Stakeholders
b. Concept Design Presentation With Stakeholders
c. Approved Concept Design

Stakeholders that have been invited to these meetings are:

- City of Parramatta Staff including representatives of Council's Open Space and Natural Resources Team, Parks Team and Recreation Team;
- Sporting Users group including the Epping Eastwood Tigers Football Club;
- Nimbus Architecture and Heritage; and
- Members of the Boronia Park Committee

Feedback from the stakeholder consultation was used to inform and guide the design process of the proposed replacement sports pavilion and associated works.

As consultation has not yet occurred with surrounding landowners, it is a recommendation of this Review of Environmental Factors that consultation occur prior to construction commencing:

- With the owners/occupiers of the townhouses complex at 28 Kent Street;
- Owners and occupiers of dwellings 53-57 Kent Street and 1 Boronia Avenue, Epping;
- Owners and occupiers of residential flat buildings at 45-53 Bridge Street, Epping.

This consultation should occur consistent with the notification requirements of Parramatta DCP 2011. It is to include a letter to the owner/occupiers of these properties, providing them with 14 days to provide written comments on the proposal and the ability to view appropriate Review of Environmental Factors documentation on Council's website.

The proposal may need to be further refined to address any feedback received from nearby properties.

6.2 Environmental Impacts and Management

6.2.1 Environmental Impacts

The environmental assessment has been undertaken with regard to the provisions contained in Section 228 of the Environmental Planning and Assessment Regulation 2000. The following sections address only key issues specific to the proposal.

Environmental Issue	Detail
Amenity Impacts	Temporary construction could generate amenity impacts in terms of noise during the works being carried out. This impact is temporary and can be mitigated.
Hazardous Materials	The construction process is likely to involve removal of existing parts of the building and care will need to be taken to ensure that any hazardous materials (such as asbestos) are handled appropriately.
Water Quality and Soils	The proposal has the potential to impact on water quality via the watercourse that runs through the reserve receiving additional sedimentation. This impact is temporary and can be mitigated. A geotechnical investigation has been prepared for the proposed works and is attached. As part of that investigation, the following areas were assessed: - Subsurface conditions, including groundwater. - Earthworks, suitability of existing fill for re-use. - Indicative presence of Acid Sulfate Soils. There is no apparent risk associated with contaminated land.
Noise and Vibration	Temporary construction could generate amenity impacts in terms of noise and vibration to surrounding residential properties.

	The Interim Construction Noise Guideline prepared by the NSW Environment Protection Authority (EPA) will have to be complied with. A qualitative assessment is most appropriate in accordance with the EPA guidelines and this is based on the fact that: - The project is minor in nature; - Sensitive receivers are limited; - Hours of work will be standard construction hours of 7am to 5pm Monday to Friday and 8am to 5pm on Saturday. - Construction program will be relatively short in duration; - Impacts are transient and are able to be mitigated through neighbour consultation as detailed further in this Review of Environmental Factors; The noise impact of the use of the park is expected to remain comparable to the existing park. No formal mitigation measures are considered necessary.
Air Quality	The Proposal is located in a residential context. Potential airborne particles within the locality are largely restricted to vehicle emissions and minor dust generated by vehicle movements in the broader landscape. The works may temporarily affect air quality through exhaust emissions from machinery and associated transportation. There may also be minor dust generated during earthworks and the removal of trees. There is potential that emissions and dust generated from the works may result in air quality impacts to adjacent sensitive receivers. However, given the temporary duration of the works and nature of the Activity, the level of potential impact is not considered significant and can be managed or minimised through implementation of safeguards and management measures. The works would contribute to greenhouse gas emissions to a minor extent via the emissions from construction equipment and traffic, as well as the consumption of materials requiring carbon emissions and the removal of vegetation that may otherwise act as a carbon sink. Given the scale of the works however, the influence on greenhouse gas emissions would be negligible. However, it is appropriate to implement measures that can reduce or minimise such effects.
Heritage Impacts	The Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (2010) has been followed (Step 2 of flowchart): a) An AHIMS search was carried out (Attached) and no results were recorded;

	Therefore an AHIP application is not necessary with works able to proceed with caution. Furthermore, the development site is not identified as a local heritage item nor is it within close proximity to any local heritage items.
Tree Protection & Biodiversity	During the proposed upgrade works, trees are to be adequately protection including measures such as fencing and exclusion zones. The landscape plan provides for the appropriate embellishment of the reserve and it is noted that the Ecological Report requires planting to offset vegetation removal. *The loss of the BGHF trees are recommended to be compensated by the replanting of BGHF either as individual trees or part of landscaped beds containing BGHF species in the ground layer, shrub and canopy. Given the proposal will likely remove six (6) trees, this could be compensated by replacement at a 2:1 ratio with local provenance stock.*
Traffic Impacts	Additional traffic will be generated during construction however considering the location and nature of works there will be limited impact on the local traffic network. There will also be construction vehicles on the site and the potential conflict with park users will need to appropriately managed. This impact is temporary and can be mitigated.
Waste Generation	The Activity would be undertaken to ensure minimal impacts are generated from waste produced onsite by ensuring that all waste is managed appropriately. Waste generated from the Activity may include, but is not limited to: - Packaging materials - General site rubbish - Oils and grease from machinery - Scrap metal - Soil spoils - General building materials waste Any excess cleared vegetation and soil not utilised on-site would be deposited at a licensed waste facility or reused as a resource (e.g. mulched) at a later date on Council projects wherever possible and as deemed fit/ suitable in accordance with NSW waste legislation. Waste has the potential to disperse into the surrounding environment and cause visual impacts and

	potential harm to terrestrial and aquatic flora and fauna. Waste products may also transport contaminants that may degrade local water quality (e.g. fuels, lead-based paint and oils). This risk can be reduced and managed through the implementation of safeguards. This impact is temporary and can be mitigated.
Amenity Impacts	The works unlikely to cause any negative amenity impacts. There is unlikely to be any significant disruption to surrounding residential properties during construction. The proposal would ultimately result in positive socio-economic outcomes, by increasing the useability of recreational facilities within the reserve. This impact is temporary and can be mitigated.
Cumulative impacts	Under Clause 228 of the EP&A Regulation 2000, any cumulative environmental effect with other existing or likely future activities must be taken into account when assessing the impact of an activity for the purposes of Part 5 of the EP&A Act. The project is expected to add to a number of minor cumulative impacts including resource consumption, vegetation clearing and generation of greenhouse gas emissions (e.g. through operation of vehicles and equipment). However, the mitigation measures stated in this Review of Environmental Factors and the final methodology for completion of the Activity would aim to minimise the extent to which the proposal contributes to cumulative adverse environmental impacts.
Ecologically Sustainable Development	The principles of ecologically sustainable development are outlined in Schedule 2 of the Environmental Planning and Assessment Regulation 2000, in relation to EIS requirements. Whilst an EIS is not required for this project, a consideration of this principles is useful. **Precautionary Principle** Schedule 2 of the Environmental Planning and Assessment Regulation 2000 states that *"the 'precautionary principle', namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by: i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and ii) an assessment of the risk-weighted consequences of various options".* To satisfy the precautionary principle, this Review of Environmental Factors has conducted a thorough analysis

	of potential environmental, economic and social concerns. This assessment has identified and examined potential impacts and developed appropriate mitigation measures and safeguards to help avoid and/or minimise any impacts and safeguard the environment. Considering this assessment's findings, the proposal is unlikely to impose significant and/or long-term adverse impacts on the environment, economy or community. The mitigation measures and safeguards outlined in this Review of Environmental Factors would be implemented to ensure sound environmental outcomes in all aspects of the proposal.

6.2.2 Mitigation Measures

Mitigation measures and environmental safeguards for the proposal are listed below. These safeguards would minimise the potential adverse impacts of the proposal discussed previously in this Review of Environmental Factors.

Air quality	Adequate Mitigation
Measures (including vacuuming or covering exposed areas) are to be used to minimise or prevent the generation of air pollution and dust. Vegetation or other materials are not to be burnt on-site. Machinery and vehicles not in use during construction would be turned off and not left to unnecessarily run idle. Vehicles, machinery and equipment would be maintained in accordance with manufacturer's specifications in order to meet the requirements of the Protection of the Environment Operations Act 1997 and associated regulation. Vehicles transporting waste or other materials that may produce odours or dust are to be covered and their tailgates sealed during transportation.	Yes
Water Quality and Soil	**Adequate Mitigation**
Erosion and sediment controls must be implemented in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book). Works must only commence once all erosion and sediment controls have been established. The controls must be maintained in place until the works are complete and all exposed erodible materials are stabilised.	Yes

All sediment control measures must be checked and repaired or re-installed (if required) if heavy rainfall is forecast. If unexpected contaminated land is encountered during the works, works are to stop immediately and relevant procedures outlined in a CEMP would be followed. The EPA and City of Parramatta would be notified immediately in response to incidents causing or threatening actual or potential harm to the environment in accordance with section 148 of the POEO Act (via EPA Environment Line on 131555).	
Construction noise and vibration	**Adequate Mitigation**
Generally works are to be carried out during normal work hours (i.e. 7am to 5pm Monday to Friday; 8am to 5pm Saturdays).	Yes
Construction noise must be managed in accordance with the NSW EPA Construction Noise Guidelines.	Yes
A qualitative approach the management of noise impacts will be carried out as follows: • All potentially affected residents will be notified of the type and duration of works prior to the commencement of construction; • All vehicles and machinery will be turned off when not in use; • Equipment will be well maintained. • Complaints are to be handled, and the contractor is to record any complaints received during the works programme and note measures undertaken to resolve the concerns raised.	Yes
Vibration resulting from construction and received at any structure outside of the project must be limited to: • For human exposure to vibration the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: A Technical Guideline (DEC 2006).	Yes
Waste management	**Adequate Mitigation**
Resource management hierarchy principles will be followed: • Avoid unnecessary resource consumption as a priority • Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery) • Disposal is undertaken as a last resort at a licenced disposal facility.	Yes

Waste material is not to be left on site once the works have been completed.	Yes
Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.	Yes
A Waste Management Plan is to be prepared by the contractor specifying the likely waste generation and how the waste generated will be disposed of. Waste material taken off site will be appropriately classified and managed in accordance with the Waste Classification Guidelines (DECCW, April 2008).	Yes
Traffic and site access	**Adequate Mitigation**
A Construction Traffic Management Plan is to be prepared by the contractor to address the construction phase of the development. This shall appropriately manage internal site traffic and pedestrian movements to ensure the safety of workers and public as well as outline required signage and fencing to assist with ensuring safety for all.	Yes
Amenity Impacts	**Adequate Mitigation**
Inform immediately adjoining and adjacent landowners of the schedule and scope of works prior to works commencing as outlined below: • With the owners/occupiers of the townhouses complex at 28 Kent Street • Owners and occupiers of dwellings 53 -57 Kent Street and 1 Boronia Avenue, Epping • Owners and occupiers of residential flat buildings at 45 -53 Bridge Street, Epping. This consultation should occur having regards to the notification requirements of Parramatta DCP 2011 and include a letter to the owner/occupiers of these properties, providing them with 14 days to provide written comments on the proposal and the ability to view appropriate Review of Environmental Factors documentation on Council's website. The proposal may need to be further refined to address any feedback received from nearby properties.	Yes
Biodiversity Impacts	**Adequate Mitigation**
In accordance with the submitted Biodiversity Report a revised landscaping plan is to be prepared prior to works commencing that addresses the recommendation of the report that is outlined below: *The loss of the BGHF trees are recommended to be compensated by the replanting of BGHF either as individual trees or part of landscaped beds containing BGHF species in the groundlayer, shrub*	Yes

and canopy. Given the proposal will likely remove six (6) trees, this could be compensated by replacement at a 2:1 ratio with local provenance stock. The current landscape plan provides for the provision of 7 replacement trees and to offset the removal of vegetation a total of 12 trees from local providence stocks are required to be illustrated on the revised landscape plan.	
Access for all	**Adequate Mitigation**
To ensure appropriate access for all for the project an updated Access report shall be prepared before construction that confirms that the detailed design of the project provides an appropriate level of accessibility. This report should address the actions required in the submitted report.	
National Construction Code	**Adequate Mitigation**
To ensure the proposal is capable of complying with the requirements of the National construction Code, prior to works commencing a revised BCA report that addresses the deficiencies and contains performance solution recommend in the attached report is to be prepared. This report shall confirm that the construction works comply with the relevant provisions of the National Construction Code.	Yes
Heritage	**Adequate Mitigation**
If any unexpected European or Aboriginal Archaeology is encountered during the construction phase, works shall cease, and discussion occur with the City of Parramatta's Heritage advisor as to whether any state or federal government agencies need to be advised.	Yes
Tree Protection	**Adequate Mitigation**
Tree protection measures are to be carried out in accordance with the recommendations of the attached arborist report.	Yes

6.2.3 Certification of Mitigation Measures

The mitigation measures and environmental safeguards for the proposal listed above would appropriately minimise the potential adverse impacts of the proposal.

	Author	**Reviewer/Approver**
Signed	B. Delapierre	
Name	Brad Delapierre	Jonathon Wood

Qualifications	B. Urban & Regional Planning	B. Urban & Regional Planning
Position	Town Planning Manager	Director
Date	24 July 2020	24 July 2020

6.3 Commonwealth Legislation- NES Matters

The purpose of the Review of Environmental Factors is also to determine whether the activity is likely to have any impact on matters of national environmental significance (MNES). Any proposed activity that may impact upon a MNES requires referral to the Commonwealth Department of Environment and Heritage for an assessment of significance, and possible Commonwealth approval.

A summary of MNES matters and elements of the activity is contained in Appendix E. The activity is not a controlled action under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* and there are no flora or fauna species prescribed within the EPBC Act within the works area.

7. Conclusions

7.1 Summary of Beneficial Effects

The main benefits of the proposal are social and physical and are as follows:

- Delivery of an upgraded modern sports pavilion and associated works with sufficient infrastructure and facilities to better meet the needs of a growing community;
- Delivery of appropriate multi-functional recreational space as well as toilet facilities that serve all of the community and are built in accordance with current CPTED principles.

7.2 Summary of Adverse Effects

The main adverse outcomes of the proposal are as follows:

- During construction there is potential for noise, traffic and waste generation. However, provided mitigation measures detailed within this assessment are addressed during the construction phase no adverse impacts are anticipated;
- Vegetation removal. The removal of six trees has the potential to adversely impact on vegetation with the reserve. The planting of 14 replacement trees will adequately mitigate this.

7.3 Justification

It has been considered that the benefits associated with the proposed works outweigh the temporary minor adverse impacts. The proposal has assessed likely environmental impacts and provided recommendations for mitigation measures to be incorporated during the construction phase.

7.4 Conclusion

This Review of Environmental Factors has concluded that the proposal to provide a replacement sports pavilion and associated works is appropriate. The works involves the replacement of an existing sports pavilion with a new facility to provide modern changerooms, new amenities, meeting space, kiosk and additional spectator seating.

This Review of Environmental Factors has been prepared in accordance with the relevant provisions of the Environmental Planning and Assessment Act 1979 and the Environmental Planning and Assessment Regulation 2000. The City of Parramatta Council is the proponent and determining authority for the proposal, noting that a development application is not required as Clause 65(3) of the State Environmental Planning Policy (Infrastructure) 2007 permits development without consent for development carried out by or on behalf of a council without consent on a public reserve under the control of or vested in the council.

The primary environmental factors considered in this Review of Environmental Factors included: traffic, noise, vegetation removal and vibration, waste, social and cumulative environmental effects.

The positive impacts associated with the proposal is a replacement of the sports pavilion which will result in improved facilities for users and the wider community.

There are a number of adverse impacts that could be generated from the proposed works however the majority of these are temporary in nature and can be mitigated. The key impacts relate to noise generation, air quality, tree removal and waste disposal and are to be mitigated as detailed in this Review of Environmental Factors.

The assessment concluded the proposed works are not expected to result in any significant adverse environmental impact provided the mitigation measures identified in the assessment are implemented.

This report and documents submitted as part of this review of environmental factors confirm that the development will not have an unacceptable impact on the environment.

8. Declaration & Certification

This Review of Environmental Factors provides a true and fair review of the activity in relation to its likely impact on the environment. It addresses to the fullest extent possible, all of the factors listed in *Clause 228 of the Environmental Planning and Assessment Regulation* (as amended) and will not result in a likely significant on the environment, threatened species, populations or ecological communities.

This Review of Environmental Factors provides an accurate review of the proposal in relation to its potential effects on the environment.

	Author	**Reviewer/Approver**
Signed	B. Delapierre	
Name	Brad Delapierre	Jonathon Wood
Qualifications	B. Urban & Regional Planning	B. Urban & Regional Planning
Position	Town Planning Manager	Director
Date	24 July 2020	24 July 2020

9. Appendices

a. Environmental Factors Considered: Clause 228 of EP&A Regulation 2000

Has the REF considered the following points?	Yes/No	Comment
Any environmental impact on a community.	Yes	See Section 5- limited impact.
Any transformation of a locality.	Yes	No impact.
Any environmental impact on the ecosystems of the locality.	Yes	See Section 5- limited impact.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality.	Yes	See Section 5- limited impact.
Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations.	Yes	See Section 5- limited impact.
Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act.1974*)	Yes	No impact.
Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air.	Yes	No impact.
Any long-term effects on the environment.	Yes	No impact.
Any degradation of the quality of the environment.	Yes	No impact.
Any risk to the safety of the environment.	Yes	See Section 5 - limited impact.
Any reduction in the range of beneficial uses of the environment.	Yes	No impact.
Any pollution of the environment.	Yes	See Section 5- limited impact.
Any environmental problems associated with the disposal of waste.	Yes	See Section 5- limited impact.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply.	Yes	No impact.
Any cumulative environmental effect with other existing or likely future activities.	Yes	No impact.

b. Environmental Issues and Approvals Checklist

Has the REF considered the following points?	Yes/No	Section
Has the Review of Environmental Factors clearly detailed who is proposing to carry out the activity or development?	Yes	1 & 2
Has the Review of Environmental Factors detailed the relevant LEP and why development consent is not required from Council?	Yes	2
Does the development involve the construction of a Water Storage Dam or Sewage Treatment Work?	No	
Is the development within a coastal wetland?	No	
Is the development within urban bushland?	Yes	3
Is the development within littoral rainforest?	No	
Do acid sulphate soils occur within the development area?	No	
Will the development restrict access to a coastal foreshore area?	No	
Will the development require the removal of native vegetation?	Yes	3
Are there State listed threatened flora or fauna species, populations or ecological communities in the development area?	Yes	3
Is the development located within 40 metres of a waterway?	No. The closest waterway is a concrete creek	
Is the development located on land either permanently or intermittently submerged by water?	Yes	
Is a bore required for de-watering of a construction site?	No	
Will wastewater be discharged from the site?	No	
Is the area likely to contain aboriginal artefacts or items of cultural heritage?	No	
Has the State Heritage Register been reviewed for listings associated with the development site?	Yes	
Are the works near a railway line or on land owned or administered by a rail corporation	No	
Will the works occur within a road reserve?	No	

Will the works occur on Crown land?	Yes	
Will the works occur within National Park Estate?	No	
Will chemicals or flammable liquids be stored on the development site?	Yes Minor quantities	
Are pesticides required to be used as part of the development works?	No	

c. Commonwealth Matters of National Environmental Significance

Significant Matter	Yes / No	Relevant Details
Are there any world or natural heritage listed items that will be impacted upon by the development?	No	No world or natural heritage items in works area.
Is the development within or adjacent to a Ramsar wetland site?	No	No RAMSAR wetlands in proximity to works area.
Are there any Commonwealth listed threatened flora or fauna species or ecological communities in the development area?	No	No Commonwealth listed threatened flora or fauna species in the proximity of the works area.
Are there any Commonwealth listed migratory species that will be impacted upon by the development?	No	No Commonwealth listed threatened flora or fauna species in the proximity of the works area.
Will the activity be carried out near or adjacent to a Commonwealth marine area?	No	No Commonwealth marine areas in proximity of the works area.
Is the activity, or will it impact upon, a Commonwealth defined “nuclear” action.	No	No impact on any nuclear actions.

d. AHIMS Search Results

AHIMS Web Service search for the following area at Lot : 341, DP:DP914533 with a Buffer of 50 meters, conducted by Brad Delapierre on 05 February 2020.

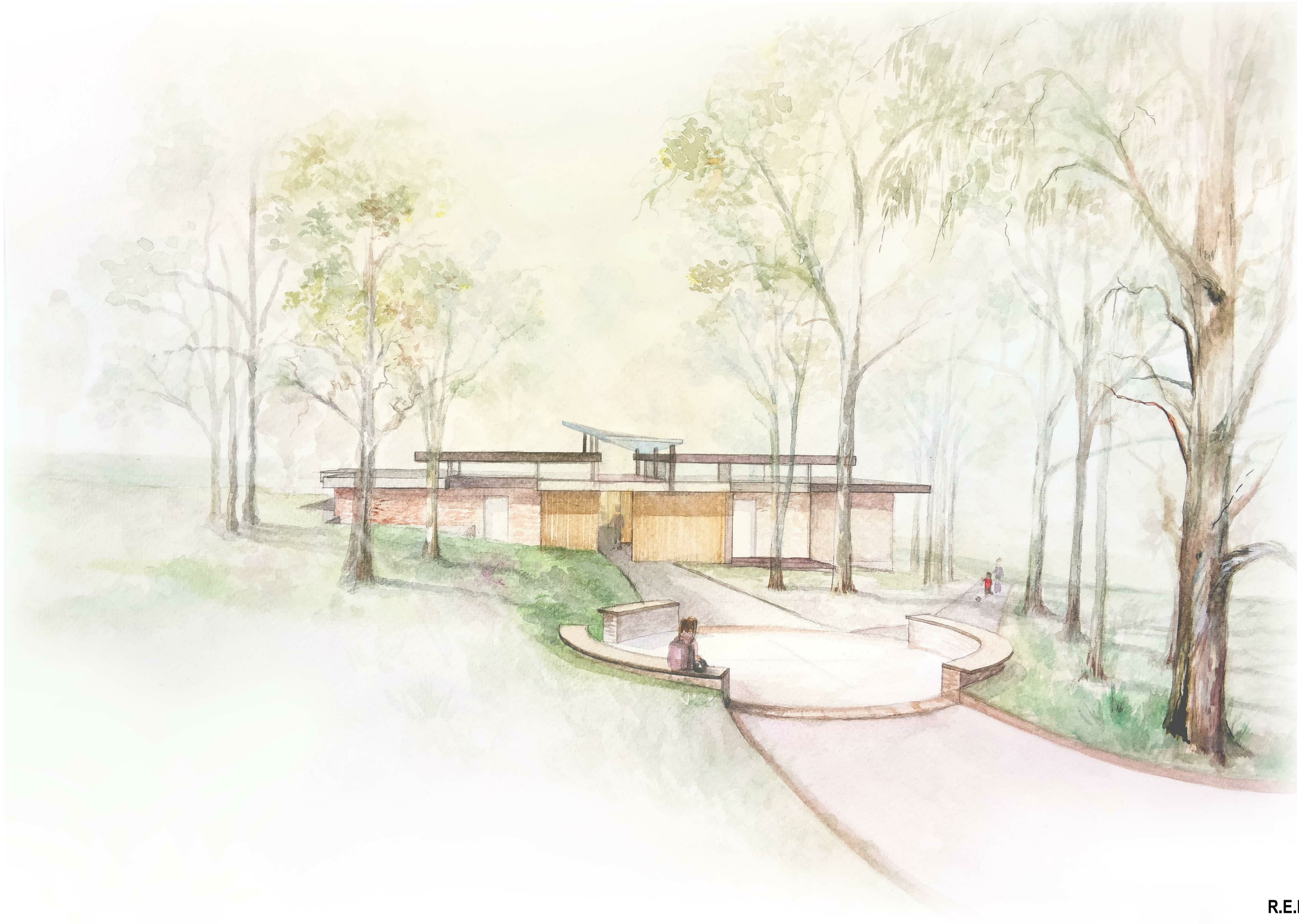
The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Appendix E- Architectural Plans

BORONIA PARK- NEW SPORTS PAVILION



R.E.F Documentation

Boronia Park New Sports Pavilion
37A Bridge Street, Epping, 2121

For : City Of Parramatta
Project Status: R.E.F Documentation

\\nimbus-srv\Shared\Projects\1914 CoP Boronia Park Sporting Pavilion\9 Documentation\9_9 BIM\9_9_1 Central File\1914_Central_REF_200507.rvt

nimbus
architecture + heritage

Nimbus Architecture and Heritage Pty Ltd
Nominated Architect: Jesse Mowbray (NSW Registration No. 8618)
ABN 71 609 346 965
Email admin@nimbusarch.com
Phone +61 2 9891 3564

Date : 19/05/2020 12:20:14 PM

(A2)

Cover Sheet

Drawing Number :
1914 A-000 **B**

PROJECT NOTES & LEGENDS

PROJECT NOTES

1.0 GENERAL

1.1 The project notes are to be read in conjunction with relevant specification sections. If provided, refer to civil, landscaping, structural, mechanical, acoustic, lighting, plumbing, fire protection, electrical consultants' drawings and specification for co-ordination of work.

1.2 The Principal's decision on the contractors interpretation of the design intent shall be final and binding.

1.3 Discrepancies existing between the drawings of the various consultants shall be brought to the immediate attention of the Principal.

1.4 If provided, refer to specification for details of structural, hydraulic, mechanical and electrical services.

1.5 Details shown are intended to be indicative of the profiles and detailing required for the work.

1.6 Where specific dimensions details or design intent cannot be determined consult with the principal before proceeding with the work.

1.7 Any discrepancies found in the architectural drawings or with drawings of the other consultants shall be brought to the immediate attention of the Principal.

1.8 Unless noted otherwise, where the architectural floor is to be provided the floor RL's are to top of finished floor.

1.9 The trade contractor shall provide finish mock-ups and samples as noted by the contract documents for approval prior to fabrication. Refer to specifications for the requirement of samples & shop drawings.

1.10 Construction of work indicated as NIC is not included in this contract.

1.12 All elevations are referenced to Australian Height Datum (AHD).

1.13 All wall tiling modules are to be laid out of the wall so that the regulating edge conditions have cut tiles not less than half the full size tile dimensions unless noted otherwise.

1.14 A finish indicated for a wall sheet means the entire length and height of a wall shall be finished as indicated unless noted otherwise, to the intent of architectural drawings.

1.15 Demonstrate with calculations and drawings the adequacy of control joints for specific materials, construction techniques and anticipated loads, movement and environment conditions for both interior and exterior parts of the builds, specifically including all exterior, roof elements and box gutter systems.

1.16 A painted sign shall be fixed to the boundary fence of the job throughout the construction period. The graphics shall be to the Principal's requirements.

1.17 All exterior joints around window and door frames between walls and foundations, roof panels and penetrations of services through the envelope shall be sealed to make the building water tight to prevent infiltration of water as necessary.

1.18 Provide complete and continuous seals at the interface of all partitions to floors, ceilings, structure, lift fixing, doors and adjacent spaces where accessible ceiling types or no ceilings occur.

1.19 Where recessed or non-modular fixtures are used in modular ceilings, they are to be centered in the tile/panel or as indicated on the architectural drawings.

1.20 There shall be no manufacturer's identification logo, trademark etc. on any items visible installed on site from any possible viewers point.

1.21 Blocking and structural support within ceilings and walls are to be provided to support the loads of fixtures such as shelving, hooks, fans, light fittings etc. No visible fixings or blocking are permitted.

1.22 Clean fill required for new external levels unless noted otherwise.

2.0 DIMENSIONS

2.1 Unless noted otherwise, all dimensions are given in millimetres.

2.2 Dimensions shall govern. Do not scale from drawings.

2.3 All dimensions & setouts shall be verified and confirmed on site prior to ordering or commencement of work

2.4 Exterior walls are dimensions to the exterior finished face for the wall unless noted otherwise. Glazed walls are dimensioned to the outer face of mullion cappings, unless noted otherwise

2.5 Interior walls are dimensioned to the exterior finished face for the wall unless noted otherwise.

3.0 SET OUT

3.1 Contractor to confirm setout points with the architect prior to commencement of work on site.

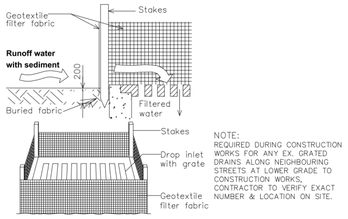
4.0 SURVEY

4.1 Survey is provided by City of Parramatta Council.

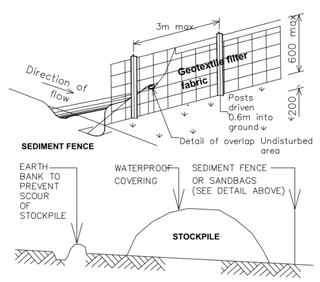
SHEET LIST

Sheet Number	Sheet Name	Current Revision
A-000	Cover Sheet	B
A-001	Project Notes & Legend	C
A-100	Demolition Plan	D
A-110	Precinct Plan	F
A-120	Ground Floor Plan	I
A-121	Roof Plan	E
A-200	Elevations	E
A-201	Elevations	E
A-300	Sections	D
A-600	Perspective	C
A-700	External Materials Schedule	C

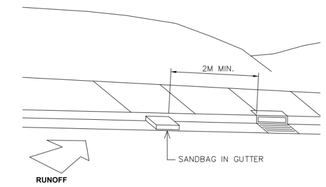
SEDIMENT CONTROL



Sandbag Kerb Sediment Trap



Building Materials Stockpile



Sediment Trap to Stormwater

1. Builder shall provide sediment fencing material during construction as required by council. Tie sediment fencing material to cyclone wire security fence. Sediment control fabric shall be an approved material (Eg. Humes propoex silt stop) standing 300mm minimum above ground and extending 200mm below ground.
2. Existing drains located within the site shall also be isolated by sediment fencing material.
3. No parking or stockpiling of materials is permitted on the lower side of the sediment fence.
4. Grass verges shall be maintained as much as practical to provide a buffer zone to the construction site.
5. Roof drainage is to be connected to the stormwater system as soon as practical. Temporary drainage shall be connected to the existing system during construction work.
6. Builder shall ensure all construction traffic entering and leaving the site site do so in a forward direction.
7. All temporary stockpiles shall be at least 2000mm clear of areas of concentrated water flow & the driveway, footpath not to be used. Refer to architectural drawings for setout of site sheds.
8. Provide mesh and gravel 'sausage' protection to gutter inlets near the allotment.

ABBREVIATIONS AND LEGEND

CJ	CONTROL JOINT
COS	CONFIRM ON SITE
EJ	EXPANSION JOINT
EX	EXISTING
ECL	EXISTING CEILING LEVEL
FC	FIBRE CEMENT SHEET
FCL	FINISH CEILING LEVEL
EFL	EXISTING FLOOR LEVEL
FFL	FINISH FLOOR LEVEL
MDF	MEDIUM DENSITY FIBRE BOARD
MR	MOISTURE RESISTANT
PB	PLASTERBOARD
PF	PAINT FINISH
SJ	SILICONE JOINT
TGSI	TACTILE GROUND SURFACE INDICATORS
WT	WATER TANK
B	BOLLARD TO AS1428.1

101 — DOOR TAG

1i — WINDOW TAG

ERL 25.500 — EXISTING LEVEL

FRL 25.500 — PROPOSED LEVEL

RELATIVE SPOT LEVEL

N 2556890 E 962509 — BUILDING SET OUT

NEW STUD WALLS

NEW FACE BRICK WALLS

NEW BLOCKWORK WALLS

EXISTING WALLS/ELEMENTS TO BE DEMOLISHED

SITE BOUNDARY

NOT IN PROJECT SCOPE OF WORKS

STOCKPILE

HOARDING/ SITE FENCE

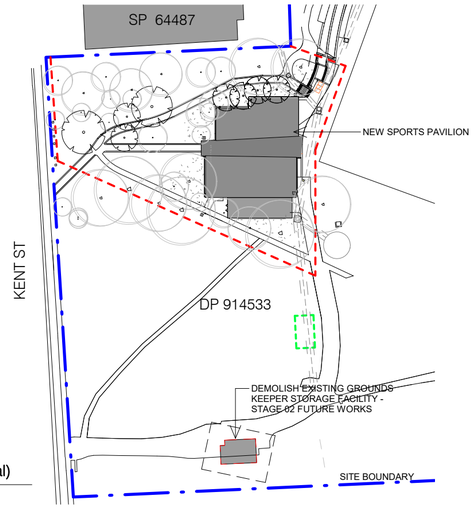
LOOSE FURNITURE

CIRCULATION ZONE TO AS1428.1

EXISTING TREES TO BE DEMOLISHED

EXISTING TREES TO BE RETAINED

PROPOSED NEW TREE LOCATION



1 Site Plan (Partial)
1 : 1000

ROOF

R1	METAL DECK ROOF SHEETING - KLIP-LOK: PT9 FINISH AS SCHEDULED
R2	DANPALON CLEAR PANELS AS SCHEDULED
R3	TRANSLUCENT ROOF SHEETING - KLIP-LOK PROFILE
REG1	FOLDED STAINLESS STEEL EAVES GUTTER TO HYDRAULIC ENGINEERS SPECIFICATION
REG2	FOLDED STAINLESS STEEL EAVES GUTTER TO HYDRAULIC ENGINEERS SPECIFICATION
DP1	STAINLESS STEEL CIRCULAR DOWN PIPE TO HYDRAULIC ENGINEERS SPECIFICATIONS
RFB	FASCIA BOARD: FOLDED METAL FASCIA WITH FINISH AS SCHEDULED ON STEEL FRAMING TO DETAIL
RAL	ROOF ACCESS LADDER BRACKET

FLOOR

FCS1	REINFORCED CONCRETE SLAB TO STRUCTURAL ENGINEERS SPECIFICATION: HONED WITH CLEAR FINISH
FCS2	REINFORCED CONCRETE SLAB TO STRUCTURAL ENGINEERS SPECIFICATION: WOOD FLOAT WITH CLEAR FINISH
FV1	HEAVY DUTY VINYL FLOORING WITH INTEGRATED SKIRTING AS SCHEDULED
TGSI	STAINLESS STEEL TACTILE GROUND SURFACE INDICATOR STUDS AS SCHEDULED

CEILING

CPC	CLEAR COAT FINISH TO UNDERSIDE OF PLYWOOD ROOF BRACING
CPB	PLASTERBOARD SQUARE SET FOR PAINT FINISH
CPA	PLYWOOD ACOUSTIC CEILING LINING CLEAR COAT FINISH
CMS	STEEL MESH SOFFIT LINING
CAP	600 x 600 ACCESS PANEL WITH FINISH TO MATCH ADJACENT CEILING SURFACE

WALL

WTC	HARDWOOD CLADDING FINISH AS SCHEDULED
WG1	FIXED GLAZING TO SECTION J REQUIREMENTS
WC1	STEEL MESH SCREENING : GALVANISED FINISH AS SCHEDULED
WFB	FACE BRICK WALL AS SCHEDULED TO DETAIL WITH HEADER COURSE ANTI GRAFFITI COATING

STRUCTURE

SS1	HDG STRUCTURAL STEEL TO STRUCTURAL ENGINEER SPECIFICATION: INTERNAL
SS2	HDG STRUCTURAL STEEL TO STRUCTURAL ENGINEER SPECIFICATION PRIMED FOR PAINT FINISH AS SCHEDULED: EXTERNAL
ST1	TIMBER FRAMING TO STRUCTURAL ENGINEERS SPECIFICATION
ST2	HARDWOOD STRUCTURAL TIMBER TO STRUCTURAL ENGINEERS SPECIFICATION

REFER TO STRUCTURAL ENGINEERS DRAWINGS FOR FULL SPECIFICATION

WALL/PARTITION

P1	BRICK VENEER WALL WITH TIMBER FRAMING: ANTI GRAFFITI CLEAR COATING FINISH AS SCHEDULED EXTERNALLY | PLYWOOD LINING FOR PAINT FINISH INTERNALLY
P2	TIMBER STUD WALL WITH PLYWOOD LINING FOR PAINT FINISH BOTH SIDES
P2	TIMBER STUD WALL WITH PLYWOOD LINING ON TOP HATS FOR PAINT FINISH BOTH SIDES
P3	CONCRETE BLOCKWORK WALL WITH ANTI GRAFFITI CLEAR COATING TO STRUCTURAL ENGINEERS SPECIFICATIONS | PLYWOOD LINING FOR PAINT FINISH ON TIMBER BATTENS TO SUIT
P4	TIMBER STUD WALL WITH FIBRE CEMENT SHEETING, WATERPROOF MEMBRANE AND CERAMIC TILES (BOTH SIDES)
P5	NEW TIMBER STUD WALL WITH FIBRE CEMENT SHEETING, WATERPROOF MEMBRANE AND CERAMIC TILES | PLYWOOD FOR PAINT FINISH
P6	NEW TIMBER STUD WALL WITH PLYWOOD LINING FOR PAINT FINISH
P7	GLAZED CURTAIN WALL SYSTEM: CAPRAL 300 NARROWLINE SERIES WITH HARDWOOD TIMBER SCREEN OVER TO DETAIL
P8	TIMBER STUD WALL WITH TIMBER CLADDING AND TIMBER BATTEN SCREENING EXTERNALLY | PLYWOOD LINING FOR PAINT FINISH INTERNALLY
P8a	TIMBER STUD WALL WITH TIMBER CLADDING AND TIMBER BATTEN SCREENING EXTERNALLY | FIBRE CEMENT SHEETING, WATERPROOF MEMBRANE AND CERAMIC TILES (BOTH SIDES)
P9	LAMINEX PARTITION SYSTEM: FMOB FLOOR MOUNTED OVERHEAD BRACED SYSTEMS WITH 13MM COMPACT LAMINATE IN BATTALION

LANDSCAPE

TF	NEW TURF: REPAIR/ REPLACE AS NECESSARY *MATCH EXISTING SPECIES*
TIM01	COMPOSITE TIMBER DECK SEATING: BLEACHERS
SC1	HDG GUARD FORCE MAX WELDED MESH FENCING SYSTEM AS SCHEDULED
WL1	FACE BRICK LANDSCAPE WALL WITH HEADER COURSE AND ANTI GRAFFITI CLEAR COATING
B	BOLLARD TO CITY OF PARRAMATTA SPECIFICATIONS
BL	MASS CAST-INSITU OFF FORM CONCRETE BLEACHERS WITH ANTI GRAFFITI CLEAR COATING TO DETAIL
HR1	40Ø CONTINUOUS STAINLESS STEEL CHS HANDRAIL AND POST WITH TACTILE BUTTON TO DETAIL (AS1428.1)
CP1	CONCRETE PATHWAYS TO MATCH EXISTING
CP2	CONCRETE PATHWAYS TO MATCH EXISTING WITH BRICK EDGING TO DETAIL
DG	DECOMPOSED GRANITE TO MATCH EXISTING AS SCHEDULED
PE	PATH EDGING: MASONRY PAVER ALIGNED FLUSH WITH PATH

REFER TO LANDSCAPE ARCHITECTURE DOCUMENTATION FOR FULL SPECIFICATION

ELECTRICAL

CR	COMMUNICATIONS RACK TO ELECTRICAL ENGINEERS SPECIFICATION
DB	DISTRIBUTION BOARD TO ELECTRICAL ENGINEERS SPECIFICATION
FIP	FIRE INDICATION PANEL TO ELECTRICAL ENGINEERS SPECIFICATION
MSB	MAIN SWITCH BOARD TO ELECTRICAL ENGINEERS SPECIFICATION
MDF	MAIN DISTRIBUTION FRAME TO ELECTRICAL ENGINEERS SPECIFICATION
SEC	SECURITY PANEL
PP	NEW PRIVATE POWER POLE TO ELECTRICAL ENGINEERS SPECIFICATION
FL	FIELD LIGHTING CONTROL UNIT TO ELECTRICAL ENGINEERS SPECIFICATION

REFER TO ELECTRICAL ENGINEERS DRAWINGS FOR FULL SPECIFICATION

HYDRAULIC

HW	GAS INSTANTANEOUS HOT WATER UNIT TO ENGINEERS SPECIFICATIONS
GSP	GRATED STORMWATER PIT WITH HEEL GUARD AS SCHEDULED
HP	GARDEN TAP
SD1	GRATED STRIP DRAIN WITH HEEL GUARD AS SCHEDULED
SD2	GRATED STRIP DRAIN WITH HEEL GUARD AS SCHEDULED
IC	EXISTING IRRIGATION CONTROL SYSTEM TO BE RELOCATED
SP1	NEW STORMWATER PIT
ESP	EXISTING STORMWATER PIT ADJUSTED AS DETAILED

ALL HYDRAULIC AND STORMWATER ITEMS TO HYDRAULIC ENGINEERS SPECIFICATION

MECHANICAL

AC	AIR CONDITIONER UNIT
PC	PUMP CONTROL

ALL MECHANICAL ITEMS TO MECHANICAL ENGINEERS SPECIFICATION

PAINT FINISHES

REFER TO FULL SPECIFICATIONS FOR PAINTING OF ANY SURFACE, PAINT SELECTION & SPECIFICATIONS.

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For : City Of Parramatta
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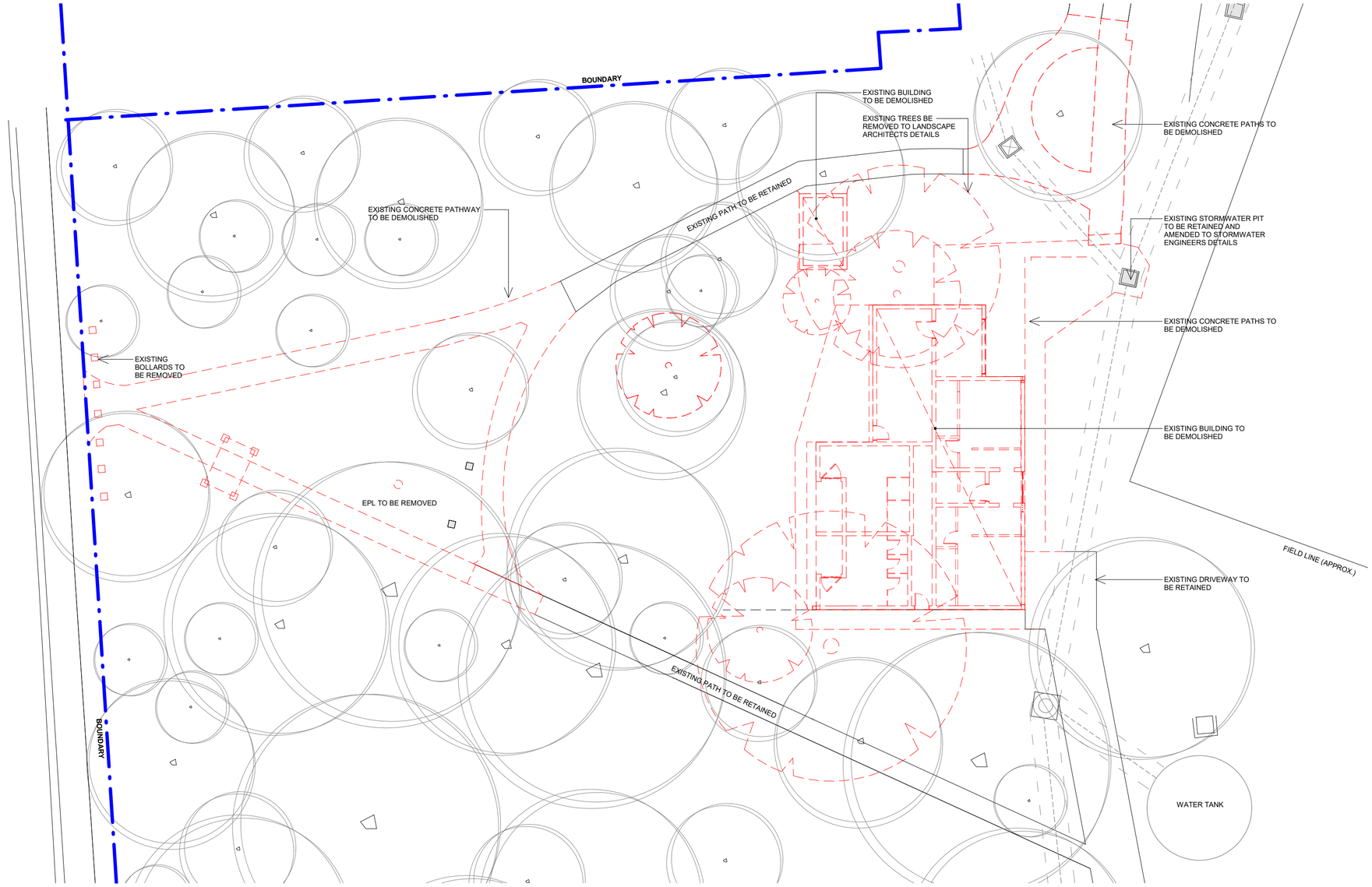
Date : 19/05/2020 12:22:20 PM

(A2)

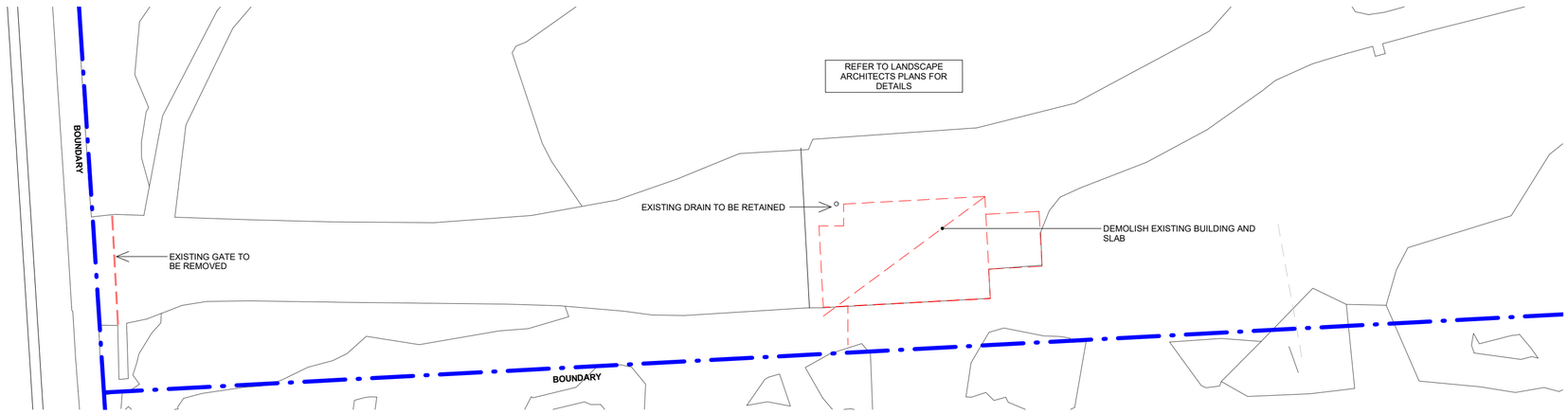
Project Notes & Legend

Drawing Number : 1914 A-001 **C**



1 Pavilion Precinct - Demolition

1 : 200



2 Services Depot - Demolition

1 : 200

R.E.F Documentation

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Scale: 1:200 @A2

Date : 19/05/2020 12:22:30 PM

(A2)

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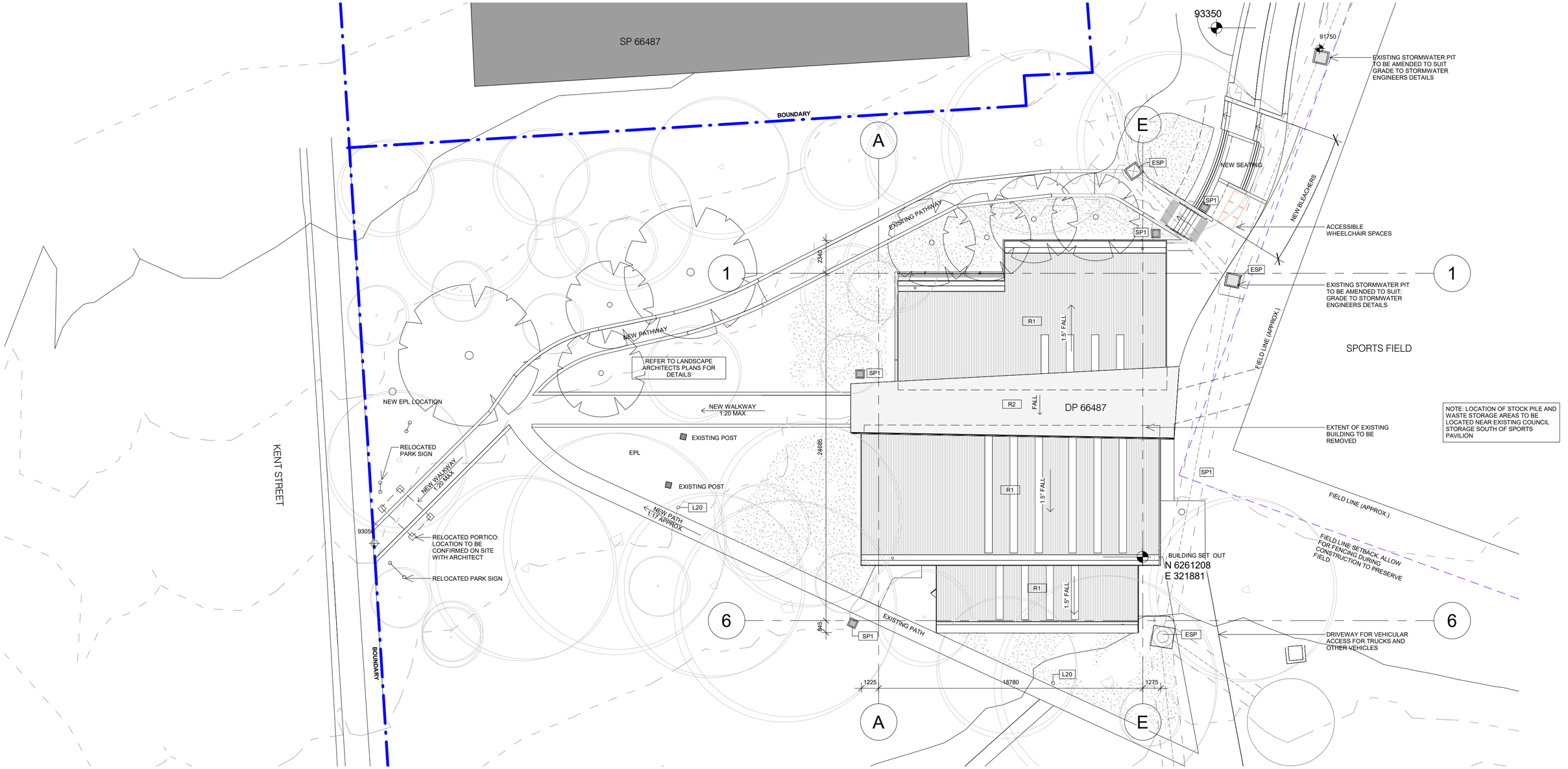
PROJECT NORTH
TRUE NORTH

Demolition Plan

Drawing Number :
1914 A-100 **D**



1 Pavilion Precinct - Proposed

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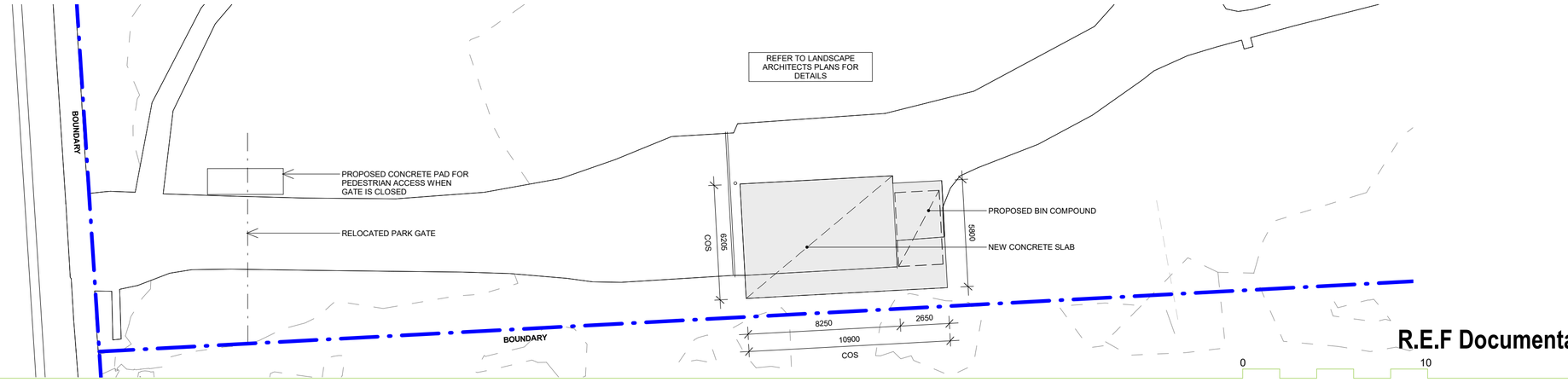

2 Services Depot - Proposed

1 : 200

R.E.F Documentation

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Date : 19/05/2020 12:32:09 PM

(A2)

Precinct Plan

Drawing Number :

1914 A-110 **F**

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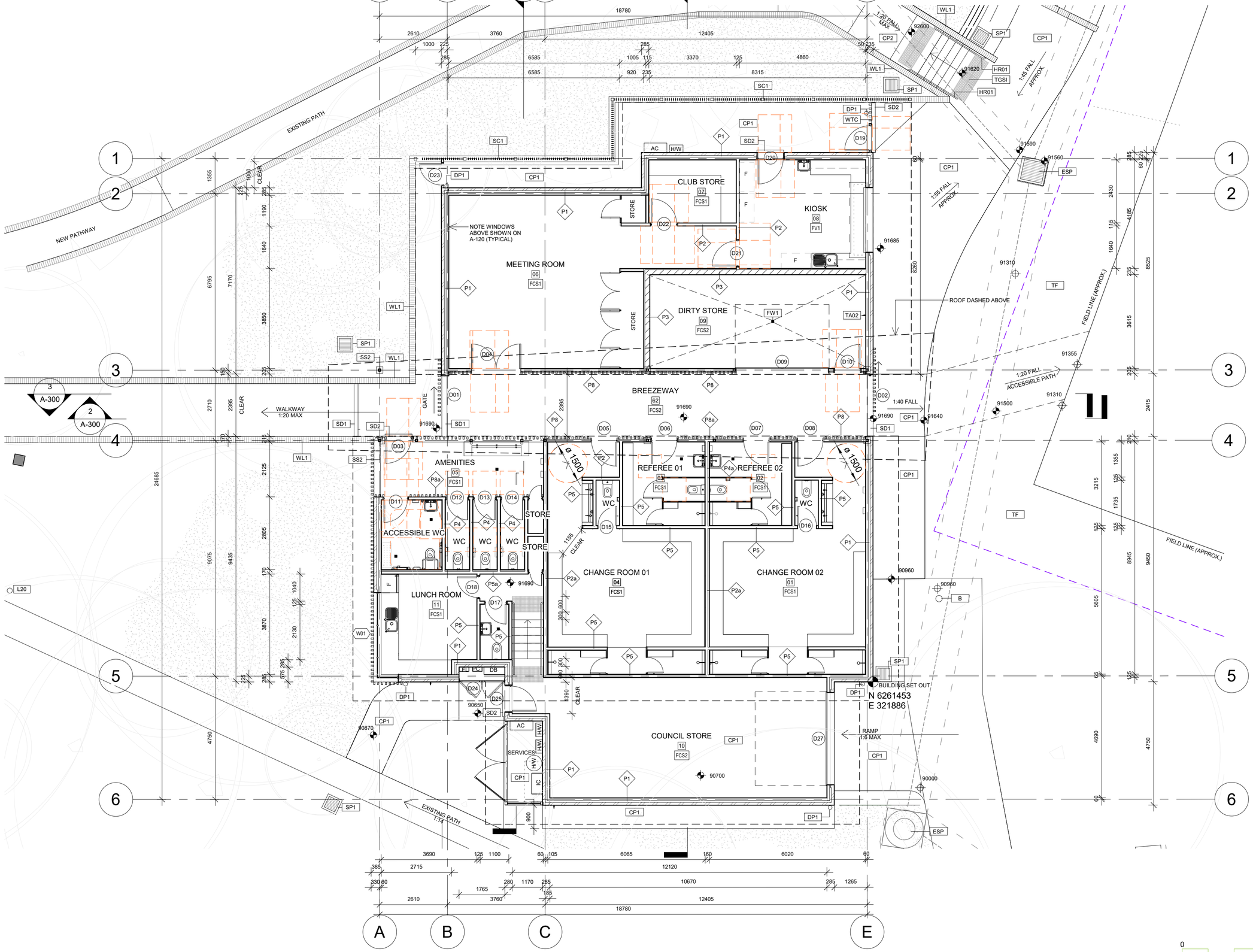

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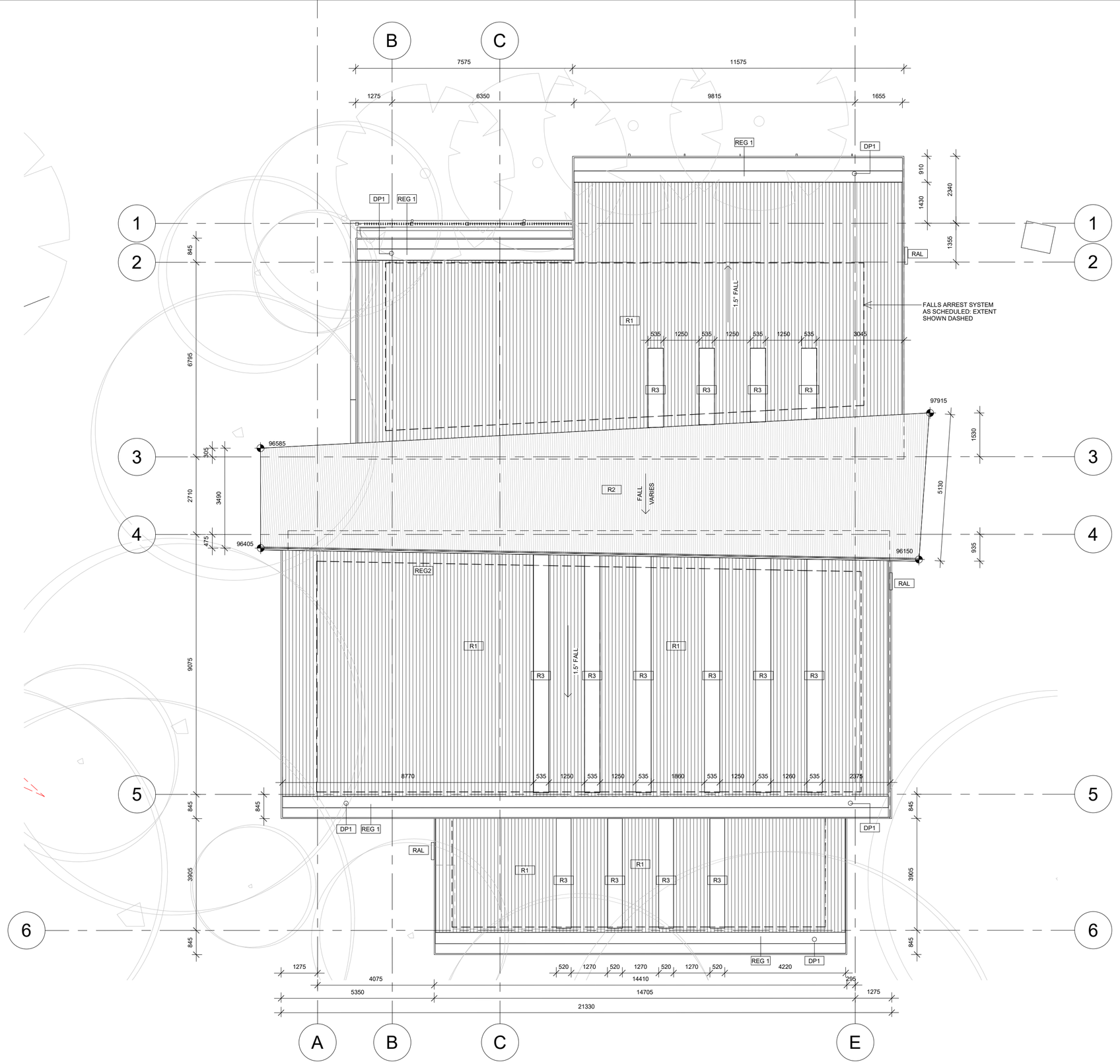
Date : 19/05/2020 12:32:26 PM

(A2)

Ground Floor Plan

Drawing Number :
1914 A-120



R.E.F Documentation

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Date : 19/05/2020 12:32:35 PM

(A2)

Roof Plan

Drawing Number :
1914 A-121 **E**

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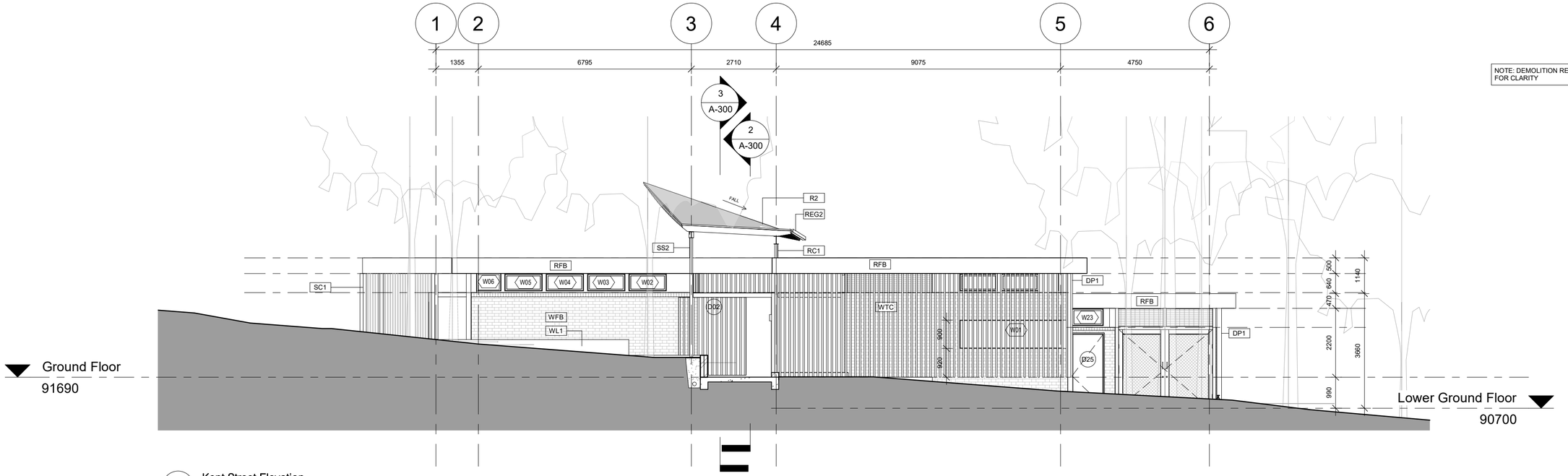
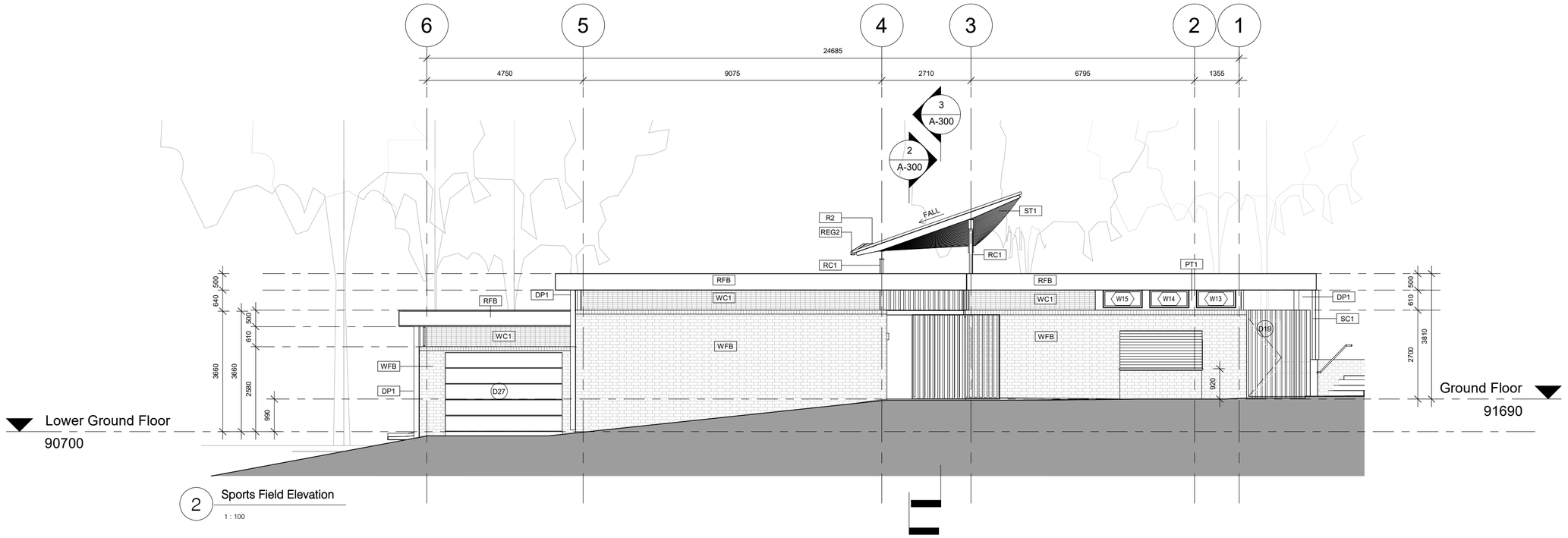


1 Kent Street Elevation

1 : 100



2 Sports Field Elevation

1 : 100

R.E.F Documentation

0 5 10 m

Scale: 1:100 @A2

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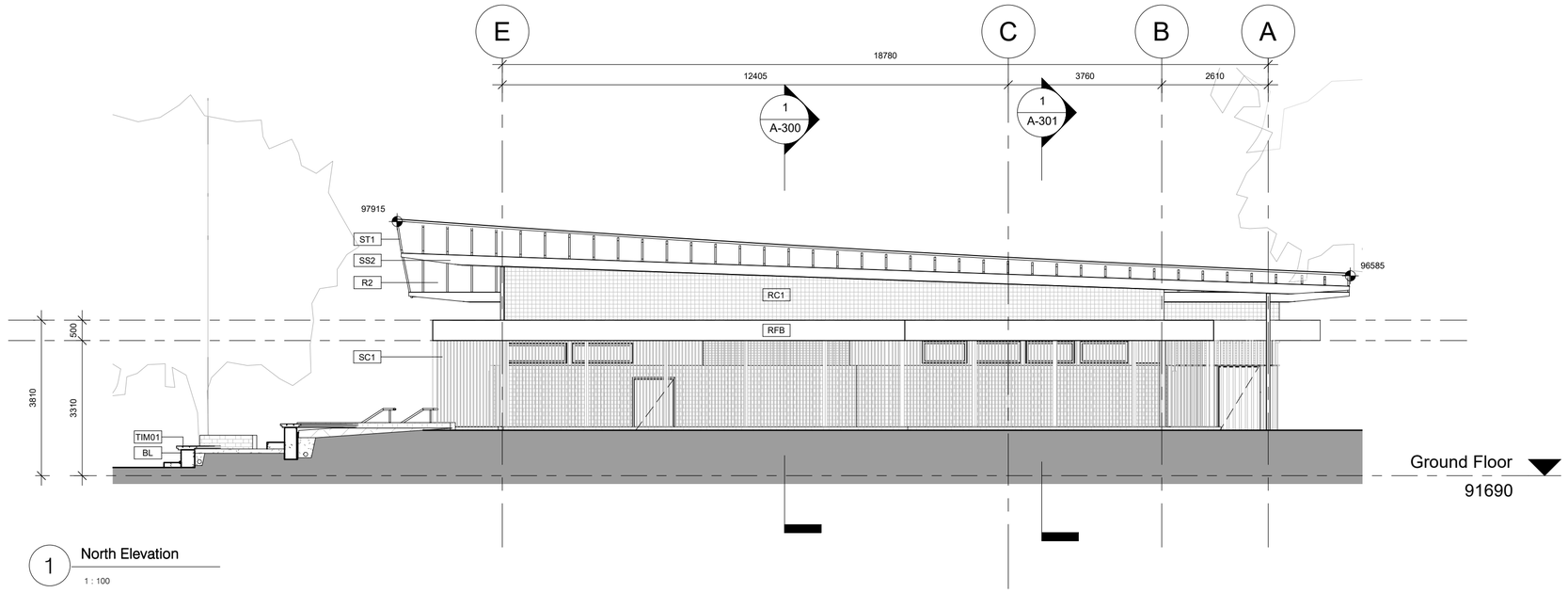
PROJECT NORTH
TRUE NORTH

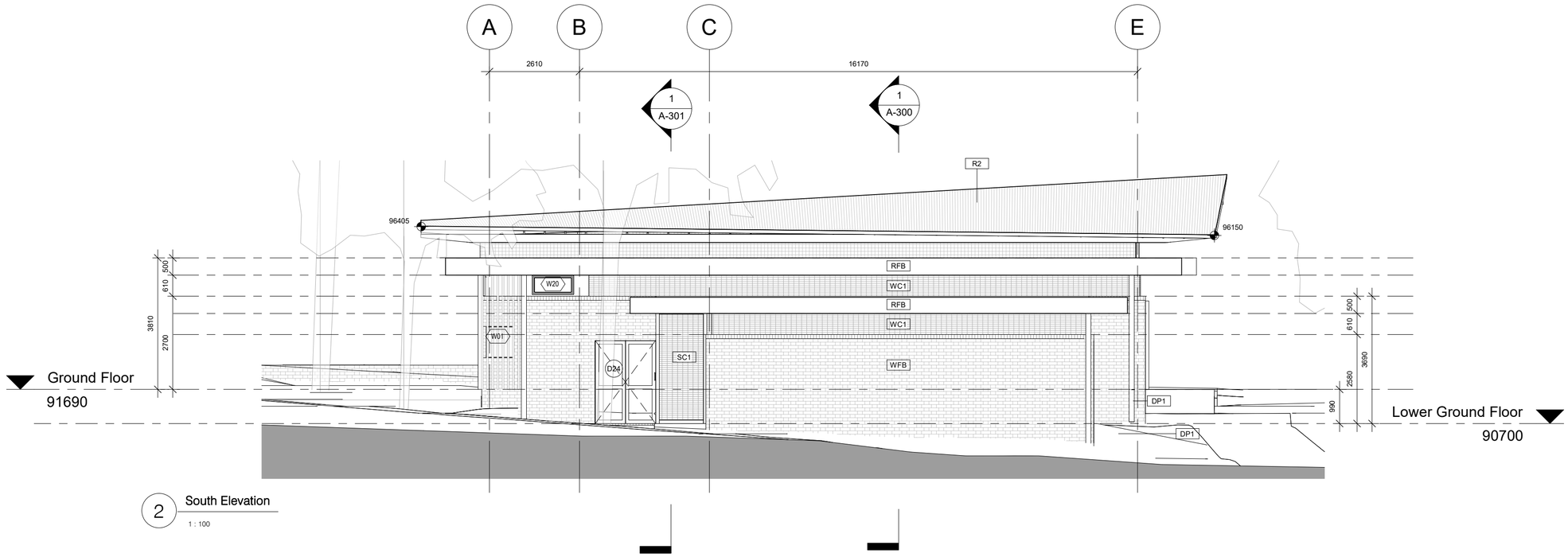
Elevations

Drawing Number :
1914 A-200 **E**



1 North Elevation

1 : 100



2 South Elevation

1 : 100

NOTE: DEMOLITION REMOVED FOR CLARITY

R.E.F Documentation

0 5 10 m

Scale: 1:100 @A2

Date : 19/05/2020 12:33:11 PM

(A2)

Elevations

Drawing Number :

1914 A-201 **E**

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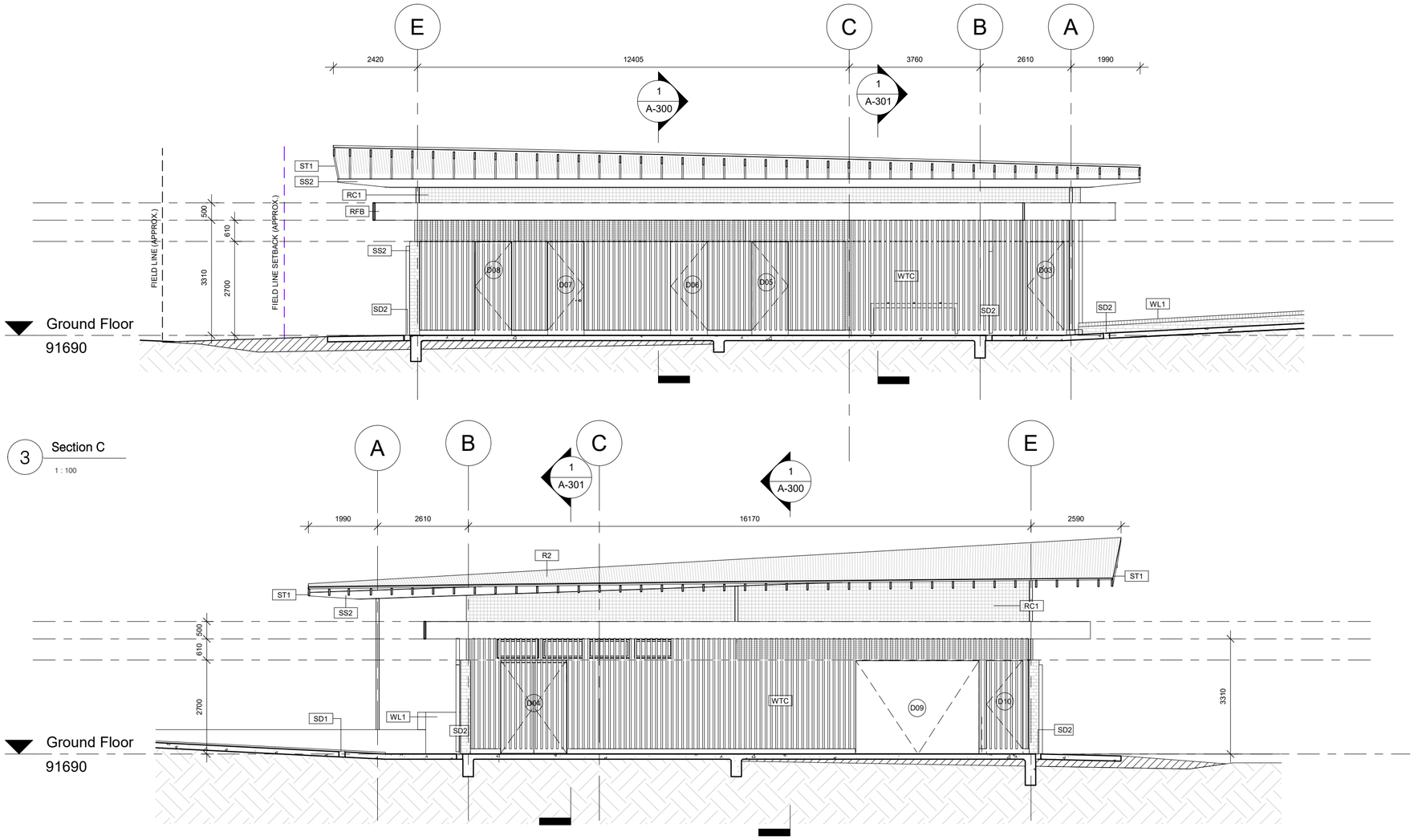
PROJECT NORTH
TRUE NORTH

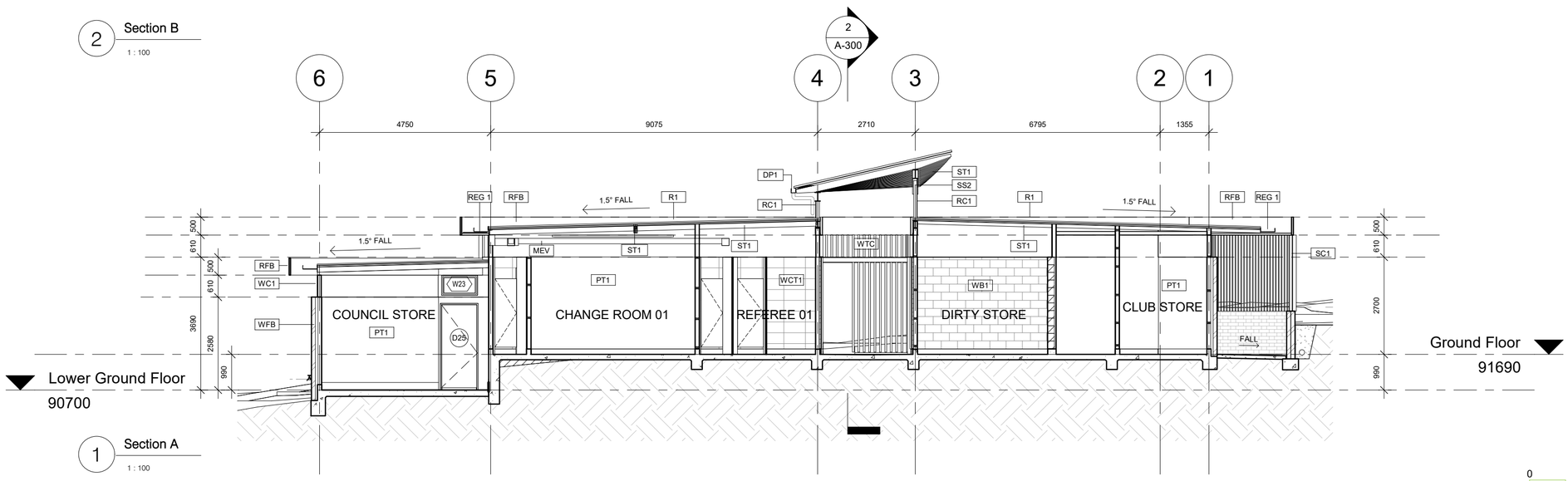


3 Section C

1 : 100

2 Section B

1 : 100



1 Section A

1 : 100

NOTE: DEMOLITION REMOVED FOR CLARITY

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PROJECT NORTH
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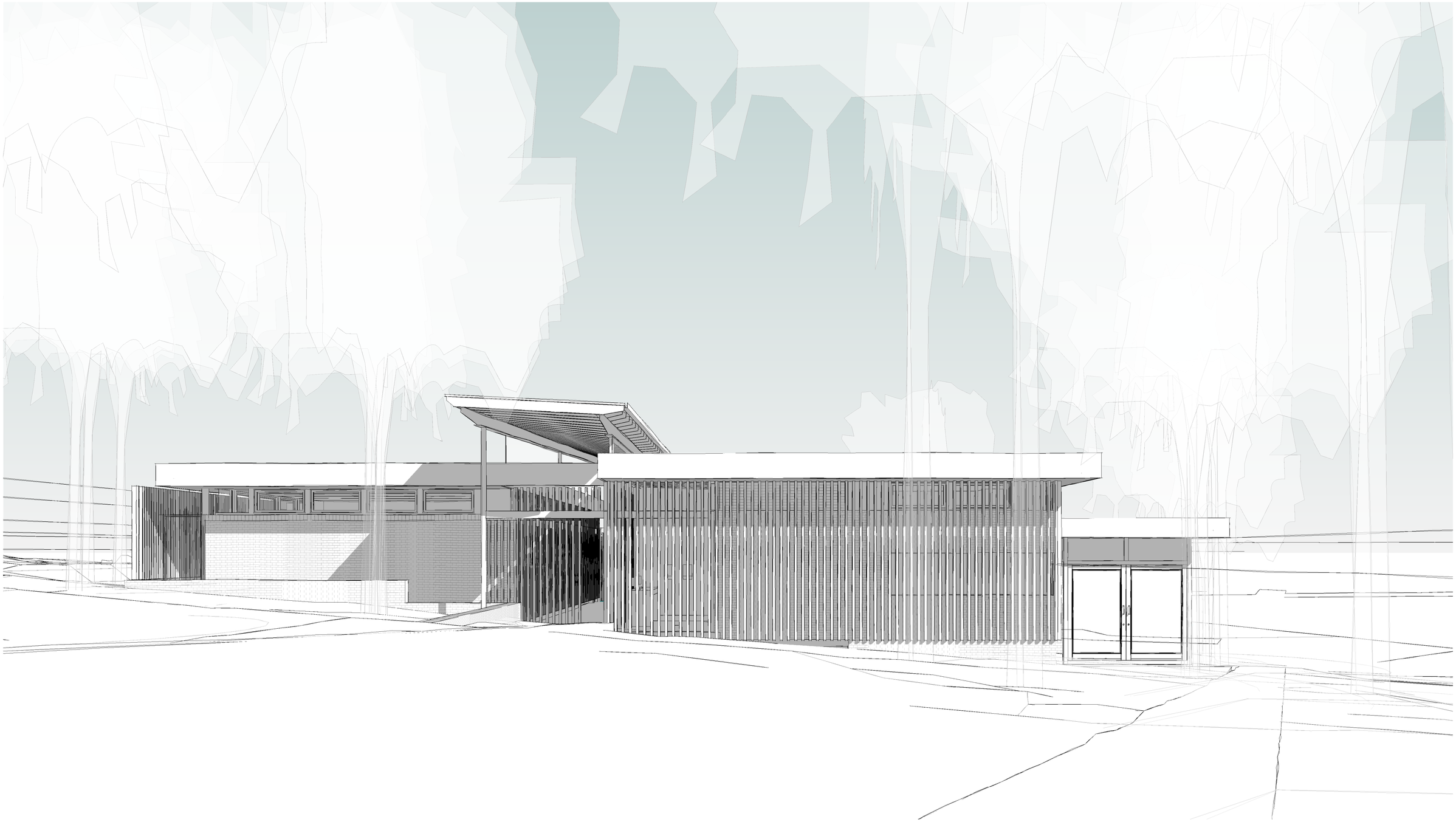
Sections

Drawing Number : 1914 A-300 D



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PROJECT NORTH
TRUE NORTH

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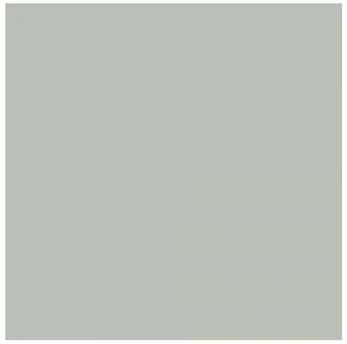
(A2)

Perspective

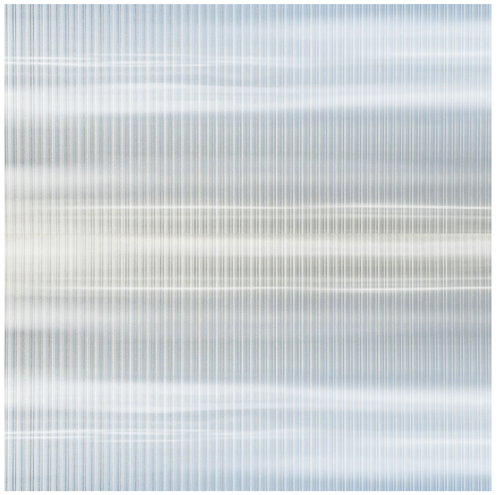
Drawing Number :
1914 A-600 C

6. COLORBOND ROOF SHEETING
COLORBOND: SHALE GREY

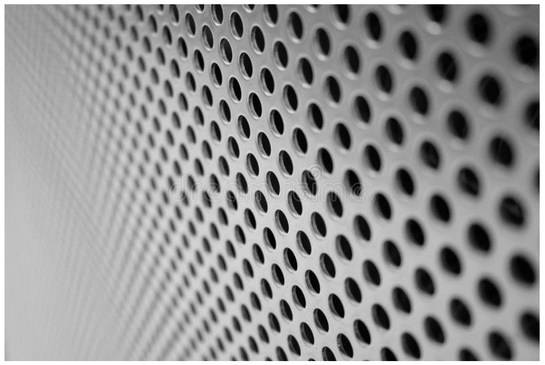


10. FIBRE CEMENT CLADDING
COLORBOND: SHALE GREY

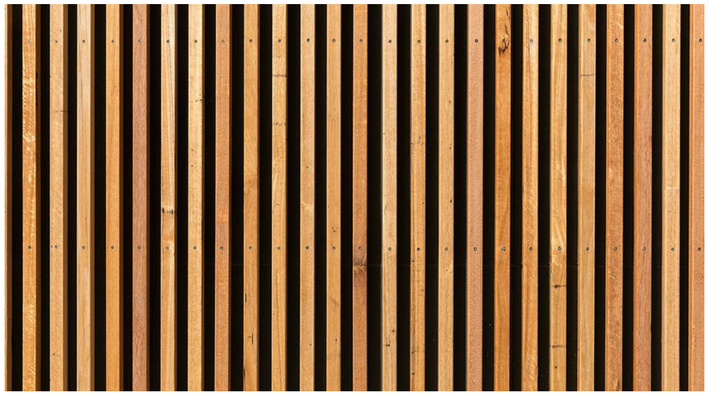
11. ALUMINUM FIXED WINDOWS
COLORBOND: SHALE GREY



3. DANPALON ROOF SHEETING



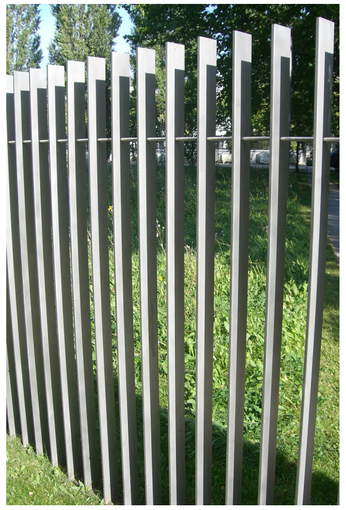
2. PERFORATED STEEL SCREENING
COLORBOND: SHALE GREY



1. HARDWOOD SCREENING, CLADDING, GATES & DOORS

4. FACE BRICK EXTERIOR WALL FEATURE
AUSTRAL BRICKS: CHESTNUT

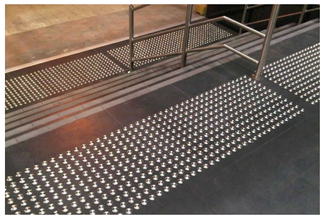
4. EXTERNAL STEEL & FASCIA
COLORBOND: MONUMENT



12.PALISADE ANTI-CLIMB FENCE

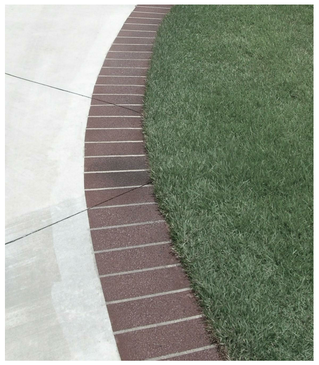
5. HONED CONCRETE FLOOR WITH CLEAR FINISH

14. LINEAR STRIP DRAINS & DOWNPIPES
STAINLESS STEEL

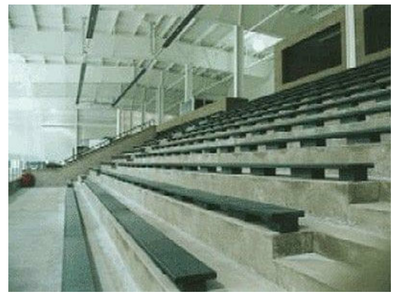


9. TACTILE GROUND SURFACE
INDICATORS

8. STAINLESS STEEL HANDRAILS



7. CONCRETE PATH AND EDGING
AUSTRAL BRICKS: CHESTNUT



13. CONCRETE BLEACHERS WITH SEATING

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Scale: 1:100 @A2

Date : 19/05/2020 12:34:33 PM

(A2)

External Materials Schedule

Drawing Number :
1914 A-700 C

Appendix F- Landscape Plans

EXISTING TREE SCHEDULE

	TREE SPECIES	WORK	HEIGHT	SPRD	TREATMENT/COMMENT
1	*Angophora costata*	REMOVE	14m	11m⌀	Conflicts with development
2	*Angophora costata*	REMOVE	16m	8m⌀	Conflicts with development
3	*Angophora costata*	REMOVE	7m	3m⌀	Conflicts with development
4	*Angophora costata*	REMOVE	7m	4m⌀	Conflicts with development
5	*Angophora costata*	RETAIN	13m	6m⌀	Retain and protect.
6	*Angophora costata*	RETAIN	13m	5m⌀	Retain and protect.
7	*Angophora costata*	RETAIN	13m	8m⌀	Retain and protect.
8	*Angophora costata*	RETAIN	13m	9m⌀	Retain and protect.
9	*Angophora costata*	RETAIN	13m	4m⌀	Decay at base of trunk
10	*Corymbia maculata*	RETAIN	13m	4m⌀	Retain and protect.
11	*Eucalypyus fibrosa*	RETAIN	11m	4m⌀	Retain and protect.
12	*Lophostemon confertus*	RETAIN	10m	8m⌀	Retain and protect.
13	*Lophostemon confertus*	RETAIN	10m	9m⌀	Retain and protect.
14	*Lophostemon confertus*	RETAIN	9m	7m⌀	Retain and protect.
15	*Lophostemon confertus*	RETAIN	8m	6m⌀	Retain and protect.
16	*Lophostemon confertus*	RETAIN	7m	5m⌀	Retain and protect.
17	*Lophostemon confertus*	RETAIN	7m	5m⌀	Retain and protect.
18	*Lophostemon confertus*	RETAIN	8m	12m⌀	Retain and protect.
19	*Lophostemon confertus*	RETAIN	9m	7m⌀	Retain and protect.
20	*Lophostemon confertus*	RETAIN	9m	12m⌀	Retain and protect.
21	*Quercus robur*	RETAIN	11m	11m⌀	Retain and protect.
22	*Eucalyptus saligna*	RETAIN	12m	5m⌀	Retain and protect.
23	*Eucalyptus robusta*	RETAIN	14m	11m⌀	Retain and protect.
24	*Corymbia maculata*	REMOVE	20m	12m⌀	Conflicts with development
25	*Corymbia maculata*	RETAIN	20m	11m⌀	Retain and protect.
26	*Corymbia maculata*	RETAIN	20m	7m⌀	Retain and protect.
27	*Corymbia maculata*	REMOVE	18m	7m⌀	Conflicts with development
28	*Corymbia maculata*	RETAIN	13m	3m⌀	Retain and protect.
29	*Corymbia maculata*	RETAIN	25m	16m⌀	Retain and protect.
30	*Corymbia maculata*	RETAIN	20m	16m⌀	Retain and protect.
33	*Corymbia maculata*	RETAIN	12m	4m⌀	Retain and protect.
34	*Melaleuca quinquenervia*	RETAIN	11m	11m⌀	Retain and protect.
35	*Corymbia maculata*	RETAIN	24m	13m⌀	Retain and protect.
36	*Corymbia maculata*	RETAIN	25m	17m⌀	Retain and protect.
37	*Corymbia maculata*	RETAIN	5m	2.5m⌀	Retain and protect.
38	*Corymbia maculata*	RETAIN	25m	8m⌀	Retain and protect.
39	*Corymbia maculata*	RETAIN	25m	8m⌀	Retain and protect.
40	*Corymbia maculata*	RETAIN	25m	8m⌀	Retain and protect.
41	*Eucalyptus saligna*	RETAIN	10m	6m⌀	Retain and protect.

See Arboricultural Impact Assessment Ver4 prepared by Susan Stratton Arboricultural Consultant for tree removal and management of trees to be retained dated July 2020

SP 64487

LEGEND

Proposed evergreen native tree refer to plant schedule

Existing trees to be retained and protected. Numbered trees refer to existing tree schedule

Existing trees to be removed

Mulch around the base of existing and proposed trees 100mm depth

Groundcover planting - maximum height 1m. Species determined by Council.
Turf areas to be made good on completion of construction.
Turf - Soft Leaf Buffalo

Boundary Line

Timber edge to planting areas

INDICATIVE PLANT SCHEDULE

SYMBOL	BOTANICAL NAME	COMMON NAME	HEIGHT	SPREAD	NO.	POT SIZE	STAKING
TREES - Endemic to Sydney Blue Gum High Forest							
AC*	*Angophra costata*	Sydney red gum	20m	10-15m	1	45 ltr	Yes
ER*	*Elaeocarpus reticulatus*	Blueberry Ash	9m	5m	3	45 ltr	Yes
EP*	*Eucalyptus pilularis*	Blackbutt	30-35m	15m	2	45 ltr	Yes
GF*	*Glochidion ferdinandi* var *ferdinandi*	Cheese tree	9m	6m	1	45 ltr	Yes
SHRUBS & GROUND COVERS							
Bc *	*Blechnum cartilagineum*	Fishbone fern	0.7m	2/m2	TBA	150mm	Nil
Da *	*Doodia aspera*	Rasp fern	0.4m	5/m2	TBA	150mm	Nil
Di *	*Dianella caerulea*	Spreading Flax Lily	0.5m	5/m2	TBA	150mm	Nil
Dr *	*Dichondra repens*	Kidney weed	0.2m	5/m2	TBA	150mm	Nil
Ll*	*Lomandra longifolia*	Matt Rush	0.8m	as shown	TBA	150mm	Nil
Lt	*Lomandra Tanika*	Tanika Matt Rush	0.8m	as shown	TBA	150mm	Nil
Vh *	*Viola hederacea*	Australian violet	0.3m	5/m2	TBA	150mm	Nil
FEATURE PLANTING							
Bm	Boronia muelleri `Sunset Serenade'	Boronia	1m	1m	TBA	140mm	Nil
Bmss	Boronia muelleri `Seaside Stars'	Boronia Seaside Stars	1m	0.5m	TBA	140mm	Nil
Bb	Banksia spinulosa `Birthday Candles		0.4m	0.5-1m	TBA	200mm	Nil
ARBOR ENTRY ONLY							
Ri	Raphiolepis `Oriental Pearl'	Indian Hawthorn	1.0m	1.0m	TBA	200mm	Nil

* indicates native species found in the Sydney Blue Gum High Forest assemblages.

LANDSCAPE ARCHITECT
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Landscape Architecture
Tel: +61 478 519 804
Email: andrew@andrewpawsey.com

REVISION	REVISION DESCRIPTION	DATE
	REVIEW OF ENVIRONMENTAL FACTORS	25.03.20
A	REF CO-ORDINATION 90% SUBMISSION	02.04.20
B	PRELIMINARY REF	06.04.20
C	RETAIN TREE 9	08.07.20

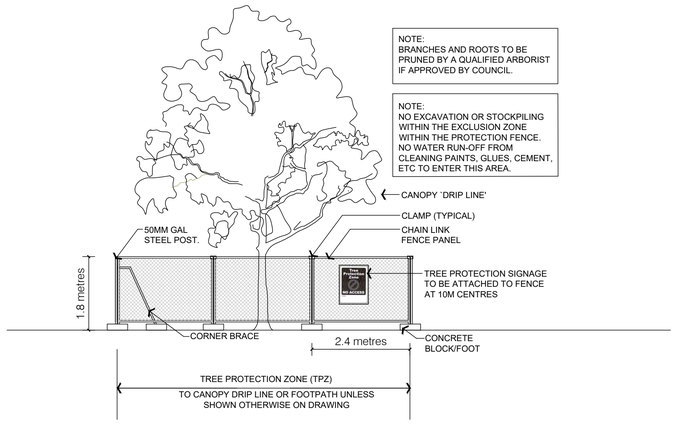
NOTES:

PROJECT
Boronia Park - New Sports Pavilion
Kent Street, Epping NSW 2121

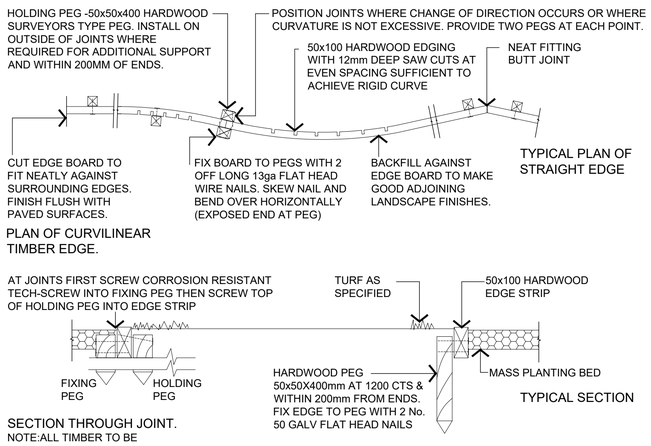
CLIENT
CITY OF PARRAMATTA
c/o NIMBIS ARCHITECTURE &HERITAGE LTD

DRAWING TITLE
LANDSCAPE PLAN

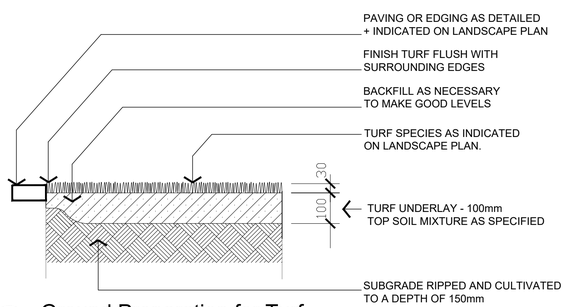
JOB NO.	DRAWING NO.	STATUS
18.018	LA-01	REF
SCALE 1:100 @ A1, 1:200 @ A3	DATE 08/07/2020	REVISION C



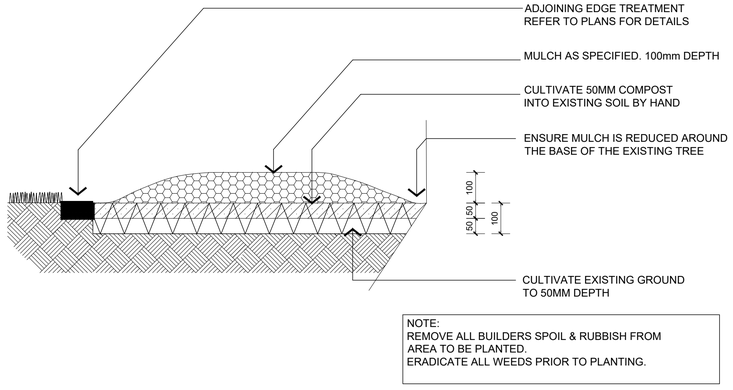
1 Tree Protection
Not to Scale



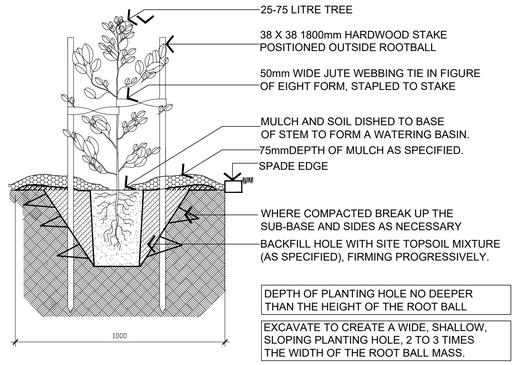
2 Timber Edge to Planter Bed
Scale 1:10



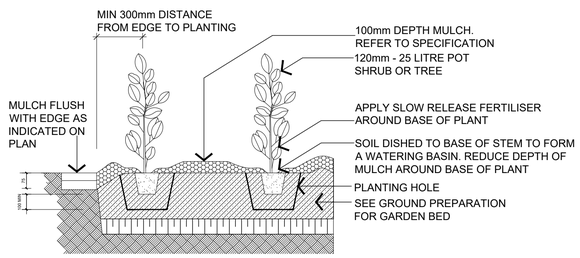
3 Ground Preparation for Turf
Scale 1:10



4 Ground Preparation for Panter Bed Beneath Existing Trees
Scale 1:10



5 Tree Planting in Grass
Scale 1:20



6 Shrub and Groundcover Planting
Scale 1:20

SPECIFICATION NOTES

SERVICES
Before landscape work is commenced. The Landscape Contractor is to establish the position of all service lines. Service lids, vents and hydrants shall be left exposed and not covered by any landscape finishes (paving, garden beds etc.) Finish adjoining surfaces flush with pit lids.

REFERENCE DOCUMENTS
Attention is drawn to AS4419, AS 3500, AS4970, AS 4373 and AS2303. Obtain copies of the relevant Aust Standards and other pertinent information. Retain these documents on-site for the duration of theworks

TREE PROTECTION FENCE
Tree Protection Fencing: Fencing 1.8m high shall be erected in the location indicated on the Landscape Plan in accordance with the detail prior to commencement of works and be maintained in a good condition during demolition and the construction processes.
Signage indicating the area is a Tree Protection Zone (TPZ) shall be displayed on the fence line at 10m intervals. Signage shall be a minimum of 600 x 600mm and shall state No Access - Tree Protection Zone and include the name and contact details of the Site Foreman and Project Arborist.

TREE PROTECTION ZONES
Mulching: Mulch shall be spread within the TPZ's of the retained trees or as instructed by the Site Arborist. The mulch shall consist of Eucalyptus leaf mulch as certified to AS4454:1997 Composts, Soil Conditioners and Mulches. Mulch shall be spread to a depth of 50mm and maintained at this depth for the duration of works.

Restricted Activities within the Tree Protection Zones:The area within the fenced Tree Protection Zone shall exclude the following works:
- o Parking of vehicles or plant
- o Installation of temporary site offices or amenities.
- o Wash down areas, disposal of liquid waste including concrete or paint wash.
- o Excavation by large machinery
- o Preparation of chemicals including paint, cement or mortar.
- o Vehicular movement
- o Pedestrian access other than for maintenance activities.
- o Trimming or removal of branches, except by a qualified Arborist
- o Attaching any objects or signage to the tree.
- o Excavation, trenching or tunneling.
- o No excavation or trenching unless under the supervision of the Site Arborist.

TOPSOIL MIXTURES
PLANTING MIXTURE: To be used in mass planting beds and for individual plantings as detailed.Shall be homogenous blend of soil and additives in the following proportions:
50% Site Topsoil or where insufficient soil exists - Imported topsoil sand soil blend 80-20 where sand is double washed course river sand.
50% Compost - well rotted vegetative material or animal manure, or other approved material, free from harmful chemicals, grass and weed growth and with neutral pH. Provide a certificate of proof of pH upon request.
TURF UNDERLAY: To be used to prepare areas to be turfed is indicated on the landscape plan.
Turf underlay to be 60% course washed river sand and 40% existing topsoil cultivated to a depth of 100mm. incorporate lawn fertilizer raked evenly into the topsoil not more than 48 hours before turf is laid.
TOP-DRESSING: Organic Top-dressing Equal to AS 4544

DRAINAGE
All landscape areas shall be free draining with positive drainage to storm water outlets or natural drainage systems. Install 100mm diameter PVC drains behind all retaining walls set in a bed of 10-20mm crushed aggregate enclosed in geotextile fabric. Refer Engineers detail.

MULCH
APPLICATION: Place mulch to the required depth, (refer to drawings) clear of plant stems, and rake to an even surface finishing 25mm below adjoining levels. Ensure mulch is watered in and tamped down during installation.
MULCH TYPE:
Recycled Forest Mulch: Similar to ANL Forest Blend. From mature trees and A grade recycled wood waste, graded in size from 20mm to 40mm. to AS4454:1997 Composts, Soil Conditioners and Mulches.

PLANT MATERIAL
All plants supplied are to conform with those species listed in the Plant Schedule on the drawings and AS 2303:2018 Tree stock for landscape use. Generally plants shall be vigorous, well established, hardened off, of good form consistent with species or variety, not soft or forced, free from disease or insect pests with large healthy root systems and no evidence of having been restricted or damaged. Trees shall have a leading shoot.
Immediately reject dried out, damaged or unhealthy plant material before planting.
All stock is to be container grown for a minimum of six (6) months prior to delivery to site.

FERTILISER
MASS PLANTING AREAS: Fertiliser shall be 'Nutricote' or approved equivalent in granule form intended for slow release of plant nutrients over a period of approximately nine months. Thoroughly mix fertiliser with planting mixture at the recommended rate, prior to installing plants.

STAKING AND TYING
Stakes shall be straight hardwood, free from knots and twists, pointed at one end and sized according to size of plants to be staked.

a.	5-25 litre size plant	1 off 17x17x1000mm marker stake
b.	35-75 litre size plant	2 off 1800x38x38mm

Ties shall be 50mm wide hessian webbing or approved equivalent nailed or stapled to stake. Drive stakes a minimum one third of their length, avoiding damage to the root system, on the windward side of the plant.

TURF
Obtain turf from a specialist grower of cultivated turf. turf shall be of even thickness, free from weeds and other foreign matter; lay in stretcher pattern with joints staggered and close butted. Water immediately after laying.
TURF TYPE: Kikuyu

TIMBER EDGE
Supply and install hardwood timber edge as indicated on the plan in accordance with detail. Treated pine H4 timber may be used as an alternative to Hardwood subject to approval by the client.

LANDSCAPE ARCHITECT
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REVISION	REVISION DESCRIPTION	DATE
	REVIEW OF ENVIRONMENTAL FACTORS	25.03.20
A	REF CO-ORDINATION 90% SUBMISSION	02.04.20
B	PRELIMINARY REF	06.04.20

NOTES:

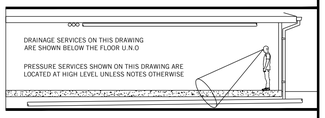
PROJECT
Boronia Park - New Sports Pavilion
Kent Street, Epping NSW 2121

CLIENT
CITY OF PARRAMATTA
c/o NIMBIS ARCHITECTURE &HERITAGE LTD

DRAWING TITLE
LANDSCAPE DETAILS

JOB NO.	DRAWING NO.	STATUS
18.018	LA-02	REF
SCALE 1:100 @ A1, 1:200 @ A3	DATE 08/07/2020	REVISION B

Appendix G- Stormwater Plans



N

SHADED AREA DENOTES NEW STAIRS TO BE CONSTRUCTED OVER EXISTING STORMWATER PIT AND 300mm PIPE

EXISTING 300Ø COUNCIL STORMWATER

EXISTING 225Ø COUNCIL STORMWATER

ARCHITECT TO COORDINATE WITH THE NEW STAIRS WITH EXISTING STORMWATER PIT, ACCESS FOR MAINTENANCE IS TO BE PROVIDED

eSWP
900 x 900
RL 92.70
IL 92.00

THE NEW STAIRS EXTEND OVER THE EXISTING COUNCIL STORMWATER LINE. THE CONTRACTOR IS TO CONFIRM AND ANY EXCAVATION WORK IN PROXIMITY TO EXISTING STORMWATER PIPE IS TO BE DONE WITH SPECIAL ATTENTION AND CARE TO AVOID ANY POTENTIAL DAMAGE THAT THERE ARE NO SITE SPECIFIC STRUCTURAL REQUIREMENTS (I.E. SLAB ON PIERS) THAT MAY IMPACT THE PIPEWORK AND ANY EXCAVATION WORK IN PROXIMITY TO EXISTING STORMWATER PIPE IS TO BE DONE WITH SPECIAL ATTENTION AND CARE TO AVOID ANY POTENTIAL DAMAGE

ACO K100 KLASSIKDRAIN WITH CLASS B HEEL PROOF GRATE & FRAME OR APPROVED EQUIVALENT

eSEWER MAIN APPROX. 1.00m DEEP BASED ON SYDNEY WATER RECORDS
RL 93.25

SET LEVELS SO THAT FINISHES FALL AWAY FROM BUILDING AND ARE DIRECTED TOWARDS OVERLAND FLOW PATH. LIFT BUILDING FFL AS HIGH AS POSSIBLE AND PROVIDE INTERNAL TO EXTERNAL STEP DOWNS WHERE PERMISSIBLE

EXISTING SYDNEY WATER SEWER MAIN

EXISTING GAS MAIN

EXISTING SYDNEY WATER MAIN

SWP
600 x 600
RL 92.10
IL 91.50

ACO K200 KLASSIKDRAIN WITH CLASS B HEEL PROOF GRATE & FRAME OR APPROVED EQUIVALENT

ACO K100 KLASSIKDRAIN WITH CLASS B HEEL PROOF GRATE & FRAME OR APPROVED EQUIVALENT

1m WIDE SWALE DRAIN WITH FALL & SUB SOIL DRAINAGE UNDER TO DRAIN TO STORMWATER PITS

SWP
600 x 600
RL 90.63
IL 90.03

ACO K100 KLASSIKDRAIN WITH CLASS B HEEL PROOF GRATE & FRAME OR APPROVED EQUIVALENT

LOCATE AND CONNECT TO EXISTING STORMWATER PIT

SWP
600 x 600
RL 92.35
IL 91.75

NEW SWP 900 x 900
RL 91.75
IL TO BE CONFIRMED ONCE BLOCKAGES ARE CLEARED OF 300mm LINE AND INVERT LEVEL OF THE PIPE IS DETERMINED AT THIS POINT

EXISTING 300Ø COUNCIL STORMWATER CLEAR ANY BLOCKAGES WITHIN THIS SITE

SWP
450 x 450
RL 91.62
IL 91.02

LOCATE & CONNECT TO EXISTING STORMWATER PIT

eSWP
1000 x 800
eRL 91.10
IL 90.00

EXISTING STORMWATER PIT IS TO BE REPLACED WITH NEW 900 x 900 PIT IN ACCORDANCE WITH CITY OF PARRAMATTA COUNCIL STANDARDS MATCH NEW GROUND LEVEL.
NEW RL 91.56
IL 90.00

EXISTING 375Ø COUNCIL STORMWATER

ACO K200 KLASSIKDRAIN WITH CLASS B HEEL PROOF GRATE & FRAME OR APPROVED EQUIVALENT

EXISTING OVERLAND FLOW PATH TO REMAIN. FLOW WATER DEPTHS UNKNOWN AND ARE TO BE CONFIRMED BY COUNCIL.

SWP
600 x 600
RL 90.60
IL 90.00

THE NEW DRIVEWAY EXTENDS OVER THE EXISTING COUNCIL STORMWATER LINE. THE CONTRACTOR IS TO CONFIRM THAT PIPE SYSTEM HAS A MINIMUM OF 600mm COVER AND THAT THERE ARE NO SITE SPECIFIC STRUCTURAL REQUIREMENTS (IE. SLAB ON PIERS) THAT MAY IMPACT THE PIPEWORK AND ANY EXCAVATION WORK IN PROXIMITY TO EXISTING STORMWATER PIPE IS TO BE DONE WITH SPECIAL ATTENTION AND CARE TO AVOID ANY POTENTIAL DAMAGE.

SHADED AREA DENOTES NEW DRIVEWAY TO COUNCIL STORE ROOM

EXISTING SWP
1050Ø WITH TRASH SCREEN
RL 89.67
IL 88.54

EXISTING 300Ø COUNCIL STORMWATER

107m³ EXISTING STORMWATER HARVESTING TANK TO BE RETAINED

3 No. STW150 OVERFLOW PIPES FROM RAINWATER TANK

TO EXISTING STORMWATER HARVESTING TANK

EXISTING 375Ø STORMWATER MAIN

STW 150

STW 225

FFL 91.69

FFL 91.69

FFL 90.70

RL 92.60

RL 91.32

RL 91.64

RL 90.96

RL 90.65

RL 90.00

N 6261433
E 321866

DP 150

FALL

TG

KENT STREET

Rev.	Issue / Amendment	By	App.	Date
T2	REISSUED FOR REF	DH	MB	15.05.20
T1	80% TENDER ISSUE	DH	MB	28.04.20
P2	RE-ISSUED FOR REF	DH	MB	24.04.20
P1	ISSUED FOR REF	DH	MB	06.04.20

PARTRIDGE HYDRAULIC SERVICES ABN 11 608 027 578
Level 5, 1 Chandos Street, St Leonards NSW 2065 Australia
t 612 9460 9000 f 612 9460 9090
email: partridge@partridge.com.au web: www.partridge.com.au

HYDRAULIC SERVICES

Client
CITY OF PARRAMATTA COUNCIL

Architect
NIMBUS ARCHITECTURE + HERITAGE
SUITE 31 - 32, 48 GEORGE STREET, PARRAMATTA
TEL: (02) 9891 3564 EMAIL: admin@nimbusarch.com

Project
BORONIA PARK SPORTS PAVILION
BORONIA PARK
KENT STREET, EPPING

Title
HYDRAULIC SERVICES
GROUND FLOOR LAYOUT

ELECTRONIC SIGNATURE:
THIS DRAWING HAS BEEN ASSIGNED AN ELECTRONIC SIGNATURE CODE. THE PRESENCE OF THIS CODE SIGNIFIES THAT THIS IS THE CERTIFIED DRAWING ISSUED FOR CONSTRUCTION.

DO NOT SCALE DRAWINGS
USE FIGURED DIMENSIONS

Electronic Code	Signature Date	Designed
-		D.H
Scale at A1	Date	Drawn
1:100	MARCH 2020	S.P
Job No.	Drawing No.	Revision
2019H0041	SWREF 1.2	T2

FOR TENDER - NOT FOR CONSTRUCTION

Appendix H- Ecology Report

Our Ref: 18NIM03

08 July 2020

Nimbus Architecture & Heritage Pty Ltd
Suite 31-32, 48 George Street
PARRAMATTA NSW 2150

Attention: Ms S Erzeybek

Dear Shanel

Re: Ecological Assessment at
Boronia Park, Boronia Avenue, Epping

Travers bushfire & ecology has been engaged to prepare a test of significance for the vegetation / trees that are likely to be impacted for the proposed works which will see the existing amenities building transformed to a sporting pavilion on the edge of the playing field, as well as construction of a small storage building.

A significance assessment has been undertaken in accordance with section 7.3 of the *Biodiversity Conservation Act* (*BC Act*), 2016, specifically for the threatened ecological community being impacted.

Documentation used for this ecological assessment includes the following:

- Arboricultural Impact Assessment by Susan Stratton Arboricultural Consultant (3 July 2020 – version 4)
- Preliminary Landscape Plan by Andrew Pawsey Landscape Architecture
- Native Vegetation of the Sydney Metropolitan Area (2016).

1. PROPOSED SITE WORKS

The proposed works for the site will include a new building over the location of the amenities block. The overall footprint of the development will not extend very far beyond the current size of the amenities block, but will require the removal of several trees in close proximity as the tree protection zone may be impacted, or the safety and health of the tree is poor.

The amenities building will be demolished to make way for a new sports pavilion. The internal floor plan is shown as Figure 2. The estimated area of impacted works has been calculated using a 5m radius outwards from the proposed building(s) to allow for tree protection zones and movement of construction vehicles and materials. This includes impacts to any existing vegetation already in place including landscaping features. It is estimated that 0.09 ha of vegetation will be impacted. The arborist report identified a total of six (6) trees will require removal as shown in Figure 3 (Trees 1, 2, 3, 4, 24 and 27). These are all planted specimens, not remnant trees.

There is an existing storage building to the south of the sporting pavilion site. There is to be a bin enclosure ~~and depot~~ to replace an existing storage building with existing slab retained. There is no new building in this location. Clarification - Bin enclosure and concrete slab proposed in location of existing storage building. Building to be removed and not replaced.

TBE Environmental Pty Ltd
ABN 85 624 419 870
PO Box 7138
Kariong NSW 2250

38A The Avenue
Mt Penang Parklands
Central Coast Highway
Kariong NSW 2250

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e: info@traversecology.com.au
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~~There is also a proposed small storage building that is sighted to the south of the sports pavilion adjacent to an existing track. This will be constructed between two (2) large trees. Given the impacted area is so small, this will not impede more than 10% on the tree protection zone of either tree, and no assessed trees are proposed for removal (refer to Figure 5).~~ Clarification - Bin enclosure and concrete slab proposed in location of existing storage building. Building to be removed and not replaced.

Figure 1 shows the approximate locations of the structures within Boronia Park.

Figure 1 - Study area loations

2. SITE DESCRIPTION

Table 1 provides a brief summary of the site's features.

Table 1 – Site features

Location	Boronia Park Epping, off Kent Street to the immediate west
Location description	The site is located within the urban suburb of Epping, approximately 500m from the town centre with access from Kent Street on the western boundary. The park is surrounded mostly by medium density residential development.
Area	<0.1 ha impact
Local government area	Parramatta
Zoning	RE1 - recreational
Grid reference MGA-56	321930E 6261230S
Elevation	Approximately 90-100AHD
Topography	Very slightly sloping land, less than 5 degrees
Catchment and drainage	Devlin's Creek Catchment
Existing land use	Recreational

Figure 2 - Landscaping plan showing the proposed building and associated works (northern proposed building) – *(Source: Andrew Pawsey Landscape Architecture)*

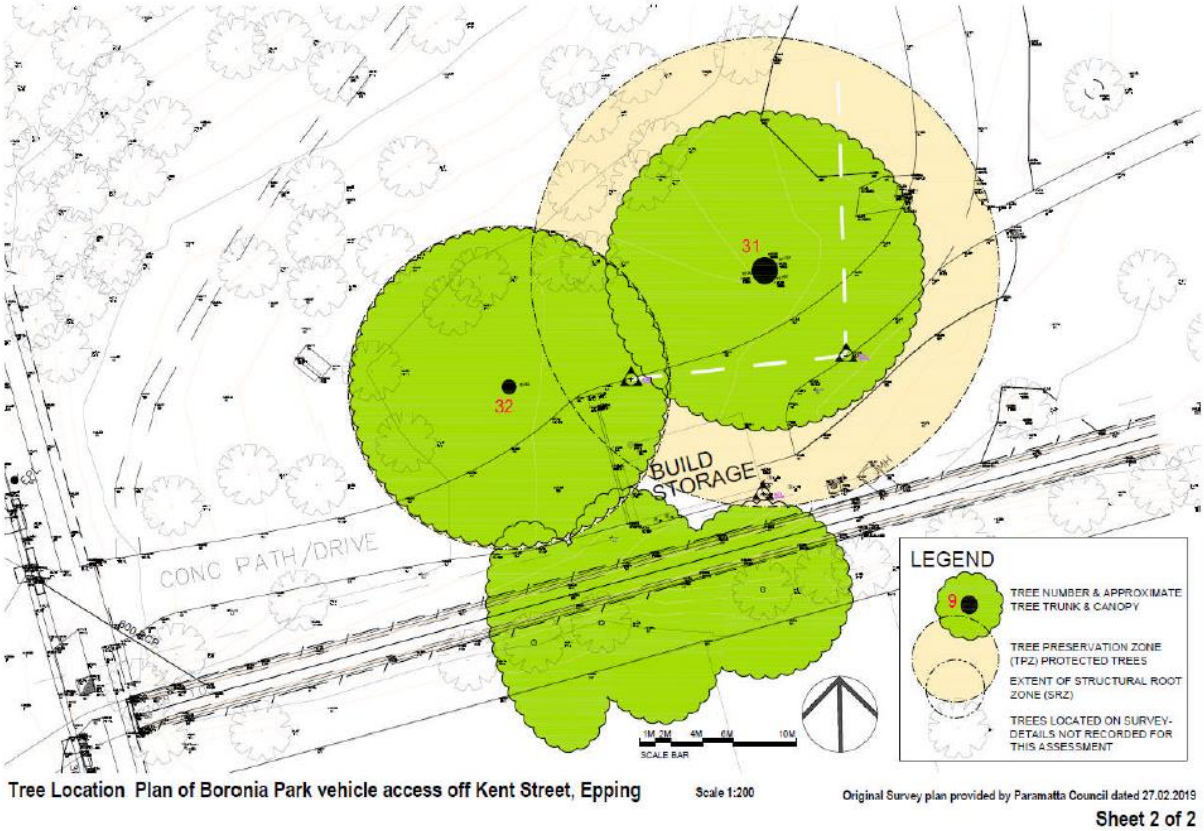

Figure 3 - Tree locations around the proposed storage shed (southern proposed building) – *(Source: Draft Arboriculture Impact Assessment – Susan Stratton)*

Clarification - Bin enclosure and concrete slab proposed in location of existing storage building. Building to be removed and not replaced.

3. SITE INSPECTION

A botanical inspection was undertaken by Lindsay Holmes (Senior Botanist – Accredited Biodiversity Assessor (BAAS17032) and BioBanking Assessor (No. 199) on 4 May 2020 to identify the extent and quality of vegetation on site and to review the presence of threatened ecological communities potentially impacted in their local context.

This inspection identified as many of the species across the site as possible. An approximate 30m radius was applied around the amenities building and a 10m radius was applied around the proposed storage building.

4. VEGETATION DESCRIPTION

It appears that only a few select trees are part of the original vegetation of the site, with the remainder being planted mostly with locally occurring species. The canopy is moderate in cover around 25-50%, the shrub layer is very limited to under 10% with largely native plantings, and the ground layer is sparse with plantings of tufted grasses and other species. There are only a few naturally occurring native species in any of the strata, with hardly any natural regeneration of species that would have occurred in their natural state.

The canopy comprises a lot of young to moderately ages planted trees 7-20m in height, with the remnant trees closer to 35m in height. Viewing the 1943 imagery of the site, it is apparent that there is very little natural vegetation on site, see Figure 4. Common canopy species include *Angophora costata, Lophostemon confertus, Eucalyptus fibrosa, Quercus robur, Eucalyptus saligna, Eucalyptus robusta, Melaleuca quinquenervia* and *Corymbia maculata.*

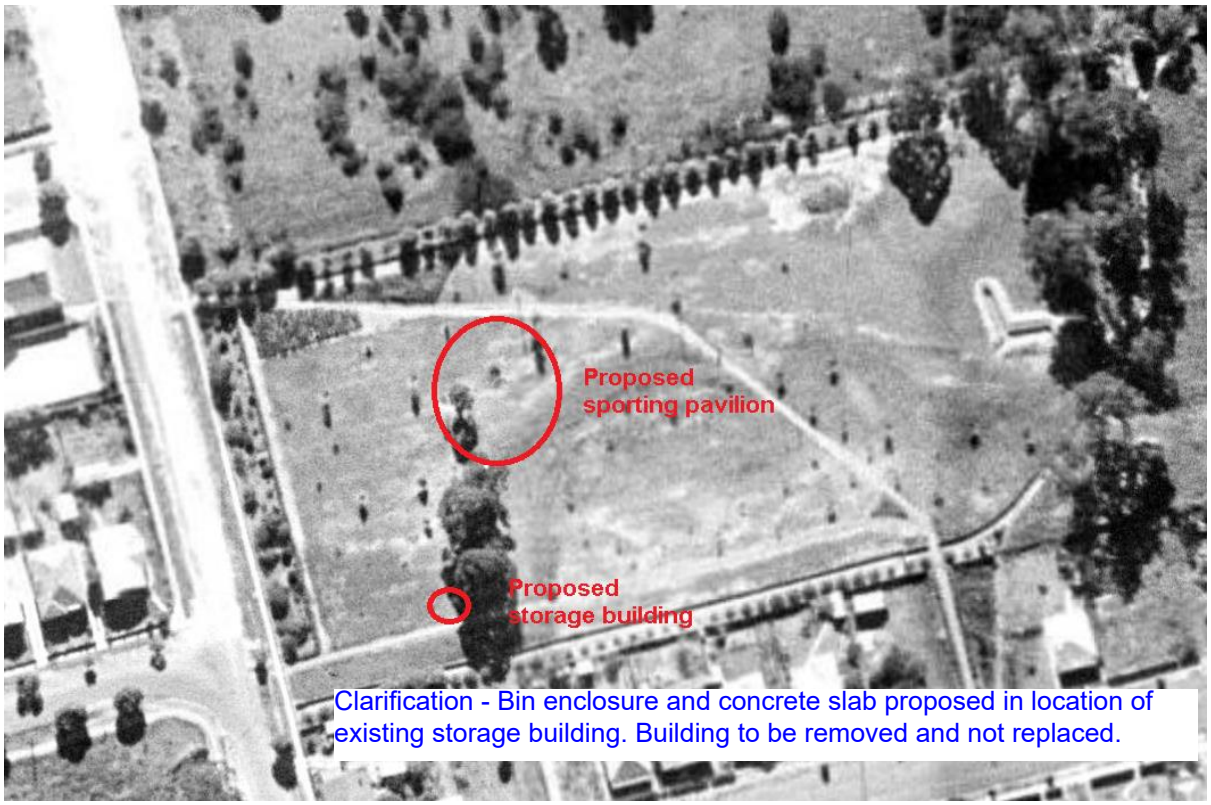

Figure 4 - 1943 imagery and approximate location of the development

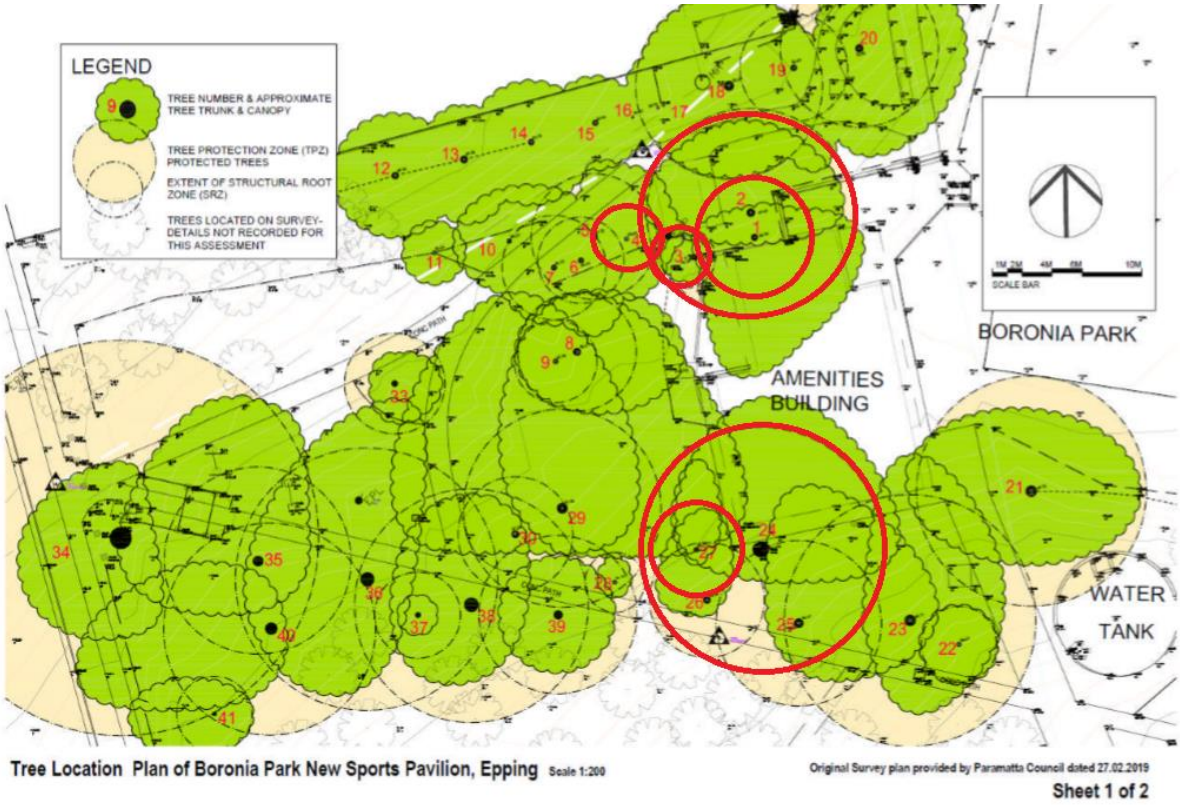

Figure 5 - Proposed removal of trees
(Source: Draft Arboriculture Impact Assessment – Susan Stratton)

The shrub layer is very limited. Common species include *Grevillea* cultivars, *Acacia implexa, Acacia floribunda, Synoum glandulosum, Rhaphiolepis indica, Syzygium luehmannii, Elaeocarpus reticulatus* and *Banksia spinulosa.*

Common groundcovers include *Lomandra longifolia, Dianella caerulea, Clematis aristata, Bromelia, Clivia miniata, Cayratia clematidea, Oplismenus aemulus, Nephrolepis cordifolia, Fumaria muralis, Imperata cylindrica* var. *major, Soliva sessilis, Stenotaphrum secundatum, Doryanthes excelsa* and *Euphorbia peplus.* The majority of these are part of the previous landscaping of the site and do not occur naturally.

Under the *BC Act,* planted native vegetation requires assignment to a plant community type (PCT) for impact assessment. So, despite the fact that >90% of the biomass in the surveyed area is planted, it must be assessed as a native PCT. It appears that the few native groundcovers present, and the presence of *Eucalyptus saligna* remnant tree may be most closely related to PCT 1237 which is equivalent to the critically endangered ecological community, Blue Gum High Forest (BGHF).

Table 2 – Flora species

Family	Scientific name	Common name
Mimosaceae	*Acacia floribunda*	Sally Wattle
Mimosaceae	*Acacia implexa*	Hickory
Myrtaceae	*Angophora costata*	Smooth-barked Apple
Apocnyaceae	*Araujia sericifera**	Mothvine
Proteaceae	*Banksia spinulosa*	Hairpin Banksia
Bromeliaceae	*Bromeliad* sp.*	-
Sapindaceae	*Cardiospermum grandiflorum**	Balloon Vine, Love in a Puff

Family	Scientific name	Common name
Vitaceae	*Cayratia clematidea*	Native Grape
Poaceae	*Cenchrus clandestinus**	Kikuyu
Asteraceae	*Cirsium vulgare**	Spear Thistle
Ranunculaceae	*Clematis aristata*	Old Man's Beard
Amaryllidaceae	*Clivia miniata**	Bush Lily
Commelinaceae	*Commelina cyanea*	Native Wandering Jew
Myrtaceae	*Corymbia maculata*	Spotted Gum
Poaceae	*Cynodon dactylon*	Common Couch
Phormiaceae	*Dianella caerulea*	Flax Lily
Convolvulaceae	*Dichondra repens*	Kidney Weed
Doryanthaceae	*Doryanthes excelsa*	Gymea Lily
Poaceae	*Ehrharta erecta**	Panic Veldtgrass
Chenopodiaceae	*Einadia nutans* subsp. *linifolia*	Climbing Saltbush
Eleocarpaceae	*Elaeocarpus reticulatus*	Blueberry Ash
Poaceae	*Eleusine tristachya**	Goose Grass
Myrtaceae	*Eucalyptus fibrosa*	Broad Leaved Ironbark
Myrtaceae	*Eucalyptus robusta*	Swamp Mahogany
Myrtaceae	*Eucalyptus saligna*	Sydney Blue Gum
Euphorbiaceae	*Euphorbia peplus**	Spurge
Oleaceae	*Fraxinus angustifolia**	Claret Ash
Fumariaceae	*Fumaria muralis**	Wall Fumitory
Fabaceae	*Glycine clandestina*	Twining Glycine
Proteaceae	*Grevillea 'Cultivar'*	-
Asteraceae	*Hypochaeris radicata**	Flatweed
Poaceae	*Imperata cylindrica* var. *major*	Blady Grass
Fabaceae	*Kennedia rubicunda*	Dusky Coral Pea
Arecaceae	*Livistona australis*	Cabbage Tree Palm
Lomandraceae	*Lomandra longifolia*	Spiky-headed Mat-rush
Lomandraceae	*Lomandra tanika*	-
Myrtaceae	*Lophostemon confertus*	Brush Box
Myrtaceae	*Melaleuca quinquenervia*	Broad-leaved Paperbark
Malvaceae	*Modiola caroliniana**	Red-flowered Mallow
Davalliaceae	*Nephrolepis cordifolia**	Fish-bone Fern
Poaceae	*Oplismenus aemulus*	Basket Grass
Oxalidaceae	*Oxalis corniculata**	Yellow Wood Sorrel
Oxalidaceae	*Oxalis latifolia**	Pink Fishtail
Geraniaceae	*Pelargonium inodorum*	Wild Geranium
Plantaginaceae	*Plantago lanceolata**	Ribwort
Fagaceae	*Quercus robur**	English Oak
Malaceae	*Rhaphiolepis indica**	Indian Hawthorn
Polygonaceae	*Rumex crispus**	Curled Dock
Malvaceae	*Sida rhombifolia**	Paddy's Lucerne

Family	Scientific name	Common name
Solanaceae	*Solanum nigrum**	Black Nightshade
Asteraceae	*Soliva sessilis**	Jojo
Poaceae	*Stenotaphrum secundatum**	Buffalo Grass
Meliaceae	*Synoum glandulosum*	Scentless Rosewood
Myrtaceae	*Syzygium luehmannii*	Small leaved Lilly Pilly
Asteraceae	*Taraxacum officinale**	Dandelion
Fabaceae	*Trifolium repens**	White Clover

Photo 1 - Young Angophora trees around the northern side of the amenities block

Photo 2 - Spotted Gums, Swamp Mahogany and English Oak on the southern side of the amenities building

Photo 3 - Planted Brush Box, Angophora and Ironbark trees to the north-west of the amenities building with an understorey mostly containing Lomandra and Dianella

Photo 4 - Existing storage building and remnant Blue Gums

5. THREATENED FLORA

The potential for threatened flora to occur was considered to be non-existent given that the site was almost cleared back pre 1943 and that there is almost no natural regeneration or remnant vegetation within close proximity to the proposed development.

None of the planted vegetation is listed as a threatened species under the *BC Act.*

During the site inspection, no threatened flora species were observed.

6. THREATENED FAUNA

Survey for threatened fauna has not been undertaken as the purpose of the assessment was only to determine the significance of impact on vegetation alone. Given the site and surrounds in an urban landscape, the site may contain foraging habitat for species such as threatened microbats or Grey-headed Flying-fox. There may also be some foraging habitat for bird and owl species but there is no roosting habitat within the inspected area. Only Tree 31, the largest observed, a *Eucalyptus saligna* near the proposed storage shed appeared to have hollows, however the tree will not be impacted.

7. THREATENED ECOLOGICAL COMMUNITIES

In areas of high urbanisation, it is difficult to ascertain the vegetation type based on the presence of limited remnant or regenerating vegetation, particularly when the number and proportion of species is so small. Given the location and edaphic features, the vegetation could potentially be either Blue Gum High Forest (BGHF), or Sydney Turpentine Ironbark Forest (STIF), both of which are critically endangered under the *BC* and *EPBC* Acts.

Based up on the remnant and regenerating species present, and lack of both Turpentine and Ironbark species typically within Sydney Turpentine Ironbark Forest, it has been determined that the natural vegetation of the impact area was likely to be BGHF.

The Native Vegetation of the Sydney Metropolitan Area also suggest that BGHF is within the impact area, with Sydney Turpentine Ironbark Forest occurring to the north and east of the existing playing field as seen in Figure 6.

The impact upon native vegetation has been estimated by overlaying the CAD on an aerial and assuming an approximate 5m radius out from the buildings to account for impacts on tree protection zones and regeneration, whilst allowing sufficient room for equipment utilised for construction. It is estimated that 0.09 ha or less than 1,000m^2 will be impacted. The impacts include a few planted trees, unlikely any shrubs, and planted groundcovers in garden beds.

Figure 6 - OEH vegetation mapping

8. CONCLUSIONS

A significance of impact assessment test for BGHF is attached. No threatened flora species have been detected and unlikely to have occurred in a natural state. The proposal is not likely to impact upon any breeding habitat for fauna species and there are no tree hollows present that will be removed.

The following conclusions are made from the test:

- 0.09 ha of planted BHGF may be impacted, which includes a 5m buffer to any building to account for egress, access and impacts on tree protection zones,

- The impacts are upon planted vegetation which contributes little to the retained gene pool of BGHF as only a small proportion of species occur naturally within this TEC,
- It will not contribute to fragmentation or isolation considering all remnants in the local area are small fragments,
- The remnant does not host nor is likely to host threatened flora species, and
- The remnant provides no breeding habitat for threatened fauna species.

9. RECOMMENDATION

The loss of the BGHF trees are recommended to be compensated by the replanting of BGHF either as individual trees or part of landscaped beds containing BGHF species in the groundlayer, shrub and canopy. Given the proposal will likely remove six (6) trees, this could be compensated by replacement at a 2:1 ratio with local provenance stock.

Please do not hesitate to contact the operations team on (02) 4340 5331 should you require further information or discussion on this matter.

Yours faithfully

Michael Sheather-Reid
Managing Director - ***Travers bushfire & ecology***

Travers bushfire & ecology **employs**
Bushfire Planning and Design (BPAD) Accredited Practitioners

Travers bushfire & ecology **employs**
Accredited BioBanking and Biodiversity Assessors

DISCLAIMER: CAD 1914_A-100 - Precinct Plan.dwg has not been georeferenced and has been aligned to georeferenced CAD Boronia Site Survey.dwg Verification by a registered surveyor required prior to finalisation

SITE OVERVIEW

KENT STREET

BRIDGE STREET

Legend

- Lot boundary (source LPI
- Impacted Blue Gum High Forest (0.09ha)

VISID 4489 Sydney Metro Vegetation mapping 2016

Plant Community Type (PCT)

- 1237 - Blue Gum High Forest (0.89ha)
- 1281 - Sydney Turpentine Ironbark Forest

Aerial source: Nearmap

0 10 20 m

Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

PROJECT & MXD REFERENCE	DATE & ISSUE NUMBER	SCALE & COORDINATE SYSTEM
Boronia Park, Kent Street, Epping 18NIM03_FL001	7/05/2020 Issue 1 SC	1:700 @A3 GDA 1994 MGA Zone 56

TITLE

Vegetation assessment and impact areas

Document Path: N:\GIS STORAGE\N Drive\18NIM03_BoroniaPark_BoroniaAve_Epping\MXDs\18NIM03_FL001.mxd

Travers bushfire & ecology

ATTACHMENT 1 - TEST OF SIGNIFICANCE FOR IMPACTS ON BGHF

Section 7.2 of the *BC Act* requires a determination as to whether a development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. Henceforth this is referred to as the 'Test of Significance'.

For the purposes of this part, development or an activity is likely to significantly affect threatened species if:

(a) it is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in Section 7.3, or
(b) the development exceeds the biodiversity offsets scheme threshold if the biodiversity offsets scheme applies to the impacts of the development on biodiversity values, or
(c) it is carried out in a declared area of outstanding biodiversity value.

Section 7.3 of the *BC Act* provides the terms of the test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats.

A botanical site inspection has been undertaken by a qualified botanist with twenty-one (21) years of experience in bushland regeneration and ecological consulting.

***BC ACT 2016* - SECTION 7.3 – SIGNIFICANCE OF IMPACT TEST**

This is the test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

BGHF is not a threatened species. No further consideration is required.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

The existing extent of BGHF is planted native vegetation and consists of two (2) remnant trees close to the ~~proposed storage shed, however the shed will be sited between these and not require their removal~~. Removal of vegetation for the proposal will impact planted vegetation consisting of a few trees and planted groundcovers over a total area of less than 0.1 ha. The remainder of vegetation within the patch will conserved within the Council reserve. The impact area has been described as any planted vegetation directly impacted by the buildings as well as a 5m buffer to provide egress or impacts on tree protection zones.

Clarification - Bin enclosure and concrete slab proposed in location of existing storage building. Building to be removed and not replaced.

The proposal will not cause fragmentation or isolation of the patch and as described above, will not impact on original remnant vegetation, only planted vegetation that was formerly part of BGHF community pre 1943.

There is low native species diversity within the impact area, and given that the planting around the buildings is not necessarily commensurate with BGHF and the source of the plants is unknown, the remnant on site provides very little to the gene pool within the local area.

The proposal will require only minimal impact on the BGHF, and in this instance, could be offset through native landscape planting around the buildings that utilises species commensurate with BGHF.

It is therefore considered that the removal or impact to 0.09 ha of the BGHF patch of vegetation is unlikely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

ii. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Based on b (i) above, if removal or impacts to 0.09 ha is unlikely to place the remnant at risk of local extinction, modification of the remnant will have the same outcome. The proposal does not seek to change the composition of the existing vegetation such as through implementation of asset protection zones.

c) In relation to the habitat of threatened species or ecological community:

i. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

No remnant trees of BGHF origin will be removed, only planted specimens and planted groundcovers. The total impact including buffer of 5m around buildings is 0.09 ha.

ii. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

Vegetation within Boronia Park as mapped by OEH is approximately 4.15 ha in extent, consisting of 0.9 ha of BGHF. The impacts of the proposal will not sever the vegetation such that it becomes fragmented or isolated.

Therefore, it is considered that known habitat for a threatened species, population or ecological community within the local area and region is unlikely to become isolated or fragmented as a result of the proposal.

iii. The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

BGHF is listed as critically endangered therefore any loss should be considered important.

The proposal has demonstrated that it will not fragment or isolate habitat that is dependent upon this vegetation type, and any impacts will not fragment or isolate the TEC itself placing it at risk of local extinction.

The importance of the impacts is lessened because the impacted vegetation is planted and not mature. The source of the plantings is unknown and only a few are commensurate with BGHF therefore having little impact on the local gene pool. No remnant trees are being impacted, they will remain intact adjacent to the storage building.

d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The development footprint is not within any declared area of outstanding biodiversity value. Therefore, the proposal will not have any adverse effects on any declared area of outstanding biodiversity value (either directly or indirectly).

e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

A key threatening process is defined as a process that threatens, or could threaten, the survival or evolutionary development of species, populations or ecological communities.

The current list of key threatening processes, and whether the proposed activity is recognised as a threatening process, is shown below.

Listed key threatening process (as described in the final determination of the Scientific Committee to list the threatening process)	**Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?**		
	Likely	**Possible**	**Unlikely**
Aggressive exclusion of birds by Noisy Miners (*Manorina melanocephala*)			✓
Alteration of habitat following subsidence due to longwall mining			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Anthropogenic Climate Change			✓
Bushrock removal			✓
Clearing of native vegetation	✓		
Competition and habitat degradation by feral goats			✓
Competition and grazing by the feral European Rabbit (*Oryctolagus cuniculus*)			✓
Competition from feral honeybees			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Entanglement in, or ingestion of anthropogenic debris in marine and estuarine environments			✓
Forest Eucalypt dieback associated with over-abundant psyllids and bell miners			✓
High frequency fire resulting in the disruption of life-cycle processes in plants and animals and loss of vegetation structure and composition			✓
Herbivory and environmental degradation caused by feral			✓

Listed key threatening process (as described in the final determination of the Scientific Committee to list the threatening process)	Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?		
	Likely	**Possible**	**Unlikely**
deer			
Importation of red imported fire ants into NSW			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae		✓	
Infection of native plants by *Phytophthora cinnamomi*		✓	
Introduction of the large earth bumblebee (*Bombus terrestris*)			✓
Invasion and establishment of exotic vines and scramblers			✓
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)			✓
Invasion and establishment of the Cane Toad (*Bufo marinus*)			✓
Invasion, establishment and spread of *Lantana camara*			✓
Invasion of native plant communities by bitou bush & boneseed *Chrysanthemoides monilifera*			✓
Invasion of native plant communities by exotic perennial grasses			✓
Invasion of native plant communities by African Olive (*Olea europaea* subsp. *cuspidata*)			✓
Invasion of the Yellow Crazy Ant (*Anoplolepis gracilipes*)			✓
Loss of Hollow-bearing trees			✓
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants			✓
Loss and/or degradation of sites used for hill-topping by butterflies			✓
Predation and hybridisation by feral dogs (*Canis lupus familiaris*)			✓
Predation by the European Red Fox (*Vulpes vulpes*)			✓
Predation by the Feral Cat (*Felis catus*)			✓
Predation by Gambusia holbrooki Girard, 1859 (plague minnow or mosquito fish)			✓
Predation by the Ship Rat (*Rattus rattus*) on Lord Howe Island			✓
Predation, habitat degradation, competition & disease transmission from Feral pigs (*Sus scofa*)			✓
Removal of dead wood and dead trees			✓

The proposal impacts on such a very small area of land within the site. The site was generally cleared back in 1943, and since the establishment of the park, it has been landscaped mostly with native vegetation to NSW, but not necessarily what would have been

there prior to the clearing. Being within a recreation reserve, the vegetation is mostly in landscape beds and sparsely planted, except for the trees which are moderately dense.

The site is not located in close proximity to drainages and watercourses, therefore hydrological influences are unlikely to be impacted.

Impacts from or to animals are not likely to be felt in this urbanised locality.

Impacts from weed species are not likely as the site is fully landscaped and well maintained.

Of the above listed key threatening processes, there are potentially only three (3) which apply which are addressed below.

Summary of "likely" or "possible" Key Threatening Processes

This section identifies what mitigation measures can be implemented to address threatening processes.

Clearing of native vegetation

Any clearing of native vegetation contributes to this key threatening process. It is generally recommended that all sites should aim to achieve a maintain or improve outcome on the quality and quantity of native vegetation cover through protection and restoration measures which may or may not include provisions of offsetting. In this instance, offsetting the impacts is not required, nor has been requested from Council. A total of six (6) trees are proposed for removal which have all been planted previously, which includes trees 1, 2, 3, 4, 24 and 27 on the tree plans.

As a measure for ensuring minimal impacts on native vegetation, the following recommendations can be implemented:

- For any actual removal trees, it should be replaced with two (2) somewhere within the BGHF portion of the site and be of BGHF origin.
- Demarcation of impact zones and tree protection zones are to be implemented to ensure protection the protection of trees from any proposed activity that requires any digging or alteration to the soil.
- Encouragement of native species to replace existing planted shrubs and groundcovers amongst that originate from BGHF.

Infection of native plants by Phytophthora cinnamomi

The proposal may temporarily increase the risk of fungal infection on site as it may be spread via vehicular movement and relocation of soil and vegetation. Consequently, standard *Phytophthora cinnamomi* protocol applies to the cleaning of all plant, equipment, hand tools and work boots prior to delivery onsite to ensure that there is no loose soil or vegetation material caught under or on the equipment and within the tread of vehicle tyres or tracks. Any equipment found to contain soil or vegetation material from offsite is to be cleaned in a quarantined work area or wash station and treated with anti-fungal pesticides prior to commencing work.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae

‘Myrtle Rust’ may be spread via machinery, animals and humans as well as by environmental factors such as wind. The presence of machinery and construction works is likely to slightly increase the potential for spread of this key threatening process. Similar protocols as to *Phytophthora cinnamomi* should be applied.

Appendix I- Arborist Report

Arboricultural Impact Assessment

Boronia Park – New Sports Pavilion

Kent Street, Epping

For Nimbus Architecture and Heritage

VERSION - 4

Prepared by Susan Stratton
Arboricultural Consultant

Member Arboriculture Australia
Member International Society of Arborists - Australian Chapter

3 July 2020

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Table of Contents

Summary

This report is provided as part of the Review of Environmental Factors. The trees have been assessed and their retention value has been provided in Appendix A. Where trees are to be retained and the development falls within the Tree Protection Zone as defined by AS 4970-2009 a specification for works is provided. This report will require approval from the consenting authority.

This report considers forty one (41) trees located in Boronia Park, Epping located within close proximity to the redevelopment of the existing Sporting Pavilion and demolition of a maintenance structure on the Kent Road access road.

The information gathered was used to provide guidance to the project architect on the constraints these trees impose on the use of the site.

Six (6) trees will be removed to facilitate the proposal. The development proposal is expected to have a moderate impact on the contribution of trees to the local amenity or character due to the removal of one (1) moderate retention value tree and five (5) low retention value trees found within the site.

The impacts on the trees to be retained on the site can be mitigated by implementation of appropriate construction methods ensuring their survival.

TABLE 1 Summary **of Trees and Schedule of Works**.				
Tree No.	**Genus + Species**	**Common Name**	**Condition** **G: Good, F: Fair P: Poor, D: Dead**	**Recommendation + Description of work to be carried out**
1	*Angophora costata*	Sydney red gum	G	**Remove** and replace with new plantings in accordance with the landscape plan
2	*Angophora costata*	Sydney red gum	G	**Remove** and replace with new plantings in accordance with the landscape plan
3	*Angophora costata*	Sydney red gum	G	**Remove** and replace with new plantings in accordance with the landscape plan.
4	*Angophora costata*	Sydney red gum	P	**Remove** and replace with new plantings in accordance with the landscape plan
5	*Angophora costata*	Sydney red gum	F	**Retain** and protect in accordance with Tree Protection Plan. Remedial pruning required and deadwood removal.
6	*Angophora costata*	Sydney red gum	F	**Retain** and protect in accordance with Tree Protection Plan. Remedial pruning required and deadwood removal.
7	*Angophora costata*	Sydney red gum	F	**Retain** and protect in accordance with Tree Protection Plan. Remedial pruning required and deadwood removal.
8	*Angophora costata*	Sydney red gum	G	**Retain** and protect in accordance with Tree Protection Plan.
9	*Angophora costata*	Sydney red gum	P	**Retain** and protect in accordance with Tree Protection Plan. Further investigation required.
10	*Corymbia maculata*	Spotted Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
11	*Eucalyptus fibrosa*	Red Ironbark	G	**Retain** and protect in accordance with Tree Protection Plan.
12	*Lophostemon confertus*	Brush Box	F	**Retain** and protect in accordance with Tree Protection Plan.
13	*Lophostemon confertus*	Brush Box	F	**Retain** and protect in accordance with Tree Protection Plan.
14	*Lophostemon confertus*	Brush Box	G	**Retain** and protect in accordance with Tree Protection Plan.
15	*Lophostemon confertus*	Brush Box	G	**Retain** and protect in accordance with Tree Protection Plan.
16	*Lophostemon confertus*	Brush Box	F	**Retain** and protect in accordance with Tree Protection Plan.
17	*Lophostemon confertus*	Brush Box	F	**Retain** and protect in accordance with Tree Protection Plan.
18	*Lophostemon confertus*	Brush Box	G	**Retain** and protect in accordance with Tree Protection Plan.
19	*Lophostemon confertus*	Brush Box	G	**Retain** and protect in accordance with Tree Protection Plan.
20	*Lophostemon confertus*	Brush Box	G	**Retain** and protect in accordance with Tree Protection Plan.

21	*Quercus robur*	English Oak	F	**Retain** and protect in accordance with Tree Protection Plan. Remedial pruning and canopy reduction away from building.
22	*Eucalyptus saligna*	Blue Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
23	*Eucalyptus robusta*	Spotted Gum	P	**Retain** and protect in accordance with Tree Protection Plan.
24	*Corymbia maculata*	Spotted Gum	G	**Remove** and replace with new plantings in accordance with the landscape plan
25	*Corymbia maculata*	Spotted Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
26	*Corymbia maculata*	Spotted Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
27	*Corymbia maculata*	Spotted Gum	F	**Remove** and replace with new plantings in accordance with the landscape plan
28	*Corymbia maculata*	Spotted Gum	F	**Retain** and protect in accordance with Tree Protection Plan.
29	*Corymbia maculata*	Spotted Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
30	*Corymbia maculata*	Spotted Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
31	*Eucalyptus saligna*	Blue Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
32	*Eucalyptus saligna*	Blue Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
33	*Corymbia maculata*	Spotted Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
34	*Melaleuca quinquenervia*	Paperbark	F	**Retain** and protect in accordance with Tree Protection Plan.
35	*Corymbia maculata*	Spotted Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
36	*Corymbia maculata*	Spotted Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
37	*Corymbia maculata*	Spotted Gum	P	**Retain** and protect in accordance with Tree Protection Plan.
38	*Corymbia maculata*	Spotted Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
39	*Corymbia maculata*	Spotted Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
40	*Corymbia maculata*	Spotted Gum	G	**Retain** and protect in accordance with Tree Protection Plan.
41	*Eucalyptus saligna*	Blue Gum	G	**Retain** and protect in accordance with Tree Protection Plan.

Glossary, acronyms and abbreviations

AIA Arboricultural Impact Assessment considers the location and condition of the trees in relation to the impact of proposed building works and recommends retention and protection, or removal and replacement, where appropriate.

AQF Australian Qualification Framework A quality assured national framework for education and training. It provides nationally recognised and endorsed qualifications through a competency based training system.

DBH Diameter at Breast Height

DRB Diameter above Root Buttress

DCP Development Control Plan

PCC Parramatta City Council

PCLEP Parramatta Council Local Environmental Plan

PCDCP Parramatta Councils Development Control Plan 2011

SRZ Structural Root Zone: The portion of the root plate comprised primarily of structural woody roots (integral with the soil profile) providing the main mechanical support and anchorage of a tree, calculated in accordance with AS 4970:2009, expressed as a radial dimension in metres from the centre of the trunk.

REF Review of environmental factors.

STIF The Sydney Turpentine-Ironbark Forest (STIF) is the name given to the endangered ecological plant community protected under provisions in the NSW Biodiversity Conservation Act 2016 under Schedule 2 Threatened ecological communities. The characteristic species found in the STIF include *Syncarpia glomulifera*, *Eucalyptus globoidea*, *Eucalyptus resinifera*, *Eucalyptus paniculata*, *Angophora costata* and *Angophora floribunda*.

TMP Tree Management Plan

TPZ Tree Protection Zone: A specified area at a given distance from the trunk set aside for the protection of a trees root system and canopy during land development works to ensure the long term viability and stability of a tree, calculated in accordance with AS 4970:2009.

TRAQ Tree Risk Assessment Qualified: A qualification in the use of a systematic methodology for evaluating risk of harm and establishing priorities for managing risks associated with trees by an assessment of potential targets, probability of failure and impact potential.

TSC Act Threatened Species Conservation Act 1995

VTA Visual Tree Assessment: A systematic method of tree assessment (developed by Claus Mattheck & Helge Breloer) using biological and biomechanical indicators to evaluate overall vitality and structural integrity of a tree.

WSUD Water Sensitive Urban Design**:** Environmentally sustainable water resource management in urban areas. The integration of water cycle management into urban planning & design, sensitive to natural ecological and hydrological cycles

1 Introduction

1.1 The following arborist report was commissioned by Mr Jesse Mowbray from Nimbus Architecture and Heritage for Parramatta City Council.

1.2 The report is an assessment of the existing trees in Boronia Park which may be impacted by modifications and/or demolition of the Sporting Pavilion and Maintenance Depot on the Kent Street frontage.

1.3 The aims of the report are to:

- Identify tree species
- Detail the condition of the trees on the site that may be affected by installation of the new building and associated infrastructure. The assessment considers individual trees or stands of trees and the current impacts on the trees.

1.4 The Arboricultural Impact Assessment (AIA) report will:
-consider the location and condition of the trees in relation to the impact of proposed building works and recommend retention and protection, or removal and replacement, where appropriate.
- Provide details in regard to protection measures or remedial works for those trees to be retained, for the period prior, during and after construction. The trees to be retained will be the subject of the Tree Protection Plan.

1.5 Consideration is given to Parramatta Council DCP 2011 Part 5.4 Preservation of Trees and Vegetation and AS4970-2009 Protection of Trees on Development Sites.

1.6 The information gathered will provide guidance to the project architect on the constraints these trees impose on the use of the site.

1.7 The initial tree survey was carried out on the 22nd March 2019. Additional trees were surveyed on the 21st June 2019 and included in this assessment to accommodate the accessible path from a proposed disabled carpark space on Kent Street to the upgraded sporting pavilion.

1.8 The Arboricultural Impact Assessment has been provided based on the Preliminary Review of Environmental Factors (REF) plans for the project provided by Nimbus Architecture and Heritage dated 16 March 2020. The concept for the building was revised after community consultation resulting in a larger footprint than previously envisaged necessitating the reassessment of some trees to the north of the proposed building and realigned footpath.

2 Method

2.1 Collection of Tree Information

2.1.1 The trees were inspected by Susan Stratton on the 22nd March 2019 and on 21st June 2019 from ground level to determine their health, vigour, viability and safety in the context of their current situation and in relation to the proposed future use of the site. The condition of each tree was identified and recorded (refer Appendix A).

2.1.2 Each tree was assessed using the Visual Tree Assessment (VTA)[1] procedure. No root exploration, internal probing or aerial inspection was performed as part of this assessment.

2.1.3 Tree identification was based on visual inspection of features available from the ground at the time of inspection. The identification of trees in this document represents the probable identity of the species as a complete taxonomical process of identification was not carried out.

2.1.4 Measurements and observations were taken using the following equipment:

- Tree Height, canopy spread and age were estimated. Diameter at Breast Height (DBH) and Diameter above Root Buttress (DRB) were measured using a diameter tape where access was available.
- Binoculars and the naked eye
- Photographs were taken on a Samsung 8 phone.

2.1.5 Any photographs included in this report, **Appendix E**, were taken at the time of the inspection

2.1.6 Plans viewed as part of this report include the Survey prepared for the site dated 27/02/2019 and the preliminary Architectural plans prepared by Nimbus Architectural and Heritage dated 16/03/2020. Trees on the site, adjacent to the proposed works were verified and located during the site inspections. These trees are indicated on the Tree Location Plan. **Appendix F**

2.1.7 This report refers to *Australian Standard AS4970-2009 Protection of trees on development sites* as a guide for setting minimum setbacks from the centre of a tree's trunk to development works, as seen in Tree Location Plan. The setbacks or Tree Protection Zone (TPZ) can be modified by the author in accordance with AS4970-2009, Section 3.3.4 after consideration of other mitigating factors and/or constraints as indicated, but not restricted to, the following:

1. Condition of the tree and therefore its ability to recover from disturbance.
2. Soil type and depth. The characteristics of the soil will influence drainage and fertility whilst depth will determine the volume of soil available to the tree.
3. Tolerance of the individual species to disturbance.
4. Geological characteristics of the site. Physical barriers caused by rock formations.
5. Topography will have a bearing on the site drainage and the slope and aspect.
6. Climatic conditions. Exposure to dominant winds, microclimatic conditions as a result of landform, existing structures or the proposed development.
7. The existence of structures or obstacles affecting root growth and crown development. The physical limitations placed on the tree/s by present or past

[1] Visual Tree Assessment (VTA) is a method of assessing the structural integrity of trees based on defects (such as cavities, cracks, splits etc.) and external symptoms of mechanical stress (bulges and reactive growth)

C. Mattheck `Updated Field Guide for Visual Tree Assessment' was used as a reference

development be it buildings, excavations for utilities, swimming pools, soil level changes, landscaping works and modified drainage patterns.

8. Potential root loss resulting from any proposed encroachment. Root mapping may determine the extent of root loss.
9. Stability of the tree. Removal of structural roots, in particular compression roots could destabilise the tree.
10. Engineering and construction techniques to mitigate impact on trees such as pier and beam, bridge footings, suspended slabs, lateral boring and subsoil drains.

2.2 Assessment Method

2.2.1 **TreeAZ method of tree assessment:** The TreeAZ is used to categorise each tree according to its suitability in the overall planning process which takes a number of variables into consideration when developing a site. The category is based on the arboricultural assessment of their health and vigour, condition and suitability to the site along with their estimated life expectancy.

2.2.3 These groups fall into two groups. An A category tree is suitable for retention in the context of the proposed development whilst a Z category tree would be the least suitable. Further explanation of TreeAZ can be found in **Appendix C**.

2.2.4 Developed in the UK, this method has to be used in conjunction with an assessment of Landscape Significance to comply with NSW legislation notably the Environment Protection and Assessment Act 1979 NSW

2.2.5 **Tree Significance:** The significance of a tree in the landscape is a combination of its amenity, environmental and heritage values. These values tend to be fairly subjective and difficult to assess consistently. To ensure a consistent approach a criteria prepared shown in **Appendix D** is used to make an assessment.[2]

2.2.6 A rating has been applied to each tree to give the relative landscape significance of each tree and to assist in determining retention value in accordance with the following categories:-

1. Significant
2. Very High
3. High
4. Moderate
5. Low
6. Very Low
7. Insignificant

2.2.7 **Tree Retention Values – Assessment Methodology:** The Retention Values shown in **Appendix A** have been determined on the basis of the A or Z values deduced after assessment of the trees and their Landscape Significance rating in accordance with Table 1. These values highlight those trees worthy of preservation and consideration when siting buildings and other infrastructure on site.

[2] The criteria for determining Landscape Significance of trees developed by A Morton has been utilised. These criteria provide objective measures for determining the combined amenity, environmental and heritage value of a tree.

2.2.8 Trees AZ method of tree assessment can define trees with special significance as being A3 and A4. This rating can be applied to trees with heritage, ecological or cultural significance warranting retention, which would normally be rated as `unimportant trees not worthy of being a material constraint'. Refer to **Appendix C** for more detail. For this reason the A and Z classification can overlap and these trees can be found in the tree retention values table as classifications Z1-3 and ZZ1 to ensure their consideration for retention. As an example the classification is usually applied to those trees identified in government legislation as being significant trees, threatened species and/or habitat.

Table 1 – Tree Retention Values

	Landscape Significance Rating						
TreeAZ category	1	2	3	4	5	6	7
A1	High retention value						
A2			Moderate retention value				
Z	(A3 and A4)	(A3 and A4)		Low retention value		Very Low ret. value	
ZZ	(A3 and A4)						

2.2.9 Tree Protection Zones (TPZ) and Structural Root Zone (SRZ) as seen in **Appendix A** are used to further verify impacts on trees and determine protection measures to minimise damage to retained trees and ensure their survival.

2.2.10 Those trees found to be dead or weed species are immediately designated for removal. Trees requiring removal because the impacts from development cannot be mitigated by protective measures and/or they are not suited to the use of the site are identified.

2.3 All data, measurements taken and Tree Retention Values can be found in **Appendix A** `Tree Survey Data' and the location of trees can be found on **Appendix F** `Tree Location Plan'.

3 Site Research & Observations

3.1 The Site

3.1.1 The subject site is identified as Lot 341 in DP 914533, Boronia Park, Epping.

Figure 1 Location plan – the two sites within Boronia Park Epping are indicated in red outline on the aerial photo. Source Six Maps 27/03/2019

3.1.2 Soil found on the site is based on the Glenorie Group that overlies the Wianamatta shales. These soils are generally moderately reactive clays with poor fertility. Those original soils located on crests and upper slopes and areas that drain well tend to be shallow to moderately deep red and brown podzolics, generally less than 1m in depth. Soils from this group found on the lower slopes and areas of poor drainage form deep (150-300cm) yellow podzolics. These soils are generally moderately reactive clays in the lower horizons with poor fertility. The existing soil has been modified by use since settlement. (Chapman and Murphy, 1989). This site appears to be situated within a 'flatter' area mid-slope from observation. The upper horizons of the now modified soil appears to contain higher amounts of organic matter than one would have expected in the original podzolics, due to the planting and maintenance associated with an urban park.

3.1.3 Aspect: South east. Boronia Park slopes from the north west corner at the front of the site on Kent Street, approximately 95.5m at the boundary to the south east. The levels taken around the low point adjacent to the concrete drain near the storage building is indicated on the survey at around 87m. This equates to a fall of 8.5 metres or 1:13 over the area in which to two sites are contained.

3.1.4 The original vegetation of this area consisted of tall open forest (Blue Gum High Forest) with some transition to Turpentine-Ironbark Forest in drier areas. Most of the original vegetation was logged and then gave way to farms and urban development. The dominant locally-indigenous tree species formerly occurring in this area included *Eucalyptus pilularis* (Blackbutt), *Eucalyptus saligna* (Sydney Blue Gum), *Syncarpia*

glomulifera (Turpentine), *Angophora floribunda* (Rough-barked Apple) and Eucalyptus tereticornis (Forest Red Gum). Other species found in this association may include *Allocasuarina torulosa* (Forest Oak).[3]

3.1.4 Climate: The majority of severe winds that may cause damage to trees, gusts over 40 kilometres per hour, noted in the Parramatta area are from the south and north east, with the occasional storm squalls from random directions.[4] The trees in Boronia Park are planted in groups and are only subject to the prevailing winds and in particular Westerlies and those channelled along the streets or across open fields where they occur on fringes of the treed areas. Generally the trees in the site are competing for sunlight and have codominant canopies.

3.2 The Trees

3.2.1 Forty one (41) trees were identified in preparing this report. Each tree has been allocated with an identification number for reference purposes and indicated on the attached Tree Location Plan (**Appendix F)**. The numbers used on this plan correlate with those in the Tree Assessment Data schedule which provides details of the subject trees, their dimensions, condition, life expectancy and retention value, refer to **Appendix A**. Photos of specific trees referred to in the report can be seen in **Appendix E**.

3.2.2 AS 4970-2009 allows a minor encroachment within the TPZ of 10% provided an equivalent area of root zone is compensated for immediately adjacent to the TPZ. Where the encroachment is greater than 10% the Site Arborist will be required to demonstrate that the tree can be protected and remain viable. Dimensions of the trees thought to be impacted by the proposed development were taken to calculate TPZ and the indicative Structural Root Zone (SRZ) for each of the trees. This information is calculated utilising the calculations specified in AS 4970-2009 section 3.2 and 3.3.5, respectively, and have been included in Appendix A, and highlighted in red, TPZ (Tree Protection Zone) and SRZ (Structural Root Zones).

3.3 Environmental Significance

- 3.3.1 Tree Management Controls. Located in Parramatta City Council Local Government area, all the trees on the site are subject to the Parramatta Council Local Environmental Plan (PCLEP) clause 5.9 and related Development Control Plans (DCP). The trees on the site and surrounding properties have to be assessed based on the provisions of the current DCP which is found in *Parramatta Councils DCP 2011 Part 5 Other Provisions Section 5.4 Preservation of Trees or Vegetation (PCDCP)*. The PCDCP generally protects those trees exceeding 5 metres in height or is located on a site classified as being part of a vulnerable, threatened or endangered ecological community. Provision also exists if trees provide or have the potential to provide habitat for native fauna or fauna classified as vulnerable or threatened under

[3] Based on information in `Taken for Granted' by Benson and Howell which provides general information as to the vegetation associations that existed prior to the development of Sydney based on historic references, current vegetation surveys and soil and geological maps of the Sydney Basin.

[4] Bureau of Meteorology website provides wind speed and direction data for nearby Parramatta North (Masons Drive). This site has been used to substantiate weather variables that may impact on the trees on the subject site.

the Biodiversity Conservation Act 2016 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth) and

- forms part of a heritage item or place
- is within a heritage conservation area
- forms part of an Aboriginal object
- is within an Aboriginal place of heritage significance
- is on public land.

3.3.2 Threatened Species and Ecological Communities: The Blue Gum High Forest and The Sydney Turpentine and Ironbark Forest (STIF) are listed in the NSW Biodiversity Conservation Act 2016 under Schedule 2 Threatened ecological communities. These ecological communities were found in the area and remnant examples were found within the site on the 1943 aerial photo seen on Six Maps. See **Appendix E**. It would appear that the majority of the site immediately around the pavilion was cleared with immature plantings on the site consistent with regrowth or planting after logging of the area. The *Eucalyptus saligna* (Sydney Blue Gum) represented by tree number T31, is possibly the only remnant tree on site. The majority of trees attributed to the threatened ecological community on the site have been planted around or since 1943. The material planted differs in appearance to the remnant tree which is likely due to genetic variation within local trees or due to introduced stock.

3.4 **Heritage Significance:** The site is not located in any of Parramatta City Council's Heritage areas.

3.5 **Amenity Value:** Criteria for the assessment of amenity values are incorporated in **Appendix D**. The amenity value of a tree is a measure of its live crown size, visual appearance (form, habit, crown density), visibility and position in the landscape and contribution to the visual character of an area. Generally the larger and more prominently located the tree, and the better its form and habit, the higher its amenity value.

3.6 The Proposal:

3.6.1 The proposed development includes the demolition of the existing maintenance and storage building adjacent to the Kent Street vehicle access and the existing amenities building and associated shed. The proposed sports pavilion is located on the existing site. The single story building has a larger footprint than the previous structure extending beyond the current building footprint in all directions except onto the playing field to the east. A new pathway to the street has been added to provide access with falls no greater than 1:20. This has impacted on trees between the existing building and the street frontage.

4 Impact Assessment

4.1 Assessment:

4.1.1 This assessment will determine the extent, if any, of encroachments into the root zones and canopies by the proposed development and evaluate the likely impact of the proposed works on the subject trees. The following plans were used in the assessment.

Plan Title	Designer	Drawing No.	Date
Precinct Plan	Nimbus Arch + Heritage	A-100	16/03/2020
Demolition Plan	Nimbus Arch + Heritage	A-110	16/03/2020
Ground Floor Plan	Nimbus Arch + Heritage	A-120	16/03/2020
Roof Plan	Nimbus Arch + Heritage	A-121	16/03/2020
Elevation Plan	Nimbus Arch + Heritage	A-200	16/03/2020
Elevation Plan	Nimbus Arch + Heritage	A-201	16/03/2020
Landscape Plan	Susan Stratton LA Pty Ltd	LA-01	25/03/2020

4.1.2 The assessment will be based on the following criteria:-

- Existing levels, in particular around the bases of trees;
- Tree Protection Zones (TPZ);
- Structural Root Zones (SRZ);
- Footprint and envelope of the proposed development and temporary structures (scaffolding, hoardings etc) that may impact on the subject trees;
- Encroachments into the TPZ & SRZ, inclusive of estimated cut and fill required beyond the building footprint, ie that required for construction of retaining walls.
- Incursions into the tree canopy by the building and temporary structures and
- Assessment of the likely impacts of the works on existing trees.

4.2 Tree Removals

4.2.1 The proposed development will necessitate the removal of Six (6) trees with low to moderate level retention values. These include Tree numbers T1 (Sydney Red Gum), T2 (Sydney Red Gum), T3 (Sydney Red Gum), T4 (Sydney Red Gum), T24 (Spotted Gum), T27 (Spotted Gum) Photos 4 and 5 in **Appendix E,** are of all the trees to be removed. Trees T1, T2, T3 and T24 are presently located within close proximity, in some instances less than 2m from the existing sporting amenities structure. These trees overhang the roof, and their roots will likely be contacting and/or entangled with the footings and retaining structures around the building. The structural integrity of the trees will be compromised during demolition. The redevelopment of the building will necessitate their removal. The removal of these trees to accommodate the proposal is deemed acceptable.

T4 and T27 will be impacted by the proposed building footprint with all, or greater than 50%, of the root plates or Structural Root Zone of these trees requiring removal. Retention of the trees would be a substantial constraint to the development of the new building.

In order to compensate for loss of amenity resulting from the removal of these trees to accommodate the proposed development, consideration should be given to replacement planting within the site in accordance with Section 6.

4.3 Trees to be retained and protected

4.3.1 Trees T31 and T32 (both Sydney Blue Gum) are significant trees and require protection during the demolition of the existing amenities block. The existing concrete driveway should provide adequate ground protection for the roots of these trees providing the machinery and trucks used for demolition are to remain on the concrete paving. A temporary tree protection fence is required to ensure that machinery is kept off the unprotected TPZ of these trees. The driveway to be demolished is to be saw cut and demolition carried out by hand or by machinery using the driveway as a base.

The tree canopy of these trees is well above a height that would be affected during demolition.

4.3.2 Tree No T25 (Spotted Gum) is to be retained. This tree will be subject to an encroachment of 20% due to the increase in the building footprint to the south of the current building. The use of pier and beam construction for the foundations of the southern wall would lessen the impact of the development. The slab for the screened ancillary services area is to be placed on grade to further minimise impacts to the roots of this tree. Sections 11 and 12 of the Generic Tree Management Plan (**Appendix F**) are to be implemented to ensure that the impacts from this structure is minimised. The canopy of the tree is unaffected by the proposed development.

4.3.3 Tree No T26 (Spotted Gum) is to be retained. This tree will be subject to an encroachment of 15% due to the increase in the building footprint to the south of the current building and the addition of a path into the maintenance staff facilities and the screened ancillary services area. The impact of this incursion could be reduced by installing paving on grade and the use of pier and beam construction for the foundations of the walls. Sections 11 and 12 of the Generic Tree Management Plan (**Appendix F**) are to be implemented to ensure that the impacts from these structures are minimised. The canopy of the tree is unaffected by the proposed development despite the close proximity of the proposed roof.

4.3.4 Tree No. T5 (Sydney Red Gum) is to be retained. This tree has poor form due to ongoing trimming away from the overhead power supply to the existing amenities building. See Photo 7 in **Appendix E**. The retention of this tree is dependent on the extent of roots impacted during excavation and that additional expenditure may be required to ensure its survival. This tree will be subject to an encroachment into the TPZ of 17% due to the increase in the building footprint to the north of the current building and the addition of a path and retaining wall. The major concern is the incursion into the Structural Root Zone as there is a possibility that removal of structural roots to allow the installation of the retaining wall will result in major impact on the viability and structural integrity of the tree. The current incursion into the structural root zone will be a wedge shape with the closest point being around 700mm from the trunk of the tree. There is no building technique that will minimise the extent of root pruning if large roots are encountered in this area and consideration will need to be given to its removal.
During transplanting of a tree generally the minimum root removal is 3 times trunk diameter. This equates to 1.2m from the centre of the trunk. The location of the wall is within this distance. In its favour the wedge shape of the intrusion will benefit the tree as there may well be roots that are radiating from the trunk that will not be impacted by the excavation.

The excavation is to be dug by hand with non-motorised machinery. Tree roots are to be cut cleanly with sharp tools. The face of the excavation is to be immediately walled off using sheet metal, old formwork boards or a similar inert material available to the builder and secured so that the resultant temporary retaining structure is able to be backfilled with coarse washed river sand and the TPZ watered to prevent the roots drying out.
The TPZ will have to be watered over the duration of construction to maintain soil moisture. An irrigation system may be installed if desired to ensure that watering occurs once per week during construction to maintain soil moisture.
During construction access for building and scaffolding will be required. The protective fence is to be located so as to minimise access into the TPZ and those areas requiring access are to be covered with geotextile, mulch and boards to prevent compaction due to pedestrian access. The excavation is to be carried out by hand and minimum soil and roots removed to allow for the construction of the footing and wall.
The wall must to be designed with the footing closest to the building and with least backfill as possible whilst ensuring that it is engineered to withstand the close proximity and pressure that will occur due to future growth of the tree.
To compensate for the reduction in roots and therefore the capacity of the tree to take up nutrients and water, additional watering would be required within the remaining TPZ during construction and for at least 1 year after construction has completed.
Mulch will need to be applied to the area around the tree and maintained at a depth of 100mm to maintain soil moisture and provide nutrients to the tree as the mulch breaks down.
The Site Arborist is to certify that installation of protection measures has been carried out in accordance with this document and any conditions of Development Consent prior to commencement of works and during construction. The works are to be monitored by the Site Arborist throughout the project either at designated witness points or maximum 1 monthly intervals, depending on the length of the development.
This tree should remain viable beyond completion of development provided recommended installation and protection measures are adhered to. The relevant sections of the Tree Management Plan (**Appendix F**) are to be implemented to ensure that the impacts from the development is minimised. The canopy of the tree is unaffected by the proposed development despite the close proximity of the proposed roof. Deadwood removal is required and is to be carried out in accordance with sections 4 and 5 of TMP

4.3.5 Tree No. T23 (Swamp Mahogany) will be subject to an incursion of 14.4% due to the increased footprint of the building to the south of the existing structure. The use of pier and beam construction for the foundations of the southern wall would lessen the impact of the development. Sections 10 and 11 of the Generic Tree Management Plan (**Appendix F**) are to be implemented to ensure that the impacts from this structure is minimised. The canopy of the tree is unaffected by the proposed development as the tree canopy has been lifted for the existing structure.
This tree has considerable decay at the base of the northern scaffold branch which will need further assessment to ascertain that there is sufficient healthy tissue and structural wood to maintain the stability of the branch. Branch reduction pruning could be carried out to reduce the canopy overhanging the building and thereby reduce the wind loading on the tree which will be increased once nearby trees are removed. This would reduce the potential for branch failure.

4.3.6 Tree No T8 (Sydney Red Gum) is to be retained. The TPZ of this tree will be impacted by the installation of the new central walkway and the increased building footprint on the western frontage of the existing building. The incursion of 19.9% into

the TPZ can be minimised by placing the footpath on grade. This will need to be investigated during the work and Sections 14 and 15 of the Generic Tree Management Plan (TMP) in **Appendix F** are to be implemented to ensure that the impacts from this footpath within the TPZ is minimised. The canopy may be impacted due to the increase in the roof height and proximity to the tree. Any trimming is to be carried out in accordance with sections 4 and 5 of TMP.

4.3.7 Tree No. T9 (Sydney Red Gum) is to be retained at Council request. The TPZ of this tree will be impacted by the installation of the new central walkway. The incursion of 18.8% into the TPZ can be minimised by placing the footpath on grade. This will need to be investigated during the work and Sections 14 and 15 of the Generic Tree Management Plan (TMP) in **Appendix F** are to be implemented to ensure that the impacts from this footpath within the TPZ is minimised.

The tree has a fruiting body at the base and damage to the trunk which has left a large unoccluded spiral wound from the base of the tree to a height of approximately 3m. Refer to Photo 6 in **Appendix E**. This Phellinus rot at the base of a tree can result in complete tree failure. Often a young tree with this amount of decay, in a sheltered location away from potential targets, would be left as there is potential for the tree to overcome the pathogen. The proposed footpath adjacent to this tree will however increase pedestrian traffic and therefore potential targets within the impact zone if failure occurs. Increased pedestrian traffic is anticipated in all weather conditions as the new Sporting Pavilion includes facilities for meetings. For these reasons further investigation is required by Council to ascertain the extent of decay and determine appropriate management of the tree and/or removal.

4.3.8 Tree number T20 (Brush Box) will have major changes to the levels within the TPZ. The majority of this work relates to the new seating and steps proposed on the eastern and southern side of the tree which is currently paved. A replacement path is proposed for the remaining sides of the tree. This tree species is known to be robust and capable of recovery from root pruning and transplant as long as appropriate measures are in place to ensure adequate water is available during periods of high evapotranspiration during the recovery period. It is anticipated that tree roots will be located beneath the current paving and some will need to be severed to accommodate the new seating and stairs. The levels on these appear greater than the existing ground levels around the tree. These existing levels immediately around the tree will need to be retained and suitable drainage installed as the area will be lower than the retaining wall for the steps and possibly the rear of the new seating structure. If possible it would be appropriate for the tree to have the seating located on a path at the existing levels and to allow water to flow under the seating during high rain occurrences. Sections 7, 8, 10, 11 and 12 of the Generic Tree Management Plan (TMP) in **Appendix F** are to be implemented to ensure that the impacts of this work are minimised.

The realignment of the existing path on the northern and western sides of the tree will have minimal impact on the tree however the work will need to be carried out by hand to prevent damage to any tree roots beneath the existing path. Sections 14 and 15 of the Generic Tree Management Plan (TMP) in **Appendix F** are to be implemented to ensure that the impacts from this footpath within the TPZ is minimised. Ground protection will be required as indicated on the Tree Protection Plan to minimise damage to the structural root zone and appropriate supervision of cutting of roots during any excavation for construction should be carried out in accordance with the Generic Tree Management Plan.

The canopy may be impacted during the work. An assessment will need to be carried out during site setup to determine those branches requiring additional protection such

as that outlined in Illustration 2 **Appendix G.** Protection of the canopy and any trimming is to be carried out in accordance with sections 4 and 5 of TMP, **Appendix F**

4.3.9 Tree numbers T6 (Sydney Red Gum) and T29 (Spotted Gum) have incursions into the TPZ which can be minimised by the installation of ground protection and appropriate supervision of cutting of roots during any excavation for construction in accordance with sections 7, 8, 10, 11, 12, 14 and 15 of the Generic Tree Management Plan, **Appendix F**. The canopy of T29 may be impacted due to the increase in the roof height and proximity to these trees. Any trimming is to be carried out in accordance with sections 4 and 5 of TMP, **Appendix F**

4.3.10 Tree T35 (Spotted Gum) will be adversely affected by the proposed realignment of the footpath due to change of levels. The incursion of 17% will be offset by the removal of existing path nearer to the tree and can be minimised by placing as much of the path on grade as possible given the requirement of a 1:20 grade. Tree protection measures including trunk protection and ground protection will be required. Sections 7, 8, 10, 14 and 15 of the Generic Tree Management Plan (TMP) in **Appendix F** are to be implemented to ensure that the impacts from this footpath within the TPZ is minimised.

4.3.11 Tree T34 (Swamp Paperbark) will be affected by the proposed realignment of the footpath due to change of levels within the TPZ. The incursion of the new path is 6% into the TPZ however the tree will benefit from the removal of the existing footpath from the northern extent of the TPZ. The construction of the path will need to be above grade and the footprint of the fill required to support the path (Angle of repose) needs to be kept to a minimum so that additional area within the TPZ is not buried and therefore impacting on the roots beneath. Burying roots with soil of depths greater than 300mm will diminish soil oxygen and is known to result in death of roots and ultimately decline of the impacted tree. The new path follows the contour and drainage will need to be addressed or a small culvert installed to prevent water pooling for extended periods over the TPZ. Sections 14 and 15 of the Generic Tree Management Plan (TMP) in **Appendix F** are to be implemented to ensure that the impacts from this footpath within the TPZ is minimised.

4.3.12 T21 (English Oak) exhibits decay which may compromise a limb directly above the footpath in front of the existing building. Trimming of this limb back from the building would reduce the length of the limb hanging over the footpath thereby reducing both wind loading and weight on the branch. Any trimming is to be carried out in accordance with sections 4 and 5 of TMP refer **Appendix F.**

4.3.13 Tree numbers T7 (Spotted Gum), T10 (Spotted Gum), T15, (Brush Box), T16 (Brush Box), T17 (Brush Box), T18 (Brush Box), T19 (Brush Box), T33 (Spotted Gum) and T36 (Spotted Gum) will require protection during realignment of paths. The incursions are minimal however the work is to be carried out in accordance with Sections 10, 11, 12, 14 and 15 of the Generic Tree Management Plan (TMP), in **Appendix F,** to ensure that the impacts from this footpath within the TPZ is minimised.

4.3.14 No other trees should be adversely affected by the proposed development however tree protection fencing is advised to prevent the unauthorised entry of plant and equipment into the TPZ during construction.

4.3.15 Trees T12, T13, T21, T23, T33, T34 and T37 were inspected and their DBH recorded to ascertain that they were not impacted by the new sports pavilion or the associated works. Whilst they will not be impacted by the works visible structural defects were detected which need to be monitored.

5 Recommendations for Tree Protection

5.1 Specific Tree Requirements.

5.1.1 Trees T1, T2, T3, T4, T24 and T27 are to be removed and replaced due to conflict with the development. Removals to be in accordance with Section 3.0 Tree Removal of the Generic Tree Management Plan **Appendix F**.

5.1.2 Trees T5 –T9, T10-T23, T25-T26, and T28-41 will require protection for the duration of the works. Tree protection fence is to be installed as shown on the tree protection plan **Appendix I** and in accordance with the Tree Protection Fence detail in **Appendix G**

5.1.3 The existing concrete paths will provide adequate root protection for Trees T10 – T19, T21, T31-32, T37-T39 and T40-T41. Where these paths are removed additional measures for tree protection are to be implemented in accordance with Sections 10, 11, 12, 14 and 15 of the Generic Tree Management Plan (TMP) in **Appendix F**

5.1.4 Ground protection and trunk protection for those trees in close proximity to the work will be required in addition to tree protection fencing for tree T5, T8, T9, T10, T20, T25 and T26 during the building works.

5.1.5 Trees T5, T6, T7 and T33 have been lopped to accommodate low voltage wires. Remedial pruning will be required in addition to the removal of branch stubs and deadwood greater than 50mm diameter. Refer to Section 16 of the Generic Tree Management Plan (TMP) in **Appendix F**

5.1.6 All trees are to be checked for and have branch stubs and deadwood greater than 50mm diameter removed in areas above pedestrian walkways. Refer to section 16 of the Generic Tree Management Plan (TMP) in **Appendix F**

5.2 Tree protection Plan.

5.2.1 The Tree Protection Plan (TPP) (refer **Appendix I**) indicates the position of tree protection devices and other recommended measures to trees to be retained as part of the proposed development. This plan is to be read in conjunction with the Tree Management Plan.

5.3 Tree Management Plan

5.3.1 A Generic Tree Management Plan (TMP) has been provided as part of this submission in **Appendix F**. The TMP specifies tree protection measures required for the duration of construction and maintenance period and is to be finalised and implemented prior to site set-up and commencement of demolition works.

5.3.2 Any requirements outlined in the Council Approval are to be addressed and included in the finalised TMP.

5.4 Implementation of Tree Protection

5.4.1 Tree removal work and any trimming of trees to be retained shall be carried out by an experienced Practicing Arborist [Australian Qualification Framework Level 3] in accordance with AS 4373-2007 Pruning of amenity trees.

5.4.2 During construction those trees indicated as being retained will have to be assessed to determine any impacts that may arise due to the amendments to structures and location of services during the works. The Tree Management Plan will need to address any amendments.

5.4.3 A Site Arborist [Australian Qualification Framework Level 5] shall be engaged to supervise the building works and certify compliance with all Tree Protection Measures. In the event of any changes to the TPZ during works the Site Arborist will be required to provide a revised Tree Management Plan.

5.4.4 Site induction must incorporate information regarding Tree Protection to ensure that all inductees are aware of their obligations to protect trees on the site and those in neighbouring properties.

5.4.5 This report must be made available to any contractor during the tendering process so that the cost associated with the required works for the protection of trees is accommodated.

5.5 Trees with Visual Defects not impacted by development

5.5.1 The fungal conk at the base of the trunk of Tree 9 indicates the presence of fungal growth and potential decay. This tree will require testing to ascertain the extent of decay. If the decay is found to be extensive then the tree may need to be removed. In the event of the decay being considered at a level unlikely to fail then the tree will require ongoing management and annual monitoring.

Trees T12, T13, T21, T23, T33, T34 and T37 have visible structural defects which need to be monitored.

Trees T12 and T13 are located along the boundary. It is unlikely that they will be impacted by the development. These trees have visible decay in the trunk and should be monitored.

T33 has a branch stub that has yet to occlude. This large wound will allow the entry of pathogens. This tree should be monitored.

T37 has a cavity at the base of the trunk and the leader has suffered dieback. The reduced canopy, as a result of the dieback, has reduced the potential hazard of tree failure. This tree will need remedial pruning and ongoing monitoring if it is going to be retained.

6 Replacement Planting

6.1 In order to compensate for loss of amenity resulting from the removal of trees to accommodate the proposed development, a minimum number of seven (7) new trees should be planted.

6.2 Replacement trees should preferably include some locally indigenous species from either the High Blue Gum Forest and/or Sydney Turpentine and Ironbark Forest communities. These will be most appropriate to the site conditions and be most valuable in terms of preserving the landscape character and wildlife habitat of the area. The following species are appropriate to the site conditions and could be considered for replacement planting:-

- *Angophora costata* (Sydney Red Gum)
- *Elaeocarpus reticulatus* (Blueberry Ash)
- *Eucalyptus pilularis* (Blackbutt)
- *Eucalyptus saligna* (Sydney Blue Gum)
- *Glochidion ferdinandii* var *ferdinandii* (Cheese Tree).
- *Syncarpia glomulifera* (Turpentine)

If you have any questions relating to this report please contact Susan Stratton on mobile: 0419 970 580 or email: ssland@bigpond.net.au.

Regards,

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DATED: 3 July 2020

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https://maps.six.nsw.gov.au/ sourced 27/03/ 2019

http://www.bom.gov.au/climate/averages/tables/cw_066124.shtml Summary statistics Parramatta North (Masons Drive) sourced 28/03/19

Appendix A – Tree Survey Data Table

Tree No	Tree Species	Age Class	DBH (m) TPZ (m) radius	DRB (m) SRZ (m)	Tree Height (m)	Canopy width N/S/E/W (m)	Canopy Cond-ition	Crown class size m^2	TreeAZ	Defects	Root Zone	Services	Comments/Landscape Significance Rating	Life expectancy
1	*Angophora costata*	M	0.33 3.96m	0.39 2.23	14	2/9/7/4	4	C	Z2	Lean	retain wall building <400m	N/a	3 Located in close proximity to building. Lean toward building One dimensional canopy over building.	Long >40 Years
2	*Angophora costata*	M	0.58 6.96	0.49 2.45	16	6/2/6/7	4	C	Z2	N/a	retain wall shed	N/a	3 Located in close proximity to building. One dimensional canopy	Long >40 Years
3	*Angophora costata*	I	0.09 2	0.11 1.5	7	3∅	4	C	Z8	Water shoots	Fence retain	N/a	3 Located on fenceline. Water sprouts.	Long >40 Years
4	*Angophora costata*	S	0.18 2.16	0.24 1.82	7	4/4/3/1	3	C	Z11	L/F	Ga L+ Fence	Lvo	3 Lopped for wires. Wounds yet to occlude.	Long >40 Years
5	*Angophora costata*	M	0.35 4.2	0.41 2.28	13	5/1/6/1	3	I	A2	L	Path	Lvo	3 Poor trunk taper and irregular shaped crown. Deadwood >100mm over path. Branch stubs.	Long >40 Years
6	*Angophora costata*	M	0.24 2.88	0.32 2.05	13	0/5/3/2	4	I	A2	L	Path	Lvo	3 Poor trunk taper and irregular shaped crown. Deadwood	Long >40 Years
7	*Angophora costata*	M	0.29 3.48	0.32	13	3/5/4/4	4	I	A2	L	Path	Lvo	3 Poor trunk taper and irregular shaped crown. Deadwood	Long >40 Years

Tree No	Tree Species	Age Class	DBH (m) TPZ (m) radius	DRB (m) SRZ (m)	Tree Height (m)	Canopy width N/S/E/W (m)	Canopy Cond-ition	Crown class size m^2	TreeAZ	Defects	Root Zone	Services	Comments/Landscape Significance Rating	Life expectancy
8	*Angophora costata*	M	0.33 3.96	0.46	13	4/4/7/4	3	C	A2	L	N/a		3 Poor trunk taper and irregular shaped crown.	Long >40 Years
9	*Angophora costata*	M	0.23 2.76	0.29	13	3/1/3/1	3	I	ZZ	B,D,M (conk evident) S	N/a		3 Tree has Phellinus conk on root crown. Decay evident from base to 4m up trunk. Deadwood >100mm	Short 1-15 Years
10	*Corymbia maculata*	M	0.2 2.4	0.24	13	4∅	4	C	A2	B	Path	Refer survey	4 Poor trunk taper and irregular shaped crown. Wound yet to occlude, kino.	Long >40 Years
11	*Eucalyptus fibrosa*	S	0.19 2.28	0.23	11	4∅	5	C	A1	Bark damage	N/a	Refer survey	4 Mechanical damage. Vehicles using pathway for access causing damage to trees.	Long >40 Years
12	*Lophostemon confertus*	M	0.3, 0.42 6.24	-	10	8∅	3	C	Z9	B,D,L	Wall		4 Perimeter screen planting. Severe basal and trunk decay. Wounds yet to occlude. Further assessment required by others.	Short 1-15 Years
13	*Lophostemon confertus*	M	0.44 5.28	-	10	3/7/4/4	4	C	Z9	L,D, lean, water sprouts	Wall		4 Perimeter screen planting. Basal decay. Further assessment required by others	Short 1-15 Years
14	*Lophostemon confertus*	M	0.36 4.32	-	9	3/4/4/4	4	C	A2	I	Wall		4 Perimeter screen planting.	Long >40 Years

Tree No	Tree Species	Age Class	DBH (m) TPZ (m) radius	DRB (m) SRZ (m)	Tree Height (m)	Canopy width N/S/E/W (m)	Canopy Cond-ition	Crown class size m^2	TreeAZ	Defects	Root Zone	Services	Comments/Landscape Significance Rating	Life expectancy
15	*Lophostemon confertus*	M	0.13, 0.14, 0.08 x 2 2.64	0.34	8	6∅	3	I	A2	N/a	Wall	See survey	4 Perimeter screen planting.	Long >40 Years
16	*Lophostemon confertus*	S	0.1 2	0.15	7	4/1/2/2	4	I	Z11	N/a	Wall	See survey	4 Perimeter screen planting. Irregular canopy	Long >40 Years
17	*Lophostemon confertus*	S	0.14 2	0.16	7	1/4/4/1	3	I	Z11	L	Wall, fence, path	See survey	4 Perimeter planting. Poor trunk taper and irregular shaped crown. Wound yet to occlude. Lean over brick shed.	Long >40 Years
18	*Lophostemon confertus*	M	0.22, 0.47 6.24	0.6	8	5/7/6/6	4	C	A2	L	Wall Path	Man hole	4 Perimeter planting. Wound yet to occlude..	Long >40 Years
19	*Lophostemon confertus*	M	0.3 3.6	0.37	9	3/7/2/1	4	C	A2	L	paving	Drain pit	4 Perimeter planting. Irregular lifted canopy.	Long >40 Years
20	*Lophostemon confertus*	M	0.23, 0.27 0.26 5.28	0.48 2.43	9	6/7/7/3	5	D	A2	L	paving	Pit cover	3 Perimeter planting. Lifted canopy	Long >40 Years
21	*Quercus robur*	O	0.36, 0.49, 0.19 7.68	0.7	11	6/5/8/8	3	D	A3	L,D,C,	Paving, fence, tank	Pit cover	3 Unknown heritage. Not seen prior to 1943. Good vigour however wounds yet to occlude. Further assessment of decay required.	Medium 15 - 40 Years

Tree No	Tree Species	Age Class	DBH (m) TPZ (m) radius	DRB (m) SRZ (m)	Tree Height (m)	Canopy width N/S/E/W (m)	Canopy Cond-ition	Crown class size m^2	TreeAZ	Defects	Root Zone	Services	Comments/Landscape Significance Rating	Life expectancy
22	*Eucalyptus saligna*	S	0.21 2.54	0.26	12	5∅	4	I	A2	F	Mulch	Pit cover	3 Potential canopy tree. Wounds to trunk occluding.	Long >40 Years
23	*Eucalyptus robusta*	M	0.7 8.4	0.69 2.83	14	11/6/6/3	3	C	Z11	L,D,B,I	Paving, building	Pit cover	3 Tree in decline. Irregular lifted canopy overhanging building. Basal and trunk decay Large scaffold branch attachment compromised by decay in trunk. Further assessment required by others	Medium 15 - 40 Years
24	*Corymbia maculata*	M	0.68 8.16	0.88	20	10/2/9/5	3	C	Z2	Co-dom branches	Building paths	N/a	3 Located in close proximity to building. One dimensional canopy with majority over building. . Deadwood 100mm and branch lifting required over roof.	Long >40 Years
25	*Corymbia maculata*	M	0.46 5.52	0.57 2.61	20	8/3/9/2	3	C	A2		Path	N/a	4 Irregular shaped crown.	Long >40 Years
26	*Corymbia maculata*	M	0.32 3.84	0.44 2.34	20	6/1/1/3	3	I	A2		Path	N/a	4 Irregular shaped crown. Vertical crack at base of trunk indicative of stress possibly due to damage to roots.	Long >40 Years

Tree No	Tree Species	Age Class	DBH (m) TPZ (m) radius	DRB (m) SRZ (m)	Tree Height (m)	Canopy width N/S/E/W (m)	Canopy Cond-ition	Crown class size m^2	TreeAZ	Defects	Root Zone	Services	Comments/Landscape Significance Rating	Life expectancy
27	*Corymbia maculata*	M	0.26 3.12	0.28	18	6/1/1/1	3	I	Z11		Path building	N/a	4 Poor trunk taper and irregular shaped crown. deadwood	Medium 15 - 40 Years
28	*Corymbia maculata*	M	0.16 2	0.24	13	2/1/1/1	3	S	Z11		Path	N/a	4 Poor trunk taper and irregular shaped crown.	Medium 15 - 40 Years
29	*Corymbia maculata*	M	0.55 606	0.65	25	14/3/11/3	4	C	A2		Path	N/a	4 Irregular shaped crown due to competition with adjacent trees	Long >40 Years
30	*Corymbia maculata*	M	0.32 3.84	0.44	20	16/1/3/7	3	I	A2		Path	N/a	4 Poor trunk taper and irregular shaped crown	Long >40 Years
31	*Eucalyptus saligna*	O	1.35 15	1.65 4.08	37	20∅	4	D	A2	L,F,	Drive/ path	Pit	1 Significant tree. Lifted canopy. Remnant tree.	Long >40 Years
32	*Eucalyptus saligna*	M	0.86 10.32	0.9 3.17	35	20∅	4	D	A2		Drive/ path	Pit	1 Significant tree. Planted after 1943.	Long >40 Years
THE FOLLOWING TREES WERE INSPECTED 21st JUNE 2019														
33	*Corymbia maculata*	M	0.28 3.36	0.36 2.15	12	2/2.5/3/1.5	4	C	A2	D	Path/ garden	Lvo	4 Trimmed for wires. Branch stubs.	Long >40 Years
34	*Melaleuca quinquenervia*	M	0.78, 0.57, 0.53 13.2	0.69, 0.65, 0.58 3.46	11	5/6/2/7	3	C	A2		Path, Garden, Shelter	Lvo	3 Multi trunk tree. Fruiting body seen on basal trunks yet to identified by others. Visible from street.	Long >40 Years

Tree No	Tree Species	Age Class	DBH (m) TPZ (m) radius	DRB (m) SRZ (m)	Tree Height (m)	Canopy width N/S/E/W (m)	Canopy Cond-ition	Crown class size m^2	TreeAZ	Defects	Root Zone	Services	Comments/Landscape Significance Rating	Life expectancy
35	*Corymbia maculata*	M	0.52 6.24	0.64 2.74	24	11/2/3/10	4	C	A2		Path shelter signs	Lvo,	3 May form part of avenue along path. Irregular shaped crown. Visible from street.	Long >40 Years
36	*Corymbia maculata*	M	0.73 8.76	0.87 3.12	25	12/5/3/8	4	C	A2		Path	Lvo and LP	3 May form part of avenue along path. Irregular shaped crown.	Long >40 Years
37	*Corymbia maculata*	M	0.24 2.88	0.33	5	2.5∅	2	I	Z10	C,F,O	Grass		4 Basal cavity. Dieback of main leader. Canopy consists of epicormic regrowth.	Short 1-15 Years
38	*Corymbia maculata*	M	0.65 7.8	0.9	25	6/5/4/4	4	C	A2		Path, Grass		3 May form part of avenue along path. Irregular shaped crown.	Long >40 Years
39	*Corymbia maculata*	M	0.44 5.28	0.54	25	8∅	4	C	A2		Path, Grass		4 May form part of avenue planting along path. Poor trunk taper and small, high canopy.	Long >40 Years
40	*Corymbia maculata*	M	0.59 7.08	0.75	25	6/2/1/11	4	C	A2		Grass		3 Irregular shaped crown.	Long >40 Years
41	*Eucalyptus saligna*	S	0.21 2.52		10	2/2/6/1	4	I	A2		Grass		3 Irregular shaped crown.	Long >40 Years

Appendix B – Explanatory Notes for Tree Survey Data Table

Tree No: Relates to number on site plan prepared specifically for this report.

Species: Coded to tree species schedule

Age Class:

I	Immature – well-established but juvenile tree
S	Semi mature- established immature tree <20% of life expectancy
M	Mature - full sized tree with further capacity for growth - 20-80% of life expectancy
O	Over mature- >80% of life expectancy. About to enter decline or already declining
LS	Live Stage – refers to a tree in a significant state of decline. Final live stage of a tree prior to death.

DBH: Diameter of trunk at breast height (1.4m above ground level), in metres.

DRB: Diameter of trunk above root buttress, in metres

Tree Height: In metres

Canopy Width: In metres

Crown Class:

D	Dominant Crown extends above general canopy; not restricted by other tree canopies
C	Co-dominant Crown forms the bulk of the Canopy but crowded by adjacent trees
I	Intermediate Crown extends into dominant/co-dominant canopy but is restricted on all sides
S	Suppressed Crown development restricted by over growing trees.

Crown Size: Live crown size in m^2 provides a measurable contribution to the visual amenity.

Crown Condition: Overall vigour and vitality

0	Dead
1	Severe decline (<20%canopy density, major deadwood)
2	Declining (20-60% canopy, twig and branch dieback)
3	Average/low vigour (60-90% canopy density, twig dieback)
4	Good (90-110% canopy density, little or no dieback or other problems)
5	Excellent (100% canopy density, no deadwood or dieback)

Root Zone: Features and services located within the root zone are noted.

Defects:

B	Borers	L	Lopped
C	Cavity	M	Mistletoe/parasites
D	Decay	S	Splits/Cracks
F	Previous failures	T	Termites
I	Inclusions	O	Other.

Services: Services and adjacent infrastructure and structures that impact on the tree are noted.

Life Expectancy:

Long >40 Years
Medium 15-40 Years
Short <1-15 Years
Dead

Tree A-Z: Categorisation of trees into important and unimportant trees which provides a hierarchy for retention and removal based on the condition of the tree and the existing site circumstances. The categories are included in the following page which has been reproduced under permission from Barrell Tree Consultancy.

Retention Value Key:

	Retention Value	Description of Retention Priority
	High	Priority for retention
	Moderate	Consider for retention
	Low	Consider for removal
	Remove	Priority for removal

Appendix C – TreeAZ

TreeAZ Categories (Version 10.04-ANZ)

CAUTION: TreeAZ assessments must be carried out by a competent person qualified and experienced in arboriculture. The following category descriptions are designed to be a brief field reference and are not intended to be self-explanatory. They must be read in conjunction with the most current explanations published at www.TreeAZ.com.

Category Z: Unimportant trees not worthy of being a material constraint

	Local policy exemptions: Trees that are unsuitable for legal protection for local policy reasons including size, proximity and species
Z1	Young or insignificant small trees, i.e. below the local size threshold for legal protection, etc
Z2	Too close to a building, i.e. exempt from legal protection because of proximity, etc
Z3	Species that cannot be protected for other reasons, i.e. scheduled noxious weeds, out of character in a setting of acknowledged importance, etc
	High risk of death or failure: Trees that are likely to be removed within 10 years because of acute health issues or severe structural failure
Z4	Dead, dying, diseased or declining
Z5	Severe damage and/or structural defects where a high risk of failure cannot be satisfactorily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, overgrown and vulnerable to adverse weather conditions, etc
Z6	Instability, i.e. poor anchorage, increased exposure, etc
	Excessive nuisance: Trees that are likely to be removed within 10 years because of unacceptable impact on people
Z7	Excessive, severe and intolerable inconvenience to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. dominance, debris, interference, etc
Z8	Excessive, severe and intolerable damage to property to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. severe structural damage to surfacing and buildings, etc
	Good management: Trees that are likely to be removed within 10 years through responsible management of the tree population
Z9	Severe damage and/or structural defects where a high risk of failure can be temporarily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, vulnerable to adverse weather conditions, etc
Z10	Poor condition or location with a low potential for recovery or improvement, i.e. dominated by adjacent trees or buildings, poor architectural framework, etc
Z11	Removal would benefit better adjacent trees, i.e. relieve physical interference, suppression, etc
Z12	Unacceptably expensive to retain, i.e. severe defects requiring excessive levels of maintenance, etc

NOTE: Z trees with a high risk of death/failure (Z4, Z5 & Z6) or causing severe inconvenience (Z7 & Z8) at the time of assessment and need an urgent risk assessment can be designated as ZZ. ZZ trees are likely to be unsuitable for retention and at the bottom of the categorization hierarchy. In contrast, although Z trees are not worthy of influencing new designs, urgent removal is not essential and they could be retained in the short term, if appropriate.

Category A: Important trees suitable for retention for more than 10 years and worthy of being a material constraint

A1	No significant defects and could be retained with minimal remedial care
A2	Minor defects that could be addressed by remedial care and/or work to adjacent trees
A3	Special significance for historical, cultural, commemorative or rarity reasons that would warrant extraordinary efforts to retain for more than 10 years
A4	Trees that may be worthy of legal protection for ecological reasons (Advisory requiring specialist assessment)

NOTE: Category A1 trees that are already large and exceptional, or have the potential to become so with minimal maintenance, can be designated as AA at the discretion of the assessor. Although all A and AA trees are sufficiently important to be material constraints, AA trees are at the top of the categorization hierarchy and should be given the most weight in any selection process.

Appendix D – Criteria for Assessment of Landscape Significance

RATING	HERITAGE VALUE	ECOLOGICAL VALUE	AMENITY VALUE
1. SIGNIFICANT	The subject tree is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance or is listed on Council's Significant Tree Register	The subject tree is scheduled as a Threatened Species as defined under the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999	The subject tree has a very large live crown size exceeding 300m² with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species
	The subject tree forms part of the curtilage of a Heritage Item (building /structure /artefact as defined under the LEP) and has a known or documented association with that item	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species	The subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area	The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.
2. VERY HIGH	The tree has a strong historical association with a heritage item (building/structure/artefact/garden etc) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally-indigenous species, representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 200m²; a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area
3. HIGH	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence	The tree is a locally-indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value	The subject tree has a large live crown size exceeding 100m²; The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% (normal)
			The tree is visible from the street and surrounding properties and makes a positive contribution to the visual character and the amenity of the area
4. MODERATE	The tree has no known or suspected historical association, but does not detract or diminish the value of the item and is sympathetic to the original era of planting.	The subject tree is a non-local native or exotic species that is protected under the provisions of this DCP.	The subject tree has a medium live crown size exceeding 40m²;The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crown density of more than 50% (thinning to normal); and
			The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.
5. LOW	The subject tree detracts from heritage values or diminishes the value of a heritage item	The subject tree is scheduled as exempt (not protected) under the provisions of this DCP due to its species, nuisance or position relative to buildings or other structures.	The subject tree has a small live crown size of less than 40m² and can be replaced within the short term (5-10 years) with new tree planting
6. VERY LOW	The subject tree is causing significant damage to a heritage Item.	The subject tree is listed as an Environment Weed Species in the relevant Local Government Area, being invasive, or is a known nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% (sparse).
7. INSIGNIFICANT	The tree is completely dead and has no visible habitat value	The tree is a declared Noxious Weed under the Noxious Weeds Act (NSW) 1993 within the relevant Local Government Area.	The tree is completely dead and represents a potential hazard.

Ref:- Morton, Andrew (2006) **Determining the Retention Value of Trees on Development Sites** Proceedings of the 7th National Street Tree Symposium TreeNet Adelaide Australia

Appendix E – Photos.

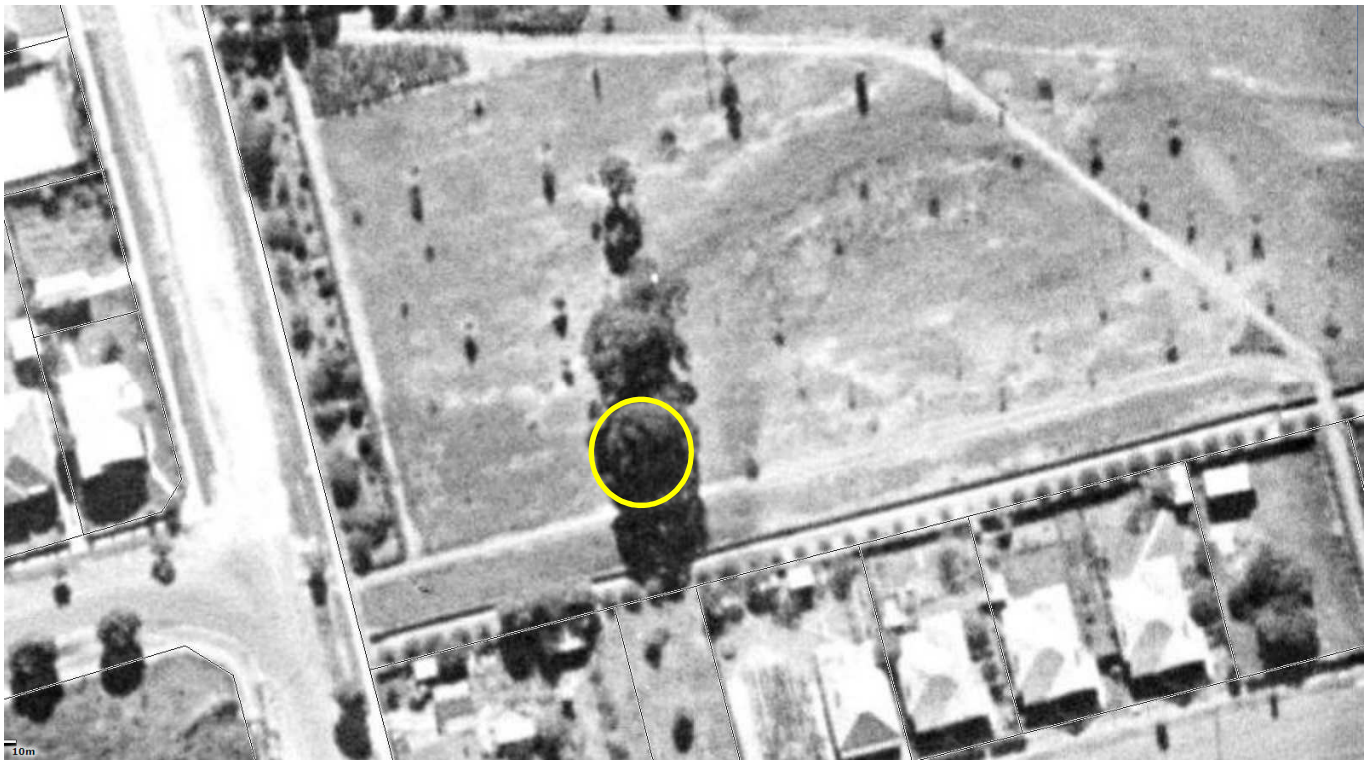


Figure 1 Possible photo of Tree 31 *Eucalyptus saligna* The tree can be seen on the aerial photo taken in 1943. This image indicates the extent of clearing of Boronia Park prior to 1943. Source Six Maps https://maps.six.nsw.gov.au/

Figure 2 Tree 31 *Eucalyptus saligna* highlighted by yellow circle in location to compared to the same site on the previous image. The property boundaries are indicated on both images. Six Maps aerial photo accessed 27 Mar2019 https://maps.six.nsw.gov.au/

Figure 3 Tree 31 *Eucalyptus saligna* shown in the foreground. Photo taken by Author 22nd March 2019,

Figure 4 Trees 1, 2 and 3 *Angophora costata* will have to be removed to accommodate the new building footprint. Photo taken by Author 22nd March 2019,

Figure 5 Tree 4 *Angophora costata* will have to be removed to accommodate the new building footprint. Photo taken by Author 22nd March 2019,

Figure 6 Tree 9 *Angophora costata* will require further assessment to determine the extent of decay and the potential for failure. Longitudinal cracks are a concern given that the occlusion of the wound will take at least 2 more growing seasons.Photo taken by Author 22nd March 2019

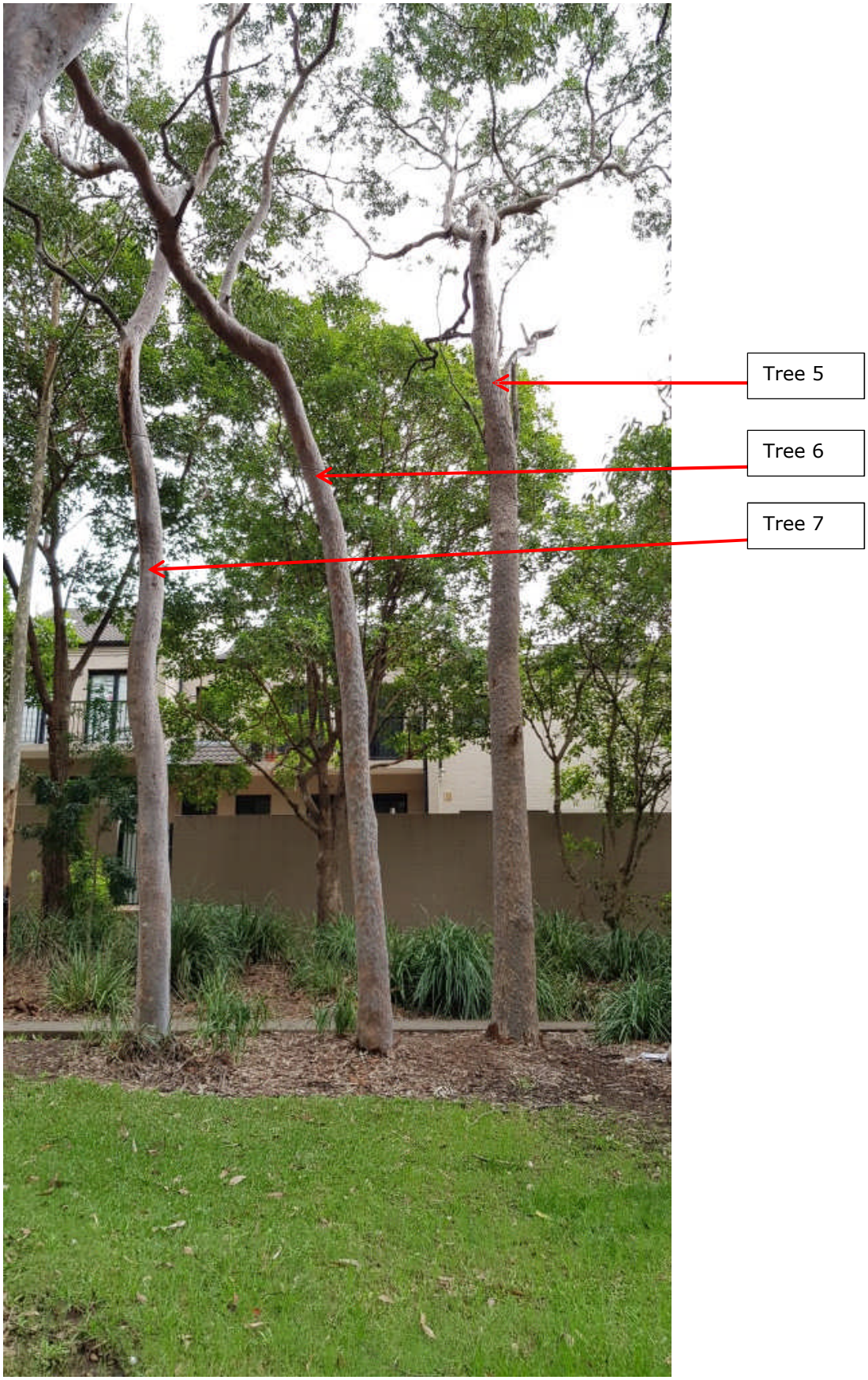


Figure 7 Trees 5, 6 and 7 are all *Angophora costata* are to be retained. These trees have been regularly trimmed away from overhead wires and as a result have poor form. Deadwood requires removal in particular that overhanging the path. Photo taken by Author 22nd March 2019

Appendix F – Generic Tree Management Plan

1.0 Tree Management Plan

1.1 Prior to demolition works, a Site Arborist shall be appointed to supervise all tree protection procedures detailed in this specification. The Site Arborist shall have a minimum level 5 AQF qualification in Arboriculture.

1.2 The following pre-determined Site Arborist stages are witness points and will require the attendance of the Site Arborist who will document the works and provide their signature stating an inspection has taken place and all works are completed in accordance this Tree Protection Plan and AS4970-2009 Protection of Trees on Development Sites.

WITNESS POINTS FOR PROJECT ARBORIST INSPECTIONS

Witness Point	Description	Action
Tree Removal	Prior to tree felling, the Site Arborist will inspect that proposed tree removal complies with Council's Notice of Determination.	Inspected, documented & certified by Site Arborist Yes/No
Tree Protection Zones	The Site Arborist shall inspect the Tree Protection Fencing & any necessary Ground Protection complies with the nominated Tree Protection Zones & Appendix J.	Inspected, documented & certified by Site Arborist Yes/No
Machinery Access	An access route for machinery shall be determined prior to demolition & construction works. Any temporary ground protection within the Tree Protection Zones shall be undertaken as per Appendix J	Inspected, documented & certified by Site Arborist Yes/No
Demolition Works	The Site Arborist shall be in attendance during the removal any existing structures within the TPZ those trees to be retained.	Inspected, documented & certified by Site Arborist Yes/No
Earth Works	The Site Arborist to monitor any earthworks within the TPZ's. **Note** these works must be undertaken with small hand held machinery or tools.	Inspected, documented & certified by Site Arborist Yes/No
Practical Completion	The Site Arborist to inspect & assess the trees condition & provide certification of tree protection at all the above mentioned Supervision Stages.	Inspected, documented & certified by Site Arborist Yes/No

2.0 Agreement

The Site Arborist and the Site Foreman shall agree upon and designate storage, dumping and wash areas prior to demolition works.

Contractors and site workers shall be informed of these Tree Protection Specifications and the significance of the trees to be retained during induction.

The Site Foreman is responsible for all tree protection procedures on the site as per this document and whenever the Arborist is not on site.

It is the responsibility of the Site Foreman to provide **a minimum 3 days notice** to the Site Arborist for the pre-determined witness points.

Any breaches to the Tree Protection Plan shall be reported immediately.

3.0 Tree Removal

3.1 Pre-determined Witness Point. All trees to be removed are to be clearly marked with a single white line around the trunk. Under no circumstances are any trees to be removed until Council consent for removal has been given.

3.2 Confirmation of consent for removal will be indicated by a single line in a contrasting colour such as orange or yellow. The Site Arborist shall inspect, document and certify that the correct trees have been marked.

3.3 Tree removal work shall be carried out by an experienced practicing arborist with minimum AQF Level 3 in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).

3.4 Trees to be removed are to be removed by controlled or sectional felling so as to avoid damage to the trees to be retained or other nearby infrastructure.

3.5 In the event that wildlife is found during the course of tree removal works, work must stop until a trained wildlife handler attends the site or the animal relocates itself. In regards to tree pruning, works may only proceed if the animals will not come into direct harm. In the event that the tree has nesting birds or native animals, works must be delayed until after the nesting period has been completed, unless in the event of an emergency.

3.6 Stumps located within the TPZs of trees to be retained shall be grubbed-out where required using a mechanical stump grinder (or by hand where less than 150mm in diameter) without damage to the root system of other trees. Any stump grinding required within the TPZ of a tree to be retained is to be supervised by the Site Arborist. Where trees to be removed are within the SRZ of any trees to be retained, consideration should be given to cutting the stump close to ground level and retaining the root crown intact. Stumps within the Tree Protection Zone of other trees to be retained shall **not** be pulled out using excavation equipment or similar.

3.7 All shrubs and woody weeds are to be removed by hand.

4.0 Canopy and Root Pruning

4.1 All canopy pruning work required shall be carried out in accordance with Australian Standard 4373-2007 – Pruning of Amenity Trees. Written approval from Council may be required under the Tree Preservation Order prior to undertaking this work. All pruning work shall be carried out by a Practicing Arboriculturalist [AQF Level 3] in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998). No branches of greater than 100mm in diameter should be removed or pruned without further advice from a Consulting Arboriculturalist [AQF Level 5].

4.2 Climbing Spikes MUST NOT be used for pruning works.

4.3 Where root pruning is required, roots shall be severed with clean, sharp pruning implements and retained in a moist condition at all times. Roots shall not be left exposed to air for a period greater than 15 minutes. Roots may be kept moist with any of the following: - Damp hessian material, mulch or course washed river sand where practical.

5.0 Tree Damage

5.1 Care shall be taken when operating cranes, drilling rigs and similar equipment near trees to avoid damage to tree canopies (foliage and branches). Under no circumstances shall branches be torn-off by construction equipment. Where there is potential conflict between tree canopy and construction activities, the advice of the Site Arborist must be sought.

5.2 In the event of any tree becoming damaged for any reason during the construction period a consulting arborist [Australian Qualification Framework Level 5] shall be engaged to inspect and provide advice on any remedial action to minimise any adverse impact. Such remedial action shall be implemented as soon as practicable and certified by the arborist.

6.0 Tree Protection Zones

Pre-determined witness point. The Site Arborist shall inspect, document and certify Tree Protection Zones and Fencing is in accordance with this Tree Management Plan and AS4970-2009.

6.1 Tree Protection Fencing: Fencing 1.8m high shall be erected in accordance with the Tree Protection Plan (**Appendix I**) or within 500mm of any construction activity to include as much of the Primary Root Zone as possible prior to commencement of works and be maintained in a good condition during the construction processes.

6.2 Signage indicating the area is a Tree Protection Zone (TPZ) shall be displayed on the fence line at 5m intervals.

Signage shall be a minimum of 600 x 600mm and shall state **No Access – Tree Protection Zone** and include the contact details of the Site Foreman and Site Arborist.

6.3 Mulching

Mulch shall be spread within the TPZ's of the retained trees or as instructed by the Site Arborist. The mulch shall consist of Eucalyptus leaf mulch as certified to AS4454:1997 Composts, Soil Conditioners and Mulches. Mulch shall be spread to a depth of 50mm and maintained at this depth for the duration of works.

6.4 Restricted Activities within the Tree Protection Zones:

The area within the Tree Protection Zone (Appendix E and J) shall exclude the following works:

- Parking of vehicles or plant
- Installation of temporary site offices or amenities.
- Wash down areas, disposal of liquid waste including concrete or paint wash.
- Excavation by large machinery
- Preparation of chemicals including paint, cement or mortar.
- Vehicular movement
- Pedestrian access other than for maintenance activities.
- Trimming or removal of branches, except by a qualified Arborist
- Attaching any objects or signage to the tree.
- Excavation, trenching or tunnelling.
- No excavation or trenching unless under the supervision of the Site Arborist.

7.0 Trunk Protection

Where provision of tree protection fencing is in impractical due to its proximity to the proposed building footprint, trunk protection shall be erected around nominated trees to avoid accidental damage, as indicated on the Tree Protection Plan (**Appendix I**). The trunk protection shall consist of a layer of carpet underfelt (or similar) wrapped around the trunk,

followed by 1.8 metre lengths of softwood timbers (90 x 45mm in section) aligned vertically and spaced evenly around the trunk at 150mm centres (i.e. with a 50mm gap) and secured together with galvanised hoop strap as shown in Figure 2 **Appendix G**. Recycled timber (such as demolition waste) may be suitable for this purpose, subject to the approval of the Project Arborist. The timbers shall be wrapped around the trunk (over the carpet underfelt), but not fixed to the tree to avoid mechanical injury or damage to the trunk. Trunk protection should be installed prior to any site works and maintained in good condition for the duration of the construction period. Carpet underfelt (alone) is sufficient for trees with a trunk diameter of less than 200mm.

8.0 Ground Protection and Weight Sharing Devices

If works occur within the TPZ of the retained trees the Site Arborist shall determine if appropriate ground protection is required and the ground surface within the TPZ shall be protected with a geotextile overlaying the existing mulch.

8.1 During construction, if access is required, the area is to be protected by a weight sharing device and the tree trunk is to be protected as shown in Appendix G `Trunk Protection'. The weight sharing device is to be made of form work board installed on 100mm bark mulch overlaying geotextile. The weight sharing device is to be installed for the full length of the tree protection zone. Once the wall construction has been completed the weight sharing device is to be removed and the garden bed made good.

8.2 Temporary access for vehicles, should this be required, will require the installation of solid boards such as Durabase or metal plate to accommodate heavy vehicles with rubber tyres and or tracks. This board shall be placed over the geotextile to allow pedestrian and /or vehicle access. (**Appendix G**)

9.0 Temporary Scaffolding

Where temporary scaffolding must be erected within the TPZ of trees to be retained, the scaffold shall be erected in accordance with Figure 3 **Appendix G**. Where foliage or branches project through the scaffold and create a safety hazard, this foliage and branches shall be temporarily excluded from the inner part of the scaffold by affixing a shade cloth screen on the outside of the scaffold **(**refer to Figure 3**)**, or alternatively temporarily tying back branches where required. The pruning or removal of branches to accommodate the scaffold should be avoided wherever possible. Suitable ground protection shall be installed beneath the scaffold as shown in **Appendix G** to prevent contamination, disturbance and compaction of the soil profile within the scaffold zone during construction

10.0 Demolition Works

Pre-determined Witness Points. The Site Arborist shall be in attendance during any works within the nominated TPZ.

10.1 The pavement surface and sub-base within the TPZ shall be gradually removed in layers of no greater than 50mm thick using a small rubber tracked excavator or alternative approved method to avoid damage to underlying roots and minimise disturbance and compaction of the underlying soil profile. The machine shall work within the footprint of the existing paved surfaces to avoid compaction of the underlying soil. The final layer of sub-base material shall be removed using hand tools were required to avoid compaction of the underlying soil profile and damage to woody roots.

10.2 Following removal of the pavement surface and sub-base, clean, friable topsoil shall be used to fill in the excavated area and bring flush with surrounding levels within new landscape areas. Soil shall only be imported and spread when the underlying soil conditions are dry to

avoid compaction of the soil profile. Where there is insufficient recovered site topsoil for this purpose, any imported material shall be free of rocks, vegetation, heavy clay or other extraneous matter. Any imported soil material should be similar in texture to the existing site topsoil.

10.3 Demolition of existing walls, kerbs and other structures within the Tree Protection Zone of trees to be retained shall be undertaken under the supervision of the Site Arborist. The structures shall be demolished using equipment and stationed outside the TPZ where possible or within the footprint of existing hardstand areas. Care shall be taken to avoid the root systems, trunks and lower branches of trees in the vicinity of the structures during demolition works, with special attention required during demolition of the footings and other sub-surface members to avoid damage to woody roots.

11.0 Excavations within Tree Protection Zones

Pre-determined Witness Points. The Site Arborist shall be in attendance during any works within the nominated TPZ.

11.1 Prior to any mechanical excavations for building foundations or pavement sub-grade within the Tree Protection Zone of all trees nominated for retention, exploratory excavation using non-destructive techniques shall be taken along the perimeter of the structure or pavement within the TPZ. Non-destructive excavation techniques may include the use of hand-held implements, air pressure (using an Air-spade® device) or water pressure. The exploratory excavation shall be undertaken along the perimeter of the foundation or pavement (within the TPZ) to the depth of the foundation or to a maximum of 800mm from surface levels, to locate and expose any woody roots prior to any mechanical excavation. All care shall be undertaken to preserve woody roots intact and undamaged during exploratory excavation. Any roots encountered of less than 50mm in diameter may be cleanly severed with clean sharp pruning implements at the face of the excavation. The root zone in the vicinity of the excavation shall be kept moist following excavation for the duration of construction to minimise moisture stress on the tree.

11.2 Where large woody roots (greater than 50mm diameter) are encountered during exploratory excavations, further advice from a qualified arborist shall be sought prior to severance. Where necessary, (to avoid severing large woody roots) consideration should be given to the installation of an elevated structure.

12.0 Works within the TPZ of Tree/Trees

Pre-determined Witness Points. The Site Arborist shall be in attendance during any works within the nominated TPZ. This includes the pruning of the tree canopy.

12.1 **Structures within the TPZ**: Where necessary, the following construction techniques are to be applied to avoid severing large woody roots should be given to the installation of an elevated structure (e.g. pier and beam footing, suspended slab or floor supported on piers, cantilevered slab, up-turned edge beam etc) in preference to structures requiring a deep edge beam or continuous perimeter strip footing. The beam section of any pier and beam footing should be placed **above** grade to avoid excavation within the SRZ. Pier footings intersecting large woody roots should be slightly offset where necessary to avoid root severance.

12.2 **Masonry Walls and Fences within the TPZ**: For masonry walls or fences it may be acceptable to delete continuous concrete strip footings and replace with suspended in-fill panels (eg steel or timber pickets, lattice etc) fixed to pillars. For paved areas, consideration should be given to raising the proposed pavement level and using a porous fill material in preference to excavation where large woody roots are found within the subbase.

12.3 A Structural Engineer shall be consulted to implement these strategies.

13.0 Underground Services:

13.1 All proposed stormwater lines and other underground services should be located outside TPZs of trees proposed to be retained wherever possible or installed by alternative measures. Alternative measures include suspending pipelines beneath the floor of a building or structure (to avoid excavation with the TPZ), non-destructive excavation methods or Horizontal Directional Drilling (HDD). Where the installation of service lines within TPZs is unavoidable, the pipelines or conduits should be installed as follows:-

13.1.1 Where the extent of the incursion to the root zone is less than 10% of the TPZ including any excavations for benching and shoring the trench, the pipeline or conduit may be installed by open trenching using standard construction methods (excavator or trenching machine). 10% of the TPZ is equivalent to one-third of the TPZ radius on one side. Refer to **Appendix A** for radial distances of TPZs for each tree.

13.1.2 Where the extent of the incursion to the root zone exceeds 10% of the TPZ, but is outside the SRZ, non-destructive excavation methods must be adopted in accordance with **Section 10**. Where large woody roots are encountered during excavation or trenching (root diameter greater than 50mm), these shall be retained intact wherever possible (e.g. by tunnelling beneath roots and inserting the pipeline or conduit beneath or re-routing the service etc.). Where this is not practical and root pruning is the only alternative, proposed root pruning should be assessed by a qualified arborist [AQF 5] to evaluate the potential impact on the health and stability of the subject tree.

13.1.3 Excavations required for underground services within the Structural Root Zone of any tree to be retained should only be undertaken by sub-surface boring (Horizontal Directional Drilling). The Invert Level of the pipe, plus the pipe diameter, must be lower than the estimated root zone depth as specified. At this site a minimum depth of 1 metre to the invert level of the pipe is specified.

14 0 Pavements

14.1 Pavements should be avoided within the Tree Protection Zone of trees to be retained where possible. Proposed paved areas within the Tree Protection Zone of trees to be retained should be placed above grade to minimise excavations within the root zone and avoid root severance and damage. Pavement sub-base material should be as per Section 15.2.

15.0 Fill Material

15.1 Placement of fill material within the Tree Protection Zone of trees to be retained should be avoided wherever possible. Where placement of fill is unavoidable, the material should be a well-drained friable material, equivalent in texture to the existing site topsoil material. The fill

should be free from rocks, vegetation and other extraneous material. The fill may be consolidated but should not be compacted to engineering standards. No fill material should be placed in direct contact with the trunk.

15.2 Where placement of fill is required for pavement sub-grade is required within TPZs of trees to be retained, a coarse, gap-graded material such as 20 – 50mm crushed inert rock (Blue Metal) or equivalent shall be used to provide some aeration to the root zone. Note that Roadbase or crushed sandstone or other material containing a high percentage of fines is unacceptable for this purpose. The fill material should be consolidated with a non-vibrating roller to minimise compaction of the underlying soil. A permeable geotextile may be used beneath the sub-base to prevent migration of the stone into the sub-grade.

16.0 Maintenance of Trees

Pre-determined monthly inspections. The Site Arborist shall inspect, document and certify that the following maintenance activities are being carried out within the TPZ. Monthly inspections will be required if there is a delay in the works and other pre-determined witness points do not fall within a calendar month.

- Irrigation – by hand will be required at regular weekly intervals
- Mulching
- Weed removal
- Crown trimming to 1m from the boundary in accordance with AS 4373-2007 Pruning of Amenity Trees.
- Soil amelioration

Maintenance activities are to commence at the beginning of the construction process by a qualified Arborist and then as required during the construction period. Regular maintenance of the trees will continue for three months after construction is completed.

16.1 Irrigation

Irrigation is to be applied by sprinkler. Weekly watering (or there about, weather dependant) is to be done to ensure that soil moisture is maintained at not less than 60% field capacity to a depth of 300mm.

The Site Arborist is to check that provision is made for a water supply to the tree to be retained and that soil moisture levels are maintained at each inspection.

The Arborist maintaining the trees should also check that soil moisture levels meet the required levels by either physical touch or by use of a tensiometer.

16.2 Soil amelioration.

Chemical fertilizers are only to be applied, if required on completion of the works and only after soil testing identifies deficiencies in the existing soil profile.

An application of Seasol or Maxicrop may be applied to manufacturer's instructions during the installation of soft landscaping.

Mulch should be reapplied to maintain the required level as specified.

Weed control shall be by hand pulling and treatment with glyphosphate based herbicide in accordance with the manufacturer's instructions

Mechanical cultivation is not permitted nor is scraping or burning as a form of weed control

16.3 **Crown Cleaning.**

Crown cleaning shall be performed in accordance with AS4373-2007 Pruning of amenity trees. The work is to be performed by a Practicing Arboriculturalist in compliance with occupational health and safety requirements.

All trees recommended for retention must have as a minimum requirement, the removal of all deadwood greater than 50mm diameter. All diseased and crossing limbs and branch stubs are to be pruned to the branch collar.

17.0 Soft and Hard Landscaping

Installation of soft or hard landscaping including paving, turf or plant material within the TPZ shall be undertaken by hand.

Planting holes are to be hand dug with a shovel or garden trowel

18.0 Non Conformance Reporting

Any non-conformance identified by the Site Arborist should be made in writing to the site foreman and the site consenting authority within 2 working days of the breach being observed. Methods to address the breach should be outlined where possible to enable timely rectification works.

Damage to a protected tree is to be reported to the Site Arborist immediately to enable appropriate remedial works.

19.0 Post Construction/ Establishment Period

The Site Arborist shall make a final inspection to assess tree condition.

Appendix G – Tree Protection Details

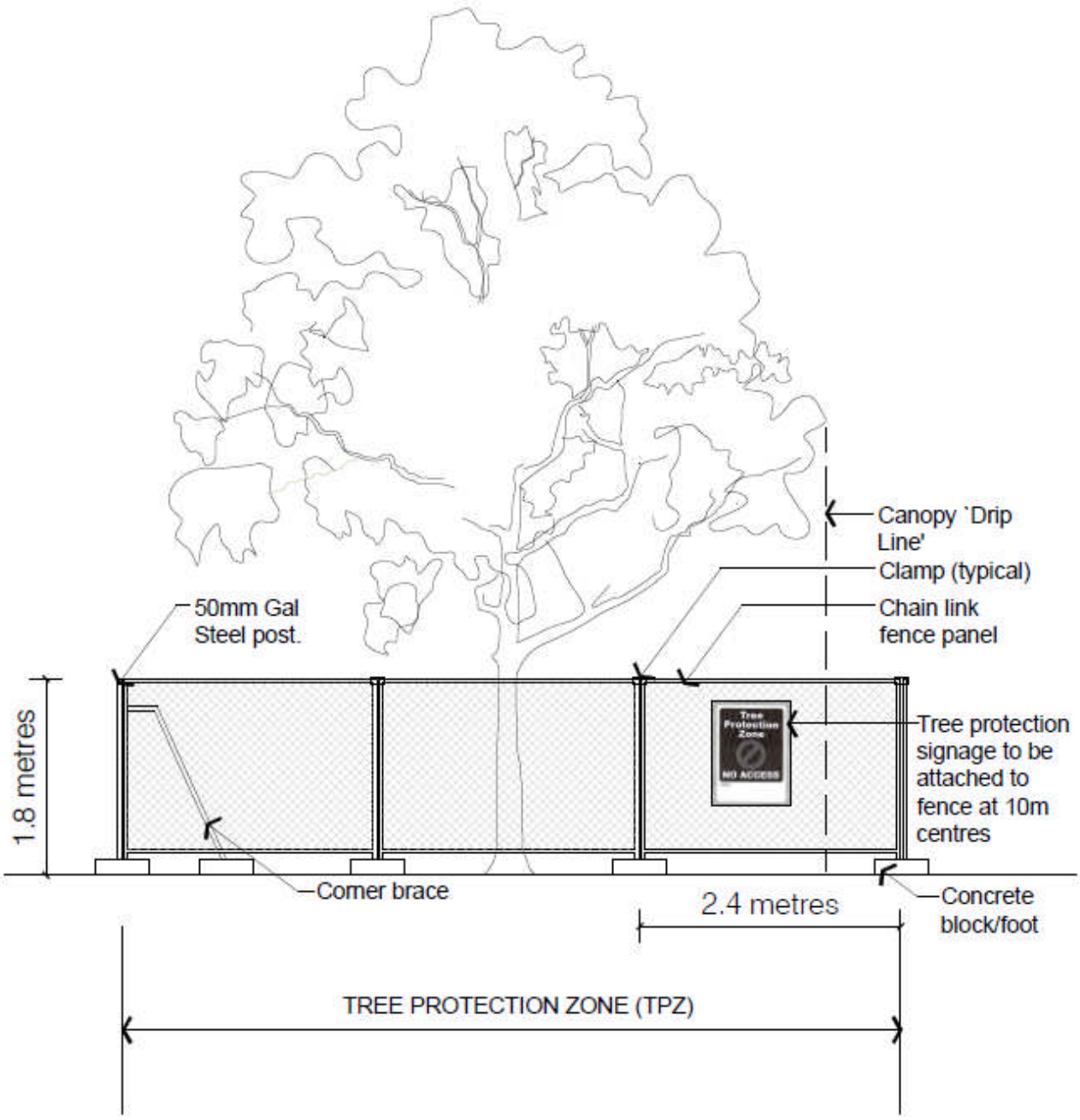


Illustration 1 Tree Protection Fence detail.
Source – AS 4970-2009 Protection of trees on development sites, p16

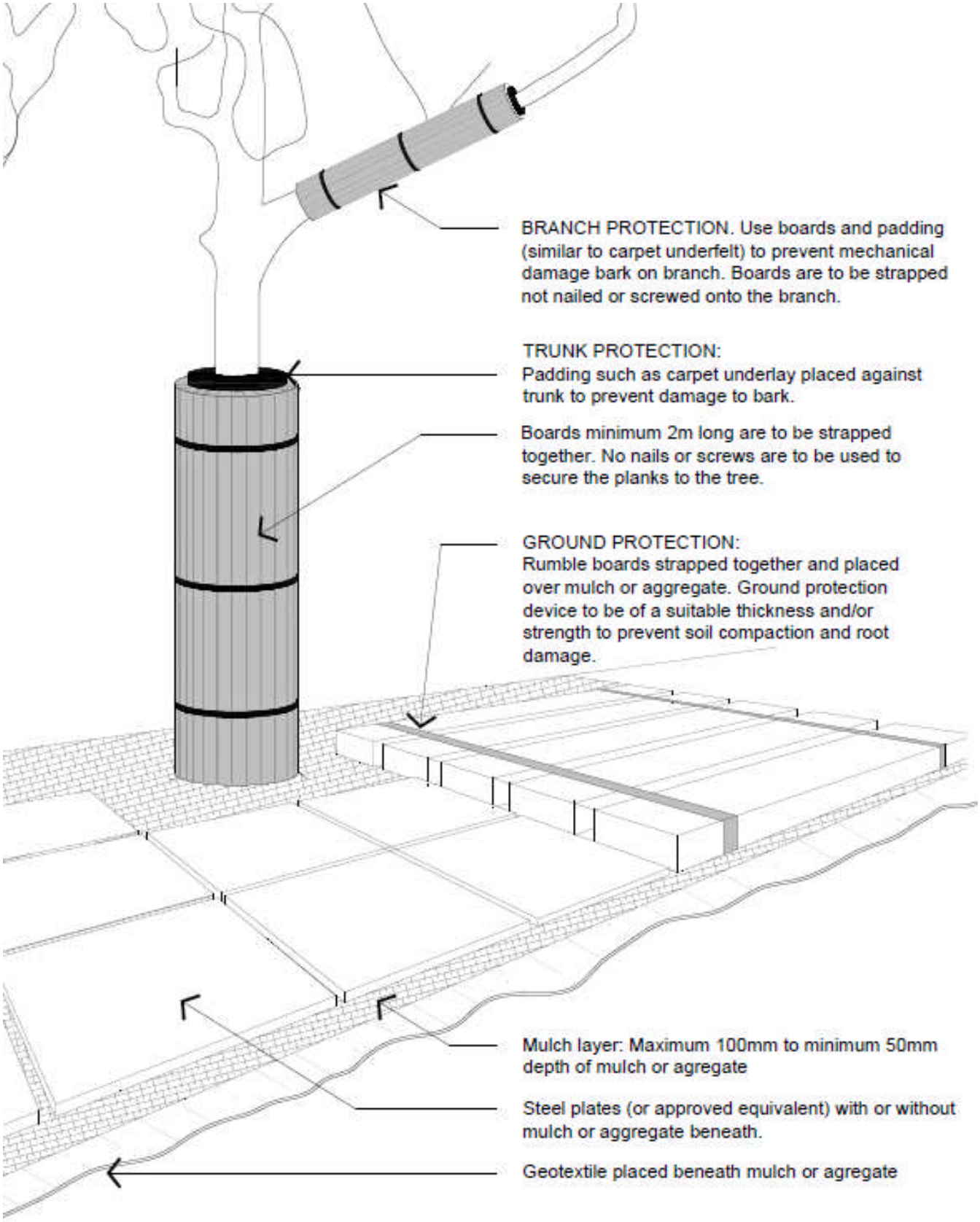


Illustration 2 Tree Trunk and Tree protection. Source AS 4970-2009 Protection of trees on development sites. This form of protection will be required during construction.

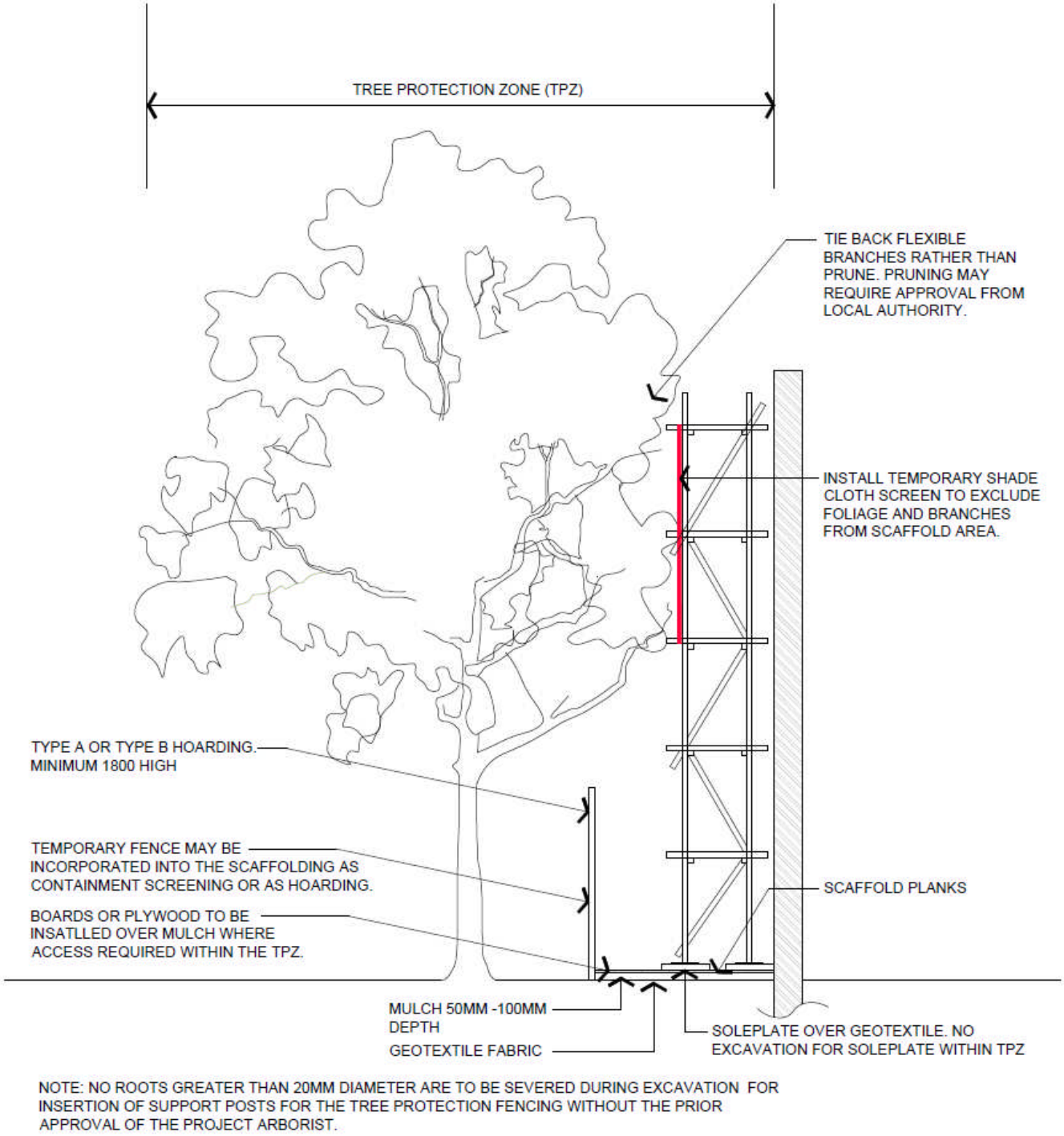
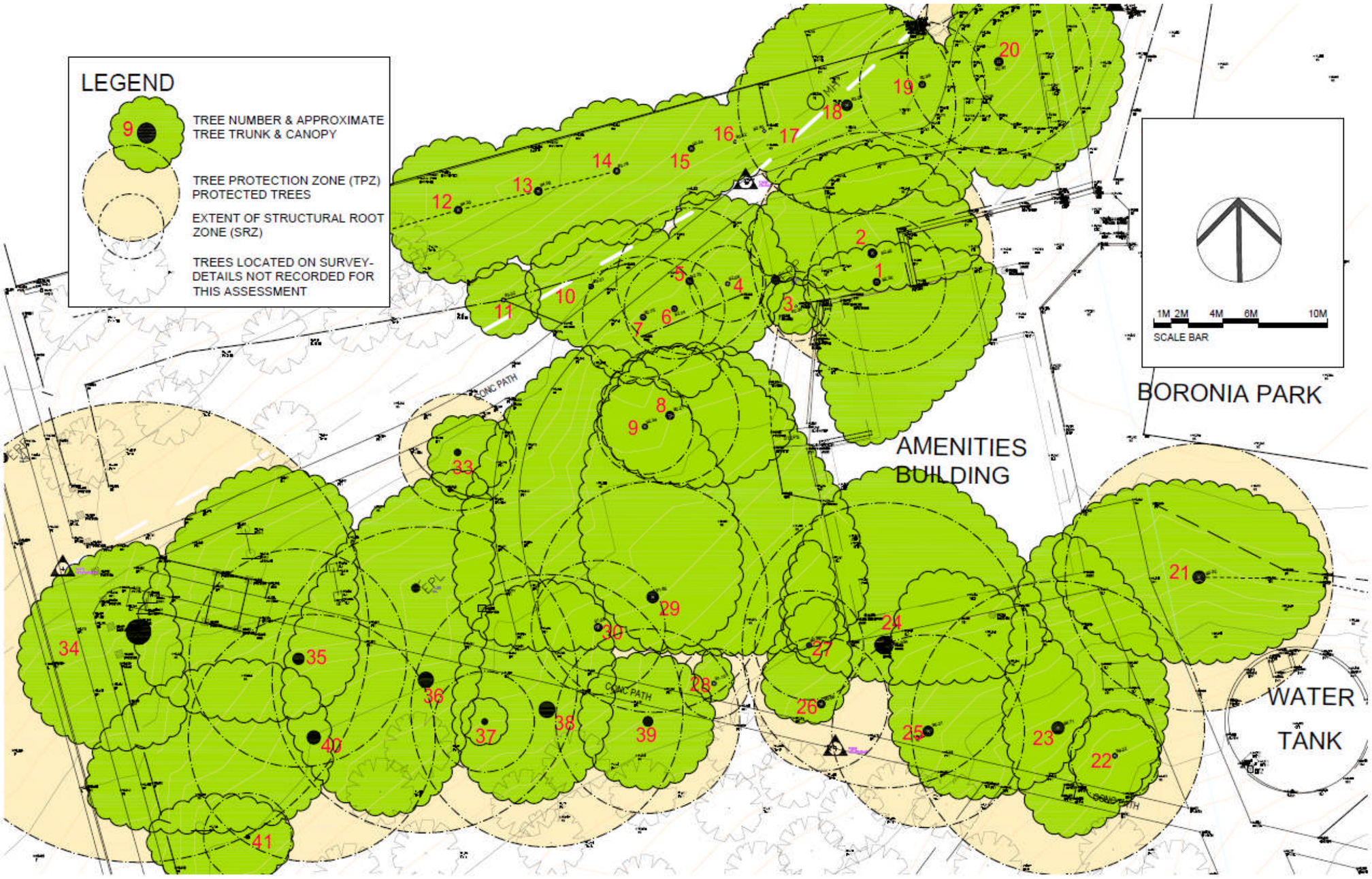


Illustration 3: Detail of Temporary Scaffolding within the Tree Protection Zone

Appendix H –Tree Location Plans

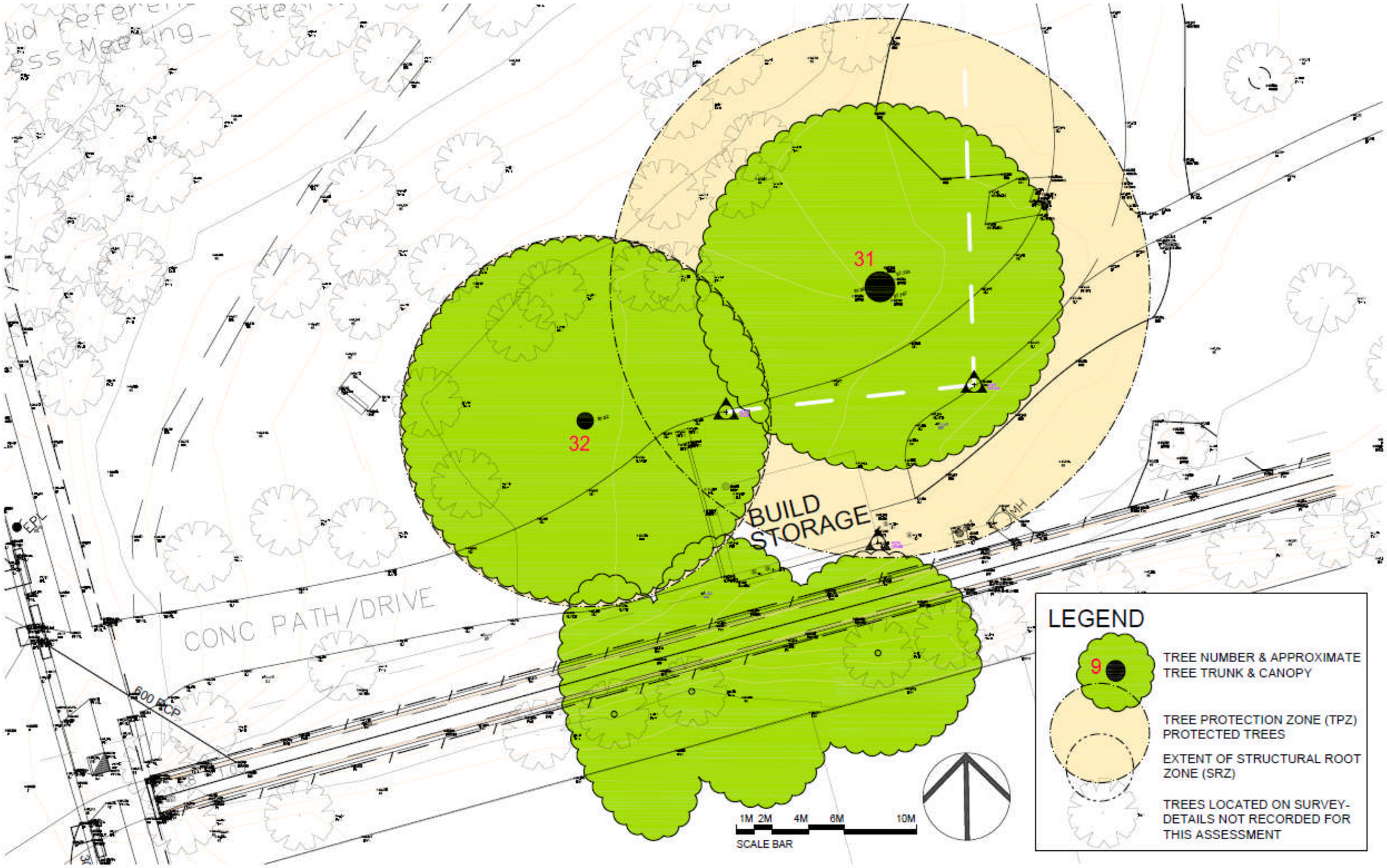


Tree Location Plan of Boronia Park New Sports Pavilion, Epping Scale 1:200

Original Survey plan provided by Paramatta Council dated 27.02.2019

Sheet 1 of 2

Please note: This plan is not to scale. It has been reduced for inclusion in this report.
TPZ indicated is that required by AS 4970-2009 Protection of trees on development sites. Actual dimensions can be found in **Appendix A**



Tree Location Plan of Boronia Park vehicle access off Kent Street, Epping Scale 1:200

Original Survey plan provided by Paramatta Council dated 27.02.2019

Sheet 2 of 2

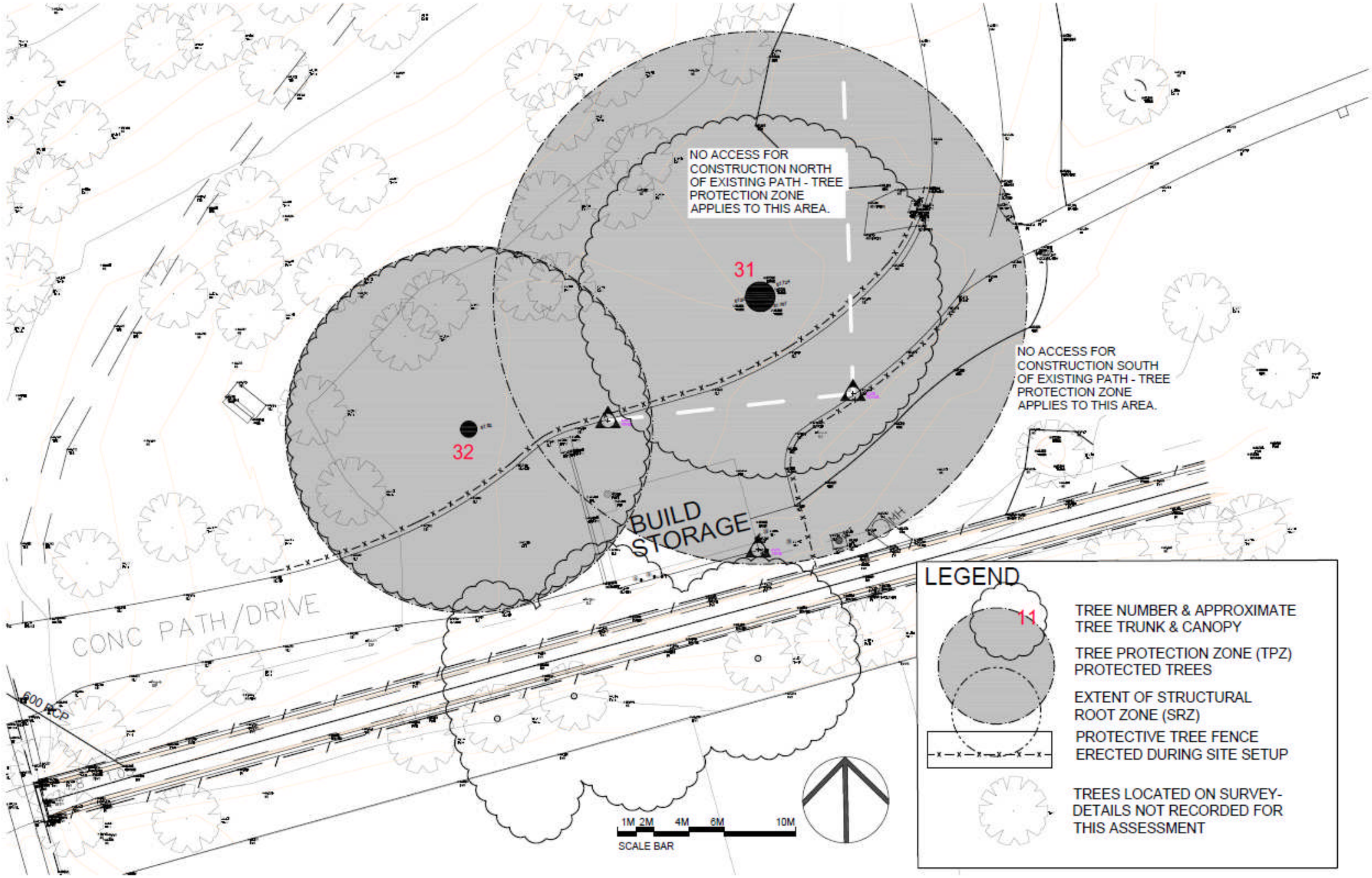
Please note: This plan is not to scale. It has been reduced for inclusion in this report.

TPZ indicated is that required by AS 4970-2009 Protection of trees on development sites. Actual dimensions can be found in **Appendix A**

Appendix I –Tree Protection Plans

Tree Protection Plan of Boronia Park - New Sports Pavilion, Epping Scale 1:200 Original Site Plan prepared by Nimbus Architecture + Heritage dated 16/03/2020

Sheet 1 of 2



Tree Protection Plan of Boronia Park vehicle access off Kent Street, Epping Scale 1:200

Original Survey plan provided by Paramatta Council dated 27.02.2019

Sheet 2 of 2

Appendix J- BCA Report

NW BUILDING CERTIFICATION

BCA REPORT

Project Name	Sporting Pavilion, Boronia Park
Project Address	Boronia Park Epping NSW 2121
Ref	NW19/4300
Rev	2
Date	03/04/2020
Attention	Nimbus Architecture

REVISION HISTORY

Revision	Date	Version	Prepared By	Reviewed By
1	05/02/2020	Initial Issue	Ryan Dillon	Robert Wood
2	03/04/2020	Revised plans	Ryan Dillon A1 Accredited Certifier / BPB2634	Robert Wood A1 Accredited Certifier / BPB2141

EXECUTIVE SUMMARY

This report documents the relevant clause assessment of the proposed works against the deemed to satisfy requirements of the National Construction Code Building Code of Australia Volume One 2019 (NCC BCA).

The project consists of demolition of existing structures and new amenities building near the sports oval to consolidate the existing toilets, kiosk, clubhouse and storage building.

The following key information has been identified in relation to the building:

Item	Description
Building Classification(s)	9b
Minimum Type of Construction	C
Effective Building height	N/A
Rise in Storeys	1
Number of Storeys	1
Floor Areas (m^2)	320m^2 approx.
Maximum Compartment Size Volume (m^3)	< 600 m^3
Occupancy Numbers	108
Climate Zone	5

Identified performance solutions

The following items have been identified as being capable of compliance against the performance requirements of the NCC BCA but would be required to be addressed as a performance solution by a suitably qualified and experienced professional.

Relevant Performance Requirement	BCA Clause	Summary
DP1	D3.2	Latch side clearance is not provided to the gates at both entrances to the breezeway.
DP2	D3.3	The gate to the BBQ area is not provided with latch side clearance. The Lunch Room is only accessed via the Council Store and stairs.
FP2.1	F2.3	Separate sanitary facilities for males and females must be provided for Class 9 buildings in accordance with Table F2.3. Toilets provided are unisex and are not separated for males and females.

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 General

The proposed development is to be located at Boronia Park, Epping and is located within the local government area of City of Parramatta Council.

The proposed development is for demolition of existing structures and new amenities building near the sports oval to consolidate the existing toilets, kiosk, clubhouse and storage building.

1.2 Purpose of the report

This report has been prepared, on behalf of Nimbus Architecture & Heritage, to establish compliance with the following:

- Environmental Planning & Assessment Regulations 2000;
- National Construction Code Building Code of Australia 2019 Volume One (NCC BCA);
- Disability (Access to Premises-Buildings) Standards 2010;
- Other applicable State Legislation.

The executive summary identifies the items requiring further information which must be addressed prior to issuing a Construction Certificate.

The plans assessed are 1914_A_100 D, 1914_A_120 G and 1914_A_121 C, 1914_A_200 C and 1914_A_201 C by Nimbus Architecture & Heritage dated 03/04/2020.

The assessment comments status are explained as follows:

Status	Detail
Not Applicable	This item is not relevant to this project.
Complies	The design meets the deemed-to-satisfy provisions of the relevant clause of the BCA.
Does Not Comply	The design does not meet the deemed-to-satisfy provisions of the relevant clause of the BCA and requires action to be taken.
Capable of compliance	Insufficient details have been provided at this stage but compliance could be achieved.
Note	For information only but to be incorporated into the scheme.
Further Information Required	Information is required prior to finalising report.
Performance Solution Required	Items do not meet the relevant performance provisions but may be addressed as a Performance Solution.

2.0 NATIONAL CONSTRUCTION CODE BUILDING CODE OF AUSTRALIA 2019 & DISABILITY (ACCESS TO PREMISES – BUILDINGS) STANDARDS

The NCC BCA is a performance-based code. Compliance can be met by either meeting the deemed to satisfy provisions, by a performance solution or by a combination of both. This section of the report sets out, so each deemed to satisfy clause of the NCC BCA. Assessment comments are provided against each clause. Where performance solutions are applicable additional reports and assessments will be required.

Performance solutions can only be considered if they are undertaken by a suitably qualified and experienced professional using one of the prescribed methodologies set out in the NCC BCA. Where performance solutions are applicable supporting CV's and evidence of qualifications will be required.

As the Disability (Access to Premises- Building) Standards aligns with the NCC BCA for new building work this section also considers the requirements under the Access Code.

Section A – General Provisions		
Clause	**Assessment Comments**	**Status**
Classification A6	The classifications for the building is: a. Class 9b (School) (Assembly Building)	Note
United Building	The proposed building has been considered as a united building due to the basement connecting all buildings. The proposed has not been considered as a united building.	Not applicable

Section B – Structure		
Clause	**Assessment Comments**	**Status**
Structural Provisions B1.1- B1.4	Structural drawings and design certificates for structural elements are to be submitted for assessment prior to issue of Construction Certificate. Please provide details of the following: a. Piling, b. Foundations, c. Floor slabs, d. Frame e. Glazed Assemblies f. Roof g. The importance level of the building has been determined as 2.	Capable of compliance
Structural software B1.5	Structural software used in the design of the building or structure must comply with the ABCB Protocol for Structural Software.	Note
Construction of buildings in flood hazard areas B1.6	A class 2 or 3 building, Class 9a healthcare building, Class 9c building or Class 4 part of building, in a flood hazard area must comply with the ABCB Standard for Construction of Buildings in Flood Hazard Areas.	Note

Section C – Fire Safety		
Clause	**Assessment Comments**	**Status**
Part C1 Fire Resistance & Stability		
Type of construction required C1.1	A 1 storey Class 9 building requires Type C construction.	Note
Calculation of rise in storeys C1.2	The building has a rise in storeys of 1	Note
Fire Hazard Properties C1.10 NSWC1.10 (9b buildings)	Fire test reports shall be provided for all wall linings, floor linings and coverings, ceiling linings, air handling ductwork and lift cars to show compliance with fire hazard properties of Specification C1.10. Test reports for floor linings must show critical radiant flux and smoke development rates. Wall and ceiling linings require a Group Number.	Capable of compliance
Part C2 Compartmentation and Separation		
Application of Part C2.1	a. C2.2, C2.3 and C2.4 do not apply to a carpark provided with a sprinkler system (other than a FPAA101D or FPAA101H system) complying with Specification E1.5, an open-deck carpark or an open spectator stand. b. C2.12(a)(v) does not apply to a Class 8 electricity network substation.	Note
General floor area & volume limitations C2.2	The maximum fire compartment size is 2000 m^2 and the Maximum volume allowed is 12000 m^3. The compartment size is within limits.	Complies
Specification C1.1 – Fire Resisting Construction		
Type C Fire-Resisting Construction		
Fire resistance of building elements 5.1	A loadbearing internal wall and a loadbearing fire wall (including those that are part of a loadbearing shaft) must be constructed from— c. concrete; or d. masonry No FRL requirements to external walls as there are no fire-source feature within 3 m	Complies

Section D – Access & Egress		
Clause	**Assessment Comments**	**Status**
Part D1 Provision for escape		
Deemed to satisfy provisions D1.0	This clause provides guidance on the application of the BCA.	Note
Application of Part D1.1	The Deemed-to-Satisfy Provisions of this Part do not apply to the internal parts of a sole-occupancy unit in a Class 2 or 3 building or a Class 4 part of a building.	Note
Number of exits required D1.2 NSWD1.2	A compliant number of exits is provided.	Complies
Exit travel distances D1.4	Travel distance is within limits.	Complies
Distance between alternative exits D1.5	The distance between exits is sufficient.	Complies
Dimension of exits and path of travel to exits D1.6	Minimum of 1m achieved to path of travel is achieved.	Complies
Number of Occupants D1.13	The number of persons accommodated in a storey must be determined with consideration to the purpose for which it is used and the layout of the floor area. Occupancy number is to be determined when more detailed drawings / layout is provided. Alternatively, please provide a population schedule of the building including staff and expected visitors. Based on Table D1.13 the occupancy number is 108 people. Public Hall 1m^2/person Shop (entered directly from open air or any lower level) 3m^2/person	Note
Part D2 Construction of Exits		
Goings and risers	Provide details of the new stair to show compliance with this Clause.	Capable of compliance

Section D – Access & Egress		
Clause	**Assessment Comments**	**Status**
D2.13 NSWD2.13 (9b buildings)	Stair treads are required to be slip resistance in accordance with Table D2.4 (i.e. P3/R10 dry; P4/R11 wet) Details will be required prior to the issue of the Construction Certificate.	
Landings D2.14	Landings must not be less than 750mm long and have a slip resistance surface in accordance with Table D2.14. Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Thresholds D2.15	This clause gives guidance on the only area a threshold can be incorporated at a doorway.	Complies
Handrails D2.17	Handrails are to be designed and installed to show compliance with these Clause. Also refer to D3. Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Doorways and Doors D2.19	A doorway serving as a required exit or forming part of a required exit a. must not be fitted with a sliding door unless- i. it leads directly to road or open space ii. the door can be manually opened by a force of not more than 110N b. If fitted with a power operated door – i. It must be opened manually under a force of not more than 110N ii. If it leads directly to road or open space, must open automatically on power failure, or activation of a fire or smoke alarm.	Capable of compliance
Operation of Latch D2.21	Exit doors and doors in the path of travel are required to be readily openable without a key by a single hand downward action or pushing action on a single device located between 900mm and 1.1m from the floor. Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Part D3 Access for People with Disabilities		
General Building access requirements D3.1	A Class 5, 6, 7b, 8, 9a, 9b (school) part of the building requires access to and within all areas normally used by occupants.	Note

Section D – Access & Egress		
Clause	**Assessment Comments**	**Status**
General Building access requirements D3.1	A Class 5, 6, 7b, 8, 9a, 9b (school) part of the building requires access to and within all areas normally used by occupants.	Note
Access to Buildings D3.2	An accessway appears to be provided to a building required to be accessible— c. from the main points of a pedestrian entry at the allotment boundary; and d. From another accessible building connected by a pedestrian link e. from any required accessible carparking space on the allotment. Accessway are to be designed to AS1428.1.	Complies
Parts of buildings to be accessible D3.3	Access is to be provided to and within all areas normally used by occupants. General access requirements to be detailed on plans are: a. Transitions between floor surfaces to be no more than 3mm b. Doorways to provide clear width of at least 850mm c. Circulation space around doorways to Fig 31 of AS1428.1-2009 d. Luminance contrast of at least 30% for doorways to Clause 13.1 of AS1428.1-2009 **The gate to the BBQ area is not provided with latch side clearance.** **The Lunch Room is only accessed via the Council Store and stairs.** **A performance could be sought from an Access Consultant**	Performance solution required
Access Exemptions D3.4	The store rooms can be considered exempt due to health and safety reasons.	Note

Section E – Services & Equipment		
Clause	**Assessment Comments**	**Status**
Part E1 Fire Fighting Equipment		
Portable fire extinguishers E1.6	Fire extinguishers should be selected and installed to AS2444-2001.	Capable of compliance

Section E – Services & Equipment		
Clause	**Assessment Comments**	**Status**
Part E2 Smoke Hazard Management		
General Requirements E2.2 NSWE2.2a (9b buildings)	An automatic smoke detection and alarm system is not required.	Not applicable

Section F – Health & Amenity		
Clause	**Assessment Comments**	**Status**
Part F1 Damp & Weatherproofing		
Deemed to satisfy provisions F1.0	This clause provides guidance on the application of the BCA.	Note
Stormwater drainage F1.1	A stormwater drainage system in accordance with AS/NZS 3500 is required. Details and design statement or will be required prior to the issue of the Construction Certificate.	Capable of compliance
F1.2**	This clause has been deleted.	Not applicable
F1.3**	This clause has been deleted.	Not applicable
External above ground membranes F1.4	Waterproofing membranes for external above ground use must comply with AS 4654 Parts 1 and 2. This included the proposed concrete roof.	Capable of compliance
Roof coverings F1.5	The concrete roof coverings are to comply with the requirement of this Clause. Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Sarking F1.6	Any sarking proposed should show compliance with AS/NZS 4200 Parts 1 & 2. Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Waterproofing wet areas F1.7	Waterproofing to wet areas is required and comply with this Clause and AS3470.	Capable of compliance

Section F – Health & Amenity		
Clause	**Assessment Comments**	**Status**
F1.8	This clause has been deleted.	Capable of compliance
Damp-proofing F1.9	Damp proofing is required to be provided in compliance with this Clause. Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Damp-proofing of floors on the ground F1.10	Damp proofing is required to be provided in compliance with this Clause. Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Part F2 Sanitary & Other Facilities		
Calculation of number of occupants and facilities F2.2	In calculating the number of sanitary facilities to be provided under F2.1 and F2.3, a unisex facility required for people with a disability may be counted once for each sex.	Note
Facilities in Class 3-9 buildings F2.3	Separate sanitary facilities for males and females must be provided for Class 9 buildings in accordance with Table F2.3. **The toilets provided are unisex and are not separated for males and females.** **A performance could be sought from a BCA Consultant.** For sanitary calculation refer to table F2.3 in Appendix B	Performance solution required
Accessible sanitary facilities F2.4	A unisex accessible sanitary facility is required to be provided in accordance with Clause 15 of AS1428.1 20009. Ambulant sanitary facilities are required to the male and female sanitary facilities in accordance with Clause 16 of AS1428.1-2009.	Capable of compliance
Construction of sanitary compartments F2.5	Lift off hinges are required to some of the bathrooms where the door is within 1200mm of the WC. Please provide a note on the drawings.	Capable of compliance
Part F3 Room Heights		
Height of rooms and other spaces F3.1	Ceiling heights are to be as follows: In a class 5,6,7 or 8 building- • Generally 2.4m or • For corridors, passageways or the like 2.1m	Complies

Section F – Health & Amenity		
Clause	**Assessment Comments**	**Status**
	• Bathrooms, shower rooms, sanitary facilities, airlock, tea preparation room, pantry, store, garage, car parking area – 2.1m • Commercial kitchen – 2.4m • Above a stairway, ramp, landing or the like – 2.0m	
Part F4 Light and Ventilation		
Ventilation of Rooms F4.5 NSWF4.5	Ventilation of habitable rooms must be achieved through either; Natural ventilation – 5 % of floor area of room; or Mechanical ventilation in accordance with AS1668.2 and AS3666.1 Details and a design statement will be required prior to the issue of the Construction Certificate	Capable of compliance
Restrictions on location of sanitary compartment F4.8	Sanitary compartments must not open directly into— a. a kitchen or pantry; or b. a public dining room or restaurant; or c. a dormitory in a Class 3 building; or d. a room used for public assembly (which is not an early childhood centre, primary school or open spectator stand); or e. a workplace normally occupied by more than one person.	Complies

Section J – Energy Efficiency		
Clause	**Assessment Comments**	**Status**
J1 – J3 Building Fabric, Glazing, Building Sealing		
Deemed-to satisfy provisions J0.0	Please provide a report from an energy efficiency consultant confirming compliance with parts J1-J3 Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Part J5 Air Conditioning and Ventilation System		
Air-conditioning systems J5.2	Air conditioning and ventilation to comply with Part J5 Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Part J6 Artificial Lighting and Power		

Section J – Energy Efficiency		
Clause	**Assessment Comments**	**Status**
Artificial lighting J6.2	Artificial lighting to comply with part J6.	Capable of compliance
Interior artificial lighting and power control J6.3	As above Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Interior decorative and display lighting J6.4	As above Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Exterior artificial lighting J6.5 -	As above Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Boiling water and chilled water storage units J6.6	As above Details will be required prior to the issue of the Construction Certificate.	Capable of compliance
Part J7 Heated Water Supply and Swimming Pool and Spa Pool Plant		
Heated water supply J7.2	Hot water supply to comply with Part J7. Details will be required prior to the issue of the Construction Certificate.	Capable of compliance

3.0 FIRE SAFETY MEASURES

System	BCA Clause & Australian Standard
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444-2001

4.0 APPENDIX A - FRL TABLES

Type C Construction – FRL of Building Elements

Building element	Class of building—FRL: (in minutes)			
	Structural adequacy/*Integrity*/*Insulation*			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated within it) or other external building element, where the distance from any *fire-source feature* to which it is exposed is—				
Less than 1.5 m	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
1.5 to less than 3 m	–/–/–	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an *external wall*, where the distance from any *fire-source feature* to which it is exposed is—				
Less than 1.5 m	90/–/–	90/–/–	90/–/–	90/–/–
1.5 to less than 3 m	–/–/–	60/–/–	60/–/–	60/–/–
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS—	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
INTERNAL WALLS—				
Bounding *public corridors*, public lobbies and the like—	60/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—	60/ 60/ 60	–/–/–	–/–/–	–/–/–
Bounding a stair if *required* to be rated—	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
ROOFS	–/–/–	–/–/–	–/–/–	–/–/–

5.0 APPENDIX B - SANITARY FACILITIES

Number of facilities is calculated based on the population under BCA clause D1.13.

The BCA allows a PWD facility to count as one male and female facility. This concession has been taken into account in the figures below so the number of facilities have been reduced accordingly.

At least one ambulant facility is required in each bank of toilets that contains a PWD in addition to conventional sanitary facilities. There is no requirement where the bank only contains a PWD, or if it contains only conventional facilities.

Ambulant facilities are required at each bank of facilities where a PWD WC is provided.

F2.4 - Sanitary Facility Calculations										
Population No.		Required			Provided			Difference		
		WC	Urinals	Basins	WC	Urinals	Basins	WC	Urinals	Basins
Male Patrons	42	1	1	1				-1	-1	-1
Female Patrons	42	2		1				-2		-1
Male Employees	13	2	0	2				-2	0	-2
Female Employees	13	2		2				-2		-2
Male Total	55	3	1	3	4	0	4	1	-1	1
Female Total	55	4		3	5		3	1		0

Appendix K- Access Report

NW ACCESS CONSULTANCY

ACCESSIBILITY REPORT – CONCEPT STAGE

Project Name	Boronia Park – New Sports Pavilion
Project Address	Kent Street, Epping NSW 2121
Ref	NW19/1371
Rev	2
Date	3.4.2020
Attention	Nimbus Architecture

REVISION HISTORY

Revision	Date	Version	Prepared By	Reviewed By
1.1	31.1.2020	Initial Issue	Riana Ingram	Nikki Jackson
1.2	3.4.2020	Revised REF issue	Riana Ingram	Nikki Jackson

EXECUTIVE SUMMARY

The following items require further consideration as part of the detailed design development phase. For more detailed information please refer to the relevant section of the report outlined below:

Report Reference	Item	Action Required
All Clauses	**Construction tolerances**	Consideration needs to be given to allow for workmanship during construction so that design dimensions can be achieved during construction and still meet the mandatory requirements

3.2	Departures	For this development, confirmation is required to determine if a Performance Solution report is required to address the following:
		• Latch side clearance to the following doors will not be in accordance with AS1428.1.2009. These doors will be held open during opening hours
		  ○ Two entrance doors to the building (breezeway)
		  ○ Doors to change room 1 and 2
		• The external pathway is provided with ramp gradients and will not be provided will all features in accordance with AS1428.1.2009.
		• An accessible path of travel is not provided to the lunch room. A letter from the Council will be required.

3.4	External walkways and pathways	• Passing places are required to all external pathways. • Please provide details of the ground surface abutting the sides of the 1:20 walkway. • Landings are required to the 1:20 walkway at intervals no greater than 15m. • Provide the gradient along the path of travel from the fixed seating to the building entrance.
3.4	External ramps	The external ramp is required to be provided will all the features of a ramp including handrail, TGSI's and landings. A performance solution report may be required however confirmation is required.
3.5, 3.7	Pedestrian entry door furniture/ door hardware	Provide door hardware schedule for review.
3.6.3	Access stairs	Handrail does not appear to extend 300mm at the top of the stairs to the lunch room.

Report Reference	Item	Action Required
3.8.1	Unisex sanitary facilities	Provide room layout for review
3.8.2	Ambulant sanitary facilities	• Cubicle door widths are to provide a clear opening width of 700mm. • Provide room layout for review
3.8.3	Accessible shower facilities	Provide room layout for review.
3.9	Signage	• Signage will be required to the ambulant facilities, accessible sanitary facility and to identify areas containing hearing augmentation, if applicable. • Please provide signage schedule for review.
3.10	TGSI's	• TGSI's may be required to the external ramp. • Provide details of TGSI's that will be used
3.12	Hearing Augmentation	Please advise if an inbuilt amplification system will be provided to the meeting room.

TABLE OF CONTENTS

1.0 INTRODUCTION

Newland Wood Access Consultancy has been engaged by Nimbus Archiecture to provide access consultancy services for the proposed new sports pavillion at Boronia Park.

1.1 Purpose of the Report

This report forms part of the design development documentation. The aim of this document is to provide feedback and confirmation that the proposals meet the principles of good accessible design and in turn demonstrate that it meets the key legislative and policy guidelines including:

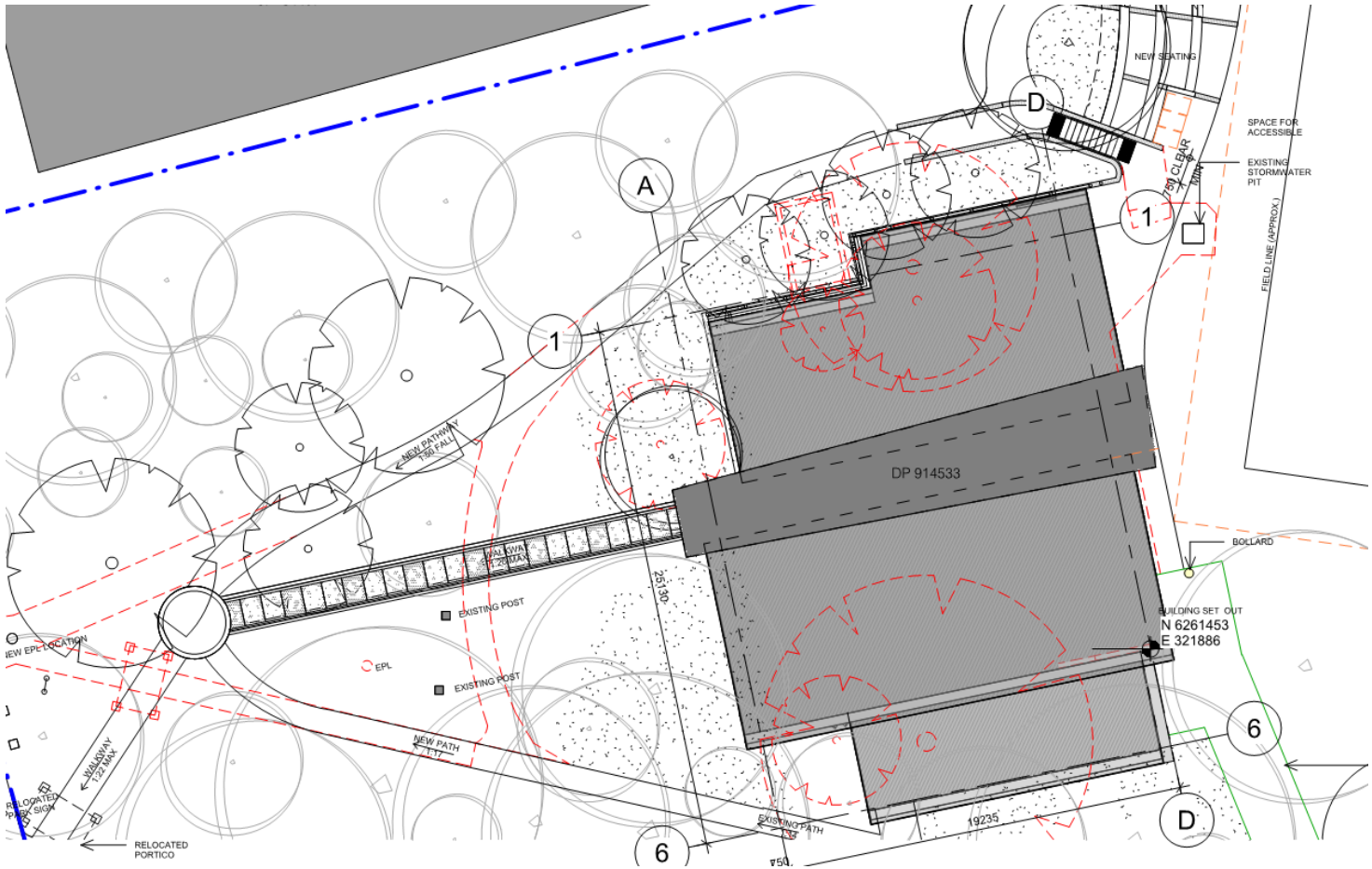
National Construction Code Building Code of Australia Volume One 2019 (BCA)
AS 1428.1 2009 Design for access and mobility. Part 1 General requirements for access
AS 1428.4.1 2009 Tactile Ground Surface Indicators
AS 2890.6 2009 Parking Facilities for people with disabilities
AS 1735.12 1999 Lifts, escalators and moving walks. Part 12: Facilities for persons with disabilities
Disability (Access to Premises-Buildings) Standards 2010
AS1428.2 - 1992 – Design for access and mobility. Part 2: Enhanced and additional requirements – Buildings and facilities

1.2 Project Details

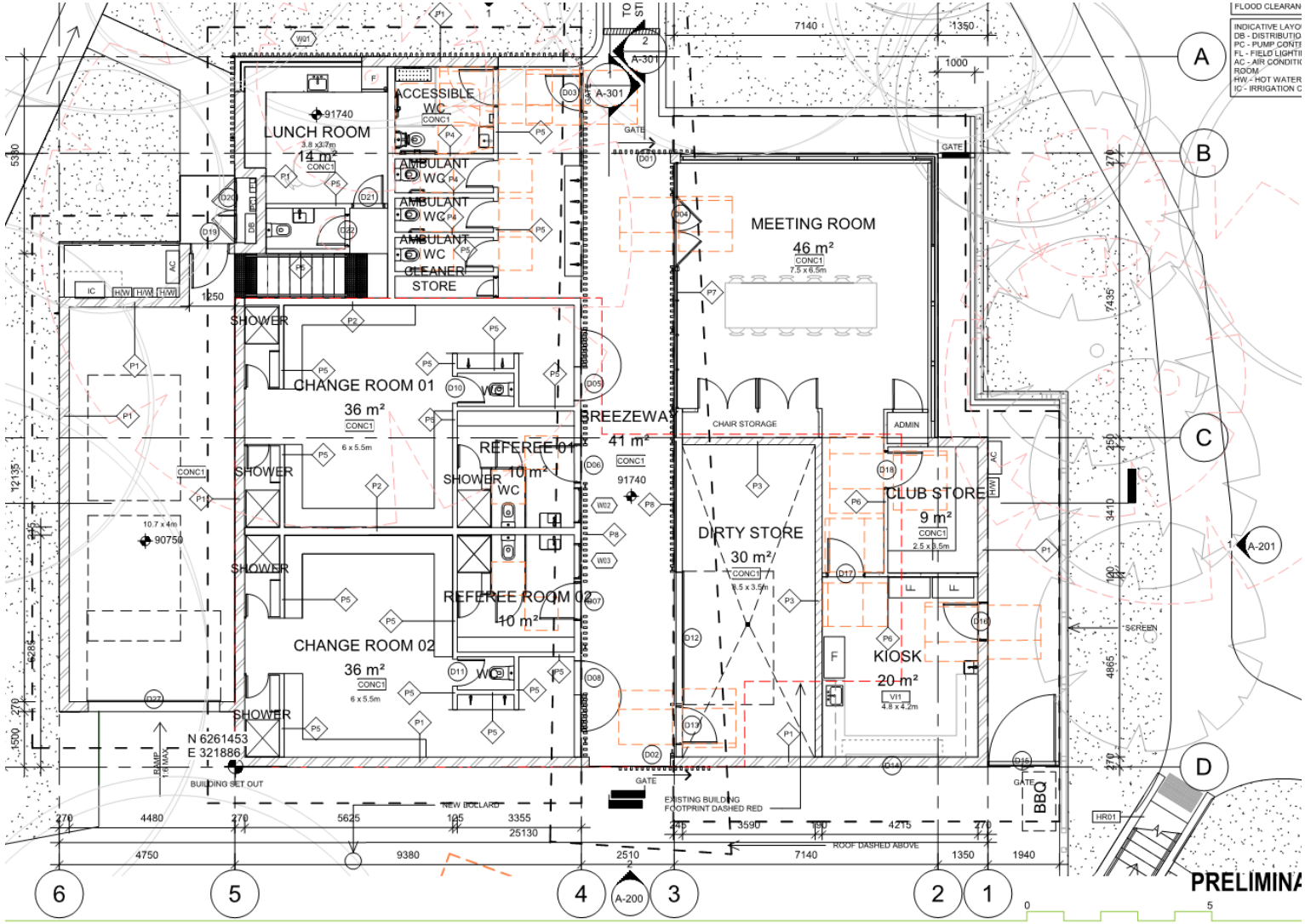
The proposed development includes the demolition of the existing Boronia Park Sports Pavilion and the construction of a new building. The proposed new building will comprise of change rooms, accessible sanitary facility, store rooms, meeting room and a kiosk. The building is accessed via a pedestrian footpath off Kent Street which leads to the building.

The building is considered a Class 9b under the Building Code of Australia.

The proposed precinct plan is indicated below;


NEW SEATING
SPACE FOR ACCESSIBLE
EXISTING STORMWATER PIT
250 CLEAR MIN
FIELD LINE (APPROX.)
DP 914533
BOLLARD
BUILDING SET OUT
N 6261453
E 321886
NEW PATHWAY 1:50 FALL
WALKWAY 1:20 MAX
EXISTING POST
EPL
NEW PATH 1:17
WALKWAY 1:20 MAX
RELOCATED PORTICO
EXISTING PATH
19235
A
D
1
6

The proposed ground floor plan is indicated below;



2.0 LEGISLATIVE REQUIREMENTS

2.1 Disability Discrimination Act 1992

The Disability Discrimination Act (DDA) is federal legislation which seeks to ensure all new building infrastructure, refurbishments, services and transport projects provide functional and equitable access for people with disabilities. The DDA is a complaints based legislation, which is administered by the Australian Human Rights Commission (AHRC). Section 23 of the DDA relates to access to premises and facilities which the public may enter or use, and states it is unlawful to:

Refuse access to, or the use of, any premises, or the facilities within them.

Impose terms or conditions specific to persons with disability and their associates on the access and use of any premises or facilities;

Exclude access based on the provision of an appropriate means of access;

Request persons with disability or their associates to leave premises or cease use of facilities

The DDA has enacted statutory instruments known as Disability Standards to provide a degree of clarity with respect to access to premises and facilities.

2.2 Disability (Access to Premises – Buildings) Standards 2010 & Building Code of Australia

The purpose of these Standards is to provide for equitable and dignified access to new buildings and those areas of existing buildings that undergo renovation or upgrade that require a building approval.

If a building complies with the Disability (Access to Premises-Buildings) Standards (Premises Standards) those responsible for the building cannot be subject to a successful complaint of unlawful discrimination under the Disability Discrimination Act (DDA) in relation to matters covered by the Premises Standards.

Building Certifiers, Building Developers and Building Managers all have obligations under the Standards and must ensure a building complies with the Standards, with each party being responsible for the area they have control over. It is unlawful to fail to comply with the requirements of the Premises Standards.

The National Construction Code Building Code of Australia aligns with the requirements of the Premises Standards and therefore new building work that complies with the BCA will also comply with the Premises Standards. However, the Premises Standard places additional requirements on existing buildings where building work is being undertaken.

3.0 APPRAISAL

The following review is an assessment against National Construction Code Building Code of Australia Volume One 2019 (BCA) and referenced Australian Standards.

3.1 General Building Access Requirements

In accordance with Clause D3.1 of the BCA buildings and parts of buildings must be accessible in accordance with Table 3.1.
A continuous accessible path of travel is to be provided as follows:

Part of Building	Accessibility Requirements
Class 9b Assembly building	• To wheelchair seating spaces • To and within all other areas normally used by the occupants, except that access need not be provided to tiers or platforms of seating areas that do not contain wheelchair seating spaces

3.2 Exemptions & Departures

Clause D3.4 of the BCA allows exemptions from the requirements of providing access for people with disabilities where an area is inappropriate because of the purpose for which it is used or where there the area may pose a health and safety risk.

For this development, please confirm if the following areas are considered as being exempt from access for people with disabilities.

- Services room
- Council store
- Dirty store
- Club store
- Path of travel between building and retaining wall.

In some cases it may be necessary to provide a Performance Solution to meet the Performance Requirements of the BCA as opposed to following the Deemed to Satisfy Solutions set out in the National Construction Code. For this development, confirmation is required to determine if a Performance Solution report is required to address the following:

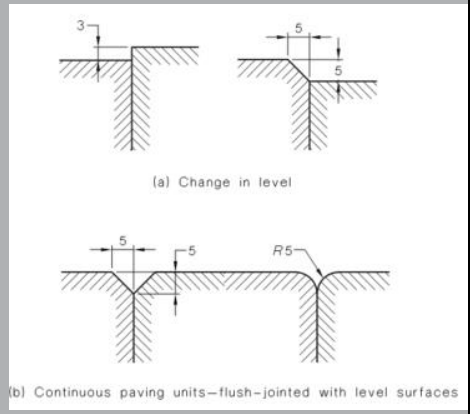
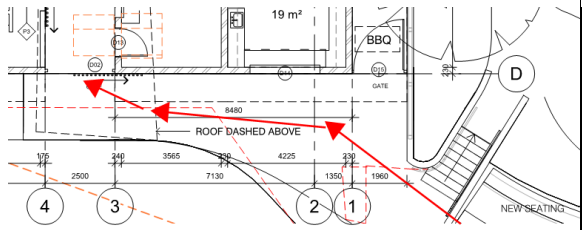
- Latch side clearance to the following doors will not be in accordance with AS1428.1.2009. These doors will be held open during opening hours
    - Two entrance doors to the building (breezeway)
    - Doors to change room 1 and 2
- The external pathway is provided with ramp gradients and will not be provided will all features in accordance with AS1428.1.2009.
- An accessible path of travel is not provided to the lunch room. A letter from the Council will be required.

3.3 Accessible Car Parking – Not Applicable

3.4 External Access to Entrances

BCA Clause D3.2

BCA Requirement	Comments	Action Required
Access to buildings BCA D3.2		
An accessway must be provided- • From the main points of a pedestrian entry at the allotment boundary • From another accessible building connected by a pedestrian link • From any required accessible car parking space	A pedestrian pathway is provided off Kent Street and leads directly to the building entrance. Carparking/ accessible carparking is not part of the proposed works.	Compliance Indicated
External walkways & pathways AS1428.1 2009 Clauses 6, 7, 10		
Pathways must be slip resistant and have a continuous accessible path of travel a minimum 1000mm wide. Passing places for 2 wheelchairs minimum 1800mm wide and 2000mm long must be provided at maximum 20m intervals. Turning spaces are also required within 2m of the end of accessways where it is not possible to continue on. These are as follows: • 60°-90°turn 1500mm wide by 1500mm long • 90°-180° turn 1540mm wide by 2070mm in direction of travel Poles, columns, stanchions, bollards and fixtures must not project into an access way. Any obstacles that abut an access way must have a minimum luminance contrast of 30%. The ground surface abutting the sides of a walkway shall provide a firm and level surface of a different material to that of the walkway at the same level of the walkway, follow the grade of the walkway and extend horizontally for a minimum of 600mm unless a kerb or kerb rail is provided.	Passing places are required along the external pathways minimum 1800mm wide and 2000mm long and provided a intervals of 20m. A 1:20 walkway is proposed as the accessible pathway to the building entrance. An accessible path of travel is required from the fixed seating to the building, please indicate the gradient along the below path of travel.	Further Information Required Passing places are required to all external pathways. Please provide details of the ground surface abutting the sides of the 1:20 walkway. Landings are required to the 1:20 walkway at intervals no greater than 15m.

BCA Requirement	Comments	Action Required
Gradients must be shallower than 1:20 or considered a ramp. Landings shall be provided as follows: • 1:33 gradient – max 25m • 1:20 gradient – max 15m • Shallower than 1:33 no landings are required Abutment of surfaces must have a smooth transition ± 3mm vertically or ± 5mm where edges are bevelled or rounded. Grates must not have openings greater than 13mm. If slotted openings are less than 8mm they can be in the direction of travel. 		Provide the gradient along the path of travel from the fixed seating to the building entrance as shown in the markup. Grates must not have openings greater than 13mm. If slotted openings are less than 8mm they can be in the direction of travel.
Kerb Ramps AS 1428.1 (2009) Clause 10.7		
Kerb ramps shall have: • Max rise of 190mm • Max length of 1520mm • Max gradient of 1:8	No kerb ramps indicated on the plans	Not applicable
External Ramps BCA D3.3, D3.11 AS1428.1 2009 Clauses 10, 12		
Ramps shall be designed to: • Have a minimum width of 1000mm • Have a max gradient of 1:14 if it exceeds 1900mm in length. • Bet set back at the intersection of a property boundary by a minimum of 900mm • Have TGSI's in accordance with AS1428.4.1 • Have kerb or kerb rails on both sides Vertical rise not to exceed 3.6m Handrails to ramps shall be:	A new and existing external path are provided with ramp gradients of 1:14 and 1:17.	Further Information Required The external ramp is required to be provided will all the features of a ramp including handrail, TGSI's and landings.

BCA Requirement	Comments	Action Required
• Circular or elliptical, not less than 30mm or greater than 50mm in height or width for not less than 270° around the upper most surface. • Be positioned between 865-1000mm • Have the ends turned through 180° or to the ground, or fully to a wall • Have a minimum 50mm clearance between any walls or adjacent surfaces • Handrails shall extend 300mm at the top and bottom of the ramp • Have a handrail on both sides Landings shall be provided as follows: • 1:14 gradient – max 9m • 1:20 gradient – max 15m • Landings in direction of travel 1200mm long; • Landings at 90° directional change 1500mm x 1500mm. • Landings at 180° directional change 1540mm x 2070mm length. • Landing or circulation space shall be provided at every doorway, gate or similar opening		A performance solution report may be required however confirmation is required.
External Stairs BCA Clause D3.3 AS 1428.1 (2009) Clause 10 & 12		
• Stairs at intersections with property boundaries shall be set back by a minimum of 900mm. • Stair to have opaque risers • Stair nosing's shall not project beyond the face of the riser • Stair nosings shall have sharp intersections, be rounded up to 5mm radius or be chamfered up to 5mm x 5mm. • Nosings require minimum 30% luminance contrast between 50-75mm wide across the full width of the path of travel. It may be set back a max of 15mm • Where the luminance contrasting strip is not set back then any area of luminance contrast shall not extend more than 10mm down the riser. • TGSI's to be installed in accordance with AS1428.4.1 • Nosings to stair to achieve suitable slip resistance as per Clause D2.24 of the BCA Handrails shall be: • Circular or elliptical, not less than 30mm or greater than 50mm in height or width	External stairs are provided between the building and the fixed seating.	Capable of compliance

BCA Requirement	Comments	Action Required
for not less than 270° around the upper most surface. • Be positioned between 865-1000mm • Have the ends turned through 180° or to the ground, or fully to a wall • Have a minimum 50mm clearance between any walls or adjacent surfaces		

3.5 Entry and Doorways

BCA Requirement	Comments	Action Required
Principal pedestrian entrances BCA Clauses D3.2		
50% of entrances are required to be accessible - Where there are no more than 3 entrances only 1 is required to be accessible. Where the building has a total floor area more than 500m^2 an entrance which is not accessible must not be located more than 50m from an accessible entrance.	There are 2 entrances to the building.	Compliance Indicated
Pedestrian entry door widths BCA Clause D3.2 AS 1428.1 2009 Clause 13.2		
Minimum clear opening width of 850mm. Where double doors are provided at least one leaf must have a clear opening width of 850mm unless operated by automatic means.		Compliance Indicated
Circulation spaces at pedestrian entry doors AS 1428.1 2009 Clause 13.3		
Circulation spaces to doors to be provided in accordance with AS1428.1 2009	Latch side clearance is not provided to the gates at both entrances to the breezeway.	Capable of compliance We understand that the gates will be held open during opening hours.

BCA Requirement	Comments	Action Required
		A performance solution report will be required.
Pedestrian Entry Door furniture AS 1428.1 2009 Clause 13.5		
• Door handles and hardware should be designed to allow operation by one hand, such as D type handles. Clearances to handles shall be not less than 35mm and not more than 45mm. Any snibs should be a minimum of 45mm long. • Handles should be positioned between 900-1100mm above finished floor level. • Panic bars or controls that are required to be pushed should be positioned between 900- 1200mm above ffl. • Controls that only need to be touched should be positioned between 900-1250mm above ffl and not less than 500mm from an internal corner. Push buttons should have a min 25mm diameter. • Door opening forces should not exceed 20N (except fire doors) • Outward opening doors should be provided with a horizontal handrail or pull bar where self closers are not fitted	No details provided at this stage of the design.	Capable of compliance Door hardware to be reviewed as the design progresses.
Operation of latch BCA Clause D2.21		
Push button devices provided under D2.21 (a)(ii) and which are not installed on the door leaf itself, are required to be installed in the following location; • manual controls to power-operated door must be at least 25 mm wide, proud of the surrounding surface • located not less than 500 mm from an internal corner • for a hinged door, between 1m and 2m from the door leaf in any position • for a sliding door, within 2m of the doorway and clear of a surface mounted door in the open position Braille and tactile signage complying with Clause 3 and 6 of Specification D3.6 must identify the latch operation device.	Push button devices are not currently indicated on the plans.	Capable of compliance Please indicate if any push button devices will be provided.
Luminance contrast to pedestrian entry doors AS 1428.1 2009 Clause 13.1		

BCA Requirement	Comments	Action Required
All doorways including the Principal pedestrian entrances must have a minimum 30% luminance contrast minimum 50mm wide between: • Door leaf and jamb • Door leaf & adjacent wall • Architrave & wall • Door leaf & architrave; or • Door jamb & adjacent wall	No details provided at this stage of the design.	Capable of compliance Luminance contrast to entry door to be reviewed as the design progresses.
Glazed Doors AS 1428.1 2009 Clause 6.6		
All glazed doors must be marked with contrast marking no less than 75mm wide for full width of doors at 910-1000mm height.		Capable of compliance Please indicate if any glazed doors will be provided.
Lobbies to principal entrance doors AS 1428.1 2009 Clause 13.4		
The distance between doorways in vestibules, air locks or lobbies must be a minimum of 1450mm.	No lobbies are provided to entrance doors.	Not applicable
Threshold ramps AS 1428.1 Clause 10.5		
Threshold ramps at doorways shall have: • Max rise of 35mm • Max length of 280mm • Max gradient of 1:8 • And be located within 20mm of door leaf it serves.	No threshold ramps are indicated on the plans.	Not applicable

3.6 Circulation

3.6.1 Internal Circulation

BCA Requirement	Comments	Action Required
Internal Accessways BCA Clause D3.3 AS 1428.1 2009 Clause 6		
A continuous accessible path of travel minimum 1000mm wide is required. Passing places for 2 wheelchairs minimum 1800mm wide and 2000mm long must be provided at maximum 20m intervals. Turning spaces are also required within 2m of the end of accessways where it is not possible to continue on. These are as follows: • 60°- 90° turn 1500mm wide by 1500mm long • 90°- 180° turn 1540mm wide by 2070mm in direction of travel	The breezeway width is approximately 2500mm.	Compliance Indicated
Surface finishes AS 1428.1 2009 Clause 7.4		
Finishes must be slip resistant. The pile height of any carpet shall not exceed 11mm and the carpet backing thickness shall not exceed 4mm. Recessed matting must not be more than 3mm vertically or 5mm if rounded or bevelled above or below the surrounding surface	No details provided at this stage of the design.	Capable of compliance Surface finishes to be reviewed as the design progresses.
Glazing on access ways BCA Clause D3.12 AS 1428.1 2009 Clause 6.6		
Any glazing on an accessway that that is capable of being mistaken for a doorway must be clearly marked with a solid non-transparent contrasting line min 75mm positioned between 900- 1000mm above finished floor level. The line shall provide a minimum of 30% luminance contrast against the floor surface.		Capable of compliance Please advise if any glazing along accessways will be provided.

3.6.2 Lifts

BCA Requirement	Comments	Action Required
Lifts BCA Clause D3.3 & E3.6 AS 1735.12 1999		

• Lift travelling <12m to have a minimum compartment size of 1100mm wide x 1400mm depth.
• Lift travelling > 12m to have a minimum compartment size of 1400mm wide x 1600mm depth.
• Door width to be min 900mm clear opening
• Handrail in accordance with clause 5.3
• Have a passenger protection system. E.g. be fitted with a series of door opening sensory devices which will detect a 75mm diameter rod across the door opening between 50mm and 1550mm above floor level.
• Have car control buttons complying with clause 7 including:
  ○ Lift control buttons on each landing sited between 900-1200mm from floor level and a minimum of 500mm away from any internal corner of obstruction
  ○ Control buttons within lift car between 700-1250mm above floor level and located where it is able to be tangentially touched by a horizontal disc with a radius of 300mm, where it is located adjacent to a door entrance and 400mm for all other locations.
  ○ Have appropriate tactile and Braille symbols
• Have appropriate lighting levels
• Have automatic audible information within the lift car to identify the level each time the car stops
• Have audible and visual indication at each landing to indicate the arrival of the lift car.
Note: Low rise, low speed constant pressure lifts cannot be used in high traffic public use areas.
	Note: There may be additional requirements to provide a stretcher lift.
	
	No lifts are provided.
		Not applicable

3.6.3 Internal Stairs

BCA Requirement	Comments	Action Required
Fire Isolated Stairs BCA Clause D3.3 AS1428.1 2009 Clause 10, 12		
• Fire-isolated stairs are required to have a single handrail in accordance with Clause 12 of AS1428.1 2009 and have luminance contrast to nosings. • Nosings to stair to achieve suitable slip resistance as per Clause D2.24 of the BCA	No fire isolated stairs are provided.	Not applicable
Access Stairs BCA Clause D3.3 AS1428.1 2009 Clause 10, 12		
Non-fire isolated stairs should be designed as follows: • Stairs at intersections with internal corridors shall be set back (see fig 26(B)). • Stair to have opaque risers • Stair nosing's shall not project beyond the face of the riser • Stair nosings shall have sharp intersections, be rounded up to 5mm radius or be chamfered up to 5mm x 5mm. • Nosings require minimum 30% luminance contrast between 50-75mm wide across the full width of the path of travel. It may be set back a max of 15mm • Where the luminance contrasting strip is not set back then any area of luminance contrast shall not extend more than 10mm down the riser. • Nosings to stair to achieve suitable slip resistance as per Clause D2.24 of the BCA • TGSI's to be installed in accordance with AS1428.4.1 Handrails shall be: • Circular or elliptical, not less than 30mm or greater than 50mm in height or width for not less than 270° around the upper most surface. • Be positioned between 865-1000mm • Have the ends turned through 180° or to the ground, or fully to a wall • Have a minimum 50mm clearance between any walls or adjacent surface • For stairs required to comply with Clause 11 handrails must also • Be positioned both sides • Extend a minimum of 300mm at the top of the flight • Extend a one tread width plus 300mm at the bottom of the flight	Stairs are located to access the lunch room and a sanitary facility.	Further Information Required Handrail does not appear to extend 300mm at the top of the stairs.

3.6.4 Internal Ramps

BCA Requirement	Comments	Action Required
Internal Ramps BCA Clause D3.3 AS 1428.1 2009 Clauses 10, 12		
Ramps shall be designed to: • Have a minimum width of 1000mm • Have a max gradient of 1:14 if it exceeds 1900mm in length. • Have a landing or circulation space shall be provided at every doorway, gate or similar opening • Be set back at the intersection of an internal corridor by a minimum of 400mm • Have TGSI's in accordance with AS1428.4.1 • Have kerb or kerb rails on both sides Handrails to ramps shall be: • Circular or elliptical, not less than 30mm or greater than 50mm in height or width for not less than 270° around the upper most surface. • Be positioned between 865-1000mm • Have the ends turned through 180° or to the ground, or fully to a wall • Have a minimum 50mm clearance between any walls or adjacent surfaces • Handrails shall extend 300mm at the top and bottom of the ramp • Have a handrail on both sides Landings shall be provided as follows: • 1:14 gradient – max 9m • 1:20 gradient – max 15m • Landings in direction of travel 1200mm long; • Landings at 90° directional change 1500mm x 1500mm. • Landings at 180° directional change 1540mm x 2070mm length. • Landing or circulation space to be provided at every doorway, gate or similar opening	No internal ramps are indicated on the plans.	Not applicable
Step Ramps		
• Step ramps shall have: • Max rise of 190mm • Max length of 1900mm	No step ramps are indicated on the plans.	Not applicable

BCA Requirement	Comments	Action Required
• Max gradient of 1:10 • A 45° splay at the edges where there is pedestrian crossing traffic		

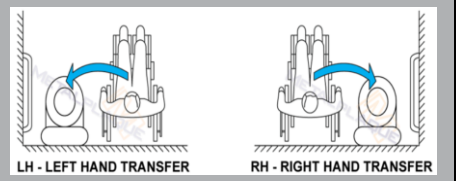
3.7 Internal Doors

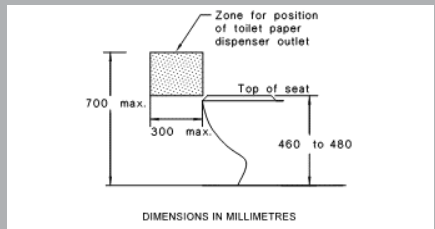
BCA Requirement	Comments	Action Required
Door widths BCA Clause D3.2 AS 1428.1 2009 Clause 13.2		
• Minimum clear opening width of 850mm. • Where double doors are provided at least one leaf must have a clear opening width of 850mm unless operated by automatic means	Doors appear to be suitably wide.	Compliance Indicated
Door circulation spaces BCA Clause D3.2 AS 1428.1 2009 Clause 13.3		
Circulation spaces to doors to be provided in accordance with Clause 13.3 AS1428.1 2009	Latch side clearance is not provided to the doors to the change rooms.	Capable of compliance Performance solution is required as latch side clearance is not provided to the doors to the change rooms.
Door Hardware AS 1428.1 2009 Clause 13.5		
• Door handles and hardware should be designed to allow operation by one hand, such as D type handles. Clearances to handles shall be not less than 35mm and not more than 45mm. Any snibs should be a minimum of 45mm long. • Handles should be positioned between 900-1100mm above finished floor level. • Panic bars or controls that are required to be pushed should be positioned between	No details provided at this stage of the design.	Capable of compliance Door hardware to be reviewed as the design progresses.

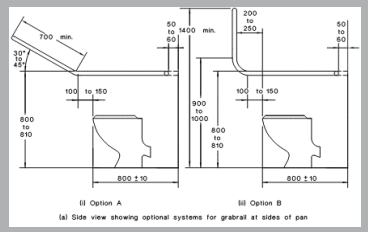
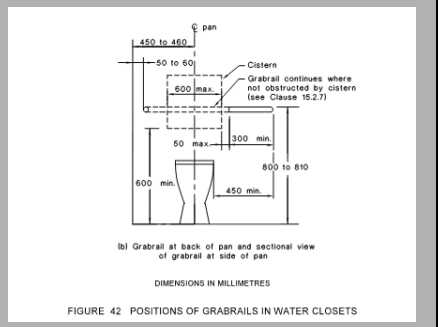
BCA Requirement	Comments	Action Required
900- 1200mm above ffl. • Controls that only need to be touched should be positioned between 900-1250mm above ffl and not less than 500mm from an internal corner. Push buttons should have a min 25mm diameter. • Door opening forces should not exceed 20N (except fire doors) • Outward opening doors should be provided with a horizontal handrail or pull bar where self closers are not fitted.		
Luminance contrast to doors AS 1428.1 2009 Clause 13.1		
All doorways including the Principal pedestrian entrances must have a minimum 30% luminance contrast minimum 50mm wide between: • Door leaf and jamb • Door leaf & adjacent wall • Architrave & wall • Door leaf & architrave; or • Door jamb & adjacent wall	No details provided at this stage of the design.	Capable of compliance
Internal lobbies AS 1428.1 2009 Clause 13.4		
The distance between doorways in vestibules, air locks or lobbies must be a minimum of 1450mm. Please also note the requirement for air lock details within facilities containing ambulant sanitary accommodation.	No internal lobbies provided	Not applicable

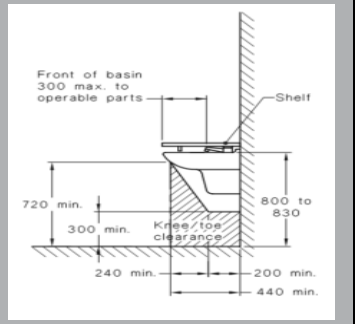
3.8 Sanitary Facilities

3.8.1 Unisex Sanitary Facilities

BCA Requirement	Comments	Action Required
Unisex Accessible sanitary compartments BCA Clause F2.4 Table F2.4(a)		
Class 5, 6, 7, 9 – Where F2.3 requires closet pans - i. 1 on every storey containing sanitary compartments; and ii. Where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks	1 accessible sanitary shower facility is provided.	Compliance Indicated
Design of unisex accessible sanitary facilities AS 1428.1 2009 Clause 15		
WC Compartment size min. 1900mm wide x 2630mm depth Compartment containing WC and Shower min. size 2300mm width x 2630mm depth Min. 1400mm circulation space around the toilet pan is provided	The compartment size is approximately 2.7m x 2.5m. The checklist below has been intentionally left blank, detailed room layout to be provided as the design progresses.	Capable of compliance Please provide a detailed room layout for review.
Transfer BCA Clause F2.4 (g)		
Where more than 1 unisex accessible facility is provided, there should be one of each transfer type (left hand / right hand) provided 	The sanitary facility is right hand transfer.	Not applicable
Toilet Pans		
Top of seat is 460-480mm above floor level		Further Information Required
Centre line of pan is 450-460mm from the side wall		Further Information Required

BCA Requirement	Comments	Action Required
Distance of pan from rear wall 790-810mm		Further Information Required
Seat - full, round, secured toilet seat at an appropriate height (load rated to 150kg) with 30% luminance contrast to the background		Further Information Required
Flushing controls are to be at a height 600-1100mm an max. distance 500mm from centerline. The flushing control shall be proud of the surface		Further Information Required
Back rest		
Backrest at a height of 120-150mm from top of seat		Further Information Required
Backrest at a height of 120-150mm from top of seat		Further Information Required
Toilet paper outlet		
Toilet paper outlet located between the height of the top of the toilet seat and 700mm from floor level  FIGURE 41 ZONE FOR POSITION OF TOILET PAPER DISPENSER		Further Information Required
Toilet paper outlet located max. 300mm from front of seat		Further Information Required
Grab rails AS1428.1-2009 Clause 15 and 17		
Grabrail located at a height of 800-810mm (measure to top)		Further Information Required

BCA Requirement	Comments	Action Required
Grabrail has a diameter of 30-40mm		Further Information Required
Grabrail is offset 50-60mm from the wall		Further Information Required
90° grab rail - Located 200-250mm from front of pan, top of vertical section min. 1400mm above floor level; or Angle grab rail - Angled at 30° to 45°. Angled section to have a min. length of 700mm 			Further Information Required
Grab rail beside pan or surface mounted cistern. 50mm max dist. from pan, 300mm min length with a concealed cistern grab rail to be continuous 		Further Information Required
Washbasin AS1428.1-2009 Clause 15.3		
Wash hand basin at a height of 800-830mm Tapware is lever handles or sensor plates		Further Information Required
Knee clearance provided at a min. height of 640-650mm		Further Information Required
Front of basin to taps max. distance 300mm		Further Information Required

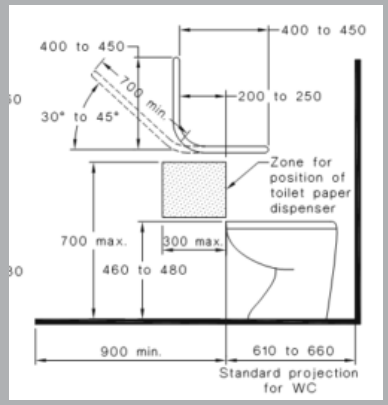
BCA Requirement	Comments	Action Required
Centre line of waste from front of basin 300mm max.		Further Information Required
Free space under basin 300mm min at wall and 200mm min from the wall then sloping up to front of basin. 		Further Information Required
Min. 425mm from wall to centreline of basin		Further Information Required
Mirror AS1428.1-2009 Clause 15.4.1		
Mirror is located at a height of 900-1850mm from floor level. Mirrors are not to be angled or tilted		Further Information Required
Shelf AS1428.1-2009 Clause 15.4.2		
A shelf 120-150mm wide by 300-400mm long is to be provided adjacent the wash basin at a height of 900-1100mm from floor level, or at 800-830mm when forming part of the vanity unit.		Further Information Required
Soap dispenser AS1428.1-2009 Clause 15.4.3		
A soap dispenser operable with one hand with the operable component positioned between 900-1100mm and min. 500mm from an internal corner is to be provided		Further Information Required
Towel dryer/paper towel dispenser		

BCA Requirement	Comments	Action Required
AS1428.1-2009 Clause 15.2.8		
A paper towel dispenser or hand dryer operable with one hand positioned between 900-1100mm and min. 500mm from an internal corner is to be provided		Further Information Required
Coat Hook AS1428.1-2009 Clause 15.4.4		
A coat hook is to be provided at a height of 1200-1350mm and a minimum of 500mm from an internal corner		Further Information Required
Signage BCA Clause D3.6 and Specification D3.6		
Signage incorporating the international symbol for access to be provided in accordance with specification D3.6 to be provided		Further Information Required
Switches & GPO's AS1428.1-2009 Clause 15.4.6		
GPOs and switches are to be located at a height of 900-1100mm above floor level and min. 500mm from an internal corner		Further Information Required
Baby Changing table AS1428.1-2009 Clause 15.2.8.2		
Baby change table is to be located at a height of max. 820mm with a minimum 720mm clearance underneath when in the open position. The baby change table is not to encroach on any circulation space when closed		Further Information Required

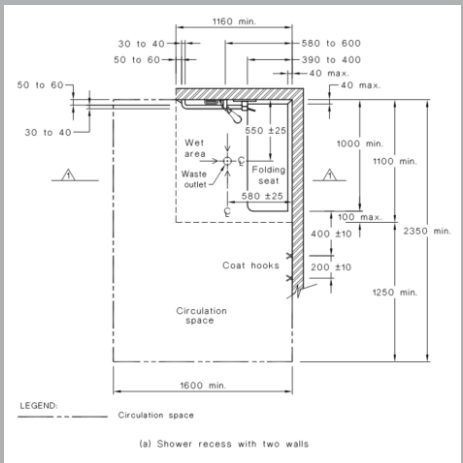
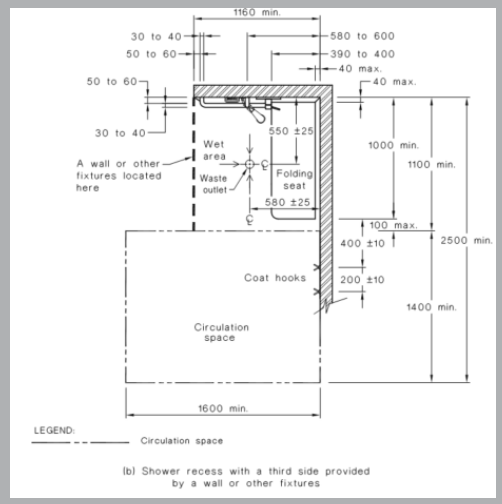
3.8.2 Ambulant Sanitary Facilities

BCA Requirement	Comments	Action Required
Ambulant sanitary compartments BCA Clause F2.4 AS 1428.1 2009 Clause 16		

BCA Requirement	Comments	Action Required
At each bank of toilets where there is one or more toilets in addition to an accessible unisex sanitary compartment at that bank of toilets, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS1428.1 is to be provided.	3 ambulant cubicles are provided for spectators. An ambulant sanitary facility is also provided in each referee sanitary facility.	Compliance Indicated
Min. circulation space of 900 x 900mm provided inside and outside of the cubicle.		Compliance Indicated
Design of ambulant sanitary facilities AS 1428.1 2009 Clause 16		
Cubicle width 900-920mm		Compliance Indicated
Cubicle entry		
Airlock to have min. dimensions of 900 x 900mm		Not applicable
Min. clear opening width of door 700mm	Cubicle doors do not provide a clear opening width of 700mm.	Does not comply
Ambulant WC Pan AS1428.1-2009 Figure 53 (A)		
WC pan located 610-660mm from rear wall		Compliance Indicated
Top of toilet seat is 460-480mm above floor level	Please provide room layout for review	Capable of compliance
Grabrails in Ambulant Cubicle AS1428.1-2009 Figure 53 (A)		
Grabrails are to be located at a height of 800-810mm and 200-250mm from front of pan	Please provide room layout for review.	Capable of compliance

BCA Requirement	Comments	Action Required
• 90° grab rail - 400-450mm long; or • 30°-45° grab rail - 700mm long 		Choose an item
Coat Hook AS1428.1-2009 Clause 16.5		
Coat hook located at a height of 1350-1500mm	Please provide room layout for review.	Capable of compliance
Ambulant Cubicle Signage BCA Clause D3.6 and Specification D3.6		
Signage is to be located at a height of 1200-1600mm above floor level and contain Braille, tactile & international symbol. Signage is to be provided to entry door to air lock to identify the facility	No information provided.	Capable of compliance Please provide signage schedule for review.

3.8.3 Accessible Shower facilities

BCA Requirement	Comments	Action Required
Accessible Shower Facilities BCA Clause F2.4 and AS1428.1-2009 Clause 15		
Unisex accessible showers must be provided in accordance with Table F2.4(b)	1 unisex accessible shower is provided.	Compliance Indicated
Class 5, 6, 7, 9 – Where F2.3 requires 1 or more showers, not less than 1 for every 10 showers or part thereof		
Design of Shower compartments AS1428.1-2009 Clause 15		
Circulation space to be in accordance with figure 47.   	Room is sufficiently sized for required circulation spaces. The checklist below has been intentionally left blank, detailed room layout to be provided as the design progresses.	Capable of compliance Please provide detailed room layout for review.
Shower seat		
A 1000mm long self-draining, slip resistant shower seat with the top at a height of 470-480mm from floor level when in the down position is to be provided. Seat to be 390-400mm wide with 40mm clearance from wall.		Further Information Required
Floor Waste & Drainage		

BCA Requirement	Comments	Action Required
Floor waste is to be located 550mm and 600mm from walls with a gradient of 1:60 -180 to shower recess and 1:80- 1:100 to the remainder of the floor.		Further Information Required
Grabrails & Shower Support Rails		
Grabrails are to have a diameter of 30-40mm located at a height of 800-810mm (measured to top)		Further Information Required
Taps		
Tapware is to be lever handle or sensor plate and located min. 300mm from adjacent wall at a max. height of 1100mm		Further Information Required
Coat Hooks		
Two coat hooks are to be provided at 400 and 600mm from the edge of the shower seat, at a height of 1200-1350mm from floor level		Further Information Required

3.9 Signage

BCA Requirement	Comments	Action Required
Signage BCA Clause & Specification D3.6		
To identify unisex and ambulant sanitary Facilities	No information received in regards to signage.	Capable of compliance Signage will be required to the ambulant facilities, accessible sanitary facility and to identify areas containing hearing augmentation, if
To identify each door required by BCA Clause E4.5 to be provided with an exit sign, stating 'EXIT' and 'Level" number		
Where a pedestrian entrance is not accessible, signage must be provide to indicate the location of the accessible entry		
Identify areas containing hearing augmentation		
Buildings subject to F2.9, directional signage to be provided at each bank of sanitary facilities		

BCA Requirement	Comments	Action Required
and at accessible unisex sanitary facility to direct a person to the nearest accessible adult change facility		applicable. Please provide signage schedule for review.

3.10 Tactile Ground Surface Indicators

BCA Requirement	Comments	Action Required
Location BCA Clause D3.8 AS 1428.4.1 Section 1 & 2		
Tactile indicators will be required in the following locations: Stairways (other than fire isolated stairways) Ramps (other than a fire isolated, step or kerb or swimming pool ramp), An escalator A passenger conveyor or moving walkway Where an overhead obstruction is less than 2m (except doorways) if no suitable barrier is provided Where an accessway adjacent to a pedestrian entrance meets a vehicular way if there is no kerb or kerb ramp at that point	TGSI's are provided to the internal and external stairs.	Capable of compliance TGSI's may also be required to the external ramp.
Design AS 1428.4.1 Section 1 & 2		
TGSI's shall be detectable by tactile means and provided with luminance contrast as follow: Min 30% where integrated TGSI's are the same colour as the underlying surface Min 45% for discrete TGSI's Min 60% to the raised surface where discrete TGSI's are constructed using two colours or materials They shall be slip resistant and laid so that there is no likelihood of the edges lifting.	No information received at this stage of the design.	Capable of compliance Please provide details of the TGSI's that will be used.

3.11 Wheelchair seating spaces in Class 9b assembly buildings

BCA Requirement	Comments	Action Required
Wheelchair seating spaces in Class 9b assembly buildings BCA Clause D3.9		
Where fixed seating is provided in a Class 9b assembly building, wheelchair seating spaces complying with AS1428.1 must be provided in accordance with the following; (a) The number and grouping of wheelchair seating spaces must be in accordance with Table D3.9 (b) In a cinema – i. With not more than 300 seats – wheelchair seating spaces must not be located in the front row of seats; and ii. With more than 300 seats – not less than 75% of required wheelchair seating spaces must be located in rows other than the front row of seats	3 wheelchair seating spaces are provided, the grouping of these spaces is to be as follows; 1 single space; and 1 group of 2 spaces.	Capable of compliance 3 wheelchair seating spaces are provided however they are all grouped together. We believe the current design is sufficient.

3.12 Hearing Augmentation

BCA Requirement	Comments	Action Required
Hearing Augmentation		
Hearing Augmentation systems must be provided where an inbuilt amplification system is provided (other than for emergency warning) as follows: • Rooms in Class 9b building • Auditorium, conference room, meeting room or room for judicatory purposes • Ticket office, teller's booth, reception area or the like where the public is screened. • If hearing augmentation is required it must be either: • An induction loop covering a minimum of 80% of the floor area of the room or space; or • Cover 95% of the floor area if a system which requires receivers or the like is provided. • Any screen or scoreboard associated with Class 9b and capable of displaying announcements must be capable of supplementing any public-address system (other than for emergency warning).	Hearing augmentation is required to the meeting room if an inbuilt amplification system is provided.	Further Information Required Please advise if an inbuilt amplification system will be provided to the meeting room.

4.0 ENHANCED DESIGN CONSIDERATIONS

Whilst the minimum standards of design for people with disabilities is incorporated with the BCA and Premises Standards there are a number of additional design elements that can be considered to enhance the access and use of a building. The following have been identified as design items that could be included within the project to enhance amenity and useability for everyone, including people with a disability.

4.1 Wayfinding & Signage

Enhanced Design Feature	Recommendations
Wayfinding & Signage AS1428.4.2	
Everyone benefits from clear information about the purpose and layout of spaces if they are to maintain a clear sense of direction and independent use of the complex and the buildings. Signs should form part of an integrated communication scheme that gives clear directions, information and instructions. Information is particularly important at junctions of circulation routes where there are decision points and at key destination points such as reception areas, to identify lifts and sanitary facilities. Clear signs are important and are necessary for people with hearing impairments who may not be able to ask or feel comfortable about asking for directions. Signs should include Braille and tactile information wherever possible, pictograms and use appropriate colour schemes and fonts of appropriate size and be contrasted with their background. In large complexes, signage also needs to be positioned at regular intervals, to provide confidence to users that they are going in the right direction.	**It is recommended that a comprehensive wayfinding strategy is implemented within the site.**

4.2 Surface finishes and acoustics

Enhanced Design Feature	Recommendations
Surface Finishes and acoustics	
Floor, wall, door and ceiling finishes can help or hinder the use of buildings by people with disabilities. E.g. blind or partially sighted people and people who or deaf or hard of hearing might have difficulty finding their way around spaces if they cannot respond to visual cues or find it difficult to distinguish sounds in an acoustically reverberant environment.	**Consider the type of surface finishes and acoustics to be used in the design and the luminance contrast between elements.**

Enhanced Design Feature	Recommendations
When considering surface finishes, the following should be considered: • Colour, pattern, luminance contrast and texture of the surfaces. Shiny surfaces can cause glare and reflections which can confuse people with vision impairments. Certain patterns of floor finishes can cause confusion for example strips across the path of travel can be confused as steps by people with vision impairments. • The definition of features e.g. the treatment of components and finishing elements such as doors, architraves and skirtings can be designed to define elements. Consider providing luminance contrast of floor finishes against wall finishes, hardware against doors, fittings to sanitary accommodation against surrounding walls and floors. • Consider the acoustic environment e.g. hard surfaces reverberate sound and create a noisy environment in which a person with a hearing impairment may have difficulty hearing what is being said. This is especially important in areas with staff/customer interaction; training spaces; cafes/dining/bar areas; reception areas etc. • Slip resistance properties of floor finishes. Ensure adjacent surfaces have similar slip resistance properties to prevent slipping or tripping. • Excessive use of glazing. Glazing can often give the illusion that there is unimpeded access even when decals are provided in accordance with the BCA, if large areas of glazing are to be specified consider using greater areas of manifestation.	

4.3 Lighting

Enhanced Design Feature	Recommendations

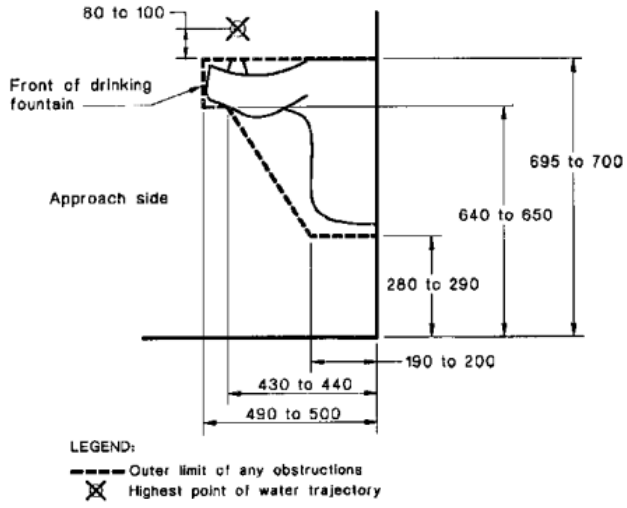
Enhanced Design Feature	Recommendations
Lighting	
Minimum levels of lighting are required for people to safely navigate their environment, read signs, see visual clues, and for contrasted elements to be seen. Lighting maybe natural or artificial. In outdoor spaces, shadows and glare can create pools of light and dark, reducing effectiveness of luminance contrasted building features. Internally, natural lighting can contribute to glare and window treatments should be used to minimise intensity. Artificial lighting may create glare if diffusers are not used. Minimum levels of maintenance illumination recommended in AS1680.2: • Entrances, passageways, walkways, stairs and ramps = 150 lux • Toilet and locker rooms = 200 lux • Lifts = 100 lux car • Counter tops = 250 lux • General displays = 200-300 lux 150 lux is recommended minimum for lip reading. Light levels can drop after a period of use. Ensure maintenance procedures replace lamps at intervals to provide minimum illumination.	**Consider the type of lighting in the design, avoiding pools of light and dark, glare and shadowing.**

4.4 Information/communication

Enhanced Design Feature	Recommendations
Information/communication	
Information/communication may be provided in various ways including through maps, information points, reception desks, interactive screens etc. Design should consider people of all abilities and provide alternative formats/methods of obtaining information or communicating. This may be for sensory impaired people, people with communication disability; people who do not speak English and so on.	**Consider how information/communication will be provided and alternatives.**

4.5 Street Furniture & Resting Points

Enhanced Design Feature	Recommendations
Street Furniture AS1428.2	
Seating AS 1428.2 provides guidance on suitable ranges of seating depending upon the occupant profile. Consider seat styles and where possible always offer a range of different types of seats. If a seat is too high or too low or if there are no armrests or side supports a person with disabilities can experience considerable discomfort as a result of poor posture. A person may also experience difficulty rising from the seated position if the seat is too low or has no armrests. Figure 32 of AS1428.2 gives typical seat designs to consider. Consider also the location of seating and manoeuvring space around the seats. Do not sit directly on a path of travel but consider setting back to allow for the seat and peoples feet when sitting down, however ensure that they are is a suitable connecting path of travel to access the seat. AS1428.2 suggests a minimum of 500mm (zone for feet). Create spaces adjacent to provided seating for wheelchair users or strollers, so people can sit together.	**Consider the design of seating to be provided across the site. Provide a variety of height and armrests. Ensure that wheelchairs can be accommodated within waiting areas without having to be parked in a circulation area.**
Resting Points Due to the distance from the site boundary to the facilities it is recommended that suitable resting points be provided along the main path of travel. It is recommended that the distance between resting points does not exceed 60m. Seating should be designed to be in accordance with AS1428.2.	**It is recommended that the distance between resting points does not exceed 60m. Seating should be designed to be in accordance with AS1428.2.**
Drinking Fountains Consider the provision of drinking fountains around the site. AS1428.2 gives specific guidance on the design of drinking fountains and water coolers. In particular figure 33 provides guidance. Drinking fountains also require an accessible path of travel.	**Any drinking fountains should be in accordance with AS1428.2.**

Enhanced Design Feature	Recommendations
 DIMENSIONS IN MILLIMETRES FIGURE 33 DRINKING FOUNTAINS AND WATER COOLERS	

4.6 Tea Points & Servery Areas – staff use areas

Enhanced Design Feature	Recommendations
Tea Points, Kitchens & Servery Areas AS1428.2	
Consider the heights of tables, counters, desks and worktops. Where possible incorporate benches at both higher and lower heights. AS1428.2 Clause 24 offers more guidance. Also consider the clear space beneath to enable people who use wheelchairs or other mobility aids to be able to position themselves close enough to be able to use the worktop. The bar height should be considered to ensure access is provided without compromising security. Consider position of key facilities such as sink, dishwashers, hobs, microwaves and ensure adequate clear space is provided to access these areas. Consider the reach ranges discussed below. This may not be appropriate if the kitchen areas are designed to be commercial kitchens.	**It is recommended that servery areas are designed to suit both wheelchair users and standing people.** **It is recommended that areas are designed in accordance with AS1428.2.**

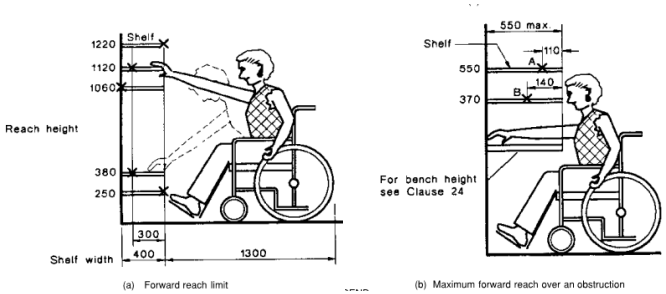
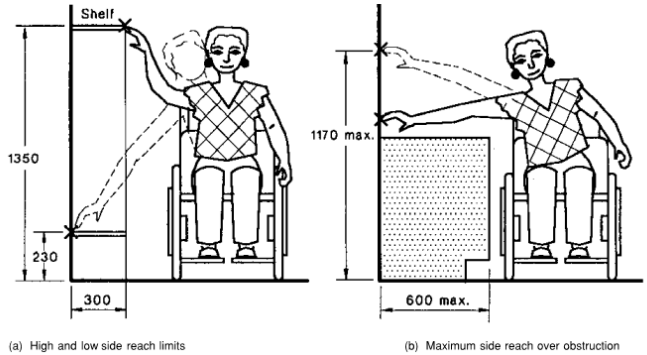
Enhanced Design Feature	Recommendations

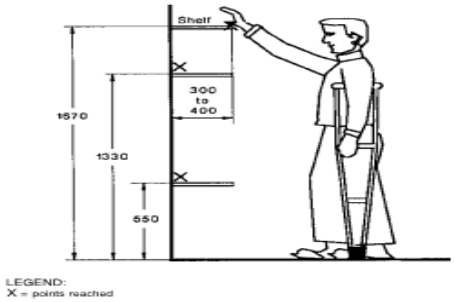
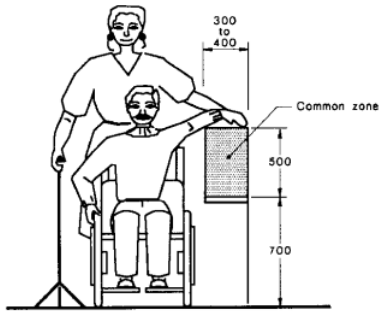
4.7 Public access servery, bar, café and associated seating areas, reception desk

Enhanced Design Feature	Recommendations
Public access servery, bar, café and associated seating areas, reception desk AS1428.2	
Consider the heights of reception counters, tables, counters, and bars. Where possible incorporate counters at both higher and lower heights. AS1428.2 Clause 24 offers more guidance. Also consider the clear space beneath to enable people who use wheelchairs or other mobility aids to be able to position themselves close enough to be able to use the counter, including making payment, filling in forms, seeking information. The bar height may need to consider security. In non-screened counters where there is a public/staff interface, consider providing a hearing loop together with signage.	**It is recommended that servery areas are designed to suit both wheelchair users and standing people.** **It is recommended that areas are designed in accordance with AS1428.2.**

4.8 Reach ranges

Enhanced Design Feature	Recommendations
Reach Ranges AS1428.2 Clause	
Consider reach ranges in the design of items such as • Controls • Door hardware • Furniture	**Consider reach ranges in the design**

Enhanced Design Feature	Recommendations
• Tables • Storage/shelving • Vending machines • Parking payment machines • ATMs • Touch screens • Intercoms Forward Reach  Side Reach  Ambulant Persons Reach	

Enhanced Design Feature	Recommendations
 LEGEND: X = points reached DIMENSIONS IN MILLIMETRES FIGURE 22 REACH OF AMBULANT PEOPLE WITH DISABILITIES Zone of common reach – ambulant and wheelchair users  DIMENSIONS IN MILLIMETRES	

4.9 Emergency Warning & Evacuation

Enhanced Design Feature	Recommendations
Emergency Warning Systems & Evacuation in an Emergency	
Whilst this is not called up directly by the BCA consideration should be given to how people with disabilities will be warned and evacuated in the case of an emergency.	**It is recommended that any building emergency and evacuation plan takes into account the entire potential building population**

5.0 APPENDIX A – DRAWINGS ASSESSED

The following drawings have been reviewed in preparation of this report:

Drawing No.	Revision	Title
A-100	D	Precinct plan
A-002	A	Project legend
A-110	B	Demolition Plan
A-120	G	Ground floor plan proposed
A-200	C	Elevations
A-201	C	Elevations

Appendix L- Geotechnical Report

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ABN: 81 620 142 145

Date	Revision
3 April 2019	A

Nimbus Architecture
PO Box 3214
PARRAMATTA NSW 2123

Our Ref AWT53218
Your Ref

Site Classification as per AS2870-2011

Boronia Park Sports Pavilion, Epping

Site Classification	**CLASS P**
Site Features	Existing structure with grasses and trees
Ground Slope	Gentle
Proposed Earthworks	Unknown (refer "about your report")
Ys Range (normal)	30-40mm (Hs = 1800 mm)
Ips Value	TS1 (300-600 mm) = 2.6%
Water Table	Not present

Allowable Bearing Pressures

100 kPa	At all levels in the natural undisturbed strata
250 kPa	500 mm and deeper into the natural undisturbed strata
400 kPa	500 mm and deeper into bedrock

The pages that form the last six pages of this report are an integral part of this report. The notes contain advice and recommendations for all stakeholders in this project (i.e. the structural engineer, builder, owner and future owners) and should be read and followed by all concerned. This report may only be copied in full. If there is any doubt whether this report is complete, please check with our office.

Please note that should additional information become available that was not supplied or known at the time of our testing, we reserve the right to revise this report without penalty.

Site Specific Notes

From the guidelines in AS 2870-2011 we have derived a normal ys in excess of 20 mm (refer front page), which is a measure of the potential of the strata to change volume with changes in soil moisture (generated by seasonal moisture variations).

During the site visit, we also noted features (see front page) within the zone of influence of the proposed building footprint, which are specifically mentioned in Clause 1.3.3 of AS 2870-2011 as contributing to "abnormal" moisture conditions (AMC). Clause 2.1.2 specifically notes that AMC sites require a "P" classification and AS 2870-2011 offers the following advice to the footing designer on the impact of AMC conditions.

> ***Clause 1.3.3 (in part)***
>
> *"Buildings constructed on sites subject to AMC have a higher probability of damage than that given in Clause 1.3.1"*
>
> ***Clause 1.4.1 General*** *The design conditions specified in Clauses 1.4.2 and 1.4.3 for beams and slabs supported by the foundation on normal sites shall apply.*
>
> *For other than normal sites, the design of the footing system shall be by engineering principles to ensure the footings perform in accordance with Clause 1.3. Design considerations that are particular to the site shall be considered.*
>
> ***Clause 1.4.3(b)*** *"Past satisfactory performance of similar footings on similar sites"*

As the above quoted "normal" ys does not take into account ground movements generated by the "abnormal" conditions, the design engineer must use his/her experience and judgment to ensure that the design provides acceptable performance. In doing this, the following must be considered-

- How the proposed development will change the existing equilibrium of the soil moistures.
- The long-term impact on the soil moisture equilibrium of existing and future vegetation and structures.

The companion book to AS 2870-2011 (SAA HB28-1997) on page 153 advises:

> ***Capacity of Designs*** *– "It should be appreciated that the standard designs can cope with significant one sided mounds resulting from quite large tree movements without failure."*

This is also the case when other sources of abnormal conditions exist. Since 1997, it has been our experience that by creating normal site conditions at the time of site preparation and using a normal slab design of sufficient stiffness to cope with an increased ys (i.e. abnormal ys) then providing the owner/occupiers of both this site and adjoining sites maintains these sites in accordance with the CSIRO guidelines, performance within the AS 2870-2011 criteria is not an unrealistic expectation.

This involves either removing or negating the effects of any tree(s) within the zone of influence of the proposed footing.

When this is done, in our judgment and experience, the following design criteria should give a performance level within the AS2870–2011 performance criteria for the proposed footing system.

Normal y_s	Abnormal	Equivalent Design Class
30-40mm	50-60mm	Class H1

Note: The engineer may also decide to support the footing system on piers taken down to competent strata to negate any future planting of trees.

Warning: Our classification has not allowed for any future tree(s), which may be planted as part of the future landscaping. The owner, future owners and any stakeholder/consultant who is involved in the landscaping, has a duty of care to ensure that any future planting does not adversely affect the proposed dwelling and both Appendix H and CH AS2870-2011 and the referenced CSIRO documents give guidance on "Acceptable Long Term Site Management". Therefore it would be prudent for any such proposal to be presented to the design engineer as soon as it is available, to ensure that the design engineer is satisfied that the landscaping proposed will not adversely affect the footing system.

There is an existing structure on this site which, when removed, will cause some disturbance to the strata down to depths equal to the depth of the footing.

We have assumed that this disturbance will be back-compacted so the performance of the proposed footings is not compromised. If during the earthworks phase it is apparent that the disturbed ground is proving problematic, then the design engineer must be consulted to reconsider the situation.

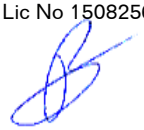
Furthermore, there are generally several uncharted abandoned sub-surface pipes, which generally hold a limited amount of water both within themselves and in the sand bed around them. If footing excavations encounter any of these pipes some local seepage may occur, but normally a competent contractor can cope with this situation.

Note: Cutting and filling the site by depths equal to or greater than 400mm will result in a 'P' classification, which may increase the design 'ys'. Therefore, when the proposed cut and fill earthworks is known, we should be contacted for further advice.

Although no water table was encountered during our testing, a perched water table or water seepage can occur during or after wet periods, generally where a porous layer overlies less porous strata. This generally results in some water seepage into excavations down to this level but a competent contractor can usually resolve this issue.

Unless specifically mentioned elsewhere within this report, we make no representation about the trafficability of the site during construction, however the thicker the topsoil/estate dressing, the greater the problem with moving construction equipment during or after rain periods.

AW Geotechnics Pty Ltd
QBCC Lic No 15082562



Bruce L Hargreaves
Dip.App.Sc (Geology)
QBCC No 616675 (Site Classifier)

References

AS 2870-2011 "Residential Slabs & Footings"
AS 2870-1996 Supplement 1-1996 "Residential Slabs & Footings – Construction Commentary
SAA HB 28-1997 "The Design of Residential Slabs & Footings"
CSIRO "Foundation Maintenance & Footing Performance A Home Owner's Guide" (Sheet BTF18)
CSIRO "Plant Roots in Drains – Prevention and Cure" (Sheet BTF17)
AS4055-2012 " Wind Loads for Housing"

TEST SITE 1					TEST SITE 2				
Depth (mm)	Description Soil Type-Colour-Consistency	FILL	DCP	PP kPa	Depth (mm)	Description Soil Type-Colour-Consistency	FILL	DCP	PP kPa
100	SILT TOPSOIL				100	SILT TOPSOIL			
200					200				
300	SILTY CLAY				300				
400	(or/gy/rd)				400				
500	moist and stiff			400	500	SILTY CLAY			
600					600	(or/gy/rd)			
700					700	moist and stiff			600
800				600	800				
900					900				
1000					1000				
1100					1100				
1200					1200				
1300					1300				
1400					1400				
1500	(xw rock layers)				1500				
1600					1600				
1700					1700				
1800					1800				
1900					1900				
2000					2000				
2100					2100				
2200					2200				
2300					2300				
2400	XW ROCK				2400				
2500	(or/gy)				2500	(xw rock layers)			
2600	dry and med strength				2600				
2700					2700				
2800					2800	XW ROCK			
2900					2900	(or/gy)			
3000					3000	dry and med strength			
	END P/A					END P/A			

NOMENCLATURE: UTP=Unable to Penetrate DCP=9kg Dynamic Cone Penetrometer PP = Pocket Penetrometer A=Auger XW-ROCK=Extremely Weathered Rock Refer Tables 7.3.2 & 7.3.3 AS1726-1993 gy=grey or=orange pnk=pink yell=yellow rd=red wh=white brn=brown bk=black bl=blue gr=green Refer AS1726-1993 Clause A2.4 for classifying soils.

TEST SITE 3

Depth (mm)	Description Soil Type-Colour-Consistency	FILL	DCP	PP kPa
100	SILT TOPSOIL			
200				
300	SILTY CLAY			
400	(or/gy/rd)			
500	moist and stiff			
600				
700				
800				
900	(xw rock layers)			
1000				
1100				
1200				
1300				
1400				
1500	XW ROCK			
1600	(or/gy)			
1700	dry and med strength			
1800				
1900				
2000				
2100				
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
	END P/A			

NOMENCLATURE: UTP=Unable to Penetrate DCP=9kg Dynamic Cone Penetrometer PP = Pocket Penetrometer A=Auger XW-ROCK=Extremely Weathered Rock Refer Tables 7.3.2 & 7.3.3 AS1726-1993 gy=grey or=orange pnk=pink yell=yellow rd=red wh=white brn=brown bk=black bl=blue gr=green Refer AS1726-1993 Clause A2.4 for classifying soils.

Site Sketch (Not to scale)

Site Photographs

About Your Report

This is a site classification report generally in accordance with AS 2870-2011 and should be sufficient for a qualified person to design footings for structures covered under the scope of this standard.

Where our proposed earthworks specification states "Unknown", AS 2870-2011 Clause 2.5.2 requires the site to be reclassified prior to footing construction if the proposed cut exceeds the lesser of $0.25H_s$ or 500 mm and the proposed fill exceeds the limits in Clause 2.5.3 of AS 2870-2011. In these instances, the site classification is in the "as tested" state and may not reflect the final site classification after earthworks. Normally this re-classification is done by the design engineer, but upon request, we can do this.

Where the site preparation is stated as "known", our classification is based on the data given, as we envisage the finished building footprint (which conforms to the AS 2870-2011 guidelines), therefore re-classification is only required if these guidelines change. This report may not be adequate for large complex dwellings that are generally outside the scope of AS 2870-2011.

AS 2870-2011 contains a system of classifying soils based on their ability to change volume with changes in soil moisture. These classes are Class A, Class S, Class M, Class H1, Class H2 and Class E (the most severe). These "Normal" classes also have a minimum allowable bearing capacity as outlined in Clause 2.4.5 of AS 2870-2011.

AS 2870-2011 also has a Class P for problem sites covering fill, soft or collapsing soils, potential slope stability problems, mining subsidence and abnormal moisture conditions.

Abnormal Moisture Conditions (AMC) is a particularly contentious area and Clause 1.3.3 of AS 2870-2011 covers many situations where this clause applies. The most common situations are sites with clay soils (normally Class M, H1, H2 or E (ys > 20)) that have either existing structures or trees or gardens within the zone of influence of the proposed footing. Some of these trees may be on adjoining properties. Where this clause is applicable, we have added further explanatory advice.

The soil shrinkage index (Ips) range quoted in this report was assigned after considering the guidelines in Section 2 of AS 2870-2011 and from this we have derived a ys, which is the "characteristic surface movement" under NORMAL moisture conditions.

Footings designed in accordance with AS 2870-2011 have a long-term performance criteria and it should be noted that this does not offer a crack or distress-free performance. It offers a performance criteria that ensures a low probability of foundation failure, provided abnormal moisture conditions, such as over-watering, bad drainage, leaking pipes or nearby trees are not allowed to exist or develop.

These performance criteria are outlined in Appendix C of AS 2870-2011 and under normal conditions a low incidence of Category 1 damage and an occasional incidence of Category 2 damage is expected. This appendix is available from our office upon request.

Where Abnormal Moisture Conditions exist and/or are allowed to continue or develop, then not only will the above probabilities increase, but the damage will be greater. The ultimate responsibility falls on the design engineer to negate the effects of these conditions when they are known and for the owner/occupier to ensure that they do not develop. Our responsibility is limited to identifying these conditions.

If any potential owner is not satisfied with the performance criteria in AS 2870 (which has been applied Australia wide since 1986) then prior to footing design he/she should consult with the design engineer and have a specially designed footing more suited to their needs.

Classification Limitations

The content of this report is based on the expertise and experience of the author representing this company. Our commission didn't extend to assessing instability due to previous or existing sub-surface mining, landslip or earthquakes, nor did it extend to testing to comply with the relevant contaminated land act or for acid sulfate soils (see note below). If, however any of these exclusions was obvious or where the allotment is within an area where we are aware of a past history of these exclusions, we have made comment and given further advice.

This report is based on the assumption that the test results are representative of the true site conditions. Even under optimum circumstances, actual conditions may differ from those reported to exist. Although our investigation exceeds the minimum requirements of AS 2870-2011, economic constraints necessarily limit the practical extent of any investigation. We therefore cannot accept responsibility for conditions encountered on this site outside the areas tested which are different to those reported. The positions of these test sites have not been surveyed, and should be regarded as approximate. We have followed AS 2870-2011 soil descriptions contained in Clause C2.1 rather than AS 1289 because where there is a conflict between referenced codes, AS 2870-2011 takes precedence.

Underslab Termiticide Irrigation Systems

These are becoming popular and besides serving their obvious purpose, they also inject extra moisture beneath the slab at various times (measured in years). This creates long term "abnormal" moisture conditions that needs to be addressed at the design stage, therefore if one of these is proposed for this project, the design engineer must be informed prior to preparing the slab.

As a general rule, to cope with these systems, the ys must be increased by about 50%, which will generally result in a slab one category higher than would normally be used (refer P12, Supplement to AS 2870-2011). Upon request we can supply more specific advice.

Acid Sulfate Soils (ASS) & Saline Soils

Unless specifically stated, we have not considered the possibility of ASS, which occur around the coastline, generally below AHD 5.0 and occasionally on broad river flood plains at higher levels. Most Councils maintain maps of these areas. In new estates the ASS problem has normally been assessed and neutralised, but it is worthwhile confirming this at land sales, if ASS are suspected. In older areas, the council is normally the best source of advice. ASS, if present, do have the potential to dramatically shorten the life of footings, slabs, reinforcement and bricks. This advice is also relevant for saline soils. Unless specifically stated, we have not considered the possibility of Saline Soils, however we can provide a quotation to complete this testing.

Filled Ground

Controlled Fill - Material that has been placed and compacted in layers by compaction equipment within a defined moisture range to a defined density requirement in accordance with AS 3798-2007 Clause 6.4.2 of AS 2870-2011 defines controlled fill.

Uncontrolled Fill - Fill that does not have sufficient documentation to be classified as controlled is by exclusion, uncontrolled. Where found we have offered further advice within this report.

Topsoil/Estate Dressing

In our soil log section, where we have logged "Topsoil" or "Estate Dressing" it is defined as per clause 1.2.15 of AS 3798-2007 thus:

"A poorly compacted superficial soil containing some organic matter, usually darker than the underlying soils"

Good building practice dictates that all heavy organic strata be scraped clear of the building envelope during the early stages of site preparation and we have assumed that this will be done.

Short Term Site Management

This is the responsibility of the builder, and besides ensuring that the site is handed over to the owner at completion in accordance with accepted practice, the following should also be done:

- Ensure all service trenches are back-filled as soon as possible in accordance with Clause 6.6 of AS 2870-2011, including the clay plug where a service pipe trench exits the building footprint.
- Ensure guttering is connected to the stormwater (via temporary pipes if necessary) as soon as the roof is on.
- Ensure that during construction and at the time of hand-over that the site is maintained as per Clause 5.2.1 of AS 2870-2011.

If any of these practices are not carried out, the site may develop "abnormal" moisture conditions, increasing the risk of damage above the AS 2870-2011 criteria.

Other Construction Issues

The builder must also ensure that other sub-trades such as plumbers, drainers and swimming pool contractors don't establish excavations within the critical zone of influence of the footing system unless the footing is piered below the influence of these excavations. This critical zone varies from 20° (1V:2H) to 45° (1V:1H), depending on the nature of the strata. If this situation is considered possible, then once the proposal is known we can offer further advice. These excavations include inground tanks. Unless we have specifically given written approval, no inground tanks should be sited within 8 metres of any structural footing.

Furthermore, there should be no in ground disposal or storage of water, (i.e. soakage pits, rubble pits, rain gardens or similar), within eight (8) metres of a structural footing, without our prior written approval.

Where the proposed earthworks involve the establishment of cut/fill batters, advice concerning safe angles is beyond the scope of commission in this report. AS 2870-2011, Clause 6.4.4 offer guidelines.

Long Term Site Management

It is the owner's responsibility to ensure both tenants and future owners are aware of these responsibilities. The referenced CSIRO sheets outline these responsibilities and if the builder does not give the owner a copy, they can be sourced from either the CSIRO (1800 645 051) or our office.

The major danger to dwellings is allowing site conditions to deteriorate to "abnormal" in the long term.

Where abnormal moisture conditions are allowed to continue or to develop, then not only will the above probabilities increase, but the damage will be greater.

The CSIRO sheets define both "normal" and "abnormal" conditions.

The significant (not necessarily in order) abnormal conditions that adversely affect the performance of AS 2870-2011 type footings are:

- Trees growing or allowed to grow within the critical zone of influence of the footings.
- Poor site drainage
- Saturated service trenches (poor site drainage).
- Leaking service pipes

The builder, owner/occupier and engineer should take note that management of trees is the most difficult part of the site management procedures and trees present the greatest risk to the future poor performance of the footing system. Trees (existing or proposed) must not be allowed to grow without taking action to negate their effects within the critical zone of the footing system.

Class	Normal ys	Critical Zone
Class M	< 40mm	.75 times mature height
Class H1	40-60mm	1.0 times mature height
Class H2	60-75mm	1.0 times mature height
Class E	75-100mm	1.5 times mature height
Class E	>100mm	2 times mature height

These spacings must be increased for groups or rows of trees.

These distances are only a "rule of thumb" as the tree species and their root systems play an equally important role

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Understanding soils, trees and how they can affect your house.

This document is a plain language guide to what should be expected from the construction of single dwellings, townhouses or similar structures not situated vertically above or below another dwelling. It has been compiled by the HEDRA Task Force committee in the belief that the information contained is helpful to the parties mentioned, however no warranty of accuracy or reliability as to the information is given, and no responsibility for loss arising is accepted.

1. EXPLANATIONS

Footings (often incorrectly called foundations) are the "members" that support the building. They are commonly concrete slabs or timber floors supported by strips and stumps. (Fig 1, 2 & 3).
Foundation is the soil or rock supporting the footings. **Reactive Clay foundations** are those that shrink and swell with changing moisture and cause the building and paving to sink or lift. **Reverse slope** is one that slopes towards the building. (Fig 18) **Sand foundations** do not shrink or swell but if they are loose they can cause the building to sink. **The Australian Standards** for building footing construction permits minor wall and floor movements. If the foundation conditions are changed after construction the floor and walls may move more than allowed-for by these standards. The designs for building footings in Australian Standard 2870 will perform adequately provided the building site and surrounds have "normal" foundation conditions which are maintained. If the building site and surrounds have "abnormal" moisture conditions, special provisions must be followed by the design engineer, builder and owners. **(AS2870 defines "abnormal" moisture conditions)**

The "reactivity" of clays is their capacity to shrink and swell with changing moisture and is classified as follows :

A	Reactivity absent
S	Slight reactivity
M or M-D	Moderate reactivity
H1 or H1-D	High reactivity
H2 or H2-D	Very High reactivity
E or E-D	Extreme reactivity

The greater the clay "reactivity" the greater the possibility of damage. Some minor cracking of walls is almost inevitable despite proper design, construction and maintenance. AS2870 suggests that cracks up to 1 mm wide are common and that cracks up to 5 mm may occur in clay sites subject to significant moisture changes. Some cracks are seasonal but if larger than 5 mm they are regarded as significant and should be investigated before becoming larger.

Fig. 1 Stiffened Raft

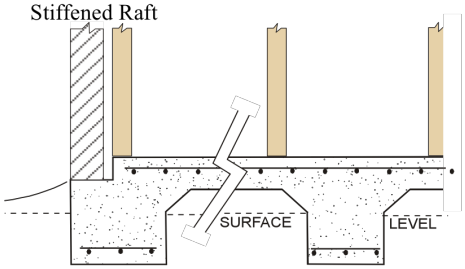


Fig 2 Waffle Slab

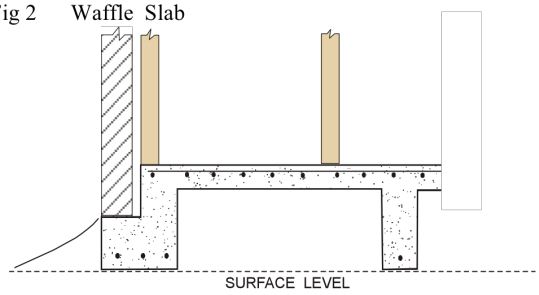
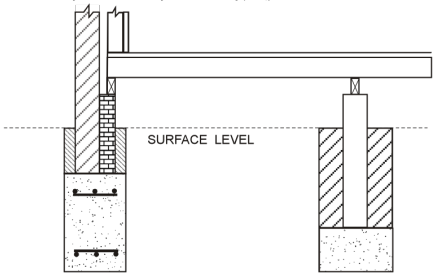


Fig. 3 Strip & Stump Footing System



2. ENGINEERING

The engineer designs house footings to ensure that they can cope with the soil and environmental conditions assessed at the time of the site investigation and perform to their design potential.

3. BUILDING

In the construction of a building the builder needs to comply the Building Code of Australia, relevant Australian Standards, engineering specifications and contract documents. (Fig. 4) The following are important aspects the builder will need to address:

- Builders should ensure that owners understand that failure to maintain adequate drainage may result in damage to the structure.
- Well-drained foundation conditions, which will create "normal" soil moisture and adequate bearing capacity.
- Ensuring that excavations are well supported or are dug to avoid collapses. (Fig. 11)
- Constructing well-compacted and retained 'soil aprons' around the building to stop erosion.
- Special considerations if any excavations are to be dug near adjoining structures.(Fig. 11)
- Sloping the soil and paths away from the building by the minimum amount required by the building regulations to prevent water flowing towards the building foundations. (Fig. 10 & 18)
- Constructing soil drains or moisture barriers in sloping sites to prevent stormwater adversely affecting the building foundations.
- In highly or extremely reactive clay sites Australian Standard 2870 – "Residential slabs and footings" requires *mechanical flexible couplings* for sub-surface drainage pipes and for above-ground connections from the downpipe to the storm water drains. These allow for the movement of the soil and minimise the risk of pipe joints breaking and creating leakage problems. (Fig.6).

4. HOME OWNERS

The home owner should read and become familiar with the Site Classification report provided prior to construction and the type of footing system used in the building. To comply with Australian Standard 2870 – "Residential slabs and footings", and achieve acceptable performance and safety during the design life of the house, the owners shall maintain the garden and foundation soil moistures, paving and drainage systems. (Fig. 7)

Failure to maintain the foundation conditions can lead to cracking of walls and floors. Damage to a building that can be attributed to actions of the owner could diminish the builder's warranty obligations, leaving the owner responsible for the cost of repairs

Fig. 4

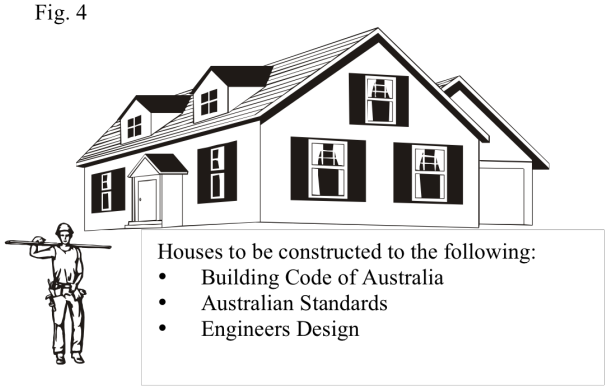


Fig. 5 Well Drained Sites

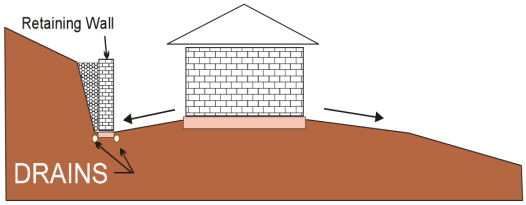


Fig. 6 Mechanical Flexible Couplings to reduce the potential of broken pipes in M/M-D, H1/H1-D, H2/H2-D & E /E-D sites plus all clay based sites with trees

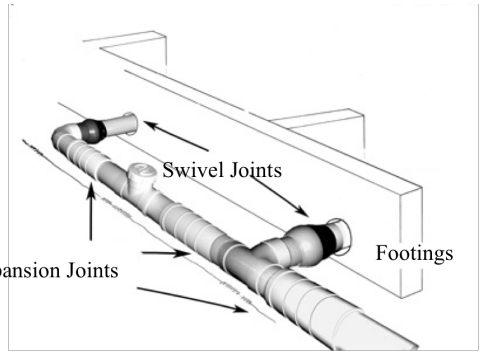


Fig.7

WORKS AFTER TAKING POSSESSION

In some cases foundation conditions are changed by the owner constructing new works such as:

- Constructing sheds or outdoor roofed areas without connecting the roof drainage to storm water lines.

- Constructing paving around the building without sufficient slope away from the building. (In sandy soils and low and moderate "reactivity" clays, a slope of 1:40 up to 1 metre away from the building is adequate. In highly reactive clays a slope of 1:20 works better. In large paved areas a drain and collection pit may be necessary). (Fig. 5 & 18)

- Australian Standard 2870, "Residential Slabs and Footings" requires soil drains and "normal" soil garden moisture in M, H1, H2, E, and P sites to be maintained by the owner. (Fig 10)

- Running machinery over shallow drain pipes may break them causing leaks and subsequent foundation movements.

- Any excavations close to building footings can cause them to sink by disturbing the foundation material or by drying the foundation clay. (Fig 11)

- Footings constructed in reactive clay sites during wet periods may be damaged if the garden is allowed to dry out excessively.

- Footings constructed in reactive clay sites during dry conditions may experience damage if the garden is watered unevenly or excessively.

5. LANDSCAPING AND TREES

Most modern allotments with clayey soils are too small to safely grow large trees without special footings. Generally the larger the root system of the tree(s) the greater the drying effect. If in doubt seek the advice of an expert arboriculturist and designing engineer.

If you are about to build in a clay area and you wish to grow, retain or remove trees near buildings, the builder should be advised of this prior to signing the building contract so that the engineer can design for these conditions.

- Trees can cause damage during their life and even for many months after their removal. If they do not receive sufficient water while alive their roots will dry the soil near buildings or under pavements.

Fig. 8 Drainage concerns

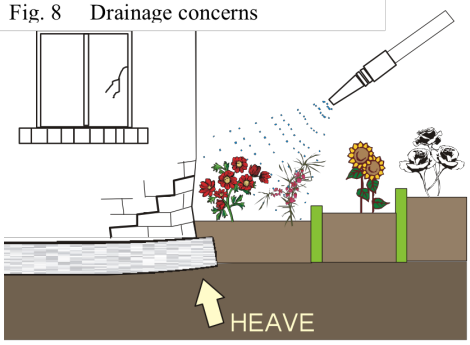


Fig. 9 Slab heave due to water ponding

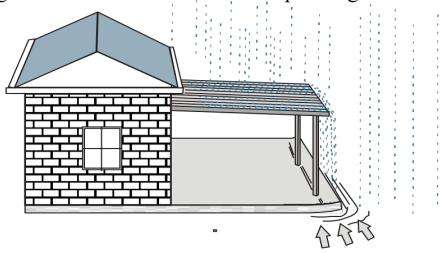


Fig. 10 Soil Drainage Plan

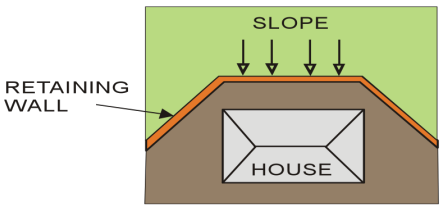


Fig. 11 De-stabilizing house foundations

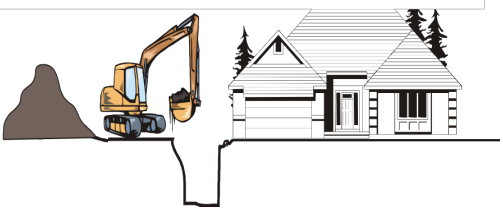
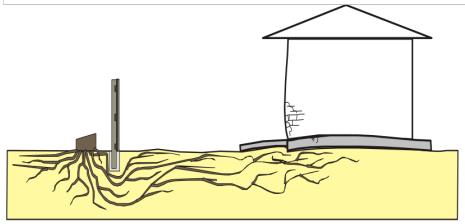


Fig. 12 Damage due to soil moisture changes



If you plan to remove trees after the building is constructed you should consult the designing engineer an expert arboriculturist or a geotechnical practitioner familiar with these problems.

Tree roots in sandy areas rarely cause any damage since sand does not shrink or swell, however if the root ball or large root is very close to a building it may grow and lift the footings of a light structure. (Fig. 13)

Foundation problems in clay sites may also be caused by :

- Excessive watering or under-watering of gardens.
- Watering systems that are overused or discharge water too close to building walls (Fig. 8)
- Constructing terraces, retaining walls or garden walls without good drainage. (Fig. 10)

6. POOR SITE MAINTENANCE

The change of foundation soil moisture is by far the greatest cause of building damage. Changes of drainage or garden watering conditions in adjoining properties can also create problems.

- A drainage system may be necessary if water flows near the building. All possible water leaks and sources should be repaired immediately, e.g.:
- Leaking or blocked roof gutters which cause water to overflow near building walls. (Fig. 14)
- Hot water systems relief valve pipes should be discharged into storm water lines. (Fig. 15)
- Air conditioners operating during hot, humid weather that discharge water near the building footings. (Fig.16)
- Leaking or overflowing water tanks near building footings. (Fig. 17)
- Land or paving that slopes towards the building and cause rain water to flow near the building. (Fig. 18)
- Water from the failure to repair plumbing leaks or leaky taps, hoses or by regularly washing cars in areas near building walls. (Fig. 19)
- Water flowing near buildings (even from neighbouring properties) must be diverted away from the footings or collected. (Fig. 20)

Fig. 13 Root Damage

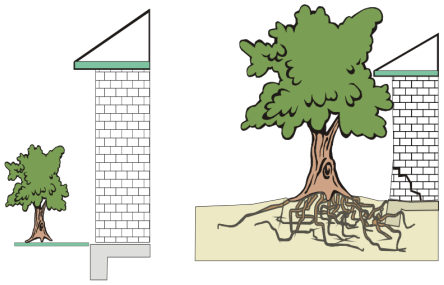


Fig. 14 Overflowing roof

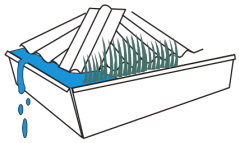


Fig. 15 Common leak source

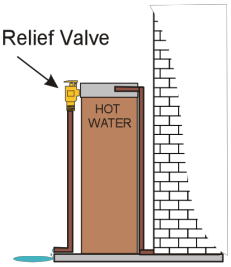


Fig. 16 Air con, up to 35 L/day loss

Fig.17 Leaky pipes

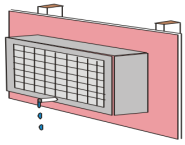


Fig. 18 Reverse Sloping paths

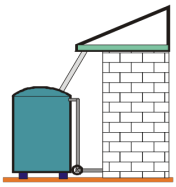
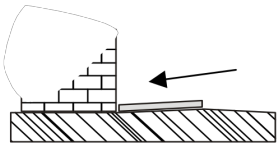


Fig 19 Leaking tap



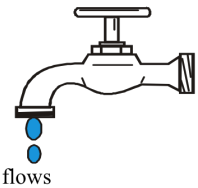


Fig. 20 Adjoining property water flows