CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Wingaru STEMP Project

for

Saint Ignatius' College Riverview

Saint Ignatius' College
RIVERVIEW

Belmadar Pty Ltd

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

PROJECT: SAINT IGNATIUS' COLLEGE WINGARU STEMP PROJECT

REVISION – 05

Date – 28 March 2024

This CEMP was completed and reviewed by the project team:

NAME	POSITION	DATE	SIGNATURE
Loui Abouhamad	Project Manager	28/03/2024	Loui Abouhamad
James Blackburne	Site Manager	28/03/2024	James Blackburne

This CEMP reviewed and understood for responsibilities by:

NAME	POSITION	DATE	SIGNATURE
Nick Aslanidis	Site Manager	28/03/2024	Nick Aslanidis
Daniel Ianni	Project Engineer	28/03/2024	Daniel Ianni
Cindy Maio	Site Engineer	28/03/2024	Cindy Maio
Brock Twigg	Site Engineer	28/03/2024	Brock Twigg

This EMS was reviewed and approved by:

NAME	POSITION	DATE	SIGNATURE
Brett Drew	Construction Director	28/03/2024	

CONTROLLED DOCUMENT

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1. PURPOSE

The purpose of this Construction Environment Management Plan (CEMP) is to describe how Belmadar will deliver the construction of the Wingaru STEMP project. The plan will detail how Belmadar will ensure the project is built safely, efficiently and to a high standard with minimal disruption to the ongoing operation of the St. Ignatius' College Riverview and the execution of works adjacent or proximate to the site by other contractors.

1.1. SCOPE OF PLAN

This Plan provides a holistic approach that:

- Advises how the project management team will comply with the requirements of the contract relating to construction.
- Defines the project objectives and targets of relevance to the construction phase.
- Describes constraints specific to the construction phase and the project in general.
- Describes the process for the identification and control of risks specific to the construction phase.
- Details the proposed strategy for the construction phase, specifically around resourcing,site organisation and construction controls.

This Plan has been prepared in accordance with relevant Guidelines including the Environmental Management Plan Guideline: Guideline for Infrastructure Projects (DPIE April 2020)

1.2. OBJECTIVES

Environmental goals and objectives have been established in accordance with relevant legislation / requirements and will be monitored by senior management. Objectives are displayed in the table below:

Aspect	Objective	Target	Controls	Responsibility
Noise / Vibration	To minimise noise and vibration disturbance to site neighbours	No complaints and comply with Breaches to Formal Instrument of Agreement for Australian Standard General Conditions of Contract Saint Ignatius' College Wingaru STEMP Project	3.1 Noise and Vibration	Excavation Contractor, Belmadar Supervisor
Dust / Air pollution	To minimise and confine dust within the site	No complaints and comply with Breaches to Formal	3.2 Dust / Air Quality	All Contractors and Belmadar

Aspect	Objective	Target	Controls	Responsibility
		Instrument of Agreement for Australian Standard General Conditions of Contract Saint Ignatius' College Wingaru STEMP Project requirements		Supervisors
Water Quality	To minimise impact on natural water courses from de-watering operations	No Breaches to Formal Instrument of Agreement for Australian Standard General Conditions of Contract Saint Ignatius' College Wingaru STEMP Project. Meet water quality targets of 14.3	3.3 Water Quality	Earthworks Contractor, Belmadar Supervisor
Erosion and Sediment Control	To minimise erosion on site during the construction period and prevent dirty water and sediment entering stormwater system	No Breaches to Formal Instrument of Agreement for Australian Standard General Conditions of Contract Saint Ignatius' College Wingaru STEMP Project. Meet water quality targets of 14.4	3.3 Erosion and Sediment Control	Earthworks Contractor, Belmadar Supervisor
Chemicals / Hazardous Materials	To control spills and minimise potential for harm	No environmental harm	Chemicals/ Hazardous Materials	All Contractors and Belmadar Supervisors
Land Contamination	To control any existing contaminated soil excavated on site	No Breaches to Formal Instrument of Agreement for Australian Standard General Conditions of Contract Saint Ignatius' College Wingaru STEMP Project with soil contaminant limits	Land Contamination	Earthworks Contractor, Belmadar Supervisor
Waste Minimisation / Management	To control all waste materials generated on the site and encourage recycling	Recycling Targets: as defined in 14.7	3.5 Waste Minimisation / Management	All Contractors and Belmadar Supervisors

Aspect	Objective	Target	Controls	Responsibility
Heritage Management	To comply with heritage legislation and ensure that existing heritage sites are protected from construction activities.	No disturbance or damage to existing known heritage sites or items.	15.8 Heritage Management	Earthworks Contractor, Belmadar Supervisor
Flora / Fauna Management	To protect flora assets identified in the Tree Protection Plan	No harm to flora assets	15.9 Flora / Fauna Management	Earthworks / Landscape Contractors, Belmadar Supervisor

Progress towards these objectives is to be monitored through internal audits conducted by theSystems Manager and HSEQ Director and reported in the monthly HSEQ report.

1.3. ROLES AND RESPONSIBILITIES

The responsibilities associated with environmental management apply to all personnel of the Belmadar team, Wingaru STEMP project. The following organisational chart outlines the Belmadar personnel responsible for the implementation of all aspects of the EMS. The chart is to be updated if any changes in circumstances arise such as legislative amendments or reported incidents.

	Managing Director	HSEQ Director	Client Representative	ABC & AEO Bodies	Systems Manager	Project Manager	Site Manager	Site Engineer	Foreman	Subcontractor
Provide resources to ensure the Environmental Management System adheres to environmental legislation, Australian Jesuits Code of Conduct and Standards.	✖	✖	✖	✖	✖					
Promote a positive workplace environmental culture.	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
Establish project specific objectives and targets. Monitor and report accordingly.		✖	✖			✖	✖	✖		
Complete project specific environmental documents using templates						✖	✖	✖		
Establish the environmental requirements for site establishment and planning requirements.						✖	✖	✖		
Obtain Working With Children (WWC) Check	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
Establish and maintain environmental registers including legislation, training and objectives.		✖			✖					
Identify and assess competency of employees and facilitate any training requirements		✖			✖	✖	✖			
Determine and assess requirements for environmental monitoring (i.e. noise, air, and dust) and implement.						✖	✖			
Provide site personnel with relevant environmental management documentation.					✖	✖				
Obtain environmental documentation from each subcontractor prior to commencing. Review and identify required changes prior to work commencement							✖	✖		
Assess subcontractors' ability to comply with the project environmental systems and requirements							✖	✖		
Conduct inductions for all personnel attending site and maintain records.							✖	✖		

	Managing Director	HSEQ Director	Client Representative	ABC & AEO Bodies	Systems Manager	Project Manager	Site Manager	Site Engineer	Foreman	Subcontractor
Complete an environmental risk assessment at commencement of the project and update as required						✖	✖	✖		
Maintain register of all onsite hazardous materials, chemicals or dangerous goods.							✖	✖		
Obtain safety data sheets and provide adequate chemicals and hazardous materials storage onsite.							✖	✖		
Attend projects to monitor and discuss Environmental issues with project management, supervisors and workers	✖	✖			✖					
Schedule and conduct environmental audits of Subcontractors. Distribute report and monitor status		✖			✖					
Conduct environmental consultation and communication when necessary	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
Implement emergency response procedures as outlined in the site Emergency Response Plan						✖	✖	✖	✖	✖
Report and investigate environmental incidents. Monitor corrective actions and distribute any lessons learnt							✖			
Report and distribute non-conformances and apply corrective actions. Review effectiveness of the applied corrective actions.		✖			✖	✖	✖	✖	✖	✖
Implement environmental sub-plans and procedures		✖			✖	✖	✖	✖	✖	✖
Obtain feedback for both internal/external training conducted and evaluate the effectiveness of the training programs		✖								
Review environmental objectives and targets annually and provide clear direction of the Environmental management system for the next 24 months.	✖	✖	✖	✖						
Review procedures and forms resulting from changes in legislation, regulation, standards, codes of practices and incidents					✖					
Attend stake holder meetings to assess environmental performance, identify and document lessons learnt	✖	✖	✖	✖						
Ensure that independent audits of the Environmental Management Systems are		✖			✖					

	Managing Director	HSEQ Director	Client Representative	ABC & AEO Bodies	Systems Manager	Project Manager	Site Manager	Site Engineer	Foreman	Subcontractor
conducted										
Review environmental performance through preparation of the monthly HSEQ report		✖			✖					
Comply with legal and contractual requirements	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖

1.4. CONTACT DETAILS FOR RELEVANT PROJECT OFFICERS

NAME	POSITION	MOBILE NUMBER
Damian Lorenzutta	Saint Ignatius' College Riverview	02 9882 8222
Jordan Graham	Senior Project Manager	0431 157 506
Alfredo Marrocco	Managing Director	0419 666 040
Matthew Stafford	Pre-Construction Director	0414 228 886
Brett Drew	Construction Director	0414 228 823
Loui Abouhamad	Project Manager	0406 505 556
James Blackburne	**Site Manager (24hr Contact)**	**0408 200 096**
Nick Aslanidis	Site Manager	0414 449 098
Damien Cavanough	HSE Manager	0436 440 221
Daniel Ianni	Project Engineer	0468 470 418
Cindy Maio	Site Engineer	0450 421 027
Brock Twigg	Site Engineer	0476 123 848

1.5. PROJECT DESCRIPTION AND SCOPE OF WORKS

The works are outlined within Development Consent (DA) as defined by Section 4.38 of the Environmental Planning and Assessment Act 1979, issued by Lane Cove Council. Relevant details re provided below.

- Application No: SSD10424
- Applicant: Saint Ignatius' College Riverview Limited
- Consent Authority: Minister for Planning and Public Spaces
- Site: 2-60 Riverview Street and Tambourine Bay Road, Riverview. Lot 10 DP1142773

- Development: Stage 2 of the Saint Ignatius' College Riverview Development comprising:
    - demolition works, removal of services and construction of new five storey building (Ignis building) to accommodate flexible teaching and learning facilities, six pastoral care areas, staff rooms, multi- purpose hall, canteen, and basement service level.
    - internal demolition works and refurbishment of the O'Neil Building to integrate with the new building.
    - redevelopment of the courtyard area and inclusion of a covered outdoor learning area; and
    - associated landscaping upgrade works.

Where the DA identifies relevant standards or policies, the Works shall adopt those standards and policies. A complete list of applicable standards and policies can be found in **Annexure 1**.

Wingaru will provide specialised facilities for studying Science, Technology, Engineering, Mathematics and Personal Development Health and Physical Education (PDHPE).

Belmadar have been engaged to construct the 4 level plus basement level building, which joins onto the existing O'Neil Building. The new structure will be a concrete framed structure and involve the fit out of the O'Neil Building.

Prior to commencement of the construction works, there are several activities requiring completion to enable commencement of construction including:

A. Installation of hoarding for construction site
B. All-weather car park and access (150mm thick compacted DGB20)
C. Construction of site access path
D. Relocation of the existing "Kiss & Drop" and all-weather pedestrian access
E. Construction of loading zone
F. Construction of stockpile area
G. Construction of scaffold bridge over student access path
H. Construction of a temporary roundabout immediately south of the relocated "Kiss and Drop".

These works have been constructed and construction work is underway. During construction, the works areas will be isolated from the remainder of the campus using a combination of temporary Chainwire fencing complete with shade cloth wrap, ATF fencing with shade cloth wrap, Waterfilled Jersey Kerb Barriers with Fencing and A class timber Hoarding.

A graphical representation of the main works area general site layout described above is provided at Figure 1 below.

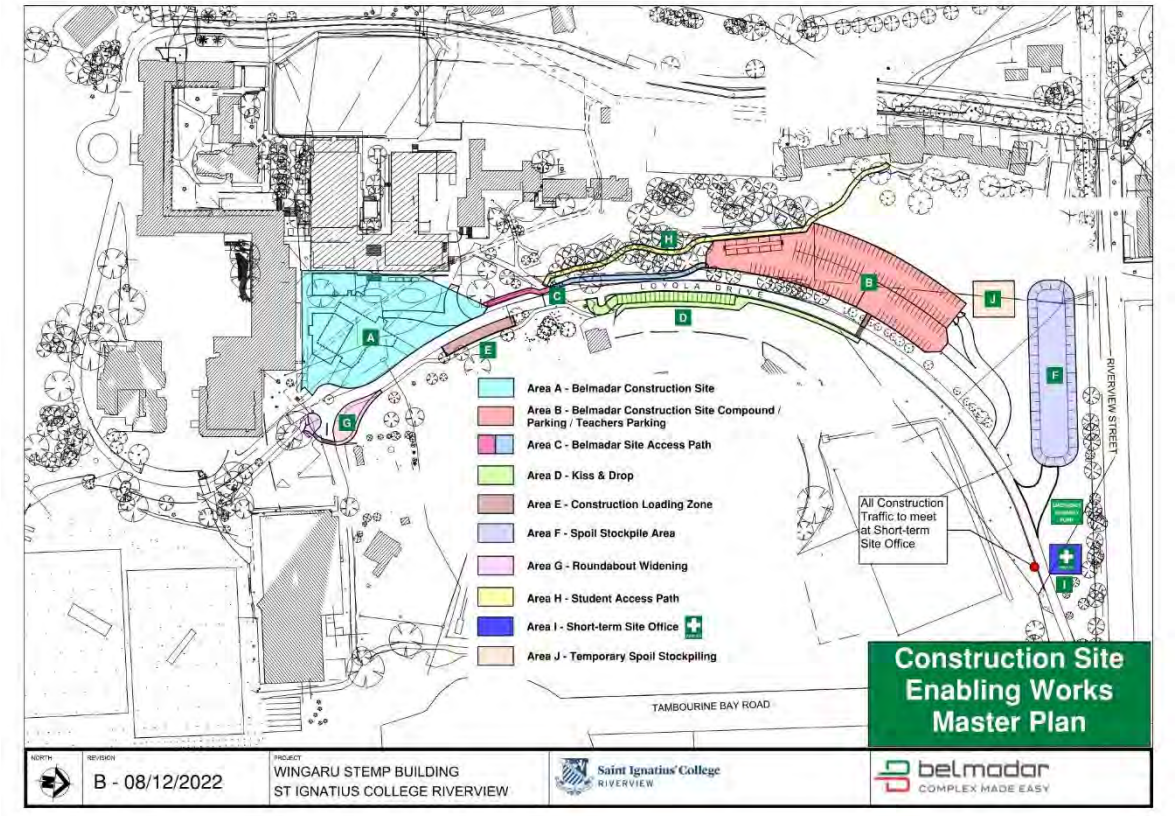


Figure 1 Construction Site Enabling Works Master Plan

1.5.1. AREA A – SITE PERIMETER

Temporary fencing/ hoarding will be installed around the perimeter of Belmadar's construction site. On completion of the temporary fencing/hoarding, sediment and erosion controls will be installed in accordance with Concept Sediment and Erosion control plan, prepared by TTW, Drawing No C10, Job No 191740, Rev B, including construction of an all-weather access road, sediment fences, sediment protection to kerb inlet pits and other sediment control features.

All construction vehicle movements will be controlled in accordance with the Construction Traffic and Pedestrian Management Plan (CTPMP), prepared by Transport Strategies, Issue: Final D (August 2023). Upon arrival to the College, all construction vehicles will be directed to the Construction Loading Zone (Area E) and wait for unloading by the Site Team. A tower Crane will handle all material unloading from the Construction Loading Zone into the site. All delivery bookings will be booked via the Site Manager.

1.5.2. AREA B- ALL-WEATHER CAR PARK, SITE COMPOUND & STAFF PARKING

With the loss of the existing available car parking spaces allocated to the proposed construction loading zone and temporary kiss and drop described above, a temporary all-weather car parking facility, complete with all-weather access road, has been constructed to provide faculty car parking for the duration of the project, including a designated area for Teachers, separated from the Construction

Traffic. Wayfinding signage is installed to direct Teachers and construction staff to the relevant parking spaces.

The temporary all-weather car park will provide a minimum of 25 car parking spaces and be established on the western side of Loyola drive to the northern end of the campus in the area known as "The Slopes". The all-weather access road will link the car park with Loyola Drive to the north.

The car park and access road surface will consist of approximately 150mm thick compacted DGB20. The Site Compound and worker access point will be via the Contractors Carpark to the site.

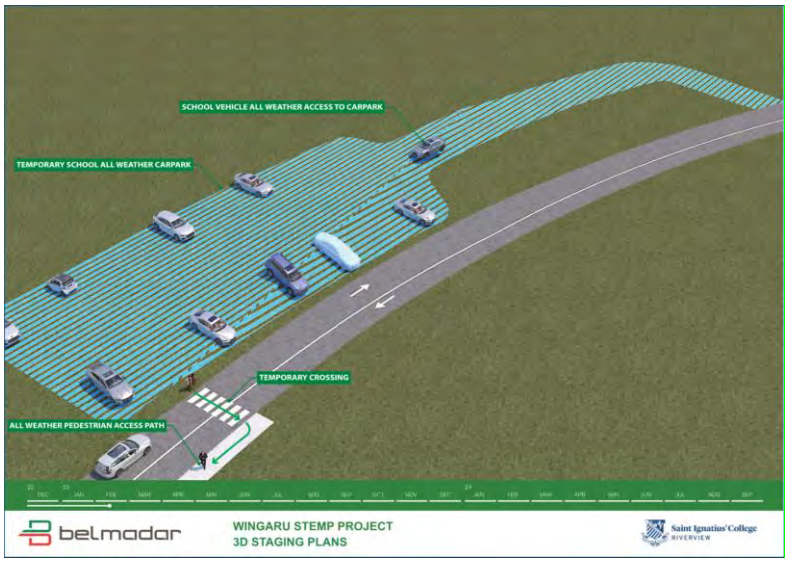


Figure 2 All-Weather Car Park and Access Road

1.5.3. AREA C- ALL-WEATHER CONTRACTOR ACCESS LINK FROM SITE COMPOUND TO AREA A

To link the Site compound (area B) to the site area (area A), Belmadar will construct a temporary cement stabilised DGB footpath to the western side of Loyola Drive. The footpath will extend from the Site Compound, located at the southern end of the Contractors Carpark (Area B) and connect with Belmadar's site (Area A) as shown below.

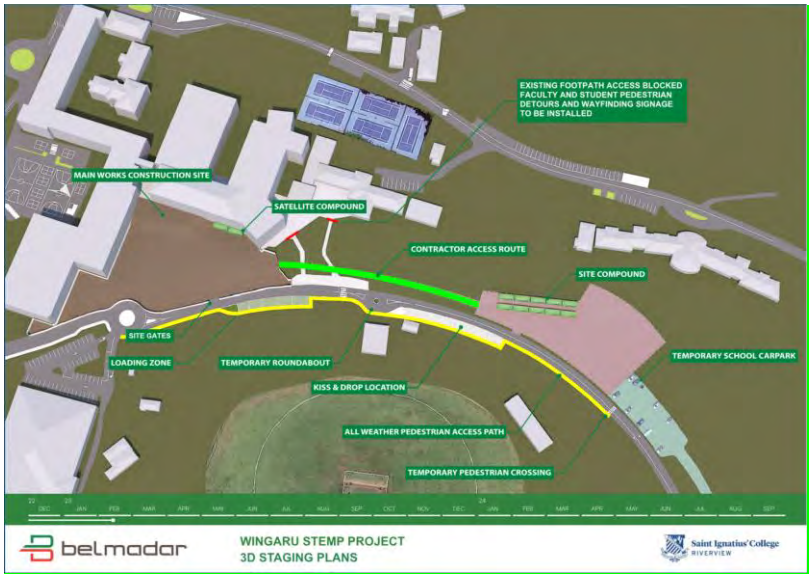


Figure 3 All-Weather Pedestrian Access

1.5.4. AREA D & E- RELOCATED KISS AND DROP AND TEMPORARY ROUNDABOUT

The existing kiss and drop facility for the College is located immediately northeast of the site, on the eastern side of Loyola Drive is to be converted into the Contractor's Loading Zone for the building works. To facilitate this the works, involve the construction of a temporary kiss and drop, further north along Loyola Drive using the existing car parking spaces, on the eastern side of Loyola Drive, immediately north of the Farther Mac Pavilion.

Establishment of the temporary kiss and drop will involve:

1. Traffic controllers to establish signage and stop/go stations as required to the traffic control plan for site boundary establishment.
2. The perimeter of the work area will be established by erecting temporary site fencing, bracing, shade-cloth and safety signage to segregate from common areas.
3. Siltation fencing to be positioned on the eastern side to the lower contour of the land. Silt/gravel bags
4. Removal of existing car park line marking
5. Plant to be loaded off with-in Kiss & drop-off compound and tracked over to excavate and prep substrate for concrete works to footpath widening.
6. Edge boards, re-enforcement and concrete placement will be supplied directly out of the Kiss & drop compound.

To facilitate safe vehicular movement out of the new temporary kiss and drop, adequate turning area will be provided. To achieve this, Belmadar has carried out the following:

7. Demolition of the existing concrete kerbs to the southern end of the former parking bay
8. Demolition of the existing concrete kerb to the northern side of the existing driveway entry to the Farther Mac Pavilion car park

9. Minor re-grading and boxing out of the existing grassed slope between the former carparking bay and the driveway.
10. Boxing out of the existing grassed area between the southern side of the driveway and the existing sewer manhole
11. Installation of subgrade material to the slope between the former carparking bay and the driveway
12. Installation of subgrade material to the area between the southern side of the driveway and the existing sewer manhole
13. Installation of asphalt to both areas described above.
14. On completion of footpath-works line marking will be carried out to identify new zones. Also, directional/wayfinding line marking will be incorporated.
15. Relocation of existing signage and allowance for temporary configuration of any additional signage will be completed.
16. Temporary fencing to be dismantled under traffic control conditions and road use re-instated for normal public use.

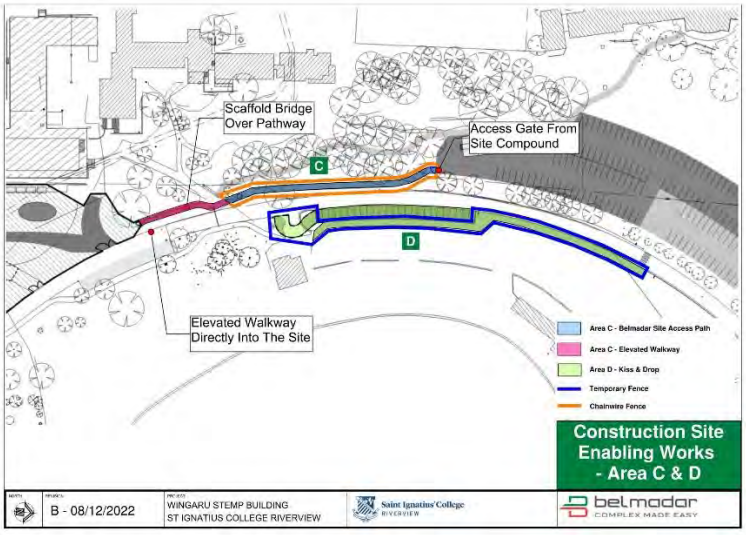


Figure 4 Temporary Roundabout Preliminary Design

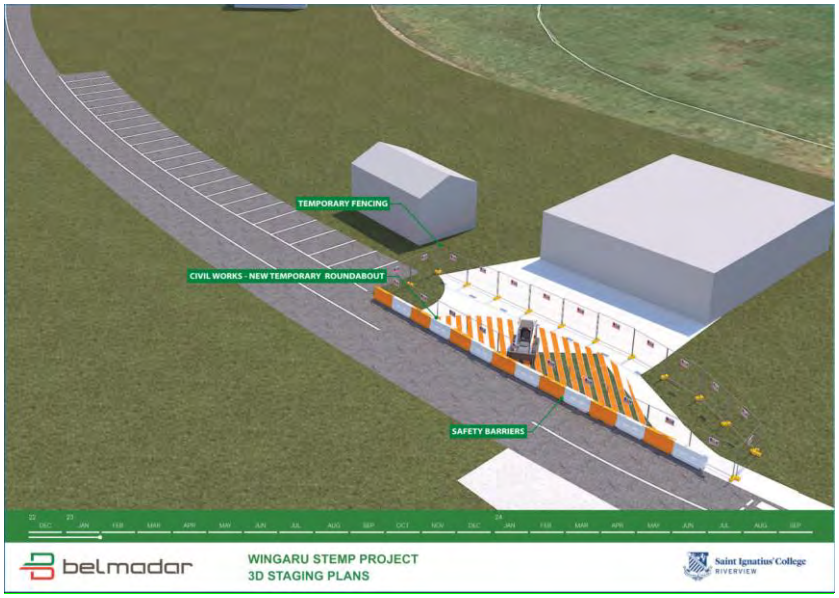


Figure 5 Temporary Turning Bay Construction

1.5.5. AREA E -FENCING – CONSTRUCTION LOADING ZONE

Belmadar will establish a Construction Loading Zone during traffic-controlled conditions as mentioned above in the location of the existing kiss and drop facility. Fence top water filled jersey kerbs (roadside) and chainwire fencing has been installed to delineate the construction loading zone from the surrounding operational areas (footpath). This area is secured via 2 access gates, at either end of the Construction Loading Zone to facilitate drive-thru construction vehicle movements in and out of the Construction Loading Zone and eliminate the need for vehicles doing U-turns out of the Construction Loading Zone.

1.5.6. AREA F- SPOIL STOCKPILE AREA

To enable suitable recycling of spoil material, excavation spoil is removed from the site (Area A) and transported to the Stockpile Site (Area F) located on the northern end of Site Compound (Area B).

This stockpile site is no longer under the control of Belmadar and has been handed over to the college for use by other Contractors, not engaged by Belmadar.

1.5.7. AREA G- TEMPORARY ROUNDABOUT WIDENING

To reduce the number of vehicles required to travel through the Construction Area (Area A & Area E) as well as to facilitate the turning around of vehicles dropping off and picking up students from the relocated "Kiss and Drop" (Area D), a temporary roundabout has been constructed.

1.5.8. AREA H- PUBLIC ACCESS PATHWAY

The existing pathway has been extended to connect the existing walkway to the Keven Fagan Building, providing Boarding Students a dedicated pathway to the classrooms and bottom fields.

1.5.9. AREA I - INITIAL SITE COMPOUND

Initial Belmadar site compound location will consist of a temporary portable shed/s enclosed by temporary fencing. This Compound will be a combined temporary office, 1st Aid, and lunchroom. Site shed is planned for a short period while site establishment of all compounds, footpaths and driveways is complete.

This area of the works has been removed and all site amenities are located within Area B.

1.5.10. AREA J – TEMPORARY STOCKPILE AREA

This temporary stockpile area has been replaced by Area J and is no longer part of Belmadar's Works.

1.5.11. DURATION AND HOURS OF WORK

Belmadar are accustomed to undertaking construction activities within a live site environment. We understand the importance of the continued operation of facilities. For this reason, Belmadar remain flexible in relation to site working hours and will regularly coordinate timing of construction activities to ensure the continuous operation of the facility.

With this understanding, all construction work will be undertaken between 7am-6pm Monday to Friday and 8am-1pm on Saturday: No construction work will be undertaken on Sundays or public holidays however, noisy works will be undertaken between 9am-5pm Monday to Friday and 9am-12pm on Saturday.

Noisy and/or disruptive works, where practicable, will be undertaken outside facility operating hours. Belmadar further understand noisy and/or disruptive works may be prohibited at short notice due to operational requirements. In these instances, Belmadar in consultation with the principal, will reschedule the works such that contract milestone dates are met.

Furthermore, respite periods will be introduced during activities which generate high level noise and/or vibration such as rock breaking. All respite periods will be developed in consultation with college representatives and will be in accordance with the Construction Noise and Vibration Management Plan (CNVMP).

Notwithstanding the above, no noisy works will be undertaken during exam periods, Trial, HSC or otherwise. Prior to any exam period, Belmadar will submit to the superintendent, a look ahead program to review the proposed works scheduled for these periods.

1.5.12. OUT OF HOURS PROCEDURES

Whilst we do not anticipate the requirement for out of hours (curfew hours) work, should they be required during the execution of the contract, the initial point of contact for the Project will be the Project Manager and the Site Manager.

The complaints response process for the Project will be outlined in the Communication Management Plan when it is developed during the initial stages of the project. This Plan will

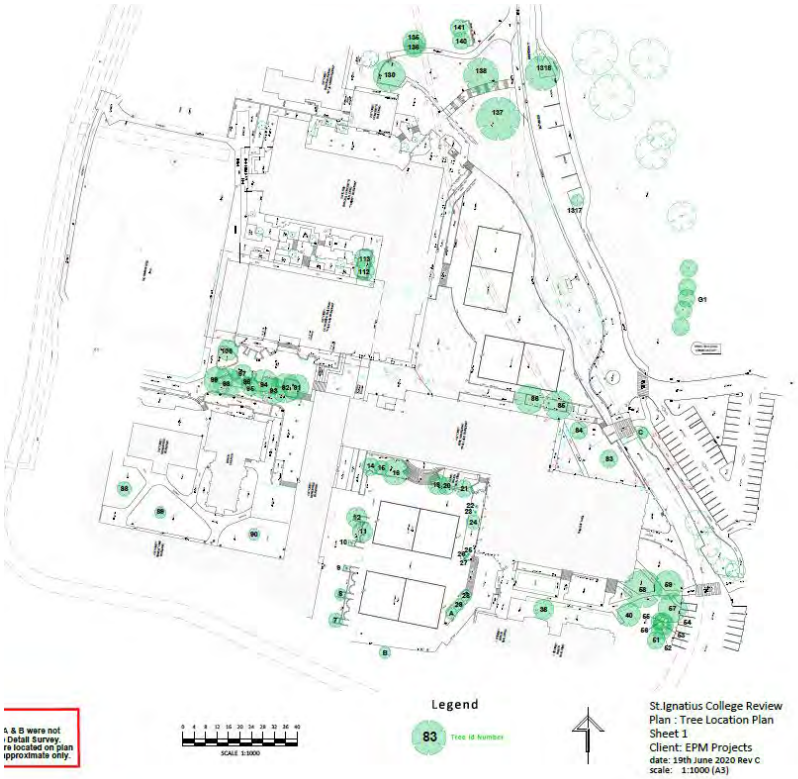
describe Belmadar's' methodology and procedures for communication with both internal and external stakeholders as well as relevant authorities and the public.

1.5.13. TEMPORARY EXTERNAL LIGHTING

Belmadar will erect temporary external lighting for security purposes throughout the construction of the project. The temporary lighting will comply to AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting. Belmadar will provide limits for the relevant light technical parameters to control these effects. Belmadar will control the obtrusive effects of outdoor lighting by appropriate design, in accordance with AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting. All temporary lighting will be installed to not have adverse effects on nearby residents (e.g. of dwellings such as houses, hotels, hospitals), users of adjacent roads (e.g. vehicle drivers, pedestrians, cyclists) and transport signalling systems (e.g. air, marine, rail), and on astronomical observations.

1.5.14. TREE PROTECTION

Tree 137 will be protected throughout the entirety of the project in accordance with the Arboriculture impact assessment tree protection specification by Tree IQ rev B dated the 2nd of November 2020.



137	*Eucalyptus botryoides* (Bangalay)	800	15	12	Fair	Fair	Pruning has removed intrenal branching framework. Small (<25mmø) epicormic growth in moderate volumes. Wound(s), various stages of decay. Grade alteration, fill.	Mature	5-15	Moderate	Consider for Retention	9.6	3.1	Retain. Major encroachment, landscape works.

Graphical representation of tree 137 being protected onsite.

Please see Belmadar arborist review and approval letter in **Annexure 4**.

1.5.15. ASBESTOS/ LEAD MANAGEMENT

Risk Identification & Assessment

The project manager will ensure the risks associated with the management and removal of asbestos-containing material are identified, assessed, and controlled in accordance with the Hierarchy of Control. **Refer to the Risk Identification & Assessment Procedure – within Annexure 2.**

Asbestos

Asbestos Register and Asbestos Management Plan

The Site Manager will ensure a written asbestos management plan and or scope of works is prepared by the Asbestos removalist contractor in conjunction with a specialist hygienist for the workplace if asbestos or ACM has been identified or assumed present or is likely to be present from time to time at the workplace. The Site Manager will ensure the asbestos management plan is maintained to ensure the information is up to date.

Sydney Environmental Group has issued an Asbestos Management Plan. Please refer to the Asbestos Management Plan described in **Annexure 5**.

The Site Manager will ensure an asbestos register **Refer to form H1.7 Asbestos Register** is prepared and kept at the workplace. The asbestos register must be maintained to ensure the information in the register is up to date. The asbestos register is intended to ensure workers and others in the workplace do not accidentally disturb asbestos.

The Site Manager will ensure any areas that contain asbestos, including plant, equipment and components, should be signposted with warning signs to ensure the asbestos is not unknowingly disturbed without the correct precautions being taken. Where it is not reasonably practicable to use labels or warning signs to indicate the presence and location of asbestos the Site Manager must consult with fellow workers about the location of Asbestos**. Refer to Toolbox Talk Record on procore.**

Asbestos Removal Control Plan and notifications made to the regulator, client, workers and other affected parties.

The Site Manger will review and approve the Asbestos Removal Plan to contain the following criteria as a minimum,

1.0. Notification requirements have been met and required documentation will be on site (e.g., removal license, control plan, training records)
2.0. Details of asbestos to be removed identified (e.g., the locations, whether asbestos is friable/non-friable, its type, condition and quantity being removed)
3.0. Consult with relevant parties (health and safety representative; workers; person who commissioned the removal work, licensed asbestos assessors)
4.0. Assigned responsibilities for the removal Program commencement and completion dates.
5.0. Emergency plans
6.0. Asbestos removal boundaries, including the type and extent of isolation required and the location of any signs and barriers.
7.0. Control of other hazards including electrical and lighting installations
8.0. Details of air-monitoring program Control and clearance
9.0. Name of the independent licensed asbestos assessor or competent person engaged to conduct air monitoring.

The Site Manager will ensure the licensed asbestos removalist will notify the regulator in writing at least five days before the licensed asbestos removal work commences. The following information must be included in your notification as a minimum criterion:

- Name, registered business name, Australian Business Number, license number and business contact details
- name and business contact details of the supervisor who will oversee the removal work
- name of the licensed asbestos assessor or competent person engaged to carry out a clearance inspection and to issue a clearance certificate for the work
- client name and contact details

- name, including registered business or corporate name, of the person with management or control of the workplace
- address of the workplace, including the specific location if it is a large workplace
- kind of workplace where the removal work will be performed (for example an office building or construction site)
- date of notification
- the start date of the removal work and an estimation of how long it will take
- whether the asbestos to be removed is friable or non-friable
- if the asbestos is friable, the way the removal area will be enclosed
- estimated quantity of asbestos to be removed
- number of workers who will perform the removal work, and
- details of each worker's competency to carry out removal work

Refer to Inspection Hazardous Material Removal Control Plan Checklist on Procore

The Project Manager will advise the client of adverse/latent site conditions on discovery of Asbestos. On receipt of Asbestos Management Plan Belmadar will send the client via Procore the current version of the Asbestos Management Plan and Asbestos register.

The Site Manager Will Toolbox talk the site with current locations of Asbestos removal and will update the site via the same consultation method if conditions change. The Site Manager will also communicate the Asbestos removal to other parties by signage attached the perimeter fencing.

Qualifications and Training

The Site Manager who commissions the removal of asbestos at the workplace must ensure asbestos removal work is carried out only by a licensed asbestos removalist (See below for details of different license class) and in accordance with the Code of Practice: How to safely remove asbestos August 19 and AS/NZS 4801:2001

The Site Manager will ensure the license to undertake the types of asbestos removal will be either Class A or Class B. The type of license required will depend on the type and quantity of asbestos, asbestos-containing material (ACM) or asbestos-containing dust (ACD) that is being removed at a workplace. See below license and competencies requirements.

Type of License	License Capability	Competencies
Class A	Can remove any amount or quantity of asbestos or asbestos containing materials (ACM), including: - any amount of friable asbestos or ACM - any amount of asbestos contaminated dust (ACD) - any amount of non-friable asbestos or ACM Note: Friable asbestos fire doors and safes – separate license	CPCCDE3015 or CPCCDE3015A – Remove friable asbestos CPCCDE4008 or CPCCBC4051A – Supervise asbestos removal & 3-year experience of Class B License.

Type of License	License Capability	Competencies
Class B	Can remove: - any amount on non-friable asbestosor ACM (Note: A Class B license is required forremoval of more than 10sqm of non- friable asbestos or ACM) - ACD associated with the removal ofnon-friable asbestos or ACM (Note: A Class B license is required forremoval of ACD associated with the removal of more than 10sqm of non-friable asbestos or ACM)	CPCCDE3015 or CPCCDE3015A – Remove friable asbestos CPCCDE4008 or CPCCBC4051A – Superviseasbestos removal
Asbestos Assessor	An asbestos assessor license is required tocarry out certain functions connected withclass A asbestos removal work. If you are licensed as an asbestos assessor,you can conduct the following: - air monitoring for Class A asbestosremoval work - clearance inspections for Class Aasbestos removal work - issuing clearance certificates in relation to Class A asbestos removalwork	CPCCDE3015A – Remove friable asbestos as evidenceof training, knowledge and skills of a relevant asbestos removal industry practice orCPCCDE5001 – Conduct air monitoring and clearance inspections for asbestos removal work
No License Required	Can remove: up to 10sqm of non-friable asbestos or ACMACD that - is associated with the removal of less than 10sqm or non-friable asbestos orACM, or - is not associated with the removal of friable or non-friable asbestos and isonly a minor contamination.	

Air Monitoring and Clearance Certificate

The Site Manager will ensure that where there is the requirement to monitor the air for possible exposure to hazards found onsite during construction, a third-party licensed contractor (Hygienist) is to undertake the monitoring and provide clearance certification to deem the site safe.

The Site Manager who commissions asbestos removal work that requires a Class A license must ensure that an independent licensed asbestos assessor undertakes air monitoring of the asbestos removal area at the workplace. Control air monitoring must be conducted by the third-party licensed contractor immediately before and during Class A asbestos removal work.

Clearance inspections must be carried out and clearance certificates issued by an independent licensed asbestos assessor, for work that must be carried out by a Class A licensed asbestos removalist.

The Asbestos removalist contractor who commissions licensed asbestos removal at the workplace requiring a Class A license must ensure the results of the control monitoring are given to the following people:

- workers at the workplace
- health and safety representatives for the workplace
- PCBUs at the workplace, and
- other people at the workplace.

The Site Manager will communicate the results to the above stakeholders on receipt of results from the asbestos removal contractor.

Lead Work

In accordance with clauses 392 – 418 of the Work Health and Safety Regulation 2017, NSW Safe work "Lead Work" and AS 4361.1 & 2 guide to lead paint management-industrial applications.

Lead hazard means material that is likely to cause lead exposure and endanger an individual's health as set in clauses above Code. "Lead hazard" includes lead-based paint, lead-contaminated dust, lead-contaminated soil, and lead-contaminated water pipes.

Belmadar will ensure to eliminate any risk associated with exposure to lead, so far as is reasonably practicable. If elimination is not reasonably practicable, employers must reduce the risk so far as is reasonably practicable, by:

- identifying whether a lead process is 'lead-risk work'
- using the hierarchy of control to ensure any risks associated with exposure to lead are controlled so far as reasonably practicable
- reviewing risk control measures
- keeping the lead process area clean
- providing washing and changing facilities
- providing an appropriate eating and drinking area that cannot be contaminated with lead from any lead process
- providing for the laundering or disposal of protective clothing and work clothing that is likely to be contaminated with lead dust
- arranging medical examinations and biological monitoring as required
- providing supervision, instruction, information and training to enable employees to work safely with lead.
- Providing appropriate PPE onsite for workers

Belmadar will also ensure the Project Risk Register and Safe work methods statements are inline with the control mitigation strategies included but not limited to items described above.

Note: Not all work that involves lead is 'lead risk work'.

'Lead risk work' means work carried out in a lead process that is likely to cause the blood lead level of a worker carrying out the work to exceed:

- 5 µg/dL (0.24 µmol/L) for a female of reproductive capacity 20 µg/dL (0.97 µmol/L) in other cases.

To determine if a task is 'lead risk work', check past medical records, injuries, and illnesses. Also check the type of lead you use, the airborne lead levels, how and how much workers are exposed, and examine your work practices.

Belmadar will obtain from the contractors who are completing the lead removal up to date blood test prior to commencement of works onsite and assess the results in accordance with the doctors' requirements and monitoring processes as below;

- a blood lead level of >/=5 ug/dL (0.24 umol/L) requires a notification to the Public Health Unit by
- laboratories by the contractors supervisor.

Belmadar or its nominated subcontractor will notify WorkSafe within 7 days if the worker is involved in a lead process where the blood lead level of the employee is reasonably likely to exceed recommended health blood lead levels.

Result (umol/L)	ug/dL	Action
<0.48	<10	Repeat within 6 months
0.48 - 0.96	10-19.9	Repeat within 3 months
0.97 - 1.44	20-29.9	Repeat within 6 weeks
>= 1.45	>=30	Remove from lead risk work Medical examination

The nominated subcontractor will also prepare a "Lead removal Control plan", safe work method statement and will notify WorkSafe within 7 days for any lead risk work such as;

- Work that exposes a person to lead dust or lead fumes arising from the manufacture or handling of dry lead compounds.
- Work in connection with the manufacture, assembly, handling or repair of, or parts of, batteries containing lead that involves the manipulation of dry lead compounds, or pasting or casting lead.
- Breaking up or dismantling batteries containing lead, or sorting, packing and handling plates or other parts containing lead that are removed or recovered from the batteries.
- Spraying molten lead metal or alloys containing more than five per cent by weight of lead metal.
- Melting or casting lead alloys containing more than five per cent by weight of lead metal in which the temperature of the motion material exceeds 450˚C.
- Recovering lead from its ores, oxides or other compounds by thermal reduction process.
- Dry machine grinding, discing, buffing or cutting by power tools alloys containing more than five per cent by weight of lead metal.
- Machine sanding or buffing surfaces coated with paint containing more than one per cent by dry weight of lead.
- A process by which electric arc, oxyacetylene, oxy gas, plasma arc or a flame is applied for welding, cutting or cleaning, to the surface or metal coated with lead or paint containing more than one per cent by dry weight of lead metal.
- Radiator repairs that may cause exposure to lead dust or lead fumes.
- Fire assays if lead, lead compounds or lead alloys are used.
- Hand grinding and finishing lead or alloys containing more than 50 per cent by dry weight of lead.

- Spray painting with lead paint containing more than one per cent by dry weight of lead.
- Melting lead metal or alloys containing more than 50 per cent by weight of lead metal if the exposed surface area of the molten material exceeds 0.1 square metre and the temperature of the molten material does not exceed 450˚C.
- Using a power tool, including abrasive blasting and high pressure water jets, to remove a surface coated with paint containing more than one per cent by dry weight of lead and handling waste containing lead resulting from the removal.
- A process that exposes a person to lead dust or lead fumes arising from manufacturing or testing detonators or other explosives that contain lead.
- A process that exposes a person to lead dust or lead fumes arising from firing weapons at an indoor firing range.
- A foundry process involving melting or casting lead alloys containing more than one per cent by weight of lead in which the temperature of the molten material exceeds 450˚C.
- A foundry process involving dry machine grinding, discing, buffing or cutting by power tools lead alloys containing more than one per cent by weight of lead metal
- A process decided by the Regulator to be a lead process under clause 393 of the WHS Regulation.

Works onsite can not procced until confirmation has been received from safe work NSW that the notification has been submitted.

The Site Manager will ensure that where there is the requirement to monitor the air for possible exposure to hazards found onsite during construction, a third-party licensed contractor (Hygienist) is to undertake the monitoring and provide clearance certification to deem the site safe.

Clearance inspections must be carried out and clearance certificates issued by an independent licensed

Asbestos and Lead Health Surveillance and Monitoring

The Site Manager will ensure health monitoring is provided to workers if they are at risk of exposure to asbestos & lead risk work when carrying out works ***in accordance with NSW Work Health and Safety Act 2011, code of practice as How to safely remove asbestos 2012, Safe work Australia "Lead work" and Part 7.2 Lead f the NSW WHS regulation 2017.***

Health monitoring includes a medical examination to provide an initial baseline medical assessment. Health monitoring must include the following unless another form of health monitoring is recommended by a registered medical practitioner.

- consideration of the worker's demographic, medical and occupational history
- consideration of records of the worker's personal exposure, and
- a physical examination of the worker with emphasis on the respiratory system, including standardized respiratory function tests, unless another form of health monitoring is recommended by a registered medical practitioner.
- If a worker is carrying out licensed asbestos and Lead removal work, the health monitoring must be conducted prior to the worker commencing the work. Health monitoring should also be provided to the worker at regular intervals (at least once every two years) after the worker commences the asbestos-related work.

The Site Manager must obtain the health monitoring report from the registered medical practitioner as soon as practicable after the monitoring is carried out and saved on Belmadar Server.

The health monitoring report must include the following information:

- the name and date of birth of the worker
- the name and registration number of the registered medical practitioner
- the name and address of the PCBU who commissioned the health monitoring
- the date of the health monitoring
- any advice that tests results indicate the worker may have contracted a disease, injury or illness as a result of carrying out the work that triggered the need for health monitoring
- any recommended remedial measures, including whether the worker can continue to carry out the work, and
- whether medical counselling is required for the worker

Health Surveillance

Health monitoring of a person refers to monitoring the person to identify changes in the person's health status due to exposure to certain substances. It involves the collection of data to evaluate the effects of exposure and to confirm that the absorbed dose is within safe levels. This allows decisions to be made about implementing ways to eliminate or minimize the worker's risk of exposure, for example, reassigning to other duties that involve less exposure or improving control measures. Monitoring is recommended by a registered medical practitioner with experience in health monitoring and or third-party professional as detailed below if hazardous substances are found onsite during work activities or require clearance before site activities commence.

Health surveillance can be described as a system of ongoing health checks. These health checks may be required by law for employees who are exposed to noise or vibration, ionizing radiation, solvents, fumes, dusts, biological agents and other substances hazardous to health. This must be completed by a registered health professional.

If the project identifies risk of exposure to hazardous substances (e.g. via hygienist reports and/or hazardous registers) and or at the start of the project to ensure all hazardous are identified. This should be documented in Belmadar **Form H1.6 Health Risk Assessment**, completed by the site Manager and/or Project Manager who has either a Certificate IV in work health and safety or 5 years' experience in a manager's position. Suitable controls must be adopted by the site manager and/or the project manager using Appendix F of the COP located on the intranet in folder F1.6.1 Health Specifications. Any risks/controls identified within the health risk assessment must be transferred into the **"Project Risk Register"** under a separate heading titled **"Health Monitoring Requirements".** Subcontractors should include for any health hazards which may impact workers and/or their ability to perform their tasks within their WMS. If site teams identify the requirement of further measurement after completing the health risk assessment, teams should in the project risk assessment outline the additional controls such as monitoring of registers, the requirement of a third-party professional such as hygienist or acoustic specialist to maintain a safe work environment.

Specific task level health surveillance risk assessment (HRA) process will be evaluated and monitored by way of task observation on Procore. The HSEQ Director will attend the site as a minimum once a month to undertake task specific observations and the alignment of these task with the Belmadar Project Risk Register and the Subcontractor SWMS. Any corrective action required will be captured in the task observation sent to the project Team for action and implementation. The Site Manager will undertake

Task Specific HIRAC process observations as a minimum 3 per month and the Project Manager 1 per Month in addition to the HSEQ Directors observations or if site conditions change.

Below is a list of potential health hazards to guide the site teams when completing the **health risk assessment (as part of the project risk register)**. Site Teams are to refer to Appendix F of the COP "Managing the Risk of Hazardous Chemical in the Workplace 2014" for a list of hazardous substances which require monitoring.

Biological Hazards:

Biological hazards can be defined as organic substances that present a threat to the health of people and other living organisms.

Biological hazards include.

- Viruses
- Toxins from biological sources
- Spores
- Fungi
- Pathogenic micro-organisms
- Bio-active substances

Biological hazards can be tested, and exposure can be monitored through testing of levels or its metabolites in by a registered medical practitioner with experience in health monitoring through testing of:

- Body fluids urine or blood
- Body Tissues such as lung testing or exhaled breath

Physical Hazards:

Physical hazards can be defined as factors or conditions within the environment that can harm your health. Physical Hazards include.

- Body Stress
- Confined space
- Electricity
- Heat
- Heights
- Noise
- Vibration

Physical hazards can be tested and controlled by Psychosocial testing and or Biomechanical testing being.

Psychosocial- Where aspects of one's job demands, control, support, financial concerns and or relationship issues contribute to a physical hazard where testing and support can be gained from a councilor or where required a clinical psychologist or psychiatrist.

Biochemical- Physical damage to one's body, soft tissue damage, muscular, tear, sprain or indirect exposure (heat or light) which leads to symptoms which may accumulate to cause further degeneration and injury. Testing and support will be gained using a registered GP or specialist.

Chemical/ Atmospheric Contaminates:

A chemical/atmospheric hazard can be defined as solid, liquid or gas which ones exposed to a person can harm a person's health.

Chemical hazards include:

- skin irritants
- carcinogens
- respiratory sensitizers. Physicochemical hazards include:
- chemical explosions and fire
- corrosion
- chemical reactions.

These hazards generally result from a substance's physical and chemical properties. The harmful effect on a worker's health is from direct contact or exposure to the chemical, usually through inhalation, skin contact or ingestion. Testing and monitoring of this hazard can be through a registered medical professional.

Where there is the requirement to monitor possible exposure to hazards found onsite during construction, a third-party licensed contractor is to undertake the monitoring and provide clearance certification to deem the site safe. Where practical before site establishment, records of site conditions such as the dilapidation report, acoustic report, hazmat report and the like should be analyzed for hazards which are identified onsite and require a licensed contractor to monitor and or remove the hazard before site personnel commence works. See below hazards which may require ongoing monitoring.

Hazard	Health Monitoring Contractor
Noise / Vibration	Acoustic Specialist
Asbestos	Asbestos assessor / Hygienist & unrestricted Demolition certificate and have a license with EPA to transport asbestos waste
Lead	Hygienist & unrestricted Demolition certificate

If during the project site personnel are exposed to any of the hazards listed in appendix E of the COP 'Managing the Risk of Hazardous Chemical in the Workplace 2014', the Site Manager and or Project Manager will organise the need for health/medical surveillance as well as a hygienist to be engaged to provide a report and recommendation for the treatment of this health hazard. A licensed contractor will then remove the hazardous substance and hygienist to provide clearance certification. With any reports and or recommendations to be sent to the HSEQ director and monitored/implemented by the Site and or Project Manager.

Please refer to the Managing Risks of Hazardous Chemicals in the Workplace Report described in **Annexure 6**.

1.5.16. LEGAL AND OTHER REQUIREMENTS

Please refer to **Annexure 1** for a copy of the project Legal Requirements.

All workers on the property of Saint Ignatius' College agree to work under the Australian Jesuit Code of Conduct.

2. ASPECTS AND IMPACTS RISK ASSESSMENT.

Please Refer to Environmental Risk Assessment in **Annexure 2**.

3. ENVIRONMENTAL SUBPLANS

3.1 NOISE & VIBRATION MANAGEMENT PLAN

3.1.1.SCOPE

This procedure details the activities to ensure that noise sources identified are controlled to meet the project and legislative requirements and minimize any impacts on adjacent properties. The objectives of the plan are to minimize disturbance or annoyance to the local community and the targets are to work within the limits of consents and permits.

3.1.2.OBJECTIVE

The objectives of this ECP is to ensure that noise and vibration sources are identified and controlled during construction to meet legislative requirements and ensure that activities do not cause environmental nuisance or annoyance to the local community and the targets are to work within the limits of consents and permits.

3.1.3.REFERENCE

Legislation

- Protection of the Environment Operations Act 1997 and associated regulations;
- Occupational Health and Safety Act 2004

Other

- AS1055.1 and AS1055.2 Acoustics – Description and Management of Environmental Noise
- AS2659.1 – Guide to the use of sound measuring equipment
- AS2659 – Sound Level Meters
- AS2072 Acoustics – Methods for Measurement of Road Traffic Noise
- AS2436 - Guide to Noise Control on Construction, Maintenance and Demolition Sites
- DECC Interim Construction Noise Guideline

Refer to **Annexure 7** for the Noise and Vibration Management Plan.

3.2 DUST & AIR QUALITY MANAGEMENT PLAN

3.2.1 SCOPE

This procedure details the practices to ensure that air quality is not compromised and that:

- Dust generation is minimized.
- There are not health risks or loss of amenity due to the emission of dust to the environment.
- Public roads are maintained as clean.
- There is no reduction of public amenity or visibility.

3.2.2. OBJECTIVE

The objectives of the plan are to:

- Minimise the generation of dust.

- Ensure that there is no health risk or loss of amenity due to the emission of dust to the environment.
- Maintain clean public roads and
- Ensure there is no reduction of public amenity or visibility.
- Limit complaints.
- Ensure safety of our workers and the public from our work practices.

3.2.2 REFERENCES

Legislation:

- Protection of the Environment Operations Act 1997
- Ozone Protection Act 1989
- Occupational Health and Safety Act 2000 and Regulations 2001

Other:

- AS3580.10.1 Determination of particulates – deposited matter – gravimetric method
- AS2923-1987 Ambient air - Guide for measurement of horizontal wind for air quality applications
- AS/NZS3580.1.1 Methods for sampling & analysis of ambient air - Guide to sitting air monitoring equipment.

3.2.3 AIR QUALITY MANAGEMENT

Actions Required	Staff Responsible	When
A speed limit of 20 km/hour will be imposed on all roads and disturbed work areas to minimise dust nuisance.	Site Manager	At all times
Where possible all haul roads should be sealed in some form to mitigate dust	Site Manager	At all times
Minimising the number of exposed surfaces on the work site	Site Manager	At all times
Ensure vehicles, plant and equipment are regularly maintained so any equipment exhibiting visual smoke will not be used.	Site Manager	At all times
The primary method for controlling dust generated by construction operations and disturbed areas will be non-potable water spraying by water tankers.	Site Manager	At all times
An adequate supply of non-potable water shall be made available for dust suppression activities	Site Manager	At all times
Water tankers shall be made available and are to operate at a desired frequency and the locations that are specified	Site Manager	At all times
Stockpile heights are to be minimised as much as possible. Stockpiles are to be oriented and located in areas that limit exposure to adverse wind conditions and graded to a smooth surface and watered to encourage the formation of a hard crust.	Site Manager	At all times
Stockpiles shall be orientated away from sensitive receptors.	Site Manager	At all times
Long standing stockpiles (greater than 1 month) shall be seeded to provide both wind and water erosion protection with crops or other covers if required.	Site Manager	At all times
Trucks importing or removing fill from site shall be covered at all times or watered prior to leaving the site	Site Manager	At all times

Regular sweeping shall be undertaken of roads to remove tracked sediment.	Site Manager	At all times
Vegetation clearing and earthworks are restricted to the minimum areas necessary in accordance with the project drawings	Site Manager	At all times
Where practical, earthworks operations should be limited during unfavourable wind conditions. Dust producing activities during adverse weather conditions (e.g. dry, windy etc) should cease when uncontrollable dust emissions are directed towards sensitive receptors.	Site Manager	At all times
Rock drilling equipment or when excavating in rock or hard dry ground, the ground will be either watered down during operations or fitted with dust collection devices.	Site Manager	At all times
All material (e.g. mud, sand etc) spilt onto external and internal roads are cleaned and removed.	Site Manager	At all times
Rock rumble/shaker grids or equivalent will be provided at all site access/egress points where there is a risk of dust/dirt/mud being tracked onto public roads.	Site Manager	At all times
Mobile plant movements shall be restricted to designated routes and standing areas.	Site Manager	At all times
Trucks transporting material from the site will have loads covered and tailgates securely fixed to prevent wind-blown emissions and spillage.	Site Manager	At all times
There will be no incineration or open burning of any material on the premises. Prompt action will be taken to extinguish any fire.	Site Manager	At all times

3.2.4 MONITORING

The Site Manager and Project Engineer will monitor dust and air polluting activities on site. Site inspections will be carried out by the Site Manager to ensure the work site works are not impacting air quality for workers and the surrounding environment and the findings recorded on the Belmadar **F.19 - Weekly Site Safety Inspection** form**.**

Sources of Air/Dust	**Control Measures**	**Frequency**	**Criteria**
Excavation/Clearing	Sprays from water trucks	Dry – 1 pass per 2 hours	No visual dust
Stockpiles in strong Winds	Hoses	Dry and windy – 1 pass per day	No visual dust
Hauling Operations	Sprays from water trucks	Dry – 1 pass per hour	No visual dust
Vehicle Emissions	Check vehicle for smoke	On arrival at site and once per month	Smoke not visible after 10 secs
Fixed Plant	Check vehicle for smoke	On arrival at site and once per month	Smoke not visible after 10 secs
Chemical Fumes	Security of container lids	On arrival at site and once per month	Lids/Cover secured
Demolition Works	Spray with water hoses	Daily during demolition	No visible dust

In the event of dust complaints, physical air quality monitoring will be undertaken in accordance with the appropriate guidelines and standards. Dust levels should not exceed 120mg/m^2 per month and 150ug/m^3 per day for PM10.

Environmental auditing will be undertaken from time to time by the Site Manager who will assess compliance to this procedure.

3.2.5 REPORTING

In the event of a breach of this ECP, a corrective action can be raised by anyone in the organisation in line with the **M1.3 Procedure Internal Audits Procedure**. These are to be forwarded to the HSEQ Director as a corrective action via Procore.

All complaints / incidents regarding noise or vibration management shall be reported to the HSEQ Manager and an Incident Report Form shall be completed and forward to the Project Manager and a copy provided to the HSEQ Director for registering purposes.

Control Parameter	Monitoring	Responsibility	Target Level	Record
Dust	Visual monitoring during work hours	Site Supervisor	Visibility of site workers and general public not reduced	Environmental Checklist Form 21-3-002. Daily Site Diary 16-1-010
Smoke and Exhaust Fumes	Visual monitoring during work hours	Site Supervisor	Correctly maintained equipment used on site	Environmental Checklist Form 21-3-002. Daily Plant and Equipment Logbook Form 16-1-011
Dirt/Mud on Roads	Visual monitoring during work hours	Site Supervisor	No mud tracked on to roads	Environmental Checklist Form 21-3-002. Daily Site Diary 16-1-010

3.3 WATER AND SOIL MANAGEMENT PLAN

3.3.1 SCOPE

This procedure details the environmental practices to be used to ensure that water pollution and erosion and sedimentation are avoided. The objective is to control sediment and erosion of soil materials and the target is no discharge of untreated sediment laden or contaminated water to catchment areas or stormwater drains.

3.3.2 OBJECTIVE

The objectives of this ECP are to:

- Comply to the Civil Engineering Report prepared by TTW on 8/12/2022 Rev B (Refer to **Annexure 8**)
- ensure appropriate soil conservation practices (management of erosion and sedimentation) are implemented and that stormwater runoff is effectively controlled.
- minimise potential for erosion and subsequent sedimentation of water courses / bodies;
- ensure adequate drainage and pollution control measures are implemented to manage runoff from disturbed areas of the site.
- ensure materials that have the potential to be contaminants are not released to any waters either in a direct or indirect manner because of construction activities.

3.3.3 REFERENCE

Legislation:

- Protection of the Environment Operations Act (1997) and associated regulations
- Civil Engineering Report prepared by TTW on 16.10.2022.
- Catchment Management Authorities Act 2003
- Contaminated Land Management Act 1997
- Coastal Protection Act 1979
- National Parks and Wildlife Act 1974
- Noxious Weeds Act 1993
- Soil Conservation Act 1938
- Sydney Water Act 1994
- Sydney Water Catchment Management Act 1998
- Water Management Act 2000

Other:

- Acid Sulfate Soils Management Advisory Committee (ASSMAC) Acid Sulfate Soil Manual 1998
- Water Quality Management Guidelines 2002
- Erosion and Sediment Control Standard Version 9 2000
- ANZECC Water Quality Guidelines for Fresh and Marine Waters (ANZECC, 2002)

- Water Quality Sampling Manual Third Edition 1999 Environment Protection Agency
- The Blue Book Landcom
- NSW Waste Classification Guidelines
- National Environmental Protection Council Schedule B: Guideline for the Investigation of Soil and Groundwater

3.3.4 SOIL STRIPPING

Prior to any earthworks on site, an Excavation Permit is required to be completed. The clearing and stripping works will be staged so this work is carried out immediately prior to excavations and earthwork. Near water courses, excavation works will be undertaken at times of low flow.

Wherever possible, cleared surface will be left in a rough condition to assist the reduction of surface runoff. Where topsoil materials are to be stripped, stockpile topsoil to assist in rehabilitation.

Replace subsoil layers in reverse order to original stripping and to the prescribed depths and compaction.

3.3.5 CONSTRUCTION ACTIVITIES

Construction activities will be programmed to minimise the area of disturbed ground that is exposed to erosion at any time. Works will be staged to minimise exposure of soils to erosion. Vegetation shall be retained as much as possible. No clearing will be allowed outside the limits of the works. Works shall limit as far as practical the disturbance to water ways and drainage lines. Disturbed areas will be progressively revegetated as soon as practicable.

Sediment and erosion control will be established in accordance with Civil Engineering Report prepared by TTW on 16.10.2022 (**Annexure 8**). All soil erosion and sediment controls will be planned and installed prior to the start of any works that will disturb soils. Erosion and Sediment Control Plans (ESCPs) will be required for all project areas where soil erosion and sedimentation impacts are potential. ESCPs are to be prepared and submitted to the client for review.

Measures such as temporary storage, filter barriers, dissipaters, silt fences, straw bales and kerb filter socks shall be installed on all road drains and around access points. Erosion and sediment controls at waterway crossings (i.e. waterway barrier works) will include silt fencing and strawbales along waterways in a multibarrier system, to prevent sediment reaching waterways. Constructing works across watercourses will involve:

- Removing and disposing of vegetation within the barrier extents
- Placing geofabric and compacting barrier material – which will be of a low permeability
- Installing a bypass pipe if required
- Trenching and installing the desalination pipe
- Placing concrete around the pipe
- Backfilling the trench, removing the barrier and reinstating the creek banks.

Construction barrier bunds shall be constructed to divert water around disturbed work areas. Pumping of water around construction zones may be necessary for significant water flows. Where water is pumped around the construction zone precautions should be taken to avoid scour and turbidity at the discharge point (e.g. in shallow water affix geofabric to bed at discharge point).

Sediment controls shall be installed in accordance with relevant guidelines and standards for the installation of such controls. These shall be continuously maintained to filter sediment from site runoff. Sediment shall be removed from all sediment controls where the accumulated sediment has reduced the capacity of the structure by 30% or more. Sediment controls shall be maintained regularly and controls replaced immediately when deteriorated or damaged.

The sediment removed will be disposed of in such locations that the sediment will not be conveyed back into watercourses. These areas include subsoil stockpiles, trenches, backfill batters etc. Suitable access to sedimentation control structures will be maintained to allow cleaning out in all weather conditions.

Rock rumble/shaker grids or equivalent will be provided at all site access/egress points where there is a risk of dust/dirt/mud being tracked onto public roads. Concrete truck washouts will occur greater than 50m from any watercourse or drainage line and waste concrete materials will be removed to concrete recyclers.

In the case of wet weather, vehicle movements will be restricted to ensure there is no transfer of mud and debris outside of the site compound. In the event that a vehicle is required to leave site with muddy tyres, Belmadar will wash the mud off the tyres with a high pressure hose as the vehicle is slowly moving over the shaker grid. The soil sediment will be captured in the well below the shaker grid layered with geofabric. The shaker grid, well and geofabric lining will be periodically cleaned and maintained.

Sediment and erosion controls shall not be removed from their respective locations until rehabilitation is completed.

3.3.6 STOCKPILE MANAGEMENT

Belmadar will generate approximately 3500 m3 of spoil generated from excavations for the proposed Ignis Stage 2 development is proposed to be kept at the St Ignatius College school grounds (outside of the Ignis Stage 2 development area). At the request of the client, this letter outlines the general procedure for the assessment of the spoil for (beneficial) reuse at the school grounds from a contamination perspective.

The proposed stockpile location for the spoil is at the western part of the secondary school grounds (within Lot 10, Deposited 1142773). The location Stockpile all soil materials in separate horizons as they are removed. Stockpiles are to be no greater than 3 metres in height and should be respread as soon as possible – maximum 3 months placement. If stockpiles are to be in place longer than 3 months, a crop cover may be required.
Stockpiles are to be protected from erosion by wind and rain. Temporary sediment control fences will be installed on the downslope side and diversion drains on the upslope side of all stockpile sites.

Stockpiles will not be placed in drainage channels, creek lines (within 1 in 5-year flood line), or within 2 metres of roads, fences or closer than 5 metres to any vegetation that is to be retained.

3.3.7 CREEK CROSSINGS

At all crossing points, maintain creek flow during construction where possible. Rehabilitate areas as soon as works are completed. Replace rock and creekline vegetation to ensure the environment is returned as close to possible to its pre-existing condition.

3.3.8 DEWATERING

Where dewatering is required, the Site Manager will ensure that the pump inlet is supported above the bed of ponded water to minimise the pickup of silt. The pumped water will be directed to a 'flock box' or like remove some course sediments. Discharges from these boxes will be directed to sediment controls to further reduce the amount of suspended material entering the creek or drain.

3.3.9 MONITORING

The Environment Manager and the Site Manager will monitor erosion and sediment control to ensure that water bodies and the work site are well protected, and the findings recorded on the Belmadar **H 1.6 Environmental Checklist Form.** Erosion and pollution controls will be inspected after rainfall events exceeding 10mm in 24 hours, and during periods of prolonged rain. Water discharge limits shall be in accordance with ANZECC Water Quality Guidelines for Fresh and Marine Waters (ANZECC, 2002).

Environmental auditing will be undertaken from time to time by the Environment Manager who will assess compliance to this procedure.

The frequency and type of monitoring under this ECP is shown below.

Control Parameter	Monitoring Frequency	Responsibility	Target Level	Record
Soil stripping/ stockpiling	Regular site inspections. European and aboriginal heritage monitors as required	Site Manager / Site Foreman / Environmental Manager	Stockpile locations and heights as per Water and Soil Management. Soil stripping as per Water and Soil Management Possible European and aboriginal heritage monitors as required for initial earthworks in first 100mm of soil in any area of work.	**H 1.6 Environmental Checklist Form**
Silt fences/ erosion controls	Weekly and after periods of heavy rain (>10mm in 24 hours), refer ECP1**4-3-003** Water and Soil Management.	Environmental Manager	To ensure no pollution of water courses.	**H 1.6 Environmental Checklist Form**

Control Parameter	Monitoring Frequency	Responsibility	Target Level	Record
Water Quality	pH, turbidity and oil and grease (visual). Where initial background sample required for some projects – 1 per month in waterways and after rainfall exceeding 10mm in 24 hours. Prior to dewatering of dams.	Environmental Manager	pH 6.5 – 8.5 Turbidity 50ntu No visible oil and grease Turbidity and ph can be tested with litmus paper or turbidity tubes or meters if meters are used Calibration is to be performed monthly on all ph and turbidity meters, please refer to the Instruction Manual Folder in the DIMS, For further details contact the Belmadar Environmental Manger.	**H 1.6 Environmental Checklist Form**
Dirt/Mud on Roads	Visual monitoring during work hours	Site Manager	No mud tracked on to roads	**H 1.6 Environmental Checklist Form** Daily Site Diary **Procore**
Rehabilitation	Weekly inspection of reinstated areas or following rain greater than 10mm per 24 hours	Safety Manager	Cover factor of at least 50% to be maintained. Weeds to be controlled.	**H 1.6 Environmental Checklist Form**

3.3.10 REPORTING

In the event of a breach of this ECP, a corrective action can be raised by anyone in the organisation in line with the **M1.3 Procedure Internal Audits Procedure**. These are to be forwarded to the HSEQ Director as a corrective action via Procore.

All complaints / incidents regarding noise or vibration management shall be reported to the HSEQ Manager and an Incident Report Form shall be completed and forward to the Project Manager and a copy provided to the HSEQ Director for registering purposes.

3.4 ACID SULPHATE SOIL MANAGEMENT PLAN

3.4.1 SCOPE

This procedure details the practices used to ensure that Acid Sulfate Soils (ASS), contaminated land and other contaminated materials are managed correctly in the event they are known to be present on site or are discovered through geotechnical investigation or excavation.

3.4.2 OBJECTIVE

The objective of this ECP is to provide appropriate management measures required to handle contaminated soils and minimise the potential impact on the environment caused by the any potential disturbance of contaminated or Acid Sulfate Soils (ASS). The procedure aims to ensure that:

- project sites are investigated to establish the presence of ASS
- no unnecessary disturbance occurs to ASS or potential ASS (PASS)
- the construction processes do not cause contamination of the site
- all contaminated material uncovered is managed in accordance with legal requirements
- Erosion and sedimentation of ASS is controlled during earthworks.

3.4.3 REFERENCES

Legislation:

- Protection of the Environment Operations Act 1997 and associated regulations
- Contaminated Land Management Act 1997
- Occupational Health and Safety Act 2004
- Soil Conservation Act 1938
- Water Management Act 2000
- The Protection of the Environment Operations Act, 1997 (POEO Act)

Other:

- Acid Sulphate Soils Remediation Guidelines for Coastal Floodplains in NSW 2007
- Water Quality Management Guidelines 2002
- Guidelines for the Assessment and Management of Groundwater Contamination
- EPA Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes
- ANZECC Water Quality Guidelines for Fresh and Marine Waters (ANZECC, 2002)
- NSW Waste Classification Guidelines
- National Environment Protections Council: Assessment of Site Contamination 1999
- The NSW Acid Sulphate Soil Management Guidelines (ASSMAC,2009)
- Queensland Acid Sulphate Soil Technical Manual (QASSMAC 2009)
- Australian Guidelines for Urban Stormwater Management (2000)
- Managing Urban Storm water, Soils and Construction (4th Edition, Landcom 2004)

3.4.4 INTRODUCTION

Acid Sulphate soils are naturally occurring sediments which may be found in low lying areas near water ways swamps and wetlands. Environmental risk is associated with Acid Sulphate soils as when exposed to air by either excavating or the lowering of water tables the soil profile can oxidize to generate sulphuric acid. The acid generation can cause fish kills, vegetation death, contamination of groundwater and corrosion of concrete and metal infrastructure.

3.4.5 IDENTIFICATION

Acid sulfate soils are predominantly located around coastal lying areas. Before construction works begin site supervisors are to the review the contents of the CEMP as previous testing may have identified existing acid sulphate conditions. If the CEMP details the presence of Acid Sulphate Soil the location and depth is to be clearly pegged/ marked onsite by the project Engineer. If a site-specific ASS management plan it must be followed as preference.

If no testing has occurred, the site supervisor should contact the Environmental Manger to ensure no further testing is required. If testing is required, no excavation works are permitted until testing has been conducted.

In all circumstances even where no further testing is required the site supervisor and Project Engineer are to remain vigilant for the following signs of Acid Sulphate soil

1. *Mottling of the profile. This is combination of two profiles is a blotched or mottled arrangement, this is usually present in the B horizon (second layer form the surface). This is commonly associated with acid sulphate soils.*
2. *Strong Organic "sulphurous smell" (similar to rotten eggs), sulphur is the main active element which causes the disassociation of Hydrogen to produce an acid, as a result suffer is commonly smelt initially when ASS are encountered.*
3. *The presence marine sediments or shells, despite the fact that shells will have a neutralising effect on the acid producing soil, shell and items commonly found in marine environment are key indicators which are also commonly associated with ASS.*

If no further testing was recommended for the site and the above signs are noticed works are to stop and the Environmental Representative called.

If testing areas have been identified by previous ASS testing and signs of ASS are identified outside the designated area excavation is to halt and the Environmental Representative called for further instruction.

3.4.6 SEGREGATION

Once the area containing ASS soil is fully delineated the soil is to be removed in layers corresponding to it classification. To ensure all ASS is removed 50-100mm of clean soil vertically and horizontally is to be included in the excavated ASS. It must be noted that this mixing of layers will always result in the material being classified as the highest classified substance within the stockpile, as a result mixing of profiles in any other circumstances is not recommended.

3.4.7 STORAGE

If the storage of ASS soil is permitted on site by the landowner the following will apply:

- ASS soil must be placed on a fully bunded pad that is covered with 1-2kg/lime prior to soil stockpiling
- The treatment pad must be fully bunded with both a limed bund (6kg/m3) no lower than 300mm above sea level
- Preliminary testing of the PASS may be required before stockpiling and treatment occurs, the Environmental representative is to be contacted prior to stockpiling for confirmation
- ASS soil treatment pad must contain a sump in the lowest point of the area to catch all runoff from the pad. The water collected within the sump can only be pumped out if water is within ph6.5-8.5, turbidity is less than 50ntu and all other water quality requirements stated in the CEMP are met.
- Untreated ASS soil must be treated within 3 days and covered over night
- Stockpiles are to be no greater than 4m in height
- Drains are to be constructed upslope of the treatment area to divert water away for the site.

3.4.8 TREATMENT

ASS soil is to be treated with fine grade agricultural lime at the rates specified by the laboratory testing, site engineers may be required to convert liming rates to simplified ratios based on the size of the excavators bucket. Operators are to be tool boxed on these rates to ensure over or under dosing of lime does not occur.

Treatment is to occur by leveling the stockpile to no thicker 500mm and applying lime at the specified rate. Once distributed the lime is to be worked into the soil until uniform mixing is achieved.

Soil is not to be reused or taken from site until verification testing has been undertaken by a trained person.

3.4.9 SAMPLING

1. Collecting Samples: All equipment is to be clean and dry.

   Note: Trace amounts of sulfuric material from previous sampling may contaminate a sample that has no sulfides present, resulting in a false positive test.

2. Sample from the treated material a sample size 40 grams at a minimum of once per 50 cubic meters or 4 samples for any project having less than 50m3 in total. (See ASSMAC guideline located in the DIMS for further details). Sample from top of pile, mid and lower sections of pile.

3. Remove large shells, stones and fragments of wood, charcoal and record removed contents. Small roots must be removed, as they contain sulfides and will contaminate the sample.
4. Place in a leak proof, temperature tolerant container and minimise the samples contact with air and moisture. Label with date time location and depth. Place in a cooler with dry ice or frozen bricks, preferably at 4oc or below.
5. Field Tests are preferentially done within 24 hours. If not samples are to be frozen until dispatch.
6. Field tests Are to be taken once every 50 cubic meters. See below for details.

3.4.10 TESTING

screening test (pH f)

- Weigh 10 g of soil and mix with 40 ml of distilled water (use scientific scales 0.01gm accuracy)
- Stir for 30 seconds to create a homogenous mixture.
- Insert calibrated pH probe and record results on form **16-3-009**.

PASS screening test (pH fox)

- Weigh 10g of soil
- Check the pH of the 30% Hydrogen Peroxide solution is between 4.5-5.5, raising or lowering the ph can be done using either NaOH or HCL.
- Next with an eyedropper place two ml of a 30% solution of Hydrogen Peroxide on the 10 gm of soil
- Stir soil for 30 seconds to create a homogenous mixture
- Allow at least 30 minutes for the reaction to finish, keep longer if reaction processes such as fizzing are still evident
- Mix soil with 40ml of distilled water
- Insert pH probe and record the result on form **16-3-009**.
- After addition of peroxide make note of temperature and colour changes, commonly reactions will emit heat and gases. Reaction intensity and odour must be recorded as the reaction takes place.

Results will be analysed based on

- **Parent material/ soil description**
- **initial moisture content**
- **presence of buffering material such as shells**
- **reaction intensity/odours/temp change/gas emissions and colour change**
- **Ph change**

Soil is considered treated if pH (f) >5.5 and the pH (fox) is between pH 5.5-8.5. If the results fall outside these values untreated soil or additional lime will be added and retested before the soil is taken offsite.

The results will then be recorded in hardcopy using form **the procedures outlined in this Section.**

If deemed necessary by the client 1:10 samples will be sent to the laboratory for confirmatory analysis by SPOCAS.

3.4.11 TRANSPORTATION

Vehicles transporting ASS/PASS are to be fully covered when operating on public roads, onsite transportation uncovered may be allowed if approval is given by the Environmental Representative.

- Trucks are to be clean and free of debris when transporting ASS offsite.
- Preference is given onsite treatment and reuse. However in the event that ASS soil has to be removed from site it can only be taken offsite after the soil has been treated and verified.
- Disposal can only be undertaken at licensed ASS handling landfills
- Prior to transportation offsite the project manager is to check with the Environmental Representative if any transportation license are required.
- Soil classified as contaminated, and ASS will need to be classified for contamination and disposed of as per its contamination classification. i.e. Hazardous/ASS

3.4.12 MONITORING

Site inspections will be carried out by the Environment Representative and the Site Supervisor during excavation, treatment and transport of ASS materials. The works shall be monitored on an ongoing basis for evidence of:

- Yellow efflorescence on soil surface; and
- Sulphureous odor

The results will be recorded on the Belmadar **F1.19 Weekly Site Inspection**. Regular inspections of the site (including plant and construction activities) in respect of possible ground contamination will also be done and recorded.

Water quality monitoring for pH, Turbidity shall be conducted in all nearby water bodies on a weekly basis or after a rainfall event exceeding 10mm in a 24-hour period. Results are to be recorded on the **H 1.8 Background Water Monitoring Log**. Environmental auditing will be undertaken from time to time by the Safety Manager who will assess compliance to this procedure.

3.4.13 REPORTING

In the event of a breach of this ECP, a corrective action can be raised by anyone in the organisation in line with the **M1.3 Procedure Internal Audits Procedure**. These are to be forwarded to the HSEQ Director as a corrective action via Procore.

All complaints / incidents regarding noise or vibration management shall be reported to the HSEQ Manager and an Incident Report Form shall be completed and forward to the Project Manager and a copy provided to the HSEQ Director for registering purposes.

3.5 WASTE MANAGEMENT PLAN

3.5.1 SCOPE

This procedure details the practices used to ensure that waste generated as a result of construction and demolition activities is minimized, recycled, reused or recovered.

3.5.2 OBJECTIVE

The objectives of the plan are to recycle materials where possible and track all wastes handled. The target of the plan is to minimise the generation of waste through waste avoidance, reduction, recycling and re-use and to responsibly dispose of that which cannot be recycled or re-used to ensure that it is not released into the environment.

3.5.3 REFERENCES

Legislation:

- Protection of the Environment Operations Act 1997 and associated regulations
- POEO Act 1997 (Scheduled Activities and Waste) Regulation 2008
- Waste Avoidance and Recovery Act 2001
- Waste Recycling and Processing Corporation Act 2001
- Pesticides Act 1999

Other

- Demolition & Construction Waste Management Plan September 2020
- ANZECC Waste Wise Construction Program
- EPA Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes

3.5.4 WASTE IDENTIFICATION

The Site Supervisor and Project Engineer will identify waste likely to be generated by the project during construction. For each identified waste, the Environment Manager, Site Supervisor and Project Engineer will determine the necessary control measures required. Refer to Table 1.

Construction Waste	Reduction Measures
Concrete materials (culverts, concrete pipes, kerbs)	Provide clearly marked bins or identified locations for collection by recycling organisations. Send waste directly to concrete recyclers.
Paving materials (bitumen, crushed rock etc)	Provide identified locations for collection by recycling organisations.

Construction Waste	Reduction Measures
Membrane/Geotextile	Provide bins for reuse/safe disposal
Timber (wood, form materials, packaging timber etc)	Provide clearly marked bins or identified locations for collection by recycling organisations
Steel (guard rails, structural, rail sidings, raid fasteners, pipes, valves, plates, mechanical parts, metal work off cuts etc)	Place in clearly marked bins for collection by recycling organisations
Paper Products	Reduce cycle bins placed in offices for collection by recycling organisations. Reuse materials e.g. envelopes, paper (use both sides). Use IT system to reduce paper usage.

Prior to disposal of waste at a tip, the Safety Manager may advise the Site Supervisor as to the re-use and recycling options available. Where waste is to be recycled, the Project Engineer will contact the respective recycling organisation to arrange collection and organise a storage area for the waste collection.

The over-riding philosophy of waste minimization will be applied. The waste hierarchy of avoidance, re-use, recycle and disposal will be directly applied to all aspects of waste from projects. If a higher order, use for a waste is found (e.g. waste re-use rather than recycling) then this will be pursued wherever possible.

3.5.5 WASTE CONTROL AND REDUCTION

Actions Required	Staff Responsible	When
All waste where possible will be segregated and recycled	Site Manager	At all times
Measures are to be undertaken to implement (where possible) waste management and keep the site tidy. All employees will be informed of the need to maintain a clean work site.	Site Manager	At all times
Material dropped in or adjacent to open drains is recovered immediately after it occurs	Site Manager	At all times

Actions Required	Staff Responsible	When
Provision will be made for correctly signed and segregated bins or skips for collection and storage of all wastes (e.g. putrescible waste, bricks, concrete, timber, chemical containers and rags, plasterboard, metals and other materials), other than natural earth, rocks or vegetation. These will be regularly emptied or removed.	Project Engineer	At all times
Locations and setup shall be determined taking into account the following: Protection from weather, Accessibility for removal, Type of waste.	Site Manager	At all times
Recycling shall be investigated of any particular waste stream generated by the construction phase. The respective recycling organisation shall be contacted to arrange for the particular storage containers to be situated on site for waste collection and the removal of waste on a regular basis.	Site Manager	At all times
Cleared vegetation, where suitable, shall be mulched and stockpiled for reuse in rehabilitation activities. The vegetation will be mulched in situ where possible and then trucked to an appropriate storage area. Large stumps and trucks will be placed adjacent to the easement.	Site Manager	At all times
Wastes are to be disposed of to approved / licensed treatment and/or disposal facilities	Site Manager	At all times
All falsework, formwork or surplus material used during construction and not forming part of the permanent works will be completely removed from the site and recycled where possible.	Site Manager	At all times
Spoil material will be tested and reused where possible or disposed of at an EPA approved landfill site.	Project Engineer	At all times
Where no contaminates are present, de-watering from excavations shall be reused where possible for dust control.	Site Manager	At all times
Site amenities will discharge all sewage to holding tanks for regular removal by a waste contractor	Project Engineer	At all times
No wastes shall be burnt on site	All staff	At all times

3.5.6 WASTE MONITORING

The Safety Manager and Project Engineer will monitor waste collection and disposal practices via dockets and other removal records from each organisation or subcontractor. The Safety Manager will record the volume of all wastes taken from the site and destination of the waste (landfill, recycling, reuse).

Site inspections will be carried out by the Safety Manager and the Site Supervisor to ensure the work site is left in a rubbish free state and housekeeping is in order and the findings recorded on the Belmadar **H 1.6 Environmental Checklist Form.**

Environmental auditing will be undertaken from time to time by the Safety Manager who will assess compliance to this procedure.

3.5.7 REPORTING

In the event of a breach of this ECP, a corrective action can be raised by anyone in the organisation in line with the **M1.3 Procedure Internal Audits Procedure**. These are to be forwarded to the HSEQ Director as a corrective action via Procore.

All complaints / incidents regarding noise or vibration management shall be reported to the HSEQ Manager and an Incident Report Form shall be completed and forward to the Project Manager and a copy provided to the HSEQ Director for registering purposes.

Please refer to Demolition & Construction Waste Management Plan September 2020 attached in **Annexure 9**. Belmadar will adhere to all aspects of this plan.

3.5.8 ENVIRONMENTAL COMPLIANCE MANAGEMENT

Roles And Responsibilities

The responsibilities associated with environmental management apply to all personnel of the Belmadar team. The following organisational chart outlines the Belmadar personnel responsible for the implementation of all aspects of the EMS. The chart is to be updated if any changes in circumstances arise such as legislative amendments or reported incidents.

	Managing Director	HSEQ Director	Construction Director	Pre-Construction Director	Systems Manager	Project Manager	Site Manager	Site Engineer	Foreman	Subcontractor
Provide resources to ensure the Environmental Management System adheres to environmental legislation, Australian Jesuits Code of Conduct and Standards.	✖	✖	✖	✖	✖					
Promote a positive workplace environmental culture.	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖

	Managing Director	HSEQ Director	Construction Director	Pre-Construction Director	Systems Manager	Project Manager	Site Manager	Site Engineer	Foreman	Subcontractor
Establish project specific objectives and targets. Monitor and report accordingly.		✖				✖	✖	✖		
Complete project specific environmental documents using templates						✖	✖	✖		
Establish the environmental requirements for site establishment and planning requirements.						✖	✖	✖		
Obtain Working With Children (WWC) Check	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
Establish and maintain environmental registers		✖			✖					
including legislation, training and objectives.										
Identify and assess competency of employees and facilitate any training requirements		✖			✖	✖	✖			
Determine and assess requirements for environmental monitoring (ie. noise, air and dust) and implement.						✖	✖			
Provide site personnel with relevant environmental management documentation.					✖	✖				
Obtain environmental documentation from each subcontractor prior to commencing. Review and identify required changes prior to work commencement							✖	✖		
Assess subcontractors' ability to comply with the project							✖	✖		

	Managing Director	HSEQ Director	Construction Director	Pre-Construction Director	Systems Manager	Project Manager	Site Manager	Site Engineer	Foreman	Subcontractor
environmental systems and requirements										
Conduct inductions for all personnel attending site and maintain records.							✖	✖		
Complete an environmental risk assessment at commencement of the project and update as required						✖	✖	✖		
Maintain register of all onsite hazardous materials, chemicals or dangerous goods.							✖	✖		
Obtain safety data sheets and provide adequate chemicals and hazardous materials storage onsite.							✖	✖		
Conduct environmental inspections, distribute for action, obtain and close out.					✖	✖	✖	✖		
Attend projects to monitor and discuss Environmental issues with project management, supervisors and workers	✖	✖			✖					
Schedule and conduct environmental audits of		✖			✖					
Subcontractors. Distribute report and monitor status										
Conduct environmental consultation and communication when necessary	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖
Implement emergency response procedures as outlined in the site Emergency Response Plan						✖	✖	✖	✖	✖
Report and investigate environmental incidents. Monitor		✖					✖			

	Managing Director	HSEQ Director	Construction Director	Pre-Construction Director	Systems Manager	Project Manager	Site Manager	Site Engineer	Foreman	Subcontractor
corrective actions and distribute any lessons learnt										
Report and distribute non-conformances and apply corrective actions. Review effectiveness of the applied corrective actions.		✖			✖	✖	✖	✖	✖	✖
Implement environmental sub-plans and procedures		✖			✖	✖	✖	✖	✖	✖
Obtain feedback for both internal/external training conducted and evaluate the effectiveness of the training programs		✖								
Review environmental objectives and targets annually and provide clear direction of the Environmental management system for the next 24 months.	✖	✖	✖	✖						
Review procedures and forms resulting from changes in legislation, regulation, standards, codes of practices and incidents					✖					
Attend stake holder meetings to assess environmental performance, identify and document lessons learnt	✖	✖	✖	✖						
Ensure that independent audits of the Environmental Management Systems are conducted		✖			✖					
Review environmental performance through preparation of the monthly HSEQ report		✖			✖					
Comply with legal and contractual requirements	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖

Training

All project personnel will receive training of environmental management during site induction to ensure that responsibilities are understand and workers and are competent to carry out the work in line with environmental requirements. The Site Manager is responsible for coordinating environmental training, forwarding training records and assessing the effectiveness of training at project level.

Project Induction

The Site Manager shall ensure that the Project Induction includes the environmental risks and control strategies identified for the project. The following will be included during induction:

- Belmadar's Environmental Policy
- Site environmental objectives and goals
- SSD – Planning Secretary's Environmental Assessment Requirements

The AEPR Regulation 1997

- Site environmental rules and consequences for non-compliance
- Potential consequences of departure from these rules
- Emergency / incident response and management

Belmadar site Supervisors shall be inducted into the requirements of this plan and the requirements of Environmental Control Programs and other management controls relevant to the work they are managing.

Client and related stakeholders

The Site Manager will ensure that minimum training is undertaken before any personnel can work on site.

- Construction Induction Card
- Project induction
- Standard Operating Procedures
- Emergency procedures

Internal Training

The Site Manager shall ensure all workers performing duties required by this plan are properly trained. Where a need is identified, arrangements shall be made for the appropriate training to be provided. Training records from external providers are sent to the Systems Manager following the completion of training.

Training of Subcontractors

The Site Manager or nominee shall assess the environmental control requirements of the subcontract package and, where considered necessary, ensure Subcontractors conduct specific environmental training sessions (through toolbox meetings or external providers etc.).

All Subcontractor site employees shall attend the Project Induction that includes general awareness topics and the key environmental issues for the project. It also includes information on emergency response actions.

3.6 CONSULTANCY AND COMMUNICATION

Communication with Damian Lorenzutta the Saint Ignatius' College and Nicholas Archer the EPM

Communications on significant environmental aspects for SSD – Planning Secretary's Environmental Assessment Requirements

Belmadar will also cooperate with the Damian and Peter and St Ignatius' College Riverview. The Australian Jesuits Code of Conduct if any required community consultation initiatives or emergency response.

Complaints Management

All complaints shall be treated with respect and referred to the Project Manager for action. Incidents including complaints are summarised in the Belmadar Monthly Report.

Communication Actions

Subject	Action	Recipient	Frequency
Breaches to Formal Instrument of Agreement for Australian Standard General Conditions of Contract ***Saint Ignatius' College Wingaru STEMP Project.***	Site Manager to distribute the St Ignatius College Riverview representative for implementation	St Ignatius College Riverview Representatives, and Belmadar workers	**Project commencement and following each revision**
Pollution incident	Workers to report incident	SM/PM	**Immediately after personnel safety check**
	SM to telephone details	SM/PM, Client,) and St Ignatius College Riverview	**Same day**
Pollution limit exceedance	SM to raise Incident Record	SM/PM, SafeWork NSW or St Ignatius College Riverview	**Next day**
Site Meetings - Environmental actions	Record in minutes of project coordination meetings	As per distribution list on minutes	**Each meeting**

Subject	Action	Recipient	Frequency
Community notification	Project Information letter with 24-hour contact number	Adjoining land users likely to be affected	**As determined by Management**
Public complaints receipt	Workers to report	SM/PM	**Immediate**
Complaint response	SM to telephone	Complainant	**Within 2 hours (during working hours)**
	SM/Foreman to submit written report	St Ignatius College Representative and Belmadar management	**Within 5 working days**
Media	SPM as per Media procedure	Belmadar Management	**Immediately**
Discovery of threatened fauna	SM/Foreman to telephone details	NPWS	**Same day**
Discovery of archaeological material, heritage items	SM/Foreman to telephone details	Architect/Heritage Office.	**Same day**
Discovery of skeletal material	SM/Foreman to telephone details	Police	**Same day**
Environmental monitoring checks	SM/Foreman to complete HSE checklist	Site File	**Weekly**
Environmental performance reporting	Site Manager to report	St Ignatius College Representative and Internal Reports	**Monthly**
HSE Audits	HSEQ Manager to notify and provide report	SM/SPM	**Monthly**
Management Review	PM to review and update EMP	Site team	**Six monthly or resultant audit finding**

Community Consultation

Belmadar will comply to community consultation and complaints handling as set out in the Community Communication Strategy required by condition C6; of the Development Consent. **Please refer to Annexure 10 for Community Consultation and Complaints Handling Strategy.**

Hold Points

Hold points are activities that cannot proceed without review and approval by the relevant authority. Specific activities cannot continue until certain procedures or requirements are met that require sign off by a member of the site team. Hold points are to be implemented into the planning stage of the project to avoid unexpected delays or bottlenecks. The following table identifies hold points that have the potential to impact environmental performance and objectives.

Hold Point	Required Action	Authority
All construction work	A Project specific Construction Environmental Management plan has been designed and approved by the site team.	Project Manager
Dewatering	A dewatering permit is to be completed and the water quality is to be tested and only dispersed if it meets required standards	Site Manager
Vegetation Removal	Clearing zones are identified with signage or any equivalent and notes are made on shop drawings. Protected areas must be clearly outlined and avoided.	Site Manager
Transport of Dangerous Goods	Must have storage facilities prepared before goods are transported on site. Transport vehicles must have covered loads and be operated by licensing-holding personnel	Site Manager
Chemical / hazardous materials use	All chemicals and hazardous materials transported on site must have a storage facility prepared, have up to date SDS and be included in the register	Site Manager
Removal of contaminated soil / spoiled land	Soil must be classified prior to leaving site and a licenced facility is to be approved for disposal	Site Manager
Groundwork	Soil and sediment erosion control measures and Construction Environmental management plans are in place, and staff are trained in awareness and competency.	Site Manager

Activities that proceed without correct actions undertaken or without authorisation from the correct authority will be deemed a system non-conformance and requires elevation to the HSEQ Director or Managing Director if necessary.

3.6.1. DESIGN

Design is to be conducted in a manner that incorporates sustainability and preservation of the broader environment by avoiding adverse environmental impacts. Belmadar has a responsibility to promote sustainability through the design phase by adopting practices that do not degrade or pollute the environment wherever possible.

The following are to be considered during the design phase:

SSD – Planning Secretary's Environmental Assessment Requirements

The AEPR Regulation 1997

Construction Environmental Management Plan

Energy-efficient operation

Using recycled or reusable materials where possible Improving efficiency to minimise natural resources used.

Environmental codes of practice, legislation, regulations and standards Environmental targets and objectives

Environmental hazard and risk control measures

Alternative systems that promote clean practices and sustainability Consultation from environmental specialists

The design and construct process is to incorporate the above factors and any extra practices that arise from meetings or consultations. Requirements and resources for environmental compliance will also be described in the design and construct procedure.

3.6.2. PROCUREMENT

The provision of goods and services by subcontracts or suppliers is to be done in consideration of environmental impacts during the selection process. Suppliers are to be evaluated on their ability to conform to environmental regulations and practices as well as their history of environmental non-conformances. A weighted score is to be given using the Subcontractor selection and procurement scorecard that can be used comparatively against other suppliers to make an environmentally conscious selection. Suppliers with a history of environmental non- conformance or with policies that do not correlate with Belmadar's will require escalation to the HSEQ Director or Managing Director for review. Suppliers of chemicals and hazardous materials are required to submit up to date SDS' and a register is to be maintained and updated by the site manager. Subcontractors' SWMS are to include environmental procedures and practices and will be assessed by the site manager during induction. Weekly site walks will include monitoring and evaluation of the subcontractor's environmental procedures and ensure they operate in accordance with their SWMS and environmental policies.

3.6.3. TRANSPORT AND STORAGE

All transport, handling and storage of goods is to be done in accordance with Belmadar's quality management plan. Chemicals and hazardous materials are to be transported, handled and stored in

accordance with supplied SDS' as well as SSD – Planning Secretary's Environmental Assessment Requirements. The AEPR Regulation 1997

Transport:

Transport documentation must be included upon delivery of each load unless an exemption has been approved. The following information must be included in the documentation:

- Contact details of workplace
- Contact details of transporter
- Transport date, origin and destination.
- Product information including name, quantity or classification.

Storage:

Materials are to be kept in designated storage areas under the discretion of the site manager, in areas clear of obstructions, access ways and water ways. Chemicals and hazardous materials require caution with handling and should be located nearby to the drop-off zone to minimise risk of spills and damage to the environment. Any provided SDS' should be stored with the respective products, with the register kept in the site office.

3.6.4. PLANT AND EQUIPMENT

All plant to be brought on site must be documented in Form F1.4 Plant ID Register prior to use. Plant is to be inspected and services to ensure it meets the criteria outlined in the form F1.3 Mobile plant requirements.

Plant and equipment used by Belmadar will be monitored and maintained at intervals in accordance with F1.7 Inspection Test Plan. In particular, the following requirements apply:

- Plant will be inspected and serviced prior to operation by the site manager. If major defects or mechanical faults are discovered, a certified engineer or manufacturer is required for sign off.
- Plant will be serviced, refuelled and washed-down in designated areas, such as concrete wash-out bays, where runoff can be captured and disposed of
- Fuelling will be conducted in bunded areas.
- Plant will be driven and operated only in approved areas, with relevant markings or signage, by personnel holding licences..
- Pollution and noise/vibration control devices will be fitted to plant where practical.

Refer to Appendix 3 for further project specific information on environmental controls for plant and equipment.

3.6.5. MONITORING

The Site Manager shall ensure that the required monitoring and inspection activities for the project/area are implemented.

Environmental Monitoring

Specific environmental monitoring requirements are included in section 14.0 Construction Environmental Management Sub-Plans and are generally the responsibility of the applicable subcontractor performing the work and Belmadar supervisors.

Where required, specialist consultants may be engaged to help establish monitoring systems and to train relevant personnel in the taking of samples, reading of instruments as well as analysis and recording of results.

Any environmental monitoring or testing agencies used on the project shall be appropriately qualified for their applicable activity.

Inspection

Surveillance inspections are conducted by the Site Manager and/or Foremen as part of their daily routine, with significant issues recorded (Site Diary or Action Notice) as applicable for resolution.

The Site Manager or responsible Foreman will also conduct a HSEQ walk which includes a check of environmental issues to confirm the environmental controls are being implemented.

Inspections are recorded on the checklist for follow up, with significant deficiencies raised as a non-compliance Notice (or electronic equivalent as applicable).

3.6.6. EMERGENCY RESPONSE

The Emergency Response Manual and evacuation plan are kept in the office and displayed on the site notice board respectively. Subcontractors and other site personnel are informed of the procedures and location of the plan during induction. Refer to Emergency Response Manual for further details.

3.7. INCIDENTS AND NON-CONFORMANCES

3.7.1. INCIDENT MANAGEMENT

Any environmental issues (potential or actual harm) which are considered as non-compliant with the requirements of this plan shall be resolved in accordance with procedure 'Incident Management'.

The site manager / supervisor will ensure that all environmental incidents / non-conformances occurring in or around the site involving Belmadar personnel, subcontractors, visitors or passers-by, external authorities, Unions etc. are investigated and reported regardless of how minor they appear at the time of the occurrence.

Major or serious incidents which are deemed notifiable will be investigated and reported to the appropriate regulatory authority i.e., St Ignatius College Riverview. The AEPR Regulation 1997 & HSEQ Director.

3.7.2. NON-CONFORMANCES AND CORRECTIVE ACTIONS

Any non-conformance requires a "Task Observation" on Procore to be completed. Situations that require a report are:

- Non-compliance with the site rules
- Non-compliance with environmental requirements
- Following a site incident or accident if changes are required to the Belmadar system to prevent a re-occurrence;
- Actions arising from audits site / weekly inspections, management reviews and weekly site team / subcontractor meetings
- The non-conformance shall be completed and issued to the offending party. Copies of the NCR shall be issued to Belmadar project manager, the subcontractor site supervisor, HSEQ director and systems manager via Procore.
- The project manager and/or site manager will decide on the appropriate disposition and corrective actions. Non-conformances raised as a result of failing to meet environmental legislation will be reviewed by the HSEQ Director to confirm if systems need to be updated and if any company wide alerts, correspondence is required.
- Refer to the Safety Management System for further details on the NCR / CRA process.

Audits

The Site Manager and Health, Safety, Environmental & Quality Director (HSEQ Director) shall ensure that the audit requirements of the EMP are being implemented. The Project Manager shall ensure that the project reporting and review requirements are implemented.

Auditing

The HSEQ Director and Systems Manager shall conduct project level audits to confirm compliance with the requirements of this EMP in accordance with the Belmadar 'Audits' procedure. Inspections are conducted at monthly intervals as specified in the Safety Management System.

Subcontractors are generally not formally audited for environment unless a requirement for a full EMP exists within their contract. Environmental implementation inspections

Management Review

Management reviews including a review of this plan, shall be carried out in accordance with Belmadar procedure 'Management Review'.

3.7.3. INCIDENT AND EMERGENCY RESPONSE

Please refer to the Belmadar Emergency Response Plan described in **Annexure 3**.

3.8 UNEXPECTED FINDS PROCEDURE

3.8.1 SCOPE

This procedure is to provide advice to an unidentified and unexpected (situation) find/s in the workplace, to ensure that unexpected finds (e.g. asbestos) are controlled and managed to prevent harmful effects to personnel from short- term irritation to long-term health effects.

3.8.2 KEY REQUIREMENTS

This procedure shall apply to all operations performed on Demolition/Civil sites where Belmadar responsibility for unexpected finds.

If the hygienist determines prior to the classification of the soil that a remedial action is required, Belmadar will complete a RAP and engage a site auditor in accordance with conditions D33-35 E23, D36-41 and C19.

3.8.3 DEFINITIONS

Asbestos-related	Any material, object, product or debris that contains asbestos.
Foreman - Supervisor Project manager	Also means contractor and sub-contractor
Asbestos Removal	Asbestos removal work requires the appointment of a Principal Contractor. Asbestos removal work is a high-risk construction activity.
Asbestos Material Report	A report by an appropriately qualified person which states: • Where and what the types of materials that were found; • The form of the materials. • The condition of the material (i.e. friable, poorly bonded, unstable). • The potential health risks to building occupants.
Asbestos Register	A register that must be kept by the owner of the building and which must: • Contain information, including any changes/updates, from the Asbestos Material Report. • Be available for inspection by any person requiring inspection. • Be available to all maintenance/building contractors. • Be available to any contractors.
Bonded ACM (B class)	When asbestos fibers are bonded in another material, such as cement or resin binder,it is known as bonded ACM. Bonded ACM cannot be crumbled, pulverised or reduced to a powder by hand pressure when dry. Asbestos cement (AC) sheeting is the most common form of bonded ACM in buildings.
Friable ACM (A class)	Some materials containing asbestos are potentially more hazardous than others. These materials are described as friable which means they crumble easily and have the potential to release asbestos fibres into the air. When dry, friable ACM can be crumbled, pulverised or reduced to powder by hand pressure. It is this friability that releases asbestos fibers into the atmosphere and increases the risk of exposure. For example, sprayed-on fireproofing is considered a friable ACM as it is very easily crumbled to a powder.

Competent person	A competent person is a person who possesses adequate qualifications, such as suitable training and sufficient knowledge, experience, or skill, to perform a specific task safely.
Unidentified and or unexpected find	A sudden unexpected event, (unidentified material) including work required by non- routine failures of equipment, that may result in persons being exposed to unidentified or hazardous materials including airborne asbestos fibres. Unexpected also means unidentified and vice versa

3.8.4 AUTHORITY

Construction Director (HSEQ)

- Approve this procedure.
- Oversee this procedure.

3.8.5 UNEXPECTED (ASBESTOS) FIND

Subject	Action Steps	Responsible
Procedural steps to follow when an unexpected find occurs	In an unexpected situation, the Worker must cease work in the immediate vicinity of the unexpected find and report their findings to their supervisor. The unexpected find area should be barricaded off until the unexpected find sample can be verified. Turn off fans and air-conditioners and seal ducts and vents to prevent the spread of any dust, use water spray to dampen the unexpected find clothing considered affected by airborne particles should remove their outer clothing and place clothing in a 200-micron thick plastic bag marked asbestos waste, the bag should be goose-neck wrapped for disposal to an asbestos approved collection site. An employer or self-employed person must not remove from a workplace protective clothing contaminated with asbestos unless the clothing is— (a) disposed of— (i) as soon as is reasonably practicable; and (ii) in an appropriate manner that eliminates the release of airborne asbestos fibres; and (iii) at a waste disposal site licensed by the Environment Protection Authority; or (b) laundered at a commercial laundry and for that purpose the clothing is contained so as to eliminate the release of airborne asbestos fibres and the exterior of the container— (i) is decontaminated before being removed from the work area; and (ii) indicates the presence of asbestos before the clothing is transferred to the laundry.	Project Manager
Procedural steps to follow when an unexpected find occurs, continued	Sampling should be arranged for a competent person to take a sample of the material and have it analysed by a National Association of Testing Authorities (NATA) accredited laboratory. In an unexpected find situation, the contractor involved in the work must	Project Manager

	not later than 24 hours after identifying the asbestos removal work, notify the Authority of the unexpected find. A notification must be in writing and include the information below: 1. The name, registered business name, Australian Business Number, licence number and contact details of the licence holder. 2. The name of the supervisor who will oversee the asbestos removal work and the supervisor's contact details. 3. The client name and contact details. 4. The name, including registered business or corporate name, and address of the workplace and type of workplace where the asbestos removal work will be performed including the specific location if it is a large workplace. 5. The date of notification.	Operations Manager

Subject	Action Steps	Responsible
	• any other activity that is likely to produce airborne asbestos fibres • any other activity determined by the Authority	
Specific measures to control risk	1. An employer must ensure that any risk associated with an asbestos- related activity is eliminated so far as is reasonably practicable. 2. If it is not reasonably practicable to eliminate a risk associated with an asbestos-related activity, an employer must ensure that the risk is reduced so far as is reasonably practicable by— • isolation; or • using engineering controls; or • combination of both 3. If an employer has complied with the (1) and (2) so far as is reasonably practicable and a risk associated with an asbestos-related activity remains, the employer must, so far as is reasonably practicable, use administrative controls to reduce the risk. 4. If an employer has complied with (1), (2) and (3) so far as is reasonably practicable and a risk associated with an asbestos-related activity remains, the employer must reduce the risk by providing personal protective equipment to employees at risk.	Project Manager
Specific measures to control risk, continued	5. If an employer provides personal protective equipment under measurement (4), the employer must ensure that—	Project

	• the person carrying out the asbestos-related activity is provided with— o appropriate personal protective clothing that is suitable for the activity being carried out o appropriate respiratory protective equipment that issuitable for the activity being carried out; and • the clothing and equipment provided are correctly fitted	Manager
Review of risk control measures	An employer must ensure that any measures implemented to control a risk associated with an asbestos-related activity are reviewed and, if necessary, revised: a) before any alteration is made to systems of work related to the activity that is likely to result in any increased risk to health or safety; or b) after any incident occurs that involves an asbestos-related activity; or c) if, for any other reason, the risk control measures do not adequately control the risks; or d) after receiving a request from a health and safety representative A health and safety representative may make a request if the health and safety representative believes on reasonable grounds that— • any of the circumstances above (a, b, and c) exists; or • the employer has failed— o to properly review risk control measures o to take account of any of the circumstances above (a, b, c) in conducting a review of, or revising, the risk control measures	Project Manager
Work area to be separate and signed	An employer must ensure that the work area used for an asbestos-related activity— • is kept separate from any other work area • so far as is reasonably possible, has appropriately placed signs and barricades that indicate the area where the activity is being carried out	Project Manager

Subject	Action Steps	Responsible
Work area to be kept clean	An employer must, so far as is reasonably practicable, ensure that the work area used for an asbestos-related activity is kept clean. An employer must ensure that the methods used to clean the work area— • do not create a risk to health • do not have the potential to spread airborne asbestos fibres beyond the work area	Foreman Supervisor Project Manag er
Medical examinations	Following exposure to an unexpected find and before arranging a medical examination Delta will await the hygienist report results of the substance. If asbestos is confirmed the employer then has 30 days to arrange an appropriate medical examination to be conducted by a registered medical practitioner for each employee who is considered to have been exposed to ACM dust (airborne particulate) and or, employees engaged in ongoing asbestos-related activities if there is a risk of exposure to airborne asbestos fibres above one half of the asbestos exposure standard. Direction for this task is administered through the Safety Manager.	

Medical examinations, continued	The purpose of the medical examination is to monitor the employee's health for the purpose of identifying changes in the employee's health status to occupational exposure to asbestos due to an unexpected find (or other). Respiratory protective equipment must not be considered in establishing whether there is a risk of exposure to airborne asbestos fibres above one half of the asbestos exposure standard. An employer must ensure that atmospheric monitoring at the workplace is provided if there is uncertainty (based on reasonable grounds) as to whether a medical examination may be required under this Division. An employer must ensure that medical examinations are provided to an employee— • at intervals of not more than 2 years • within 30 days after the employee has ceased an asbestos-related activity (unexpected find), unless the employee has had a medical examination within the preceding year The duties of an employer in relation to medical examinations extend to an independent contractor.	Safety Manager Supervisor Project Manager
Results of atmospheric monitoring to be made available	An employer must ensure that copies of the results of atmospheric monitoring are accessible to the health and safety representative of any affected designated work group and to the affected employees.	Supervisor Project manager
Notice of medical practitioner	The employer must notify the Authority in writing within 7 days of the name and contact details of the registered medical practitioner the employer has engaged to undertake medical examinations.	Supervisor Project manager
Exposure to asbestos	Details of persons exposed to asbestos at the workplace will be registered with the Australian Government Asbestos Safety and Eradication Agency http://www.asbestossafety.gov.au/	RTW Coordinator
Results of medical examination	An employer must ensure that a summary of results of a medical examination indicating whether an asbestos-related disease exists and the employee's fitness for asbestos-related activities is provided to the employer by the registered medical practitioner. The employer must retain a copy of the summary of results: • a period (not exceeding 30 years) determined by the Authority	Supervisor Project manager

Subject	Action Steps	Responsible
	• if no period has been determined by the Authority, 30 years	
Decontamination facilities	An employer carrying out an asbestos-related activity must ensure that a person does not remove personal protective clothing or personal protective equipment that is likely to be contaminated with asbestos from the work area used for the asbestos-related activity unless the clothing or equipment is decontaminated or contained before its removal. An employer carrying out an asbestos-related activity must ensure that any equipment (other than personal protective equipment) that is used for the asbestos-related activity and that is likely to be contaminated with	Supervisor Project

Decontamination facilities, continued	asbestos is— • decontaminated before removal from the work area used for the asbestos-related activity • placed in a sealed container, the exterior of which is decontaminated before the container is removed from the work area used for the asbestos-related activity	manager
Waste containment	An employer carrying out an asbestos-related activity must ensure that— • any asbestos derived from or associated with the activity, and that is no longer required in connection with the activity, is contained so as to eliminate the release of airborne asbestos fibres • the exterior of the container— o is decontaminated before being removed from the work area used for the activity o indicates the presence of asbestos	Foreman Supervisor Project manager
Disposal of asbestos waste	An employer carrying out an asbestos-related activity must ensure that asbestos waste is— • disposed of as soon as is reasonably practicable • disposed of in an appropriate manner that eliminates the release of airborne asbestos fibres • disposed of at a waste disposal site licensed by the Environment Protection Authority	Foreman Supervisor Project manager
Laundering of clothing contaminated with asbestos	An employer carrying out an asbestos-related activity must provide for the laundering of personal protective clothing that is used for an asbestos-related activity and that is likely to be contaminated with asbestos and that is not contained and disposed. If the employer arranges for personal protective clothing that is likely to be contaminated with asbestos to be laundered at a commercial laundry, the employer must ensure that— • the clothing is contained so as to eliminate the release of airborne asbestos fibres; and • the exterior of the container— o is decontaminated before being removed from the work area; and o indicates the presence of asbestos before the clothing is transferred to the laundry	Project manager
Provision of information to job applicants	An employer must provide each applicant who applies for employment with the employer to carry out an asbestos-related activity with information about the nature of the hazard and the risks associated with exposure to airborne asbestos fibres.	Project Manager

Subject	Action Steps	Responsible
Training record	An employer must make a record of training provided in relation to carrying out asbestos-related activities and retain that record for so long as it is applicable	Safety Manager Project Manager

3.8.6 NOTIFICATION

A sudden, unexpected find, including work required by non-routine failures of equipment, that may result in persons being exposed to airborne asbestos fibres; or

an unexpected breakdown of an essential service (including gas, water, sewerage, electricity, and telecommunications) that requires immediate rectification to enable continuance of that service. In an unexpected situation, the asbestos license holder must, not later than 24 hours after commencing asbestos removal work, notify the Authority of the removal work in accordance with legislation.

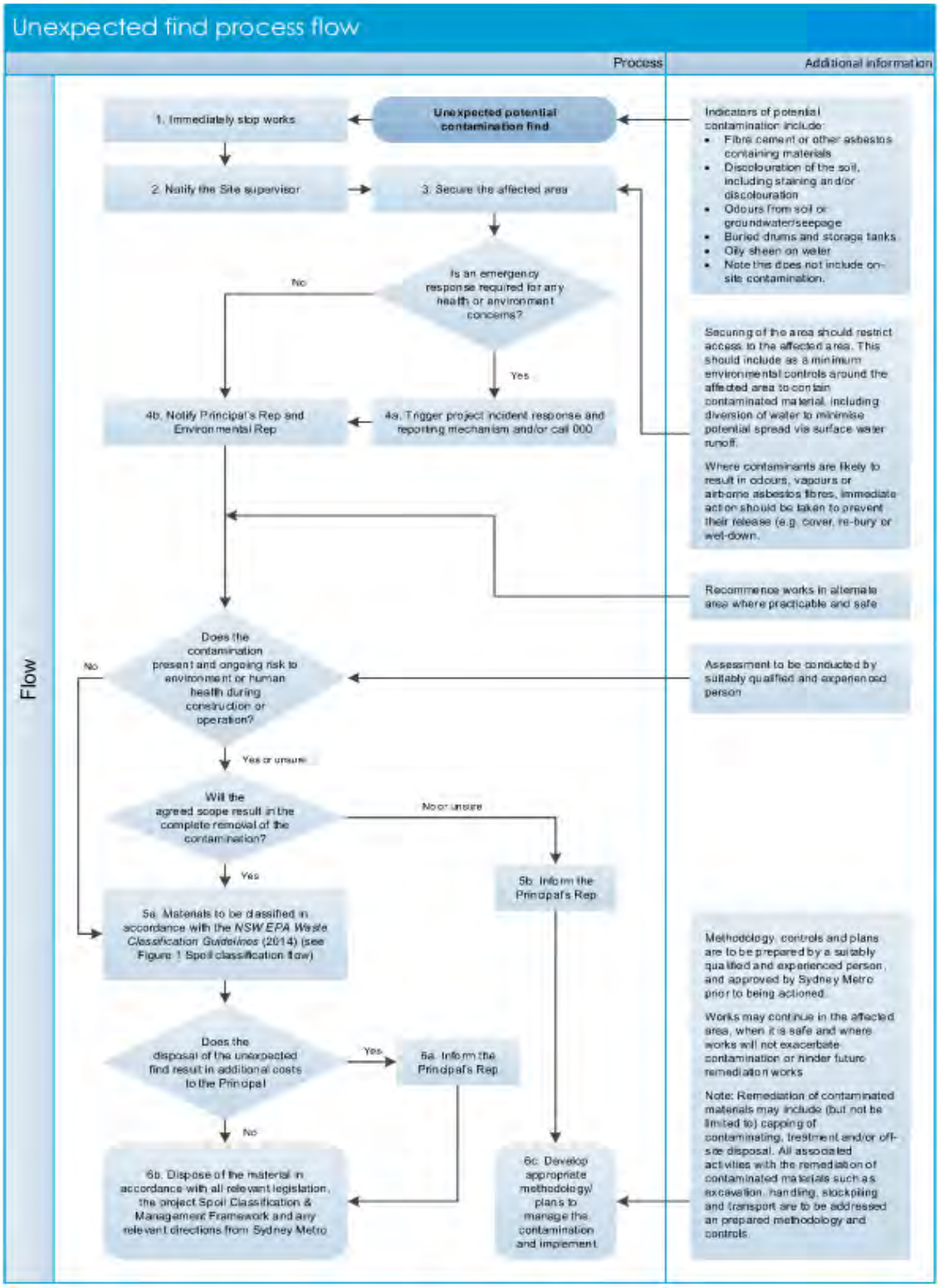
3.8.7 WILDLIFE

Subject	Action Steps	Responsible
Wildlife and Protected species	**Kangaroo:** If the kangaroo approaches, turn your body sideways, exposing a narrow profile to the animal and protecting your face and organs. Raise your hands and lean your head away from the animal to minimize the chances of being scratched across the face by the kangaroo's nasty claws. Retreat, but do not turn your back and run. **Snake:** If you discover a snake, do not approach it closely. If you step on a snake or are very close to a snake then move away quickly. If the snake is onlyabout a meter away, freeze at first and see the snakes' reaction - it will likely look for an escape route. If it is cornered, back away slowly. **Bats:** Do not be alarmed. Like most wild animals, bats are shy. You are advised to leave bats alone. They will fly away after they have done feeding. As bats are drawn to fruit trees such as Chiku (Manilkara zapota), especially when they are fruiting, residents are advised to harvest the fruits within their premises. Bats are shy and will usually not attack humans unless they feel threatened or are attacked. You are advised to leave bats alone, they will usually fly off after feeding. To discourage bats from visiting your property, install bright outdoor lights as they prefer dark places. **Fox:** If you encounter a fox or dingo who does not immediately run away, make some noise. Yell, clap your hands, wave your arms, stomp your feet—make your presence felt, but do not approach or chase the animal. **Bull:** Use your common sense and instincts when handling or walking in a pasture with a bull in it, to avoid getting charged at the bull, do not instigate him nor tease him. Climb the nearest tree if you can, if you are or end up in a treed area, try to keep a large tree between you and the bull and stay close to the fence. **Pigeons:** Pigeons are a problem because their droppings stain buildings and public amenities. They can also spread diseases to humans. In some areas, you can be fined for feeding pigeons. If you have a problem with pigeons in your neighbourhood or home, contact your town council or estate manager. You can also hire a pest control company.	Project Management Team

3.8.8 REFERENCE

- OHS/OSH/WHS Act - OHS/OSH/WHS Regulations
- Australian Standard 1319: 1994 Safety Signs for the Occupational Environment Australia/New Zealand Standard 1715: 1994 Selection Use and Maintenance of Respiratory Protective Devices
- Australia/New Zealand Standard 1716: 2003 Respiratory Protective Devices
- Australian Standard 3544: 1988 Industrial Vacuum Cleaners for Particulates Hazardous to Health
- Australian Standard 4260: 1997 High Efficiency Particulate Air (HEPA) Filters – Classification, Construction and Performance
- WorkSafe Australia - Code of Practice for the Safe Removal of Asbestos NOHSC: 2002 (2005). WorkSafe Australia - Code of practice for the Management and Control of Asbestos in Workplaces [NOHSC: 2018 (2005)] AS 2601-2001 Demolition of Structures
- Public Health Act
- Managing Asbestos in Workplaces Compliance Code (VWA) Removing Asbestos in Workplaces Compliance Code (VWA) Coveralls used for Asbestos Removal (VWA)
- Asbestos-A Handbook for Workplaces (VWA) Asbestos Removal Application Package (VWA) Notification of Asbestos Removal (VWA)
- COP for the safe removal of asbestos (NOHSC)
- COP for the management & control of asbestos in workplaces (NOHSC) COP How to safely remove asbestos in the workplace (QLD)
- COP How to safely remove asbestos (NSW)
- COP How to manage and control asbestos in the workplace (SA)

3.8.9 ATTACHMENT 2 – UNEXPECTED FIND PROCESS FLOW



NOTE: Subject: Condition C19, D33-D35, D36-D41 and E23 Site Contamination SSD - 10424

Belmadar confirm that in response to Condition 19 Site Contamination of the SSD – 10424. If Belmadar, or one of their contractors, discover or become aware of any contamination during the works that will require a Remediation action Plan a NSW EPA-accredited Site Auditor will be engaged to provide advice throughout the duration of the works.

Belmadar propose to engage Nation Partners (a NSW EPA-accredited Site Auditor) to manage the process in accordance with Conditions;

C19 **Site Contamination**

The Applicant must engage a NSW EPA-accredited Site Auditor to provide advice throughout the duration of works to ensure that any work required in relation to soil or groundwater contamination is appropriately managed.

D33 **Site Contamination**

Where relevant, if remediation is required for the site (as per requirements of condition B9), it must be carried out in accordance with a Remediation Action Plan (approved by an NSW EPA accredited Site Auditor) required by condition B9 (where necessary) and the unexpected finds protocol required by condition C9.

D34 **Site Contamination**

If work is to be carried out / completed in stages, a NSW EPA-accredited Site Auditor must confirm satisfactory completion of each stage by the issuance of Interim Audit Advice(s).

D35 **Site Contamination**

The Applicant must ensure the proposed development does not result in a change of risk in relation to any pre-existing contamination on the site that would result in significant contamination.

D36 **Independent Environmental Audit**

Proposed independent auditors must be agreed to in writing by the Planning Secretary prior to the preparation of an Independent Audit Program or commencement of an Independent Audit.

D37 **Independent Environmental Audit**

Independent Audits of the development must be conducted and carried out in accordance with the Independent Audit Post Approval Requirements (2020).

D38 **Independent Environmental Audit**

The Planning Secretary may require the initial and subsequent Independent Audits to be undertaken at different times to those agreed to above, upon giving at least 4 weeks' notice to the applicant of the date or timing upon which the audit must be commenced.

D39 **Independent Environmental Audit**

"In with the specific requirements in the Independent Audit Post Approval Requirements (2020), the Applicant accordance
must:
(a) review and respond to each Independent Audit Report prepared under condition D37 of this consent;

(b) submit the response to the Planning Secretary and the Certifier; and
(c) make each Independent Audit Report and response to it publicly available within 60 days after submission to the Planning Secretary."

D40 **Independent Environmental Audit**

Independent Audit Reports and the Applicant's response to audit findings must be submitted to the Planning Secretary within 2 months of undertaking the independent audit site inspection as outlined in the Independent Audit Post Approval Requirements (2020), unless otherwise agreed by the Planning Secretary.

D41 **Independent Environmental Audit**

Notwithstanding the requirements of the Independent Audit Post Approval Requirements (2020), the Planning Secretary may approve a request for ongoing independent operational audits to be ceased, where it has been demonstrated to the Planning Secretary's satisfaction that an audit has demonstrated operational compliance.

3.9 UNEXPECTED FINDS PROCEDURE- ARCHAEOLOGICAL AND ABORIGINAL HERITAGE ITEMS

Refer to **Annexure 11** Heritage Management plan for Unexpected Finds Protocol.

3.10 TRAFFIC MANAGEMENT PLAN

Refer to **Annexure 12** for Construction Traffic and Pedestrian Management Plan.

ANNEXURE 1 - LEGAL REQUIREMENTS

Legislations Master Register

Title	State	Category	Compliance Requirement (Yes /No)	Notes	Revision history
Hazardous manual tasks: Code of practice	NSW	Code of Practice	Yes		Aug-19
How to manage work health and safety risks: Code of practice	NSW	Code of Practice	Yes		Aug-19
Induction for construction work: National code of practice	NSW	Code of Practice	Yes		May-07
Labelling of workplace hazardous chemicals: Code of practice	NSW	Code of Practice	Yes		Jul-20
Managing noise and preventing hearing loss at work: Code of practice	NSW	Code of Practice	Yes		Jul-20
Preparation of safety data sheets for hazardous chemicals: Code of practice	NSW	Code of Practice	Yes		Jul-20
Work health and safety consultation, cooperation and coordination: Code of practice	NSW	Code of Practice	Yes		Aug-19
Work in hot or cold environments: Code of practice	NSW	Code of Practice	Yes		Jul-20
Work near overhead power lines: Code of practice	NSW	Code of Practice	Yes		2006
SafeWork NSW - Managing the risk of falls at workplaces	NSW	Code of Practice	Yes		Aug-19
Control of work-related exposure to hepatitis and HIV (blood-borne) viruses	NSW	Code of Practice	Yes		Dec-03
Safe handling of timber preservatives and treated timber: Code of practice	NSW	Code of Practice	Yes		Jun-08
Safe use of synthetic mineral fibres: Code of practice	NSW	Code of Practice	Yes		1990
Managing the work environment and facilities: Code of practice	NSW	Code of Practice	Yes		Aug-19
How to safely remove asbestos: Code of practice	NSW	Code of Practice	Yes		Aug-19
How to manage and control asbestos in the workplace: Code of practice	NSW	Code of Practice	Yes		Jul-20
Confined spaces: Code of practice	NSW	Code of Practice	Yes		Jul-20
Moving plant on construction sites: Code of practice	NSW	Code of Practice	Yes		2004
Safe use and storage of chemicals (including pesticides and herbicides) in agriculture	NSW	Code of Practice	Yes		2006
Amenities for Construction Work: Code of Practice	NSW	Code of Practice	Yes	Construction work	Aug-19
Cutting and Drilling Concrete and Other Masonry Products: Code of Practice	NSW	Code of Practice	Yes		Mar-97
Excavation work: Code of practice	NSW	Code of Practice	Yes		Jan-20
Safe work on roofs, Part 1 - Commercial and industrial buildings: Code of practice	NSW	Code of Practice	Yes		2009
Formwork: Code of Practice	NSW	Code of Practice	Yes		Jun-20
Managing the risk of falls at workplaces	NSW	Code of Practice Reference Material	Yes		Oct-18
Excavation work	NSW	Code of Practice Reference Material	Yes		Jan-20
First aid in the workplace	NSW	Code of Practice Reference Material	Yes		Jul-19
Managing electrical risks at the workplace	NSW	Code of Practice Reference Material	Yes		Aug-19
Managing risks in construction work	NSW	Code of Practice Reference Material	Yes	No legislation - used Construction work	Aug-19
Managing risks of hazardous chemicals	NSW	Code of Practice Reference Material	Yes		Jul-20
Managing risks of plant in the workplace	NSW	Code of Practice Reference Material	Yes		Aug-19
Safe design of structures	NSW	Code of Practice Reference Material	Yes		Aug-19
Spray painting and powder coating	NSW	Code of Practice Reference Material	Yes		Jul-20
Welding.	NSW	Code of Practice Reference Material	Yes		Jul-20
Contaminated Land Management Act 1997	NSW	Environmental Legislation	Yes		Dec-20
Contaminated Land Management Regulation 2008	NSW	Environmental Legislation	Yes		Aug-13
Environmental Planning and Assessment Act 1979	NSW	Environmental Legislation	Yes		Nov-17
Environmental Planning and Assessment Regulation 2000	NSW	Environmental Legislation	Yes		Dec-20
State Environmental Planning Policy (Infrastructure) 2007	NSW	Environmental Legislation	Yes		Dec-20
Environmental Trust Act 1998 (no environmental obligations for non-regulatory organisations)	NSW	Environmental Legislation	Yes		Dec-18
Environmentally Hazardous Chemicals Act 1985	NSW	Environmental Legislation	Yes		Oct-18
Environmentally Hazardous Chemicals Regulation 2008	NSW	Environmental Legislation	Yes		Sep-17
Local Government Act 1993	NSW	Environmental Legislation	Yes		Dec-20
Local Government (General) Regulation 2005	NSW	Environmental Legislation	Yes		Dec-20
Poisons and Therapeutic Goods Act 1966	NSW	Environmental Legislation	Yes		May-18
Protection of the Environment Administration Act 1991	NSW	Environmental Legislation	Yes		Dec-18
Protection of the Environment Legislation Amendment Act 2011	NSW	Environmental Legislation	Yes		Oct-14
Protection of the Environment Administration Regulation 2012	NSW	Environmental Legislation	Yes		Dec-18
Protection of the Environment Operations Act 1997	NSW	Environmental Legislation	Yes		Dec-20
Protection of the Environment Operations (Clean Air) Regulation 2010	NSW	Environmental Legislation	Yes		Jan-19
Protection of the Environment Operations (General) Regulation 2009	NSW	Environmental Legislation	Yes		Dec-20
Protection of the Environment Operations (Noise Control) Regulation 2008	NSW	Environmental Legislation	Yes		Dec-20
Protection of the Environment Operations (Waste) Regulation 2005	NSW	Environmental Legislation	Yes		Oct-20
Protection of the Environment Operations Amendment (Miscellaneous) Regulation 2011	NSW	Environmental Legislation	Yes		May-17
Protection of the Environment Operations (General) Amendment (Pollution Incident Response Management Plans) Regulation 20	NSW	Environmental Legislation	Yes		Feb-12
Public Health Act 1991	NSW	Environmental Legislation	Yes		Dec-20
Soil Conservation Act 1938	NSW	Environmental Legislation	Yes		Aug-18
Sydney Water Act 1994	NSW	Environmental Legislation	Yes		Jul-19

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Title	State	Category	Compliance Requirement (Yes /No)	Notes	Revision history
Sydney Water Catchment Management Regulation 2008	NSW	Environmental Legislation	Yes	Changed to Water NSW Regulation	Jul-18
Sydney Water Regulation 2006	NSW	Environmental Legislation	Yes		Aug-17
Waste Avoidance and Resource Recovery Act 2001	NSW	Environmental Legislation	Yes		May-20
Waste Recycling and Processing Corporation Act 2001	NSW	Environmental Legislation	Yes		Dec-18
Water Act 1912	NSW	Environmental Legislation	Yes		Dec-18
Water Management Act 2000	NSW	Environmental Legislation	Yes		Dec-20
Induction for construction work: National code of practice	NSW	Environmental Legislation	Yes		May-07
Protection of the Environment Operations Act 1997	NSW	Environmental Legislation	Yes		Dec-20
Anti-Discrimination Act 1977	Commonwealth	QUALITY LEGISLATION	Yes		Dec-20
Fair Work Act 2009	Commonwealth	QUALITY LEGISLATION	Yes		Oct-20
Privacy Act 1988	Commonwealth	QUALITY LEGISLATION	Yes		Jul-20
Trade Practices Act 1974	Commonwealth	QUALITY LEGISLATION	Yes		Apr-10
AS 4390:1996 Records Management	NSW	QUALITY LEGISLATION	Yes		Feb-96
AS/NZS/ISO 15489 Records Management (2002)	NSW	QUALITY LEGISLATION	Yes		May-17
Roads and Maritime Services Traffic Services Regulation	NSW	Codes of Practice and Standards	Yes	No legislation - used Traffic control at worksites	Oct-20
AS 1742.3 - RTA Traffic Control and Worksites Manual	NSW	Codes of Practice and Standards	Yes		Oct-20
AS 1576.1:2010 Scaffolding General Requirements	NSW	Codes of Practice and Standards	Yes		Jul-17
AS/NZS 1577: Scaffold decking components	NSW	Codes of Practice and Standards	Yes		Jun-18
AS/NZS 1892.1: Portable Ladders – Metal	NSW	Codes of Practice and Standards	Yes	Part 1 is performance and geometric requirements	Aug-96
AS/NZS 1892.3: Portable Ladders – Reinforced Plastic	NSW	Codes of Practice and Standards	Yes		Aug-96
AS/NZS 4576: Guidelines for Scaffolding	NSW	Codes of Practice and Standards	Yes		00/00/2020
AS/NZS 1891.1:2007: Industrial fall-arrest systems and devices Harnesses and ancillary equipment	NSW	Codes of Practice and Standards	Yes		Jul-07
AS 2626 Industrial Safety Belts and Harnesses - Selection, Use and Maintenance	NSW	Codes of Practice and Standards	Yes		Jan-91
AS 4626 Industrial Fall Arrest Devices - Selection, Use and Maintenance	NSW	Codes of Practice and Standards	Yes	INACTIVE	Jul-97
AS 1657:2018 Fixed platforms, walkways, stairways and ladders—Design, construction and installation	NSW	Codes of Practice and Standards	Yes		Apr-18
AS 2317 Collared Eyebolts	NSW	Codes of Practice and Standards	Yes		Oct-98
AS 2319 Rigging Screws and Turnbuckles	NSW	Codes of Practice and Standards	Yes		Oct-01
AS 3569 Steel Wire Ropes	NSW	Codes of Practice and Standards	Yes		00/00/2010
AS 4142 Fibre Ropes	NSW	Codes of Practice and Standards	Yes		Nov-93
AS/NZS 3760:2003 in Service Safety Inspection And Testing of Electrical Equipment	NSW	Codes of Practice and Standards	Yes		Dec-03
AS 1742.3 – Traffic control devices for works on roads	NSW	Codes of Practice and Standards	Yes		Dec-19
AS/NZS 1269.3 – Occupational noise management – Hearing protector program	NSW	Codes of Practice and Standards	Yes		Apr-05
AS/NZS 1336 – Recommended practices for occupational eye protection	NSW	Codes of Practice and Standards	Yes		00/00/2014
AS/NZS 1337 – Eye protectors for industrial applications	NSW	Codes of Practice and Standards	Yes		00/00/2010
AS/NZS 1801 – Occupational protective helmets	NSW	Codes of Practice and Standards	Yes		Sep-97
AS/NZS 2604 – Sunscreen products	NSW	Codes of Practice and Standards	Yes		May-12
AS/NZS 4602 – High visibility safety garments	NSW	Codes of Practice and Standards	Yes		00/00/2011
AS1067.2 – Sunglasses and fashion spectacles	NSW	Codes of Practice and Standards	Yes		Sep-16
AS1319 – Safety signs for the occupational environment	NSW	Codes of Practice and Standards	Yes		00/00/2018
Codes of Practice First Aid in the Workplace, 2012. Safe Work	NSW	Codes of Practice and Standards	Yes		Jul-19
Code of Practice – Construction work	NSW	Codes of Practice and Standards	Yes		Aug-19
Code of Practice – How to manage work health and safety risks (May 2018)	NSW	Codes of Practice and Standards	Yes		Aug-19
Code of Practice - Managing the risk of falls at workplaces	NSW	Codes of Practice and Standards	Yes		Aug-19
Code of Practice - Managing the risk of falls in housing construction	NSW	Codes of Practice and Standards	Yes		Oct-18
Code of Practice - Managing the work environment and facilities	NSW	Codes of Practice and Standards	Yes		Aug-19
Code of Practice – Work near overhead power lines code of practice	NSW	Codes of Practice and Standards	Yes		2006
Work Health and Safety Act 2011	NSW	OH&S	Yes		Jul-18
Work Health and Safety Regulation 2017	NSW	OH&S	Yes		Dec-20
Work Health and Safety Act 2011 No 10	NSW	OH&S	Yes		Removed irrelevant legislation, standards, and COP's
	NSW	OH&S	Yes		Jan-12
Work Health and Safety Regulation 2017	NSW	OH&S	Yes		Dec-20
Work Health and Safety Amendment (Review) Act 2020	NSW	OH&S	Yes	New release, LCA raised.	Jun-20
Workplace Injury Management and Workers Compensation Act 1998 No 86	NSW	OH&S	Yes		Nov-19
Workers Compensation Act 1987 No 70	NSW	OH&S	Yes		Oct-20
Workers' Compensation (Dust Diseases) Act 1942 No 14	NSW	OH&S	Yes		Nov-19
Workers Compensation Legislation Amendment Act 2000 No 87	NSW	OH&S	Yes		Dec-00

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Title	State	Category	Compliance Requirement (Yes /No)	Notes	Revision history
Workers Compensation Legislation Amendment Act 2012 No 53	NSW	OH&S	Yes		Jun-12
Workers Compensation Legislation Amendment (Miscellaneous Provisions) Act 2005 No 113	NSW	OH&S	Yes		Dec-05
Dangerous Goods Safety Management Act 2001	QLD	OH&S			
Dangerous Goods Safety Management Regulation 2001	QLD	OH&S			
Electricity Act 1994	QLD	OH&S			
Electricity Regulation 2006	QLD	OH&S			
Transport Operations (Road Use Management - Dangerous Goods) Regulation 2008	QLD	OH&S			
Transport Operations (Road Use Management - Fatigue Management) Regulation 2008	QLD	OH&S			
Transport Operations (Road Use Management - Vehicle Standards and Safety) Regulation 1999	QLD	OH&S			
Transport Operations (Road Use Management) Act 1995	QLD	OH&S			
Workplace Health and Safety Act 2011	QLD	OH&S			09/01/2011 SJ: Updated
Workplace Health and Safety Regulation 2011	QLD	OH&S			09/01/2011 SJ: Updated
Workers Compensation & Rehabilitation Act 2003	QLD	OH&S			12/01/2012 SJ: Added to the list
Workers Compensation & Rehabilitation Reg 2003	QLD	OH&S			12/01/2012 SJ: Added to the list
Electrical Safety Act 2002	QLD	OH&S			12/01/2012 SJ: Added to the list
Electrical Safety Regs 2002	QLD	OH&S			12/01/2012 SJ: Added to the list
Abrasive Blasting 2004	QLD	Code of Practice			
Children and Young Workers Code of Practice 2006	QLD	Code of Practice			
Concrete Pumping Code of Practice 2005	QLD	Code of Practice			
First Aid Code of Practice 2004	QLD	Code of Practice			
Formwork 2006	QLD	Code of Practice			
Hazardous Substances 2003	QLD	Code of Practice			
Manual Tasks Involving the Handling of People 2001	QLD	Code of Practice			
Mobile Crane Code of Practice 2006	QLD	Code of Practice			
Plant Code of Practice 2005	QLD	Code of Practice			
Prevention of Workplace Harassment 2004	QLD	Code of Practice			
Scaffolding Code of Practice 2009	QLD	Code of Practice			
Steel Construction 2004	QLD	Code of Practice			
Tilt-Up and Pre-cast Construction Industry Code of Practice 2003	QLD	Code of Practice			
Traffic Management for Construction or Maintenance Work Code of Practice 2008	QLD	Code of Practice			
Aboriginal Cultural Heritage Act 2003	QLD	Environmental			
Aboriginal Land Act 1991	QLD	Environmental			
Building Units and Group Titles Act 1980	QLD	Environmental			
Coastal Protection and Management Act 1995	QLD	Environmental			
Dangerous Goods Safety Management Act 2001	QLD	Environmental			
Dangerous Goods Safety Management Regulation 2001	QLD	Environmental			
Environmental Protection (Air) Policy 2008	QLD	Environmental			
Environmental Protection (Noise) Policy 2008	QLD	Environmental			
Environmental Protection (Waste Management) Policy 2000	QLD	Environmental			
Environmental Protection (Waste Management) Regulation 2000	QLD	Environmental			
Environmental Protection (Water) Policy 2009	QLD	Environmental			
Environmental Protection Act 1994	QLD	Environmental			
Environmental Protection Regulation 2008	QLD	Environmental			
Land Act 1994	QLD	Environmental			
Land Title Act 1994	QLD	Environmental			
Local Government Act 1993	QLD	Environmental			
Metropolitan Water Supply and Sewerage Act 1909	QLD	Environmental			
National Environment Protection Council (Queensland) Act 1994	QLD	Environmental			
National Trust of Queensland Act 1963	QLD	Environmental			
Nature Conservation Act 1992	QLD	Environmental			
Plumbing and Drainage Act 2002	QLD	Environmental			
Queensland Heritage Act 1992	QLD	Environmental			
Soil Conservation Act 1986	QLD	Environmental			
Soil Survey Act 1929	QLD	Environmental			
Standard Plumbing and Drainage Regulation 2003	QLD	Environmental			
Surveyors Act 2003	QLD	Environmental			
Sustainable Planning Act 2009	QLD	Environmental			
Sustainable Planning Regulation 2009	QLD	Environmental			
Water Act 2000	QLD	Environmental			
Building Code of Australia	QLD	Others			

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Title	State	Category	Compliance Requirement (Yes /No)	Notes	Revision history
Australian Building Greenhouse Rating	QLD	Others			
Confined Space Code of Practice 2011	QLD	Code of Practice			23/01/2012 SJ: Replaced 2010 version
Hazardous Manual Tasks Code of Practice 2011	QLD	Code of Practice			23/01/2012 SJ: Added to this list
How to Manage Work Health & Safety Risks Code of Practice 2011	QLD	Code of Practice			23/01/2012 SJ: Replaced 2007 version
How to Manage & Control Asbestos in the Workplace Code of Practice 2011	QLD	Code of Practice			23/01/2012 SJ: Replaced old version
How to Safely Remove Asbestos Code of Practice 2011	QLD	Code of Practice			23/01/2012 SJ: Replaced old version
Labelling of Workplace Hazardous Chemicals Code of Practice 2011	QLD	Code of Practice			23/01/2012 SJ: Replaced 2003 version
Managing Noise & Preventing Hearing Loss at Work Code of Practice 2011	QLD	Code of Practice			23/01/2012 SJ: Replaced 2004 version
Managing the Risk of Falls at the Workplace Code of Practice 2011	QLD	Code of Practice			23/01/2012 SJ: Added to this list
Managing the Work Environment and Facilities Code of Practice 2011	QLD	Code of Practice			23/01/2012 SJ: Added to this list
Work Health & Safety Consultation, Cooperation & Coordination	QLD	Code of Practice			23/01/2012 SJ: Added to this list
Hazardous Chemicals Code of Practice 2003	QLD	Code of Practice			23/01/2012 SJ: Added to this list
Accident Compensation Act 1985	VIC	OH&S			
Accident Compensation (Occupational Health and Safety) Act 1996	VIC	OH&S			
Accident Compensation (WorkCover Insurance) Act 1993	VIC	OH&S			
Accident Compensation Regulations 2001	VIC	OH&S			
Building Act 2006	VIC	OH&S			
Building Regulations 2006	VIC	OH&S			
Dangerous Goods Act 1985	VIC	OH&S			
Dangerous Goods (Explosives) Regulations 2000	VIC	OH&S			
Dangerous Goods (HCDG) Regulations 2005	VIC	OH&S			
Dangerous Goods (Storage and Handling) Regulations 2000	VIC	OH&S			
Dangerous Goods (Transport by Road or Rail) Regulations 2008	VIC	OH&S			
Equipment (Public Safety) Regulations 2007	VIC	OH&S			
Magistrates' Court (Occupational Health and Safety) Rules 2005	VIC	OH&S			
Occupational Health and Safety Act 2004	VIC	OH&S			
Occupational Health and Safety Regulations 2007	VIC	OH&S			
Workers Compensation Act 1958	VIC	OH&S			
Code of Practice No.13 - Building and Construction Workplaces 1990	VIC	Code of Practice			
Code of Practice No.14 – Demolition 1991	VIC	Code of Practice			
Code of Practice No.14 - Demolition (Amendment No.1) 1998	VIC	Code of Practice			
Code of Practice No.25 - Manual Handling 2000	VIC	Code of Practice			
Code of Practice No.19 – Plant 1995	VIC	Code of Practice			
Code of Practice No.23 - Plant (Amendment No.1) 1998	VIC	Code of Practice			
Code of Practice No.29 - Prevention of Falls in Housing Construction 2004	VIC	Code of Practice			
Code of Practice No.8 - Safety Precautions in Trench Operations 1988	VIC	Code of Practice			
Communicating occupational health and safety across languages 2008	VIC	Compliance Code			
Confined spaces 2009	VIC	Compliance Code			
First aid in the workplace 2008	VIC	Compliance Code			
Managing asbestos in workplaces 2008	VIC	Compliance Code			
Prevention of falls in general construction 2008	VIC	Compliance Code			
Removing asbestos in workplaces 2008	VIC	Compliance Code			
Workplace amenities and work environment 2008	VIC	Compliance Code			
Industry Standard - Electrical Installations on Construction Sites 2010	VIC	Industry Standard			
Industry Standard - for Concrete Cutting and Drilling 2010	VIC	Environmental			
Industry Standard - Precast and Tilt-up Concrete for Buildings 2001	VIC	Environmental			
Industry Standard - Concrete Pumping 2004	VIC	Environmental			
Industry Standard - Contaminated Construction Sites 2005	VIC	Environmental			
Industry Standard - Structural steel erection for buildings 2009	VIC	Environmental			
Aboriginal Heritage Act 2006	VIC	Environmental			
Aboriginal Heritage Regulations 2007	VIC	Environmental			
Building Act 1993	VIC	Environmental			
Building Regulations 2006	VIC	Environmental			
Catchment and Land Protection Act 1994	VIC	Environmental			
Coastal Management Act 1995	VIC	Environmental			
Dangerous Goods (Explosives) Regulations 2000	VIC	Environmental			
Dangerous Goods (Storage and Handling) Regulations 2000	VIC	Environmental			
Dangerous Goods (Transport by Road or Rail) Regulations 2008	VIC	Environmental			
Dangerous Goods Act 1985	VIC	Environmental			
Electricity Industry Act 2000	VIC	Environmental			

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Electricity Safety Act 1998	VIC	Environmental			
Environment Effects Act 1978	VIC	Environmental			
Environment Protection (Amendment) Act 2006	VIC	Environmental			
Environment Protection (Environment and Resource Efficiency Plans) Regulations 2007	VIC	Environmental			
Environment Protection (Fees) Regulations 2001	VIC	Environmental			
Environment Protection (Industrial Waste Resource) Regulations 2009	VIC	Environmental			
Environment Protection (Scheduled Premises and Exemptions) Regulations 2007	VIC	Environmental			
Environment Protection (Vehicle Emissions) Regulations 2003	VIC	Environmental			
Environment Protection Act 1970	VIC	Environmental			
Fences Act 1968	VIC	Environmental			
Flora and Fauna Guarantee Act 1988	VIC	Environmental			
Heritage Act 1995	VIC	Environmental			
Heritage Rivers Act 1992	VIC	Environmental			
Local Government Act 1989	VIC	Environmental			
Monetary Units Act 2004	VIC	Environmental			
Notifiable Chemicals Order (arsenic and arsenic compounds) (Gazette No. S 58, June 1997)	VIC	Environmental			
Notifiable Chemicals Order (CFCs and Halons) (Gazette No. G 14, April 1990)	VIC	Environmental			
Notifiable Chemicals Order (organotin antifouling paint) (Gazette No. S 94, June 2000)	VIC	Environmental			
Notifiable Chemicals Order (polychlorinated biphenyls) (Gazette No. G 51, December 1997)	VIC	Environmental			
Order Prohibiting the Removal of Certain Asbestos at Workplaces	VIC	Environmental			
Permanent Water Savings Plan Notice, Victorian Government Gazette G 36, 6 September 2007, p 2041-2043	VIC	Environmental			
Planning and Environment Act 1987	VIC	Environmental			
Planning and Environment Regulations 2005	VIC	Environmental			
Plant Health and Plant Products Act 1995	VIC	Environmental			
Plant Health and Plant Products Regulations 2006	VIC	Environmental			
Pollution of Waters by Oil and Noxious Substances Act 1986	VIC	Environmental			
Pollution of Waters by Oil and Noxious Substances Regulations 2002	VIC	Environmental			
Prescribed Industrial Waste Classification (Designated Organic Contaminated Soils)	VIC	Environmental			
Prescribed Industrial Waste Classification (Firefighting Dry Chemical Powder Waste)	VIC	Environmental			
Prescribed Industrial Waste Classification (Grease Interceptor Trap Waste)	VIC	Environmental			
Prescribed Industrial Waste Classification by Hazard for Absorbent Materials	VIC	Environmental			
Prescribed Industrial Waste Classification by Hazard for Ceramic-Based Fibres	VIC	Environmental			
Prescribed Industrial Waste Classification by Hazard for Packaging Waste	VIC	Environmental			
Public Health and Wellbeing Act 2008	VIC	Environmental			
Public Health and Wellbeing Regulations 2009	VIC	Environmental			
Road Safety (Vehicles) Regulations 2009	VIC	Environmental			
Safety on Public Land Act 2004	VIC	Environmental			
Sentencing Act 1991	VIC	Environmental			
State Environment Protection Policy (Air Quality Management)	VIC	Environmental			
State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade)	VIC	Environmental			
State Environment Protection Policy (Groundwaters of Victoria)	VIC	Environmental			
State Environment Protection Policy (Prevention And Management Of Contamination Of Land)	VIC	Environmental			
State Environment Protection Policy (Waters of Victoria)	VIC	Environmental			
State Environment Protection Policy (Waters of Victoria) - Schedule F3: Waters of Gippsland Lakes and Catchment	VIC	Environmental			
State Environment Protection Policy (Waters of Victoria) - Schedule F5: Waters of the Latrobe and Thomson River Basins and Merriman Creek Catchment	VIC	Environmental			
State Environment Protection Policy (Waters of Victoria) - Schedule F6: Waters of Port Phillip Bay	VIC	Environmental			
State Environment Protection Policy (Waters of Victoria) - Schedule F7: Waters of the Yarra Catchment	VIC	Environmental			
State Environment Protection Policy (Waters of Victoria) - Schedule F8: Waters of Western Port and Catchment	VIC	Environmental			
Summary Offences Act 1966	VIC	Environmental			
Transport Act 1983	VIC	Environmental			
Variation dated 1 February 2000 (relates to polychlorinated biphenyls) (Gazette No. S 5, February 2000)	VIC	Environmental			
Variation dated 31 October 2001 (relates to environment improvement plans for noise emissions)	VIC	Environmental			
Variation dated 5 October 2004 to the State Environment Protection Policy (Waters of Victoria)	VIC	Environmental			
Victorian Energy Efficiency Target Act 2007	VIC	Environmental			
Victorian Energy Efficiency Target Regulations 2008	VIC	Environmental			
Victorian Renewable Energy Act 2006	VIC	Environmental			
Waste Management Policy (Movement of Controlled Waste between States and Territories)	VIC	Environmental			
Waste Management Policy (National Pollutant Inventory)	VIC	Environmental			
Waste Management Policy (Protection of the Ozone Layer)	VIC	Environmental			
Waste Management Policy (Used Packaging Materials)	VIC	Environmental			

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Title	State	Category	Compliance Requirement (Yes /No)	Notes	Revision history
Waste Management Policy (Waste Acid Sulfate Soils)	VIC	Environmental			
Water Act 1989	VIC	Environmental			
Water Efficiency Labeling and Standards Act 2005	VIC	Environmental			
Water Industry Regulations 2006	VIC	Environmental			
Wildlife Act 1975	VIC	Environmental			
Wildlife Regulations 2002	VIC	Environmental			
Building Code of Australia	VIC	Others			
Australian Building Greenhouse Rating	VIC	Others			
Building (ACT Appendix to the Building Code-2008 and 2009 editions) Determination 2009	ACT	OH&S			
Building (Asbestos code - asbestos removal control plan) Determination 2006	ACT	OH&S			
Building (Asbestos code - minor maintenance work) Determination 2006	ACT	OH&S			
Building (General) Regulation 2008	ACT	OH&S			
Building (Recognised Standard) Declaration 2006	ACT	OH&S			
Building (Safe Live Load Plates) Approval 2008	ACT	OH&S			
Building Act 2004	ACT	OH&S			
Construction Occupations (Licensing) Act 2004	ACT	OH&S			
Construction Occupations (Licensing) Regulation 2004	ACT	OH&S			
Dangerous Substances (General) Regulation 2004	ACT	OH&S			
Dangerous Substances (Storage and Handling Code of Practice) Approval 2006	ACT	OH&S			
Dangerous Substances (Training Course) Approval 2005 (No 1)	ACT	OH&S			
Dangerous Substances Act 2004	ACT	OH&S			
Discrimination Act 1991	ACT	OH&S			
Electricity Safety Act 1971	ACT	OH&S			
Electricity Safety Regulation 2004	ACT	OH&S			
Gas Safety (Provision of Compliance Indicator and Certificate of Compliance) Code of Practice 2008	ACT	OH&S			
Gas Safety Act 2000	ACT	OH&S			
Gas Safety Regulation 2001	ACT	OH&S			
Road Transport (Alcohol and Drugs) Act 1977	ACT	OH&S			
Road Transport (Alcohol and Drugs) Regulation 2000	ACT	OH&S			
Road Transport (Safety and Traffic Management) Act 1999	ACT	OH&S			
Road Transport (Safety and Traffic Management) Regulation 2000	ACT	OH&S			
Scaffolding and Lifts Act 1912	ACT	OH&S			
Scaffolding and Lifts Regulation 1950	ACT	OH&S			
Work Safety Act 2008	ACT	OH&S			
Work Safety Regulation 2009	ACT	OH&S			
Workers Compensation Act 1951	ACT	OH&S			
Workers Compensation Regulation 2002	ACT	OH&S			
Refer to National Codes	ACT	Code of Practice			
Environment Protection Act 1997	ACT	Environmental			
Environment Protection Regulation 2005	ACT	Environmental			
Environment Protection (Fees) Determination 2009	ACT	Environmental			
Magistrates Court (Environment Protection Infringement Notices) Regulation 2005	ACT	Environmental			
Nature Conservation Act 1980	ACT	Environmental			
General Environment Protection Policy (August 2007)	ACT	Environmental			
Air Environment Protection Policy (November 1999)	ACT	Environmental			
Contaminated Sites Environmental Protection Policy (November 2009)	ACT	Environmental			
Hazardous Materials Environment Protection Policy (November 2010)	ACT	Environmental			
Noise Environment Protection Policy (January 2010)	ACT	Environmental			
Wastewater Reuse Environment Protection Policy (July 1999)	ACT	Environmental			
Water Quality Environment Protection Policy (April 2008)	ACT	Environmental			
Building Code of Australia	ACT	Others			
Australian Building Greenhouse Rating	ACT	Others			
Code for Management and Control of Asbestos in the Workplace 2005	National	Code of Practice			2018
Code of Practice for the Control of Scheduled Carcinogenic Substances 1995	National	Code of Practice			2014
Induction for Construction Work 2007	National	Code of Practice			May-07
National Code of Practice for the Control and Safe Use of Inorganic Lead at Work 1994	National	Code of Practice			2015
National Code of Practice for the Control of Workplace Hazardous Substances 1994	National	Code of Practice			2007
National Code of Practice for the Storage and Handling of Dangerous Goods 2001	National	Code of Practice			2017
National Code of Practice for Noise Management and Protection of Hearing at Work - 3rd Edition 2004	National	Code of Practice			2009
National Code of Practice for the Prevention of Musculoskeletal Disorders Caused From Performing Manual Tasks 2007	National	Code of Practice			Aug-07

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Title	State	Category	Compliance Requirement (Yes /No)	Notes	Revision history
National Code of Practice for the Prevention of Occupational Overuse Syndrome [NOHSC:2013(1994)] 2013	National	Code of Practice			2013
National Code of Practice for the Safe Handling of Timber Preservatives and Treated Timber 1989	National	Code of Practice			2003
National Code of Practice for the Safe Use of Synthetic Mineral Fibres 1990	National	Code of Practice			2006
National Exposure Standards for Atmospheric Contaminants in the Occupational Environment 1995	National	Code of Practice			Apr-18
National Occupational Health & Safety Certification Standard for Users and Operators of Industrial Equipment – 3rd Edition 2001	National	Code of Practice			2001
National Standard for Construction Work 2005	National	Code of Practice			Apr-05
National Standard for Licensing Persons Performing High Risk Work 2006	National	Code of Practice			Apr-06
National Standard for Manual Tasks 2007	National	Code of Practice			Aug-07
National Standard for Occupational Noise 2000	National	Code of Practice			Jul-00
National Standard for Plant 1994	National	Code of Practice			1994
National Standard for Synthetic Mineral Fibres 1990	National	Code of Practice			May-90
National Standard for the Control of Inorganic Lead at Work 1994	National	Code of Practice			2015
National Standards for Storage and Handling of Workplace Dangerous Goods 2001	National	Code of Practice			Mar-01
Precast, Tilt-up and Concrete Elements in Building Construction 2008	National	Code of Practice			Feb-08
Safe Removal of Asbestos 2nd Edition 2005	National	Code of Practice			Apr-05
Safe Working in a Confined Space – AS2865-1995 1994	National	Code of Practice			Jan-95
Workplace Injury & Disease Recording Standard in the Workplace (AS 1885.1) 990	National	Code of Practice			Jun-90
Workplace Injury and Disease Recording Standard - Australian Standard AS 1885.1-1990 1990	National	Code of Practice			Jun-90
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	National	Environmental			Oct-16
Airports Act 1996	National	Environmental			Jul-16
Airports (Environment Protection) Regulations 1997	National	Environmental			Nov-17
Australian Radiation Protection and Nuclear Safety Act 1998	National	Environmental			Oct-16
Australian Radiation Protection and Nuclear Safety Regulations 1999	National	Environmental			Dec-18
Energy Efficiency Opportunities Act 2006	National	Environmental			Jun-14
Energy Efficiency Opportunities Regulations 2006	National	Environmental			Aug-13
Environment Protection and Biodiversity Conservation Act 1999	National	Environmental			Jul-16
Environment Protection and Biodiversity Conservation Regulations 2000	National	Environmental			Oct-16
Hazardous Waste (Regulation of Exports and Imports) Act 1989	National	Environmental			Jul-17
Industrial Chemicals (Notification and Assessment) Act 1989	National	Environmental			Jul-16
National Environment Protection Council Act 1994	National	Environmental			Jul-16
National Environment Protection (Air Toxics) Measure	National	Environmental			Sep-11
National Environment Protection (Ambient Air Quality) Measure	National	Environmental			Feb-16
National Environment Protection (Assessment of Site Contamination) Measure	National	Environmental			May-13
National Environment Protection (Diesel Vehicle Emissions) Measure	National	Environmental			Jun-01
National Environment Protection (Movement of Controlled Waste between States and Territories) Measure	National	Environmental			Dec-12
National Environment Protection (National Pollutant Inventory) Measure	National	Environmental			Feb-98
National Environment Protection (Used Packaging Materials) Measure	National	Environmental			Sep-11
National Environment Protection (Used Packaging Materials) Measure - Application Thresholds	National	Environmental			Sep-11
National Greenhouse and Energy Reporting Act 2007	National	Environmental			Dec-18
National Greenhouse and Energy Reporting (Measurement) Determination 2008	National	Environmental			Jul-17
National Greenhouse and Energy Reporting Regulations 2008	National	Environmental			Mar-17
Ozone Protection and Synthetic Greenhouse Gas Management Act 1989	National	Environmental			Jan-18
Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995	National	Environmental			Mar-14
Renewable Energy (Electricity) Act 2000	National	Environmental			Jun-16
Renewable Energy (Electricity) Regulations 2001	National	Environmental			Mar-20
Road Transport Reform (Dangerous Goods) Regulations 1997	National	Environmental			1997
Telecommunications Act 1997	National	Environmental			Mar-19
Telecommunications Code of Practice 1997	National	Environmental			Feb-18
Trade Practices Act 1974	National	Environmental			Apr-10
Occupational Health, Safety and Welfare Act 1986	SA	OH&S			
Occupational Health, Safety and Welfare Regulations 2010	SA	OH&S			
Biological Control Act 1986	SA	OH&S			
Blood Contaminants Act 1985	SA	OH&S			
Agricultural and Veterinary Chemicals (South Australia) Act 1994	SA	OH&S			
Agricultural and Veterinary Products (Control of Use) Regulations 2004	SA	OH&S			
Controlled Substances Act 1984	SA	OH&S			
Controlled Substances (Pesticides) Regulations 2003	SA	OH&S			
Controlled Substances (Exemptions) Regulations 2004	SA	OH&S			
Controlled Substances (Poisons) Regulations 1996	SA	OH&S			
Controlled Substances (Prohibited Substances) Regulations 2000	SA	OH&S			

Legislations Master Register

Title	State	Category	Compliance Requirement (Yes /No)	Notes	Revision history
Controlled Substances (Volatile Solvents) Regulations 1996	SA	OH&S			
Dangerous Substances Act 1979	SA	OH&S			
Dangerous Substances Regulations 2002	SA	OH&S			
Explosives Act 1936	SA	OH&S			
Explosives Regulations 1996	SA	OH&S			
Explosives (Security Sensitive Substances) Regulations 2006	SA	OH&S			
Explosives (Fireworks) Regulations 2001	SA	OH&S			
Radiation Protection and Control Act 1982	SA	OH&S			
Radiation Protection and Control (Ionising Radiation) Regulations 2000	SA	OH&S			
Radiation Protection and Control (Transport of Radioactive Substances) Regulations 2003	SA	OH&S			
Mines and Works Inspection Act 1920	SA	OH&S			
Mines and Works Inspection Regulations 1998	SA	OH&S			
Environment Protection Act 1993	SA	OH&S			
Equal Opportunity Act 1984	SA	OH&S			
Racial Vilification Act 1996	SA	OH&S			
Workers Rehabilitation and Compensation Act 1986	SA	OH&S			
Workers Rehabilitation and Compensation Regulations 2010	SA	OH&S			
Code of Practice for the Safe Removal of Asbestos - National code is also the South Australian code	SA	Code of Practice			
Code of practice for logging stanchions and bulkheads	SA	Code of Practice			
Code of practice for manual handling	SA	Code of Practice			
Code of practice for occupational health and first aid in the workplace	SA	Code of Practice			
Code of practice for the control of workplace hazardous substances	SA	Code of Practice			
Code of practice for the labelling of workplace substances	SA	Code of Practice			
Code of practice for the safe handling of timber preservatives and treated timber	SA	Code of Practice			
Code of practice for the safe use of synthetic mineral fibres	SA	Code of Practice			
Aquaculture Act 2001	SA	Environmental			
Environment Protection Act 1993	SA	Environmental			
Environment Protection (Miscellaneous) Amendment Act 2005	SA	Environmental			
Radiation Protection and Control Act 1982	SA	Environmental			
Wingfield Waste Depot Closure Act 1999	SA	Environmental			
Environment Protection Regulations 2009	SA	Environmental			
Adelaide Dolphin Sanctuary Act 2005	SA	Environmental			
Coast Protection Act 1972	SA	Environmental			
Development Act 1993	SA	Environmental			
Groundwater (Border Agreement) Act 1985	SA	Environmental			
National Environment Protection Council (SA) Act 1995	SA	Environmental			
Natural Resources Management Act 2004(replaces the repealedWater Resources Act 1997)	SA	Environmental			
Nuclear Waste Storage Facility (Prohibition) Act 2000	SA	Environmental			
Plastic Shopping Bag (Waste Avoidance) Act 2008	SA	Environmental			
Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987	SA	Environmental			
River Murray Act 2003	SA	Environmental			
Wingfield Waste Depot Closure Act 1999	SA	Environmental			
Whyalla Steel Works Act 1958	SA	Environmental			
Zero Waste SA Act 2004	SA	Environmental			
Environment Protection (Fees and Levy) Regulations 1994	SA	Environmental			
Environment Protection (General) Regulations 1994	SA	Environmental			
Environment Protection (Exempt Classes of Persons and Activities) Regulations 2001	SA	Environmental			
Environment Protection (Site Contamination) Regulations 2008	SA	Environmental			
Environment Protection (Beverage Container) Regulations 2008	SA	Environmental			
Environment Protection (Air Quality) Policy 1994	SA	Policy (Env)			
Environment Protection (Burning) Policy 1994	SA	Policy (Env)			
Environment Protection (Motor Vehicle Fuel Quality) Policy 2002	SA	Policy (Env)			
Environment Protection (National Pollutant Inventory) Policy 2008	SA	Policy (Env)			
Environment Protection (Noise) Policy 2007	SA	Policy (Env)			
Environment Protection (Used Packaging Materials) Policy 2007	SA	Policy (Env)			
Environment Protection (Water Quality) Policy 2003	SA	Policy (Env)			
Environment Protection (Waste to Resources) Policy 2010	SA	Policy (Env)			
Code of practice for aquifer storage & recovery	SA	Code of Practice (Env)			
Code of practice for the environmental management of the South Australian abalone aquaculture industry	SA	Code of Practice (Env)			
Code of practice for the environmental management of the South Australian oyster farming industry	SA	Code of Practice (Env)			

Legislations Master Register

Title	State	Category	Compliance Requirement (Yes /No)	Notes	Revision history
Code of practice for materials handling on wharves	SA	Code of Practice (Env)			
Code of practice for milking shed effluent	SA	Code of Practice (Env)			
Code of practice for vessel and facility management (marine and inland waters)	SA	Code of Practice (Env)			
Code of practice for wastewater overflow management	SA	Code of Practice (Env)			
Wastewater incident notification and communication protocol	SA	Code of Practice (Env)			
Stormwater Pollution Prevention codes of practice - Building and construction industry	SA	Code of Practice (Env)			
Stormwater Pollution Prevention codes of practice - Community	SA	Code of Practice (Env)			
Stormwater Pollution Prevention codes of practice - Local, state and federal government	SA	Code of Practice (Env)			
Building Code of Australia	SA	Others			
Australian Building Greenhouse Rating	SA	Others			
Workers Compensation Commission Rules 2011	NSW	OH&S	Yes		2011
Workers' Compensation (Dust Diseases) Regulation 2018	NSW	OH&S	Yes		2018
Workers Compensation Regulation 2016	NSW	OH&S	Yes		2016
Green Star Rating	NSW	Others	Yes		Oct-20
Bridge and gantry crane drivers: A guide for power crane drivers	NSW	Guides	Yes		Dec-15
Building facade access systems: Guidelines	NSW	Guides	Yes		Aug-19
Ceiling Dusts Containing Lead: Guidance Note	NSW	Guides	Yes		UNDATED
Competent person for testing and tagging electrical equipment	NSW	Guides	Yes		Sep-10
Dogging: Guide	NSW	Guides	Yes		2003
Erecting, altering and dismantling scaffolding ,Part 2: Aluminum tower-frame scaffolding	NSW	Guides	Yes	Scaffolding work general guide also contains highly relavantinformation (Jul-14)	Feb-11
Erecting, altering and dismantling scaffolding, Part 1: Prefabricated steel modular scaffolding	NSW	Guides	Yes		Nov-10
Fatigue Prevention in the workplace	NSW	Guides	Yes		Jun-08
First aid in the workplace: Guide	NSW	Guides	Yes		Jul-19
Forklift truck drivers: Guide	NSW	Guides	Yes		Jul-14
Front end loader and excavator drivers: Guide	NSW	Guides	Yes		1994
Guide to work health and safety incident notification	NSW	Guides	Yes		Nov-15
Hoist operators: Guide	NSW	Guides	Yes		Mar-17
Machinery and equipment safety: An introduction	NSW	Guides	Yes		May-14
Management of asbestos in recycled construction and demolition waste: Guide	NSW	Guides	Yes		Dec-10
Masonry wall safety during construction work	NSW	Guides	Yes		Sep-17
Preventing and Dealing with Workplace Bullying Brochure	NSW	Guides	Yes		Nov-13
Preventing slips, trips and falls: Guide	NSW	Guides	Yes		2006
Quick reference guide - soft tissue injury management	NSW	Guides	Yes	No NSW - used VIC	May-19
Rigging: Guide	NSW	Guides	Yes		1997
Safe design of buildings and structures	NSW	Guides	Yes		Jul-12
Safe working at heights: Guide	NSW	Guides	Yes		2006
Sharp edges on factory cut metal reinforcement bar: Guidance note	NSW	Guides	Yes		Dec-07
Storage and handling of dangerous goods	NSW	Guides	Yes		Jun-06
What is adequate site supervision?	NSW	Guides	Yes	No guide - used "pocket guide to construction safety" which included a relevant section	Aug-18
Work near underground assets: Guide	NSW	Guides	Yes		2007
Working with asbestos: Guide	NSW	Guides	Yes		Jul-20
Building Code of Australia	NSW	Other Requirements	Yes		Jan-17
Australian Building Greenhouse Rating	NSW	Other Requirements	Yes		2013
EDITION 6 Work Health & Safety management guidelines	NSW	Other Requirements	Yes		Dec-19
NSW Government QA Guidelines	NSW	Other Requirements	Yes		Dec-19
NSW Government Environment Guidelines	NSW	Other Requirements	Yes		Jul-15
Green Star Rating	NSW	Other Requirements	Yes		Oct-20
NSW Department of Housing's Managing Urban Stormwater (2004);	NSW	Other Requirements	Yes		Mar-04
ISO 9001:2015 - Quality Management Systems,		Management System Standards	Yes		Sep-15
AS/NZS 4801:2001 - Occupational Health and Safety Management Systems,		Management System Standards	Yes		Nov-01
ISO 14001:2015 - Environmental Management Systems		Management System Standards	Yes		Sep-15
Guide to scaffold inspection and maintenance	NSW	Safe Work	Yes		2014
Guide to Scaffolds and Scaffolding	NSW	Safe Work	Yes		2014
Guide to Suspended (Swing Stage) Scaffolds	NSW	Safe Work	Yes		2014
Tower and Mobile Scaffolds – Information Sheet	NSW	Safe Work	Yes		2017
HB 436-2013 Amdt 1·2005 Risk Management Guidelines - Companion to AS NZS 4360- 2004	NSW	Standards	Yes		2013

Legislations Master Register

Title	State	Category	Compliance Requirement (Yes /No)	Notes	Revision history
HB 221-2004 Business Continuity Management	NSW	Standards	Yes		2004
HB 205-2017 OHS Risk Management Handbook	NSW	Standards	Yes		2017
HB 203-2012 Managing environment-related risk	NSW	Standards	Yes		2012
HB 139-2003 Guidance on Integrating the Requirements of Quality Environment and OHS Mgmt	NSW	Standards	Yes		2003
HB 90.3-2000 The Construction Industry· Guide to ISO 9001-2000(R2016)	NSW	Standards	Yes		2000 (R2016)
Guide to Standards-Occupational Health and Safety	NSW	Standards	Yes		2011
ENA NENS04-2006 Guidelines for safe approach distances to electrical and mechanical apparatus	NSW	Standards	Yes		2006
CB 029-2003 The Audit Skills Handbook	NSW	Standards	Yes		2003
AS NZS ISO 31000-2009 Risk management- Principles and guidelines	NSW	Standards	Yes		2009
AS NZS ISO 19011 Guidelines	NSW	Standards	Yes		2011
AS NZS ISO 14031 2013 Environmental Management	NSW	Standards	Yes		2013
AS NZS ISO 10005-2018 Quality management systems - Guidelines for quality plans	NSW	Standards	Yes		2018
AS NZS ISO 9001-2015 Quality Management Systems - Requirements	NSW	Standards	Yes		2015
AS NZS ISO 9001-2015 Amdtl-2012 Quality mgmt sys - Requirements	NSW	Standards	Yes		2015
AS NZS4804-2001 Occupational Health and Safety Management Systems - General guidelines	NSW	Standards	Yes		2001
AS NZS 2210.3-2019 Occupational protective footwear - Specification for safety footwear (ISO 20345-2004 MOD)	NSW	Standards	Yes		2019
ISO 19011-2011 Guidlines for quality and or environmental management systems auditing	NSW	Standards	Yes		2011
ISO 19011-2011 Guidelines for quality and or environmental management systems auditing	NSW	Standards	Yes		2011
ISO 14004-2016 Basic Set Environmetal Management Basic Set	NSW	Standards	Yes		2016
ISO 14001-2015 Environmental management systems Requirements with guidance for use	NSW	Standards	Yes		2015
ISO 14001-2015 Basic Set Environmetal Management Basic Set	NSW	Standards	Yes		2015
ISO 45001-2018 Occupational health and safety management systems	NSW	Standards	Yes		2018
AS/NZS 4799·2000 · Installation of underground utility services and pipelines within railway boundaries	NSW	Standards	Yes		2000
AS/NZS 1891.1:2007 Industrial fall-arrest systems and devices	NSW	Standards	Yes		2007
AS/NZS 4488.2:1997 Industrial rope access systems	NSW	Standards	Yes		1997
AS 1657:2018 Fixed platforms, walkways, stairways and ladders - Design, construction and installation	NSW	Standards	Yes		2018
IRATA ICOP	NSW	Standards	Yes		2014
4602·1999 High visibility safety garments	NSW	Standards	Yes		1999

ANNEXURE 2 - RISK ASSESSMENT

Environmental Risk Assessment Register

Doc. No.: H1.3.2 Environmental Risk Register

Rev.: 1 15/02/2023

Project No.:	C220011	Prepared By:	**Brett Drew**	Project Engineer:	Brandon You
Project Description:	**St Ignatius Riverview College**			Project Manager:	Loui Abouhamad
Scope of Works:	Construction				

			Current Risk Assessment					RA after proposed treatment		
No.	Aspect of the Project	Environmental Hazards	Likeli-hood	Conse-quence	Risk Rating	Hierarchy of Control	Proposed Treatment (Prevention/Mitigation Action)	Likeli-hood	Conse-quence	Risk Rating
1	**Noise and Vibration**									
1.1	Noise from general construction activities in residential areas	Disturbance of residents resulting in noise complaints	Likely	Moderate	**9 Medium**	6 PPE	Ensure eqiupment has noise miminisation technology where applicable	Rare	Moderate	**14 Low**
1.2	Noise from general construction activities in residential areas	Disturbance of residents resulting in noise complaints	Likely	Moderate	**9 Medium**	5 Admin	Consult with community in relation to construction activities	Rare	Moderate	**14 Low**
1.3	Noise from general construction activities in residential areas	Disturbance of residents resulting in noise complaints	Likely	Moderate	**9 Medium**	5 Admin	Establish noise monitoring targets and monitor for compliance	Rare	Moderate	**14 Low**
1.4	Vibration from works such as demolition and piling	> Disturbance of residents resulting in noise complaints > Damage to surrounding structures	Likely	Major	**5 High**	6 PPE	Use equipment with mimal vibration output where possible	Rare	Major	**11 Moderate**
1.5	Vibration from works such as demolition and piling	> Disturbance of residents resulting in noise complaints > Damage to surrounding structures	Likely	Major	**5 High**	5 Admin	Consult with community in relation to construction activities	Rare	Major	**11 Moderate**
1.6	Vibration from works such as demolition and piling	> Disturbance of residents resulting in noise complaints > Damage to surrounding structures	Likely	Major	**5 High**	5 Admin	Establish vibration targets and monitor for compliance	Rare	Major	**11 Moderate**
2.0	**Dust / Air Quality**									
2.1	General construction works such as demoltion, excavation piling	Generation of dust leading to pollution and complaints from residents	Likely	Moderate	**9 Medium**	5 Admin	Toolbox talks to discuss air quality and dust management	Possible	Moderate	**12 Moderate**
2.2	General construction works such as demoltion, excavation piling	Generation of dust leading to pollution and complaints from residents	Likely	Moderate	**9 Medium**	4 Engineer	Mitigate dust through equipment such as water carts and water	Possible	Moderate	**12 Moderate**
2.3	General construction works such as demoltion, excavation piling	Generation of dust leading to pollution and complaints from residents	Likely	Moderate	**9 Medium**	4 Engineer	Physical barriers to be erected to prevent wind or activity from generating dust emissions	Possible	Moderate	**12 Moderate**
2.4	Plant and equipment exhaust	Air pollution	Likely	Moderate	**9 Medium**	5 Admin	Conduct pre-start checks and servicing checks with up to date register	Possible	Moderate	**12 Moderate**
3.0	**Water Quality / Erosion & Sediment Control**									

Environmental Risk Assessment Register

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Rev.: 1 15/02/2023

Project No.:	C220011	Prepared By:	**Brett Drew**	Project Engineer:	Brandon You
Project Description:	**St Ignatius Riverview College**			Project Manager:	Loui Abouhamad
Scope of Works:	Construction				

			Current Risk Assessment					RA after proposed treatment		
No.	Aspect of the Project	Environmental Hazards	Likeli-hood	Conse-quence	Risk Rating	Hierarchy of Control	Proposed Treatment (Prevention/Mitigation Action)	Likeli-hood	Conse-quence	Risk Rating
3.1	Sediment runoff from construction works	Degradation of existing waterways / water pollution	Likely	Major	**5 High**	4 Engineer	Use sediment bases and other equipment for control meaures	Possible	Major	**8 Medium**
3.2	Sediment runoff from construction works	Degradation of existing waterways / water pollution	Likely	Moderate	**9 Medium**	5 Admin	Toolbox talks to discuss water quality and erosion control methods / competency training to take place if necessary	Possible	Moderate	**12 Moderate**
3.3	Vegetation and topsoil	Weed and seed dispersion from wind or water	Likely	Moderate	**9 Medium**	5 Admin	Designated vegetation stockpiling areas away from protected vegetation	Possible	Moderate	**12 Moderate**
3.4	Discharging water	Pollutant water entering stormwater system	Likely	Moderate	**9 Medium**	5 Admin	Dewatering permits to be completed prior to discharge to ensure water quality is maintained	Possible	Moderate	**12 Moderate**
3.5	Discharging water	Pollutant water entering stormwater system	Likely	Moderate	**9 Medium**	4 Engineer	Toolbox talks to discuss water discharge procedures / competecy training to take place if necessary	Possible	Moderate	**12 Moderate**
4.0	**Land Contamination**									
4.1	**Contaminated / untreated materials**	Pollutant materials entering stormwater system / Damage to ecosystems	Likely	Moderate	**9 Medium**	5 Admin	Develop and apply contaminated land or materials management procedures	Possible	Moderate	**12 Moderate**
4.2	**Contaminated / untreated materials**	Pollutant materials entering stormwater system / Damage to ecosystems	Likely	Moderate	**9 Medium**	5 Admin	Toolbox talks to discuss contaminated land procedures / competecy training to take place if necessary	Possible	Moderate	**12 Moderate**
4.3	**Discovery of unexpected contaminated land**	Release of odours into atmosphere / spread of contaminated materials	Possible	Major	**8 Medium**	5 Admin	Stop all works and commence professional investigation before recommencing any activities	Rare	Major	**11 Moderate**
4.4	**Asbestos**	Spread of asbestos into uncontaminated areas	Possible	Major	**8 Medium**	5 Admin	Develop and apply asbestos management procedures	Rare	Major	**11 Moderate**
5.0	**Waste Minimisation / Management**									
5.1	Waste disposal	Incorrect disposal causng environemntal contamination / pollution	Possible	Major	**8 Medium**	5 Admin	Facilities to be established on site for recycling and waste storage	Rare	Major	**11 Moderate**
5.2	Waste disposal	Incorrect disposal causng environemntal contamination / pollution	Possible	Major	**8 Medium**	5 Admin	All off site material to be tested / classified by competent personnel before disposal	Rare	Major	**11 Moderate**
5.3	Waste disposal	Incorrect disposal causng environemntal contamination / pollution	Possible	Major	**8 Medium**	5 Admin	Maintain waste records	Rare	Major	**11 Moderate**
5.4	Concrete Washout	Sediment / water pollution of stormwater systems	Likely	Major	**5 High**	5 Admin	Concrete washout areas to be designated by site manager prior to works commencing	Rare	Major	**11 Moderate**

Environmental Risk Assessment Register

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Project No.:	C220011	Prepared By:	**Brett Drew**	Project Engineer:	Brandon You
Project Description:	**St Ignatius Riverview College**			Project Manager:	Loui Abouhamad
Scope of Works:	Construction				

			Current Risk Assessment					RA after proposed treatment		
No.	Aspect of the Project	Environmental Hazards	Likeli-hood	Conse-quence	Risk Rating	Hierarchy of Control	Proposed Treatment (Prevention/Mitigation Action)	Likeli-hood	Conse-quence	Risk Rating
6.0	**Heritage Management**									
6.1	Discovery of unexpected heritage items	Damage to heritage items	Possible	moderate	**12 Moderate**	4 Engineer	Toolbox talks to discuss possibility of heritage item discovery and management procedures	Rare	moderate	**14 Low**
6.2	Discovery of unexpected heritage items	Damage to heritage items	Possible	moderate	**12 Moderate**	5 Admin	Known areas with heritage items / land to be makred on site drawings and considered when undergoing all works. A safe distance is to be applied	Rare	moderate	**14 Low**
6.3	Discovery of unexpected heritage items	Damage to heritage items	Possible	moderate	**12 Moderate**	4 Engineer	Stop all works and commence professional investigation before recommencing any activities	Rare	moderate	**14 Low**
7.0	**Flora and Fauna Management**									
7.1	Vegetation removal	Removing or damaging threatened species	Possible	Major	**8 Medium**	5 Admin	Clear markings to be put in place for protected areas / species both on site and on drawings	Rare	major	**11 Moderate**
7.2	Vegetation removal	Removing or damaging threatened species	Possible	Major	**8 Medium**	5 Admin	Toolbox talks to discuss existing clearance zones and necessary protection measures for avoiding destruction of flora and fauna	Rare	major	**11 Moderate**
7.3	Vegetation removal	Removing or damaging threatened species	Possible	Major	**8 Medium**	5 Admin	Erosion and sediment control plans to be in place prior to works with vegetation commencing	Rare	major	**11 Moderate**
8.0	**Chemicals / Hazardous Materials Management**									
8.1	Storage of chemicals and hazardous materials	Spills into the environment	Likely	Major	**5 High**	5 Admin	Storage areas to be designated in a location away from stormwater sytems or egress paths.	Possible	Major	**8 Medium**
8.2	Storage of chemicals and hazardous materials	Spills into the environment	Likely	Major	**5 High**	5 Admin	SDS to be approved for all chemicals on site with a register to be maintained	Possible	Major	**8 Medium**
8.3	Storage of chemicals and hazardous materials	Spills into the environment	Likely	Major	**5 High**	4 Engineer	Spill kits to be located in an accessible location on site, with site personnel trained in their use	Possible	Major	**8 Medium**
8.4	Runoff	Contaminated runoff entering stormwater systems	Likely	Major	**5 High**	4 Engineer	Toolbox talks to discuss chemcials and hazardous materials storage	Possible	Major	**8 Medium**
8.5	Runoff	Contaminated runoff entering stormwater systems	Likely	Major	**5 High**	4 Engineer	All runoff material to be tested / classified by competent personnel before disposal	Possible	Major	**8 Medium**

ANNEXURE 3 - EMERGENCY RESPONSE MANUAL

EMERGENCY RESPONSE MANUAL

Wingaru STEMP Project

for

Saint Ignatius' College Riverview

Saint Ignatius' College
RIVERVIEW

Belmadar Pty Ltd

Emergency Response Manual
Project: St Ignatius College
Revision - 1

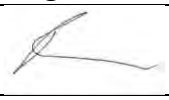
This ERM was completed and reviewed by the project team:

Name	Position	Date	Signature
Lou Abouhamad	Project Manager	9-12-2022	
Mark Chmielewski	Site Manager	9-12-2022	

This ERM reviewed and understood for responsibilities by:

Name	Position	Date	Signature
Mark Chmielewski	Site Manager	9-12-2022	
Brandon You	Project Engineer	9-12-2022	

This ERM was reviewed and approved by:

Name	Position	Date	Signature
Brett Drew	Construction Director	9-12-2022	

CONTROLLED DOCUMENT

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1 PROJECT DESCRIPTION

1.1 SECTIONS WITHIN MANAGEMENT PLANS

Section 1 EMERGENCY RESPONSE PLAN: Overview of elements documented within the plan, applicable addresses, emergency-related resources, emergency response and evacuation process and post incident investigation management.

Section 2 EMERGENCY RESPONSE ACTION PLAN: This section provides response guidelines for different emergency situations/critical incidents that may occur onsite during the duration of the project.

Section 3 APPENDICES: This includes for the following documents which will be (Variable) per project including but not limited to.

- Emergency Response team
- Emergency Evacuation/response flowchart
- Emergency contact details
- Emergency Evacuation plan
- Emergency hotlines

1.2 REFERENCES

This management plan was established conjunction with the following:

- Work Health and Safety Act 2011
- Work Health and Safety Regulation 2011
- AS3745 Emergency Response team and procedures for Buildings, Structures and Workplaces
- AS1670.1 Fire detection, warning, control and intercom system-Systems Design, installation, and commissioning-Fire
- AS4665 Fire Safety Audits Building code of Australia- Amendment 12.

1.3 INDUCTION TO ERM

The project teams will be required to be inducted into the ERM prior to commencement onsite by either the HSEQ Director and or Systems Manager. Evidence of this will be documented in a toolbox talk, which the site team will sign and acknowledge their requirements under the emergency response management plan. Site teams after this induction will be required to sign the front of the ERM verifying that their responsibilities will be fulfilled.

3 OBJECTIVES

- The safety and wellbeing of all people on the site and the public is protected.
- Damages, losses, and the duration of disruption to the project are minimised.
- Recovery tasks are coordinated to ensure that the project is restored to normal operation as soon as possible.
- An appropriate public relations strategy is implemented where necessary to ensure the public image of the company is maintained.
- To provide a guide in which key personal can develop the competencies to effectively respond to an onsite emergency promptly.

4 ELEMENTS OF PLAN

Compliance/Review	• Responsibility of Emergency Planning • Review of plan to be conducted following any site emergency and not less the once every 6mths and on addition of unforeseen of additional activities. • Pollution incidents tests must be carried out once every 12mnths or at least once in the project life cycle. • Pollution incidents tests and plan reviews must be carried out within once month of any pollution incident relating to the activity.

	Type	**Objectives**	**Required**	**External Training code/Unit of Compentency**	**Frequency**
Training (Min Requirement)	Fire Warden Training	Awareness of Warden responsibilities	Site Manager and/ Or Site Engineer	PUAFER005 or similar By RTO Accredited Trainer	Before Project commencement and as required
	Emergency Management Training (Internally)	Awareness of emergency management procedures as per ERM	ALL site personal including project manager	Systems Manger and or HSEQ Director	Before Project commencement and as required (Toolbox Acknowledgement)
	First Aid Training	Management of onsite incidents and Injuries	Site Manager and Site Engineer	HLTAID011 or similar By RTO Accredited Trainer	Before Project commencement and as required
Additional Training (Desirable	First aid Equipment Training	Management of First aid	Site Manager	HLTAID011 or similar By	Before Project commencement and as required

2 KEY RISKS/ISSUES

Risks/Issues	Risk Mitigation Actions	Outcomes after Mitigation
Incidents at workplaces or projects that result in lack of co-ordination of appropriate emergency response	HSE Director or Project Manager has established and identified Emergency response key personal (Project Based). Systems Manager to ensure project staff are trained to the workplace emergency response plan.	Mitigation/reduction of incident risks using proper management.
Project Manager and site team attempt to manage the incident solely.	Incidents reported to senior management who may declare the incident a crisis	Appropriate support mobilised to site to assist.
Emergency Equipment not available	Site Engineer to ensure required emergency equipment is available	Incident is mitigated and better controlled until external emergency response teams (NSW) control site.
External Emergency services not contacted	Emergency instructions, contact details posted around site	All project personnel have prompt required response
Project teams uncertain as to what to do when incident occurs on project sites	Emergency/Evacuation drills, audits carried out to test and train project emergency response personal	Incident better controlled, managed, and dealt with properly
Relevant authorities not notified of pollution incidents	Communication of such requirement to all Belmadar employees	Community notified of pollution incidents; appropriate mitigation strategies chosen to further minimise harm to the environment
Potential Pollutant incident Identification not implemented	All projects must ensure PPID is prepared and implemented	Better control, mitigation, and management of potential pollutants.

2.0 ROLES AND RESPONSIBILITIES

The below R&R'S matrix summarises the main activities which must be completed, the positions who have direct responsibility and positions that require to provide support and assistance to those directly responsible.

Task Description		Responsibility Matrix								Reference Material	
Key: **R:** Direct Responsibility for leading the task **S:** Assistance and support in performing the task		Foreman/ Leading hand	Safety Manager	Site Manager	Project Manager	Project /Site Engineer	HSE Director	Managing director	Systems Manager	Task Frequency	Documentation /Forms
1.	Appoint Emergency Personal on site			S	R		S		S	Prior to commencement onsite	Form I1.1
2.	Compile Emergency Response plan			s	R		s			Prior to commencement onsite	Form I1.2
3.	Conduct training in accordance with plan		S				S		R	Prior to commencement onsite	
4.	Conduct internal audits (Drills and EMR Updates)		S				R		R	As required on project commencement and as required (3 x per project)	See Form J1.3
5.	Run EMR drills	S	R	R	S	S	S	S	S	Min 2 x yearly	See form I1.13
6.	Minute and send drills for formulation in Senior Management review				R	R	S	S	R	Min 2 x yearly	
7.	Maintain First aid provisions and emergency equipment	S		S	S	R				As required	See form I1.16 / I1.14
8.	Notify HSE Director/Senior Management			S	R		S	S	S	As required	
9.	Review/Maintain plan		S	S	S		R	S	R	Min 1 x yearly see page 8 of EMR plan below	

but not Essential to operate)		equipment and requirements	and/Or Site Engineer	RTO Accredited Trainer	
	Work Health and Safety Cert IV	Practical knowledge to implement safety onsite	Site Manager and or Project Manager	BSB41415 by RTO Accredited trainer	As required
	Emergency response training	Participate as a member of the ERT	Site Manger and or Site engineer	PUAFER009 by RTO accredited trainer	As required
			Note: Please see training requirements, personal and who is responsible for facilitating training in training matrix		

	Type	Form Number	Frequency
Forms/Processes	Emergency Response Drill	I1.13	Min 2 x yearly
	Emergency response contacts	I1.1	Before Project commencement and as required

Drill Requirements

The Emergency response teams are required to participate in two by yearly drills or at least one drill per project depending on the duration (If projects are less then 6mth). Site Managers and or the Safety Manager are required to schedule dates for proposed drills based on project activities and progress. These will be documented within an outlook calendar invite by the Site Manager and or Safety Manager and sent out to the HSEQ director, Systems Manager and Project Manager to advise of occurrence and to allow participation and findings of the drill to be reviewed and actioned appropriately. Form I1.15 is to be used to document the drill and meeting minutes of the debrief will be sent via procore to all involved. The Site Manager and/or Project Manager will allocate "Task Observations" in procore for actions which need to be addressed which are required to be completed to close out the drill. The close out period of any tasks are documented below. It is important that if any system documentation is required to be updated that this is advised on the form and sent to the systems manager for corrections and implementation.

Status (Both Site and Admin level)	Close out timeframe
Critical	Within 24 hours
High	Within 1-2 days
Medium	Within 3-5 Days
Low	Within 2 weeks

Drills should reflect works onsite and be based off High-risk activities chosen from the Project Risk Register. It is encouraged that the Site Manager and or safety Manager choose an emergency response which reflects the stage of the project and is one of the items listed as "HIGH" in the Project risk register even after controls are

implemented, the drill should be conducted when the emergency could potentially occur onsite for example, if the project is in excavation stage the drill should be based on a "Mobile Plant Emergency".

A variety of drills are to be tested and can be programme driven as per stage of the project as below:

1. Demolition works .
2. Ground Works.
3. Structural Works.
4. Fit-out Works.

5 DEFINITIONS AND ABBREVIATIONS

Term	Abbreviation	Definition
Crisis		A crisis is an out of ordinary event, announcement, disclosure or set of circumstances, which threatens the safety wellbeing of employees, the environment, other stakeholders of the integrity, performance, reputation, or survival of the company. *A crisis may include a serious accidents, incidents, emergencies or potential near miss or accident, incident, or emergency.* ***Crisis incidents are as follows:*** - Multiple fatalities and or serious injuries - Repeat injuries - Small/large scale oil, contaminate spillage - Bomb threats or criminal acts. - Kidnap/hostage. - Failure/collapse of construction structure. - Major equipment failure. - Vehicular/Plant incidents - Industrial accidents - Major Information technology failure - Environmental disaster - Fire/explosive - Significantly community impact/ Natural disaster - Threat of self-harm, violence and mental health issues or psychological injuries.
Return to Work / Injury Management Program		Refer to Section 1.21 of SMS
Emergency		Any Incident which could: - Any event that arises internally or from external sources, which may adversely affect persons or the community generally, which requires an immediate response (AS 3745)

Emergency Response Personal	**ERP**	Collective name given to staff who perform emergency-related roles on site within Belmadar's organisation
Emergency Procedures		Procedures that have been designed so that all responding on-site personnel will act in a coordinated manner which will complement and support the actions and deeds of the emergency services.
Evacuation Assembly Area		A safe location which evacuees proceed to in the event of an evacuation
Pollution Incident (NSW)		Any pollution incident that causes or threatens material harm to the environment or human health
Material Harm (NSW)		Harm to the environment is material if: (i) It involves actual or potential harm to the health or safety of human beings or to the ecosystems that is not trivial, or (ii) It results in actual or potential loss or property damage of an amount, or amount in aggregate, exceeding $10,000.00 and the loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.

6 ORGANISATIONAL STRUCTURE

6.1 Subcontractors onsite supervisors' responsibilities:

A) Have a responsibility to oversee and ensure the following emergency preparedness tasks are completed for their team and the overall project in support of the Belmadar Site management team.
B) Ensure the effectiveness and accuracy of the workplace emergency response plan, procedures, and relevant documentation by undertaking fortnightly safety walks with the Belmadar site management team
C) Appoint their own subcontractor emergency response team such as first aider and fire warden and communicate this to their team.
D) Ensure their project personal are trained and understand the emergency response procedures.
E) Help if required co-ordinate and ensure attendance in project emergency drills
F) Ensure attendance in emergency drill reviews

6.2 Meetings with site personnel:

Belmadar will ensure all subcontractors and their supervisors are able to convey any issues or concerns always relating to emergency preparedness via email or phone conversations. Although, at a minimum Belmadar will ask for subcontractor's supervisors' attendance in fortnightly safety walk (which is documented on Procore) to assess any significant changes to workplace conditions / activities and address their possible impact on the Workplace and the Workplace Emergency Response Plan. If an emergency does take place, as soon as practicable they will meet to review organisational response and at other times when matters affecting the emergency preparedness of the site deem it necessary. This meeting shall be documented, and the minutes distributed.

6.3 Meeting agenda:

If after an emergency occurs onsite Belmadar and the Subcontractors supervisors will meet as soon as practicable to discuss the following. Belmadar's project manager will chair this meeting using the Procore meetings tool.

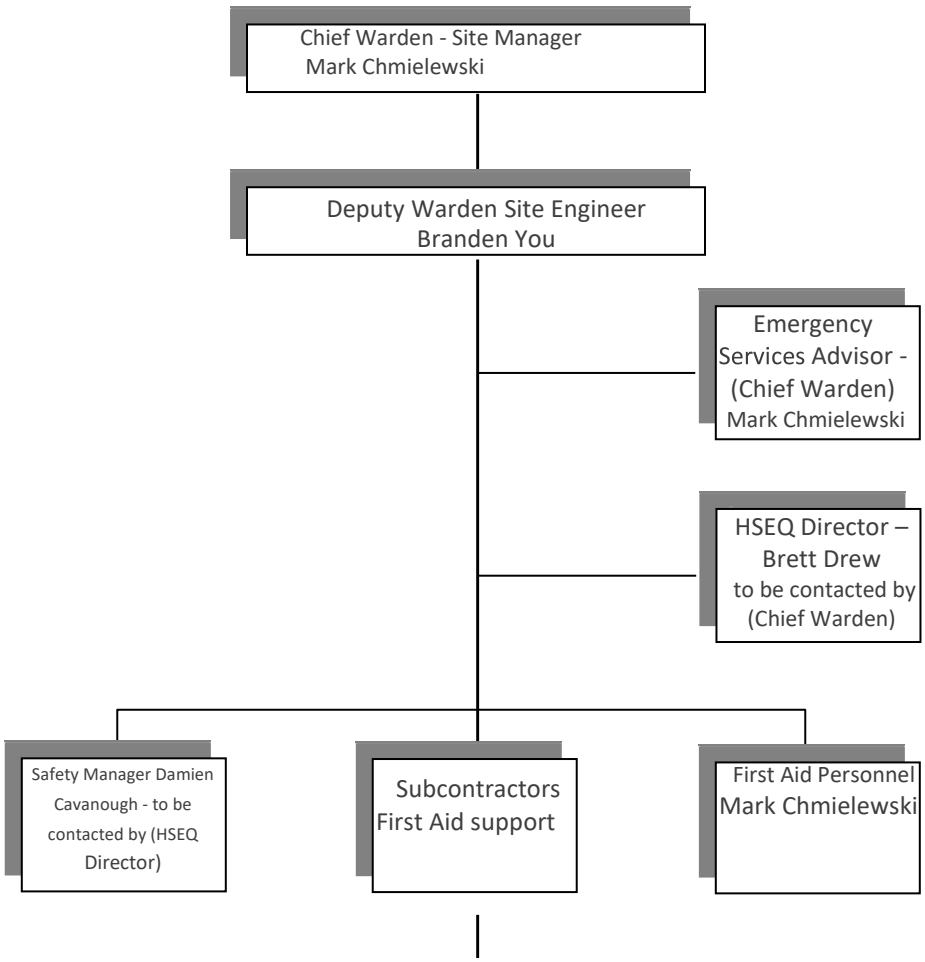
- Concerns regarding any emergency or critical incident which has occurred at the site and evaluation of the site's response to that event.
- Staff training in emergency preparedness which detail names, positions, and date they last attended training and what training is upcoming.
- Details, evaluation, and issues arising from the most recent site emergency and evacuation exercise
- Most recent inspection of site emergency systems and equipment
- Proposed amendments to the site workplace emergency procedures and equipment
- Review of EMR to ensure that all information contained within the plan remains accurate and in date.
- Issues impacting site emergency preparedness onsite.
- On completion of the meeting the site engineer will update, make the changes discussed and send to all subcontractor's supervisors, clients and Belmadar personal via Procore email correspondence tool.

6.4 Belmadar's Emergency Response Team responsibilities:

A) Protection and rescue of human life
B) Protection of property and sensitive information
C) Ensuring the affected area is safe
D) Restore order to disrupted services
E) Resume normal activities
F) Clearing damaged/affected areas and
G) Recording, assessing the emergency/damage and the effectiveness of the measures implemented using the Belmadar incident tab on Procore

The Emergency Response Team will be responsible for providing emergency response action once the alarm has been raised and the appropriate level of response has been determined necessary.

6.5 Emergency Response Team Structure:



NOTE:

In the absence of a designated area warden, the applicable deputy will assume the role.
If a foreman and site engineer are both onsite both will take the role of the deputy warden

6.6 Emergency Response Team (ERT) Duties

6.6.1 CHIEF WARDEN: Mark Chmielewski

The Chief Warden is responsible for coordinating the internal on-site response to an emergency or critical incident occurring within or affecting the normal operations of the site. The Chief Warden's major priorities will be:

- Ensuring the safety of persons on site
- Assessing the impact of the incident on personnel safety, property, and site activities
- Ensuring that appropriate agencies have been informed
- Coordinating internal resources to mitigate the impact of the incident on site activities
- Ensuring that appropriate senior management are informed and regularly updated
- Ensuring that evidence material to any post-incident investigation is not interfered with
- Determining and implementing an appropriate post-incident recovery strategy

6.6.2 DEPUTY CHIEF WARDEN:TBA

The Deputy Chief Warden assists the Chief Warden as required and, in the event of an evacuation, proceeds to the Evacuation Assembly Area, receives reports from subcontractors, updates the Chief Warden on evacuation progress and controls the Evacuation Assembly Area.

- Acting in accordance with instructions issued by the Chief Warden
- In the event of an evacuation, providing it is safe to do so:
- Confirming that designated area has been evacuated and checked
- Lock site gate and appoint subcontractor who will ensure non-first aiders stay in the evacuation point until told otherwise.
- Confirming that Belmadar staff and subcontractors are safe and accounted for
- Unless otherwise instructed, proceeding to the Evacuation Assembly Area
- Promptly reporting the results of the evacuation to the Safety Manager
- Evacuating personnel from project area
- Checking assigned area to ensure that all persons have vacated
- Promptly reporting the results to the chief warden
- Proceeding to Evacuation Assembly Area

6.6.3 EMERGENCY SERVICES ADVISOR: Mark Chmielewski

This role will be assigned by the chief warden (site manager).

- Provide information about the incident to emergency services
- Make the phone call to the emergency services
- Escorting the emergency services to the scene of the incident
- Relaying the information and advising the HSEQ director as soon as practicable
- Maintaining a chronological record of organisational response and key events during the emergency.

6.6.4 FIRST AID PERSONNEL: ADD PERSONAL NAMES TO MAKE PROJECT SPECIFIC

Both the first aiders associated with Belmadar and the subcontractors first aiders will be required to.

- Administering first aid to casualties as required until the arrival of appropriate emergency services.

6.6.5 HSEQ DIRECTOR: Brett Drew

The HSEQ Director will be notified of the incident by the Chief Warden. The HSEQ director will be responsible for.

- Contacting the safety manager for additional support to site staff and ensure they make their way to site
- Advise the Managing Director about the incident
- Attend site as soon as practicable
- Notify environmental authorities if required
- Communicate with the media/unions and police once onsite
- Contact safe work where required and attend all meetings which occur and send documentation to safe work.
- Contact lawyer if required for advice on documentation release
- Attend emergency review meeting
- Communicate incident to shareholders during weekly shareholders meetings and other Belmadar staff via outlook including lessons learnt, how the incident occurred and additional mitigation strategies which should be put in place

6.6.6 SAFETY MANAGER: Damien Cavanough

The safety manager will be notified of the incident by the HSEQ Director, the Safety Manager will be responsible for:

- Attending the site as soon as practical
- Supporting the deputy warden in the emergency evacuation process
- Providing first aid to casualties
- Point of contact to environmental authorities after notification
- Managing/assessing any pollution incident
- Reviewing safety documentation with site team
- Supporting Site manager fill incident report and identify the root cause of the incident occurrence
- Providing direction in rectification to ensure this does not occur again.

6.7 Emergency Response Team (ERT)- Selection Guidelines

The Project Manager will ensure when selecting persons to perform emergency response team roles, the following selection guidelines should be considered:

- Be physically capable
- Have leadership qualities and command authority
- Have maturity of judgement, good decision-making skills and be capable of remaining calm under pressure
- Generally, work in one area and be in attendance during working hours (in particular, normal duties should not frequently take them away from the Site)
- Be good communicators
- Have a good knowledge of the site/building layout and operations, and
- Have undergone appropriate training relative to their roles and responsibilities within the ERT

Maintenance of Emergency Response Team (ERT) Coverage & Identification:

6.7.1 RESPONSIBILITY FOR MAINTENANCE OF SUFFICIENT ERT PERSONNEL

Overall responsibility for the maintenance of sufficient ERT personnel and an accurate listing rests with the chief warden.

6.7.2 RESPONSIBILITY FOR CHECKING AND UPDATING ERT LIST

The chief warden will check with ERT personnel on a 3 monthly basis to confirm the accuracy of the ERT List and where practicable, make any adjustments.

6.7.3 ERT VACANCIES

On being advised of any ERT vacancies that cannot be filled, the chief warden will communicate with the applicable manager requesting an appropriate ERT nomination.

6.7.4 PRODUCTION OF UPDATED ERT LIST

The chief warden will ensure that an updated ERT list is produced and distributed to ERT personnel on an as required basis. Copies of this list will be forwarded to all manual holders for insertion in the workplace emergency response plans manual (superseded copies to be destroyed).

6.7.5 EMERGENCY RESPONSE TEAM IDENTIFICATION

In an emergency, ERT personnel chief warden will wear a RED hardhat when an emergency takes place.

Please find attached in annexure A – Emergency contact details, emergency services details and authority contact details.

7 EMERGENCY RESOURCES

Emergency resources may change on a project specific basis. The site managers and or site engineers are required to complete a first aid risk ***assessment Form I1.14 First Aid Emergency and Risk Assessment*** to establish what emergency resources are required upon project commencement and the site managers and or site engineers are required to have up to date third party first aid training to complete this task. This form is required to be reviewed and updated every 6 months at a minimum and immediately after an incident occurs onsite by the site manager. Any items which require to be purchased will be the responsibility of the site engineer. The below project specifics will need to be updated by the site engineer as soon as practicable after the site manager completes the First aid risk assessment form ensuring the date of the update is included below.

Project Specifics to date: **Project emergency resources updated on the 9/12/2022**

FIRE SAFETY

Fire Protection	▪ Fire Extinguisher, Fire Blanket
Emergency Warning	▪ Air Horn

COMMUNICATIONS

Public Address Systems	▪ N/A
Internal Phone System	▪ Site management all carry mobile phones
Two-Way Radio System	▪ N/A

7.1 EMERGENCY EQUIPMENT

All fire emergency equipment requires 6-monthly inspection and maintenance if required as per AS1851-2012. To ensure this is completed site engineers and or Site Managers are required to keep a register of fire equipment and all emergency equipment (as detailed below) with expiry dates of last tests. Tests will be undertaken by the onsite licenced fire subcontractor for fire extinguishers and

signed off on ***Form F1.10 Emergency Equipment Register*** which will be kept on the SharePoint Drive. All other emergency equipment will be checked during weekly site walks or as per monitoring requirements. **(the register below must be filled out at project commencement and updated If required after completing first aid risk assessment 3 monthly)**

ITEM	LOCATION	QUANTITY
Nurse Call	Each level next to entry	**5**
Fire extinguisher	**Each level next to entry**	**5**
Defibrillator kit	**First aid room**	**1**
Medical kits	**First aid room/Site Office**	**4**
Syringe kit	**N/A**	
Spill kit	**Site office**	**1**
NOTE: All equipment was brought brand new and no testing was required. The fire extinguishers will be tested 6-monthly in accordance with AS 1851-2012.		

7.2 NOTIFICATION PROTOCOL

Site Emergency contact**:**

See **Annexure A** for detailed emergency contact details. This required update on project-to-project basis upon commencement of the project. Updates to this annexure will be completed by the site engineer if the ERT team changes as soon as practicable.

Notification of incidents:

ALTERNATE CONTACT NO.	**Loui Abouhamad**
Project Manager	**0417 425 539**

In an event of an emergency onsite assistance will be obtained by dialling-

PRIMARY CONTACT NO. **Site Manager**	**Mark Chmielewski** **0474 932 266**

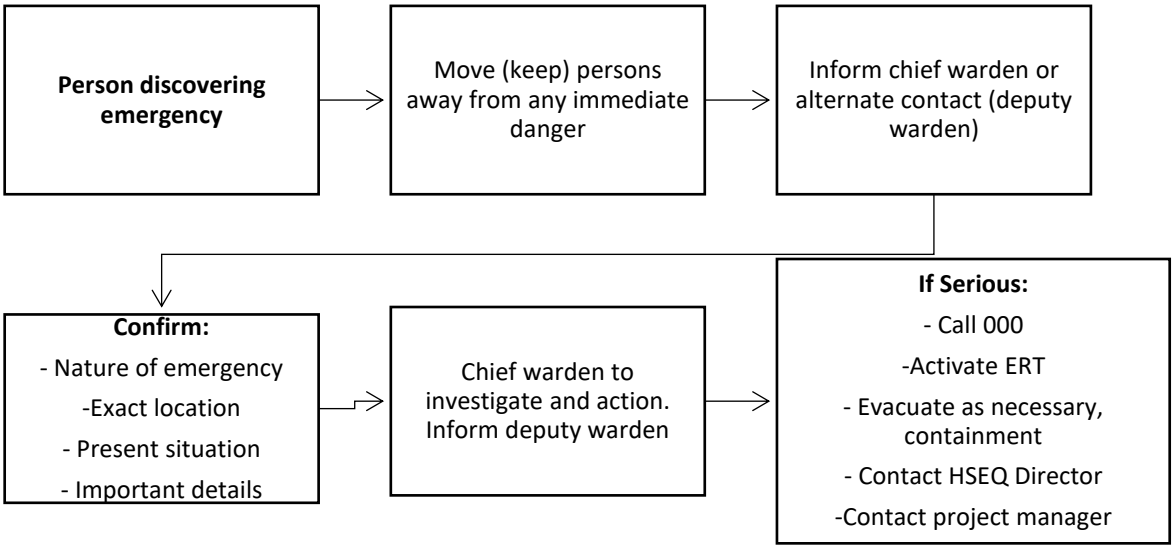
Note: The primary contact (chief warden) will be responsible for notifying emergency services and authorities. If unable to quickly contact the site emergency number (or alternate), dial 000 and request applicable emergency service/s.

IMPORTANT INFORMATION

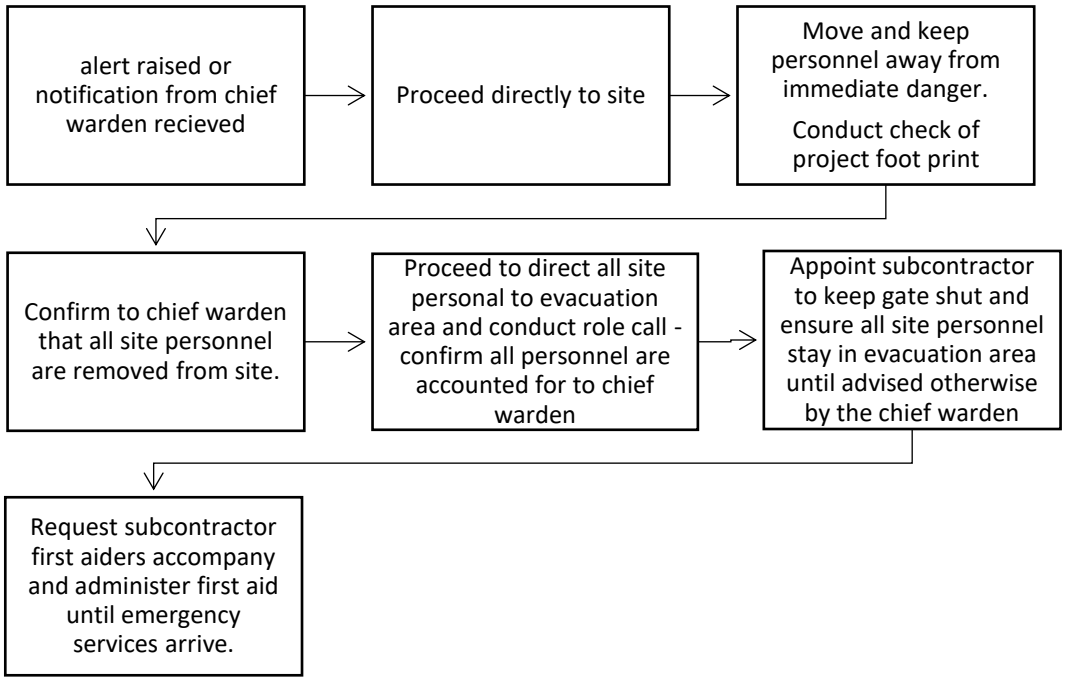
When reporting an emergency, the following information should be included:

- Nature of the emergency
- Exact location, including Building, Level & Area/Room Name/No. (where applicable)
- See site map in the Appendix at the rear of this manual for gate numbers and building names
- Present situation
- Name of person reporting the emergency, location and/or contact number (where applicable)

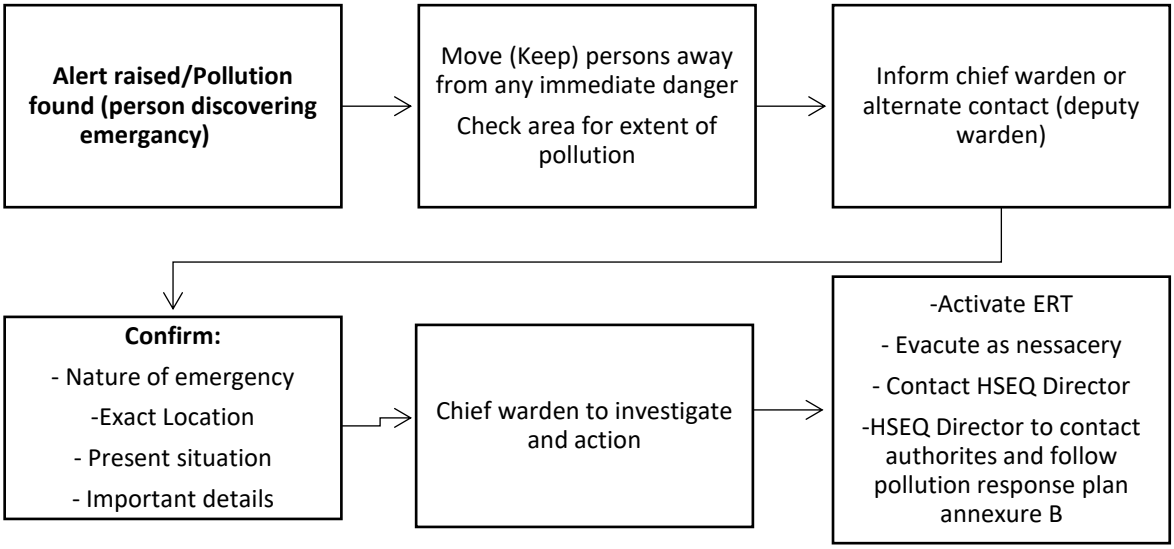
Remember: When providing information remain calm and speak clearly.



Deputy Wardens:



7.3 INITIAL ACTIONS - DISCOVERY OF POLLUTION INCIDENT



7.4 KEY ELEMENTS OF EVACUATION PLAN

General Evacuation - Authority	The chief warden is authorised to initiate a general evacuation of the site. Where practicable, this would be done only after conferring with HSEQ Director and/or emergency services
Alert Tone	Upon alert, supervisor to stop critical processes as appropriate and await further instruction on evacuation
Evacuation Signal	Supervisor to ensure employees proceed to the primary muster point unless directed elsewhere. Evacuation signal – EVACUATION Nurse call will sound Verbal directive from chief warden via emergency response team personnel or, obvious necessity
Evacuation Assembly Areas	Primarily should be right hand side of main driveway entrance away from harm (See Annexure B for evacuation plan)
Warden & Deputy Meeting Point	Providing it is safe to do so the warden and deputy area wardens: • Meet at the identified area meeting point to collect red safety hat

	• Whichever person – warden or deputy warden – who reaches the meeting point first should assume the role of the warden and conduct the area check Where possible a cooperative check of the area by both the warden and the deputy warden is more efficient
Warden Meeting Point	Providing it is safe to do, so all wardens should meet at the nominated evacuation assembly area.
Re-Entry	• Only when authorised by chief warden (after consultation with senior emergency services advisor and applicable management/specialists) • A verbal announcement will be made by the deputy chief warden or chief warden
Restrictions/ Considerations	• If applicable, persons with disabilities to be assisted by staff who are not deployed on ERT duties • Traffic access to the site may need to be restricted • Emergency services vehicles may need to be met and navigated to the scene • Persons must not gather in areas where they could obstruct emergency services vehicles or personnel or be exposed to danger

7.5 EMERGENCY CONTINGENCIES

a) Informing Emergency Services

When requesting attendance of emergency services, the following information must be included:

- Name of organisation
- Nature of emergency
- Initial response actions
- Any casualties
- Any hazardous materials / processes involved
- Address and nearest cross street
- Name of person making the call and contact number

Where applicable, considerations shall be given if the project is in a remote location and/or difficult to access when contacting emergency services.

b) Informing Relevant Authorities

When notifying authorities that a pollution incident has occurred, the following information must be provided

- The time, date, nature, duration, and location of the incident
- The location of the place where pollution is occurring or is likely to occur
- The nature, the estimated quantity or volume and the concentration of any pollutants involved, if known
- The circumstances in which the incident occurred (including the cause of the incident, if known)
- The action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution, if known

c) Access Control

In the event of a major emergency, it may become necessary for the Chief Warden to invoke restrictions over non-essential vehicular and pedestrian access to the site or affected area and environs.

Note that Police are responsible for control of external roadways, pedestrian, and vehicle control.

d) Emergency/Critical Incident-Management Notification

In the event of an emergency or other critical incident, the following persons must be notified at the first reasonable opportunity:

- HSEQ Director
- Safety Manager
- Managing Director
- Systems Manager
- Project Manager

Additional notifications if required will be managed by the Managing Director and HSEQ Director

If an emergency escalates into a crisis, the Belmadar Crisis Management Team will assume control of the decision-making process.

e) Counselling Services

Appropriate professional counselling services and additional support are to be made available to staff requiring their support. This service can be accessed by contacting the Belmadar Employee Assist Program on the dedicated hotline **0407 086 000**

f) First Aid Assistance

In the event of an evacuation or emergency, First Aid Officers both within Belmadar and subcontractors' teams on site with appropriate equipment should proceed to the First Aid muster point and standby to respond to any requests received for First Aid assistance.

7.6 MEDIA LIAISON

Should any staff member be approached by media representatives for a comment they are only authorised to make the following statement:

GENERAL STATEMENT TO MEDIA IN THE EVENT OF AN INCIDENT

"I am sorry, but I am not authorised to make any statement to the media. Please refer your inquiry to Media Affairs on (02) 8436 3508

Belmadar's crisis management plan provides guidance of media liaison responsibilities.

7.7 POST INCIDENT PROCESS

a) Termination of Emergency

Once emergency services have concluded their involvement, control of the affected area will be handed back to the chief warden. In determining the suitability of the area to be re-occupied and to resume normal operations, the chief warden should consider:

- Any residual/lingering hazards

- Any structural or process weaknesses caused by the original event, which could initiate a subsequent emergency if operations are reinstituted
- The need to preserve the scene if there is to be a subsequent investigation
- Occupant safety
- Industrial relations ramifications
- Need for post incident support or counselling for the psychological wellbeing of workplace staff

Where applicable, the decision to re-commence operations will be taken in consultation with specialist staff.

b) Preservation of the Scene

In any emergency where there is the possibility of a subsequent statutory investigation or coronial inquiry, the chief warden must ensure that all evidence relating to the incident is preserved and not interfered with. In addition, that any cleaning up, movement of bodies, repairs and so on, apart from that necessary to bring the emergency under control, does not occur without approval of investigating officers. Ideally, measures should be taken to barricade off the immediate area.

c) Report

At the first practicable opportunity following the conclusion of a major emergency/incident and in any event no later than 48 hours after the incident, the chief warden will ensure that a report is prepared concerning the emergency and organisational response for the information of the chair-emergency planning committee. All records are to be retained for period of 7 Years.

d) Injury Response Procedure

Injury Response Procedure (IRP) aims to assist employees who are not injured and who have witnessed an incident that they might find to be traumatic. In such an event, the employee(s) may require special counselling immediately after the event. The Employee Assistance Program (EAP) provides for these types of services.

The project manager in consultation with relevant employee representatives (e.g., safety manager or HSEQ Director) are to determine if such services are required.

e) De-Brief

Within 7 days of the conclusion of the emergency, the senior management team will conduct a formal review of the events and processes affecting the emergency to ensure that the emergency response plan and organisational preparedness remain appropriate and competent.

Where deficiencies or weaknesses are identified, a written strategy will be developed to rectify these together with a time frame. This review will involve debriefing relevant personnel and compiling an appropriate safety alert, which the HSEQ director will send to all Belmadar site staff.

f) Recovery Plan

Senior management coordinates the implementation of any recovery plans. Key site personnel will receive communication and action plans for implementation at site level.

7.8 EMERGENCY GUIDELINE SUMMARY

To ensure that potential incidents or potential emergencies are adequately identified, any new activity involving plant, hazardous substances/dangerous goods, electrical equipment etc. shall undergo a Risk Assessment in accordance with risk assessment procedure.

The purpose of this Risk Assessment will be to determine potential hazardous situations and thus the development of an appropriate Emergency Response Action Plan to deal with such an event should it ever arise by the systems manager. The Risk Assessment will address issue such as:

- What could go wrong?
- What are the effects?
- What are the probabilities?
- How often might it occur?
- How can the risk be lessened?

From the information, Emergency Response Action Plan will be developed and will provide guidance to the individual Emergency Response Team (ERT) members in responding to the emergency. All ERT members should be familiar with these actions.

In line with the construction program and the workplace risk assessment the senior project team will identify high risk activities/issues and the conduct desktop audits against the workplace specific emergency response action plan to ensure readiness. These audits will be formalized, any identified actions or improvements, raised and re-assessed to ensure compliance.

Before site teams commence works onsite, they will assess each emergency response situation addressed within this plan, use the check box on the page across and cross reference against the Project risk register to ensure all potential emergency situations are addressed and dealt with prior to arising onsite.

2.1	[A] Air Supply Contamination *	
2.2	[B] Armed Hold-Up	
2.3	[C] Assault *	
2.4	[D] Bio-Hazard/Blood Product Spill *	
2.5	[E] Bombs – Threat/Found/Mail Bombs *	
2.6	[F] Civil Disorder/Demonstrations	
2.7	[G] Communications Failure	
2.8	[H] Deceased Person *	
2.9	[I] Electric Shock	
2.10	[J] Evacuation *	
2.11	[K] Explosion/Disaster *	
2.12	[L] Fire – Building / Bush *	
2.13	[M] Food Poisoning	
2.14	[N] Gas Leak *	
2.15	[O] Hold / Shelter-in-Place *	
2.16	[P] Medical Emergency *	
2.17	[Q] Motor Vehicle Accident *	
2.18	[R] Power Failure	
2.19	[S] Seismic Event	
2.20	[U] Spill/Release	
2.21	[V] Storm/Severe Weather *	
2.26 2.22	[W] Structural Damage to Building/s * [X] Mental Health Emergency	

8 REVISION:

Revision Number	Date Updated	Item Updated	Updated By
1	17/12/2020	Introduced ERM	Systems Manager
2	08/02/2021	Complete revision	Systems Manager
3	08/03/2021	Reformatted	Systems Manager

9 NEXT REVIEW:

Reviewed	Reviewed By	Next Review (If no Incidents occur onsite)

11/03/2021	Systems Manager, HSEQ Director & Project Manager	

Annexure A: EMERGENCY RESPONSE GUIDELINES

Update in accordance with guidelines specified in Project Risk Register. Remove Guidelines below not in use to make site specific.

GUIDELINE #1 CONFINED SPACE

SCENARIO	NOTES	ACTION
Persons overcome in Confined Space	☐ Rescue from a confined space must only be performed by trained personnel. ☐ Emergency equipment maintained and on standby	**All Personnel** ☐ Raise the alarm as per general emergency procedures **EMERGENCY - EMERGENCY - EMERGENCY**. ☐ Evacuate all personnel from the confined space. ☐ Do not attempt to re-enter confined space to rescue unconscious persons, initiate agreed rescue method as per confined space permit and risk assessment. **Area Supervisor / Emergency Team Leader** ☐ Ensure the confined space has been evacuated and prevent entry to area. ☐ Assist the ERT when they arrive. **Emergency Response Team** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with ETL on the current situation ☐ Advise if emergency services are required ☐ Review emergency rescue procedures developed for the works in the confined space ☐ Use gas detector to monitor possible explosive levels. If explosive level is registered, purge space until atmosphere is within safe limits, where trained to do so, ☐ Ensure all power is isolated and naked flames are not present within area. ☐ Provide first aid where required. **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency

GUIDELINE #2 ELECTRIC SHOCK

SCENARIO	NOTES	ACTION
Vehicle/ Plant comes into contact with power lines through collision or contact	Exercise extreme caution when approaching incident scene, watch for fallen power lines. Maintain at least 10 metres clearance from fallen power lines. Advise vehicle occupants to stay where they are in the vehicle until power is isolated. If other life threatening hazards present imminent danger to occupants before power can be isolated advise them to jump well clear with both feet together. Do not touch the equipment and the ground at the same time. Advise them to jump/shuffle away from hazardous area keeping both feet together until at least 10 metres away. **Under no circumstances should they run or walk!** Note: Tyres that have had current passed through them have the potential to explode at the time or up to 24 hours later due to gas build up in the tyre. **Be aware** of the danger zones and only attack the fire from the safe zones.	**All Personnel** ☐ **DANGER**: Do not touch or go near fallen lines and affected vehicle. Keep calm. ☐ Encourage the vehicle occupants to stay in the vehicle. ☐ The power pole may be severely damaged. Live wires may fall at any time. ☐ Raise the alarm as per general emergency procedures **EMERGENCY - EMERGENCY - EMERGENCY** ☐ **Ensure the Electrical Department has arranged someone to isolate the power.** ☐ Have someone meet the Emergency Response Team on arrival. **Area Supervisor / Emergency Team Leader** ☐ Confirm that the power is to be isolated and Emergency Response Team called for. ☐ Keep bystanders back and cordon off area where possible. **Emergency Response Team** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with ETL on the current situation ☐ Confirm that the power is to be isolated. ☐ Commence rescue operation as per **Guideline #13 – Vehicle Incident**. **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the

GUIDELINE #2 ELECTRIC SHOCK		
SCENARIO	**NOTES**	**ACTION**
	There is no known accurate safe distance from tyre fires. Standard is 300m. There is no known safe approach distance as they can explode out of the tread or the side walls. Once the heat source is removed the plant should still be isolated for 24h.	
Worker has received an electric shock whilst in the workplace.	☐ Burns could impact on the airway, hands and face. Treat burns with cool flowing water, do not remove burnt clothing, use moistened sterile burns dressings on visible wounds. Monitor for and treat shock. ☐ Ensure the senior site manager has been notified.	**<u>All Personnel</u>** ☐ Do not touch or go near casualty until it is confirmed that the power supply has been disconnected, keep calm. ☐ Raise alarm. Isolate at the power point or switchboard. ☐ Locate the low voltage rescue kit (for use only by people who have received low voltage rescue training). ☐ Remove person from danger, do not put yourself at risk. ☐ Follow the DRSABCD: **Danger:** To yourself, bystanders and patient **Response:** Touch and Talk **Send:** get others to call 000 and get defib **Airway:** Check for obstruction **Breathing:** Look, listen and feel **Compressions:** If patient not breathing normally and not responding commence CPR **Defibrillation:** If needed start use of defib machine ☐ Have someone meet the Emergency Response personnel on arrival. **<u>Area Supervisor / Emergency Team Leader</u>**

GUIDELINE #2 ELECTRIC SHOCK		
SCENARIO	**NOTES**	**ACTION**
		☐ Confirm that the power is to be isolated and Emergency Response Team notified. ☐ Keep bystanders back and cordon off area. **Emergency Response Team** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with ETL on the current situation ☐ Confirm that the power is to be isolated. ☐ Commence first aid as per Guideline #1 - Medical Emergency. ☐ Follow up patient treatment with visit to medical practitioner and ECG (Electrocardiogram). **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency

GUIDELINE #3 EVACUATION

SCENARIO	NOTES	ACTION
Evacuation of personnel due to site emergency or drill	Evacuation may be required for a particular area on site, or for the entire site, this should be communicated as soon as possible. If a particular Emergency Assembly Area cannot be used due to hazardous emergency conditions this should be communicated as soon as possible. Erect barricades and/or post sentries to prevent personnel accessing the area.	**All Personnel** ☐ Remain calm when evacuation call is received. ☐ Shut down equipment/make equipment safe - if safe to do so. ☐ Evacuate from immediate danger area, use a safe route, and notify workmates as you go. ☐ Follow evacuation instructions given by supervisory personnel and move to nominated Emergency Assembly Area. ☐ Listen for your name at roll-call and respond clearly when called. ☐ Await further instructions – do not leave assembly area until instructed. **Area Supervisor / Emergency Team Leader** ☐ Evacuate workers from the immediate danger area; communicate location of emergency and advise of safe route/s to use if necessary. ☐ Assign ERT members to check that areas have been fully evacuated. ☐ Erect barricades and/or post sentries to prevent access to hazardous areas. ☐ Account for personnel at the Emergency Assembly Area using site sign-on sheets (Belmadar / client / sub-contractors / visitors). **Emergency Team Leader** ☐ Confirm whether all personnel are accounted for, notify emergency services if all workforce is or is not accounted for. ☐ Initiate radio calls / physical search if any workers are missing (consult with necessary personnel to determine potential location/s of missing personnel) if it is safe to do so. ☐ Manage emergency as per specific emergency guidelines. ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0)

GUIDELINE #3 EVACUATION		
SCENARIO	**NOTES**	**ACTION**
		☐ Arrange for counselling debrief of all involved in the emergency **Emergency Response Team (ERT)** ☐ Inspect work areas as determined by the ETL ☐ Make way to evacuation assembly point as soon as possible ☐ Upon arrival, liaise with ETL on the current situation

GUIDELINE #4 FIRES

SCENARIO	NOTES	ACTION
Building fire	Fire can spread rapidly, prompt action is required. Establish a safe zone rapidly and position barricades and/or personnel in locations that will prevent others from entering. Close door behind you as you go. Ensure all power to the affected area is isolated before water is used. Firefighting attempts should only be made if safe to do so, maintain a safe distance from any fire and two possible exit routes. Work the fire perimeter first. All efforts should be made to stay upwind of the fire to keep clear of any smoke or fumes. Do not enter smoke filled areas, poisonous gases may be present. Follow emergency exit signs	**All personnel** ☐ Raise the alarm as per general emergency procedures. **EMERGENCY - EMERGENCY - EMERGENCY** ☐ Evacuate building and assemble at the relevant muster point. ☐ Extinguish fire if safe and competent to do so. **Area supervisor / Emergency response team leader** ☐ Follow the Evacuation Procedure. Assume the role of Fire Warden and ensure employees are evacuated and have been accounted for at the muster area. ☐ Do not allow anyone to re-enter the building. ☐ Ensure power is isolated. ☐ Have someone guide the Fire Brigade on arrival. ☐ Give Emergency Services personnel a brief report on the situation, missing employees if any, the building plan and any other inherent dangers. **Emergency Response Team** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with Emergency Team Leader on the current situation ☐ Assess the situation and commence firefighting if safe to do so. ☐ Notify external services where required. **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency
Bush Fire	Bush fire monitoring via http://www.rfs.nsw.gov.au/dsp_content.cfm?cat_id=683	**All personnel – Once smoke seen or smelt** ☐ Raise the alarm as per general emergency procedures. **EMERGENCY - EMERGENCY - EMERGENCY**

GUIDELINE #4 FIRES		
SCENARIO	**NOTES**	**ACTION**
	This will show location of nearby fires and give progress reports that can be relayed to work crews Escape routes can be blocked off rapidly and it's important to evacuate the area quickly.	☐ Wait for confirmation from Emergency Team Leader or foreman on situation ☐ Park up machinery on hard stand if available giving a distance of 3m minimum between **Area supervisor / Emergency Team Leader** ☐ Follow the Evacuation Procedure. Assume the role of Emergency Response Team Member and ensure workers are evacuated and have been accounted for at the assembly area. Use site sign register for this and area sweeps ☐ Do not allow anyone to re-enter the area. ☐ Have someone guide the Rural Fire Brigade on arrival. ☐ Give Emergency Services personnel a brief report on the situation, missing employees if any, the area plan and any other inherent dangers. **Emergency Response Team** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with Emergency Team Leader on the current situation ☐ Assess the situation and commence firefighting if safe to do so. ☐ Notify external services where required. **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency
Mobile equipment Fire	Danger exists from the chance of exploding tyres, fuel tank, hydraulic tanks.	**Mobile equipment operator** ☐ Raise the alarm as per general emergency procedures. **EMERGENCY - EMERGENCY - EMERGENCY**

GUIDELINE #4 FIRES		
SCENARIO	**NOTES**	**ACTION**
	Driveline and shock absorbers pose an explosive hazard to rescuers If persons are injured refer to the "Injury or Medical Emergency" section of this document If safe to do so activate any automatic fire suppression systems fitted and/or use available portable fire extinguishers.	☐ If possible, stop the mobile equipment on level ground in an isolated area, apply the park brake and shut down the engine. ☐ Activate any automatic fire suppression systems fitted as appropriate ☐ Extinguish fire if safe and competent to do so ☐ Evacuate the mobile equipment on the side of the machine opposite the fire if possible **All personnel** ☐ Use a 2-way radio/telephone to raise the alarm as per general emergency procedures ☐ Look for possible dangers, i.e. fallen power lines, unstable vehicle and oncoming traffic ☐ Render first aid where required ☐ Extinguish fire if safe and competent to do so **Area supervisor / Emergency Team Leader** ☐ Limit access to scene ☐ Call water truck for fire control if available ☐ Have someone guide the external Emergency Services on their arrival ☐ Provide details to ERT as required **Emergency Response Team ERT)** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with Emergency Team Leader on the current situation ☐ Assess the situation and commence firefighting if safe to do so ☐ Provide first aid where required ☐ Notify emergency services If occupants are thought to be trapped in the vehicle, **Emergency Team Leader (ETL)**

GUIDELINE #4 FIRES		
SCENARIO	**NOTES**	**ACTION**
		☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the incident
Tyre fire	Tyre fires are dangerous. Please be aware of the danger zones and only attack the fire from the safe zones. There is no known accurate safe distance from tyre fires. Standard is 300m. There is no known safe approach distance as they can explode out of the tread or the side walls. Once the heat source is removed the plant should still be isolated for 24h.	**Mobile equipment operator** ☐ Use 2-way radio to raise the alarm as per general emergency procedures **EMERGENCY - EMERGENCY - EMERGENCY** ☐ If possible, stop the mobile equipment on level ground in an isolated area, apply the park brake and shut down the engine ☐ Activate any automatic fire suppression systems fitted as appropriate ☐ Extinguish fire if safe and competent to do so ☐ Evacuate the mobile equipment on the side of the machine opposite the fire if possible ☐ Evacuate area for a distance of not less than 1000m radius of the fire **All personnel** ☐ Use a 2-way radio/telephone to raise the alarm as per general emergency procedures ☐ Evacuate area for a distance of not less than 1000m radius of the fire **Area supervisor / Emergency Team Leader** ☐ Have water truck travel to scene immediately if available ☐ Limit access to area ☐ Guide ERT to safe position **Emergency Response Team** ☐ Make way to scene of incident as soon as possible ☐ Upon arrival, liaise with Emergency Team Leader on the current situation ☐ Work with area supervisor / ETL on plan of attack in regard to tyre fire

GUIDELINE #4 FIRES		
SCENARIO	**NOTES**	**ACTION**
		☐ Position water truck to ensure positions of operator's cab is as far as possible from fire. Control of monitor positions to ensure continued safe coverage of the fire will require constant review ☐ Remember safe zones of attack during the fire ☐ Safe zones must not be in the line of fire travel **Incident management Team (IMT)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency
Major Gas / Chemical Fire or Explosion **Fuel Farm Fire**	Major gas fires such as LPG can develop into a BLEVE *(Boiling Liquid Expanding Vapour Explosion)* situation. Clear the area around the fire (1000m plus). Keep bystanders well back. **Gas release without fire:** Use Emergency Shutdown controls. Isolate leak if possible. Shutdown/isolate any motorised equipment or any other sources of ignition. Use fire hose nozzle to dilute and help disperse vapour release. **Gas release with fire:** Use Emergency Shutdown controls. Isolate leak if possible. Adjust fire hose nozzle to reduce heat on first response team. Concentrate a second hose any area on the tank that	**All Personnel** ☐ Raise the alarm as per general emergency procedures. **EMERGENCY - EMERGENCY - EMERGENCY** ☐ Immediately cease all hot work on site. ☐ Evacuate to up wind of the area immediately. ☐ Provide first aid where required. ☐ Do not attempt to shut down supply valves or extinguish fire. **Area Supervisor / Emergency Team Leader** ☐ Ensure all personnel are evacuated and limit access to area. ☐ If chemicals are involved, try to identify the chemicals. Major gas fires and fuel fires require the area to be evacuated and all utilities turned off (power, gases etc.). ☐ Have a clear route for the ERT to operate where safe to do so. **Emergency Response Team** ☐ Make way to the incident scene as soon as possible ☐ Upon arrival, liaise with Emergency Team Leader on the current situation ☐ Provide first aid where required.

GUIDELINE #4 FIRES		
SCENARIO	**NOTES**	**ACTION**
	may be affected by heat. Areas of greater concern are above the liquid level (vapour space). DO NOT extinguish the fire, instead cool and contain. Consult Safety Data Sheet (SDS) for specific advice on emergency response, PPE, and First Aid treatment. If after obtaining the relevant SDS, you decide expert help is required, Dial 000 for NSWFRS.	☐ Assess situation and commence fighting of fire if safe to do so. ☐ Use SDS to identify the PPE and extinguishing strategy for the attack. And have SDS information for emergency services. **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per IMS Section 10.0 - Incident Management ☐ Arrange for counselling debrief of all involved in the emergency

GUIDELINE #5 FLOOD		
SCENARIO	**NOTES**	**ACTION**
Worker falls into water (Harbour, swimming pool, sediment pond etc.) where there is a risk of drowning	☐ Rain forecast to be monitored so that pumps can be set up in pits etc. ☐ Evacuation of personnel from at risk areas; If anyone is injured during any operation, refer to **Guideline #9 - Medical Emergency**.	**All Personnel** ☐ If any worker is at risk of falling into water or has fallen in to water raise the alarm as per general emergency procedures. ☐ Upon instruction or where necessary due to conditions, personnel are to evacuate the area immediately. ☐ No one is to put themselves in unnecessary danger. **Area Supervisor / Emergency Response Leader** ☐ Ensure all workers are removed from any danger areas. ☐ Restrict access to incident zone. **Emergency Response Team** ☐ Make way to the scene of the incident as soon as possible

		☐ Upon arrival, liaise with ETL on the current situation ☐ Where a worker person has fallen into the water or is in danger of doing so, assess the situation and determine best plan of rescue starting with the use of a life buoy and notifying external assistance i.e. NSWFRS, SES etc. where deemed necessary. **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency

GUIDELINE #6 HAZARDOUS CHEMICAL SPILLS

SCENARIO	NOTES	ACTION
Major Fuel Spill (e.g. Diesel)	When evacuating the area, be sure to evacuate to up-wind area. Be aware of the danger of naked flames around flammable liquids. Information on various fuels (flash point) can be obtained from SDS's stored at various locations across site.	**All Personnel** ☐ Raise the alarm as per general emergency procedures **EMERGENCY - EMERGENCY - EMERGENCY** ☐ Control / contain leak if safe to do so. Call for grader or dozer to establish earth bund. ☐ Evacuate the area. ☐ Ensure all naked flames are extinguished. **Area Supervisor / Emergency Team Leader** ☐ Limit access to area. ☐ Supervisor construction of the earth bund where required. ☐ Guide the ERT to location. **Emergency Response Team** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with ETL on the current situation ☐ Determine appropriate action (foam coverage if fire risk present, booms in water courses etc.). ☐ Liaise with Areas Supervisor / ETL and Environmental Officer on clean-up of affected area. **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency

GUIDELINE #6 HAZARDOUS CHEMICAL SPILLS

SCENARIO	NOTES	ACTION
Hazardous Chemicals/ Dangerous Goods Release or Spill (including possible vapour/fume exposure)	Haz Chemicals/DGs can spread rapidly. Prompt action is required to protect people and the environment. Releases could be either vapour, liquid or solid. Consult Safety Data Sheet (SDS) for specific advice on emergency response, PPE, and First Aid treatment. If after obtaining the relevant SDS, you decide expert help is required, Dial 000 for NSWFRS. Fumes/vapour from a release may affect personnel some distance away such as those located down-wind who are not directly involved in the incident. Establish a safe zone rapidly and position barricades and/or personnel in up-wind locations that will prevent others from entering hazardous down-wind zones. Use Oxy-Viva to treat persons with vapour/fume exposure if trained to do so. Use appropriate spill kits where available.	**All Personnel** ☐ Raise the alarm as per general emergency procedures **EMERGENCY - EMERGENCY - EMERGENCY** ☐ Render first aid where required. ☐ Identify substance and refer to SDS for action. ☐ Evacuate to up-wind of the area if substance is known to be potentially harmful. ☐ Control / contain leak if safe to do so ☐ Call for grader or dozer to establish earth bund. **Area Supervisor / Emergency Team Leader** ☐ Limit access to area. ☐ Ensure all people are accounted for. ☐ Supervise construction of the earth bund where required. ☐ Contact emergency services as required ☐ Guide the ERT to location. **Emergency Response Team** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with ETL on the current situation ☐ Confirm spilt substance. ☐ Formulate action plan for managing the spill: ☐ Control and contain the spill where possible ☐ Clean up affected area **Environmental Representative** ☐ Assist in formulating an action plan in handling release/spill. **Incident management Team (IMT)**

GUIDELINE #6 HAZARDOUS CHEMICAL SPILLS		
SCENARIO	**NOTES**	**ACTION**
		☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency.

GUIDELINE #7 HEAT STRESS/ HEAT STROKE

SCENARIO	NOTES	ACTION
Worker has been working continuously in the sun with no break and is behaving abnormally	**SYMPTOMS:** **Heat Cramps:** ☐ Heavy perspiration, tired and thirsty. ☐ Irritability, loss of appetite. ☐ Prickly heat rash, nausea. ☐ Muscle spasms / twitching, moist cool skin. ☐ Painful muscle cramps (limbs and abdomen. **Heat Exhaustion:** ☐ Profuse perspiration. ☐ Cold, clammy, pale skin. ☐ Fatigue, weakness and restlessness. ☐ Headache and vomiting. ☐ Weak but rapid pulse. ☐ Poor Coordination. ☐ Normal temperature, but faintness. **Heat Stroke:** ☐ Confusion, headache, nausea, dizziness. ☐ Skin flushed, hot and unusually dry. ☐ Dry swollen tongue. ☐ High body temperature (>40˚C). ☐ Deep unconsciousness may develop rapidly.	**TREATMENT/FIRST AID:** **Heat Cramps:** ☐ Drink more water. ☐ Have a cold shower/bath. ☐ Lie in a cool place with legs supported and slightly elevated. ☐ Massage limbs gently to ease spasms, or firmly if cramped, then apply ice packs and drink glucose solution. (E.g. cordial). ☐ DO NOT have salt. **Heat Exhaustion:** ☐ Lay victim down in a cool place as for heat cramps. Loosen clothing and apply wet cloths to head and body. ☐ Fan the victim, or move them to an air conditioned environment. ☐ Give sips of cold water. ☐ If vomiting continues, seek medical assistance immediately **Heat Stroke:** ☐ Seek medical assistance urgently. In the meantime: ☐ Lay victim in a cool place and remove outer clothing. ☐ If unconscious, check airway and breathing. ☐ Cool victim quickly by applying cold water or wrap in a wet sheet and fan them (keep the sheet wet). ☐ When conscious, give sips of water.

GUIDELINE #8 HEIGHTS RESCUE

SCENARIO	NOTES	ACTION
Person suspended by a harness.	Personnel hanging in a fall arrest harness for longer than 10 minutes can suffer serious injuries. Death can occur from extended periods in a fall arrest harness due to suspension trauma. This occurs where blood flow is restricted to the lower limbs because of the body's weight being concentrated on the crotch straps. When the blood flow is restored the blood from the lower limbs can be toxic to the rest of the body. **IMPORTANT: Recovery must occur as soon as possible.** If the suspended person is conscious and is able to take some weight on their legs, get them to do so regularly. This may be achieved by: ✓ using nearby objects or structures if accessible; or. ✓ using a suspension trauma strap if fitted to the harness; or, ✓ rigging a rope loop to the harness (similar to a suspension trauma strap); or,	**All Personnel** ☐ Raise the alarm as per general emergency procedures **EMERGENCY – EMERGENCY – EMERGENCY** ☐ Cease all operations within the area. ☐ If safe to do so, contact affected person and maintain contact until help arrives. ☐ Request Ambulance. ☐ Await ERT. **Area Supervisor / Emergency Team Leader** ☐ Restrict access to the area. ☐ After gaining advice from qualified personnel mobilise suitable recovery equipment, i.e. crane, man-box, EWP, Gotcha Kit, rope recovery equipment etc. ☐ Assist the ERT as required. **Emergency Response Team** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with ETL on the current situation ☐ Assess the situation and attempt communication with the suspended worker if deemed safe approach casualty. Adopt DRSABCD as per **Guideline #9 – Medical Emergency.** ☐ Begin recovery of person if suitable equipment and personnel are available, i.e. crane, man box, EWP, Gotcha Kit, rope recovery equipment etc. ☐ Contact Ambulance and external emergency services where required. ☐ Provide necessary assistance to Ambulance. **Emergency Team Leader (ETL)**

GUIDELINE #8 HEIGHTS RESCUE		
	✓ lowering a bonus's seat for them to sit on	☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency

GUIDELINE #8 HEIGHTS RESCUE		
SCENARIO	**NOTES**	**ACTION**
Falling from elevated platforms	Typical injuries from falls can include unconsciousness, blocked airway, impalement, serious head or abdominal injuries and fractures. Focus on potentially life-threatening conditions such as severe bleeding, shock, or spinal injuries. First Aid kits are available in light vehicles and in-field crib rooms. Trauma Kit (run Kit) available with Occupational first aiders. Elevated platforms include but are not limited to: ➢ Elevated Formwork Platform ➢ Elevated Scaffold Platform	**<u>All Personnel</u>** ☐ Raise the alarm as per general emergency procedures **EMERGENCY – EMERGENCY – EMERGENCY** ☐ Cease all operations within the area. ☐ If safe to do so, contact affected person and maintain contact until help arrives. ☐ Request Ambulance. ☐ Await ERT. **<u>Area Supervisor / Emergency Team Leader</u>** ☐ Restrict access to the area. ☐ After gaining advice from qualified personnel mobilise suitable recovery equipment, i.e. crane, man-box, EWP, Gotcha Kit, rope recovery equipment etc. ☐ Assist the ERT as required. **<u>Emergency Response Team</u>** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with ETL on the current situation ☐ Assess the situation and attempt communication with the suspended worker if deemed safe approach casualty. Adopt DRSABCD as per **Guideline #9 – Medical Emergency.**

GUIDELINE #8 HEIGHTS RESCUE		
	➢ Ladders ➢ Roofs	☐ Contact Ambulance and external emergency services where required. ☐ Provide necessary assistance to Ambulance. **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency

GUIDELINE #9 INJURY OR MEDICAL EMERGENCY		
SCENARIO	**NOTES**	**ACTION**
General injuries	Stay calm and follow the First Aid **DRSABCD** action plan. **D**anger: To yourself, bystanders and patient **R**esponse: Touch and talk **S**end for Help: Ask nearby people to call emergency services or gather equipment. **A**irway: Check for obstruction **B**reathing: Look, listen and feel **C**irculation: If patient is not breathing normally and not responding, start CPR **D**efibrillator: Apply an Automatic Electronic Defibrillator (AED), available in First Aid Room	**All personnel** ☐ Raise the alarm as per general emergency procedures **EMERGENCY - EMERGENCY - EMERGENCY** ☐ Follow First Aid DRSABCD action plan ☐ Provide First Aid assistance as required **Area supervisor / Emergency response team leader** ☐ Limit access to scene ☐ Provide necessary assistance to emergency response personnel **Emergency response Team** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with Emergency Team Leader on the current situation ☐ Provide first aid as required

GUIDELINE #9 INJURY OR MEDICAL EMERGENCY

SCENARIO	NOTES	ACTION
	Cardio-Pulmonary Resuscitation (CPR): **One/two person** 30 compressions / 2 inflations (compression rate ~100 compressions/minute) Focus on potentially life threatening conditions such as severe bleeding, shock, spinal injuries First Aid kits are available in light vehicles and in-field crib rooms. Trauma Kit (run Kit) available with Occupational first aiders.	☐ Request emergency services (Dial 000) if required ☐ Arrange for an escort to meet Emergency services ☐ Provide necessary assistance to Ambulance **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency
Life-threatening/ Fatal injuries	Shock could have a delayed effect on persons involved in responding to an incident of this nature. Employees involved need to be closely monitored for any signs of stress, even if they were not involved directly in the incident Symptoms of shock may include: • Rapid and weak pulse • Increased heart rate • Fast, shallow breathing • A vacant / distant look (preoccupied) • Cold and clammy skin • Grey lips • Nervousness or tremors	**All personnel** ☐ Raise the alarm as per general emergency procedures **EMERGENCY - EMERGENCY - EMERGENCY** ☐ Follow First Aid DRSABCD action plan ☐ Provide First Aid assistance as required **Area supervisor / Emergency Team Leader (ETL)** ☐ Limit access to scene ☐ Provide necessary assistance to emergency response personnel **Emergency Response Team (ERT)** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with Emergency Team Leader on the current situation ☐ Provide first aid as required

GUIDELINE #9 INJURY OR MEDICAL EMERGENCY		
SCENARIO	**NOTES**	**ACTION**
	• Dryness in mouth	☐ Request emergency services (Dial 000) if required ☐ Arrange for an escort to meet Emergency services ☐ Provide necessary assistance to Ambulance NOTE: First aid shall be administered until such time death is confirmed by the Ambulance or other factors prevent continuance of first aid at the scene. Unless safety issues dictate, do not move the body or alter the scene until authorised by representatives of the Police or Ambulance **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency

GUIDELINE #10 MALICIOUS THREAT

SCENARIO	NOTES	ACTION
A malicious threat has been received (including bomb threat)	Threat may include: • Heated argument • Threats of specific civil action • Unlawful detainment • Person influenced by drugs or alcohol • Threatening injury • Any other volatile situation Remain calm, do not panic. **DO NOT** inflame the situation by being: ☒ argumentative ☒ sarcastic ☒ aggressive ☒ non-committal **DO** try to calm the situation: ✓ Talk to the person quietly and slowly. ✓ listen, try to calm, offer assistance ✓ maintain appropriate distance ✓ avoid unnecessary movements, gestures ✓ be a problem solver without making definitive promises Accurate records are very important to properly assess the bomb threat - use the Bomb Threat Checklist form. Potential threat	**All Personnel** ☐ If receiver of call - note details on "Bomb Threat Checklist" form try and hold caller on phone and request information as noted on form. ☐ If physically confronted remain calm and do not say or do anything to inflame the situation, note details on form ASAP. ☐ Get someone else to raise alarm if you cannot. **Area Supervisor / Emergency Team Leader** ☐ Ensure evacuation of the area and establish exclusion zone. ☐ Ensure all people are accounted for. ☐ Arrange an escort for Police and others to threat location and provide briefing to Police on arrival. **Emergency Response Team** ☐ Await instructions from Police or ETL. ☐ If bomb detonation occurs prior to Police arrival, render first aid where required if safe to do so and await further instructions from Police **Emergency Team Leader (ETL)** ☐ Travel to the scene of the incident as soon as possible ☐ Upon arrival, liaise with Police on the current situation ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency if required.

	recipients to review this form or ensure it are on hand. The form is to be completed immediately after incident by each person involved and witnesses. A separate form is required for each offender. Please tick your selections as applicable. Do not speak to others while completing the form. ETL or delegate is to ensure forms are completed and handed to Police.	

GUIDELINE #11 RECOVERY FROM VOID/ENGULFMENT

SCENARIO	NOTES	ACTION
Recovery of persons from stockpile void / engulfment.	Various scenarios can arise whilst people are traversing stockpiles from voids, open trenches or engulfment from water intake Check for dangers such as further engulfment, vehicle movement, Consult ETL to obtain advice regarding geological failure management. Isolate any energy sources that could impact the emergency situation e.g. movement of powered mobile plant Consider the need to secure equipment or vehicles against further unwanted movement by anchoring to appropriate objects/ heavy vehicles with slings/ chains. Consider the use of appropriate heavy earthmoving equipment to manage/ remove engulfing material. Remove vehicles	**All Personnel** ☐ Raise the alarm as per general emergency procedures **EMERGENCY - EMERGENCY - EMERGENCY** ☐ Call emergency services ☐ Check for dangers that could affect the first person on the scene (further engulfment, vehicle movement, etc.), ☐ Commence removal if safe to do so. **Area Supervisor / Emergency Team Leader** ☐ Limit access to area. ☐ Establish road blocks as required. ☐ Guide the ERT to location. **Emergency Response Team** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with ETL on the current situation ☐ Assess the situation and attempt to make communication with any trapped worker(s). ☐ Contact NSWFRS 000 if additional assistance is required. ☐ Mobilise appropriate equipment after gaining advice from qualified emergency personnel. ☐ Provide first aid where required **Incident management Team (IMT)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency

GUIDELINE #12 SEVERE STORM		
SCENARIO	**NOTES**	**ACTION**
Severe storm	Severe storms may comprise some or all of the following characteristics: very strong winds (>90kmh), very heavy rain (possible flash flooding), lightning, hail. Storms may occur at any time of the year however they typically occur October to March. Weather forecasts and observations, storm warnings, and weather radar images are available via the Bureau of Meteorology (BOM) internet site http://www.bom.gov.au	**All Personnel** ☐ Immediately report any storm activity to Supervisor ☐ Prepare site for weather event, secure loose material, protect, concrete pours, clear drains or make diversion drains. **Area Supervisor** ☐ Monitor daily BOM weather reports, site weather conditions, employee reports ☐ Make call with General Manager Construction in regards with site shut down.

GUIDELINE #13 VEHICLE INCIDENT

SCENARIO	NOTES	ACTION
Light Vehicle Incident	Vehicle incidents are very unstable situations and must be treated with caution until stabilised. They are often emotionally charged by those involved if minor, whilst a major vehicle accident can be life threatening.	**All Personnel** ☐ Raise the alarm as per general emergency procedures. **EMERGENCY - EMERGENCY - EMERGENCY** ☐ Check for dangers, which could affect the first person on the scene (fire, oncoming vehicles, leaking fuel, fallen power lines etc.), make the area as safe as possible. ☐ Render first aid and extinguish fires if competent and safe to do so. **Area Supervisor / Emergency Team Leader** ☐ Limit access to area. ☐ Establish road blocks as required. ☐ Guide the ERT to the incident location. **Emergency Response Team (ERT)** ☐ Make way to the scene of the incident as soon as possible ☐ Upon arrival, liaise with Emergency Team Leader on the current situation ☐ Stabilise all vehicles involved in the incident if possible. ☐ Isolate the area. ☐ Render first aid and extinguish fires. ☐ If required call Emergency services **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency
Heavy Vehicle/Plant Incident or roll over	Vehicle incidents are potentially very unstable situations and must be treated with caution until stabilised.	**All Personnel** ☐ Raise the alarm as per general emergency procedures. **EMERGENCY - EMERGENCY - EMERGENCY**

GUIDELINE #13 VEHICLE INCIDENT		
SCENARIO	**NOTES**	**ACTION**
	Due to the size of equipment involved, additional effort may be required in extracting persons from heavy vehicles or buses. The construction material used in these vehicles or buses can often render standard cutting equipment ineffective.	☐ Check for dangers, which could affect the first person on the scene (fire, oncoming vehicles, leaking fuel, fallen power lines etc.), make the area as safe as possible. ☐ Render first aid and extinguish fires if competent and safe to do so. **Area Supervisor / Emergency Team Leader** ☐ Limit access to area. ☐ Establish road blocks as required. ☐ Stabilise scene until the ERT arrive. ☐ Guide the Emergency Response Team to location. **Emergency Response Team** ☐ Make way to scene of incident as soon as possible ☐ Upon arrival, liaise with Emergency Team Leader on the current situation and assist if required. ☐ Assess Area for Danger – overhead lines, electrical arcing, spills, or risk of an explosion or fire. ☐ Stabilise all vehicles involved in the incident. ☐ Isolate the area. ☐ Render first aid and extinguish fires. ☐ If multiple casualties, establish triage and prioritise response. Call for backup Ambulances if conditions dictate. **Emergency Team Leader Team (ETL)** ☐ Initiate Critical incident control if needed, liaise with stakeholders ☐ Organise for an investigation into the emergency.
Public Road Vehicle Incident	Public vehicles after an incident can be very unpredictable and having control of the live	**All Personnel**

GUIDELINE #13 VEHICLE INCIDENT		
SCENARIO	**NOTES**	**ACTION**
	traffic is essential while other initiates first aid or firefighting where reasonably practicable i.e. situation should be assessed by the ETL in relation to the traffic incident and the effect on the project.	☐ Raise the alarm as per general emergency procedures. **EMERGENCY - EMERGENCY - EMERGENCY** ☐ Check for dangers, which could affect the project, any person on the scene (fire, oncoming vehicles, leaking fuel, fallen power lines etc.), make the area as safe as possible. If available deploy traffic control ☐ Emergency services to be called on 000 **Area Supervisor / Emergency Team Leader** ☐ Assess the situation and determine any effect on the workers on site. ☐ Limit access to area where required. ☐ Close off road or footpath as required. ☐ Advise the ERT of the incident. **Emergency Response Team (On standby)** ☐ After being notified of the incident remain on standby to be called to assist or after being advised that incident has been attended by others. ☐ Make way to the scene of the incident as soon as possible if required ☐ Upon arrival, liaise with ETL on the current situation ☐ Render first aid and extinguish fires if required. ☐ If required call Emergency services **Emergency Team Leader (ETL)** ☐ Once the information has been confirmed, notify the relevant parties as per Incident Procedure (IMS Section 10.0) ☐ Arrange for counselling debrief of all involved in the emergency

GUIDELINE #14 AIR SUPPLY CONTAMINATION		
SCENARIO	**NOTES**	**ACTION**
Air Supply Contamination	Air supply contamination can cause a serious effect on the health of human beings. Studies conducted in Australia show that on average one-third of deaths are related to contaminated air of some kind. Furthermore, if the air supply has been contaminated, it means it is very hard to escape no matter where you live.	☐ Immediately contact maintenance staff required ☐ Providing it is safe to do so ensure that the suspect air handling system is immediately shut down or ventilated to atmosphere as appropriate ☐ Attempt to identify source of contamination ☐ If necessary, evacuate the areas serviced by the suspect system ☐ If necessary, isolate smoke detectors ☐ Cordon off any suspect plant/area to prevent unauthorised access ☐ Consult with appropriate specialists and determine if areas fed by the air supply should be naturally ventilated ☐ Report findings to the Emergency Planning Committee and indicate any remedial actions to be taken to prevent a recurrence ☐ Inform council and health departments

GUIDELINE #15 ARMED HOLD-UP

SCENARIO	NOTES	ACTION
Armed Hold-Up	Although rare on a construction site, there are still items of value such as tools and petty cash which may attract thieves. These can be life threatening and obedience of the bandit's demands is crucial to a successful outcome.	Actions during the Emergency: COLLEAGUES OR PERSONS INVOLVED ☐ DON'T BE A HERO - stay calm. Your safety and the safety of those around you is of paramount importance. If you are not directly involved stay out of it. ☐ DON'T ARGUE - obey the bandit's instructions. But do only what you are told and no more. Do not volunteer any information. ☐ BE DELIBERATE in your actions. If you are ordered to do something by the bandit. Avoid sudden movements. ☐ DON'T STARE at the bandit. Avoid direct eye contact. ☐ MAKE A MENTAL NOTE of everything you can about the bandit. In particular note speech, mannerisms, clothing, scars or any other distinguishing features such as tattoos. ☐ Try and OBSERVE ANY VEHICLE used by the bandit. Once the bandit has left, if you can without risk and if nobody else has already done so, take particular note of the registration number, type, colour and any distinguishing features. Actions after the Emergency: COLLEAGUES OR PERSONS INVOLVED ☐ HELP any person who has been injured ☐ Activate DURESS ALARM (if applicable) ☐ RING the Police and the Site Emergency Number ☐ LOCK DOORS to secure crime scene ☐ RECORD your observations in writing as quickly as you can after the Hold-Up using the attached check sheet for reference. See Bandit/Offender

GUIDELINE #15 ARMED HOLD-UP

		Checklist in the Appendix at the rear of this manual for assistance in recalling details that may help post incident. (The Police need individual impressions of what happened, uninfluenced by others.) ☐ Contact the following persons: ☐ Chief Warden ☐ Police ☐ Ambulance (if required) CHIEF WARDEN ☐ Consider Hold/Shelter-In-Place procedure ☐ Confirm offenders have left and obtain brief description (ensure police are updated) ☐ Confirm if any persons injured and ensure appropriate medical treatment is provided ☐ Secure the area where the incident occurred and don't allow anyone into the area ☐ Nobody should be allowed into this area until the Police have checked for fingerprints and other evidence ☐ Inform appropriate senior management ☐ Obtain names, addresses and telephone numbers from all persons involved together with brief details of incident (including description of offender/s, estimated value of cash/valuables stolen) ☐ All persons involved to remain until the Police arrive. Explain to them that their view of what ☐ happened, however fleeting, could prove vital when pieced together with other evidence. Provide a quiet place for them to sit down and offer them a cup of coffee or tea ☐ Obtain names of attending police (and station) and prepare a brief incident report

GUIDELINE #16 ASSAULT		
SCENARIO	**NOTES**	**ACTION**
Assault	Assault may not necessarily be physical, it could also take the form of a verbal, sexual or written abuse. In all cases, they are often initiated by disagreements and moments of rage.	<u>Actions during the Emergency:</u> CHIEF WARDEN ☐ Assess the situation ☐ Remain calm ☐ Obtain assistance ☐ Do not provoke the assailant or aggravate the situation ☐ If safe to do so, assist the victim (e.g. Determine if first aid or medical attention is required and action accordingly) ☐ Disperse any casual spectators but ask witnesses to remain ☐ Obtain and note details concerning the incident; ☐ Full details of victim ☐ Circumstances surrounding the incident ☐ Witnesses ☐ Description/details of assailant/s <u>Actions after the Emergency:</u> CHIEF WARDEN If Minor Assault: ☐ Refer the matter to the Senior Management for follow-up

GUIDELINE #16 ASSAULT

		☐ Complete a report for the information of the Senior Management detailing the incident & action taken If Serious Assault: ☐ Immediately notify the Police (include description of offender/s, any weapon/s, vehicle/s and last known whereabouts and direction of travel) ☐ Cordon off the scene of the incident ☐ Identify any witnesses and request them to remain until police arrive ☐ Where witness(s) cannot wait for Police attendance, their details are to be noted ☐ If offender is still present on-site, ensure that victim and witness(s) are isolated from the person ☐ If offender is still present on site and is considered to pose a danger to others, attempt to keep persons away from the offender and keep the offender under discrete surveillance. If Sexual Assault: On receipt of a report of a sexual assault: ☐ Ensure that appropriate medical treatment is afforded ☐ Ascertain the facts from relevant persons - preserve the crime scene. ☐ Explain to the victim that Police will be called as they can provide specialist expertise and support to the victim. It will however be up to the victim to determine whether s/he wishes Police to take further action in relation to the matter. ☐ Notify Police ☐ Notify Operations Safety Manager who will inform applicable counselor. ☐ Log brief details and complete a detailed confidential Incident Report NOTE:

GUIDELINE #16 ASSAULT		
		Sexual Assault is a very personal and traumatic (both physically and psychologically) crime for the victim and must be handled with the sensitivity and well-being of the victim foremost in the mind of the Chief Warden. The preservation of physical evidence can prove to be of significance in obtaining the subsequent conviction of an offender for this crime. For this reason, where circumstances permit, the victim should be discouraged from cleansing themselves or disposing of clothing worn at the time of the offence until police are in attendance.

GUIDELINE #17 BOMBS – THREAT/FOUND/MAIL BOMBS		
SCENARIO	**NOTES**	**ACTION**

GUIDELINE #17 BOMBS – THREAT/FOUND/MAIL BOMBS

Bombs – Threat/Found/Mail Bombs	☐ Bomb threat calls must always be treated seriously. Action in relation to any call should always be assessed by the Chief Warden who will determine the level of response required, where practicable in consultation with Police and appropriate senior management. ☐ Police and Security should always be informed of any bomb threat calls received. ☐ Wherever time permits and/or suggested by Emergency Services, a search is recommended (precautionary inspection) of any area mentioned in the threat, relevant building/s exterior, exit routes and Assembly Area/s should always be undertaken in response to a specific bombthreat. ☐ Because improvised explosive or incendiary devices can be easily disguised, colleagues who are familiar with the area to be searched are more likely to quickly discover an unusual item or object. ☐ If colleagues are requested to check their work area in response to a bomb threat, any such search must be on a voluntary basis and should be based on a recommendation by Emergency Services.	**If evacuating in response to a suspected bomb being discovered or as a precaution:** ☐ **Evacuation should be initiated no later than 30 minutes prior to any detonation deadline** ☐ **All persons should take bags and personal belongings with them** ☐ **Where practicable, doors and windows in close proximity to the suspect item should be leftopen** ☐ **People must not assemble in any location that is line of sight to a possible danger area** ☐ **Building re-entry should only be considered after a thorough search has been conducted by volunteers together with Police (not to be initiated less than 30 minutes after detonation deadline has elapsed) and after consultation with police, senior management and other applicable personnel** <u>Actions during the Emergency:</u> The person receiving the threat shall: ☐ Take note of all details you can remember (see format below) ☐ Don't hang up the phone ☐ Use another phone to contact the Site Emergency Number and Chief Warden The chief warden shall: ☐ Interview call recipient ☐ Review threat information ☐ Inform Police, Security & applicable management ☐ Confer with appropriate management and Police (where practicable and time permits)

GUIDELINE #17 BOMBS – THREAT/FOUND/MAIL BOMBS

	☐ Whenever a bomb threat call is received, colleagues located in the building/area affected by the threat should be notified of the threat and advised of what action is being taken in relation to the threat.	☐ Determine and implement appropriate response (see 'Precautionary Inspection' in this section and Hold/Shelter-In-Place procedure section in this plan. ☐ Inform other company sites ☐ Establish search areas and an agreed report in time. Review procedures for what to do if a suspicious object is discovered ☐ Standby at MECP (Master Emergency Control Point) for confirmation of areas checked and cleared The precautionary inspection team personnel shall: ☐ On being requested to conduct a Precautionary Inspection, ERT personnel will promptly and discreetly inspect their assigned areas for any suspicious object. ☐ Prior to conducting inspection, review inspection process as follows: • Review safety precautions in the event of discovering a suspicious object • Discreetly check with staff regarding anything unusual • Be clear on what area/s each person is responsible for inspecting • What to look for • Confirm time by which they will meet back at the Control Point ☐ When searching for a possible explosive or incendiary device, packages, bags, boxes or other items may be viewed as 'suspect' in any of the following circumstances: • The item appears similar to the one described in the threat message • The item is foreign to the premises and its' origin is questionable • The item is labelled suspiciously • The physical characteristics of the item are suspicious in size, shape, weight and sound • The item cannot be vouched for as belonging to anyone on site • There are signs of forced entry, footprints, scrapes or fresh diggings • Pieces of tape, wire, string, or explosive wrappings etc. are present • The condition of the room or area has been altered e.g. furniture has been

GUIDELINE #17 BOMBS – THREAT/FOUND/MAIL BOMBS

		rearranged, doors have been closed which are usually open or windows have been opened which are usually closed etc. ☐ On completion of the inspection, Area Wardens (and other Inspection Team Leaders) will then contact the Chief Warden and advise the results of the inspection (note – if a suspicious object has been discovered, this fact should be immediately communicated). Comply with any subsequent instructions issued by the Chief Warden. If a suspicious object is discovered: ☐ Do not touch suspicious object – note description and location ☐ Keep people away ☐ Immediately inform the Chief Warden ☐ Do not use 2-way radios or mobile phone in close proximity ☐ Evacuate the potential danger area ☐ Where time permits, request all employees take their personal belongings with them, leave internal doors open (not fire doors) and implement controlled shut down procedures (if applicable). ☐ Colleagues should NOT be permitted to gather in an area that is in line of sight to a suspected danger area. ☐ Inform Police, security and senior management ☐ Isolate gas and hazardous processes (if applicable) ☐ Cordon off the potential danger area ☐ Liaise with Police on their arrival

GUIDELINE #18 CIVIL DISORDER/DEMONSTRATIONS

SCENARIO	NOTES	ACTION
Civil Disorder/Demonstrations	Often initiated by groups of people seeking reform or change, relying on publicity and volumes of supporters to put their message forward. It is often associated with hostility towards an authority and is therefore typically succeeded by violence.	**On being advised of a forthcoming event which could possibly result in civil disorder, the chief warden shall:** ☐ The Chair-Emergency Planning Committee must be notified and the Committee will co-opt, as appropriate, applicable on-site personnel and representatives of the Fire Brigade, Police and Ambulance for a planning meeting. ☐ The Emergency Planning Committee would determine the appropriate level of Site preparedness after identifying the risks. ☐ A written action plan would be prepared <u>Actions during the Emergency:</u> ☐ Where time permits, consult with senior management, security and the Police to determine if appropriate personnel and property protection measures should be instituted ☐ Where sufficient advanced warning of possible unrest is obtained, an action plan must be documented (see below) ☐ If there is a risk to occupant safety or of unlawful building entry, then colleagues should be directed as follows for personnel and property protection: ☐ Restrict access to buildings or infiltration within buildings by the demonstrator/s ☐ Remove colleagues and visitors to safe areas within the buildings

GUIDELINE #18 CIVIL DISORDER/DEMONSTRATIONS		
		☐ Secure critical records, equipment and valuable items ☐ Remove any objects in accessible locations that could be used as weapons or missiles by aggressive trespassers. ☐ Be mindful of possible diversionary tactics by demonstrators to mask criminal activity ☐ Ensure that any group of demonstrators is kept under continuous discreet surveillance and attempt to ascertain size of group, composition, leader's identity, motive, intentions, mood, and location ☐ From the moment that the possibility of civil disorder is first suspected, the safety of the site's occupants must be of paramount consideration to the Chief Warden and all necessary action undertaken (particularly providing advanced warning to the site's occupants) to assure this.

GUIDELINE #19 COMMUNICATIONS FAILURE		
SCENARIO	**NOTES**	**ACTION**
Communications Failure	Telephone systems are equipped with a battery back-up system – in the event of a mains power failure the Site telephone system will continue operating for up to 2 hours.	**The chief warden shall:** ☐ Notify head office or IT/ communications contacts and inform them of the failure. ☐ Contact Telstra on 132000 to confirm service conditions ☐ Alternative communications methods include: **Site management are equipped with mobile phones. If necessary, these could be pooled and temporarily re-distributed to key areas.** ☐ A 'pool' of **runners** can be temporarily established to provide an internal messenger service

GUIDELINE #20 DECEASED PERSON

SCENARIO	NOTES	ACTION
Deceased Person	Likely accidental however it also encompasses intentional (suicide) death.	**The person discovering the deceased individual shall:** ☐ Remain calm ☐ Isolate the site where the incident has occurred ☐ Notify the Site Emergency Number immediately **The chief warden shall:** ☐ Isolate the site where the incident has occurred, if not already done ☐ Segregate any witnesses in a private area away from the incident scene and each other. ☐ Segregate any friends/colleagues of the deceased in private area away from incident scene ☐ Disperse any spectators ☐ Avoid contact with blood and other body fluids by using protective gloves ☐ If practicable, cover the body and make sure that it cannot be disturbed ☐ Inform Police, Ambulance, applicable senior management, HR Manager (if colleague involved as victim, witness or first responder) and HSE Manager ☐ Do not interfere with any evidence ☐ Comfort witnesses/colleagues ☐ Collect accurate information about the incident

GUIDELINE #21 FOOD POISONING

SCENARIO	NOTES	ACTION
Food Poisoning	**As suspected food/water borne illnesses can have a gestation period of some time (sometimes up to 72 hours) it must be considered that the first notification of concern could be some time after consumption and from person's no longer on site.**	**PERSON REPORTING** ☐ Once food poisoning is suspected, immediately inform your supervisor, the Safety Advisor - Coordinator and on-site management as appropriate **PERSON TAKING REPORT** ☐ Helpful information to obtain: • Relationship to Site - Colleague/Visitor/Contractor • Meal or item(s) purchased/consumed • Day/Date/Time of consumption • Names of any dining companions • Length of time after consumption and before the onset of illness • History of foods consumed in last 72 hours • Condition assessed by local Doctor; Yes/No – If YES, when and by whom and if fecal or vomit samples have been taken **PERSON FOLLOWING UP THE INVESTIGATION** ☐ Contact the chef or the source of the suspected consumed food

GUIDELINE #21 FOOD POISONING

		☐ Quarantine any suspected food ☐ Ascertain delivery, storage and food preparation details ☐ Confirm statutory/local government reporting requirements and comply. ☐ Follow up on the outcome of tests and inspections and inform the person(s) concerned ☐ Update senior management and the Safety Advisor - Coordinator as applicable

GUIDELINE #22 GAS LEAK

SCENARIO	NOTES	ACTION
Gas Leak	**Colleagues or other persons must not enter any confined area where there is a risk of being overcome by gas** **Gases present a vapour explosion hazard indoors, outdoors, and in sewers.**	The person discovering the leak shall: ☐ Alert persons in the vicinity of the leak ☐ Contact the Site Emergency Number immediately (if unable to quickly contact then ring the Site Manager) ☐ Turn off ignition sources and gas, if safe to do so and aware of how this should be done ☐ Eliminate any other hazards (e.g. incompatible materials) if safe to do so. Small gas cylinders should be moved to the laboratory fume hood to reduce the risk. ☐ Dry Chemical or CO_2 extinguishers should be used on small fires, or water spray or fog for large fires, if trained and safe to do so The chief warden shall: ☐ Where applicable, evacuate persons from the affected area (or building if a

GUIDELINE #22 GAS LEAK		
		major leak) and assemble them in a well-ventilated area where they are not exposed to further risk. (see also Hold/Shelter-in-Place Action Plan). Wind direction should be monitored to ensure that the gas is not re-directed to the assembled area and pose a further threat. ☐ Inform maintenance staff ☐ Ensure no naked flames or smoking throughout the building ☐ Ensure the affected area is well ventilated ☐ Do not allow any electrical equipment to be operated in the immediate vicinity and do not touch any electrical equipment ☐ Ensure no cordless or mobile phones are used in the vicinity ☐ See also Spill / Release Action Plan ☐ Update applicable senior management **Where applicable, evacuate persons from the affected area (or building if a major leak) and assemble them in a well-ventilated area where they are not exposed to further risk. (see also Hold/Shelter-In-Place Action Plan)** ☐ Inform maintenance staff ☐ Ensure no naked flames or smoking throughout the building ☐ Ensure the affected area is well ventilated ☐ Do not allow any electrical equipment to be operated in the immediate vicinity and do not touch any electrical equipment ☐ Ensure no cordless or mobile phones are used in the vicinity ☐ See also Spill / Release Action Plan ☐ Update applicable senior management After the emergency: ☐ Consult with emergency services personnel to ensure that clearance to re-

GUIDELINE #22 GAS LEAK

		enter the building can be given ☐ Advise the Deputy Chief Warden that re-entry is allowed as per the Evacuation Procedure ☐ Evaluate any damage and investigate cause of the leak ☐ Update senior management and HSEQ Director. ☐ Arrange debriefing with the ERT within **7** days of a major incident on site

GUIDELINE #23 HOLD/SHELTER IN PLACE

SCENARIO	NOTES	ACTION
Gas Leak	**Situations can develop external to the site or a building within the site where it is prudent in the interests of personnel safety to temporarily hold persons. These situations may be safety related, such as a cyclone, gas leak or chemical release or, security-related, such as a report of an armed offender or a suspected explosive device outside.**	On being instructed by emergency services to hold personnel within the site or building/s, the following process may be adopted: ☐ Establish line of communication with appropriate emergency services senior officer in order to be able to keep abreast of developments outside and to confirm how you will know when it is safe to release personnel from the site/building ☐ Confirm nature and location of threat/hazard with applicable emergency services seniorofficer ☐ Depending on the threat/hazard, confirm if building air-handling system/s should be shut down

GUIDELINE #23 HOLD/SHELTER IN PLACE

	In any such event, the priority for the Chief Warden is the safety of personnel within the site and building/s and this will be primarily dependant on effective, prompt, site/building-wide communications and perimeter security.	☐ Depending on the threat/hazard, determine if persons should withdraw indoors ☐ Ensure adequate supplies exist to sustain the individuals. ☐ Inform all colleagues and other persons on site of actions being taken in response to an emergency The chief warden shall: ☐ Confirm that the site/building perimeter is secure ☐ Inform applicable senior management ☐ If you have a radio or TV, monitor an appropriate news channel ☐ Continue to monitor occupant morale/welfare and update personnel on any developments ☐ Maintain line of communication with appropriate emergency services senior officer in order to be able to keep abreast of developments outside and to confirm how you will know when it is safe to release personnel from the site/building ☐ Consult with emergency services personnel to ensure that the emergency has ended ☐ Update senior management and colleagues ☐ Arrange debriefing with the ERT within **7** days of a major incident on site

GUIDELINE #24 SEISMIC EVENT

SCENARIO	NOTES	ACTION
Seismic Event	**The onset of a seismic event will occur without warning and even a slight tremor will cause anxiety and uncertainty amongst all staff on-site.**	**Minor Tremor** ☐ In the event of a slight tremor, the Chief Warden should consider the following: • The possibility of further tremors (and uncertainty concerning

GUIDELINE #24 SEISMIC EVENT

magnitude, frequency, duration and timing)
- Impact on building structures
- Impact on utilities
- Impact on critical processes
- Impact on fire safety and communications systems
- Impact on occupant morale

☐ Determine if a risk is posed to occupant safety as a result of any or all of the above factors and implement an appropriate response

☐ Where practicable, consultation would be undertaken with emergency services, senior management and site specialists

Earthquake

☐ In the event of a more pronounced seismic event, the consequences may be far more extreme and could encompass any or all of the following:
- Structural collapse
- Gas leaks
- Fires
- Communications Failure
- Uncontrolled movement of personnel
- Casualties
- Loss of critical personnel
- Failure of essential services
- Dilution of emergency service capabilities
- In the event of such a disaster, the Chief Warden's major priorities would include:
- Prompt re-establishment of command, control and communications
- Evacuation of non-essential personnel
- Combating fires
- Isolation of hazardous utilities
- Treatment of casualties

GUIDELINE #24 SEISMIC EVENT		
		• Cordoning off dangerous areas • Accounting for staff • Support to emergency services

GUIDELINE #25 STORM/SEVERE WEATHER		
SCENARIO	**NOTES**	**ACTION**
Storm/Severe Weather	**Severe weather includes heavy rain, hail, lightning and strong winds. These phenomena could impact on:** • Power to the site • The safety of persons in exposed areas • Motor vehicles in exposed areas • The security and stability of structures and equipment in exposed areas	☐ If strong winds are anticipated, ensure that any objects that could become airborne in strong wind gusts and cause damage are brought under cover and (where possible) secured ☐ If torrential rain is likely, ensure that windows and doors are closed to minimise water ingestion ☐ If a severe electrical storm are anticipated, review safety precautions concerning critical processes or outdoor work activity (staff and contractors) with applicable specialist personnel – caution persons concerning use of electrical equipment such as phones and computers. Monitor passage of storm cell/s and temporarily suspend outdoor movement if risk of lightning strike

GUIDELINE #26 STRUCTURAL DAMAGE TO BUILDINGS

SCENARIO	NOTES	ACTION
Structural Damage to Buildings	Adjacent structures may be affected if their foundations are undermined during boundary-to-boundary construction. Swinging loads from cranes and other on grade accidents may also be severe enough to damage the structural integrity of a structure. In these instances, no shortcuts are to be taken.	Where there is the possibility of a **total or partial building collapse**: ☐ Persons should be immediately evacuated/kept away from the building until it has been professionally inspected to determine structural integrity. ☐ The area surrounding the building should be cordoned off at a sufficient distance that persons cannot be exposed to falling debris ☐ Where applicable, isolate gas supply to building from external point ☐ Once the building has been evacuated, determine if it is practicable and safe to isolate power to the building from an external point ☐ Consider alternative shelter for displaced occupants ☐ Where there is no risk of building collapse, but there is the possibility of **objects falling from the building** (e.g. roof cladding, window failure): ☐ Immediately cordon off the area below, to prevent persons from being injured by falling debris

GUIDELINE #27 MENTAL HEALTH EMERGENCY

SCENARIO	NOTES	ACTION
Mental Health Emergency	**Mental Health Emergencies include:** ☐ Threats of self-harm ☐ Psychosis leading to the risk of injury to self or others ☐ Altered state of awareness leading to the risk of injury to self or others ☐ Deliberate acts of sabotage arising from an altered state of mental wellbeing. **Specialist care and action is required under these circumstances.**	**Where there is the possibility of self harm or harm to others;** ☐ Persons should be immediately evacuated/kept away from the area. ☐ Contact the Police and/or the local Area Mental Health Services and advise of the nature of the threat. ☐ Where applicable, isolate energy supplies such as gas and electricity if the threat from harm involves their usage.

GUIDELINE #28 MOBILE PLANT COMPLIANCE

SCENARIO	NOTES	ACTION
Maintenance of Mobile Plant equipment	**The person with management or control of powered mobile plant at a workplace must in accordance with Part 3.1, manage risks to health and safety associated with the following:** ☐ **the plant overturning;** ☐ **things falling on the operator of the plant;** ☐ **the operator being ejected from the plant;** ☐ **the plant colliding with any person or thing;** ☐ **mechanical failure of pressurised elements of plant that may release fluids that pose a risk to health and safety.**	<u>Daily prestart sheets:</u> ☐ All items of Plant either large or small must have a Sticker or Tag that states the item has been inspected & is fit for use. ☐ The sticker must contain the Inspection date, name of the competent person who has carried out the Test, & the date the next Inspection is due. ☐ Prior to an item of plant being used, it must have a Pre-Usage Check completed. ☐ It is the responsibility of the Foreman to ensure that the Small Plant Checklist is carried out by acompetent Operator. ☐ The Small Plant Checklist shall be the responsibility of the competent operator of that equipment. ☐ The Foreman shall ensure that the check is completed & its results registered on the Small Plant Weekly Inspection Record. ☐ Complete the Small Plant Weekly Inspection Record, prior to use of the equipment, using the Small Plant Checklist that addresses Inspection requirements for that equipment. ☐ When an Item of Plant is used it shall be recorded on the Daily Site Diary ☐ Should there be a change of Operator at any time, a new Small Plant Checklist must be carried out by the new Operator & a new entry made in the Small Plant Weekly Inspection Record by the Foreman. ☐ The Pre-usage Weekly Form number shall be recorded on the Daily Site Diary against the Id Number of that particular Item of Plant. ☐ The Foreman shall be responsible for the maintenance of the Small Plant Weekly Inspection Records under his control & the retention of the same until collected by Belmadar Personnel. ☐ On receipt of the Small Plant Weekly Inspection Records, the Contract Support Staff shall record & file the hard copy under Weekly Small Plant Usage in the relevant Job File. <u>Maintenance records:</u>

GUIDELINE #28 MOBILE PLANT COMPLIANCE

		☐ If on following the Small Plant Checklist by the operator, an item of Plant is found to have a fault or is due for Maintenance, the Foreman shall register these on the Small Plant Weekly Inspection Record. ☐ The Foreman shall request rectification of any Rep airs & Maintenance by issuing a Request for Maintenance, using the RFM (Request for (Materials or) Maintenance) Form. ☐ Each Item of Plant shall have its own Individual RFM. ☐ The RFM form shall be completed & sent to the Contract Support & Maintenance Supervisor immediately via Digital Pen ☐ The Foreman shall record the RFM Form No. on the Small Plant Weekly Inspection Record hard copy, to highlight that a Request has been made. ☐ A note shall be made on the Daily Site Diary highlighting that an RFM has been requested. ☐ Upon receipt of the RFM Form, Contract Support Staff shall enter the Small Plant Weekly Inspection Record Form No. & a description of Repairs & Maintenance required into the Small Plant Maintenance Register. ☐ If the plant/equipment is Belmadar's property, the Contract Support Staff in conjunction with the Maintenance Supervisor shall agree on a Cycle Time for the type of Repair or maintenance required <u>In the event of:</u> ☐ Safety issue ☐ Broken down ☐ risk to workers, the public or the environment. ☐ Quick hitch not working, ☐ oil leaks, ☐ serious noise, ☐ cracked components: ☐ Flashing light not working ☐ Seat Belts, Brakes, steering and/or suspension broken ☐ Exhaust blown, leaking tipping ram

GUIDELINE #28 MOBILE PLANT COMPLIANCE		
		The general warden shall: ☐ Tag out item ☐ Site conditions are unsafe ☐ Set exclusion zone around item of plant or equipment ☐ Report fault to the manufacturer ☐ Contact Plant Manager as replacement is required

GUIDELINE #29 FALLING OBJECTS FROM HEIGHT		
SCENARIO	**NOTES**	**ACTION**
Objects dropped from a height onto personnel below	**A Standby Person or Rescuer shall be required while equipment is working at height over ground based personnel.** **This may involve a loose object dropped by either a crane or mobile plant equipment onto a person below, where they may either be trapped or otherwise injured.**	In the event that a fall from heights has occurred, the Standby or Rescue Person shall ensure the following steps are undertaken; ☐ Notify the general warden of the event, including providing the following information; o a. Gender - Male or female b. Age - approximate c. Weight - approximate d. Known problems from the fall e.g. broken leg, conscious, unconscious, equipment damaged. ☐ The general warden shall in turn relay this information to NSW Emergency Services. ☐ The Standby Person or Rescuer shall initiate Verbal Contact with the victim as soon as possible to assess consciousness, reassure and ask whether the person can “Self Rescue” (i.e. un-trap themselves if necessary) providing appropriate equipment is available to them and have been trained to do so. ☐ If manual rescue is not possible – immediately set up the stand-by rescue equipment on hand. ☐ Rescue if safe to do so – if not safe, do not put other lives at risk and wait for Emergency Services to arrive. ☐ Leave the rescue equipment in place that you have set up, as the Emergency Services may be able to use some of your equipment and save time by not setting theirs up. ☐ Assist where required when asked by emergency services

GUIDELINE #30 TEMPORARY STRUCTURE COLLAPSE		
SCENARIO	**NOTES**	**ACTION**
Scaffolding or Formwork Collapse	**Both formwork and scaffolding are temporary structures designed with different safety factors to long-term, permanent structures. As such they may be prone to poor workmanship and this can lead to collapse and potential injury or death if working personnel is standing on it.** **Where possible, catch netting shall be installed to ensure a secondary safety protection beneath scaffold or formwork. This will drastically reduce the severity of any falls.**	THE IMMEDIATE RESPONSE IS: ☐ Shut down or switch off equipment. Leave lights on. ☐ If safe to do so, assist and care for injured personnel. ☐ Call for first aid assistance. ☐ Report details to the Area Warden or Chief Warden – who will contact emergency services. ☐ Restrict access to the area. ☐ Await instructions from the Area Warden or Chief Warden ☐ Stand by to provide assistance, and await further instructions. STRUCTURAL EMERGENCY – GENERAL WARDEN/FOREMAN RESPONSIBILITIES When notified of the emergency and location: ☐ Proceed to site and assess ☐ If necessary, initiate an evacuation. ☐ If necessary, contact emergency services. ☐ Contact Site Management who will report to EPA and WorkCover. STRUCTURAL EMERGENCY – HSEQ DIRECTOR RESPONSIBILITIES When notified of the emergency and location: ☐ Move people in immediate danger to safety, and ensure their continued safety and care. ☐ Ensure emergency services have been contacted. ☐ Restrict access to the area. ☐ Take note of details, including photos if possible to assist with report.

GUIDELINE #31 ENCROACHMENT OF AIR RIGHTS		
SCENARIO	**NOTES**	**ACTION**
Consent of property owners to occasionally encroach their airspace	**In many cases, cranes provide cost effective advantages in construction. The nature of the operation of cranes means that at certain times the boom or counterweight may necessarily extend over adjoining land, due to the physical title boundaries of the developed land. Although the crane may be programmed in some cases not to traverse over the boundaries of an adjoining property, this is not always practical or possible.**	Prior to crane erection, Belmadar is to arrange for the following details: ☐ The type of crane being operated ☐ Whether loads will be transported over the neighbouring land ☐ Obligations of the builder to minimise disturbance and nuisance, prevent injury, loss or damage, and meet all operational and safety standards o The period of access, including: - the date of installation of the crane and termination of the right of access - permitted working hours - amount of written notice required before accessing the airspace o The builder's obligations including make good: - commissioning a dilapidation report for the neighbouring land from a licensed expert, with the neighbour's approval, for the neighbour's records and references, at the builder's own cost - promptly cleaning, repairing and restoring the neighbouring land at the builder's own cost to make good any damage or changes caused to the land

Annexure B: EMERGENCY & EVACUATION DIAGRAM & DRILL SHEET.

belmadar
COMPLEX MADE EASY

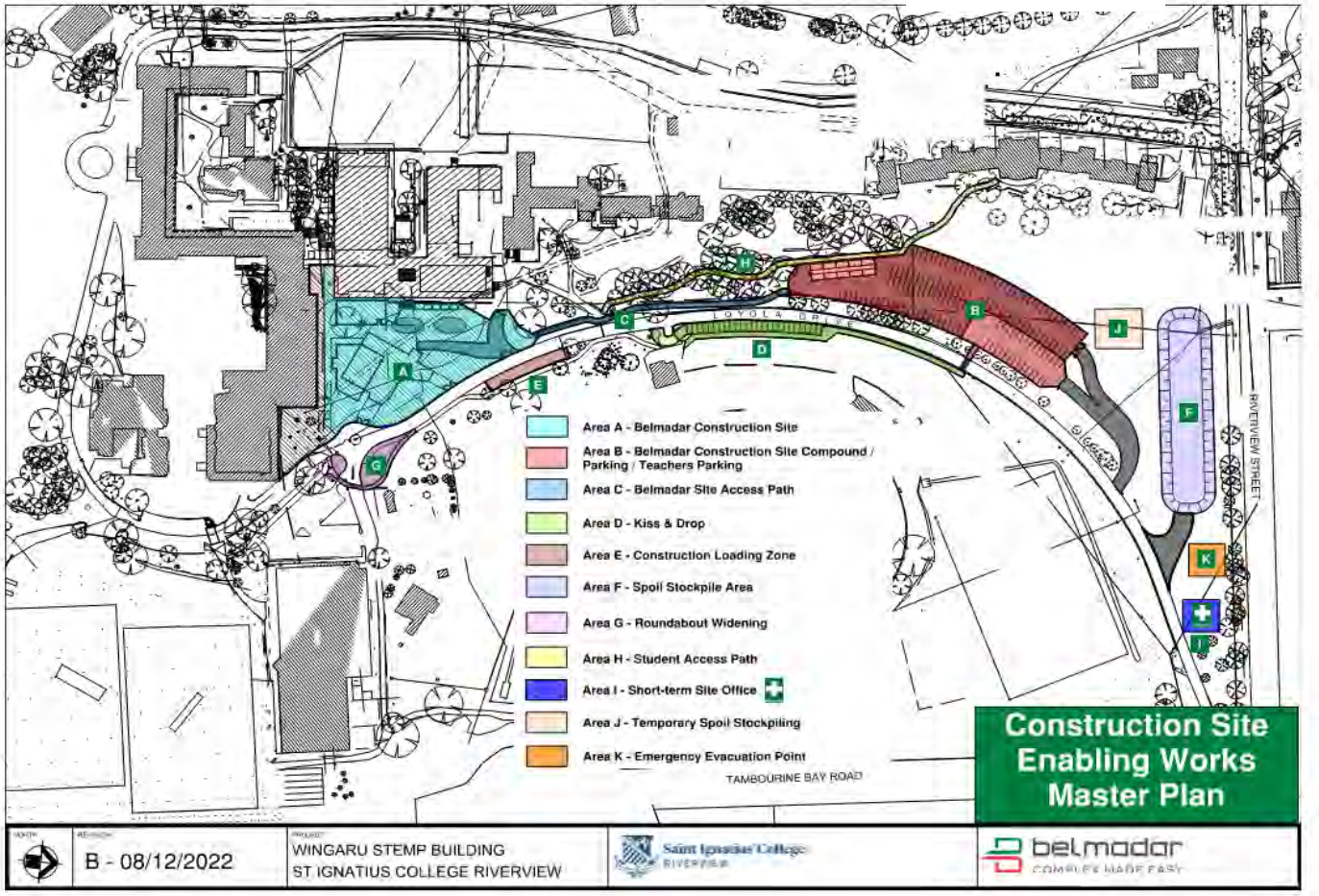
EVACUATION PROCEDURE

In the event of an emergency evacuation, please observe the following:

1. **SYSTEM ALERT** – sounding of the alarm will be made to evacuate the site. All works are to cease immediately and if possible, equipment and work lights switched off. Ensure that persons in your immediate vicinity are aware that they must evacuate. Assist any persons experiencing difficulty with evacuation. Do not put yourself or others at risk.
2. **EXIT THE SITE** - All personnel are to make their way via the evacuation route to the Emergency Assembly Area (refer diagram).
3. **CHECK ATTENDANCE** - Wardens to cross check attendance register and check with contractor supervisors to confirm all personnel have exited the site and report findings to Chief Warden / emergency authorities.
4. **WAIT FOR ALL-CLEAR** - No person is to leave the Emergency Assembly Area until instructed by the Warden or his representative. At no time is anyone permitted to re-enter the building until the all-clear has been given by emergency services personnel or Warden.

For all emergencies
Dial 000
Police - Fire - Ambulance

EVACUATION DIAGRAM



Saint Ignatius' College RIVERVIEW

belmadar COMPLEX MADE EASY

Form I1.13

EMERGENCY & EVACUATION CHECKLIST

Revision Date: 10/07/2020

Project Name:		**Address:**	
Date:		**Time:**	
Area/Floor/Location: *(if applicable)*			

SECTION 1 – EVACUATION SEQUENCE	**TIME**
Alarm Sounded	
Emergency Response Team (ERT) respond to Alarm	
ERT members check floor or area	
Evacuation commenced	
ERT members report floor/ clear area	
Persons with disabilities accounted for	
Arrive at assembly area	
ERT complete roll call	
Evacuation completed	
Exercise Finished	
Time taken to evacuate building	

SECTION 2 – DEBRIEFING/EVALUATION

Emergency Drill/Incident Evaluated

☐ Breach of Utility/Service ☐ Chemical Spill/Leak ☐ Fire/Explosion ☐ Other:	☐ Bomb threat/Suspect Package ☐ Confined Space Rescue ☐ Height Rescue ☐ Excavation collapse	☐ Evacuation (full) ☐ Evacuation (local) ☐ Vehicle Incident ☐ Structural collapse (Scaffold/Wall etc.)	☐ Environmental ☐ Fatality ☐ Medical emergency ☐ Plant Rollover

Brief description of Emergency Drill or Incident:

Evaluation Questions	**Yes**	**No**
Did all ERT members report to the ETL?	☐	☐
If no, which ERT members/areas did not respond?		
Did the ERT members the emergency equipment competently?	☐	☐
If no, specify details		
Could the alarm / siren be heard across the building site?	☐	☐
If no, please specify the area/s		
Were exits / egress points clear of debris?	☐	☐
If no, specify area/s and problems		
Were exit paths well lit?	☐	☐

If no, specify area/s		
Were all workers evacuated?	☐	☐
If no, who did not evacuate & number of workers involved?		
What was the total number of workers on site?		
Was a Nurse Call Activated? If yes, was the nurse call in good working order?	☐	☐

Evaluation
How did the emergency response team respond?
Lessons Learnt?
NEXT SCHEDULED DRILL:
NEXT DRILL OPTION:

Are Changes Required to:					
Project Safety Plan/IMS	☐	IMS Procedure(s)	☐	Communication	☐
SWMS	☐	Site Inspections	☐	Permits	☐
Emergency Response Plan/Manual	☐	Site Rules	☐	Environmental Surveillance	☐
Emergency/Critical Incident Controls	☐	Site Induction	☐	Training	☐
Project Risk Assessment	☐	Site Supervision	☐	Counselling	☐
Environmental Management Plan	☐	PPE	☐	Other:	☐

Evaluated by:	**Name**	**Signature**	**Date**
Site Manager			
Project Manager			

ANNEXURE 4 – ARBORIST LETTER OF COMPLIANCE

Complete
Arborcare
Professional Consulting Arborists

Date: 15/02/2023

Re: Saint Ignatius College, Riverview 2066

To Whom It May Concern

To ensure that tree **T137** (as reported upon in the Arboricultural Impact Assessment (AIA) issued by tree IQ on the 2nd November 2020) had been correctly protected in accordance with the Australian Standard (AS) 4970-2009,Protection of Trees on Development Sites, a site inspection was conducted on the 15th February 2023.

On the day of inspection, it was observed that protection measures comply with AS 4970 (*see image next page*).

It must be noted that if any future cuts/fills are required within the TPZ[1] of T137, arboricultural supervision/advice will be required.

.

Best Regards
Colin Curtis

Level 5 Consulting Arborist
Member of Arboriculture Australia #2332
Tree Risk Assessment Qualification (TRAQ)
Member of the International Society of Arboriculture # 228182

[1] Tree Protection Zone (TPZ) - is a "No Go Zone" surrounding a tree to aid in its ability to cope with disturbances associated with construction works. Tree protection involves minimising root damage that is caused by activities such as construction. Tree protection also reduces the chance of a tree's decline in health or death & the possibly damage to structural stability of the tree from root damage.

ANNEXURE 5 – ASBESTOS MANAGEMENT PLAN

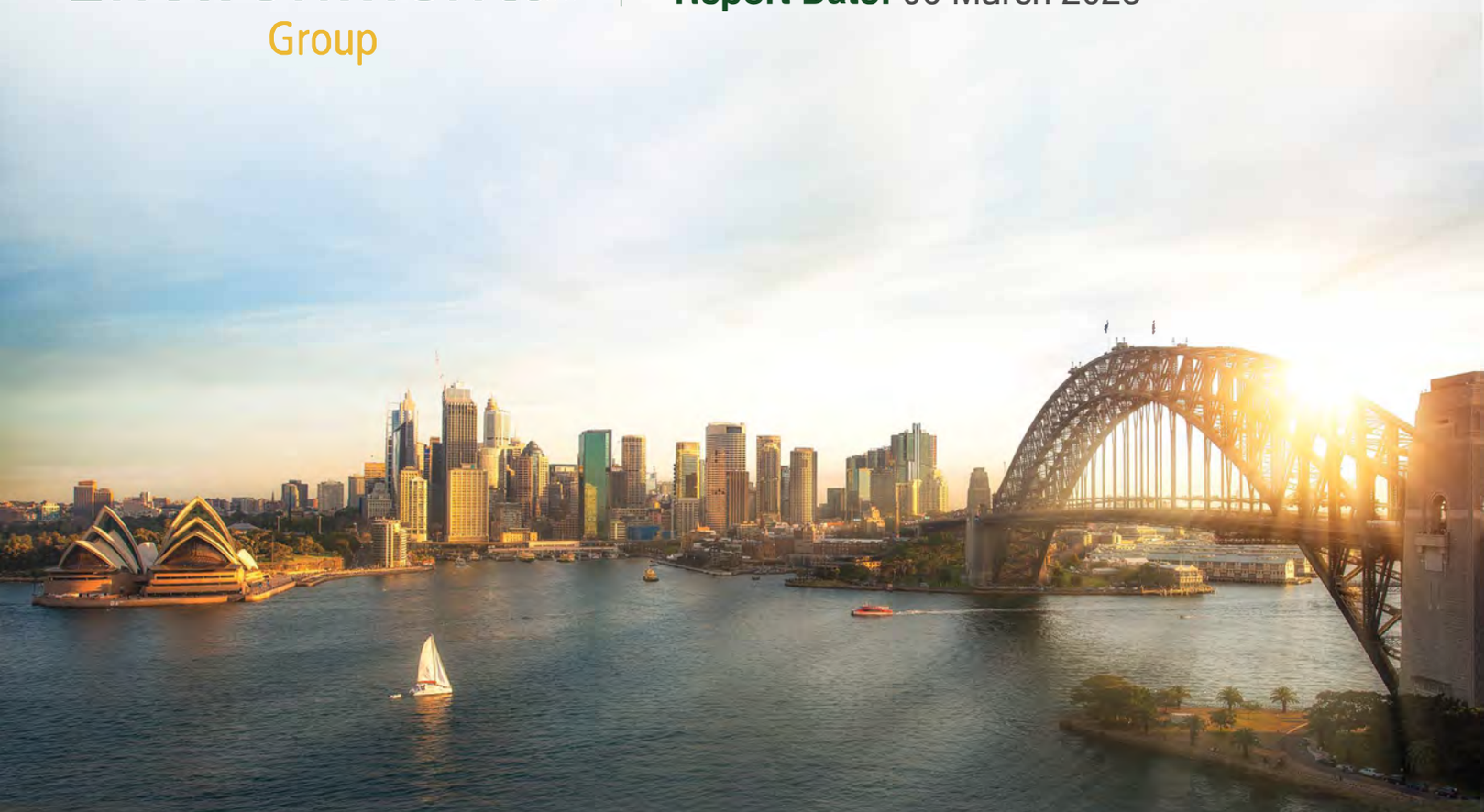
Sydney Environmental Group

Asbestos Management Plan

Saint Ignatius College Riverview, Lane Cove NSW

Belmadar Constructions

Report No: 2027-AMP-01-060323.v1f
Report Date: 06 March 2023



Sydney Environmental Group Pty Ltd PO Box A1420, Sydney South NSW
Info@sydneyenvironmental.com.au

DOCUMENT RECORD

Revision	Date	Author	Reviewer
v1f	06 March 2023	Patrick Brown	Steven Wallace

Author Signature		**Reviewer Signature**	
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Credentials	B.Sc. (Adv.Hons.) Chemistry. NSW Licensed Asbestos Assessor (LAA001490)	**Credentials**	M.Sc.Envir.Sci, B.Sc. Meteorology, NSW Licensed Asbestos Assessor (LAA001096)
Title	Occupational Hygienist	**Title**	Managing Consultant

Document Title:	Asbestos Management Plan – Saint Ignatius' College Riverview, Lane Cove NSW
Site Address:	Saint Ignatius' College Riverview, Tambourine Bay Road, Lane Cove NSW
Client Name:	Belmadar Constructions
Site Size:	6,100 m^2
Reference Number:	2027-AMP-01-060323
Project Type:	Asbestos Management Plan
Project Type Abbreviation:	AMP
Document Draft:	FINAL
Document Revision No.	v1

PREPARED BY SYDNEY ENVIRONMENTAL GROUP PTY LTD ABN: 14 631 026 214

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DEFINITIONS
The use of the words below in bold in this document indicates the word or words have the following defined meaning:

Asbestos: The asbestiform varieties of mineral silicates belonging to the serpentine or amphibole groups of rock forming minerals including the following:

- Actinolite asbestos;
- Grunerite (or amosite) asbestos (brown);
- Anthophyllite asbestos;
- Chrysotile asbestos (white);
- Crocidolite asbestos (blue);
- Tremolite asbestos; and
- A mixture that contains 1 or more of the minerals referred to into (f).

Asbestos-containing material (ACM): Means any material or thing that, as part of its design, contains asbestos.

Asbestos-contaminated dust or debris (ACD): Means dust or debris that has settled within a workplace and is, or assumed to be, contaminated with asbestos.

Asbestos Register: A register recording the type, condition and location of all asbestos and asbestos containing materials for all premises on site.

Asbestos vacuum cleaner: A vacuum cleaner that complies with Class H requirements in AS/NZS 60335.2.69 Industrial vacuum cleaners or its equivalent and whose filters conform to AS 4260-1997 high efficiency particulate air (HEPA) filters – Classification, construction and performance.

Class A licence: Means a licence that authorises the carrying out of Class A asbestos removal work and Class B asbestos removal work by or on behalf of the licence holder.

Class B licence: Means a licence that authorises the carrying out of Class B asbestos removal work by or on behalf of the licence holder.

This allows the holder to conduct the removal of more than 10 square metres of non-friable asbestos or ACM removal work and/or the removal of ACD associated with the removal of more than 10 square metres of non-friable asbestos.

Class A asbestos removal work: Work requiring a Class A asbestos removal license.

Class B asbestos removal work: Work requiring a Class B asbestos removal license.

Competent person: A person possessing adequate qualifications, such as suitable training and sufficient knowledge, experience and skill, for the safe performance of the specific work.

Control Level: The airborne concentration of a particular substance which, if exceeded, indicates a need to implement a control, action or other requirement. Control levels are generally set at no more than half the National Exposure Standard (NES for the substance. Control levels are occupational hygiene 'best practice', and are not health-based Standards

Control Monitoring: Means air monitoring, using static or positional instruments to measure the level of airborne asbestos fibres in an area during work on ACM. Control monitoring is designed to assist in assessing the effectiveness of control measures. Its results are not representative of actual occupational exposures, and should not be used for that purpose.

Friable (asbestos): Means material that is in a powder form or that can be crumbled, pulverised or reduced to powder by hand pressure when dry, and contains asbestos.

Hierarchy of hazard control: Measures taken to minimise risk to the lowest level reasonably practicable in the descending order of: Elimination, Substitution, Engineering controls, Administrative controls, and Personal Protective Equipment (PPE).

Licensed asbestos removal work: Means asbestos removal work for which a Class A asbestos removal licence or a Class B asbestos removal licence is required.

Licenced asbestos assessor: Means a person licenced to carry out air monitoring and clearance inspections during and following work with friable asbestos.

Non-friable (or bonded) asbestos: Material containing asbestos that is not friable, including material containing asbestos fibres reinforced with a bonding compound.

PCBU: Person conducting a business or undertaking.

Person with management or control of a workplace: Means a PCBU to the extent that the business or undertaking involves the management or control, in whole or in part, of the workplace.

The person with management or control of a workplace must ensure, so far as is reasonably practicable, that the workplace, the means of entering and exiting the workplace and anything arising from the workplace are without risks to the health and safety of any person.

Worker: In accordance with the Work Health and Safety Act 2011, a person who carries out work in any capacity for a PCBU, including work as:

- An employee, or
- A contractor or subcontractor, or
- An employee of a contractor or subcontractor, or
- An employee of a labour hire company who has been assigned to work in the person's business or undertaking, or
- An outworker, or
- An apprentice or trainee, or
- A student gaining work experience, or
- A volunteer, or
- A person of a prescribed class.

For the purpose of Work Health and Safety Act 2011, a police officer is:

- A worker, and
- At work throughout the time when the officer is on duty or
- Lawfully performing the functions of a police officer, but not otherwise.
- The PCBU is also a worker if the person is an individual who carries out work in that business or undertaking.

1. INTRODUCTION

1.1 Background

Sydney Environmental Group Pty Ltd (SE) was engaged by Belmadar Constructions (the client) to prepare an Asbestos Management Plan (AMP) for the proposed remediation and bulk earth works / civil works as part of a proposed development located at Saint Ignatius' College Riverview, Lane Cove NSW (refer to **Figure 1, Appendix A**).

This AMP covers the management of any non-friable or friable asbestos containing materials (ACM) from identified areas in which the client and its sub-contractors are undertaking works as well as processes in the event of unexpected finds. The AMP outlines the management practices required of the client and its sub-contractors in relation to specific tasks which may involve work with and around asbestos materials (refer to **Figure 2, Appendix A**) as per the scope of works.

The methodology has been prepared in accordance with the requirements outlined within the Safework *NSW Code of Practice: How to Manage and Control Asbestos in the Workplace (2022) and the Safework NSW Code of Practice: How to Safely Remove Asbestos (2022).*

1.2 Objectives of an Asbestos Management Plan

This AMP details the client's approach towards managing the asbestos hazards identified at the site, by documenting procedures designed to minimise the risk of exposure to asbestos at the site, for employees, maintenance personnel, contractors, construction workers and visitors.

This AMP has been developed in line with the Safework NSW Code of Practice: How to Manage and Control Asbestos in the Workplace which states:

> *An asbestos management plan sets out how asbestos or ACM that is identified at the workplace will be managed, for example what, when and how it is going to be done.*
>
> *An asbestos management plan must include:*

- *The identification of asbestos and ACM, for example a reference or link to the asbestos register for the workplace, and the locations of signs and labels;*
- *Decisions, and reasons for the decisions, about the management of asbestos at the workplace, for example safe work procedures and control measures;*
- *Procedures for detailing accidents, incidents or emergencies of asbestos at the workplace; and*
- *Workers carrying out work involving asbestos, for example consultation, information and training responsibilities.*

Additionally, an asbestos management program should be seen as part of an organisation's overall approach to risk management. Where the evaluation process has revealed a likelihood of exposure to asbestos fibres all practicable steps should be taken to ensure that employees are not unnecessarily exposed. A thorough examination of work practices is an essential preliminary action. Procedures designed to ensure that employees are not exposed to asbestos likely to cause danger to their health should then be adopted.

The ultimate aim of this AMP is to ensure that no persons whether employed at the site, visiting the site or contracted to work on the Site are exposed to the risk of the inhalation of airborne asbestos fibres. In addition, it is essential that all employees, visitors and contractors be fully informed of the control strategies that have been established and the factual health consequences of exposure to airborne asbestos fibre.

1.3 Scope of Work

Asbestos finds are likely considering the historical nature and the previous investigations developed on site. This management plan will detail:

- How asbestos and associated materials are to be managed;
- Safety precautions required whilst handling asbestos materials;
- Actions to be employed if unexpected asbestos is identified/and or suspected; and
- Verification/certification of remediation works.

In consultation with the client, the following activities were raised for consideration in terms of meeting the remedial goal for the site:

- Capping and containing of asbestos impacted fill materials within the site;
- Excavation, transport, temporary stockpiling, and re-burial of asbestos impacted materials within allocated placement areas within the site (where required); and
- Excavation and off-site disposal of asbestos impacted soil materials.
- Unexpected asbestos finds uncovered during trenching / excavation associated with the bulk earthworks / civil works scope.

1.4 Regulatory Framework

This document is designed to assist the client in fulfilling its general obligation to ensure the health and safety of employees, contractors, visitors and others accessing the site. It also addresses specific asbestos related legislative requirements and guidelines in approved industry standards.

This AMP satisfy the requirements of the Safe Work Australia Asbestos Codes of Practice and Guidance Notes, these being:

- SafeWork NSW *Code of Practice: How to Manage and Control Asbestos in the Workplace* (2022).
- SafeWork NSW *Code of Practice: How to Safely Remove Asbestos* (2022).
- *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition [NOHSC: 3003 (2005)].*

The AMP is consistent with NSW legislative requirements, these being:

- *Work Health and Safety Regulation 2017.*
- *Work Health and Safety Act 2011.*
- *Environmentally Hazardous Chemicals Act 1985.*
- *Protection of the Environment Operations Act* (1997).
- *National Environmental Protection Measures (NEPM) 1999, amended 2013.*

In addition, the AMP has considered the following Australian and New Zealand Standards:

- AS1319-1994 Safety Signs in the Occupational Environment.
- AS/NZS1715-2009 Selection, Use & Maintenance of Respiratory Protective Equipment.
- AS/NZS1716-2003 Respiratory Protective Devices.
- AS/NZS 60335.2.69:2003 Household and similar electrical appliances – Safety - Particular requirements for wet and dry vacuum cleaners, including power brush, for industrial and commercial use.
- AS4260-1997 High Efficiency Particulate Air (HEPA) Filters – Classification, Construction and Performance.

2. ASBESTOS BACKGROUND

Asbestos is a naturally occurring fibrous mineral that possesses numerous properties that make it suitable for insulating and reinforcing applications. Asbestos materials were therefore used extensively in building products in Australia and throughout the world, particularly in the 1950s to 1970s.

The health effects associated with asbestos exposure are due to the inhalation of airborne respirable asbestos fibres. Respirable fibres are asbestos fibres that can be inhaled to the lower reaches of the lung and conform to the following constraints; < 3 microns in width, > 5 microns in length & possessing a length to width ratio of at least 3:1.

2.1 Asbestos Definition

Asbestos is usually classed as either *non-friable* or *friable*. Non-friable asbestos materials are usually well encapsulated within the matrix of the product and therefore not able to be rendered into respirable asbestos fibres unless released by machining processes. Friable asbestos is material that can be crumbled, pulverised or reduced to powder by hand pressure when dry.

Examples of friable asbestos include lagging of hot water pipes and sprayed insulation on boilers/structural beams for heat insulation. Asbestos Cement (AC) material and vinyl floor tiles are examples of non-friable asbestos materials. Non-friable materials however, can become friable through weathering or mechanical disturbance. Friable asbestos is classed as more hazardous than non-friable asbestos materials as asbestos fibres are more easily released into the air when disturbing the materials.

The main purpose of asbestos fibres being present in AC products is for re-enforcement. Asbestos fibres are very flexible and strong, and when AC products are broken, some of the bundles may be pulled out, rather than fracture along the break. In general these fibres are present as fibre bundles and are not able to be inhaled because they are too large.

2.2 Health Effects of Exposure to Asbestos

Asbestos presents a hazard only if fibres of respirable size become airborne and there is the potential for workers to inhale them. The release of asbestos fibres from materials and substrates is dependent on the amount of disturbance impacted upon these materials (cutting, abrading, crushing, etc). The danger of airborne asbestos is that fibres are not visible to the naked eye and the long duration required between exposure to asbestos and the onset of disease.

The following are typical diseases related to asbestos exposure:

- Asbestosis – progressive scarring of lung tissue similar to silicosis. Occurs 5 to 15 years after continued exposure to high fibre concentration.
- Mesothelioma – cancer of the lining of the chest cavity. Occurs 20 to 50 years after first exposure and is usually fatal.
- Lung Cancer – cancer of the bronchial lining or lung tissue. Occurs 20 or more years after first exposure and is almost always associated with heavy exposure to asbestos. The risk of contracting lung cancer is greatly elevated among smokers who are exposed to asbestos.

The primary factors that increase the risk of contracting an asbestos-related disease are:

- Higher levels of asbestos fibres in the air;
- Higher frequency of exposure;
- Longer duration of exposure; and
- The time that elapses after exposure.

NOTE: Although an increased risk is presented by the above factors, no level of exposure to respirable asbestos fibres is perceived as safe.

3. ROLES AND RESPONSABILITIES

Outlined in **Table 3.1** below are the key roles, company and their representatives who will implement this plan to eliminate/minimise any potential risk of exposure to asbestos fibres for all personnel and general public.

Table 3.1. Key Roles and Responsibilities.

Role	Company/Organisation	Responsibility
Premises Controller	Saint Ignatius' College Riverview	• Identify any foreseeable hazards arising from the premises / site that have the potential to harm the health and safety of any persons accessing or using the premises including the presence of materials containing asbestos, • Risk assess and control, • Communicate hazards and implement required controls, • Review of Asbestos Management Plan and SWMS.
Principal Contractor	Belmadar Constructions	• Must ensure that an asbestos register is prepared and kept at the workplace and ensure that the asbestos register is maintained to ensure the information is up to date, • Review of asbestos management plan, • Provision of access to worksite, • Provision of site supervision, • Provision of emergency evacuation and response requirements, • Notify hygienist of all excavation works conducted onsite, • Notification of any unexpected finds to site hygienist, • Activation of emergency incident response plan, • Enforcement of safety rules, • Site induction and communication of known site hazards and controls, • Management of the asbestos management plan in line with duties outlined within, • Undertake identification and surveying activities to indicate whether asbestos materials are present at worksite and in a condition that could during the course of the works affect the health and safety of site visitor or others, • Engage licensed asbestos contractor, • Review licensed asbestos contractor SWMS, • Review and ensure current appropriate licenses and competencies are held by asbestos contractor, • Ensure that the waste generated onsite is correctly classified in accordance with NSW EPA guidelines and disposed of at a facility licensed to accept that waste class, • Provide assistance and advice regarding asbestos management onsite and arranging for waste classification and transportation offsite.
Nominated Environment and / or Safety Coordinator	Belmadar Constructions	• Provide assistance and advice regarding asbestos management onsite and arranging for waste classification and transportation offsite, • Ensure Construction Environment Management Plan is being appropriately implemented in relation to waste disposal, • Assist in emergency incidents.
LAA / Qualified Occupational Hygienist	Sydney Environmental Group (SE)	• Development and management of asbestos management plan, • Designated site supervisor for hygienist work, • Airborne asbestos monitoring, inspections, clearance inspections and asbestos supervisions during any asbestos handling works, • Supervise Class A or Class B Asbestos removal contractor, • Certify / verify that removal areas are free from ACM or friable asbestos as per the removal scope, • Review licensed asbestos contractor SWMS, • Guidance on methodology for the control of hazardous materials, • Provide advice to the Project on Work Cover Notifications, permit to works, insurances and license requirements.

Table 3.1. Continued.

Role	Company/ Organisation	Responsibility
Licensed Asbestos Contractor	TBC	• Prepare an Asbestos Removal Control Plan in accordance with Part 3.5 of the Safework NSW *Code of Practice: How to Safely Remove Asbest*os (2022), • Lodgethe required Safework NSW notifications, • Ensure consultation with people affected by the removal work, including neighbours, have occurred prior to works commencing, • Hold (at minimum) a Class B asbestos license for non-friable removal, • Control and establishment of asbestos working zones, • Ensuring PPE is been worn correctly, • Control of potentially contaminated dust in the removal area at all times, • Asbestos removal, • Transport asbestos waste material to a licensed waste facility, • Decontaminating all plant and materials appropriately, • Provision of waste tracking receipts.

3.1 Premises Controller and Primary Contractor (St Ignatius' College Riverview / Belmadar Constructions)

The premises controller will provide any emergency evacuation and response requirements (eg. evacuation alarm, emergency assembly point, first aid provisions). The emergency evacuation procedures are to be included in the Safe Work Method Statement (SWMS) as appropriate. Any changes required will be communicated in the daily pre-start briefing / toolbox talks and SWMS.

3.2 NSW Licensed Asbestos Assessor / Qualified Occupational Hygienist (SE)

All suspected asbestos materials not previously identified shall be subject to an asbestos inspection by a NSW Licensed Asbestos Assessor (LAA) or Qualified Occupational Hygienist. The suspected materials are to be sampled and analysed by a NATA accredited laboratory for the presence of asbestos. Asbestos analysis is to be undertaken using a polarised light microscopy, supplemented with dispersion staining. Other approved methods may be used where appropriate (if required). All asbestos analysis must be undertaken by a NATA accredited laboratory.

The LAA or Qualified Occupational Hygienist will undertake air monitoring and supervision, visual clearance inspections of remediated areas and provide clearance certificates after approval for an area has been given.

The LAA or Qualified Occupational Hygienist must provide independent verification of the licensed asbestos removal contractor's work practices, implemented controls and standards employed during removal operations.

Supervision by a LAA / Qualified Occupational Hygienist will be carried out during any asbestos removal / handling works to ensure the works are undertaken in accordance with relevant codes of practice, guidelines and have been completed to a satisfactory standard.

The LAA / Qualified Occupational Hygienist supervising the removal works must attend all pre-start meetings/tool box talks and ensure all employees working within the area are aware of any safety matters regarding asbestos and/or any asbestos related works being undertaken in the area.

3.3 Licensed Asbestos Removalist (TBC)

As prescribed by the *Safework NSW Code of Practice: How to Safely Remove Asbestos (2022)*, all friable asbestos works are to be undertaken by a licensed Class A asbestos removal contractor (i.e. a contractor holding a business certificate for the prescribed activity of friable or non-friable asbestos removal). A Class B licensed asbestos removalist can only undertake works involving non-friable asbestos.

All asbestos removal works must be undertaken using the following mandatory controls;

- Delineated asbestos removal work area;
- Appropriate Personal Protective Equipment (PPE);
- Suppression techniques (wet and dry); and

- Decontamination procedures (wet and dry).

Asbestos removal / handling works must be performed in accordance with all legislative requirements. The statutory requirements for asbestos removal are prescribed in *Section 274 of the Work Health and Safety Act, 2011*. The *Safework NSW Code of Practice: How to Safely Remove Asbestos (2022)* provides necessary guidelines for the safe handling / removal of asbestos containing materials.

Prior to commencing works the asbestos contractor must ensure consultation with any people who may be affected by the removal works, including, but not limited to, neighbours, and workplaces adjacent to the site. The licensed asbestos contractor must also prepare an Asbestos Removal Control Plan and a Safety Health and Environment Work Method Statement.

3.3.1. Asbestos Removal Control Plan

An Asbestos Removal Control Plan is to be developed by the licensed asbestos removalist prior to undertaking any asbestos removal / handling works. The Asbestos Removal Control Plan must identify the specific control measures a license holder will install to ensure workers and other persons are not at risk when asbestos removal work is being conducted.

An asbestos removal control plan helps ensure the asbestos removal is well planned and carried out in a safe manner. The plan must be prepared before the licensed asbestos removal work commences.

The asbestos removal control plan must include details of:

- How the asbestos removal will be carried out, including the method, tools, equipment and PPE to be used;
- The asbestos to be removed, including the location, type and condition of the asbestos; and
- Decontamination procedures and waste disposal.

3.3.2. Safety Work Method Statement (SWMS)

The Safe Work Method Statement details the proposed work methodologies to be used in order to safely and effectively remove, enclose or encapsulate (as requested by Site Project Management in line with this plan) the asbestos containing materials. This SWMS must be submitted to Site Project Management and the LAA / Qualified Occupational Hygienist Contractor for review and approval prior to commencing work on site.

3.3.3. Health Monitoring

The licensed asbestos removalist contractor will require their employees / subcontractors to undertake health surveillance and monitoring by a GP, including X-rays at a minimum of once every 2 years or in line with current Safeworks NSW (2022).

4. MANAGEMENT OF ASBESTOS

4.1 Management and Control of the Asbestos Risk

Prior to commencement of work, all persons involved in the work shall be inducted onto the Safety Health and Environment Work Method Statement which covers:

- The potential health risk and toxic effects associated with the contaminants;
- The control measures used to minimise the risk to health and safety;
- The correct use of methods used to minimise the contamination of employees, other persons and the workplace; and
- The correct care and use of personal protective equipment.

Records of induction shall be maintained by the client.

4.1.1. Atmospheric Monitoring

Airborne Asbestos Monitoring is to be conducted at the site during any asbestos removal or handling. Monitoring should also be used to validate any implemented controls put in place to mitigate potential asbestos exposure.

Portable battery-operated air monitors are to be placed within static positions approximately 1.5m above the ground surrounding the work/removal area. The monitoring shall be conducted by a NATA-accredited laboratory. The results of asbestos air monitoring should be provided to the Site Project Management Representative the day following the removal or handling works. Project management will display results of air monitoring on the site's safety notice board for a period of 24hr.

Concentrations of asbestos fibres shall be dealt with as follows:

Table 4.1. Concentration of Asbestos Fibres.

Action Level (airborne asbestos fibres/ml)	Action
Less than 0.01	Continue with control measures
Between 0.01 and 0.02	Review control measures, Investigate the cause, Implement new controls to prevent further release.
More than 0.02	Stop removal works, Notify the relevant regulator that work has ceased, Investigate the cause, Extend the isolation area and implement controls to minimise further exposure, Do not recommence work until fibre levels are at or below 0.01 fibres/ml.

4.2 Notifications of Remediation/Removal Works

Prior to any work taking place the following notifications will be required as follows:

- The licensed asbestos contractor must give a minimum five (5) days' notice to SafeWork NSW regarding the removal of asbestos and obtain an Asbestos Removal Permit. This permit will be obtained prior to any work occurring in an area. The permit is valid for the time outlined by the contractor and must be extended if the works are to proceed past the allotted time period;
- The client must consult with persons affected by the asbestos removal works, this includes speaking with neighbours. Further guidance can be sort from the *Safework NSW Code of Practice: Work Health and Safety Consultant, Cooperation and Coordination;* and
- The asbestos contractor must ensure that this consultation has occurred prior to commencing works.

4.3 Site Establishment during Asbestos Remediation/Removal Works

1. Suitable exclusion zones are to be established around the removal area. The LAA / Qualified Occupational Hygienist shall assess the exclusion zone and provide zone parameters on the day of works being conducted.

2. Warning signs are to be erected at boundary to the exclusion zone for the duration of the exclusion zone being in force, including overnight or over weekends if the removal work has not been completed. The signs will be similar to the following:

3. Whilst there are potentially hazardous materials present within the exclusion zone, all personnel must decontaminate prior to exiting the exclusion zone and PPE must either be disposed of or remain inside the exclusion zone until the completion of works.

4. All tools, plant and equipment which may have been contaminated by hazardous materials must be thoroughly decontaminated prior to leaving the worksite. If deemed necessary by the LAA / Qualified Occupational Hygienist, tools, plant and equipment may need to be swabbed and a clearance certificate issued before leaving the worksite. Alternatively, if tools are exclusively used for hazardous materials work they may be sealed in air tight containers and removed from site for future reuse or disposal.

4.4 Asbestos Removal / Handling

Asbestos removal / handling works must be performed in accordance with all legislative requirements. The statutory requirements for asbestos removal are prescribed in the *Section 274 of the Work Health and Safety Act, 2011*. The *Safework NSW Code of Practice: How to Safely Remove Asbestos (2022)* provides useful guidelines for the safe removal of asbestos containing materials.

The following procedure will be adopted where removal of asbestos material is undertaken:

1. Site works within 10 metres of the asbestos effected area are to cease immediately.
2. Relevant Foreman, Engineer and Safety Manager on site are to be notified.
3. All contractors are to ensure that they have the correct PPE for the asbestos removal task, including appropriate handling gloves, P2 or P3 respirators and disposable overalls (all PPE to be sealed in a bag with contaminated material and removed and disposed appropriately).
4. Prior to works commencing the SWMS shall be reviewed by the Construction Manager.
5. The area shall be isolated and barricaded prior to removal works commencing and signage erected.
6. Only appropriate licensed and competent contractors will remove/dispose of asbestos containing materials. Construction Manager will check the qualifications of the individuals prior to work commencing.
7. All Hazardous Materials including PPE will be sent to a licensed facility as soon as possible with full waste transfer traceability.
8. All vehicles and equipment which have (or potentially have) come into contact with asbestos materials will be inspected cleaned down prior to exiting the work zone.
9. The waste shall be disposed of to a landfill carrying a license appropriate for the type of waste needed to be disposed of. In accordance with NSW legislation the waste class (type of waste) shall be predetermined through testing prior to disposal. To demonstrate proof of proper disposal, copies of waste disposal receipts are to be kept for inspection by SafeWork NSW, the NSW EPA, the local council or project team.

Important: Both the owner of the waste and the transporter are legally responsible for proving the waste was transported to a facility licensed to accept such waste.

4.5 Decontamination Procedures

4.5.1. Cleaning

After completion of removal works personnel must undertake the following decontamination procedures if they have been involved in removal of asbestos:

- Remove and dispose of all PPE appropriately.
- Wash hands, face and exposed skin areas.

All machines, tools, equipment and cables are to be decontaminated. All cleaning wipes, materials or water must be disposed of as asbestos waste.

4.5.2. Disposal of PPE

Following removal works, all PPE must be disposed of using the procedures listed below;

- All disposable suits and respirators are to be placed in asbestos waste bags (200 µm thick polyethylene bags) after each decontamination process.
- PPE, excluding respirators, will be removed from the workers person inside the designated decontamination zone.
- Bags should be twisted tightly, folded over and the neck secured in the folded position with adhesive tape, or any other effective method.
- These waste bags should not be used for other waste and should be removed from the work zone and placed in a designated and signposted asbestos waste bin.
- The asbestos waste bags should be disposed of by a licensed asbestos contractor and transported to a NSW EPA licensed waste depot approved to accept asbestos contaminated waste. The contractor should have a documented procedure outlined in the SWMS to ensure the vehicles are adequately cleaned and checked prior to leaving the site and landfill.
- Disposal permits or certificates should be sought from the landfill or waste transfer station at the end of the disposal operation. This documentation should be filed with all relevant asbestos documentation for the project, and a copy forwarded to the Consultant Hygienist and Project Supervisor.

4.6 Waste Disposal

- All asbestos waste generated on site will be placed in the designated and signposted waste bin provided. The waste bin will be lined with black 200µm plastic lining prior to asbestos waste being placed inside. The waste bin will be placed in a secure area and locked outside of working hours.
- In the case where asbestos containing soil or building materials is identified during works, the spoil is to be placed in the waste bin and sufficiently wet down to minimise dust during transportation to the bin.
- In the case where asbestos waste is placed in bags, the waste shall be double bagged prior to its removal from the work zone using 200 µm thick polyethylene bags. Asbestos waste shall be bagged once at the workface and a second time away from the workface but prior to leaving the removal area enclosure. It is recommended that a maximum bag size of 1200 millimetres (length) x 900 millimetres (width) be used. Bags should be filled to no more than 50 percent capacity, and contents should be wet before sealing. Consistent with good manual handling practice, bags should not exceed 16 kilograms in weight.
- The disposal of any asbestos materials / products off site will be in accordance with the relevant legislation.
- Transport and final disposal of asbestos waste material shall be carried out in a manner that will prevent the liberation of asbestos dust to the atmosphere by appropriate licensed contractors. All asbestos waste material shall be disposed of at a licensed NSW EPA landfill approved to accept asbestos contaminated waste and in a manner approved by the local and state authorities.

4.7 Validation Works Following Asbestos Soil Removal/Remediation Works

4.7.1. Clearance Inspections

After any removal/remediation works have been completed, the area must be inspected to ensure all asbestos materials have been removed to a satisfactory standard. The process for validation should be as follows:

- LAA / Qualified Occupational Hygienist to conduct visual inspection;
- LAA / Qualified Occupational Hygienist to take clearance soil or dust samples (if and where appropriate);
- LAA / Qualified Occupational Hygienist to carry out clearance air monitoring (if and where appropriate); and
- LAA / Qualified Occupational Hygienist to conduct clearance inspection to confirm all plant / equipment has been adequately decontaminated.

4.7.2. Clearance Report

The visual clearance inspection of the work area should be carried out when the Asbestos Removal Contractor's representative on site considers the removal works are satisfactorily completed. Inspections are to be carried out with the Asbestos Removal Contractor's site representative in order to confirm areas that may require further attention after the removal works have taken place.

As asbestos removal works are to be undertaken, an analytical program will be carried out. This will involve collecting residual soil or dust samples of the appropriate surfaces within excavation / soil removal area and submitting the samples to a NATA accredited laboratory. The analytical results will be made available with 24 hours of submission and any scheduled works may resume upon a negative result.

In the case of a positive analytical result for asbestos, further removal works may be required or, alternatively, steps taken as outlined in Section 7 of this report.

Asbestos materials which are to remain shall be made safe in a manner deemed suitable by the LAA / Qualified Occupational Hygienist prior to a clearance certificate being issued.

A clearance report will be issued by the LAA / Qualified Occupational Hygienist following the clearance inspection and/or analytical program that demonstrates that removal works have been effectively carried out. A Clearance Certificate will be issued to certify that works have been completed satisfactorily and it is safe to resume normal operations. The asbestos removalist contractor, will provide all waste transfer dockets for all material removed during the works (where applicable).

All results, reporting and clearance certificates are to be forwarded directly to the client's Project Manager, the Project Safety Manager and Environment Coordinators as soon as practical.

4.8 Minimum PPE Requirements

The following is the minimum PPE required when within the work area or handling potential asbestos products. The PPE shall be worn at all times in the work area until a clearance certificate has been issued to the client:

- A P2 or P3 respirator (entry into an exclusion zone is prohibited to persons unable to effectively wear respiratory protection due to facial fit characteristics etc).

General note about respirators - Respirators shall be correctly fitted, maintained in good condition, and kept in clean storage when not in use. Replaceable filters and cartridges should be replaced regularly, in accordance with guidelines issued by the manufacturer. The protection offered by some types of respirators may be affected by personal characteristics such as beards and the wearing of glasses or goggles and subsequently a facial fit test should be conducted prior to use.

- Suitable gloves (non-penetrable);
- Coveralls suitable for removal work being undertaken (Disposable coveralls rated Type 5, Category 3 (EN ISO 13982–1); and
- Gumboots or disposable boot covers (where applicable).

NOTE: All disposable PPE will be disposed of as asbestos waste at the completion the removal works.

4.9 Access to asbestos contaminated area without use of PPE

Access to an asbestos contaminated area may be granted to contractors without validation, at the LAA / Qualified Occupational Hygienist discretion. Open trenches, excavations and / or exposed asbestos materials must be encapsulated using geo-fabric. The geo-fabric must be secured to the soil surface with the use of pins and / or sandbags so that it cannot be easily removed. The geo-fabric must be applied by the removal contractor under working conditions stated in the Safework *NSW Code of Practice: How to Safely Remove Asbestos (2022).*

The geo-fabric layer must be inspected by an LAA / Qualified Occupational Hygienist before any contractors are allowed to access the area without the use of PPE, to ensure that the risk has been controlled. A report will be issued by the LAA / Qualified Occupational Hygienist following visual inspection that demonstrates that the make safe works have been effectively carried out.

5. REQUIRED EQUIPMENT AND PPE FOR ASBESTOS MANAGEMENT AND CONTROL

5.1 Equipment List

The following is an equipment register of required materials in preparation for works:

- Appropriate personal protective equipment; disposable suits, P2 and P3 respirators, disposable gloves and disposable boot covers.
- Asbestos warning signage and barricade taping.
- 200 µm thick polyethylene asbestos waste bags.
- Black 200 µm plastic lining.
- Light mist capable water system.
- General personal hygiene equipment (e.g. wipes, brushes etc).
- Asbestos Licensed Contractor to dispose of asbestos contaminated waste such as asbestos disposable bags.
- Qualified Occupational Hygienist to conduct airborne asbestos monitoring, supervision of removal works and clearance inspections.
- Required waste transport system.

5.2 Personal Protective Equipment

The following personal protective equipment (PPE) is required on the project:

- Steel capped safety boots / steel capped gum boots.
- Disposable gloves.
- Disposable boot covers (if required).
- Safety Hard Hat.
- Disposable coveralls (type 5, category 3 (EN ISO 13982–1) or equivalent that would meet this standard (if required).
- Coveralls worn should be made from either 100% synthetic material or a mixed natural / synthetic fabric capable of providing adequate protection against fibre penetration. All fabrics must be capable of preventing the penetration of asbestos fibres down to a diameter of 0.5µm and to a maximum 1% penetration of all airborne asbestos fibres. Once worn, disposable overalls are not to be reused or laundered.
- Disposable half-face particulate respirator (P2 or P3 rated dependant on type of removal): The respirator must conform to the requirements of AS/NZS 1716:2009 *Selection, Use and Maintenance of Respiratory Protective Devices* or its equivalent. These disposable respirators must be replaced at each decontamination event.

6. ASBESTOS IMPACTED FILL MATERIALS HANDLING

Regarding works associated with the identified asbestos impacted fill materials within the site, SE recommends the following:

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- All works associated with asbestos impacted soil materials including excavation, handling, movement, temporary storage and placement are to be carried out under the supervision of a Class A or Class B licensed removalist contractor. Supervision by an occupational hygienist or SafeWork NSW Licensed Asbestos Assessor is highly recommended for asbestos handling works to ensure appropriate controls are maintained and works are undertaken in compliance with all relevant legislation, guidance, and the RAP.

- At least five (5) days prior to the beginning of the scheduled works, a Notification for Removal of Non-friable Asbestos must be lodged with SafeWork NSW by the Class A or B licensed asbestos removalist contractor.
- The NSW Licensed Asbestos Assessor (LAA) / Occupational Hygienist should be made available to supervise the works to ensure that all procedures are implemented in accordance with the *NSW Code of Practice: How to Safely Remove Asbestos (2022)* and requirements set out within the site's Asbestos Management Plan (AMP).
- Asbestos Air Monitoring (AAM) is required for any asbestos works, in part due to the particularities and sensitivities associated with the school environment. AAM works to ensure adequacy of control measures within the asbestos materials handling areas.
- Asbestos impacted fill materials will then be excavated and stockpiled within a temporary storage area. This may be done in stages and in line within any spatial and project timeframe constraints.
- Materials may then to be excavated from the stockpiled soil materials, and placed within allocated placement areas to be determined in consultation with the principal contractor and SE.
- Following placement of ACM impacted soil materials, a marker layer of geofabric will be laid on top of the materials followed by the proposed concrete slab.
- A visual inspection of the soil surface will be carried out by the NSW Licensed Asbestos Assessor (LAA) / Occupational Hygienist at the end of the exercise, with a clearance report issued.
- Excavated materials are to be tracked via the 'Materials Tracking Sheet' provided in the appendices.
- It should be noted that the following end of day tasks will be required as per the *SafeWork NSW Code of Practice: How to Safely Remove Asbestos (2022):*
    - At the end of each shift, the remaining stockpiled soil materials, source area and beneficial re-use area will be made safe using geofabric / black plastic.
    - At the end of each shift, the NSW Licensed Asbestos Assessor (LAA) / Occupational Hygienist shall undertake an asbestos clearance / make-safe inspection to ensure that each area has been cleared / made safe – Weekly Reports will be sent to the client.
    - At the completion of asbestos works, all plant and machinery used during the works are to be decontaminated (as applicable) by the licensed removalist contractor and subsequently inspected by the LAA / Occupational hygienist who will then issue an asbestos materials clearance report or arrange for additional decontamination.

7. UNEXPECTED FINDS

Regarding any potential works outside of the subject area presumed not to contain asbestos, SE recommends the following when encountering unexpected asbestos materials:

- Stop works and restrict access to the affected area.
- An asbestos inspection shall be undertaken by the LAA / Qualified Occupational Hygienist to determine the presence or absence, nature, quantity and extent of asbestos contamination.
- The LAA / Qualified Occupational Hygienist is to notify the Principal Contractor, so that the area can be characterised, remediated and validated.
- An LAA / Qualified Occupational Hygienist will supervise the removal works to ensure that all removal procedures are implemented in accordance with the *Safework NSW Code of Practice: How to Safely Remove Asbestos (2022).*
- Following the removal of asbestos materials, a LAA / Qualified Occupational Hygienist shall undertake an asbestos clearance inspection to ensure no asbestos materials remain within the subject area.
- Any asbestos containing soil materials earmarked to stay onsite may remain in-situ / moved to placement areas provided it has been assessed against the relevant land-use suitability criteria. The location of any remaining asbestos should be listed on an asbestos register.
- If asbestos-containing materials are found outside of the removal area, management options may be employed to ensure safety of personnel and community.

Procedures for responding to incidents involving the inadvertent discovery of suspected asbestos containing materials is provided in the Unexpected Asbestos Find Emergency Procedure (**refer to Appendix B – Unexpected Finds Flow Chart**).

8. RECOMMENDATIONS

Reviews of the AMP should be performed on a regular basis and it may be updated as new information on site becomes available.

The review will encompass the entire workings of this AMP including such things as maintenance of registers, asbestos removal procedures, tendering, monitoring, asbestos related functioning etc.

The purpose of the review is to monitor compliance with the AMP, and where appropriate, improve it.

Reviews shall be undertaken in accordance with the WHS Regulations and relevant Codes of Practice.

APPENDIX A

FIGURES

Legend

- Test-Pit Location
- Surficial Non-Friable Asbestos Detected
- **Subject Area A**
  0.0 - 0.3 m bgs Special Waste - (Non-Friable Asbestos) as GSW
  0.3 - 1.3 m bgs ENM
- **Subject Area B**
  0.0 - 0.3 m bgs GSW
  0.3 - 1.3 m bgs ENM

Notes
GSW = General Solid Waste (Non-Putrescible)
ENM = Excavated Natural Material

Sydney Environmental Group

Scale:	10 m	Subject Area and Sampling Locations	
Client Name:	Belmadar Constructions Pty Ltd	Figure Number:	1
Project Name:	Asbestos Management Plan (AMP)	Figure Date:	6 March 2023
Project Location:	Saint Ignatius College Riverview, Tambourine Road, Lane Cove NSW	Report Number:	2027-AMP-01-060323.v1f

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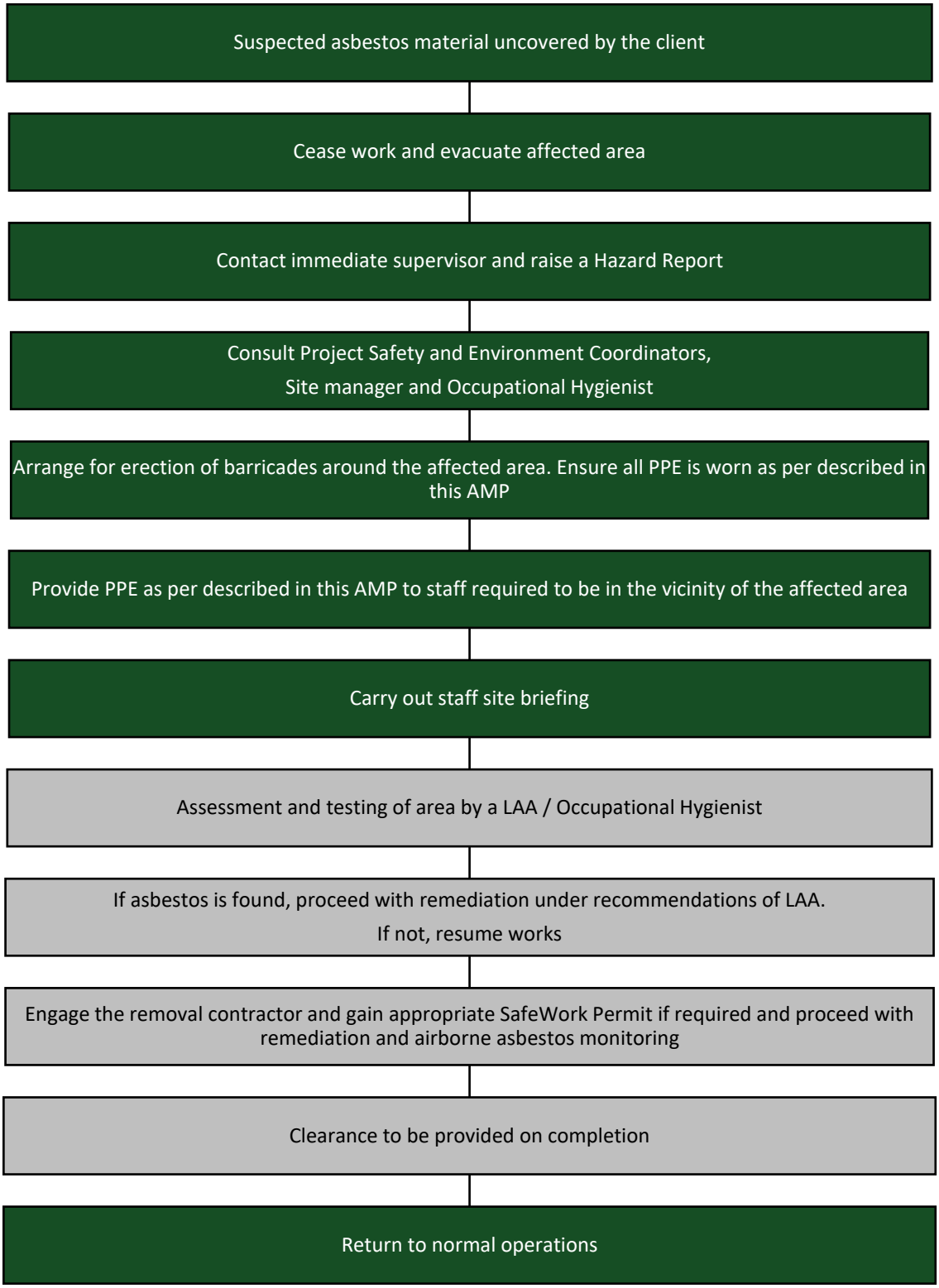
APPENDIX B

UNEXPECTED FIND PROTOCOL



Green sections to be performed by the client
Grey sections to be performed by others

APPENDIX C

MATERIALS TRACKING SHEET

Source Location:	Receiving Location:	Quantity (Tonnes)	Date of Import	Type / Description	Waste Classification Report Reference	Reviewed by:

ANNEXURE 6 – MANAGING RISKS OF HAZARDOUS CHEMICALS IN THE WORKPLACE

3. The risk management process

A risk assessment is not mandatory for hazardous chemicals under the WHS Regulations. However, in many circumstances it will be the best way for you, as a person conducting a business or undertaking (PCBU), to determine the measures that should be implemented to control risks. It will help you to:

- identify which workers are at risk of exposure
- determine what sources and processes are causing that risk
- identify if and what kind of control measures should be implemented, and
- check the effectiveness of existing control measures.

Where the hazards and associated risks are well -known and have well established and accepted control measures, it may not be necessary to undertake a risk assessment, for example, where there are a small number of chemicals in a workplace and the hazards and risks are well understood. If after identifying a hazard you already know the risk and how to control it effectively, you may simply implement the controls.

Your risk assessment should also consider foreseeable failures of plant and equipment, as well as any control measures, for example:

- A power failure may impact on the operation of a mechanical ventilation system at the workplace.
- Accidental spills have the potential to corrode or impact on nearby plant or equipment.

Documenting risk assessments is not mandatory, but may help when reviewing where improvements can be made and risks controlled more effectively.

Appendix F provides an overview and Appendix G provides a checklist of the risk assessment process.

Further guidance on the risk management process and the hierarchy of control measures is available in the *Code of Practice*: How to manage work health and safety risks.

3.1. Decide who should do the assessment

Assessments are based on a thorough understanding of what happens, or might happen, in the workplace and should be carried out by a person or persons who have:

- a practical understanding of the WHS laws, codes of practice and relevant guidance materials
- an understanding of the work processes involved at the workplace, and
- enough resources to gather information, consult the appropriate people, review existing records and examine the workplace.

The person or persons should also have abilities to:

- interpret the information on the label and SDS of the hazardous chemical
- observe the conditions of work, and to foresee potential problems
- communicate effectively and where appropriate consult with manufacturers, importers, suppliers, managers, technical specialists and workers including contract workers
- draw all the information together in a systematic way to form valid conclusions about exposures and risks, and
- accurately report the findings to all parties concerned.

A single person such as a supervisor may be suitably competent to perform simple assessments. In more complex cases, several persons representing a variety of skills may need to be involved in collecting and assessing the information. Whether a single person or multiple people undertake the assessment, they should consult with workers and their health and safety representatives.

Seeking external assistance

In some cases, it may be necessary to seek external professional assistance to assist or undertake risk assessments. External assistance may be required to:

- design an air-monitoring strategy
- collect and analyse samples, and/or
- interpret monitoring and testing results.

External professional assistance may also be required in the design, installation and maintenance of control measures, such as ventilation systems or fire protection systems.

3.2. Decide what sort of risk assessment is appropriate

The type of risk assessment that should be conducted will depend on the nature of the work being performed.

A basic assessment consists of:

- reviewing the labels and the SDS of the hazardous chemicals and assessing the risks involved in their use, and
- deciding whether the hazardous chemicals in the workplace are already controlled with existing control measures, as recommended in the SDS or other reliable sources, or whether further control measures are needed.

For example, the SDS and label might report that a cleaning agent has potential skin irritation effects and may liberate a toxic gas when in contact with certain other chemicals, while it in itself is non-volatile. A basic assessment might indicate that you should, as part of your duties to manage risks to health and safety associated with using, handling, generating or storing a hazardous chemical at a workplace, implement control measures such as requiring the use of protective clothing and gloves, and requiring the chemical to be kept away from incompatible materials.

In **a generic assessment**, an assessment is made of a particular workplace, area, job or task and the assessment is then applied to similar work activities that involve the use of the chemical being assessed.

For example, a business or industry association might do a generic assessment for a number of workplaces that use, handle, generate or store identical chemicals (such as service stations or dry cleaners). When conducting a generic assessment, it is important that the workplace, tasks and hazardous chemicals being assessed are identical in characteristics, properties, potential hazards and risks. Generic assessments are not appropriate for very high risk chemicals such as carcinogens.

A detailed assessment may be needed when there is a significant risk to health and for very high risk chemicals such as carcinogens, mutagens, reproductive toxicants or sensitisation agents in the case of health hazards. Information on the label and SDS will allow you to determine whether the chemical has these hazards. Schedule 10 of the WHS Regulations provides further information on the hazardous chemicals that are restricted or

prohibited for use (see Appendix C of this Code). A more detailed assessment may also be required when there is uncertainty as to the risk of exposure or health.

In order to complete a detailed assessment, further information may be sought and decisions taken to:

- eliminate the uncertainty of any risks
- select appropriate control measures
- ensure that control measures are properly used and maintained, and
- determine if air monitoring or health monitoring are required.

It may be necessary to engage external professional assistance to undertake a more detailed assessment.

Structuring risk assessments

Risk assessments can be simplified by evaluating the nature of the work in smaller, more manageable parts. You do not need to do a risk assessment covering each work activity in the whole workplace. Instead, evaluate the nature of the work by:

- **Dividing up the workplace**—If it is not practicable for the workplace to be assessed as a whole, divide it into smaller units (locations/areas or processes) to make risk assessment more manageable. Walking through the workplace and looking at floor plans or process plans will help you decide how to divide up the workplace.
- **Grouping similar work**—Workers performing similar work or using similar substances may be grouped together if it has been established that their exposures are representative of their group. They are referred to as 'similarly exposed groups'. In doing this you can avoid having to repeat exposure assessments for each and every worker.
- **Grouping similar chemicals**—If the work involves a large number of different hazardous chemicals, they may be grouped on the basis of their form, properties and the way they are used or handled. This kind of grouping may be appropriate for example, where:

  - a range of solvent-based paints containing a number of different solvents and additives are used in the same or similar way (for example, sprayed, brushed or applied with a roller)
  - solvent-based liquid pesticides are used in the same or similar way (for example, decanted, mixed or sprayed).

- **Examining work practices and conditions**—Once you have divided the workplace into manageable units, you should observe and consult with workers to find out how the job is actually done. Workers may sometimes not adhere strictly to standard operating procedures for certain tasks. This could be because they have devised a more efficient and/or safer method for performing that task, or because the control measures or personal protective equipment (PPE) provided make it cumbersome and difficult. Workers should be encouraged to share their views and concerns on working practices and be involved in discussions on how to improve working methods. Also, it is good practice to find out what changes in workplace activities occur during cleaning, maintenance, breakdowns and during staff absences or shortages.
- **Sourcing other information**—You should take account of any information about incidents, fires, spills, illnesses or diseases that may be related to the use of the hazardous chemical. Check your accident/incident records. Ask those doing the work if they have experienced symptoms listed on the SDS. This information will help you to determine if exposure has been significant.

Considering both health and physical risks

Hazardous chemicals may present an immediate or long-term risk to human health through their toxicological properties (**health hazards**), or a risk to safety of persons and property as a result of their **physical hazards**. In some cases, chemicals may present both health and physical hazards, for example solvents such as benzene, toluene and xylene.

There are many common elements to assessing risks from health and physical hazards, but also several key differences in the way these risks are assessed. As a consequence, the assessment of health and physical risks are discussed separately in this chapter.

3.3. Things to consider in assessing health risks

The assessment of health risks from hazardous chemicals involves gaining an understanding of the situations where people can be exposed to, or come into contact with the chemicals, including the extent of exposure and how often this can occur. Health risk depends on hazard severity and level of exposure, and thus depends on both the type of chemical and also the nature of the work itself.

As with all risk assessments, the assessment of chemical hazards needs to consider all workers potentially at risk, including those not directly involved in a work activity, as well as other people such as visitors to the workplace.

The routes of entry by which the chemical can affect your health

The type of hazard (for example, hazard classifications of carcinogenicity, sensitisation, acute toxicity) and relevant routes of exposure (for example, inhalation, ingestion, skin contact) should be known from the hazard identification step (see Chapter 2). This information is needed in the risk assessment to understand the level of risk from likely or potential exposure scenarios in your workplace.

For particulates in air, the primary health concern is effects on the lungs due to inhalation exposure. For example, crystalline silica is considered hazardous principally because of the long-term, irreversible lung effects (such as silicosis) that may arise from prolonged or repeated exposure to excessive concentrations. Its hazardous properties are associated with inhalation, so the evaluation of risk should be based on the potential for breathing in the crystalline silica dust rather than other routes of exposure (for example, contact with the skin). In the case of crystalline silica, it is the respirable fraction of the dust that presents the greatest risk to workers as this fraction contains the smallest particles which can reach further into the lungs causing the most damage.

In contrast, even brief exposures to high concentrations of sodium hydroxide may lead to immediate effects which include irritation and burning of the skin, eyes and respiratory tract and blindness. Its hazardous properties relate to exposure via skin or eye contact and inhalation. Evaluation of risks to health for sodium hydroxide (caustic soda) should therefore consider the potential exposure through all of these routes.

Some chemicals may exhibit ototoxic effects. That is, they may cause hearing loss or exacerbate the effects of noise. Evaluating the use of these chemicals should be carried out in conjunction with the *Code of Practice: Managing noise and preventing hearing loss at work*.

The physical form and concentration

Some substances may be virtually harmless in some forms (such as a block of metal, a piece of wood or granulated solid chemicals) but may be very hazardous in another form

(such as fine dust particles or fumes that can be readily inhaled, or solutions that may be splashed and readily absorbed through skin). This is also an important consideration in assessing risks from physical hazards.

The concentration of hazardous ingredients is also an important factor in the overall risk. Concentrates or pure substances may be extremely hazardous, while dilute solutions of the same chemical may not be hazardous at all.

The chemical and physical properties of the substance

Gases or liquids with low boiling points or high vapour pressures can give rise to high airborne concentrations in most circumstances, whereas high boiling point liquids such as oils are only likely to create a hazardous airborne concentration if they are heated or sprayed. Chemicals with a very low or high pH (for instance, strong acids and caustics respectively) are corrosive to the skin and eyes.

Some substances give off distinctive odours which can alert workers to the presence of a hazardous chemical. For example, hydrogen cyanide has a smell of bitter almonds. However, not everyone can smell hydrogen cyanide and higher concentrations of hydrogen cyanide can also overload nasal receptors resulting in workers being unable to detect it. Thus, odour should not be relied on as a means of detecting the presence of hazardous chemical.

The chemical and physical properties of a substance are also important in assessing risks from physical hazards, described in Section 3.4: How to assess physical risks.

Determining who could be exposed, and when this could occur

Workers can come in contact with a hazardous chemical and any waste, intermediate or product generated from the use of the substance if they:

- work with it directly
- are in the vicinity of where it is used or likely to be generated
- enter an enclosed space where it might be present
- disturb deposits of the substance on surfaces (for example, during cleaning) and make them airborne, and/or
- come into contact with contaminated surfaces.

You should consider all people at the workplace, including those who may not be directly involved in using, handling, storing or generating a hazardous chemical, such as:

- ancillary or support/services workers (be aware that cleaners, maintenance and laboratory staff are often exposed to both the hazardous chemicals they use in the course of their work, such as cleaning products, and the hazardous chemicals used in the workplace by other workers)
- contractors
- visitors, and
- supervisors and managers.

You should consider:

- how specific tasks or processes are actually carried out in the workplace (for example, decanting, spraying, heating). By observing and consulting workers you can find out if they are not adhering strictly to standard procedures or if procedures are not adequately providing protection to workers
- the quantity of the chemicals being used. Use of larger quantities could result in greater potential for exposure

- the risk controls in place and their effectiveness. For example, a ventilation system may be in use but when poorly designed, installed or maintained it may not achieve the correct level of protection (such as if filters are not regularly cleaned)
- whether each worker's work technique has a significant bearing on their level of exposure—poor techniques can lead to greater exposure, and
- workers who may be working alone with hazardous chemicals and if any additional precautions or checks may be necessary in case they become incapacitated.

How often is exposure likely to occur and for how long?

The total dose (amount) of a hazardous chemical a worker is likely to receive increases with an increase in the duration or frequency of exposure. Estimations of the duration and frequency of exposure can be based on observation, knowledge and experience of the work. Seek information from your workers and their health and safety representatives to find out:

- Which work activities involve routine and frequent exposure to hazardous chemicals (for example, daily exposure, including during end-of-shift cleaning) and who are the people performing these activities?
- What happens when non-routine work, production of one-off items or isolated batches, trials, maintenance or repair operations are performed?
- What happens when there are changes to work practices in events such as cleaning, breakdowns, changes in volume of production, adverse weather conditions?
- Are there differences between workers within a group? Anyone whose work habits or personal hygiene (for example, washing before eating, drinking or smoking) are significantly different should be considered separately.

Estimating the level of exposure to hazardous chemicals

Once you have investigated the hazardous chemicals, the following information should then be used to estimate the level of exposure:

- the quantities used
- the frequency and duration of exposure
- the effectiveness of the controls already in place, and
- whether workers are working directly with the substance.

An estimation of the amount of exposure to hazardous chemicals can be obtained by a number of methods:

- **Personal sampling**—This can determine inhalation exposure.
- **Static area sampling**—This can determine the level of airborne concentrations of chemicals; however this method is not acceptable for determining compliance with exposure standards.
- **Air monitoring**—This should be carried out by a person such as an occupational hygienist with skills to carry out the monitoring according to the appropriate standard and to interpret the results. Results from air monitoring indicate how effective your workplace controls are, for example whether ventilation systems are operating as intended. Records of air monitoring for airborne contaminants with exposure standards must be kept for a minimum of 30 years, and must be available to workers who are exposed.
- **Observation**—For example, you might look for evidence of fine deposits on people and surfaces, or the presence of dusts, mists or fumes visible in the air (for example, in light beams), or the presence of odours.
- **Simple tests** such as indicator tubes or dust lamps. However, in most cases the amount of exposure may vary throughout the day, so such tests may not establish workers' exposure with confidence and it may be necessary to undertake detailed air

monitoring. For chemicals that present a significant hazard you should consider undertaking air monitoring to determine the level of exposure.

Complying with exposure standards

WHS Regulation 49

Ensuring exposure standards for substances and mixtures not exceeded

As described in Section 1.5 of this Code, you must ensure that no person at the workplace is exposed to a substance or mixture in an airborne concentration that exceeds the exposure standard for the substance or mixture. Air monitoring may be necessary to ensure that workers are not exposed to airborne concentrations above the chemical's exposure standard.

Some chemicals with exposure standards can also be absorbed through the skin—these are given a notation of 'Sk' in the publication *Workplace Exposure Standards for Airborne Contaminants*.

Biological monitoring may be a helpful means of assessing a worker's overall exposure to a hazardous chemical that can be absorbed through the skin as well as inhaled. Further information on biological monitoring is available in the *Guidance material for health monitoring*.

Where results of monitoring show concentrations of airborne contaminants approaching (for example reaching greater than half of) the exposure standard, you should review your control measures. Even if monitoring indicates that exposure is below an exposure standard, sensitive workers may still be at risk. Exposure standards do not represent a 'no-effect' level which makes exposure at that level safe for all workers, therefore you should ensure that exposure to any hazardous chemical is kept as low reasonably practicable. This includes exposure to hazardous chemicals that do not have exposure standards, as they may still pose a risk to workers.

Some chemicals, such as isocyanates, are known to be sensitisers and can induce an adverse reaction in workers at levels well below the exposure standard once sensitisation has occurred. If a worker becomes sensitised to a chemical, the exposure standard for that chemical is no longer relevant and control measures such as improving engineering controls or job rotation to remove the affected worker from potential exposure to the chemical should be implemented.

For more information on how to interpret exposure standards and comply with the WHS Regulations, refer to Safe Work Australia's *Workplace Exposure Standards for Airborne Contaminants* and *Guidance on the Interpretation of Workplace Exposure Standards for Airborne Contaminants*.

3.4. How to assess physical risks

The assessment of physical risks in the workplace is different in many respects from that needed when assessing health risks. Whereas health risks arise from interaction of people with the chemical, physical risks arise mainly from hazardous chemicals where they come into contact with other things such as ignition sources.

Fire and explosion

WHS Regulations Part 3.2: Division 8

Hazardous atmospheres

As a PCBU, you must manage the risk to health and safety associated with a hazardous atmosphere or an ignition source in a hazardous atmosphere at the workplace.

Fire and explosion can result in catastrophic consequences, causing serious injuries or death of workers, as well as significant damage to property. They occur when the following three primary elements come together (commonly referred to as the fire triangle—see Figure 1):

- a source of fuel (a flammable or combustible substance)
- a source of oxygen (usually in the air), and
- an ignition source (a source of energy sufficient to cause ignition).

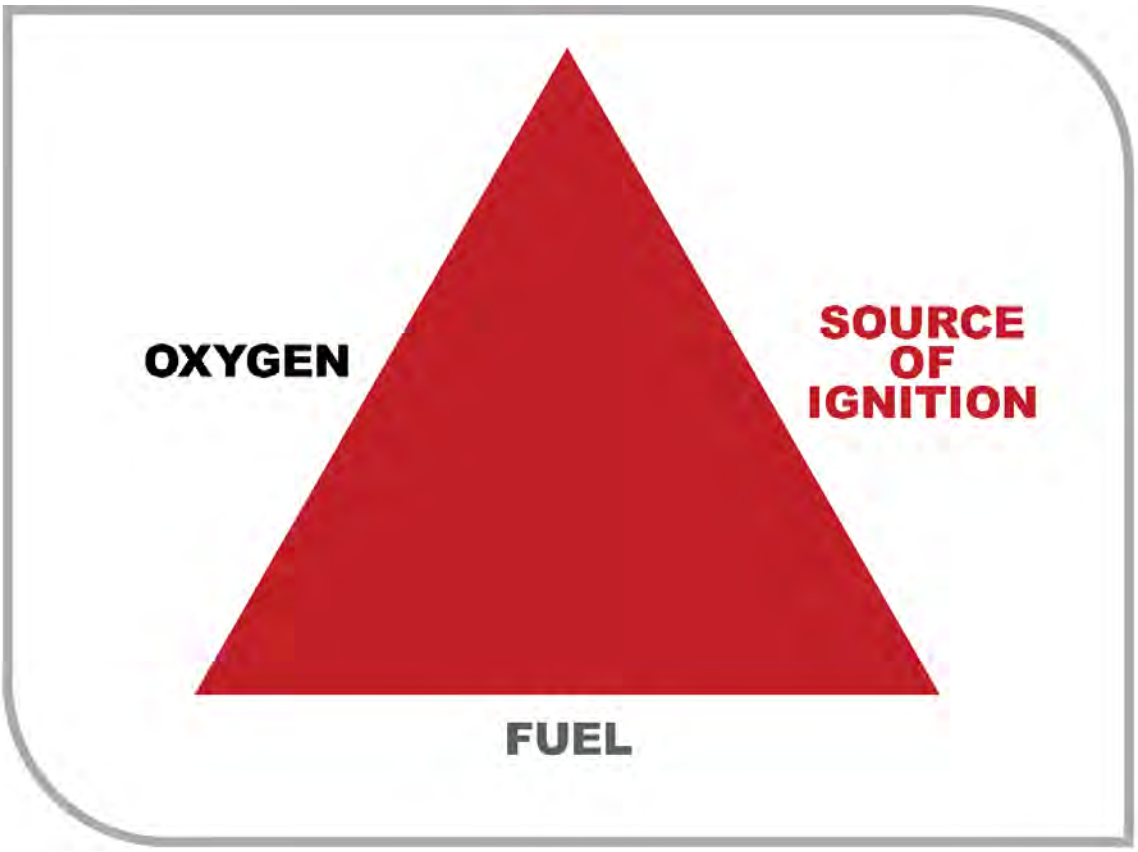


Figure 1 Fire triangle

When identifying hazards you should have identified all of the sources of fuel in your workplace that could contribute to fire and explosion risks. Fuels that present the highest risk are:

- those hazardous chemicals that are flammable (for example, flammable solids, liquids or gases, including their vapours and fumes)
- other fire-risk substances in other hazard classes (for example, pyrophoric solids, liquids and gases that ignite spontaneously in contact with air, substances that react with water to emit flammable gases), and
- other materials that are not hazardous chemicals, like wood, paper and leaves, and other combustible materials that contribute to the fire load.

You should also identify sources of oxygen, such as oxygen gas and compressed air in cylinders, chemical oxidisers and peroxides. Oxygen is always present in the air. Common fuel and oxygen sources are listed in Appendix H.

Note: Chemical reactions and other processes which generate gases can also cause explosions through an increase in the pressure in the container in which the chemical is stored if the gas cannot escape, even if that gas does not itself ignite.

Identifying ignition sources

Ignition sources can be any energy source that has the potential to ignite a fuel. They can be categorised into three broad types: flames, sparks and heat. Some common examples of ignition sources are provided in Table .

Table 3 Common examples of ignition sources

Type of ignition source	Examples
Flames	– Welding flames, gas heaters, pilot lights
Sparks	– Welding arcs, starters for fluorescent lighting, electric motors, electrical equipment like power points, cigarette lighters, switches and telephones – Static electricity including from friction sources – Lightning – Friction from drilling, grinding, scraping of metal on concrete
Heat	– Hot surfaces including light bulbs, ovens, radiators or heaters, flue pipes, vehicle engines and exhaust systems, pumps and generators – Exothermic chemical reactions (those which generate heat)

Some electrical equipment may also be a source of ignition. However, not all electrical equipment is an ignition source if it is specifically designed so that it does not create sparks. This type of equipment is referred to as ‘intrinsically safe’.

You must identify any ignition source in your workplace that has the potential to ignite flammable or combustible material. You should also consider sources of ignition that are adjacent to your workplace or may periodically come into your workplace, for example delivery vehicles (with hot engine and exhaust systems), visitors, or portable items like cordless power tools, radios and fans.

Other factors affecting fire and explosion risks

The following physical and chemical characteristics of materials can influence the level of risk of a fire or explosion occurring.

Form and physical state

The form or physical state of chemicals, substances or other materials can have a significant influence on the level of risk of a fire or explosion. The physical state of a material is generally considered as being solid, liquid or gas. However, materials can be further categorised as aerosolised droplets, vapours, fumes, mists, powders, dusts or fibres.

Bulk materials in solid, liquid and gas forms behave differently and present different risks. Liquids spread readily compared to solids and have a greater risk of coming into contact with an ignition source if spilled. Gases present a greater risk as concentrations in air are

generally higher than for liquids (and their vapours) and can spread more rapidly. Depending on the vapour density, some gases can flow across surfaces in a similar way to liquids, rather than dissipating quickly. For example, vapours which have a density greater than air can move along the floor and spread to adjacent work areas where ignition sources may be present, thereby creating a significant risk in those areas.

Temperature and pressure

Changes in temperature and pressure can affect the properties of a chemical.

The explosive range of a chemical (for instance, its lower and upper explosive limits) can change with temperature. At higher temperatures, the lower explosive limit is usually lower, meaning that the substance is more likely to ignite at lower concentrations in air. Heating solid or liquid combustible substances can also increase the vapour pressure (for instance, the concentration of vapours emitted) of the substance making it more likely to ignite.

Handling chemicals under pressure increases the risk in several ways. Any loss of containment will occur more rapidly than under normal atmospheric pressure so that more hazardous chemical is released. Increasing pressure generally increases the temperature of the material, and some chemicals also become unstable at higher temperatures and pressures causing an uncontrolled decomposition or reaction.

Confinement

The effects of an explosion can be exacerbated where the fuel and air mixture is contained, for example in a tank, duct or pipework, as well as in larger structures like silos, rooms or buildings. Explosions can be more violent than when unconfined, and flying debris (such as from the container or building) can cause serious injuries or death.

Fire and explosion risks involving chemical oxidisers

Chemical oxidisers can react violently and unexpectedly with many chemicals such as organic material (for example, wood, paper, cellulose products), hydrocarbon solvents (for example, mineral turpentine, petrol, diesel) and other organic (carbon-based) chemicals (for example, ethanol, mineral oils).

You should assess any situation where an oxidiser could come into contact with these types of materials. This includes any containers and other equipment used in handling or transferring the chemicals. Oxidisers should be handled in compatible containers and with compatible equipment to avoid a dangerous reaction occurring.

It is important to note that, since oxidisers provide oxygen through the chemical reaction, rather than air being the oxygen source, a risk of fire or explosion can still exist even if these materials are handled under an inert atmosphere like nitrogen.

Fire and explosion risks from other chemical reactions

Fires and explosions can occur as a result of chemical reactions. Many chemical reactions are exothermic—that is, they give off heat during the reaction—and this heat can act as an ignition source igniting any fuels present. Pressure can build up in enclosed systems (for example, containers, flasks, pressure vessels) causing the container to rupture or even explode.

You should assess any situation where incompatible chemicals could interact and cause a dangerous or uncontrolled violent reaction.

Dust explosion risks

Dust explosions present a significant risk in some workplaces, however they are often overlooked. Dust explosions usually occur where combustible dusts (or fibres, for example from paper, grain, finely divided organic compounds and metals) have accumulated and are then disturbed and released into the air, coming into contact with an ignition source. Common ways in which dusts can be disturbed include from wind when opening doors or

windows, during cleaning or sweeping up of waste or using compressed air to blow out material accumulated in crevices, gaps or in machinery.

Dusts may also be generated when transferring materials, such as filling the hold of a ship or a silo with grain (liberating grain dust).

When the dust cloud comes into contact with an ignition source such as a flame, hot surface or spark, ignition can occur causing an explosion. Dust–air mixtures can be classified as hazardous atmospheres in the same way as other flammable materials like vapours from flammable liquids and gases.

Dust clouds can also be generated when the pressure of an explosion disturbs dust accumulated in other areas. These new dust clouds may also ignite, causing further dust explosions.

Effect of particle size on dust explosion risk

The size of particles in dust can have a significant impact on the explosion risk. Smaller particles have a greater surface-to-mass ratio and present a greater risk, for example a block of metal such as a metal ingot may be practically inert but could be extremely reactive when in the form of filings or shavings, dust or powder. Similarly, the risk from an aerosol form of flammable liquid (for instance, fine droplets in air) is much greater than for the bulk liquid. Processes that generate fine particles, like grinding and milling of flour and nanomaterials can present significant risks. Special control measures may be needed for handling such materials.

The classification of dust hazardous atmospheres is complex and depends on many factors, including the rate of dust dispersion, sedimentation characteristics and particle size. Further information is contained in the following Australian Standards:

- AS/NZS 4745: Code of Practice for handling combustible dusts, and
- AS/NZS 60079.10.2: Explosive atmospheres—Classification of areas—Explosive dust atmospheres.

Common examples of the types of industries and processes that have a potential for presenting a fire, explosion or implosion risk are listed in Appendix I.

Off-site risks

Some activities, systems of work, structures and equipment that are not directly involved with the use, storage and handling of hazardous chemicals in the workplace may create a hazard that you need to be aware of when undertaking your risk assessment. These include:

- Hazardous chemicals on adjacent or nearby premises that could be ignited by activities at your workplace, and other substances and materials that are not hazardous chemicals but that could add to the overall fire load, such as wooden pallets, paper, combustible liquids or other combustible materials.
- Activities and installations on adjacent premises, such as the operation of plant, equipment and vehicles, deliveries of hazardous chemicals, personnel movements in normal and emergency situations, visitor access and the trial of site emergency procedures.
- The proximity of sensitive facilities which may be put at risk by the presence of hazardous chemicals and during an emergency, such as schools, hospitals, child and aged care facilities, theatres, shopping centres and residences. These may require special consideration when planning for emergencies.
- The presence of incompatible materials, either other chemicals or the materials that plant, equipment, storage and handling systems are made of which could react with the chemicals being stored or handled.
- Foreseeable failures of plant, equipment, storage systems, as well as natural disasters

or extreme weather events such as temperature extremes, wind, lightning or rainfall, including the potential for flooding.
- Other failures which could occur and events which may give rise to new hazards or greater risk. Any examination should be systematic, and include consideration of the possibility of human error in the system's operation.

Risks from corrosive substances

Hazardous chemicals that are corrosive to metals can cause damage to plant and equipment, such as containers, pipes, fixtures and fittings. Corrosion can lead to leaks or complete failure and loss of containment of the chemical, resulting in serious damage to property, exposure of workers to the hazardous chemicals and potential injury and death.

Compressed gases

Compressed and liquefied gases are used as fuel, a source of oxygen or as shielding gases in certain types of welding. The hazards associated with compressed and liquefied gases include fire, explosion, toxicity, asphyxiation, oxidation and uncontrolled release of pressure. Gas leakage is one of the greatest hazards.

Cylinders contain large volumes of gas under high pressure and precautions need to be taken when storing, handling and using cylinders.

Asphyxiation hazards

Asphyxia is a condition that occurs where there is lack of oxygen. This can occur either through:

- consumption of oxygen in the air (burning of fuel, or oxidation processes such as microbial activity or rusting)
- an accumulation of gases displacing oxygen in air, or
- inhalation of a chemical affecting the ability of the body to use oxygen (for example, hydrogen cyanide can asphyxiate a person by binding to haemoglobin in the blood following inhalation).

All gases, including fuel gases (for example, hydrogen, acetylene and liquid petroleum gas) and inert gases (for example, argon, helium and nitrogen) are an asphyxiation hazard in high concentrations.

Too little oxygen in the air that we breathe can cause fatigue and in extreme cases death. Using compressed and liquefied gases can result in dangerously low levels of oxygen. For example, gases that are heavier than air can accumulate in low-lying areas such as pits, wells and cellars, and gases that are lighter than air can accumulate in high areas such as roof spaces and lofts. Working in an enclosed or confined space with inadequate ventilation, where hazardous vapours can accumulate, is a potential asphyxiation hazard.

You should identify possible causes of asphyxiation in your workplace. In welding and allied processes, asphyxiation can occur from gas slowly leaking in a work area. If asphyxiation hazards are due to working in a confined space, see the *Code of Practice: Confined spaces* for further guidance.

Compressed air

Compressed air can be hazardous and should be handled carefully by workers. For example, the sudden release of gas can cause hearing damage or even rupture an eardrum. Compressed air can also deeply penetrate the skin, resulting in an air bubble in the blood stream known as an embolism. Even a small quantity of air or other gas in the blood can be fatal.

Ensuring workers are trained to handle compressed air properly can eliminate many of the associated risks. Training and work procedures should emphasise the safe use of air tools and safeguard against the deliberate misuse of compressed air. Also, maintaining air receivers properly prevents the potential for an explosive rupture.

4. Controlling risks

4.1. The hierarchy of control measures

There are a number of ways to control the risks associated with hazardous chemicals. Some control measures are more effective than others. Control measures can be ranked from the highest level of protection and reliability to the lowest. This ranking is known as the *hierarchy of control*.

As a person conducting a business or undertaking (PCBU), you must always aim to eliminate a hazard and associated risk first. If this is not reasonably practicable, the risk must be minimised by using one or more of the following approaches:

- substitution
- isolation
- implementing engineering controls.

If a risk then remains, it must be minimised by implementing administrative controls, so far as is reasonably practicable. Any remaining risk must be minimised with suitable personal protective equipment (PPE).

Administrative control measures and PPE do not control the hazard at the source. They rely on human behaviour and supervision and when used on their own, tend to be the least effective ways of minimising risks.

Eliminating the hazard

This means removing the hazard or hazardous work practice from the workplace. This is the most effective control measure and must always be considered before other control measures. You may choose to not use a hazardous chemical (for example using nails instead of using chemical-based adhesives) or eliminate exposure (for example eliminating a handling activity and potential worker exposure by purchasing pre-mixed or diluted chemicals instead of manually mixing or diluting chemicals at the workplace).

Substitution

Substitution is the replacement of a hazardous chemical with a chemical that is less hazardous and presents lower risks, for example:

- substituting a less volatile material to control a vapour hazard (which may cost less than the installation and maintenance of a mechanical ventilation system)
- substituting a highly flammable liquid with one that is less flammable or combustible
- using hazardous chemicals with a single hazard class rather than those with multiple hazards
- substituting high hazard chemicals like carcinogens, mutagens, reproductive toxicants
  and sensitisers with less hazardous chemicals
- using diluted acids and alkalis rather than concentrates
- using a product in either paste or pellet form rather than as a dust or powder.

Note: The elimination and substitution of hazardous chemicals can be supported by implementing a purchasing policy that promotes the purchase of non-hazardous and less hazardous chemicals.

Isolation

Isolation involves separating people from the chemicals or hazards by distance or barriers to prevent or minimise exposure. Examples of isolation include isolating workers from chemicals, and segregation of chemicals.

Isolate workers from chemicals

This can be achieved through methods such as:

- use of closed systems such as those used during the processing and transfer of flammable liquids in petroleum refineries, or the use of glove boxes or glove bags
- placing a process, or a part of it, within an enclosure which may also be fitted with exhaust extraction to remove contaminants
- isolating operations in one room with access restricted to properly protected personnel
- placing operators in a positive pressure cabin that prevents airborne contaminants entering
- distancing workers from hazardous chemicals and any potential hazards generated by their use.

Isolate chemicals from other chemicals (segregation of chemicals)

Hazardous chemicals should be physically separated from any chemicals or other things that may be incompatible. This is achieved by distance, barriers, or a combination of both barriers and distance.

Isolation as a control measure is usually used to control physical hazards because of the greater consequences when incompatible materials interact. However, it is also important to consider isolation from other hazardous chemicals. The choice of isolation measure used will depend on a range of factors, including:

- the quantity of hazardous chemicals stored and handled in the work area
- the type of installation involved, and the processes applied to the hazardous chemicals in the work area and their associated hazards
- all other activities in the work area which may increase the risks, and
- any other control measures in place that will minimise the risks.

If possible, separation distances should be applied in a way that would not require additional control measures. If this is not possible, barriers may be required.

When choosing to use a barrier, you should consider:

- the effect that climatic elements may have on a barrier and its effectiveness
- the level of fire resistance provided by the barrier
- the structural capability which may be required to withstand weather, and
- overpressure resulting from internal or external incidents.

When storing chemicals on shelving or other storage systems, hazardous chemicals should not be stored above or below other chemicals or other things which may be incompatible, potentially interact or contaminate. Hazardous chemicals should never be stored where they could contaminate food, food packaging and other items like personal use products, cosmetics, cigarettes, medication and toiletries.

Information on safely storing and segregating flammable liquids is available in AS 1940: *The storage and handling of flammable and combustible liquids*.

Engineering controls

Engineering controls are physical in nature, including mechanical devices or processes that eliminate or minimise the generation of chemicals, suppress or contain chemicals, or limit the area of contamination in the event of spills and leaks. They often involve partial enclosure, use of exhaust ventilation or automation of processes. Examples of engineering controls include:

- using intrinsically safe electrical equipment in hazardous areas
- using robots to minimise operator exposure, for example, spraying in coating operations
- partially enclosed and ventilated spray booths or fume cupboards
- fully enclosed ventilation booths (see diagram 1 in Figure below), or
- local exhaust ventilation to capture airborne contaminants close to their point of release (see diagrams 2 and 3 in Figure below).

Ventilation

Ventilation is a major engineering control. Correct design is essential to ensure that ventilation is effective. There are a range of different ventilation systems, and the most appropriate form needs to be used.

Design considerations for ventilation systems

Ventilation is a means of maintaining a safe atmosphere by the introduction or recirculation of air; by natural, forced or mechanical means. Maintaining a safe atmosphere in the storage and handling area of hazardous chemicals is an important control measure. Recirculation should be avoided unless precautions are taken to detect and avoid harmful contamination, and prevent accumulation of airborne contaminants. Recirculation should only be used where temperature control is required.

A ventilation system should operate exclusively for the particular building, room or space. Where this is not practicable, the system may be linked to another area provided that this does not increase the risk to exposure of hazardous chemicals, for example by recirculating hazardous or flammable vapours or spreading them into other areas where that chemical is not being used.

Ventilation systems should be suitable for the types of hazardous chemicals on the premises. For example, if a hazardous chemical has vapours which are denser than air, these will accumulate in low-lying areas. In this case, extraction of vapours should be from the lowest point and fresh air introduced from above.

Exhaust systems and ducting should be resistant to the vapours, mists or dusts being extracted. The risk of fire propagation can be reduced by installing self-closing fire dampers, for example in laboratory fume cupboards. Extraction ducting should not be linked to multiple items of plant if there is any risk of fire spreading through the ducting. Provision against flashback, for example by installing flame arresters, may be necessary.

Exhaust gases and air should be discharged where they will not cause other hazards. For example, fume cupboard extraction systems should not exhaust close to air intakes and should be in compliance with any local building or environmental protection requirements. Exhaust systems can also be fitted with means to reduce airborne contaminants which may be harmful to the environment or people prior to discharge to the atmosphere. This might include particulate filters, absorbents and adsorbents (for example carbon), catalysts, scrubbers or burners.

Regular checks of these systems should be included in planned maintenance schedules to ensure that vents remain unobstructed.

To ensure the effectiveness of ventilation systems, they should be designed in accordance with appropriate technical standards, and installed and maintained by qualified or experienced persons, such as engineers or occupational hygienists.

Further information on the design of ventilation systems can be found in:

- AS 1940: The storage and handling of flammable and combustible liquids
- AS/NZS 60079.10.1: Explosive atmospheres—Classification of areas—Explosive gas atmospheres [IEC 60079-10-1, Ed 1.0 MOD]
- HSG258 Controlling airborne contaminants at work: A guide to local exhaust ventilation (LEV), 3rd edition 2017, Health and Safety Executive (UK), and
- *Industrial Ventilation: A Manual of Recommended Practice for Design*, 28th edition, American Conference of Governmental Industrial Hygienists (ACGIH).

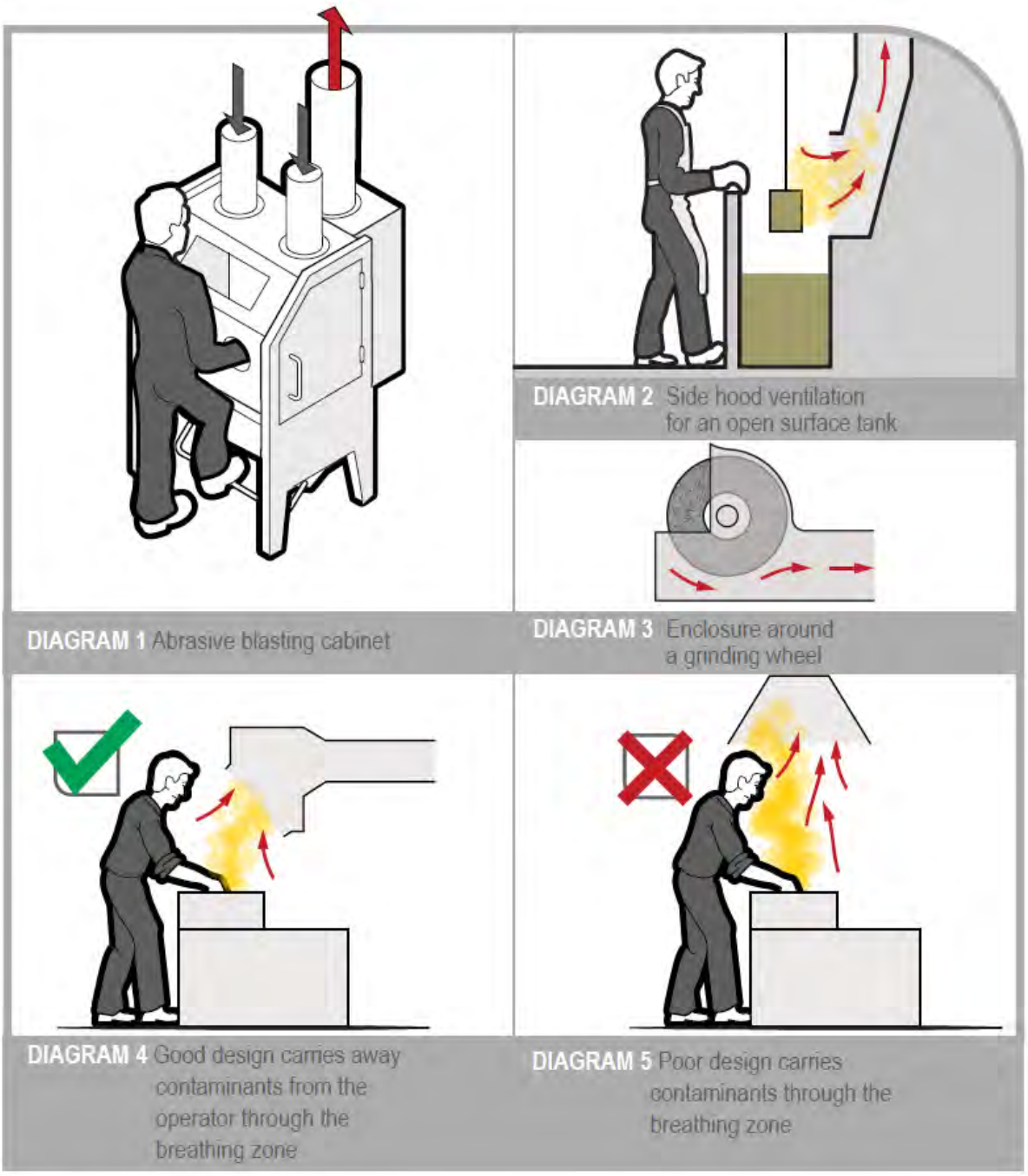


Figure 2 Diagram 1 shows an abrasive blasting cabinet; Diagram 2 shows side hood ventilation for an open surface tank; Diagram 3 shows an enclosure around a grinding wheel; Diagram 4 shows good design carrying away contaminants from the operator's breathing zone; Diagram 5 shows poor design carrying contaminants through the operator's breathing zone

Mechanical ventilation

Inlet and outlet vents located on opposite sides of the storage area at low levels provide airflow across the floor. Where both inlet and outlet are mechanically assisted, capacities and rates should be adjusted to ensure that the pressure inside the store or room never exceeds that outside and airflow into any adjoining work areas and offices is prevented.

Local exhaust ventilation

Local exhaust ventilation is used to remove airborne contaminants before they reach the breathing zone of workers in the area. It is used for effective control of more highly toxic

contaminants created in large quantities and is applied close to the source of generation. It is more effective than increasing general ventilation to try to dilute toxic contaminants.

Local exhaust ventilation is designed to capture airborne contaminants close to the source of generation. This prevents them from contaminating the working environment. The ventilation should be arranged to prevent contaminants from entering the breathing zone of the operator. In Figure 2, the exhaust extraction shown in diagram 4 is well-designed, while that shown in diagram 5 is poorly designed as it carries contaminants directly through a person's breathing zone.

Natural ventilation

Natural ventilation can be used to control small amounts of relatively low toxicity contaminants including dusts, fumes, gases and vapours which have low and steady rates of generation. It requires a large building space for dilution and relatively large capacity for airflow through open doors, windows or ceiling exits. For solvent storage or handling areas, where vapours heavier than air may accumulate in lower regions (for example, near floor level) with a subsequent build-up of hazardous concentrations, vents should be provided at a level immediately above any spill containment, on the opposite sides of the room or space, to provide for airflow across the area. High level ventilation may also be necessary for temperature control (for example, roof vents to allow the escape of warm air).

As natural ventilation does not capture or filter out airborne contaminants it should not be used where it may cause a hazard in surrounding areas, for example when high levels of chemicals are present and would accumulate outside.

Note: Vents in a screen wall may negate any fire protection or vapour barriers.

Administrative controls

Administrative controls should only be considered when other higher order control measures are not practicable, or to supplement other control measures. For carcinogens, administrative controls should only be used to provide additional protection.

Administrative controls should also be considered for emergencies when other control measures fail, such as for managing spills and leaks, and are particularly important for those workers who are required to clean up spills, or who carry out regular cleaning and maintenance work. Examples of administrative controls include:

- written rules and policies for using, handling or storing hazardous chemicals—for example, having a written clean-up procedure for spills
- a job rotation schedule—so that the same workers are not continually exposed to chemicals with chronic health effects
- a purchasing policy—this may include just-in-time ordering so that large quantities of chemical do not need to be stored on site, or preferential purchasing of premixed chemicals so that workers do not need to manually mix hazardous chemicals
- restricted area policies—so that only staff who are involved in the use, handling, storage or generation of hazardous chemicals are allowed access to high risk areas where there may be a greater risk of exposure
- implementing procedures to prevent introduction of ignition sources in hazardous areas
- using a work method that minimises the time that mixers, reactors or ovens are open to the environment (both during and after use)—this limits the period of time in which a chemical could escape into the work area
- having a cleaning schedule for work areas and a maintenance schedule for engineered controls
- requiring staff to use vacuuming or wet sweeping methods to suppress dust that may be generated during dry sweeping

- prohibiting eating, drinking and smoking in areas where hazardous chemicals are used, stored or handled, and
- providing washing facilities for rinsing off chemicals (such as hand washing, showers, laundering of clothes).

Training and supervision should always be provided to ensure administrative controls are implemented effectively.

Personal protective equipment (PPE)

WHS Regulation 44

Provision to workers and use of personal protective equipment

PPE is anything used or worn by a person to minimise risk to the person's health and safety. PPE includes overalls, aprons, footwear, gloves, chemical resistant glasses, face shields, respirators and air-supplied respiratory equipment.

If PPE is to be used at the workplace, you must ensure that the equipment is:

- selected to minimise risk to health and safety, including by ensuring that the equipment is suitable for the nature of the work and any hazard associated with the work and is of suitable size and fit and reasonably comfortable for the worker who is to use or wear it
- maintained, repaired and replaced so that is continues to minimise risk to the worker who uses it, including by ensuring that the equipment is clean and hygienic, and in good working order.

If you direct the carrying out of work, you must provide the worker with information, training and instruction in the proper use and wearing of PPE, and the storage and maintenance of PPE.

A worker must, so far as reasonably able, use or wear the PPE in accordance with any information, training or reasonable instruction and must not intentionally misuse or damage the equipment.

In most circumstances, PPE should not be relied as a control measure. It should be used only as a last resort when all other reasonably practicable control measures have been used and the risk has not been eliminated, or as interim protection until higher level controls are implemented.

For some high risk activities, such as spray-painting, abrasive blasting and some emergency response actions, PPE should always be used to supplement higher level control measures.

The effectiveness of PPE relies heavily on workers following instructions and procedures correctly, as well as fit, maintenance, and cleaning. Workers might avoid using PPE if it must be used for long periods, if dexterity and clear vision are needed for the task, or if they have not been adequately trained on how to fit and use it properly.

The best way to determine this is to observe workers performing the task. If they discard the PPE or do not use it, this may indicate that it does not fit, is uncomfortable or is a hindrance to the work. You should also observe workers after the task is complete to ensure that the PPE they have used is stored and maintained correctly.

PPE must be suitable for the task being performed. Examples include:

- Choosing appropriate chemical-resistant gloves, offering the best resistance to the chemical being used. Some gloves may be resistant to some solvents but not to others.

- Using a full-face, air-fed respirator rather than a half-face respirator during spray-painting operations to reduce exposure to hazardous chemicals like isocyanates, which can cause skin and respiratory allergic reactions.

4.2. Specific control measures

This section includes information on key control measures that should be considered when managing risks from hazardous chemicals in the workplace. The information provided here is general in nature and aims to provide an understanding of the principles involved in managing the risks.

Information on control of risks may be included on SDS and labels. Table 4 shows some examples.

Table 4 Examples of information on control of risks

Type of information on SDS and labels	Specific control measures included
Instructions on use	Some products may have defined uses, e.g. agricultural and veterinary chemicals, and some consumer chemicals. It may be illegal to use some chemicals contrary to label directions.
Instructions on storage	This may include advice on not to store with certain incompatible materials, or advice on potential hazardous degradation products. Examples include—storage of acids and bases; storage instructions to avoid formation of explosive peroxides in ether during extended storage.
Personal protective equipment (PPE)	This may include specific types of PPE to be used, e.g. use of nitrile gloves to protect from exposure to hydrocarbon solvents; use of a specific type of respiratory protection.

Labels provide precautionary statements such as:

- Use explosion proof electrical equipment
- Use only outdoors or in a well ventilated area.

Appendix J contains specific information on managing risks in particular situations or for particular types of hazardous chemicals.

Fire and explosion risks

WHS Regulation 355

Specific control—fire and explosion

As a PCBU you must, if there is a possibility of fire or explosion in a hazardous area being caused by an ignition source being introduced into the area, ensure the ignition source is not introduced into the area (from outside or within the space).

Section 3.4 of this Code identified the factors that should be considered when assessing risks from fire and explosion. Key control measures for managing these risks include:

- designing buildings and plant to relieve and redirect pressure and flame in the event that an explosion occurs
- installing systems to detect leaks of flammable gases or vapours
- using intrinsically safe equipment
- installing ventilation to avoid creation of a hazardous atmosphere
- substituting flammable materials for ones that are less flammable or combustible
- ensuring incompatible materials are separated or segregated
- reducing quantities of flammable and combustible materials, including items that contribute to the fire load but that are not hazardous chemicals themselves (for example, wooden pallets)
- eliminating ignition sources from hazardous areas (this may include establishing a hot work permit system, detailed below)
- ensuring equipment used in handling hazardous chemicals is maintained in accordance with the manufacturer's instructions, and
- cleaning to minimise accumulation of combustible dusts.

Hot work

Hot work is any process involving grinding, welding, brazing, oxycutting, heat treatment or any other similar process that generates heat or continuous streams of sparks. Undertaking hot work in areas where flammable or combustible chemicals or other materials are present creates a significant risk of fire or explosion. Conducting hot work on containers such as drums, tanks and pipes that have not been properly decontaminated is a common ignition scenario resulting in fatalities. A hot work permit system is a system designed to eliminate or minimise risks from these activities, by controlling when and how hot work is undertaken in these areas.

Further information on hot work permit systems is available in the following Australian Standards:

- AS 1940: The storage and handling of flammable and combustible liquids
- AS 2865: Confined spaces: Appendix F, and
- AS 1674.1: Safety in welding and allied processes—Fire precautions.

Oxidising agents can contribute to fire and explosion risks. Information on working with oxidising agents can be found in AS 4326: *The storage and handling of oxidising agents.*

Eliminating ignition sources

Some common ignition sources are included in Table 3 of Section 3.4 of this Code. Ignition sources must be eliminated from any hazardous areas. This may be achieved by:

- use of intrinsically safe electrical equipment (which will not act as an ignition source). Consider whether the hazardous chemicals can generate flammable or explosive atmospheres, and ensure that any equipment being used, like stirrers, is intrinsically safe
- ensuring electrical equipment is effectively maintained. Poorly maintained electrical equipment can present a significant risk (for example, through worn brushes)
- ensuring electrical equipment is properly earthed, and
- implementing administrative controls such as permit systems preventing hot work (for example, welding) in these areas.

Static electricity can be created from a range of activities including the transfer of hazardous chemicals. Information on control of static electricity can be found in AS 1020: *The control of undesirable static electricity.*

The auto-ignition temperature of the hazardous chemical should be considered as some hazardous chemicals may ignite spontaneously above certain temperatures.

The WHS Regulations define a hazardous area as an area in which:

- an explosible gas is present in the atmosphere in quantity that requires special precautions to be taken for the construction, installation and use of plant, or
- a combustible dust is present or could reasonably be expected to be present in the atmosphere in a quantity that requires special precautions to be taken for the construction, installation and use of plant.

Hazardous areas generally exist around flammable or combustible materials, for example, those present in tanks, drums or containers.

Further information on hazardous areas can be obtained from the following Australian Standards:

- AS/NZS 60079.10.1: Explosive atmospheres—Classification of areas—Explosive gas atmospheres (IEC 60079-10-1, Ed.1.0 MOD)
- AS/NZS 60079.10.2: Explosive atmospheres—Classification of areas—Combustible dust atmospheres.

Reducing vapour emissions

Accumulation of vapours creates the potential for a hazardous area to exist. Vapour emissions resulting from transfer can be minimised by:

- the use of enclosed transfer systems and vapour recovery connections
- keeping lids open only for the minimum period required for transfer
- minimising exposed surface areas
- avoidance of splash filling
- minimising the temperature of liquids being transferred, and
- providing extraction ventilation for all sources of vapour.

When heated, the vapour pressure of flammable and combustible materials may increase, resulting in higher vapour emissions. Containers of hazardous chemicals should therefore be stored away from sources of heat (for example heaters or other heating appliances). Heat may also deteriorate packaging and increase the risk of failure of the container.

Keeping hazardous chemicals stable

WHS Regulation 356

Keeping hazardous chemicals stable

As a PCBU, you must ensure, so far as is reasonably practicable, that hazardous chemicals do not become unstable, decompose or change so as to:

- create a hazard different to the hazard originally created by the hazardous chemical, or
- significantly increase the risk associated with any hazard in relation to the hazardous chemical.

Some hazardous chemicals are inherently unstable or highly reactive, or can become unstable under certain conditions.

The WHS Regulations require that a PCBU must:

- maintain the recommended proportions of ingredients, and other components that constitute the hazardous chemicals, for example, phlegmatizers, diluents, solvents, wetting agents, desensitisers, inhibitors and/or other adulterants, and

- keep the hazardous chemicals within any control temperature range where necessary.

To keep hazardous chemicals stable, you should also follow the manufacturer's instructions or instructions on the SDS including:

- using a stabilising ingredient where appropriate, and
- keeping the hazardous chemical and the packaging dry, unless the packages themselves are impervious to moisture.

These requirements do not apply where:

- the hazardous chemical is changed or allowed to become unstable without a risk to health or safety, as part of a deliberate process or activity, or
- the hazardous chemical undergoes a chemical reaction in a manifesting process or other deliberate process.

Some hazardous chemicals may provide an expiry date on the label and SDS. Where a chemical has passed its expiry date it should not be used, but be disposed of in accordance with the manufacturer's instructions and local laws.

Impact protection—containers, structures and plant

To prevent damage from the movement of the structure or plant, including any attached pipe work or equipment, you should ensure that structures or plant used for the storage or handling of hazardous chemicals are appropriately located and fixed to stable foundations.

Measures required for preventing or controlling impact normally depend on the nature of potential risks. Impact protection measures may be necessary for:

- structures containing large quantities of hazardous chemicals
- plant and equipment including storage and process vessels, associated pipe work, pumps and controls
- storage areas (including transit storage) for packages, intermediate bulk containers (IBCs) and associated shelves and racks, and
- exposed parts of the fire protection systems.

The most effective ways to protect containers, pipe work, pumps and attachments from impact is to locate the containers away from trafficable areas or prevent vehicle access. Installation of crash protection measures, such as bollards and guardrails, is an alternative means of impact protection. These should be designed to absorb the energy of any reasonably foreseeable impact and minimise the likelihood of injury to anyone involved in the incident.

Containing spills

WHS Regulation 357

Containing and managing spills

As a PCBU you must ensure, so far as is reasonably practicable, that where there is a risk of a spill or leak of a hazardous chemical in a solid or liquid form, provision is made in each part of the workplace where the hazardous chemical is used, handled, stored or generated for a spill containment system that contains within the workplace any spill or leak of the hazardous chemical and any resulting effluent.

When a spill, leak or accidental release of hazardous chemicals occurs, appropriate actions must be taken to contain the hazardous chemicals within the workplace.

The spill containment system must describe how to contain, clean up and dispose of the spill or leak and any resulting effluent. The system must not create a hazard by bringing together different hazardous chemicals that are not compatible or that would react together to cause a fire, explosion, harmful reaction or evolution of flammable, toxic or corrosive vapour.

Leaving containers open when not in use is one of the main causes of spills and can also lead to generating hazardous atmospheres and fire risks. Procedures, training and supervision should ensure containers are sealed when not in use.

Any spill containment system should be large enough to ensure that all spills can be held safely until cleaned up. Factors you should consider when designing a spill containment system include:

- the nature of the hazardous chemicals (whether liquid or solid)
- the quantity of the hazardous chemicals
- the size of the largest container or reasonably foreseeable largest spill
- the potential impact if the hazardous chemicals escape to the environment
- whether it is necessary to provide for the management of firefighting water at an incident
- separate spill containment for incompatible goods
- the materials used to construct the containment system, as well as any materials used for absorption, are compatible with the hazardous chemicals
- other materials in the vicinity that will prevent contamination of groundwater or soil, and
- how the system's integrity will be maintained in any reasonably foreseeable incident.

For large quantities of hazardous chemicals, bunding may be required. Bunding should be designed and constructed in accordance with the relevant Australian Standard specific to the type of hazardous chemical, for example AS 1940*: The storage and handling of flammable and combustible liquids*, and in consultation with the emergency services authority.

Transfer of hazardous chemicals

Transferring hazardous chemicals generally presents a far greater risk than static storage. Unconfined transfer of hazardous chemicals should be eliminated where possible, or, if that is not possible, steps should be taken to manage the risks of an unconfined transfer. Common methods for eliminating or reducing risks during transfer operations include:

- avoiding spillage or overflow, including overflow protection on equipment and receiving vessels
- providing emergency shut-offs to limit the amount of hazardous chemical released during a loss of containment
- providing a spill containment system
- reducing static electricity and vapour generation. This is particularly important for fire risk hazardous chemicals such as flammable liquids
- ensuring transfer fittings are compatible
- avoiding sources of ignition
- installing flow and pressure regulators on pipe work or pumps
- installing interlocking of valves and switches, and
- implementing systems for detecting losses from pipe work and fittings, such as static pressure loss detectors, measurement to determine losses in transfer, or external sensors.

Plumbed eye wash stations and safety showers should be installed in areas where workers may be exposed in the event of a spill during transfer operations.

Controlling risks from compressed gases

Key considerations for safe storage and handling of gas cylinders include:

- maintaining and regularly checking cylinders, regulators, hoses and pipes to cylinders to ensure that there are no leaks or dents
- storing cylinders in an upright position to ensure the safety device functions correctly
- securing cylinders to prevent dislodgement
- transport cylinders with appropriate equipment such as trolleys or gas cages
- keep the cylinder valve closed when the cylinder is not being used
- keep all sources of heat and ignition away from gas cylinders, even if the cylinders do not contain flammable material, and
- store cylinders outdoors or in very well ventilated areas.

Gas cylinders should be fitted with a bursting disc safety device and liquid petroleum gas (LPG) cylinders should have an operational spring-loaded pressure relief valve.

If a small leak occurs, the cylinder valve should be closed, if it is safe to do so. Appropriate PPE should be put on before attempting to locate the leak point. For toxic gases, self-contained breathing apparatus may be required for emergency use. The area should be well ventilated and air-conditioning systems should be turned off to avoid spreading gas. However, if a large amount of gas escapes, the area should be evacuated. If it is safe to do so, before evacuating, ventilate the area and remove or isolate ignition sources. Contact the gas supplier for advice, or in an emergency, contact the emergency services authority.

Potential risks associated with the transport and storage of small gas cylinders (for example, acetylene and LPG) in vehicles must also be managed appropriately.

A range of Australian Standards provide further information relating to controlling risks from compressed and liquefied gases, such as AS/NZS 1596: *The storage and handling of LP gas,* and AS 4332: *The storage and handling of gases in cylinders*.

Asphyxiation hazards

Key considerations in minimising the risk of asphyxiation include:

- avoiding working in oxygen-depleted (under 19 per cent) atmospheres—air monitoring may need to be undertaken to determine if the atmosphere is safe
- keeping the work area well-ventilated, particularly in low-lying areas and roof spaces where gases can accumulate—this could be done by ensuring windows are open where necessary and ventilation and extraction systems are on and are fully functional
- purging contaminants from the atmosphere or the space where work is being carried out
- using an air-supplied respirator, particularly in confined spaces (see the *Code of Practice: Confined spaces* for further information), and
- checking cylinders, cylinder fittings, hoses and connections to ensure that they are not damaged or in poor condition—this might include checking fittings and hoses for signs of corrosion or degradation or spraying them with a small amount of detergent solution or leak-detection spray and looking for bubble formations which may indicate the presence of a gas leak.

4.3. Maintaining control measures

WHS Regulation 37

Maintenance of control measures

As a PCBU, you must ensure that the implemented control measures remain effective. This includes checking that the control measures are fit for purpose; suitable for the nature and duration of the work and are installed and used correctly.

Maintenance of control measures may involve the following:

- regular inspections of control measures
- supervision to ensure workers are using the control measures properly
- preventative maintenance and testing programs for chemical storage and handling systems, and
- periodic air monitoring to ensure that engineering and administrative controls remain effective.

Maintenance procedures should include mechanisms for workers to report defective control measures as soon as they are identified so that prompt remedial action can be taken.

Preventative maintenance and integrity testing

WHS Regulation 363

Control of risks from storage or handling systems

You must ensure, so far as is reasonably practicable, that a system used at the workplace for the use, handling or storage of hazardous chemicals is used only for the purpose for which it was designed, manufactured, modified, supplied or installed and is operated, tested, maintained, installed, repaired and decommissioned having regard to the safety of workers and other persons at the workplace.

Systems for the storage and handling of hazardous chemicals generally require ongoing maintenance and testing to ensure that they continue to be safe for the intended use and that they maintain their operational integrity. Such systems include, but are not limited to, reaction vessels, chemical transfer lines, pumps, spill bunding, storage tanks and filters.

To ensure that the integrity of chemical handling systems are preserved, planned maintenance programs should be designed and carried out at regular intervals, consistent with the manufacturer's instructions or advice provided by other competent persons. If this is not reasonably practicable, inspections and maintenance should be carried out annually.

Examples of preventative maintenance and integrity testing might include:

- Inspection of glass linings on steel or metal alloy reaction vessels to ensure there are no cracks or holes which might allow contact of incompatible materials with the metal vessel.
- Regular checking of bursting (rupture) discs and pressure-relief systems on pressure vessels to ensure they have not 'blown' and are of the correct pressure rating for the work being performed. Bursting or rupture discs are safety features of cylinders that prevent damage or injury from over-pressurisation.
- Checking spill bunding walls for cracks or other signs of wear to ensure that, in the event of a spill, the bunding will not leak or fail.
- Checking for signs of corrosion or degradation on tanks, pipe work and compressed gas fittings.

If preventative maintenance checks show that the integrity of any chemical handling system is in doubt or not performing as it is intended, repair or replacement of the faulty system should be carried out as soon as practicable and before its next use.

4.4. Providing information, training, instruction and supervision

WHS Act section 19

Primary duty of care

WHS Regulation 39

Provision of information, training and instruction

The WHS Act requires that a PCBU ensure, so far as reasonably practicable, the provision of any information, training, instruction or supervision that is necessary to protect all persons from risks to their health and safety arising from work carried out as part of the conduct of the business or undertaking.

As a PCBU you must ensure that information, training or instruction provided to a worker is suitable and adequate having regard to:

- the nature of the work carried out by the worker
- the nature of the risks associated with the work at the time the information, training or instruction is provided, and
- the control measures implemented.

You must also ensure, so far as is reasonably practicable, that the information, training and instruction are provided in a way that is readily understandable for the worker to whom it is provided.

Workers must be trained and have the appropriate skills to carry out a particular task safely. Training should be provided to workers by a competent person.

WHS Regulation 379

Duty to provide supervision

In addition to your general duty to provide any supervision necessary to protect all persons from work health and safety risks, the WHS Regulations also impose specific duties to provide supervision necessary to protect a worker from risks to health and safety where the worker:

- uses, handles, generates or stores a hazardous chemical
- operates, tests, maintains, repairs or decommissions a storage or handling system for a hazardous chemical, or
- is likely to be exposed to a hazardous chemical.

Information, training, instruction and supervision must be provided not only to workers but to other persons at the workplace such as visitors.

Information, training and instruction should include the following:

- the nature of the hazardous chemicals involved and the risks to the worker
- the control measures implemented, how to use and maintain them correctly, for example how and when to clean or replace filters on a spray-painting booth
- the arrangements in place to deal with emergencies, including evacuation procedures, containing and cleaning up spills and first aid instructions
- the selection, use, maintenance and storage of any PPE required to control risks and the limitations of the PPE

- any health monitoring which may be required and the worker's rights and obligations
- the labelling of containers of hazardous chemicals, the information that each part of the label provides and why the information is being provided
- the availability of SDS for all hazardous chemicals, how to access the SDS, and the information that each part of the SDS provides, and
- the work practices and procedures to be followed in the use, handling, processing, storage, transportation, cleaning up and disposal of hazardous chemicals.

The WHS Regulations also include specific requirements to provide information, training and instruction regarding:

- the proper use, wearing, storage and maintenance of PPE
- undertaking work in confined spaces
- emergency procedures, and
- storage and handling systems for hazardous chemicals.

Information, training and instruction must be provided in such a way that it is easily understood. The amount of detail and extent of training will depend on the nature of the hazards and the complexity of the work procedures and control measures required to minimise the risks.

Records of training provided to workers should be kept, documenting who was trained, when and on what.

5. Monitoring and review

5.1. Health monitoring

WHS Regulation 368

Duty to provide health monitoring

As a person conducting a business or undertaking (PCBU), you must ensure health monitoring is provided to a worker carrying out work for the business or undertaking if:

- the worker is carrying out ongoing work using, handling, generating or storing hazardous chemicals and there is a significant risk to the worker's health because of exposure to a hazardous chemical referred to in Schedule 14, table 14.1 of the WHS Regulations, and
- the person identifies that because of ongoing work carried out by a worker using, handling, generating or storing hazardous chemicals there is a significant risk that the worker will be exposed to a hazardous chemical (other than a hazardous chemical referred to in Schedule 14, table 14.1 of the WHS Regulations) and either:

- valid techniques are available to detect the effect on the worker's health, or
- a valid way of determining biological exposure to the hazardous chemical is available and it is uncertain, on reasonable grounds, whether the exposure to the hazardous chemical has resulted in the biological exposure standard being exceeded.

Health monitoring of a worker means monitoring the worker to identify changes in their health status because of exposure to certain substances. It involves the collection of data to measure exposure or evaluate the effects of exposure and to determine whether or not the absorbed dose is within safe levels.

Health monitoring allows decisions to be made about implementing ways to eliminate or minimise the worker's risk of exposure, for example reassigning a worker to other duties that involve less exposure, or improving control measures.

Schedule 14, table 14.1 (reproduced at Appendix E of this Code) includes the type of health monitoring that must be carried out for each hazardous chemical listed, unless:

- an equal or better type of health monitoring is available, and
- the use of that other type of monitoring is recommended by a registered medical practitioner with experience in health monitoring.

Health monitoring is not an alternative to implementing control measures. Health monitoring is a way of identifying if control measures are effective. If the results of health monitoring indicate that a worker is experiencing adverse health effects or signs of exposure to a hazardous chemical, the control measures must be reviewed and if necessary revised.

You must:

- inform workers and prospective workers about health monitoring requirements
- ensure health monitoring is carried out by or under the supervision of a registered medical practitioner with experience in health monitoring
- consult workers in relation to the selection of the registered medical practitioner
- pay all expenses relating to health monitoring
- provide certain information about a worker to the registered medical practitioner

- take all reasonable steps to obtain a report from the registered medical practitioner as soon as practicable after the monitoring has been carried out
- provide a copy of the report to the worker as soon as practicable after obtaining the report
- provide a copy of the report to the regulator if the report contains test result that indicate the worker may have contracted a disease, injury or illness or recommends remedial measures should be taken as a result of the work that triggered the requirement for health monitoring
- provide the report to all other persons conducting a business or undertaking who have a duty to provide health monitoring for the worker as soon as reasonably practicable after obtaining the report
- keep reports as confidential records for at least 30 years after the record is made (40 years for reports relating to asbestos exposure), and
- not disclose the report to anyone without the worker's written consent unless required under the WHS Regulations.

The WHS Regulations also contain specific requirements relating to health monitoring for lead and asbestos. Further information on health monitoring can be found in SWA's Health monitoring for exposure to hazardous chemicals – guide for persons conducting a business or undertaking.

5.2. Reviewing control measures

WHS Regulation 38

Review of control measures

You must review and, as necessary, revise control measures so as to maintain, so far as is reasonably practicable, a work environment that is without risks to health or safety.

WHS Regulation 352

Review of control measures

You must also ensure that any measures implemented to control risks in relation to a hazardous chemical at the workplace are reviewed and as necessary revised.

Control measures must be reviewed (and revised if necessary) in the following circumstances:

- when the control measure does not control the risk it was implemented to control so far as is reasonably practicable
- before a change at the workplace that is likely to give rise to a new or different risk to health and safety that the measure may not effectively control
- a new relevant hazard or risk is identified
- the results of consultation indicate that a review is necessary
- a health and safety representative requests a review if that person reasonably believes that:
  - a circumstance in any of the above points affects or may affect the health and safety of a member of the work group represented by the health and safety representative
  - the control measure has not been adequately reviewed in response to the circumstance.

- if an SDS or register of hazardous chemicals is changed
- if a health monitoring report for a worker contains:
  - test results that the worker has been exposed to a hazardous chemical and has an elevated level of the chemical or metabolites for that hazardous chemical in their body
  - any advice that test results indicate the worker may have contracted a disease, injury or illness as a result of carrying out the work that triggered the need for health monitoring
  - any recommendation that the PCBU take remedial measures, including whether the worker can continue to carry out the type of work that triggered the requirement for health monitoring.
- if atmospheric monitoring indicates that the airborne concentration of a hazardous chemical at the workplace exceeds the relevant exposure standard, and
- at least once every five years.

A change at the workplace includes:

- a change to the workplace itself or any aspect of the work environment, and
- a change to a system of work, a process or a procedure.

Common review methods include workplace inspection, consultation, testing and analysing records and data.

You can use the same methods as in the initial hazard identification step to check control measures. When reviewing the control measures, consultation must occur with workers and their health and safety representatives. The following questions should be considered when undertaking the review:

- Are the control measures working effectively in both their design and operation?
- Have the control measures introduced new problems?
- Have all hazards been identified?
- Have new work methods, new equipment or chemicals made the job safer?
- Are safety procedures being followed?
- Has the instruction and training provided to workers on how to work safely been successful?
- Are workers actively involved in identifying hazards and possible control measures? Are they openly raising health and safety concerns and reporting problems promptly?
- Are the frequency and severity of health and safety incidents reducing over time?
- If new legislation or new information becomes available, does it indicate current controls may no longer be the most effective?

If problems are found, go back through the risk management steps, review your information and make further decisions about risk control.

6. Emergency preparedness

Regardless of controls put in place to prevent incidents occurring in your workplace, they can still occur. For example, people can be exposed to chemicals and require immediate medical treatment, a fire can start, or a loss of containment can occur. It is therefore necessary to be prepared for any foreseeable incident.

6.1. Emergency plan

WHS Regulation 43

Duty to prepare, maintain and implement emergency plan

As a person conducting a business or undertaking (PCBU), you must prepare an effective emergency plan for the workplace.

WHS Regulation 361

Emergency plans

An emergency plan must be prepared and provided to the emergency services organisation if the quantity of Schedule 11 hazardous chemicals used, handled or stored at a workplace exceeds the manifest quantity for that hazardous chemical. You must revise the plan in accordance with any recommendations the primary emergency services organisation provides about its effectiveness.

The purpose of the emergency plan is to plan for, and thus minimise the effects of, any dangerous occurrence or near miss at a workplace resulting from handling of hazardous chemicals.

When developing an emergency plan, consideration must be given to the following factors:

- the nature of the work being carried out at the workplace
- the nature of the hazards at the workplace
- the size and location of the workplace, and
- the number of workers and other persons at the workplace.

For workplaces that use, store or handle large quantities of hazardous chemicals, providing a copy of emergency plans and details of actions to be taken in the event of an alarm or emergency situation to neighbouring sites may assist in coordinating responses in the event of an emergency.

Additional information regarding emergency management associated with the storage and handling of flammable hazardous chemicals is available in AS 1940: *The storage and handling of flammable and combustible liquids*.

More information about emergency plans can be found in SWA's *Emergency Plans Fact Sheet*, and information about emergency plans for major hazard facilities can be found in SWA's *Guide for Major Hazard Facilities—Emergency plans*.

Content of emergency plan

The emergency plan must provide for:

- emergency procedures that include:

- an effective response to an emergency
- evacuation procedures
- notification procedures to advise emergency services organisations at the earliest opportunity
- medical treatment and assistance
- communication procedures between the person coordinating the emergency response and all persons at the workplace.

- the testing procedures and how often they will be done
- how relevant workers will be provided with information, training and instruction about implementing the emergency procedures.

A comprehensive emergency plan should also include:

- a site map that indicates where hazardous chemicals are stored
- responsibilities of key persons in managing emergencies
- circumstances to activate the plan
- systems for raising the alarm
- estimating the extent of the emergency
- alerting emergency services organisations to the emergency or if it has the potential to become a dangerous occurrence
- procedures that account for all people at the workplace
- isolation of the emergency area to prevent entry by non-essential personnel
- roles of on-site emergency response teams (including First Aid Officers, Emergency Wardens)
- containment of any spillage
- the requirement for firefighting water retention to ensure that contaminated firefighting water cannot enter waterways, drains or groundwater
- disconnection of power supplies and other energy sources except when required to maintain safety of a critical operation or to run emergency equipment such as fire booster pumps
- prevention of hazardous chemicals or contaminated material of any kind from entering drains or waterways
- provision of relevant information and assistance to the emergency services authority, both in anticipation of emergencies and when they occur
- maintenance of site security throughout the emergency
- provision for dealing with the public and the press, and
- site rehabilitation requirements.

Emergency procedures

The extent of emergency procedures required will depend on the size and complexity of the workplace, types and quantities of hazardous chemicals and the processes involved when the goods are in use. As a minimum, emergency procedures should include instructions on:

- how to raise the alarm, including how to contact the appropriate emergency services organisation
- any actions to be taken by workers in an emergency to ensure the safety and health of all persons at the workplace to minimise risks, damage to property as well as the environment, and
- any actions to be taken by prescribed persons such as fire wardens, for example how to evacuate the workplace or use fire extinguishers.

To be effective, workers need to be appropriately trained, and any procedures tested. Workers should be consulted and ideally directly involved in the development of emergency procedures.

An example of an effective emergency procedure is a simple one-page document in point form, suitable for display on signs or to be carried by workers or visitors as a pocket card, detailing evacuation procedures, assembly areas, identifying first aid officers and emergency wardens at the workplace, contact numbers of emergency services organisations (such as fire brigade, police, ambulance, local hospital and regulatory authorities).

Consultation and communication

The emergency plan must be developed in consultation with your workers, the primary emergency services organisation and neighbouring premises. The emergency services organisation should also be consulted when developing and designing fire protection systems used in the workplace.

Off-site considerations

Where any foreseeable incident may have effects beyond the boundary of the workplace, the emergency plan should also address managing the off-site effects. Where off-site effects are possible, the plan should contain information on necessary warnings or communications with neighbouring premises.

Where the emergency plan includes activities that involve persons who reside or work adjacent to the workplace, the relevant parts of the plan should be communicated to those persons.

Implementation and testing

The emergency plan should be tested when first devised and after each modification.

Throughout the year, at suitable intervals, practice drills and simulated emergencies should be undertaken and involve all workers and the emergency services authority. These drills should be focused on familiarising anyone who would be involved in an incident related to the storage and handling of hazardous chemicals with the workplace procedures.

Reviewing the emergency plan

The emergency plan should be reviewed:

- within five years of its development
- in intervals of no more than five years
- if there is a change of risk at or in the proximity of the workplace
- when updated information becomes available, or
- if a possible deficiency is identified, for example through regular testing.

Emergency plans should be readily available in hard copy form at all times. The location of the emergency plan should be easily located by all workers and should be discussed with the emergency services organisation when it is updated or reviewed.

6.2. Emergency equipment and safety equipment

WHS Regulations Part 7.1 Division 5: Subdivision 3

Emergency plans and safety equipment

As a PCBU that uses, handles, generates or stores hazardous chemicals you must ensure that equipment is always available at the workplace for use in an emergency.

The type of emergency equipment required to respond to an emergency, contain and clean up spills and assist workers in conducting emergency procedures safely will vary depending on the type and quantities of hazardous chemicals at the workplace.

Equipment must be located so it is readily accessible for all workers if an emergency arises. If safety equipment is needed to respond to an emergency, you must ensure that it is provided, maintained and readily accessible at the workplace. Safety equipment for use with hazardous chemicals should be compatible with the hazardous chemicals they may come in contact with. For example, water fire extinguishers must not be used on oil fires.

Examples of emergency equipment that may be required in your workplace include:

- over packs such as oversized drums for containing leaking containers
- absorbent material suitable for the chemical likely to be spilled
- booms, plates and/or flexible sheeting for preventing spillage from entering drains and waterways
- fire extinguishers
- neutralising agents such as lime and soda ash
- suitable pumps and hoses for removing spilled material
- first aid kits (including antidotes for specific chemical exposures such as cyanide)
- emergency showers and eye wash stations
- hand tools such as mops, buckets, squeegees and bins, and
- suitable protective clothing and equipment to protect the safety and health of personnel involved in the clean-up.

6.3. Fire protection systems

WHS Regulation 359

Fire protection and firefighting equipment

As a PCBU, you must ensure that fire protection and firefighting equipment:

- is designed and built for the types of hazardous chemicals at the workplace in the quantities in which they are used, handled, generated or stored at the workplace and the conditions under which they are used, handled, generated or stored
- is compatible with firefighting equipment used by the primary emergency service organisation
- is properly installed, tested and maintained, and
- has its latest testing date recorded and test results are kept until the next test is conducted.

Where large quantities of hazardous chemicals are used, handled, generated or stored in your workplace simple fire extinguishers may not be sufficient to deal with a fire. In these cases you need to consider installing a fire protection system that is designed for the types and quantities of hazardous chemicals used, handled, generated or stored in your workplace.

When installing a fire protection system you must have regard to:

- the fire load of the hazardous chemicals and from other sources
- the compatibility of the hazardous chemicals with other substances or mixtures at the workplace, and
- the compatibility of the equipment with equipment used by the primary emergency service organisation.

You should also consider the proximity of the workplace to other workplaces or premises and any requirements under the Building Code of Australia.

The fire protection system should have the capacity to quickly control and extinguish any fire that occurs involving the hazardous chemicals. It should also effectively protect the hazardous chemicals stored within the workplace from any fire in adjacent properties.

If at any stage the fire protection or firefighting equipment becomes ineffective or inoperable, you must assess the implications of having an unserviceable or inoperative system and must control the risk with alternative measures. In these circumstances you should make sure that alternative arrangements are made immediately. If alternative resources cannot be obtained to provide the required level of protection, it may be necessary to cease operating until effective fire protection can be restored. You must ensure that the fire protection and firefighting equipment are returned to full operation as soon as possible.

6.4. Monitors and alarms

Monitors and alarms can be critical to controlling an emergency situation as they allow the emergency or dangerous situation to be identified early and response actions initiated quickly. Effective alarm systems should:

- activate automatically and be capable of being operated manually through the use of clearly identified alarm activators at convenient and safe locations, that are easily accessible to work areas
- utilise alarm signals that are distinguishable from any other signal and are clearly audible throughout the premises
- contain a visual component (for example, flashing lights) in situations where there are high noise levels or the use of protective clothing may prevent the recognition of an alarm signal, and
- remain operable if the main power supply fails.

Monitors and alarms should be installed in accordance with manufacturers' specifications. Fire alarms should be installed where fire control may require the direction of large quantities of firefighting water (or equivalent) at a fixed installation, with minimum exposure to risks for fire fighters. Where large quantities of hazardous chemicals are involved, it is recommended that this be done in consultation with the relevant emergency services authority.

To ensure that monitors and alarms remain effective, they should be tested regularly.

6.5. Automatic sprinkler systems

Depending on the level of risk, you may choose to install an automatic sprinkler system. Automatic sprinkler systems may allow the fire to be controlled almost immediately after it starts. However, they may not be suitable in all workplaces, for example where use of water as the extinguishing agent is not appropriate because of the presence of chemicals that react with water. Automatic sprinkler systems may comprise:

- individual-actuation sprinklers
- deluge sprinklers
- foam sprinklers, or
- a combination of any of the above.

6.6. Water supply

A reliable water supply is required to ensure that the protection system remains operable in case of an emergency. The supply should be sufficient to supply both the internal fire protection equipment and additional equipment used by the emergency services organisation controlling a fire at the premises.

Where sufficient supply is not available from the main water supply, it may be necessary to supplement this with additional water storage and/or pumps. If the local authorities permit it, water may be obtained from reliable alternative sources such as close-by rivers and dams, using whatever resources are suitable.

The emergency services organisation that is attending a fire at the workplace should be requested to conduct regular checks on the adequacy of the local water supply and water pressure within the workplace.

Appendix A—Glossary

Table 5 The meaning of key terms

Key terms	Meaning
ADG Code	The Australian Code for the Transport of Dangerous Goods by Road and Rail, as in force or remade from time to time, approved by the Transport and Infrastructure Council. The ADG Code is accessible at the National Transport Commission website www.ntc.gov.au
Article	A manufactured item, other than a fluid or particle, that is formed into a particular shape or design during manufacture and has hazard properties and a function that are wholly or partly dependent on the shape or design.
Biological monitoring	The measurement and evaluation of a substance, or its metabolites, in the body tissue, fluids or exhaled air of a person exposed to that substance, such as blood lead level monitoring.
Combustible substance	A substance that is combustible and includes dust, fibres, fumes, mists or vapours produced by the substance.
Container	Anything in or by which a hazardous chemical is, or has been, wholly or partly covered, enclosed or packed, including anything necessary for the container to perform its function as a container.
Correct classification	The set of hazard classes and hazard categories assigned to a hazardous chemical when it is correctly classified. *Note: Part 1 of Schedule 9 of the WHS Regulations sets out when a hazardous chemical is correctly classified.*
Duty holder	Any person who owes a work health and safety duty under the WHS Act including a person conducting a business or undertaking, a designer, manufacturer, importer, supplier, installer of products or plant used at work (upstream duty holder), officer or a worker.
Exposure standard	An exposure standard published by Safe Work Australia in *the Workplace Exposure Standards for Airborne Contaminants*.
Flash point	The lowest temperature (corrected to a standard pressure of 101.3 kPa) at which the application of an ignition source causes the vapours of a liquid to ignite under specified test conditions.
GHS	The *Globally Harmonized System of Classification and Labelling of Chemicals, 7th Revised Edition*, published by the United Nations as modified by Schedule 6 to the WHS Regulations.

Key terms	Meaning
Hazard	A situation or thing that has the potential to harm a person. Hazards at work may include: noisy machinery, a moving forklift, chemicals, electricity, working at heights, a repetitive job, bullying and violence at the workplace.
Hazard category	A division of criteria within a hazard class in the GHS.
Hazard class	The nature of a physical, health or environmental hazard under the GHS. *Note: This includes dangerous goods.*
Hazardous area	An area in which: – an explosible gas is present in the atmosphere in a quantity that requires special precautions to be taken for the construction, installation and use of plant, or – a combustible dust is present or could reasonably be expected to be present in the atmosphere in a quantity that requires special precautions to be taken for the construction, installation and use of plant.
Hazardous chemical	Any substance, mixture or article that satisfies the criteria for any one or more hazard classes in the GHS (including a classification referred to in Schedule 6 of the WHS Regulations), unless the only hazard class or classes for which the substance, mixture or article satisfies the criteria are any one or more of the following: – acute toxicity—oral—category 5 – acute toxicity—dermal—category 5 – acute toxicity—inhalation—category 5 – skin corrosion/irritation—category 3 – aspiration hazard—category 2 – flammable gas—category 2 – acute hazard to the aquatic environment—category 1, 2 or 3 – chronic hazard to the aquatic environment—category 1, 2, 3 or 4 – hazardous to the ozone layer. Note: The Schedule 6 tables replace some tables in the GHS.
Hazard pictogram	A graphical composition, including a symbol plus other graphical elements, that is assigned in the GHS to a hazard class or hazard category.
Hazard statement	A statement assigned in the GHS to a hazard class or hazard category describing the nature of the hazards of a hazardous chemical including, if appropriate, the degree of hazard.
Health and safety committee	A consultative body established under the WHS Act. The committee's functions include facilitating cooperation between workers and the person conducting a business or undertaking to ensure workers' health and safety at work, and assisting to develop work health and safety standards, rules and procedures for the workplace.

Key terms	Meaning
Health and safety representative	A worker who has been elected by their work group under the WHS Act to represent them on health and safety matters.
Label	Written, printed or graphical information elements concerning a hazardous chemical that is affixed to, printed on, or attached to the container of a hazardous chemical.
Manufacture	The activities of packing, repacking, formulating, blending, mixing, making, remaking and synthesising of the chemical.
May	'May' indicates an optional course of action.
Mixture	A combination of, or a solution composed of, two or more substances that do not react with each other.
Must	'Must' indicates a legal requirement exists that must be complied with.
Officer	An officer under the WHS Act includes: – an officer within the meaning of section 9 of the Corporations Act 2001 (Commonwealth) – an officer of the Crown within the meaning of section 247 of the WHS Act, and – an officer of a public authority within the meaning of section 252 of the WHS Act. A partner in a partnership or an elected member of a local authority is not an officer while acting in that capacity.
Person conducting a business or undertaking (PCBU)	A PCBU is an umbrella concept which intends to capture all types of working arrangements or relationships. A PCBU includes a: – company – unincorporated body or association – sole trader or self-employed person. Individuals who are in a partnership that is conducting a business will individually and collectively be a PCBU. A volunteer association (defined under the WHS Act, see below) or elected members of a local authority will not be a PCBU.
Placard	A sign or notice displayed or intended for display in a prominent place, or next to a container or storage area for hazardous chemicals at a workplace, that contains information about the hazardous chemical stored in the container or storage area.
Placard quantity	The quantity referred to in Schedule 11 of the WHS Regulations, table 11.1, column 4 for that hazardous chemical. *Note: This schedule has been replicated in Appendix D of this Code.*

Key terms	Meaning
Precautionary Statement	A phrase prescribed by the GHS that describes measures that are recommended to be taken to prevent or minimise the adverse effects of exposure to a hazardous chemical or the improper handling of a hazardous chemical.
Risk	The possibility harm (death, injury or illness) might occur when exposed to a hazard.
Should	'Should' indicates a recommended course of action.
Substance	A chemical element or compound in its natural state or obtained or generated by a process: – including any additive necessary to preserve the stability of the element or compound and any impurities deriving from the process, but – excluding any solvent that may be separated without affecting the stability of the element or compound, or changing its composition.
Supply	Selling or transferring ownership or responsibility for a chemical.
Volunteer association	A group of volunteers working together for one or more community purposes where none of the volunteers, whether alone or jointly with any other volunteers, employs any person to carry out work for the volunteer association.
Work group	A group of workers established to facilitate the representation of workers by one or more health and safety representatives. A work group may be all workers at a workplace but it may also be appropriate to split a workplace into multiple work groups where workers share similar work conditions or are exposed to similar risks and hazards. For example all workers on night shift.
Worker	Any person who carries out work for a person conducting a business or undertaking, including work as an employee, contractor or subcontractor (or their employee), self-employed person, outworker, apprentice or trainee, work experience student, employee of a labour hire company placed with a 'host employer' or a volunteer.
Workplace	Any place where work is carried out for a business or undertaking and includes any place where a worker goes, or is likely to be, while at work. This may include offices, factories, shops, construction sites, vehicles, ships, aircraft or other mobile structures on land or water.

Appendix B—Comparison of hazard classes and categories under the ADG Code and the GHS[1]

ADG class/category, packing group	Equivalent GHS class and category as classified under the WHS Regulations
Class 1 Explosives	
Unstable explosives (Goods too dangerous to be transported)	Unstable explosives
Division 1.1	Division 1.1
Division 1.2	Division 1.2
Division 1.3	Division 1.3
Division 1.4	Division 1.4
Division 1.5	Division 1.5
Division 1.6	Division 1.6
Class 2 Gases	Gases under pressure NOTE: The GHS has 4 categories which correspond to the transport condition under the ADG Code. They are: – Gas under pressure—Compressed gas – Gas under pressure—Liquefied gas – Gas under pressure—Refrigerated liquefied gas – Gas under pressure—Dissolved gas.
Division 2.1	Flammable gases category 1, 1A and 1B including Pyrophoric Gases, and Chemicals Unstable Gases. Aerosols category 1 and category 2
Division 2.2	Oxidising gases category 1 Aerosols category 3 Gases under pressure not otherwise specified
Division 2.3[2]	Acute toxicity: Inhalation categories 1–4 (Note: category 4 only up to LC_{50} of 5000 ppmV) Skin corrosion/irritation categories 1A–C
Class 3 PG I	Flammable liquids category 1

[1] Substances and mixtures classified as Desensitized explosives in the GHS may be classified for transport under the ADG Code for transport in Division 4.1 (solids), Class 3 (liquids), or Class 5 (solids or liquids).
[2] Division 2.3 dangerous goods also may be aerosols – category 3 in some circumstances.

ADG class/category, packing group	Equivalent GHS class and category as classified under the WHS Regulations
Class 3 PG II	Flammable liquids category 2
Class 3 PG III	Flammable liquids category 3
Division 4.1 Self-reactive substances types A–G[3] [1]	Self-reactive substances types A–F ADG Code Type G self-reactive substances are not classified under WHS Regulations as hazardous chemicals.
Division 4.1 PG II	Flammable solids category 1
Division 4.1 PG III	Flammable solids category 2
Division 4.2 PG 1	Pyrophoric liquids category 1 Pyrophoric solids category 1
Division 4.2 PG II	Self-heating substances category 1
Division 4.2 PG III	Self-heating substances category 2
Division 4.3 PG I	Substances and mixtures which in contact with water emit flammable gases, category 1
Division 4.3 PG II	Substances and mixtures which in contact with water emit flammable gases, category 2
Division 4.3 PG III	Substances and mixtures which in contact with water emit flammable gases, category 3
Division 5.1 PG I	Oxidising solids, oxidising liquids, category 1
Division 5.1 PG II	Oxidising solids, oxidising liquids, category 2
Division 5.1 PG III	Oxidising solids, oxidising liquids, category 3

[3] *Depending on packing method, self-reactive substances and organic peroxides type A will either be classified under the ADG Code as 'Goods too dangerous to be transported' or their comparative Divisions (4.1 or 5.2).*

ADG class/category, packing group	Equivalent GHS class and category as classified under the WHS Regulations
Division 5.2 Organic Peroxides types A–G[1]	Organic peroxides types A–F ADG Code Type G organic peroxides are not classified under WHS Regulations as hazardous chemicals.
Division 6.1 PG I	Acute toxicity: Oral category 1 Acute toxicity: Dermal category 1 Acute toxicity: Inhalation category 1 (dusts, mists, vapours)
Division 6.1 PG II	Acute toxicity: Oral category 2 Acute toxicity: Dermal category 2 Acute toxicity: Inhalation category 2 (dusts, mists, vapours)
Division 6.1 PG III	Acute toxicity: Oral category 3 Acute toxicity: Dermal category 3 Acute toxicity: Inhalation category 3 (dusts, mists, vapours)
Division 6.2	No equivalent GHS class and not classified under WHS Regulations as hazardous chemicals.
Division 7	No equivalent GHS class and not classified under WHS Regulations as hazardous chemicals.
Class 8 PG I	Skin corrosion category 1A
Class 8 PG II	Skin corrosion category 1B
Class 8 PG III	Skin corrosion category 1C Corrosive to metals category 1
Class 9[4]	Not classified under the WHS Regulations.
Goods too dangerous to be transported	Self-reactive substances type A[1] Organic peroxides type A[1] Unstable explosives
C1 combustible liquids (flash point 60–150°C)	Flammable liquids category 4 (flash point 60–93°C)

[4] Class 9 dangerous goods include ecotoxicological hazard classes and categories, and are not mandatory under WHS Regulations. They may be used to supplement the GHS classification of a substance or a mixture or to comply with other environmental legislation.

Appendix C—Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals

The table below shows prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals, as specified in the WHS Regulations (Schedule 10) and WHS Regulations 340 and 380–384.

The prohibition of the use of carcinogens listed in Table 6 column 2 and the restriction of the use of carcinogens listed in Table 7 column 2 apply to the pure substance and where the substance is present in a mixture at a concentration greater than 0.1%, unless otherwise specified.

Table 6 Prohibited carcinogens

Column 1 Item	Column 2 Prohibited carcinogen [CAS number]
1	2-Acetylaminofluorene [53-96-3]
2	Aflatoxins
3	4-Aminodiphenyl [92-67-1]
4	Benzidine [92-87-5] and its salts (including benzidine dihydrochloride [531-85-1])
5	bis(Chloromethyl) ether [542-88-1]
6	Chloromethyl methyl ether [107-30-2] (technical grade which contains bis(chloromethyl) ether)
7	4-Dimethylaminoazobenzene [60-11-7] (Dimethyl Yellow)
8	2-Naphthylamine [91-59-8] and its salts
9	4-Nitrodiphenyl [92-93-3]

Table 7 Restricted carcinogens

Column 1 Item	Column 2 Restricted carcinogen [CAS Number]	Column 3 Restricted use
1	Acrylonitrile [107-13-1]	All

Column 1 Item	Column 2 Restricted carcinogen [CAS Number]	Column 3 Restricted use
2	Benzene [71-43-2]	All uses involving benzene as a feedstock containing more than 50% of benzene by volume Genuine research or analysis
3	Cyclophosphamide [50-18-0]	When used in preparation for therapeutic use in hospitals and oncological treatment facilities, and in manufacturing operations Genuine research or analysis
4	3,3'-Dichlorobenzidine [91-94-1] and its salts (including 3,3'-Dichlorobenzidine dihydrochloride [612-83-9])	All
5	Diethyl sulfate [64-67-5]	All
6	Dimethyl sulfate [77-78-1]	All
7	Ethylene dibromide [106-93-4]	When used as a fumigant Genuine research or analysis
8	4,4'-Methylene bis(2-chloroaniline) [101-14-4] MOCA	All
9	3-Propiolactone [57-57-8] (Beta-propiolactone)	All
10	o-Toluidine [95-53-4] and o-Toluidine hydrochloride [636-21-5]	All
11	Vinyl chloride monomer [75-01-4]	All

Table 8 Restricted hazardous chemicals

Column 1 Item	Column 2 Restricted hazardous chemical	Column 3 Restricted use
1	Antimony and its compounds	For abrasive blasting at a concentration of greater than 0.1% as antimony

Column 1 Item	Column 2 Restricted hazardous chemical	Column 3 Restricted use
2	Arsenic and its compounds	For abrasive blasting at a concentration of greater than 0.1% as arsenic For spray painting
3	Benzene (benzol), if the substance contains more than 1% by volume	For spray painting
4	Beryllium and its compounds	For abrasive blasting at a concentration of greater than 0.1% as beryllium
5	Cadmium and its compounds	For abrasive blasting at a concentration of greater than 0.1% as cadmium
6	Carbon disulphide (carbon bisulphide)	For spray painting
7	Chromate	For wet abrasive blasting
8	Chromium and its compounds	For abrasive blasting at a concentration of greater than 0.5% (except as specified for wet blasting) as chromium
9	Cobalt and its compounds	For abrasive blasting at a concentration of greater than 0.1% as cobalt
10	Free silica (crystalline silicon dioxide)	For abrasive blasting at a concentration of greater than 1%
11	Lead and compounds	For abrasive blasting at a concentration of greater than 0.1% as lead or which would expose the operator to levels in excess of those set in the WHS regulations covering lead
12	Lead carbonate	For spray painting
13	Methanol (methyl alcohol), if the substance contains more than 1% by volume	For spray painting
14	Nickel and its compounds	For abrasive blasting at a concentration of greater than 0.1% as nickel
15	Nitrates	For wet abrasive blasting

Column 1 Item	Column 2 Restricted hazardous chemical	Column 3 Restricted use
16	Nitrites	For wet abrasive blasting
17	Radioactive substance of any kind where the level of radiation exceeds 1 Bq/g	For abrasive blasting, so far as is reasonably practicable
18	Tetrachloroethane	For spray painting
19	Tetrachloromethane (carbon tetrachloride)	For spray painting
20	Tin and its compounds	For abrasive blasting at a concentration of greater than 0.1% as tin
21	Tributyl tin	For spray painting

Note: Regulation 382 deals with polychlorinated biphenyls (PCBs).

Appendix D—Placard and manifest quantities

The table below shows placard and manifest quantities of hazardous chemicals, as specified in the WHS Regulations Schedule 11. The final column of this table shows the link between the GHS classes and categories and the equivalent classes and categories of dangerous goods under the ADG Code.

Note: Where the WHS Regulations (Schedule 13) require a placard, the relevant dangerous goods class label (pictogram) must be displayed on the placard, rather than the corresponding GHS pictogram.

Column 1	Column 2	Column 3	Column 4	Column 5	ADG Code Classification
Item	Description of hazardous chemical Hazard Class	Description of hazardous chemical Hazard Category	Placard quantity	Manifest quantity	
1	Flammable gases	Category 1A, category 1B or any combination of categories 1A and 1B	200L	5000L	2.1
2	Gases under pressure	With acute toxicity, categories 1, 2, 3 or 4 Note—Category 4 only up to LC50 of 5000 ppmV	50L	500L	2.3
3		With skin corrosion categories 1A, 1B or 1C	50L	500L	2.3
4		Not specified elsewhere in this table	1000L	10 000L	2.2
5	Aerosols	Category 1, category 2, category 3 or any combination of these categories	5000L	10 000L	2.1 or 2.2

Column 1 Item	Column 2 Description of hazardous chemical Hazard Class	Column 3 Description of hazardous chemical Hazard Category	Column 4 Placard quantity	Column 5 Manifest quantity	ADG Code Classification
6	Flammable liquids	Category 1	50L	500L	3 (PG I)
7		Category 2	250L	2500L	3 (PG II)
8		Category 3	1000L	10 000L	3 (PG III)
9		Any mix of chemicals from Items 6 to 8 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000L	10 000L	
10		Category 4	10 000L	100 000L	Note 3
11	Self-reactive substances	Type A	5kg or 5L	50kg or 50L	GTDTBT—Note 4
12		Type B	50kg or 50L	500kg or 500L	4.1 (Type B)
13		Type C to F	250kg or 250L	2500kg or 2500L	4.1 (Type C–F)

Column 1 Item	Column 2 Description of hazardous chemical Hazard Class	Column 3 Description of hazardous chemical Hazard Category	Column 4 Placard quantity	Column 5 Manifest quantity	ADG Code Classification
14	Flammable solids	Category 1	250kg	2500kg	4.1 (PG II)
15		Category 2	1000kg	10 000kg	4.1 (PG III)
16		Any combination of chemicals from Items 12 to 15 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
17	Pyrophoric liquids and pyrophoric solids	Category 1	50kg or 50L	500kg or 500L	4.2 (PG I)
18	Self-heating substances and mixtures	Category 1	250kg or 250L	2500kg or 2500L	4.2 (PG II)
19		Category 2	1000kg or 1000L	10 000kg or 10 000L	4.2 (PG III)
20		Any combination of chemicals from Items 17 to 19 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	

Column 1 Item	Column 2 Description of hazardous chemical Hazard Class	Column 3 Description of hazardous chemical Hazard Category	Column 4 Placard quantity	Column 5 Manifest quantity	ADG Code Classification
21	Substances which in contact with water emit flammable gas	Category 1	50kg or 50L	500kg or 500L	4.3 (PG I)
22		Category 2	250kg or 250L	2500kg or 2500L	4.3 (PG II)
23		Category 3	1000kg or 1000L	10 000kg or 10 000L	4.3 (PG III)
24		Any combination of chemicals from Items 21 to 23 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	

Column 1	Column 2	Column 3	Column 4	Column 5	ADG Code Classification
Item	Description of hazardous chemical Hazard Class	Description of hazardous chemical Hazard Category	Placard quantity	Manifest quantity	
25	Oxidising liquids and oxidising solids	Category 1	50kg or 50L	500kg or 500L	5.1 (PG I)
26		Category 2	250kg or 250L	2500kg or 2500L	5.1 (PG II)
27		Category 3	1000kg or 1000L	10 000kg or 10 000L	5.1 (PG III)
28		Any combination of chemicals from Items 25 to 27 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	

Column 1 Item	Column 2 Description of hazardous chemical Hazard Class	Column 3 Description of hazardous chemical Hazard Category	Column 4 Placard quantity	Column 5 Manifest quantity	ADG Code Classification
29	Organic peroxides	Type A	5kg or 5L	50kg or 50L	GTDTBT—Note 4
30		Type B	50kg or 50L	500kg or 500L	5.2 (Type B)
31		Type C to F	250kg or 250L	2500kg or 2500L	5.2 (Type C–F)
32		Any combination of chemicals from Items 30 and 31 where none of the items exceeds the quantities in columns 4 or 5 on their own	250kg or 250L	2500kg or 2500L	

Column 1 Item	Column 2 Description of hazardous chemical Hazard Class	Column 3 Description of hazardous chemical Hazard Category	Column 4 Placard quantity	Column 5 Manifest quantity	ADG Code Classification
33	Acute toxicity	Category 1	50kg or 50L	500kg or 500L	6.1 (PG I)— Note 5
34		Category 2	250kg or 250L	2500kg or 2500L	6.1 (PG II)
35		Category 3	1000kg or 1000L	10 000kg or 10 000L	6.1 (PG III)
36		Any combination of chemicals from Items 33 to 35 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
37	Skin corrosion	Category 1A	50kg or 50L	500kg or 500L	8 (PG I)
38		Category 1B	250kg or 250L	2500kg or 2500L	8 (PG II)
39		Category 1C	1000kg or 1000L	10 000kg or 10 000L	8 (PG III)

Column 1	Column 2	Column 3	Column 4	Column 5	ADG Code Classification
Item	Description of hazardous chemical Hazard Class	Description of hazardous chemical Hazard Category	Placard quantity	Manifest quantity	
40	Corrosive to metals	Category 1	1000kg or 1000L	10 000kg or 10 000L	8 (PG III)
41		Any combination of chemicals from Items 37 to 40 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
42	Unstable explosives		5kg or 5L	50kg or 50L	GTDTBT—Note 4
43	Unstable chemicals	Any combination of chemicals from Items 11, 29 and 42 where none of the items exceeds the quantities in columns 4 or 5 on their own	5kg or 5L	50kg or 50L	

(1) For the purposes of this table, if a flammable liquid category 4 is used, handled or stored in the same spill compound as one or more flammable liquids of categories 1, 2 or 3, the total quantity of flammable liquids categories 1, 2 or 3 must be determined as if the flammable liquid category 4 had the same classification as the flammable liquid in the spill compound with the lowest flash point. Example: For placarding and manifest purposes, a spill compound containing 1000L of flammable liquid category 1 and 1000L of flammable liquid category 4 is considered to contain 2000L of flammable liquid category 1.

(2) For item 2 in the table, Gases under pressure with acute toxicity, category 4 only applies up to a LC50 of 5000 ppmV. This is equivalent to Division 2.3 dangerous goods under the ADG Code.

(3) Only flammable liquids with a flash point of up to 93°C are classified as hazardous chemicals under the WHS Regulations and the GHS. C1 combustible liquids with flash points between 93°C and 150°C are not classified as hazardous workplace chemicals.

(4) GTDTBT means goods too dangerous to be transported.

(5) Division 2.3 under the ADG Code includes gases and vapours classified as acutely toxic (categories 1, 2 and 3) and gases which are corrosive to skin (category 1).

Appendix E—Requirements for health monitoring

The table below shows the requirements for health monitoring, as specified in the WHS Regulations (Schedule 14).

Table 9 Requirements for health monitoring

Column 1 Item	Column 2 Hazardous Chemical	Column 3 Type of health monitoring
1	**Acrylonitrile**	– Demographic, medical and occupational history – Records of personal exposure – Physical examination
2	**Arsenic (inorganic)**	– Demographic, medical and occupational history – Records of personal exposure – Physical examination with emphasis on the peripheral nervous system and skin – Urinary inorganic arsenic
3	**Benzene**	– Demographic, medical and occupational history – Records of personal exposure – Physical examination – Baseline blood sample for haematological profile
4	**Cadmium**	– Demographic, medical and occupational history – Records of personal exposure – Physical examination with emphasis on the respiratory system – Standard respiratory questionnaire to be completed – Standardised respiratory function tests including for example, FEV1, FVC and FEV1/FVC – Urinary cadmium and β2-microglobulin – Health advice, including counselling on the effect of smoking on cadmium exposure
5	**Chromium (inorganic)**	– Demographic, medical and occupational history – Physical examination with emphasis on the respiratory system and skin – Weekly skin inspection of hands and forearms by a competent person

Column 1 Item	Column 2 Hazardous Chemical	Column 3 Type of health monitoring
6	**Creosote**	– Demographic, medical and occupational history – Health advice, including recognition of photosensitivity and skin changes – Physical examination with emphasis on the neurological system and skin, noting any abnormal lesions and evidence of skin sensitisation – Records of personal exposure, including photosensitivity
7	**Crystalline silica**	– Demographic, medical and occupational history – Records of personal exposure – Standardised respiratory questionnaire to be completed – Standardised respiratory function test, for example, FEV_1, FVC and FEV_1/FVC – Chest X-ray full size PA view
8	**Isocyanates**	– Demographic, medical and occupational history – Completion of a standardised respiratory questionnaire – Physical examination of the respiratory system and skin – Standardised respiratory function tests, for example, FEV_1, FVC and FEV_1/FVC
9	**Mercury (inorganic)**	– Demographic, medical and occupational history – Physical examination with emphasis on dermatological, gastrointestinal, neurological and renal systems – Urinary inorganic mercury
10	**4,4'-Methylene bis (2-chloroaniline) (MOCA)**	– Demographic, medical and occupational history – Physical examination – Urinary total MOCA – Dipstick analysis of urine for haematuria – Urine cytology
11	**Organophosphate pesticides**	– Demographic, medical and occupational history including pattern of use – Physical examination – Baseline estimation of red cell and plasma cholinesterase activity levels by the Ellman or equivalent method – Estimation of red cell and plasma cholinesterase activity towards the end of the working day on which organophosphate pesticides have been used

Column 1 Item	Column 2 Hazardous Chemical	Column 3 Type of health monitoring
12	Pentachlorophenol (PCP)	– Demographic, medical and occupational history – Records of personal exposure – Physical examination with emphasis on the skin, noting any abnormal lesions or effects of irritancy – Urinary total pentachlorophenol – Dipstick urinalysis for haematuria and proteinuria
13	Polycyclic aromatic hydrocarbons (PAH)	– Demographic, medical and occupational history – Physical examination – Records of personal exposure, including photosensitivity – Health advice, including recognition of photosensitivity and skin changes
14	Thallium	– Demographic, medical and occupational history – Physical examination – Urinary thallium
15	Vinyl chloride	– Demographic, medical and occupational history – Physical examination – Records of personal exposure

Appendix F—Overview of a risk assessment process

An overview of the process for the assessment of health risks arising from the use of hazardous chemicals in the workplace is provided below.

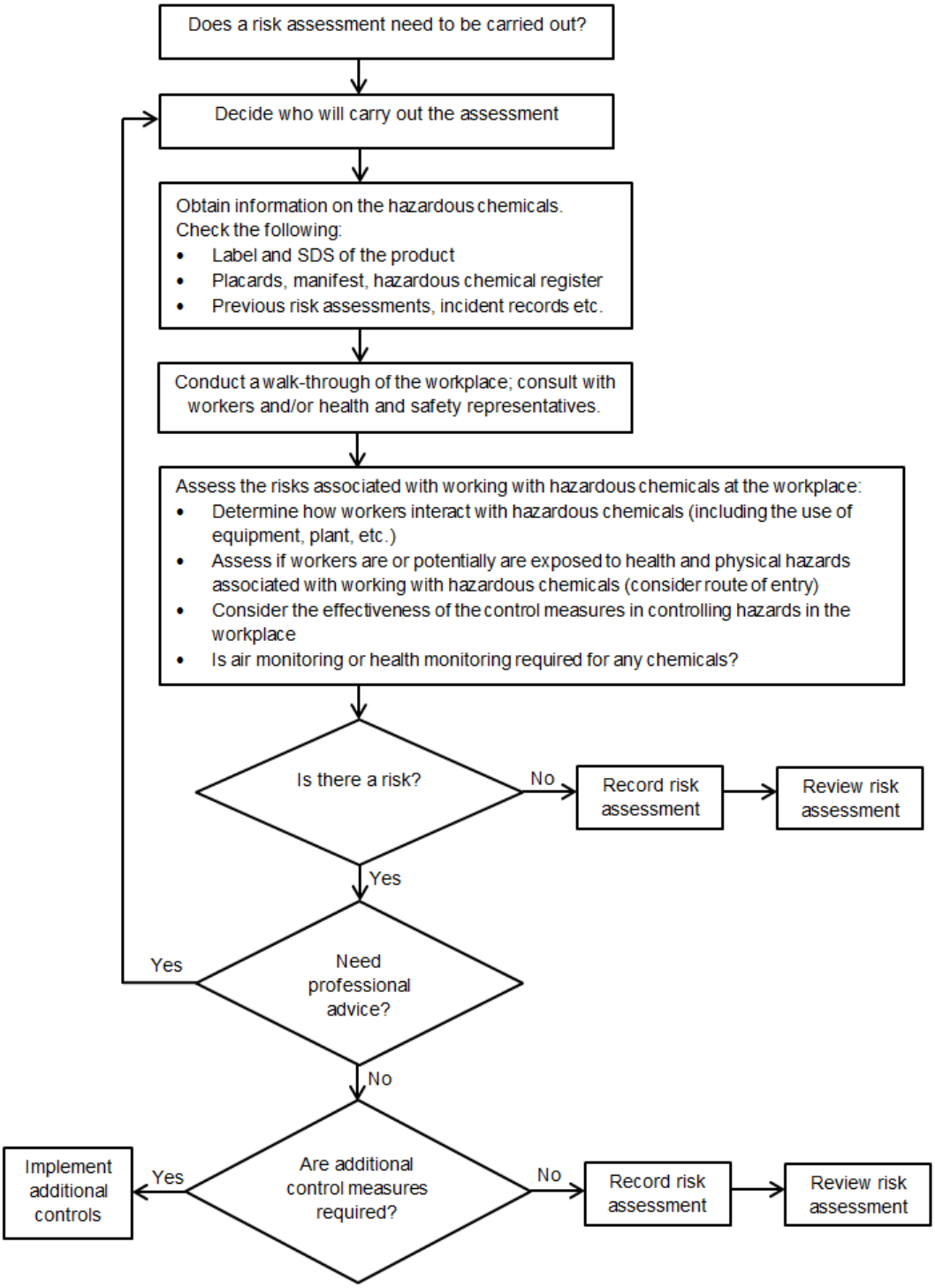


Figure 2 Overview of the process for the assessment of health risks arising from the use of hazardous chemicals in the workplace

Appendix G—Risk assessment checklist

Table 10 Risk assessment checklist

Questions	Yes	No
1. Does a risk assessment need to be carried out?	☐	☐
2. Has it been decided who should carry out the risk assessment?	☐	☐
3. Have all the hazardous chemicals in the workplace been identified? Has a hazardous chemical register been produced?	☐	☐
4. Has information about the hazardous chemicals been gathered? (refer to labels, SDS, placards and relevant Australian Standards for the type of hazardous chemical)	☐	☐
Q. 5–9 should be answered for each hazardous chemical or each process where hazardous chemicals are used in the workplace		
5. Have you checked other records associated with the hazardous chemical? (consider previous assessments, monitoring records, injury or incident records, induction training, task-specific training etc) If 'Yes', are there any hazardous chemical risks previously assessed as 'high' or as 'significant risk'? Specify the risk(s).	☐	☐
6. Does the chemical have health hazards? (consider potential acute/chronic health effects and likely route of entry)	☐	☐
7. Does the hazardous chemical have physical hazards?	☐	☐
8. Does the hazardous chemical have an exposure standard? (refer to the Workplace Exposure Standards for Airborne Contaminants)	☐	☐
9. Do workers using the hazardous chemical require health monitoring? (refer to Part 7.1, Division 6 and Schedule 14 of the WHS Regulations) If 'Yes', air monitoring may be required.	☐	☐

Questions	Yes	No
10. Are workers, or can workers be potentially, exposed to hazardous chemicals at the workplace, including by-products and waste? For each hazardous chemical or group of hazardous chemicals in the work unit, find out: – Is the substance released or emitted into the work area? – Are persons exposed to the chemical? – How much are the persons exposed to and for how long? Air monitoring may be required to determine exposure. – Are there any risks associated with the storage and transport of the chemical?	☐	☐
11. Are control measures currently in the workplace well maintained and effective in controlling the hazards? If 'No', take appropriate action.	☐	☐
12. What are the conclusions about risk? Only answer 'Yes' to one conclusion. – Conclusion 1: Risks are not significant – Conclusion 2: Risks are significant but effectively controlled If you answer Yes to conclusion 1 or 2, go to Q.14. – Conclusion 3: Risks are significant and not adequately controlled – Conclusion 4: Uncertain about risks If you answer 'Yes' to conclusion 3 or 4, go to Q.13.	☐	☐
13. Have actions resulting from conclusion about risks been identified? – Seek expert advice – Requires appropriate control measure – Requires induction training – Requires ongoing monitoring – Requires health monitoring – Requires emergency procedures and first aid	☐	☐
14. Has the assessment been recorded?	☐	☐

Appendix H—Examples of common fuel and oxygen sources

Table 11 Examples of fuel types and label elements

Fuel type	Examples*	Workplace label	Transport label
Flammable gases	Liquefied petroleum gas (LPG), natural gas, hydrogen, acetylene, hydrogen sulphide, carbon monoxide		
Flammable and combustible liquids	Petrol, mineral turpentine, lighter fluid or ‘shellite’, kerosene, methylated spirits, acetone, ether, ethanol, hexane, pentane, naphtha, some solvent-based paints, diesel including biodiesel, petroleum-based oils, some oil-based paints, cottonseed, linseed and eucalyptus oils	 (flammable liquids categories 1–3 only)	
Flammable and combustible solids	Bitumen, asphalt, fats and greases, waxes, shellac, acetate and nitrocellulose films, timber and timber products, paper, cardboard, dry grasses, hay, straw, plastics, silk, granulated rubber, metal shavings, filings	 (flammable solids only)	
Other fire risk chemicals**	Pyrophoric substances like some barium and calcium alloys, iron sulphide and celluloid scrap		
Dusts	Any dusts that are generated through other processes, such as metal grinding, filing etc	none	none
Chemical reactions***	Water-reactive chemicals like calcium carbide, sodium hydride, and some aluminium, lithium, magnesium or zinc powders (which liberate flammable gases like hydrogen on contact with water or acids)		

Notes:

* The form of the substance or material can significantly affect the risk. In general, the smaller the particle size the greater the risk. For example, fine shavings or powders of metals present a much greater risk than metals in the bulk or massive form.

** Pyrophoric substances can react spontaneously in contact with air.

*** Chemical reactions which generate gases can also cause explosions through an increase in the pressure in the container in which the chemical is stored if the gas cannot escape, even if that gas does not itself ignite.

Table 12 Examples of oxygen sources and label elements

Examples of oxygen sources	Workplace Label	Transport Label
Oxygen and air cylinders in welding equipment, hospitals for treatment of patients, reticulated gas supplies in a laboratory, air tanks in self-contained breathing apparatus (SCBA) equipment		
Nitric acid, nitrates, nitrous oxide, sodium hypochlorite, chlorates, perchlorates, hydrogen peroxide and organic peroxides, potassium permanganate		

Note: While oxygen is present in the air, the presence of additional oxygen sources will cause a fire to burn with more intensity and at a higher temperature. In oxygen enriched atmospheres (greater than around 23%) some substances that are not normally flammable can even self-ignite.

Appendix I—Fire and explosion risks

Table 13 Fire and explosion risks

Industry	Process	Hazards
Agriculture	Handling grain at silos or with auger loaders	Combustible particles in the form of husks and fine dusts, dust explosions
	Chaff and hay processing and storage	Combustible particles and dusts and spontaneous combustion of haystacks
	Milling grains, sugars, cellulose or fibres—cotton, linen, polyesters, possible peroxide powders	Flammable and combustible materials, dusts and fibres, possible static build-up, oxidising agents
	Processing oil and oil seeds—cottonseed, linseed, other vegetable oils, canola, olives	Combustible oils with possible combustible wastes
	Viticulture and alcoholic spirit manufacture	Flammable and combustible materials and vats or tanks containing flammable vapours
	Drying and processing grains and vegetables for example, tobacco drying, vegetable preparation	Cellulose fibres, dusts, and other combustible material; rotting vegetable matter produces methane gas
	Using flammable or combustible pesticides	Some pesticides contain flammable or combustible carrier liquids
	Using liquid and gaseous ammonia for nitrogen fixing in soils	Flammable gas, toxic gas, corrosive

Industry	Process	Hazards
Automotive industry	Manufacture	Fuels, oils, spray-painting, electrical
	Motor mechanics	Fuels, oils, solvents, oxy-acetylene
	Auto electrical	Battery charging, oils, sparks
	Upholstery—vinyls, plastics, glues and solvents, wadding	Flammable and combustible materials
Bakeries	Transferring and pouring flour	Grain flour dusts, heat generation
Battery industry	Recharging wet cells	Hydrogen gas generation and sparks
Bootmaker / Shoe repairs	Gluing, grinding and buffing rubber, leather and plastics	Flammable glues and vapours
Chemical industry (manufacturing)	Bulk storage, mixing, blending, aerosol cans Acetone, ether, polishes, oils, waxes, matches, fire lighters, cigarettes etc.	Flammable gases, flammable liquids, flammable or combustible solids and other hydrocarbons, sulphur
	Plastics manufacture and rotomoulding	Flammable and combustible solids, powders, oxidation, heat, static sparks
Construction industry	Curing agents	Flammable
Drycleaners	Solvent cleaners	Flammable liquids and vapours
Electrical industry	Power generation, transformers and transmission lines	Combustible oils, high temperatures and heat, sparks, fires
Explosives industry	Manufacturing, storage, mixing/blending, loading, including auger loaders, nitrates, explosive powders, oxidising agents	Potentially explosive metal powders and dusts, mechanical attrition milling, temperature and pressure, flames, heat, incompatible materials

Industry	Process	Hazards
Fibreglass work	Catalysts and resins used contain styrenes and organic peroxides, also use of solvents such as acetone and Methyl ethyl ketones (MEK)	Flammable liquids, oxidising substances and exothermic heat generation capable of causing combustion in other flammable or combustible materials
Film industry	Acetate and nitrocellulose films as well as solvents	Highly flammable and may be liable to spontaneous combustion when exposed to air
Food industry	Grains, flours, sugars, fermentation gases, alcohols	Combustible particles in the form of husks and fine dusts, flammable or combustible gases, and liquids
Gas industry	Manufacturing, storage, transmission, pumping and transport	LPG, methane, hydrogen, acetylene, gas accumulation in tanks, pipes and tankers
Laboratories	Mixing, blending, storage, heating, reactions, acids, alkalis, oxides and peroxides, use of Bunsen burners	Flammable and combustible gases, liquids, solids, dusts, exothermic heat, flames, oxidising agents
Metal production and manufacturing, iron, steel and foundry work, product manufacture	Melting, casting, milling, grinding, welding, electroplating	Molten metals and heat, mechanical attrition milling, metal dusts, shavings, filings, welding gases and sparks Flammable solvents and electrolysis can produce hydrogen gas bubbles
Mining	Coal mining	Coal dust, methane gas, hydrogen gas, sulphur powder
	Metaliferous mines	Iron, aluminium, magnesium, zinc Metal powders and dusts
Paint industry	Oil and solvent-based paints, spray-painting	Flammable and combustible aerosolised particles, mists vapours, fumes
Paper and cardboard manufacturing	Paper and cardboard processes bleaching fibres and paper—use of peroxides, fibreboard box manufacture	Combustible particles in the form of fibres and dusts, flammable or combustible materials and articles, oxidising agents

Industry	Process	Hazards
Petroleum industry and other chemical manufacturing	Crude oil and other petroleum products such as petroleum gases, petroleum fuels and oils including diesel and biodiesel, bitumen, kerosene etc	Generation of flammable and combustible hydrocarbons in the form of flammable gases
Pharmaceutical	Bulk storage, mixing and blending	Flammable and combustible materials and articles
Plastics manufacture	Plastics including vinyls, ethylene, styrene, vinyl chloride	Flammable and combustible solids, powders, oxidation, heat, static sparks
Printing industry	Inks, dyes, solvents, paper and cardboard	Flammable and combustible materials and articles, for example paper & cardboard
Road works	Asphalt and bitumen, LPG heating, kerosene, solvents	Flammable and combustible materials and articles
Sewage treatment	Organic waste treatment	Generation of methane and hydrogen sulphide gases
Textile industry	Cotton, linen, silk, synthetics	Fibres
Tyre manufacture	Hot rubber moulding, gluing and grinding rubber	Heat, flammable and combustible glues, combustible dusts and solids
Underground car parks and cellars	Accumulation of heavier than air gases, carbon monoxide	Flammable gas and asphyxiant
Woodworking	Milling and processing, furniture and cabinet-making glues, thinners, oils, waxes, plastics, rubber, shellac	Sawdust, fine wood dusts, flammable and combustible solvents

Appendix J—Practical examples of control measures

The following table illustrates some situations involving risks from hazardous chemicals that may be encountered in the workplace, and provides some examples of controls that may be considered to eliminate or minimise the risks. The conclusions you make in your assessment should be supported by clear and valid evidence.

Table 14 Examples of risks from hazardous chemicals in the workplace

Examples of risks	Examples of controls
Use of petrol-driven vehicles in poorly ventilated work areas	Ensure adequate ventilation. Consider use of electric or diesel vehicles.
Activities which involve prolonged skin contact with hazardous chemicals that are either readily absorbed through the skin or that can directly affect the skin	Change work practices to avoid skin contact, or select and use appropriate PPE to control exposure.
Handling of caustic or acidic chemicals where there is a potential for splashes onto the skin or eyes	Consider installing automated systems to dispense or transfer chemicals between containers. Use eye protection. Provide an emergency eye wash facility.
Dry sweeping of fine particulates	Use vacuum cleaning as an alternative, or wet cleaning methods.
Manually cleaning printing screens or large printing rollers with large quantities of volatile solvents	Automate or enclose the process and ensure adequate ventilation. Use non-volatile solvents or detergent/water-based cleaning solutions.
Processes for which monitoring results approach or exceed exposure standards	Upgrade ventilation systems so that monitoring results are well below the exposure standard. More efficient ventilation systems may avoid the need for expensive air monitoring in some situations.
Evidence of significant quantities of fine deposits on workers and surfaces, or processes that generate fine mists or solid particulates (including fumes) within the breathing zones of workers	Review control measures of the process to minimise release of particles at the source. Examples may include enclosing the process or installing ventilation systems. Review and revise housekeeping procedures to remove dust build-up more frequently.
Application of volatile chemicals over large surface areas	Substitute less volatile and hazardous solvents.

Safe management of higher hazard chemicals

The following information provides more specific guidance and recommendations on managing the risks for particular types of hazardous chemicals, primarily those hazardous chemicals that have physical hazards. It gives in more detail some precautions that you should consider to assist in the safe management of higher hazard chemicals like gases under pressure, flammable liquids and solids, self-reactive and oxidising substances as well as advice on how to manage the risks during the abandonment or removal of underground storage tanks.

Gas cylinders (gases under pressure)

Used or empty cylinders should be treated with the same precautions as for full cylinders, since residual hazards remain.

Testing and maintenance of gas cylinders

Gas cylinders need to be tested periodically to ensure that they remain safe to use. A poorly maintained gas cylinder can leak, exposing workers to harmful or potentially explosive vapours, or fail catastrophically. In-built safety features may also become inoperable over time. Details of inspection and testing for gas cylinders are provided in AS 2030.1: *Gas cylinders—General requirements*.

As a guide, gas cylinders should be tested every 10 years for dry gases and more frequently for damp or corrosive gases—check with the gas supplier if you need advice. The last test date will be stamped on the cylinder near the valve or on the collar, or on the foot ring of some small cylinders. If the test period has expired, the cylinder may be unsafe to use and it should not be refilled until it is re-tested (and receives a new date stamp). However, it is permissible to use up the cylinder's contents after its test date has expired, prior to testing. Alternatively it could be replaced with a new cylinder. Testing stations can give advice on disposal of a used cylinder if you wish to replace it. Owners of cylinders should keep records of testing and test dates.

Storage and handling of gas cylinders

Cylinders may be stored safely by following these steps:

- any cap provided for use with a cylinder is kept in place on the cylinder at all times when the cylinder is not being filled and not connected for use
- the cylinder valve is kept securely closed when not in use, including when empty (unless the cylinder is connected by permanent piping to a consuming device)
- any removable valve protection cap or valve outlet gas tight cap or plug is kept in place on the cylinder at all times (unless the cylinder is being filled or connected for use)
- keep the cylinder secured against unintended movement by installing chains preventing the cylinder from falling
- do not lubricate valves or attempt repair of leaks—if the valve is not closing properly, immediately remove the cylinder to a safe area outdoors and seek expert assistance
- have a water hose or fire extinguisher handy to put out any small fire close to the cylinder—a water spray can also be used to keep the cylinder cool in the event of a fire.

To ensure the in-built safety features of a cylinder function correctly, cylinders of liquefied flammable gas need to be positioned so that the safety relief device is in direct contact with the vapour space within the cylinder. Keep the cylinder upright, unless the design permits other positions—this depends on the position and operation of the relief device. If in doubt check the manufacturer's or supplier's instructions.

For further guidance on safe storage and handling of gas cylinders, refer to AS 4332: *The storage and handling of gases in cylinders.*

Further advice on storage and handling of specific gases is available from the following Australian Standards:

- AS/NZS 2022: Anhydrous ammonia—Storage and handling
- AS 1894: The storage and handling of non-flammable cryogenic and refrigerated liquids
- AS/NZS 2927: The storage and handling of liquefied chlorine gas
- AS 3961: The storage and handling of liquefied natural gas
- AS/NZS 1596: The storage and handling of LP gas
- AS 4839: The safe use of portable and mobile oxy-fuel gas systems for welding, cutting, heating and allied processes
- AS 4289: Oxygen and acetylene gas reticulation systems.

Unodourised liquefied petroleum gas (LP gas) or dimethyl ether

Although the sense of smell should not be relied upon to detect gas leaks and hazardous chemicals, it can often provide some level of warning to nearby workers in some instances. Unodourised LP gas can be particularly hazardous and, due to the absence of any discernible odour, it cannot be detected by the sense of smell. Dimethyl ether (DME), a highly flammable gas, is often used as a propellant for LP gas.

The risks from storing and using unodourised LP gas can be reduced by using the following control measures:

- Keep the storage and handling of unodourised LP gas or DME to a minimum, and restrict uses to those for which no less hazardous alternative is available (for example, aerosol propellant).
- The area where it is stored and handled should be well ventilated, or in a room designed for that purpose fitted with explosion ventilation, or in the open. Access to these areas should be restricted to essential personnel.
- Gas detection equipment should be installed to detect gas where an explosive atmosphere could develop. The gas detector should provide an automatic alarm before dangerous levels of gas are reached so that immediate action may be taken. The gas detector should emit an audible sound and have a visual display.

Flammable liquids in packages and in bulk

Australian Standard AS 1940: *The storage and handling of flammable and combustible liquids* provides guidance on the safe storage and handling of flammable and combustible liquids, including aspects such as package stores, bulk storage, tank design, pipe work and valves.

Abandoning or removing underground tanks of flammable liquids

The WHS Regulations require notification to the regulator when an underground, partially underground or fully mounded tank containing flammable liquids or flammable gases is to be abandoned. When the container no longer contains hazardous chemicals, placards and signs should be removed.

Any work on existing or abandoned underground tanks or associated pipe work is potentially dangerous where residual levels of the flammable gases, liquids and vapours are present. Introducing an ignition source may cause an explosion or other dangerous occurrence unless suitable procedures are adopted.

Tar-like deposits and sludge may have accumulated in the tank and pipe work. Flushing with water may not remove them and vapour testing may not detect this. Exposure of these

deposits to air and sunlight under normal temperatures, or work involving heat (for example, use of grinders or oxy-acetylene cutting), may release vapours creating a potential explosion hazard.

By following the steps listed below, the likelihood of dangerous occurrences can be minimised or even eliminated:

- Remove the tank from the ground and transport to a disposal area and arrange for the tank to be decommissioned.
- Fill the tank with an inert solid material like concrete or sand.
- If it is intended that the tank be used again (within two years), you can fill the tank with water and a corrosion inhibitor.

Further information on removal and disposal of underground tanks is available in Australian Standards, for example AS 4976: *The removal and disposal of underground petroleum storage tanks*.

Self-reactive substances, flammable solids, pyrophoric liquids and solids, self-heating substances and mixtures and substances which in contact with water emit flammable gas

There are a number of key considerations for controlling the fire risks from storing and handling the above types of hazardous chemicals. These include:

- ensuring non-combustible materials are used in the construction of buildings and storage areas
- installing and maintaining appropriate fire protection systems
- utilising separation distances (or barriers such as fire resistant screen walls)
- ensuring ignition and heating sources are controlled within the storage and handling areas, for example, electrical equipment used in these areas is intrinsically safe
- ensuring adequate ventilation and/or extraction is provided to avoid creation of a hazardous atmosphere or hazardous area
- installation of explosion doors or vents if there is the potential that flammable gases or vapour could be formed or there is the potential to form combustible dusts
- ensuring that the storage area is moisture free and protected from the elements
- ensuring that measures are taken to protect light or temperature sensitive materials, for example, by installing temperature controls or protecting from direct sunlight.

Tanks to be used for storing or handling these hazardous chemicals should be designed and operated to ensure that:

- moisture cannot enter the tanks
- valves and fittings are readily accessible, easily operated and operate as designed
- if practicable, remote operation for primary shut off valves at the tank is provided.

Flammable solids

Nitrocellulose film and other nitrocellulose products—handling and storage

Nitrocellulose film and products containing nitrocellulose can represent a significant explosion hazard if the risks are not properly controlled. Risks can be minimised by:

- reducing the amount of material stored or handled in the work area at any one time
- ensuring the storage and handling area is constructed from non-combustible materials
- ensuring there is sufficient means of escape in the event of an emergency. For example, use of outward opening doors, and removing all non-essential furniture and equipment from the work area to allow unimpeded access to the emergency exit
- eliminating all ignition sources, including

- using intrinsically safe electrical wiring and equipment suitable for use in hazardous areas
- guard or enclose heating elements and other electrical equipment to prevent ignition or decomposition of any nitrocellulose products
- keeping the temperature of any surfaces and equipment (including enclosures) to a suitably safe temperature for the material being used.

- installation of an automatic sprinkler system
- preventing accumulations of excessive amounts of waste materials
- displaying suitable signs warning of hazards and precautions (for example, 'No smoking').

Oxidising agents

Oxidising substances are hazardous chemicals that are reactive and can support combustion. They can react and are incompatible with a range of other substances including organic materials (wood, paper) and hydrocarbon solvents. You should always refer to the SDS to check for any incompatibilities with the materials you are using, storing or handling.

Unintended dangerous reactions of oxidising agents can be avoided by observing the following precautions:

- keep away from combustible or readily oxidisable materials, including fuel containers, sulphur and powdered metal and any other incompatible materials. Stores of oxidisers should be a reasonable distance away (for example, at least 5 m)
- place packages and containers on clean pallets, racks or shelving to allow easier detection of leaks and to prevent contact with other substances. Some oxidising chemicals can ignite on contact with timber, therefore old and weathered pallets should not be used
- eliminate sources of heat if practicable. If this is not practicable, ensure that heat sources do not allow the oxidising agents to be heated to within about 15°C of their decomposition temperature
- keep packages closed when not in use to avoid spillage
- do not park or drive any vehicles (for example, forklifts) nearby because heat from the engine or fuel or oil leaks may cause a dangerous occurrence
- do not store any liquids above oxidising agents in case leaks cause incompatible materials to spill onto the oxidising substance
- do not allow accumulation of dust and keep surfaces clean in areas where oxidising substances are handled in the workplace
- clean up spillages immediately and dispose of waste in accordance with your local regulations. Do not mix substances in the waste bin because they might react or cause a fire.

Solid (dry) pool chlorine

If your workplace keeps large quantities of solid (dry) pool chlorine on the premises, avoid dangerous reactions by observing the precautions listed above for Oxidising agents. You should also ensure that the pool chlorine is kept a safe distance away (for example, at least 10 m) from any ammonium salt like ammonium sulfate, or be separated from it by suitable bunding.

Organic peroxides

Organic peroxides are capable of self-reaction and stabilisers are usually necessary. Some are classified as 'Goods too dangerous to be transported' and extreme caution is needed when storing or handling these materials.

Like oxidising agents, organic peroxides can be highly reactive with incompatible materials and precautions are necessary to avoid unintended reactions occurring. Risks can be eliminated or minimised by observing the following precautions:

- keep packages in a specifically designated and designed cabinet, room or external storage building containing explosion vents and/or doors to limit the effects in the event of an explosion
- keep a suitable safety zone (for example, 5 m) opposite the cabinet or storeroom doors and blow out panels
- use cabinet doors with friction or magnetic catches to allow any pressure build-up to escape more easily
- keep nothing else in the organic peroxides store. If this is not practicable, then measures should be taken to ensure that incompatible materials cannot come into contact with the organic peroxides
- keep the storage area free of waste, dirt, dust or metal filings (these could react with spillages) or any combustible materials
- eliminate ignition sources inside, or outside within a suitable exclusion zone (for example, 3 m) of the storage area or entrance to the store
- keep packages on sealed or laminated hardwood or coated metal shelves free from rust or corrosion to avoid a harmful reaction in the event of a spill
- keep a space of at least 100 mm between the packages and the floor, ceiling or walls. Fitting a guarding system or raised shelving can assist with this
- keep suitable spill containment equipment close to the store which can be accessed quickly and used in the event of a spillage
- if opening packages, take them at least 3 m clear of the store. Reseal all packages before returning them to the store.

Temperature controls can be important in the safe handling and storage of organic peroxides. To avoid harmful reactions or decomposition of the organic peroxides due to temperature:

- determine any critical temperatures including any recommended maximum temperature. The label and SDS may provide this information. Otherwise, other sources should be consulted. Keep the store within the recommended temperature range for the different types of organic peroxides present and keep organic peroxides out of direct sunlight
- do not permit heating to be installed in the storage area.

If cooling or refrigeration is required to maintain the desired temperature in the storage area, expert advice should be obtained because air conditioners and unmodified refrigerators are potential ignition sources.

Further information on storage and handling of organic peroxides can be obtained from AS 2714: *The storage and handling of organic peroxides*.

Corrosives

Corrosive substances and mixtures can be either alkaline or acidic and these two categories are incompatible. Acids should never be stored with alkaline chemicals due to the potential for harmful reactions. Some reactions of acids and alkaline chemicals can be highly exothermic and rapidly generate large amounts of gas, causing an explosion risk.

Risks associated with storage and handling of corrosive substances and mixtures can be eliminated or minimised by observing the guidance in the following Australian Standards:

- AS 3780: The storage and handling of corrosive substances
- AS 1940: *The storage and handling of flammable and combustible liquids* (where the corrosive substance or mixture is also a flammable liquid or has a dangerous goods Subsidiary Risk of Class 3 (flammable liquid)

- AS/NZS 3833: The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers.

Eyewash and safety showers should be readily accessible where corrosives are handled or transferred.

Appendix K—Case studies

A number of examples illustrating the process of risk assessment and control are presented in this section. They do not cover all the possible hazards, risks and control options for the particular situations described. Their purpose is to demonstrate the different ways in which the process can be carried out, and the steps involved in making decisions—particularly about the risk and the controls to be put in place. As these case studies show, the complexity of the process depends on the substance(s) used and the nature of the work.

Case study 1: Motor vehicle finishing workshop

A spray-painting shop uses isocyanate spray paints and organic solvents for equipment cleaning and paint thinning.

One of the spray-painters reported symptoms of skin rash and light-headedness, which often occur at the end of his shift. The reported symptoms are consistent with exposure to isocyanates. It was decided to assess the processes undertaken at the shop to see if any measures could be taken to reduce exposure to the chemicals being used.

The team at the spray-painting shop were not experienced in carrying out risk assessments so engaged the services of a professional occupational hygienist.

The occupational hygienist worked with the team to assess the working environment and found significant risk of exposure to isocyanates and organic solvents in the four main tasks carried out at the premises.

- **Mixing**: Paints are mixed manually in a small room with no mechanical ventilation. According to the SDS, most of the isocyanate in the paint hardener (HDI) was present in a non-volatile form and as such would not be released into the air. Given the nature of the task, inhalation exposure to HDI vapour or aerosol during mixing was low. However, there remained a significant risk to health due to potential skin exposure because gloves are not generally worn. The mixing takes around 15 minutes to complete and is performed as required.
- **Colour matching**: This is carried out in the same area as the mixing and involves spraying a test panel until the required colour is achieved. It was concluded that there is a significant risk of short-term inhalation exposure to isocyanate-containing aerosol and vapour because respiratory equipment is not routinely worn for this task and there is no ventilation. There is also a risk to health through skin exposure to isocyanates because suitable PPE is not generally worn. The colour matching takes approximately five minutes and is undertaken no more than twice in any given day.
- **Spray-painting**: A brand-name two pack paint system is used for spray-painting vehicles. This is carried out in a ventilated down-flow booth that complied with AS/NZS 4114.1–1995: *Spray painting booths—Design, construction and testing* but had not been maintained properly for some years. The spray painter wears a half-face combined particulate/vapour respirator while performing this task and no other protective equipment other than standard cotton overalls. It was concluded that there was significant inhalation risk to the spray painter as the respiratory equipment was not suitable for the task. There was also a risk of skin contact because suitable PPE, such as gloves, was not worn. The spray painter spends up to six hours per day spraying.
- **Cleaning**: This task is also carried out in the same area as the mixing and colour matching operations. Used equipment is soaked in an open vessel containing organic solvent. Solvent-soaked rags used for cleaning were placed in an open bin beside the mixing table for disposal. According to the SDS, the solvent is flammable. Equipment

cleaning takes around 30 minutes and is performed at the end of the day. The solvent is stored in a flame-proof, lockable cabinet when not in use.

The assessment also considered the potential for a fire or explosion resulting from the use of the flammable solvent. The assessment indicated that the use of solvents was not extensive and only small quantities were kept on the premises at any one time. Solvents were stored in a lockable, flame-proof cabinet. Paints were thinned and mixed when required in a dedicated work area and no ignition sources were present in that area. When solvents were used to clean equipment, this took place in the same area. Although there was electrical equipment in the area it was rated as intrinsically safe in accordance with the relevant Australian Standards.'

The following main actions from the assessment are recommended:

- regular maintenance and testing of ventilation rates and the clearance time of the spray booth
- regular replacement/cleaning of filters in the spray booth
- provision of suitable PPE including respiratory protection against solvent vapours and airborne isocyanates during spray-painting
- regular air monitoring of solvent vapours and isocyanates
- health monitoring (including biological monitoring) for determining isocyanate exposure be considered
- appropriate training of workers.

The tables below contain a summary of the assessment and actions to be taken.

Table 15 Case study 1: Process of risk assessment and control

Task	Route of exposure	Controls already in place?	Risk	Risk to health? Yes/No/Not sure	Actions to be taken
Mixing	**Skin**	No specific controls are used	Yes	SDS states that isocyanate and thinning solvent exposure can cause skin irritation. The risk of exposure is high because protective clothing is generally not worn.	Gloves and overalls should be worn as stipulated on SDS
	Inhalation	No; the area used for this task is not mechanically ventilated	Yes	SDS of pre-polymer indicates only 0.4% content of volatile HDI. Given the nature and duration of the task, the risk of exposure from inhalation is not considered significant. There is risk to health from inhalation of solvents used for thinning paints.	Air monitoring should be considered to assess levels of solvents used for thinning paints. Due to low levels of volatile HDI in paint, the risk is low, however, it may still be worth considering air monitoring for isocyanates too.
	Ingestion	No eating, drinking or smoking permitted in the area	No	Procedures are followed.	N/A

Task	Route of exposure	Controls already in place?	Risk	Risk to health? Yes/No/Not sure	Actions to be taken
Colour matching	**Skin**	No specific controls are used	Yes	The risk of skin exposure is high because gloves and suitable overalls are not worn for this task. Isocyanates are skin irritants and sensitisers.	Gloves and overalls should be worn as per SDS to prevent skin contact.
	Inhalation	No specific controls are used	Yes	Short-term inhalation exposure to isocyanate aerosol and vapour is high during spraying because no respiratory protection is worn. Exposure standard may be exceeded during this task. Isocyanates are respiratory irritants and sensitisers.	This task should be performed wearing an air-fed, full-face respirator to prevent inhalation. Perform task in down-flow spray booth. Immediately service down-flow booth to ensure it is working as designed and installed. Air monitoring for isocyanates is recommended unless process moved to ventilated area.
	Ingestion	No eating, drinking or smoking is permitted in the area	No	Procedures are followed	N/A

Task	Route of exposure	Controls already in place?	Risk	Risk to health? Yes/No/Not sure	Actions to be taken
Spray painting	**Skin**	No specific controls are used	Yes	The risk of skin contact is high because isocyanate-based paint is sprayed without protective clothing being worn. The respirator only covers half the face of operator so skin on face and head at risk of exposure.	Protective gloves and overalls should be worn as per SDS to prevent skin contact. Air-fed, full-face respirator should be worn.
	Inhalation	A combination particulate/vapour respirator is used. This respirator only covers half of the face.	Yes	This task is performed in a down-flow booth which has not been maintained properly for some years. Furthermore, the respiratory equipment is inadequate; particulate/vapour respirators are not particularly suitable for spray-painting. Health effects from inhalation of isocyanates are serious and can be irreversible. The task is long in duration and the exposure standard is very low. This is a high risk activity.	Down-flow booth should be immediately serviced and tested to ensure it is working effectively. A regular maintenance program needs to be put into place. Spray-painting should be undertaken using a full-face, air-fed respirator. Health monitoring should be considered to ensure controls are adequate.
	Ingestion	No eating, drinking or smoking is permitted in the area	No	Procedures are followed	N/A

Task	Route of exposure	Controls already in place?	Risk	Risk to health? Yes/No/Not sure	Actions to be taken
Cleaning	**Skin**	No specific controls are used	Yes	Gloves and overalls are generally not worn. Although the task is relatively short, the solvent is highly flammable and a skin irritant. The risk of skin exposure is high due to no gloves being used. SDS states that prolonged skin contact with the solvent may lead to dermatitis.	Consider automated spray-gun washing up unit Use gloves and overalls as per SDS
	Inhalation	No specific controls are used	Yes	The solvent is volatile and represents an inhalation risk. Cleaning is performed in an open vessel and soiled rags stored in an open bin with low ventilation in the room, which can allow solvent vapour to build up.	Install wash-up units fitted with LEV. Use respirator fitted with organic vapour cartridge. Use a closed vessel to minimise evaporation and perform cleaning in area with better ventilation. Store solvent-soiled rags in a suitable, sealed container prior to disposal.
	Ingestion	No eating, drinking or smoking is permitted in the area	No	Procedures are followed	N/A

Table 16 Case study 1: Example of a risk assessment summary sheet

Questions	Responses
Are there any reported health effects?	A spray painter has reported skin irritation and light-headedness after spray-painting. These symptoms are consistent with exposure to isocyanates. Immediate action is necessary. The affected employee should be moved on to different duties and immediately assessed by a medical practitioner and should not return to spray-painting until cleared to do so.
Physical hazards	Flammable solvents are used in the workshop however quantities are small. The solvent being used is highly flammable. It is stored overnight, along with any generated waste, in a lockable, flame-proof cabinet prior to disposal by a local waste company. There have been no reported spillages in the past 12 months and no fires have occurred. Smoking is prohibited and the procedure strictly adhered to and there are no other sources of ignition close to the storage or mixing areas. The equipment in the spraying work area is rated as intrinsically safe. The overall risk of fire is not significant if current procedures are maintained.
Other comments	The workshop has strong chemical odours. The filters servicing the spray booth should be cleaned and/or replaced at the end of each working day to prevent the build-up of ignitable vapours from spraying operations. Spray booth has not been serviced for some time and airflow does not meet AS requirements. It is recommended all spray painters undergo regular health monitoring checks to ensure the integrity of controls in place. A detailed report* is attached (*report not provided for the purpose of this example)
Actions arising	See above assessment matrix for action in light of the assessed processes. Particular attention should also be paid to the following to ensure that controls maintain their integrity and protect employees: – Scheduled testing of the down-flow ventilation system – Regular replacement/cleaning of filters in the spray booth – Regular assessment of PPE to check for any signs of wear and tear (refer to manufacturer's instructions) – Supervision and training of personnel in the use of PPE and other controls – Filters for air supply to be cleaned or changed at regular intervals and according to the manufacturer's instructions – Regular air monitoring should be considered for operations where employees are exposed to solvent vapour or isocyanates.

Questions	Responses
Assessment result and recommendations by (person responsible):	Occupational Hygiene Consultant Pty Ltd.
Actions due by and re-inspection date	1 March 2012
Approved by/name	General Manager
Signature	
Date	2/1/2012
Assessor's name	Occupational Hygiene Consultant Pty Ltd
Signature	
Date	2/1/2012

Case study 2: Vapour Degreasing Operation

Job description

Small metal components are produced on an automated press that uses oil as a lubricant for the cutting tool. The components are collected in a metal basket and then manually transferred into the solvent vapour-degreasing unit to remove the oil. Trichloroethylene is used as the degreasing solvent. One operator runs the press and the degreasing unit.

Information about the chemical classification

Manufacturer's SDS and label indicate that trichloroethylene (a volatile solvent) is a hazardous chemical. The oil is not classified as a hazardous chemical.

Health effects for the different routes of exposure

The SDS indicates that exposure through inhalation can affect the central nervous system and organs such as the liver, lungs and kidneys. Skin and eye irritation can also occur on contact.

Physical hazards of the chemical

The following information was obtained by reviewing the SDS and label of trichloroethylene:

- Stable at normal conditions, and stable under recommended storage conditions.
- Flammability—substance is not flammable. However, it decomposes in a fire giving off toxic fumes: hydrogen chloride gas
- Conditions to avoid: Keep away from open flames, hot surfaces and sources of ignition
- Materials to avoid: Incompatible with strong bases and oxidising agents, alkaline metals / alkaline earth metals.

Exposure standard

The exposure standard for trichloroethylene is 10 ppm (parts per million) in air averaged over an 8-hour period. Trichloroethylene also has a short-term exposure limit (STEL) of 40 ppm averaged over a 15-minute period.

Controls already in place

- Task: normal operation
  - The degreaser is fitted with a cooling coil to prevent escape of the hot vapour. The baskets are lowered into, and raised out of, the degreaser at a pre-set controlled rate (slow speed) using a winch to minimise vapours being dragged out of the unit.
- Task: cleaning out the sludge
  - Before the operator enters the degreaser to clean out the sludge, the solvent is drained out of the unit. A half-face respirator and gloves are worn. This task is carried out approximately three times a year.
- Task: storage areas
  - The chemical is stored away from incompatible materials.

Routes of exposure

Considering the nature of the hazardous chemical and the task during normal operation, the main route of exposure is inhalation. There is very little potential for skin and eye contact

during normal operation because of the way the components are handled and the solvent readily evaporates. This would also apply to ingestion.

When cleaning out the sludge at the bottom of the degreaser, there is the potential for significant skin and eye exposure in addition to inhalation.

Evaluation of risk to health

It was determined that there is a risk to health for the following reasons:

- The degreaser is quite old and poorly maintained.
- A very strong solvent odour can be detected in the vicinity of the degreaser, particularly when lifting the basket out. This is because the components trap the condensing solvent vapour. In this case, stacking the components in the basket in a different way would not overcome this problem.
- The operator has reported symptoms of eye irritation and light-headedness.
- The operator would be exposed to a very high level of trichloroethylene vapour whenever the build-up of sludge is cleaned from the bottom of the degreaser. Although this task is only performed occasionally, it requires the operator to get into the degreaser. The degreaser is a confined space under the WHS Regulations, and trichloroethylene vapour may accumulate inside. Exposure to the substance in this confined space poses a serious risk to health (possibly death) particularly through inhalation of trichloroethylene vapour. The PPE used provides inadequate protection.

Evaluation of risks from physical hazards

Since the chemical is stored away from incompatible materials, the risk of hazardous reactions occurring during storage is minimal.

Controls to be put in place

The sole purpose of the vapour degreasing operation is to remove the fine coating of oil and supply the client with a clean product. Discussion with the client indicated they prefer the components to be coated with oil as it protects against corrosion while the components are stored on their premises. Therefore it was decided that the use of trichloroethylene be eliminated.

Case study 3: Cleaning offices

Risk Assessment Report Date
20 June 2011

Assessor(s)
Management and health and safety representative

Job description
Products used by cleaners of several office blocks include a disinfectant, a toilet cleaner and a glass cleaner. The toilet and glass cleaners are used as supplied. The disinfectant is diluted with two parts of water and sprayed and wiped onto surfaces. Dilution (mixing) of the disinfectant (Zap) takes place in a central storeroom.

Hazardous chemical
The SDS for Zap indicated that the product is classified as hazardous. Manufacturers of the other products confirmed that their products were not hazardous according to the WHS Regulations.

Form
Water-based concentrate

Active ingredient
Sodium hypochlorite (15%)

Health effects
Skin, eye and respiratory irritant; prolonged skin contact may cause dermatitis

Routes of exposure
Skin, eyes and inhalation (particularly spray mist). Exposure through ingestion is not considered to present a risk to health because of the nature of the tasks and the controls in place (see below).

Physical hazards
May decompose above 40°C, in sunlight or in contact with acids. Also reacts with oxidisable materials, heavy metals (which act as catalysts), reducing agents, ammonia solutions, ether, and many organic and inorganic chemicals such as paint, kerosene, paint thinners, shellac, grease and oils. May liberate chlorine gas on decomposition.

Who is exposed
All cleaners are involved in the mixing and application of Zap.

Frequency and duration of exposure
Mixing (dilution) is done once at the start of each shift. It takes approximately a minute to perform this task. Workers use the working strength solution for 4 hours a day, 5 days a week.

Controls already in place:

- Cleaners are provided with training on the hazards of using the chemicals, including correct storage locations.
- Cleaners are provided with rubber gloves.
- There is good general ventilation in the storeroom.
- Eating, smoking and drinking are prohibited in the storeroom. Signs to this effect are displayed.
- Washing facilities are available in the storeroom and in the areas where Zap is used.
- Only non-metallic plastic containers are used for mixing and it is stored indoors away from direct sunlight.

Table 17 Case study 3: Risk Assessment Worksheet

Task	Routes of exposure	Risk to health? (Yes/No/Not sure)
Mixing	**Skin/eyes**	**Yes:** – Handling of the concentrate presents the greater risk—particularly to skin and eyes. – Splashes to the skin and face have occurred occasionally when decanting concentrate. – Gloves provided are not always worn. – Goggles or a face shield are not provided.
	Inhalation	**No:** – Exposure through inhalation does not present a risk to health due to the short duration of the task. – Adequate general ventilation. – Potential for generating fine spray mist during this task is negligible.
Spray and wipe	**Skin**	**Yes:** – Gloves provided are not worn very often. – SDS indicates that prolonged contact even with the diluted substance may cause skin irritation and possibly dermatitis.
	Inhalation	**Yes:** – When working in small, poorly ventilated areas. – Fine spray mist generated by spray applicator.

Risk control actions:

- Purchase the concentrate in containers fitted with a dispenser (tap) to minimise the potential for spills and splashes during decanting. Hang a small plastic container under the tap dispenser to contain any drips. Alternatively, an automatic dilution and dispensing system may be installed to avoid contact with the concentrate.
- Use a more dilute working strength solution. The directions for use on the label recommend a concentration of 1–2% for this type of application. Cleaners have been using a more hazardous 5% working strength solution. The reason for this is not known.
- Use a coarse spray applicator to reduce the potential for exposure through inhalation.

- Make further enquiries about alternative products by contacting manufacturers. Consider purchasing a ready-to-use (1–2%) solution of the product to eliminate mixing, or consider a less hazardous product.
- Rubber gloves must still be worn during application of the dilute solution, in order to avoid prolonged contact. Information and training to be provided on the nature of the hazards, risks and the need to wear the gloves.

Case study 4: Pesticide spraying

Assessor(s)
Manager; health and safety representative; spray operator

Hazardous chemical
Product name: Chlorpyrifos 500 EC

Form
Solvent-based concentrate containing 500 grams per litre of Chlorpyrifos in a hydrocarbon solvent

Active ingredient
Chlorpyrifos (an organophosphorus insecticide)

Health effects
Nervous system (cholinesterase inhibition)

Major routes of exposure
Inhalation (spray mist and solvent) and skin absorption (Chlorpyrifos is readily absorbed through intact skin). Chlorpyrifos is an insecticide used on vineyards. Sometimes other liquid organophosphates are also used, following the same mixing and spraying techniques. Therefore this assessment would also cover their use.

500 ml of the concentrate is poured (decanted) from a 20 litre drum into a plastic jug. Before pouring this into the spray tank of a tractor-drawn air blast sprayer, water is added to the tank to dilute the concentrate to a concentration of 0.25 grams per litre (2000 times dilution).

The tractor-drawn airblast sprayer can generate a large quantity of fine spray mist.

Chlorpyrifos is sprayed two to three times a week on several vineyards from about October to February.

One operator, who has completed the Farm Chemical Users Course, does all the mixing, spraying and the cleaning up of the equipment used.

Others who may be exposed to some Chlorpyrifos are those involved in thinning, pruning or repairing spray equipment. They are not considered to be at risk (refer to report).

Physical hazards
Chemical is a flammable liquid category 4 (flash point 68°C).

Table 18 Case study 4: Job description

Task	Route of exposure	Controls already in place?	Risk	Risk to health? Yes/No/Not sure	Actions to be taken
Mixing	**Skin**	Gauntlet rubber gloves, PVC apron, gumboots and face shield worn. Measuring jug is rinsed immediately after use. Tap available for washing.	Yes	Spills and splashes have occurred. Chlorpyrifos is very toxic. It is handled in concentrated form. The SDS indicates it is easily absorbed through skin. If protective equipment is not worn or properly maintained there would be a serious risk to health.	Consider ways of eliminating or reducing the use of the pesticide. Consider using a less hazardous pesticide. Investigate the use of suitable dispensers to minimise spills. A dispenser would mean that less PPE would be required.
	Inhalation	Mixed in well-ventilated area.	No	The SDS indicates that Chlorpyrifos is not very volatile. The solvent is volatile but mixing only takes a few minutes and is done in a well-ventilated area.	
	Ingestion	No eating, drinking or smoking when handling the pesticide. Washing facilities are provided.	No	Procedures followed. Operator has attended training course. Supervision provided.	

Task	Route of exposure	Controls already in place?	Risk	Risk to health? Yes/No/Not sure	Actions to be taken
Spraying	**Skin**	No specific controls besides a cotton hat, long sleeve cotton overalls and leather work boots are worn.	Yes	The operator may be exposed to spray drift although the pesticide is not as concentrated as when it is mixed. The airblast sprayer can generate a large quantity of fine spray mist.	Consider the use of a tractor cabin to control the risk. If the use of a tractor cabin is not practicable, consider application techniques that reduce spray drift.
	Inhalation	As above	Yes	As above	
	Ingestion	No eating, drinking or smoking when handling the pesticide. Washing facilities provided.	No	Procedures followed	
Thinning **Pruning** **Picking**	**Skin, Inhalation, Ingestion**	Recommended re-entry periods are observed. People doing these jobs also know when the vineyard was sprayed and the pesticide used. Jobs on the vineyard are coordinated so that people not involved in spraying are kept well away from the areas where Chlorpyrifos 500 EC is sprayed. These people are told when spraying is being done and where.	No	Refer to 'CONTROLS ALREADY IN PLACE'. Note: where re-entry periods are not given, operators doing these jobs do not enter the orchard for at least 24 hours so that the spray mist has settled.	None. Current controls are adequate. Ensure existing controls are maintained.

Task	Route of exposure	Controls already in place?	Risk	Risk to health? Yes/No/Not sure	Actions to be taken
Cleaning, service and repair of equipment	**Skin, Inhalation, Ingestion**	After spraying, the empty tank is rinsed and the nozzles flushed. Where the tank is not empty the remaining contents are disposed of in accordance with label instructions, including use of appropriate PPE.	No	Where the spray tank is empty following spraying, the pesticide is further diluted during cleaning and the task is such that there is no likelihood of skin contact with the diluted pesticide/rinsing water.	None
		The spray equipment, including the tractor, is also hosed down. This process is repeated for the tank and the nozzles if the equipment is to be repaired or serviced externally.	Yes	Where the tank is not empty after spraying, skin contact and inhalation may occur during emptying. Risks are minimised by following label directions and wearing appropriate PPE.	
Storage and mixing	**Fire risks**	Storage and mixing operations involving the flammable concentrate are in a dedicated work area away from ignition sources and incompatible materials like oxidisers (hypochlorite bleach). Recommendations in AS 1940: *Storage and handling of flammable and combustible liquids* have been followed. Workers are provided with training and advised of the fire risks.	No	Procedures in place and followed including not smoking in storage and mixing areas or while mixing.	None

Notes: 1. Organophosphate pesticides such as Chlorpyrifos, are hazardous chemicals for which health monitoring may be required. In this case, health monitoring is likely to be required for workers spraying and mixing the chemical if adequate controls are not used. However, if adequate controls are in place and there is no risk to health, health monitoring may not be required. Workers not applying the insecticide, such as thinners, pruners and pickers, would not need health monitoring provided recommended re-entry periods are observed and spraying is not carried out near them when they are working.

Amendments

The model Code of Practice: *Managing the risks of hazardous chemicals in the workplace* has been amended since its publication in July 2012, including a number of amendments agreed to in 2017 as part of a technical and usability review of the model Code. The current version, dated May 2018, incorporates all of those amendments.

Additional amendments were made to this model Code of Practice in July 2020 to reflect the adoption of the 7th revised edition of the GHS.

ANNEXURE 7 – NOISE AND VIBRATION MANAGEMENT PLAN

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Construction Noise & Vibration Management Plan

Wingaru Project

St Ignatius' College Riverview, NSW

Client:
Belmadar

10 July 2023

Association of Australasian Acoustical Consultants

acousticdynamics

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Document	Rev	Date	Prepared	Reviewed	Authorised	Approved
6102R001.JC.230707	0	10 July 2023	JC	LB	RH	

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GLOSSARY

NOISE

Noise is produced through rapid variations in air pressure at audible frequencies (20 Hz – 20 kHz). Most noise sources vary with time. The measurement of a variable noise source requires the ability to describe the sound over a particular duration of time. A series of industry standard statistical descriptors have been developed to describe variable noise, as outlined in **Section 2** below.

NOISE DESCRIPTORS

L_{eq} – The sound pressure level averaged over the measurement period. It can be considered as the equivalent continuous steady-state sound pressure level, which would have the same total acoustic energy as the real fluctuating noise over the same time period.

$L_{Aeq(15min)}$ – The A-weighted average equivalent sound level over a 15 minute period.

L_{A90} – The A-weighted noise level that has been exceeded for 90% of the measurement duration. This descriptor is used to describe the background noise level.

RBL – Rating Background Level. The overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period (as opposed to over each 24hr period used for assessment background level) This is the level used for assessment purposes.

dB – Decibels. The fundamental unit of sound, a Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell. Probably the most common usage of the Decibel in reference to sound loudness is dB sound pressure level (SPL), referenced to the nominal threshold of human hearing. For sound in air and other gases, dB(SPL) is relative to 20 micropascals (μPa) = 2×10^{-5} Pa, the quietest sound a human can hear.

A-WEIGHTING

"A-weighting" refers to a prescribed amplitude versus frequency curve used to "weight" noise measurements in order to represent the frequency response of the human ear. Simply, the human ear is less sensitive to noise at some frequencies and more sensitive to noise at other frequencies. The A-weighting is a method to present a measurement or calculation result with a number representing how humans subjectively hear different frequencies at different levels.

NOISE CHARACTER, NOISE LEVEL AND ANNOYANCE

The perception of a given sound to be deemed annoying or acceptable is greatly influenced by the character of the sound and how it contrasts with the character of the background noise. A noise source may be measured to have only a marginal difference to the background noise level, but may be perceived as annoying due to the character of the noise.

Acoustic Dynamics' analysis of noise considers both the noise level and sound character in the assessment of annoyance and impact on amenity.

1 INTRODUCTION

1.1 EXECUTIVE SUMMARY

Acoustic Dynamics is engaged by **Belmadar** to assess and, where required, make recommendations to reduce and manage the noise and vibration impact at the nearest potentially affected receivers resulting from the demolition, excavation, construction works and associated activities for the proposed Wingaru Project at St Ignatius' College, Riverview, NSW.

This report presents the relevant construction noise and vibration emission objectives, construction noise and vibration prediction calculations, an impact assessment and recommendations for mitigation and management measures to be implemented, to minimise the potential for adverse impact at the nearest potentially affected internal and external receivers, resulting from excavation and construction works.

This report is prepared in accordance with the various acoustic requirements of:

(a) Lane Cove Council;
(b) NSW Environment Protection Authority (EPA);
(c) NSW Department of Planning & Environment (DPE); and
(d) Australian Standards.

1.2 DESCRIPTION OF PROPOSAL

The subject demolition, excavation and construction works will be undertaken at St Ignatius' College, Riverview for the construction of a new four-storey school building, situated on the campus within a SP2 Educational Establishment land zone. The college grounds have road frontages direct to Riverview Street and Tambourine Bay Road to the north and east, respectively, and shares a boundary with residential properties along its western boundary. The southern and south-eastern boundaries are the shoreline of the Lane Cove River. The most affected receivers will be staff and students within the college.

Acoustic Dynamics is advised that use of noise generating equipment during the proposed works will be undertaken between the following operating hours, as shown in **Table 1.1**.

Table 1.1 Operating Hours of Noise Generating Equipment

Activity	Permitted Work Hours
All building, construction and site work, including site deliveries (except as detailed below)	• Monday to Friday – 7:00am to 6:00pm • Saturdays – 8:00am to 1:00pm • Sundays & public holidays – No work or deliveries permitted

Activity	Permitted Work Hours
Excavating of rock, sheet-piling, pile-drivers or similar activities	• Monday to Friday – 9:00am to 12:00pm, 2:00pm to 5:00pm (Respite break 2 hours between 12:00pm to 2:00pm) • Saturday – 9:00am to 12:00pm. • Sundays & public holidays – No work permitted

The subject site, adjacent receivers and surrounding area is shown in the Location Map, Aerial Image and Drawings presented within **Appendix A**.

2 ASSESSMENT CRITERIA AND STANDARDS

Acoustic Dynamics has conducted a review of the local council, state government and federal legislation that is applicable to the construction works associated with the subject site. The relevant sections of the legislation are presented below. The most stringent criteria which have been used in this assessment of the subject development are summarised below.

2.1 COUNCIL CRITERIA

2.1.1 COUNCIL PLANNING & DEVELOPMENT CONTROL INSTRUMENTS

Acoustic Dynamics has conducted a review of the relevant planning and development control instruments published by Lane Cove Council, including the following documents:

- *Lane Cove Local Environmental Plan (LEP) 2015*; and
- *Lane Cove Development Control Plan (DCP) 2022*.

Acoustic Dynamics' review of the *Lane Cove LEP 2015* did not yield specific acoustic criteria or information relevant to this assessment.

Acoustic Dynamics' review of the *Lane Cove DCP 2022* did not yield specific acoustic criteria or information relevant to this assessment.

2.2 NSW DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT

2.2.1 SSD-10424 CONDITIONS OF CONSENT

Acoustic Dynamics has been provided the Conditions of Consent for the State significant Development approved by the NSW Department of Planning, Industry and Environment dated 25 October 2021. The following conditions relate to noise and vibration emission during construction:

"C12. The Construction Noise and Vibration Management Sub-Plan (CNVMSP) must address, but not be limited to, the following:

(a) *Be prepared by a suitably qualified and experienced noise expert;*
(b) *Describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009) and the noise guidelines criteria in section 5.4 of the SEARs Acoustic Report Riverview Ignis Project – Stage 2, prepared by PKA Acoustic Consulting dated 14 October 2020 (R02v1);*
(c) *Describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;*
(d) *include details of house within which the rock hammering, sheet piling, pile driving and similar activities are proposed to be scheduled, such as (but not limited to):*
  (i) *9am to 12pm, Monday to Friday;*
  (ii) *2pm to 5pm Monday to Friday; and*
  (iii) *9am to 12pm, Saturday.*
(e) *Include strategies that have been developed with the community for managing high noise generating works;*
(f) *Describe the community consultation undertaken to develop the strategies in condition C12(e);*
(g) *Includes details of the noise management measures (including scheduling of high noise generating activities, noise barriers within the site, hoardings etc) that would be installed to ensure that students / staff are not impacted by the construction noise;*
(h) *Include a complaints management system that would be implemented for the duration of the construction; and*
(i) *Include a program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the management measures.C8"*

Acoustic Dynamics has conducted a review of the report prepared by PKA dated 14 October 2020, and has included the same noise guidelines criteria in the subsections below. Additionally, Acoustic Dynamcis has provided criteria for school classrooms, as these were not provided in the PKA report. Further, Acoustic Dynamics has been provided and reviewed the geotechnical report prepared for the project by Douglas & Partners Geotechnical Engineers dated 3 March 2020. The applicable vibration criteria has been extracted and included below.

2.3 AUSTRALIAN STANDARDS

Acoustic Dynamics has conducted a review of relevant Australian Standards in relation to the subject development. The following details this review.

2.3.1 AS2436 *"GUIDE TO NOISE CONTROL ON CONSTRUCTION ... SITES"*

Australian Standard 2436-2010: *"Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites"* provides guidance on noise control in respect of engineering construction, maintenance and demolition works, including guidance in investigation and identification of noise sources, measurement of sound, and it's assessment, with a view to planning of measures for noise control.

Acoustic Dynamics advises that AS 2436 contains the following information relating to appropriate noise emission goals for construction sites:

"3.2 NOISE AND VIBRATION IMPACTS ON THE COMMUNITY

Whether or not noise from a construction, maintenance or demolition site is likely to constitute a problem depends upon a number of considerations, such as –

(a) existing background noise level;
(b) distance between the site and the areas likely to be affected by the construction noise;
(c) nature of buildings and the activity therein, where the noise is likely to be heard;
(d) the likely duration of construction, maintenance and demolition operations and the hours during which the above operations will be carried out (whether during the day, night or weekends);
(e) the nature of the noise, e.g. audible pure tone components and impulsive character; and
(f) the number of items of major plant and equipment being utilized simultaneously on the site for their cumulative impact.

Some construction or demolition activities are by their very nature noisy. The authorities responsible for setting noise level criteria for essential works will take note of the constraints imposed by such activities, especially when they are of short duration."

Acoustic Dynamics advises that determination of appropriate noise emission goals for the proposed works in accordance with the EPA's guidelines will satisfy the recommendations and guidelines detailed within AS 2436.

We advise that assessment of the proposed works, detailed within this document, has been carried out in accordance with the information and guidelines detailed within AS 2436.

2.4 NSW EPA INTERIM CONSTRUCTION NOISE GUIDELINE

In this section, the relevant construction noise emission criteria and conditions applicable to the works are outlined, based on the NSW Environment Protection Authority's (EPA's) *Interim Construction Noise Guideline* (ICNG).

The NSW EPA's ICNG is developed to manage noise from construction works. The ICNG advises that a quantitative methodology of assessment of construction noise emission may be undertaken for long-term (greater than three weeks) works.

Acoustic Dynamics advises that the most appropriate methodology for the assessment of noise emission from the proposed works is a quantitative assessment, to ensure noise emission from the works is minimised. Note should be made that the ICNG states that when developing noise mitigation strategies for reducing construction noise emission focus should be given to *"applying all 'feasible' and 'reasonable' work practices to minimise construction noise impacts"*.

Accordingly, relevant noise emission goals have been determined for the proposed works, in accordance with the information contained within the ICNG, which should be achieved where possible.

The ICNG provides information on management levels (noise emission goals) for construction noise emission at residential receivers, and other various sensitive receivers. The management noise levels at residential receivers are dependent upon the relevant rated background level

(RBL) at the residential receiver, and the time of day that the construction noise is to be generated.

Acoustic Dynamics has used the daytime background noise environment at the nearest receiver properties, as reported by PKA Acoustic Consulting Pty Ltd (PKA) in their SEARS report dated 10 October 2020. The results of PKA's noise measurements at and near the subject site are presented in **Table 2.1**.

Table 2.1 Measured Ambient Noise Environment

Location	Period	Measured Noise Levels [dB][1,2]
		RBL (L_{A90})
Subject Site and nearest receivers	Daytime (7am to 6pm)	38

Note: 1) Measured noise levels are ambient, and do not include any subject works or associated activities.
2) Works at the site will not take place outside daytime hours of 7am to 5pm Monday to Saturday.

Based on the measured background noise environment, **Table 2.2** presents the construction external noise emission management levels/objectives, as detailed in the EPA's ICNG, for the nearest receivers:

Table 2.2 Site Specific Construction External Noise Objectives at Receivers

Time of Day	EPA Management Level ($L_{Aeq\ (15\ min)}$)	Site specific construction noise emission goals $L_{Aeq\ (15\ min)}$ [dB]	Site specific construction noise emission goals $L_{Aeq\ (15\ min)}$ [dB]
Recommended Standard Hours: Monday to Friday 7am to 6pm Saturday 8am to 1pm No work on Sundays or Public Holidays	Residences	**Noise affected RBL + 10 dB(A)**	**48**
		Highly noise affected 75 dB(A)	**75**
	School Classrooms (Internal)	**45 dB(A)**	**45 (Internal)**
	Commercial (External)	**70 dB(A)**	**70**

Note: 1) Works at the site are not expected to take place outside recommended standard hours.

Based on the information contained within the EPA's ICNG, Acoustic Dynamics recommends that noise emission from the proposed works achieves the following noise emission goals, when possible.

Note should be made that as night-time works are not expected to occur, the assessment of sleep disturbance is not warranted.

2.5 CONSTRUCTION VIBRATION CRITERIA

Structural and cosmetic damage vibration criteria are guided by the vibration levels presented within the standards BS 7385 and DIN 4150 and the NSW EPA document *"Assessing Vibration - a technical guide"*.

In terms of the most recent relevant vibration damage criteria, British Standard 7385: Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2 - Guide to damage levels from ground-borne vibration" *represents a definitive standard against which the likelihood of building damage from ground vibration can been assessed.*

Although there is a lack of reliable data on the threshold of vibration-induced damage in buildings both in countries where national standards already exist and in the UK, BS 7385: Part 2 has been developed from an extensive review of UK data, relevant national and international documents and other published data.

The standard sets guide values for building vibration based on the lowest vibration levels above which damage has been credibly demonstrated. These levels are judged to give a minimum risk of vibration-induced damage, where minimal risk for a named effect is usually taken as a 95% probability of no effect.

Sources of vibration, which are considered in the standard, include blasting (carried out during mineral extraction or construction excavation), excavation, piling (sheet, bored, contiguous), ground treatments (e.g. compaction), construction equipment, tunnelling, road and rail traffic and industrial machinery.

The guide values from this standard for transient vibration judged to result in a minimal risk of cosmetic damage to residential buildings and industrial buildings are presented numerically in **Table 2.3** and graphically in **Figure 2.4**.

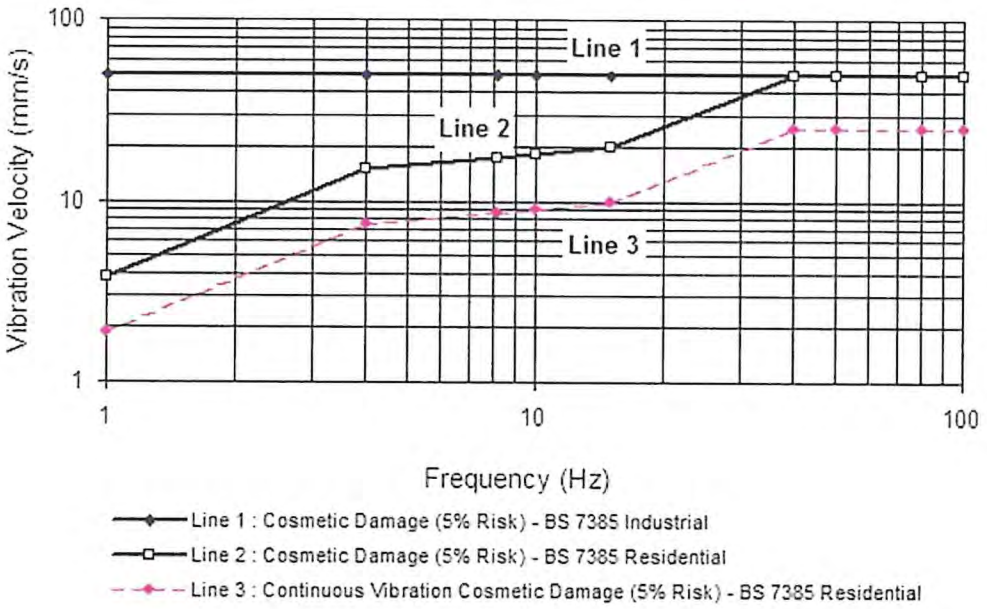
Table 2.3 Transient Vibration Guide Values - Minimal Risk of Cosmetic Damage

Line	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

In relation to guide values for continuous vibration relating to cosmetic damage, the standard states that the guide values in **Table 2.5** relate predominantly to transient vibration, which does not give rise to the resonant responses in structures, and to low-rise buildings.

Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at lower frequencies where lower guide values apply, then the guide values in **Table 2.5** may need to be reduced by up to 50%, as is the case with continuous vibration from rock breaking.

Figure 2.4 Graph of Transient Vibration Guide Values for Cosmetic Damage



The standard goes on to state that minor damage is possible at vibration magnitudes, which are greater than twice those given in **Table 2.3**, and major damage to a building structure may occur at values greater than four times the tabulated values.

It is noteworthy that in addition to the guideline values presented in **Table 2.3**, the standard also states the following:

> *"Some data suggests that the probability of damage tends towards zero at 12.5 mm/s peak component particle velocity. This is not inconsistent with an extensive review of the case history information available in the UK."*

Note is made that **cosmetic damage** to buildings occurs at vibration levels significantly lower than those causing **structural damage**.

- British Standard 7385 indicates a 5% risk of **cosmetic damage** to commercial/industrial buildings at 50 mm/s from transient vibration and at 25 mm/s from continuous vibration; and

- British Standard 7385 indicates a 5% risk of **cosmetic damage** to residential and light framed structures at 15 mm/s at 4 Hz from transient vibration and at 7.5 mm/s at 4 Hz from continuous vibration.

In addition to the above standard, the German Standard DIN 4150 provides guideline values of vibration velocity for evaluating the effects of short-term vibration. Table 1 of DIN 4150 is reproduced as **Table 2.5** below.

Table 2.5 Guideline values of vibration velocity, vi, for evaluating the effects of short-term vibration

Line	Type of structure	Vibration Velocity, v_i, in mm/s			
		Foundation			Plane of floor of uppermost full storey
		At a frequency of			Frequency mixture
		Less than 10 Hz	10 to 50 Hz	50 to 100)* Hz	
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that, because of their particular sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8
*) For frequencies above 100 Hz, at least the values specified in this column should be applied.					

In view of the foregoing, and advice by Douglas Partners Geotechnical Engineers the following **conservative** site assessment control limits could be adopted for the purposes of monitoring and evaluating the measured vibration levels from the excavation works:

Structures Adjacent to Proposed Works:

- All buildings and structures adjacent to works – **5 mm/s** peak component particle velocity (site control level).

3 ASSESSMENT METHODOLOGY

Acoustic Dynamics has performed calculations to predict maximum L_{Aeq} noise emission levels at adjacent receiver locations resulting from the proposed works and operations.

Acoustic Dynamics has conducted operator-attended noise monitoring of similar/equivalent equipment at various other sites on numerous occasions. Based on previous operator-attended surveys of similar activities and equipment, prediction calculations have been undertaken to predict the noise impact at adjacent receiver locations, resulting from the proposed works, in accordance with the information and guidelines detailed **Section 2**.

Within our calculations and acoustic modelling, noise emission contributions from the development have been considered taking the following factors into account:

- Airborne noise losses due to distance and ground topography;
- Losses due to direction and diffraction;
- Increases due to reflections; and
- Acoustic shielding.

3.1 NOISE SOURCES AND OPERATIONS

Acoustic Dynamics advises that the project is likely to be undertaken in three main stages:

1. Demolition (approximately 5 weeks duration, contemporaneous of excavation);
2. Excavation (approximately 3 months duration, contemporaneous of demolition); and
3. Construction (approximately 13 months duration).

Acoustic Dynamics understands that the following items of noise emitting equipment and machinery are likely to be used during the proposed works.

For the purpose of noise assessment, the likely maximum *"at source"* noise levels (A-weighted sound pressure levels at 1 metre) have been used as detailed below.

Table 3.1 Predicted Noise Sources and Operations

Source	Sound Pressure Level @ 1m L_p [dBA]
Demolition Works	
Hammers	85
Saws	101
Grinders	80
Other hand-held tools	94
25-Tonne Excavator (including attachments)	93 (108)
15-Tonne Excavator	93
Trucks (for removal of materials)	92
Excavation Works	
25-Tonne Excavator (including attachments)	93 (108)
15-Tonne Excavator	93
Piling rig	93
Bobcat	80
Trucks (for removal of materials)	92
Construction Works and Site Restoration	
Hammers	85
Kanga Hammers	103
Saws	101
Grinders	80
Drills	80
Mud/cement mixers	85
Compressors	92
Nail guns	85

Source	Sound Pressure Level @ 1m L_p [dBA]
Concrete trucks/pumps	95
Trucks (for delivery of materials)	92
Trades	N/A
Other typical building tools and equipment	90

Accordingly, assessment of the operation of the above items requires calculation of their noise emission levels to nearby potentially affected receiver locations.

3.2 NEAREST RECEIVERS

The cumulative noise impact has been assessed to the potentially most affected point at the adjacent sensitive receiver properties and presented in **Table 3.2** below.

Table 3.2 Nearest Sensitive Receiver Locations

Source	Location	Direction
School Receivers		
S_1	O'Neill Building	West
S_2	Wallace Building	South
S_3	Therry Building	North
Residential Receivers		
R_1	28 Conah Parade	Northwest
R_2	43 Conah Parade	Northwest
R_3	120-126 Tambourine Bay Road	Northeast

Acoustic Dynamics advises that by achieving compliance with the nearest sensitive receiver locations, compliance will also be achieved at all other sensitive receiver locations further away.

4 NOISE AND VIBRATION EMISSION PREDICTION AND ASSESSMENT

In this section Acoustic Dynamics provides an assessment of noise emission from proposed construction works at the subject site.

4.1 PREDICTED NOISE EMISSION LEVELS

The results from Acoustic Dynamics' noise prediction calculations and modelling are presented in **Table 4.1** below, and represent calculated **maximum** received external noise emission levels resulting from the use and operation of the highest noise emitting items listed above.

Note should be made that the highest noise emitting items of plant and equipment are unlikely to be used for long durations.

Note should be made that the predicted noise levels presented in **Table 4.1** below, are the **maximum** predicted L_{Aeq} noise levels at the nearest boundaries of the listed properties, resulting from proposed demolition, excavation and construction works at the subject site. Typically, received L_{Aeq} noise emission levels would be expected to be lower than these during the majority of the works. Significantly lower noise levels than those presented in the table would also be expected within (inside) the nearby dwellings.

Table 4.1 Maximum Excavation and Construction Works Noise Emission and Criteria

Receiver Location	Stage of Works	Predicted Range of L_{Aeq} Noise Levels[1] [dB]	EPA L_{Aeq} Noise Management Levels [dB]		Achieves EPA Guidelines?	
			Noise Affected	Highly Noise Affected	Noise Affected	Highly Noise Affected[2]
S_1 (Internal)	Demolition	24 – 45	45 (Internal)	-	**Yes**	-
	Excavation	21 – 42			**Yes**	-
	Construction	24 – 45			**Yes**	-
S_2 (Internal)	Demolition	27 – 44			**Yes**	-
	Excavation	24 – 41			**Yes**	-
	Construction	27 – 44			**Yes**	-
S_3 (Internal)	Demolition	20 – 41			**Yes**	-
	Excavation	17 – 38			**Yes**	-
	Construction	20 – 41			**Yes**	-
R_1	Demolition	23 – 25	48	75	**Yes**	**Yes**
	Excavation	20 – 22			**Yes**	**Yes**
	Construction	23 – 25			**Yes**	**Yes**
R_2	Demolition	23 – 24			**Yes**	**Yes**
	Excavation	20 – 21			**Yes**	**Yes**
	Construction	22 – 24			**Yes**	**Yes**
R_3	Demolition	44 – 45			**Yes**	**Yes**
	Excavation	41 – 42			**Yes**	**Yes**
	Construction	44 – 45			**Yes**	**Yes**

Note: 1) Calculated noise level at nearest residential boundary or nearest exposed facade.
2) Instances considered "highly noise affected" will be infrequent, and are unlikely to unreasonably disturb the adjoining properties.

4.2 NOISE EMISSION ASSESSMENT

The predicted noise emission levels presented in **Table 4.1** above indicate:

1. L_{Aeq} noise emission associated with all proposed demolition, excavation and construction works is expected to **comply with** the relevant "Noise Affected" construction noise management level at the following receivers, following the implementation of our recommendations detailed in **Section 5**:

- S_1 receivers within the O'Neil Building;
- S_2 receivers within the Wallace Building;
- S_3 receivers within the Therry Building;
- R_1 Residential receiver at 28 Conah Parade;
- R_2 Residential receiver at 43 Conah Parade; and
- R_3 Residential receiver at 120-126 Tambourine Bay Road.

2. L_{Aeq} noise emission associated with all proposed demolition, excavation and construction works is expected to **comply** with the relevant "Highly Noise Affected" construction noise management level at the following receivers:

    - R_1 Residential receiver at 28 Conah Parade;
    - R_2 Residential receiver at 43 Conah Parade; and
    - R_3 Residential receiver at 120-126 Tambourine Bay Road.

Although the majority of construction activities are **expected to comply** with the relevant "*Highly Noise Affected*" noise management level set by the EPA Guidelines, the magnitude of the predicted exceedance may lead to complaint and appropriate strategies should be developed for management of noise emission and community liaison.

To ensure that construction noise emission levels from the proposed works are kept to a minimum, Acoustic Dynamics provides recommendations for feasible and reasonable noise mitigation and management in **Section 5**, which should be incorporated into the noise management plan for the proposed construction works.

4.3 PREDICTED VIBRATION EMISSION LEVELS

Acoustic Dynamics has been advised that mechanical excavation methods will be utilised, and based on this information advises that this excavation methodology is likely to result in minimal perceivable vibration levels (human comfort) at nearby/adjacent residential dwellings.

Acoustic Dynamics advises that where rock is to be removed from the site, excavation should incorporate the use of saw cuts in rock to enable smaller, rather than large, rock-breakers to be used to break the rock away from the saw cut.

Such sawing has been shown to produce significantly lower vibration levels and substantially reduce the potential for structural (or even cosmetic) damage to adjacent buildings and structures.

Acoustic Dynamics has predicted likely vibration levels at the nearest potentially affected adjacent receiver locations. Acoustic Dynamics' prediction calculation results are presented in **Table 4.2** below.

Table 4.2 Predicted Excavation Works Vibration Emission Levels and Criteria

Construction Stage	Receiver Location	Predicted Vibration Levels (PPV)[1]	5% Risk of Cosmetic Damage Criterion	Likely to Comply?
Excavation works	S_1	< 5 mm/s^2	5 mm/s	Yes
	S_2	< 5 mm/s^2		Yes
	S_3	< 5 mm/s^2		Yes
	R_1	< 1 mm/s		Yes
	R_2	< 1 mm/s		Yes
	R_3	< 1 mm/s		Yes
All other works	S_1	< 1 mm/s	5 mm/s	Yes
	S_2	< 1 mm/s		Yes
	S_3	< 1 mm/s		Yes
	R_1	< 1 mm/s		Yes
	R_2	< 1 mm/s		Yes
	R_3	< 1 mm/s		Yes

Note: 1) Predicted received peak component particle velocity (PPV) at structure.
2) Predicted vibration levels following the implementation of the vibration control measures recommended in **Section 5** below.

Acoustic Dynamics advises that predicted vibration emission levels to adjacent residential receivers indicate that low levels of vibration are predicted for the excavation stage of works.

The predicted vibration levels resulting all other stages of the proposed works are below structural damage criteria presented within **Section 2.4** of this report.

5 RECOMMENDATIONS AND ADVICE

Further to the predicted noise emission levels presented in **Section 4**, Acoustic Dynamics advises that measures are required to minimise and manage noise emission and impact from the proposed demolition, excavation and construction works at the subject site.

5.1 NOISE AND VIBRATION MANAGEMENT PLAN

Acoustic Dynamics recommends that the use of noise generating equipment during the proposed works at the subject site only be carried out during the following construction hours:

- **Monday to Friday:** 7:00am to 5:00pm; and
- **Saturday:** 8:00am to 1:00pm.

Acoustic Dynamics recommends the following measures be implemented to minimise and manage noise and vibration emission from the subject excavation and construction works:

1. Noise & vibration induction of all site staff – including the explanation of noise and vibration control and minimisation and a discussion of project specific reduction strategies;

2. Implementation of an appropriate community liaison procedure – including a noise and vibration management and noise and vibration complaint procedure and continual liaison with nearby potentially affected receivers;

3. Implementation of a noise and vibration monitoring and reporting programme (where necessary – to protect the interest of all parties or should complaints arise);

4. The use of temporary noise barriers around particularly noisy activities (where feasible and reasonable);

5. Use of quietest available equipment and lowest vibration generating equipment for works (where feasible and reasonable);

6. Where excavation of rock is required, an appropriate excavation methodology should be adopted:

    - Use of saw cuts in rock around the external perimeter of any excavation works, and wherever feasible, to enable smaller rock-breaker to be used to remove the remaining rock;
    - Use of hand held jackhammers for rock-breaking activities within 5m of adjacent structures;
        i. No use of small rock-breakers within 5m of adjacent structures;
        ii. No use of large rock-breakers within 10m of adjacent structures;
    - Vibration monitoring during periods of intensive excavation works, where adverse comment is generated or possible;

7. Where there is any risk of damage, a dilapidation survey of adjacent buildings and structures should be completed prior to the commencement of any excavation works;

8. Implementation of periods of respite, where highly intensive activities produce loud noise (i.e. greater than 75 dB(A) at nearby residences) to minimise disturbance on nearby receivers; and

9. Should trucks or other vehicles be required to be on site for longer than five minutes, Acoustic Dynamics advises that engines should be switched off for the duration.

The following sections provide detail about the various measures listed above and how they are to be incorporated into the noise management procedures for the proposed works.

5.2 NOISE AND VIBRATION INDUCTION OF ALL SITE STAFF

Acoustic Dynamics recommends all site staff be inducted, ensuring each person is aware of the noise and vibration management and mitigation procedures applicable to the site and subject site works.

5.3 COMMUNITY LIASON PROCEDURE

Acoustic Dynamics recommends implementation of an appropriate community liaison procedure, including a noise management and compliant procedure, and continual liaison with the nearby potentially affected receivers. The following should be carried out by the proponent:

1. A sign is to be located near the entry to the site with 24-hour contact details (mobile phone numbers and email addresses for receipt of complaints); and

2. A detailed (physical) log of all complaints relating to noise is to be kept on site. Such a log should include details of:
   i. the address of the complainant;
   ii. the date and time of the complaint;
   iii. the date and time the subject noise was heard;
   iv. a description of the activities being undertaken at the time of the subject complain;
   v. a contact telephone number for the complainant; and
   vi. detail of the person who fielded and logged the complaint;
   vii. the signature of the project manager or site foreman confirming the complaint has reached an appropriate level of responsibility;
   viii. detail of the action taken to respond to the complaint and the timing of this response; and
   ix. the signature of the project manager or site foreman signing off confirmation that the complaint has been appropriately addressed.

3. Neighbouring residents be notified in writing prior to the commencement of excessively noisy activities. Notices should include an approximate timeframe of the works and a site contact phone number. The following would be suitable phrasing to include within a notification letter:

   "Dear Resident

   We are writing to inform you of the upcoming works and activities that will be occurring in the areas east of the O'Neil Building.

Between date DD/MM/YY and date DD/MM/YY, we will be conducting demolition activities, removal of site waste and construction activities.

The works will be occurring weekdays (7:00am to 5:00pm) and Saturdays (8:00am to 1:00pm).

To ensure amenity impacts are controlled, we are implementing management measures such as restricting the duration of noisy activities, allowance for respite periods and selecting low noise equipment.

The contact details for the site manager are listed below should you wish to discuss any aspect of the noise impacts associated with the works.

We appreciate your understanding during this inconvenience."

NB: Note is made that should the complaint require the services of an independent consultant to investigate or conduct measurements, such services shall be engaged promptly and dates and times of contact with such a consultant shall be maintained/detailed within the complaints log.

5.4 USE OF TEMPORARY NOISE BARRIERS

Where feasible and reasonable, Acoustic Dynamics recommends the use of temporary noise barriers along the windows and balconies of the O'Neil Building, to assist with reducing noise emission during high noise generating activities to these receiver locations. These barriers must line the second and third floor of the building.

A suitable, temporary noise barrier is likely to:

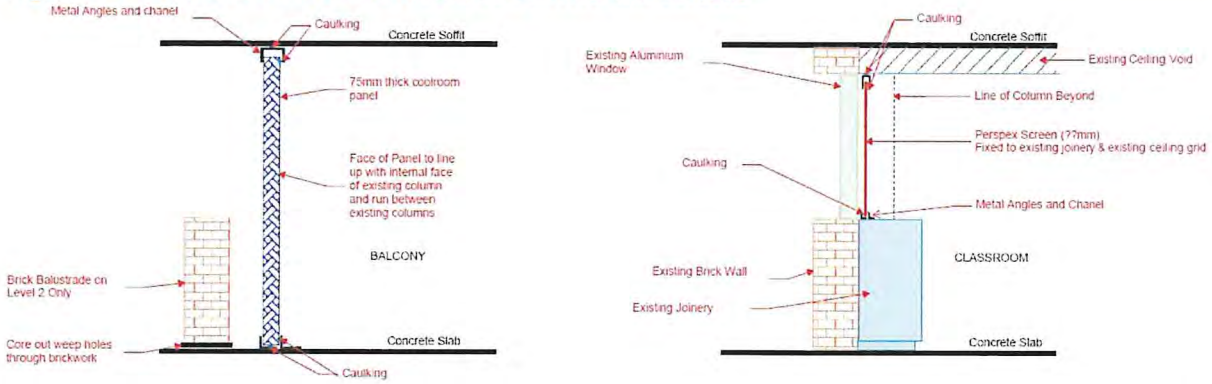
- Contain **no gaps** along the surface area of the screen, and be **close fitting (ie within 30mm) to the ground** (to prevent the transmission of noise below the barrier); and

- The temporary noise barrier(s) should provide a minimum surface density of **14 kg/m^2**, and contain **no gaps** along the surface of the barrier(s).
  i. 25mm thick marine plywood; or
  ii. A minimum 9mm thick compressed fibre-cement sheeting; or
  iii. Other suitable material such as Perspex or Cool-Room Panels (minimum surface density of **14 kg/m^2**); and

- Design of supports of any temporary noise barrier(s) must be verified by a suitably qualified person to ensure sufficient structural and wind loading support is provided.

Acoustic Dynamics understands that Cool-room panels have been selected to line the balconies of the second and third floor of the O'Neil Building, and Perspex will be fixed to the inside of the windows to the staff rooms of Levels 2 and 3. Detail of this installation is provided in **Figure 5.4.1** below:

Figure 5.4.1 Construction Detail of Acoustic Barriers and Screens



Acoustic Dynamics advises that these barrier constructions will ensure noise is attenuated to compliant levels for the receivers within the O'Neil Building.

5.5 AN APPROPRIATE EXCAVATION METHODOLOGY

Where excavation of rock is required, the excavation methodology should incorporate the use of saw cuts in the rock wherever feasible to enable smaller rock-breakers to be used to remove the rock. Such sawing has been shown to produce significantly lower vibration levels and substantially reduce the potential for structural (or even cosmetic) damage to adjacent buildings and structures.

In addition, Acoustic Dynamics recommends the following:

- Use of hand-held jackhammers for rock-breaking activities **within 5m** of adjacent structures;
- No use of small rock-breakers **within 5m** of adjacent structures; and
- No use of large rock-breakers **within 10m** of adjacent structures.

5.6 VIBRATION MONITORING AND REPORTING PROGRAMME

Vibration monitoring during excavation works will need to be incorporated to monitor and quantify received vibration levels at adjacent buildings and structures.

Vibration monitors should be installed on The O'Neil and Wallace buildings for the duration of excavation works. These monitors must incorporate an alarm system to alert construction workers when vibration levels exceed 3.5 mm/s (lower limit) and 5 mm/s (upper limit) at the nearest sensitive receivers. Such a methodology is expected to further lower the risk of cosmetic damage to nearby residential dwellings.

Monthly summary reports should then be provided to the College for review and to enable discussion regarding the excavation works for the project.

5.7 PREPARATION OF A DILAPIDATION SURVEY OF ADJACENT BUILDINGS AND STRUCTURES

Where there is any risk of damage, a detailed dilapidation survey of adjacent buildings and structures completed prior to the commencement of any excavation works would provide an appropriate reference condition, against which post works inspections can be compared.

5.8 PROVISION OF RESPITE PERIODS DURING INTENSIVE ACTIVITIES

Where there is potential for receivers to be affected by sustained high noise levels (i.e. greater than $L_{Aeq(15minute)}$ 75 dB at nearby residences), periods of respite are to be provided. Such respite may include provisions:

1. Not to commence such noisy activities prior to 9:00am;
2. Not to undertake such noisy activities after 5:00pm; and
3. Not to undertake such noisy activities for any sustained period greater than 3 hours without a minimum 2-hour period of respite.

5.9 RESTRICTING THE USE OF HIGH NOISE EMISSION APPLIANCES

Acoustic Dynamics recommends that the operation of high noise emission appliances, plant and/or machinery such as pile-drivers, rock breakers and hydraulic hammers and those which are not listed in Groups B, C, D, E or F of Schedule 1 of the City of Sydney Code of Practice/Noise 1992 and Australian Standard 2436-2010 Guide to Noise Control on Construction, Maintenance and Demolition Sites be restricted to the following construction hours only:

- **Monday to Saturday**: 9:00am to 12:00pm; and
- **Monday to Friday**: 2:00pm to 5:00pm.

5.10 NOISE MONITORING AND REPORTING PROGRAMME

Noise monitoring during excavation works will need to be incorporated to monitor and quantify received noise levels at adjacent buildings and structures. Information from this monitoring can then be referenced in relation to any complaint or comments from the College or nearby residential receivers. Noise monitoring is only recommended for the Excavation phase of works.

Two noise monitors are required. These monitors should be located near the facades of the O'Neil Building and the Wallace Building, to be representative of noise levels received at the most affected receivers internal of each building.

Monthly summary reports should then be provided to the College for review and to enable discussion regarding the excavation works for the project. Consideration should be given of transmission loss through barriers and glazing when presenting received noise levels for classrooms and staff offices.

6 CONCLUSION

Acoustic Dynamics has undertaken a quantitative assessment of the noise impact at the nearest potentially affected receivers resulting from the demolition, excavation and construction works and associated activities, for the proposed works at St Ignatius' College, Riverview, NSW. This report is prepared in accordance with the various acoustic requirements of:

(a) Lane Cove Council;
(b) NSW Department of Planning, Industry and Environment;
(c) NSW Environment Protection Authority (EPA); and
(d) Australian Standards.

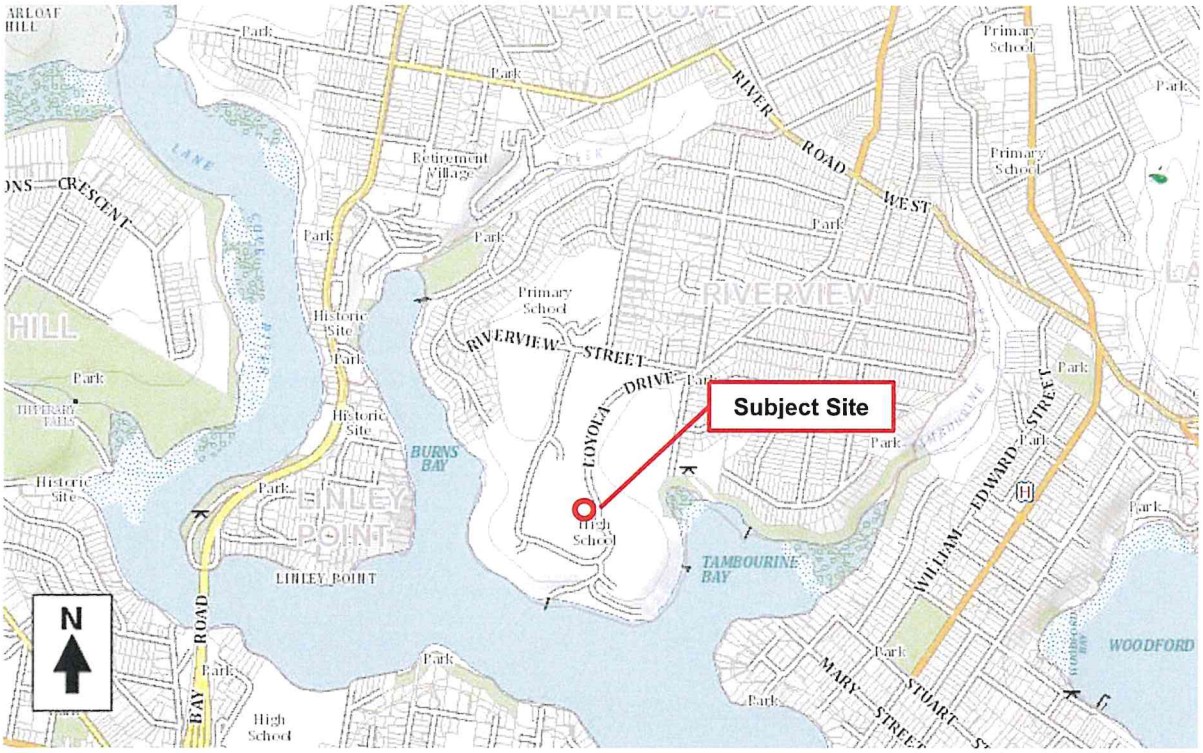
Acoustic Opinion

The magnitude of the predicted noise exceedances above the construction noise goals (determined in accordance with the EPA's ICNG) may lead to complaint (adverse comment) and appropriate strategies should be developed for management of noise emission and community liaison. Acoustic Dynamics advises that implementation of the recommendations contained in Section 6 of this report will assist with the mitigation and management of noise emission from excavation and construction activities at the subject development site.

We trust that the above information meets with your present requirements and expectations. Please do not hesitate to contact us on 02 9908 1270 should you require more information.

APPENDIX A – LOCATION MAP, AERIAL IMAGE & DRAWINGS

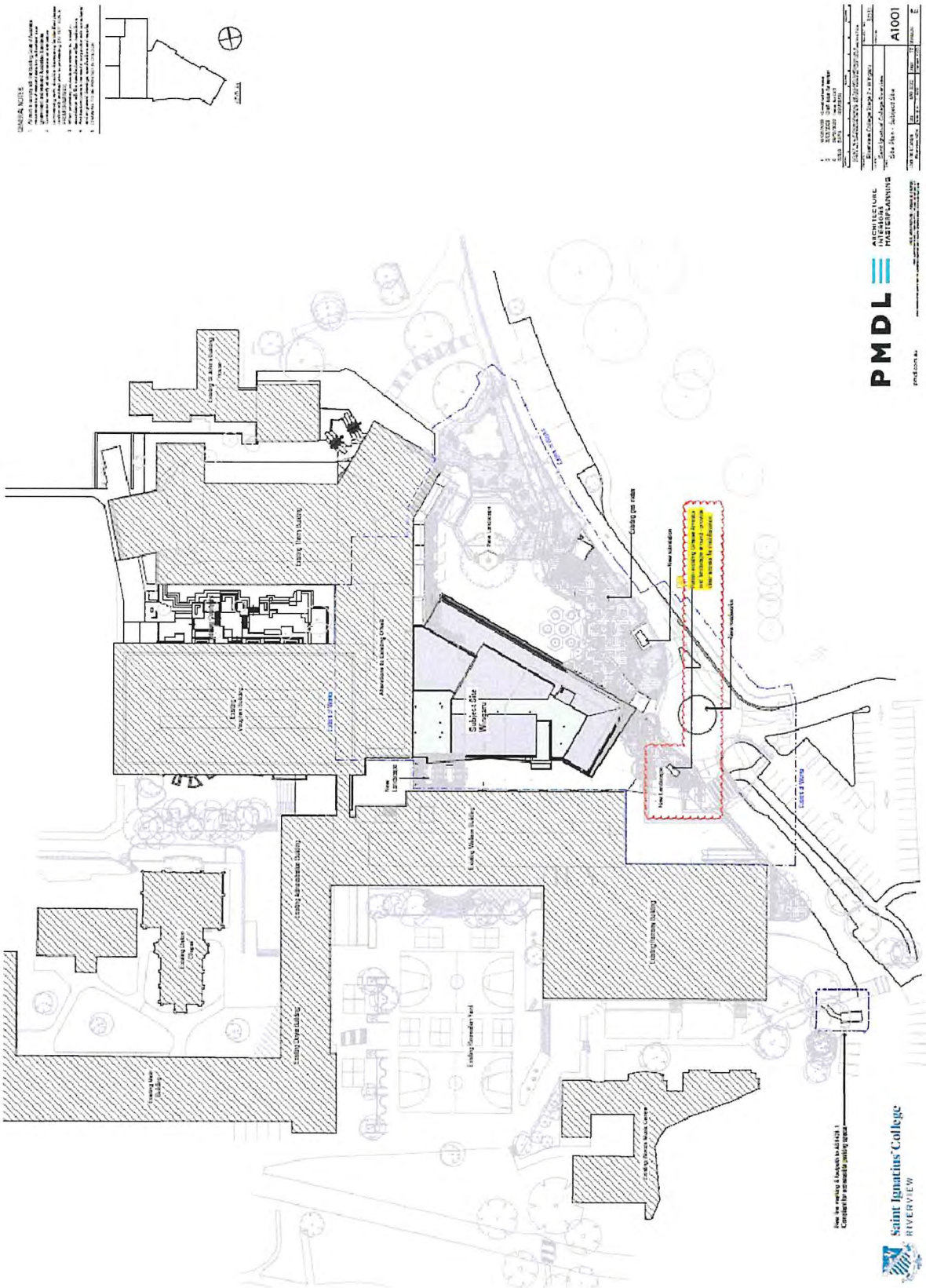
A.1 LOCATION MAP (COURTESY OF SIX MAPS)



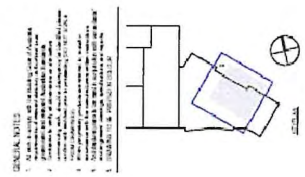
A.2 AERIAL IMAGE (COURTESY OF SIX MAPS)

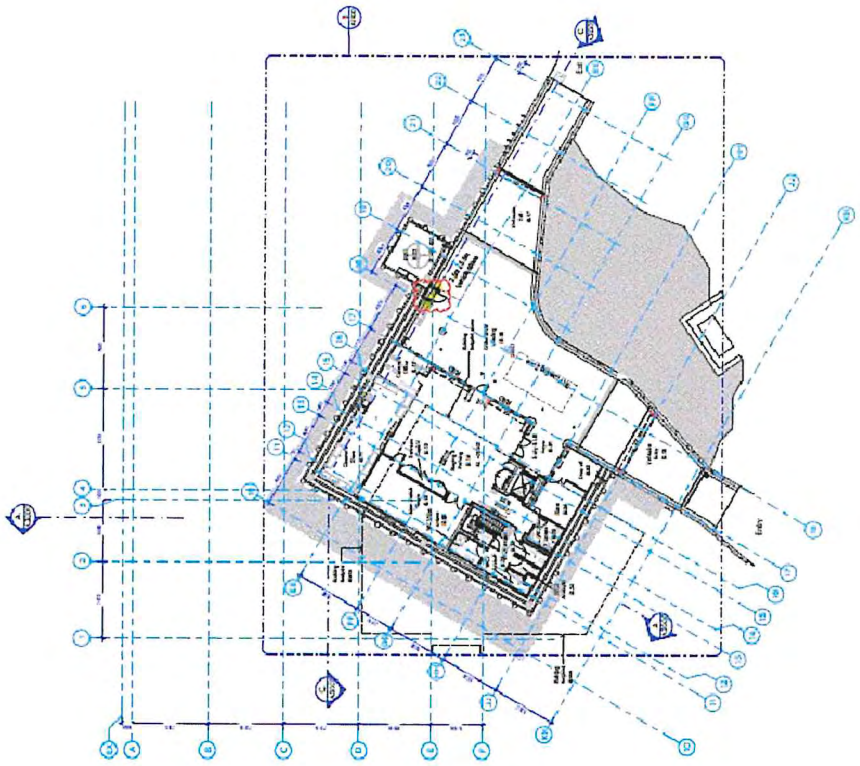
A.3 ARCHITECTURAL DRAWINGS

A.3.1 SITE PLAN

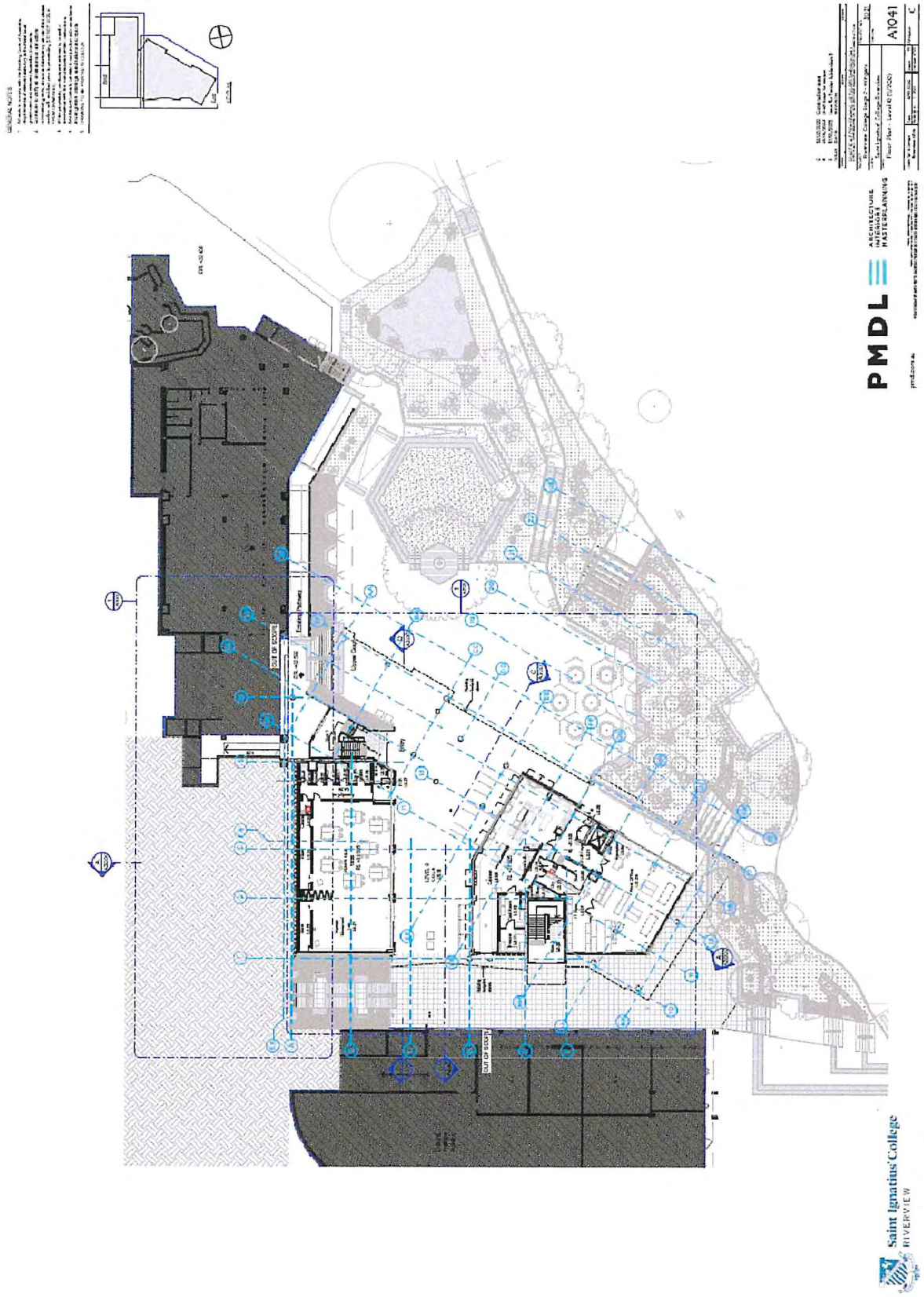


A.3.2 BASEMENT FLOOR PLAN

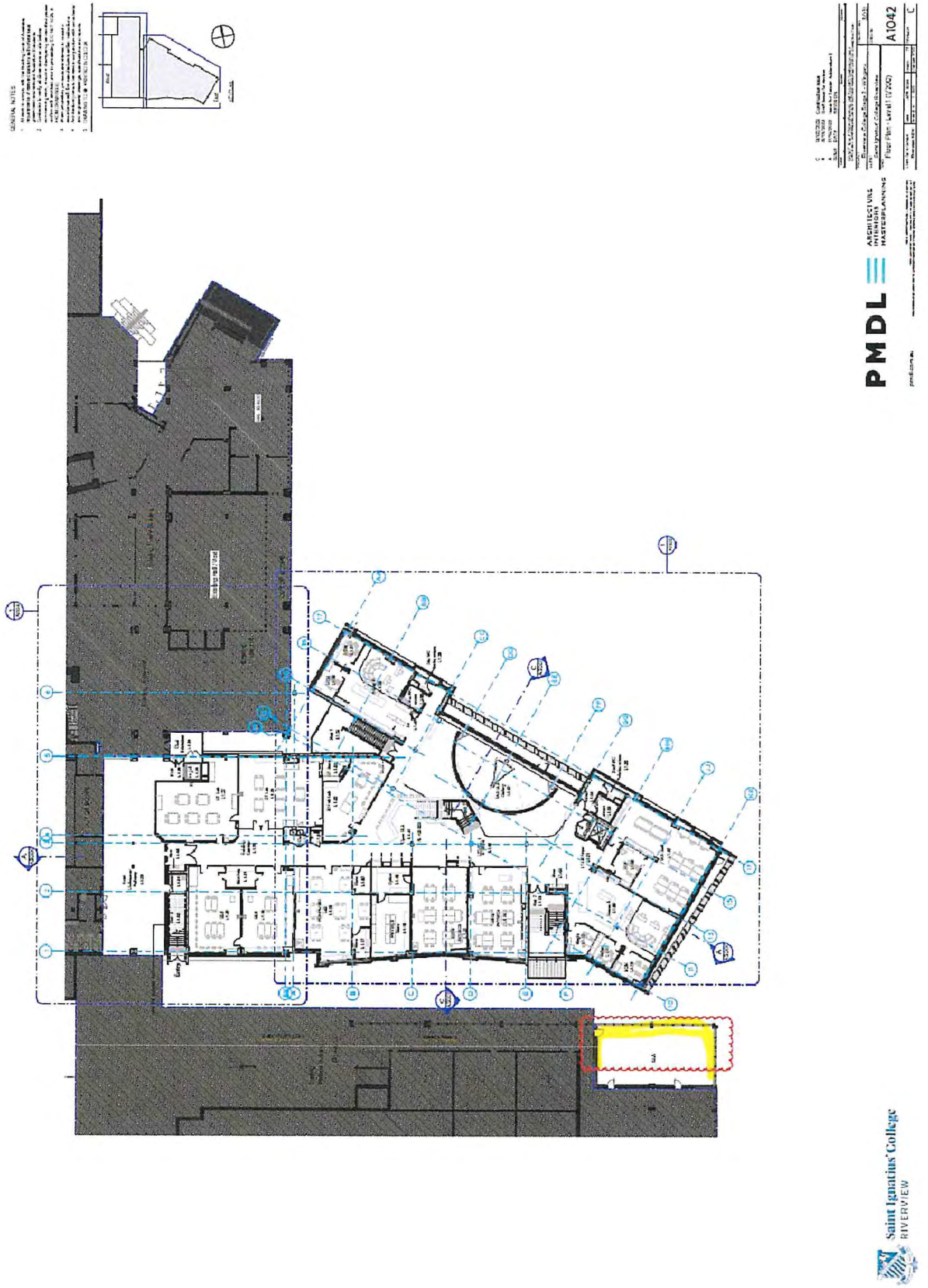




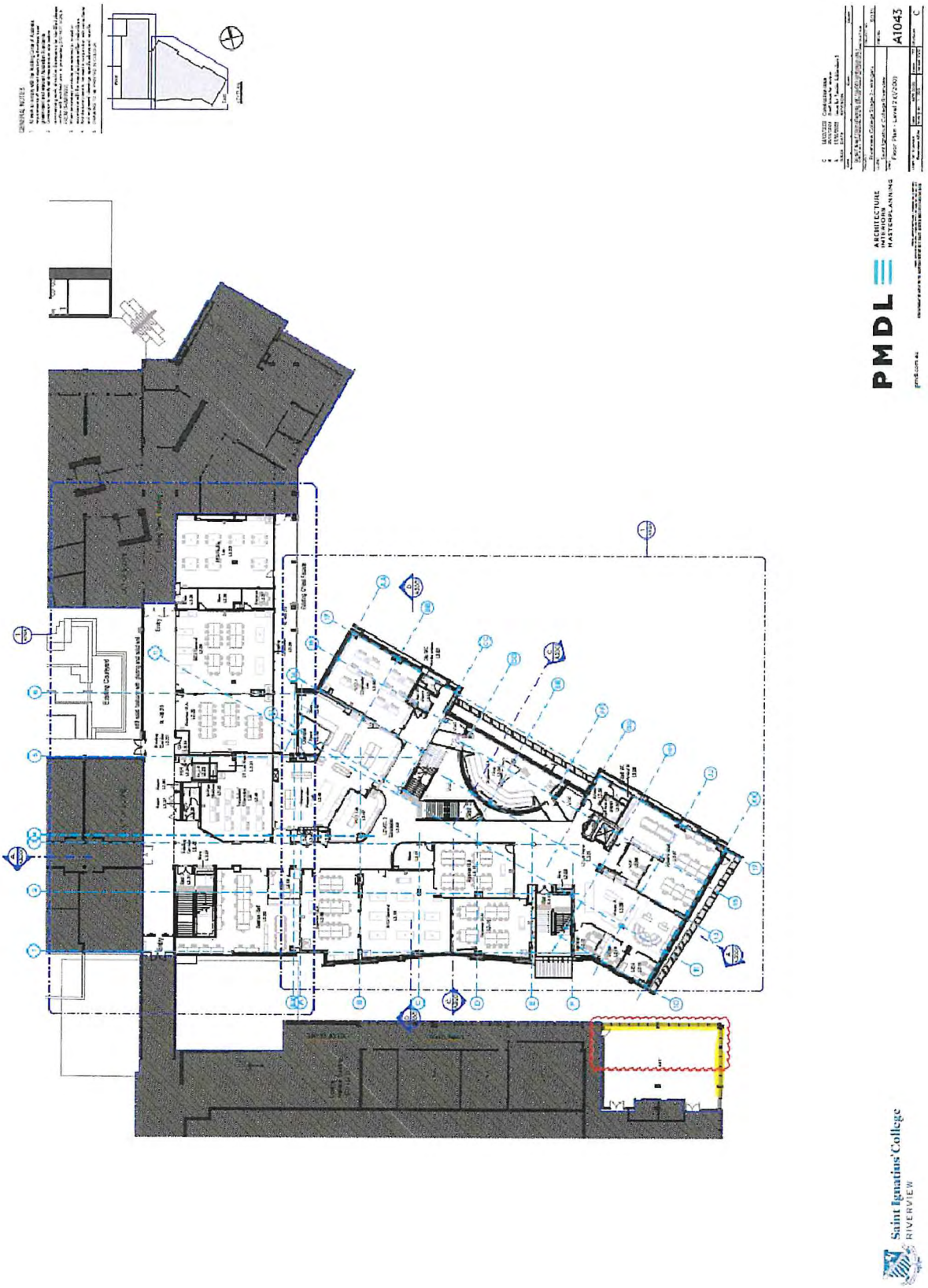
A.3.3 LEVEL 0 FLOOR PLAN



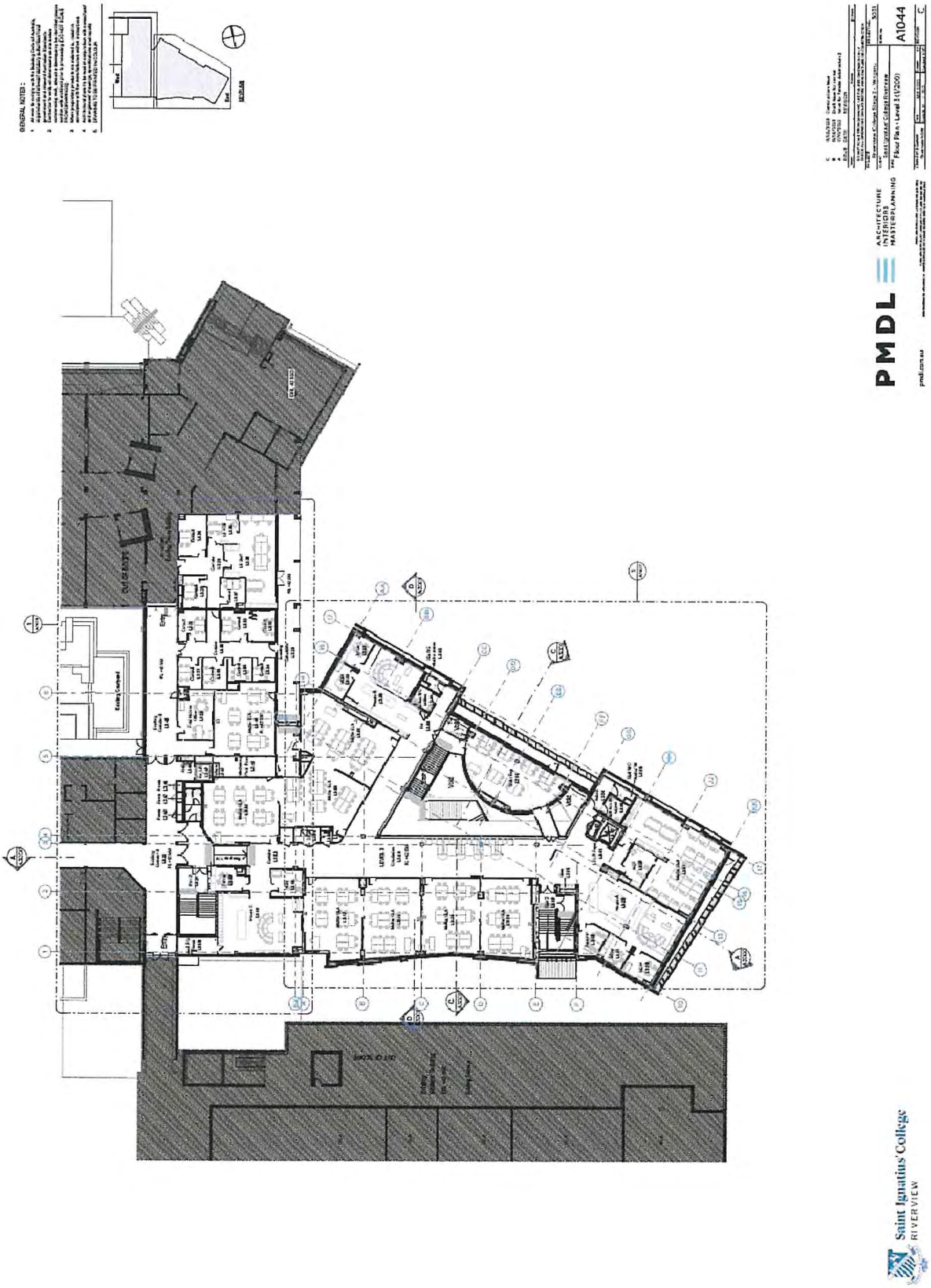
A.3.4 LEVEL 1 FLOOR PLAN



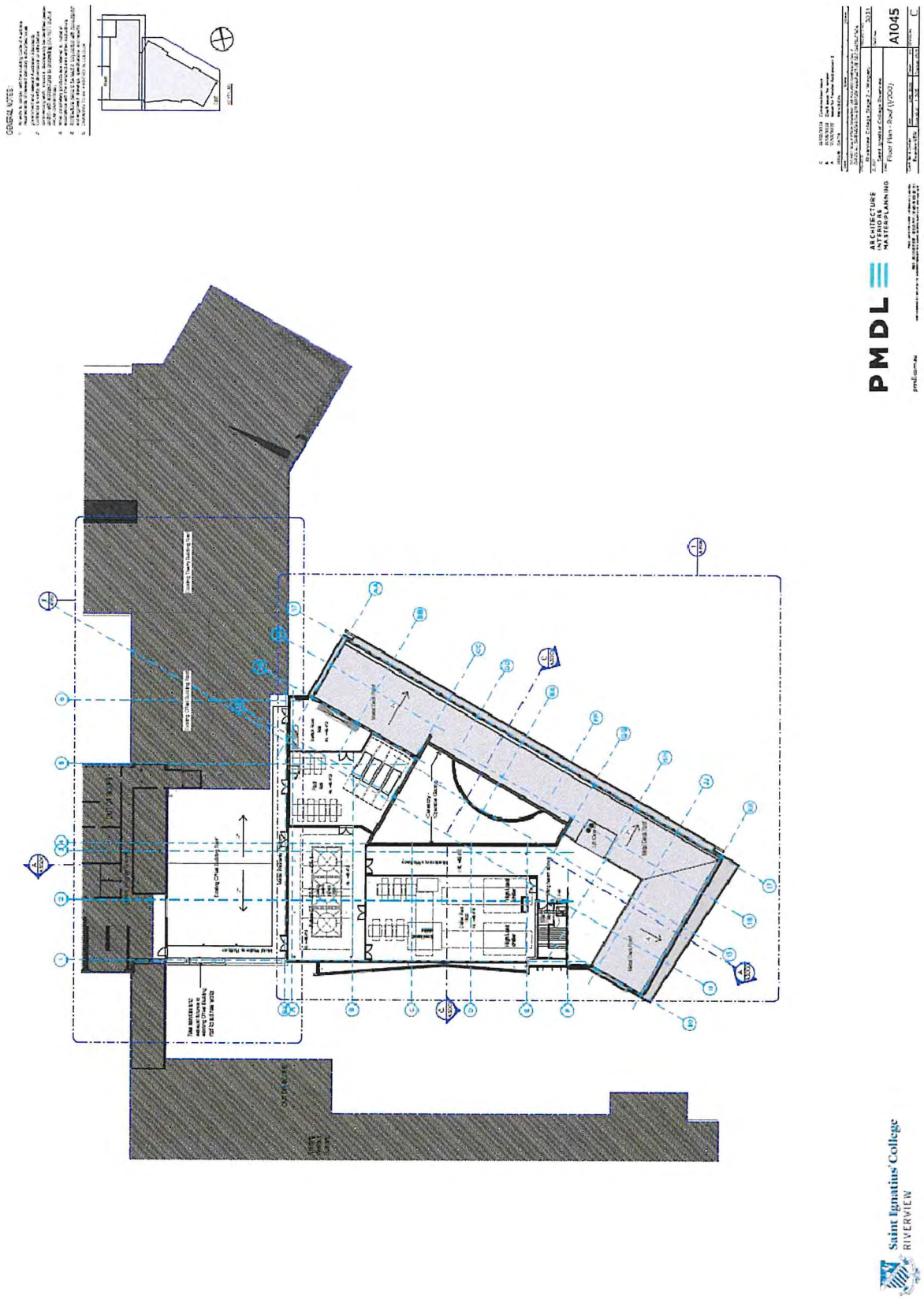
A.3.5 LEVEL 2 FLOOR PLAN



A.3.6 LEVEL 3 FLOOR PLAN



A.3.7 ROOF FLOOR PLAN



ANNEXURE 8 – TTW REPORT CIVIL ENGINEERING REPORT

Structural
Civil
Traffic
Façade

Civil Engineering Report

Saint Ignatius' College Riverview, Stage 2

State Significant Development Application

Prepared for epm Projects / 16.10.2020

191740 CAAA

Taylor Thomson Whitting (NSW) Pty Ltd (ACN 113 578 377)
as trustee for the Taylor Thomson Whitting NSW Trust
(ABN 59 514 956 558) I Consulting Engineers
Level 3, 48 Chandos Street, St Leonards NSW 2065

Your Partner in Engineering

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PREPARED BY	APPROVED BY	STATUS	ISSUE	DATE
Duncan Marshall	Stephen Brain	Draft Approval	A	30.07.20
Duncan Marshall	Stephen Brain	Issue for SSDA	B	16.10.20

1.0 Introduction

1.1 Executive Summary

Taylor Thomson Whitting Pty Ltd (TTW) has been engaged to provide civil engineering consulting services for the proposed developments across the three Meriden School campuses.

This report supports a State Significant Development Application (SSDA) submitted to the Department of Planning and Environment (DPE) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This proposed development is identified as a State Significant Development by way of Clause 15(2) of Schedule 1 under *State Environmental Planning Policy (State and Regional Development) 2011* on the basis that the development is for the purpose of an existing school and has a Capital Investment Value of more than $20 million.

1.2 Secretary's Environmental Assessment Requirements (SEARs)

Under application number SSD-10424, we have been provided with Secretary's Environmental Assessment Requirements (SEARs) issued on the 5th of February 2020. This report provides a response (in part or full where relevant) to the following SEARs:

Condition	**Description**	Reference within this report
16	**Drainage:** • Detail measures to minimise operational water quality impacts on surface waters and groundwater. • Stormwater plans detailing the proposed methods of drainage without impacting on the downstream properties.	Refer to Section 3.0
17	**Flooding:** • Identify flood risk on-site (detailing the most recent flood studies for the project area) and consideration of any relevant provisions of the NSW Floodplain Development Manual (2005), including the potential effects of climate change, sea level rise and an increase in rainfall intensity. If there is a material flood risk, include design solutions for mitigation.	Refer to Section 4.0
19	**Sediment, Erosion and Dust Controls:** • Detail measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles.	Refer to Section 5.0

Relevant Documents
- ANZECC (2000) Guidelines for Fresh and Marine Water Quality
- Lane Cove Local Environmental Plan 2009
- Lane Cove Council DCP – Part O Stormwater Management (2010)
- Lane Cover River Coastal Zone Management Plan Draft Report (2012)
- Managing Urban Stormwater: Soils and Construction (Landcom NSW)
- NSW Floodplain Development Manual (2005)
- Australian Rainfall and Runoff 2019 Guidelines

The details of this report are preliminary and based on current available information and correspondence undertaken at the time of writing.

2.0 Overview of Proposed Development

2.1 Development Description

Client: St Ignatius' College, Riverview
Client Acronym: SICR
State Significant Development Number: SSD 7140
Project Name: Senior School Redevelopment
Project Address: Tambourine Bay Road, Lane Cove NSW 2066

The St Ignatius' College Redevelopment – Ignis Stage 2 project proposes a significant expansion of the current facilities on site (Refer to Site Concept in Figure 1). The proposed works are as follows:

- Construction of new five (5) storey building with a maximum RL52.00 at the heart of the Campus to accommodate modern, flexible teaching and learning spaces;
- Provide improved learning opportunities for Science, Technology, Engineering, Mathematics and PDHPE as a STEMP facility, along with six (6) Pastoral Care House areas, and staff rooms;
- The ground floor will accommodate a C.O.L.A, multi-purpose Hall and Canteen (Food and Beverage) with servicing by a loading area on basement level;
- Refurbishment of existing O'Neil Building to allow integration of New Ignis Stage 2 STEMP Building to connect to existing fabric;
- New North Landscaped Area;
- New Landscaped Area between the existing Wallace Building and the New Ignis Stage 2 STEMP Building; and
- Upgrade courtyard to improve the integration of the learning space and create a sense of place.

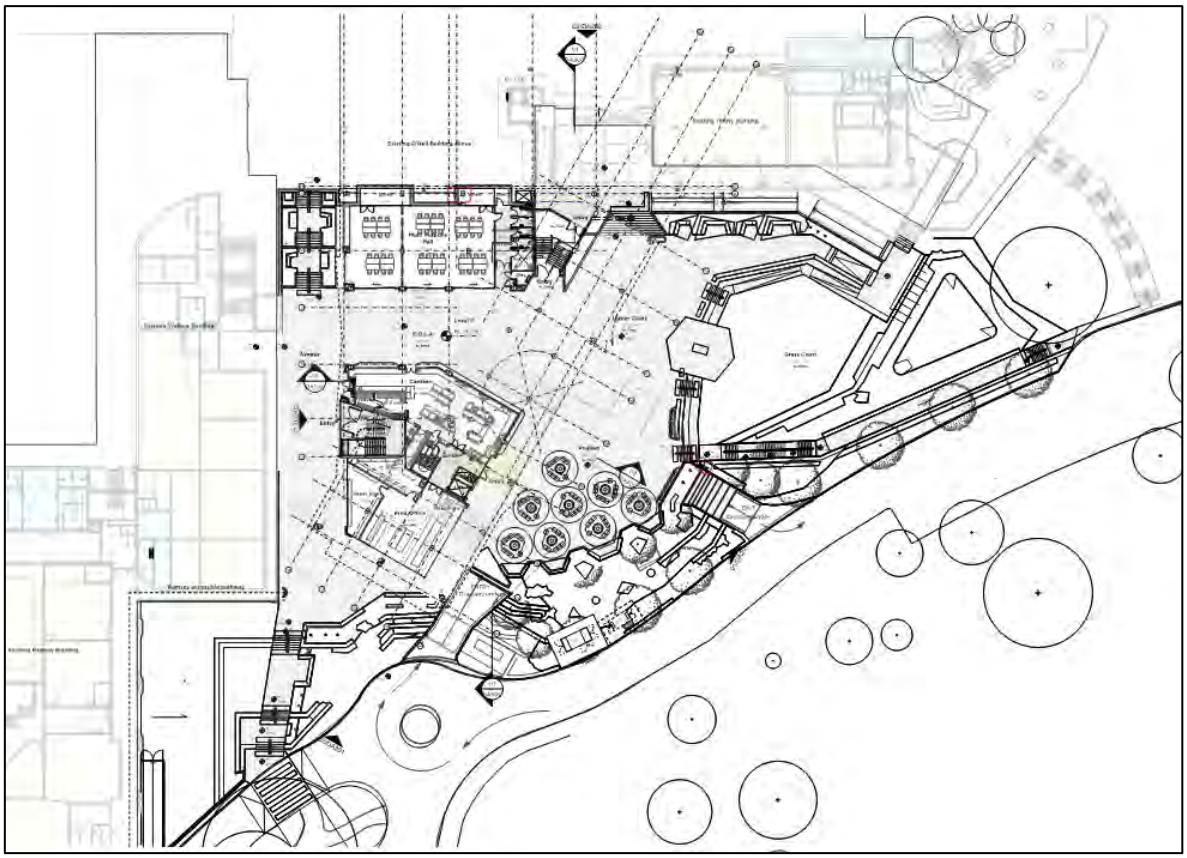

Figure 1 - Concept Layout Plan (Source: PMDL)

2.2 Site Background

The site is located at 2-60 Riverview Street, Riverview (Lot 10 DP 1142773) at the Saint Ignatius' College Riverview campus. The college was established in 1880 and sits elevated above the Lane Cove River between Tambourine Bay and Burns Bay. The site falls within the Lane Cove Council local government area with primary access to the site via Riverview Street and Tambourine Bay Road from the north. A ferry service is also operated for students to arrive at Riverview College Wharf on the Lane Cove River.

The campus includes several classroom and education buildings, several large playing fields, circulating access road (Loyola Drive) and surrounding bushland along the south embankment.

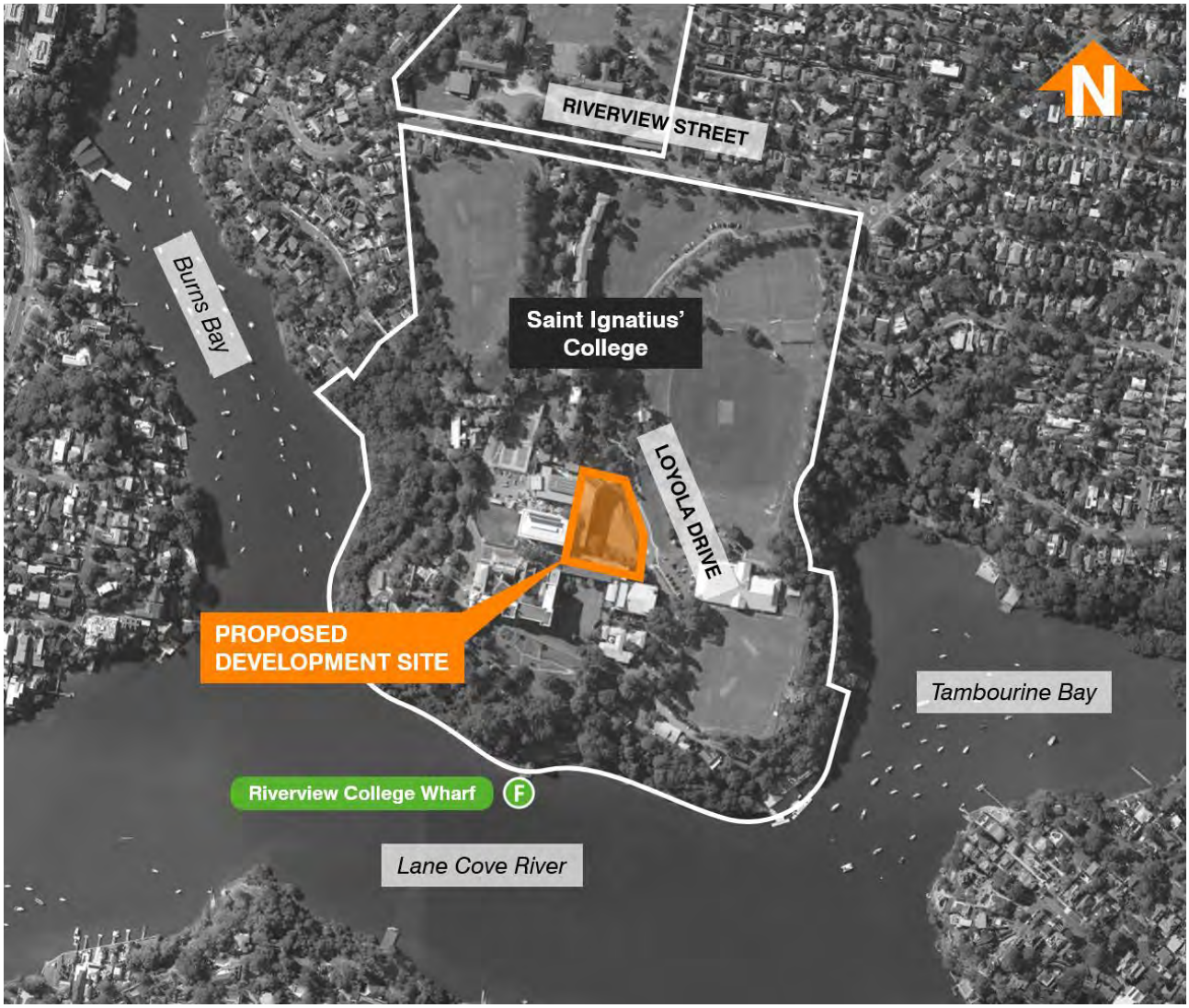

Figure 2 - Locality plan of existing site

The natural topography divides the campus site into three catchments. The western and southern catchments outside the proposed development area drains via surface flow or localised piped networks into Burns Bay and the Lane Cover River. Roof and surface runoff in the eastern catchment is collected via a network of grated pits, swales which discharges into Tamborine Bay via a 1200mm outlet pipe.

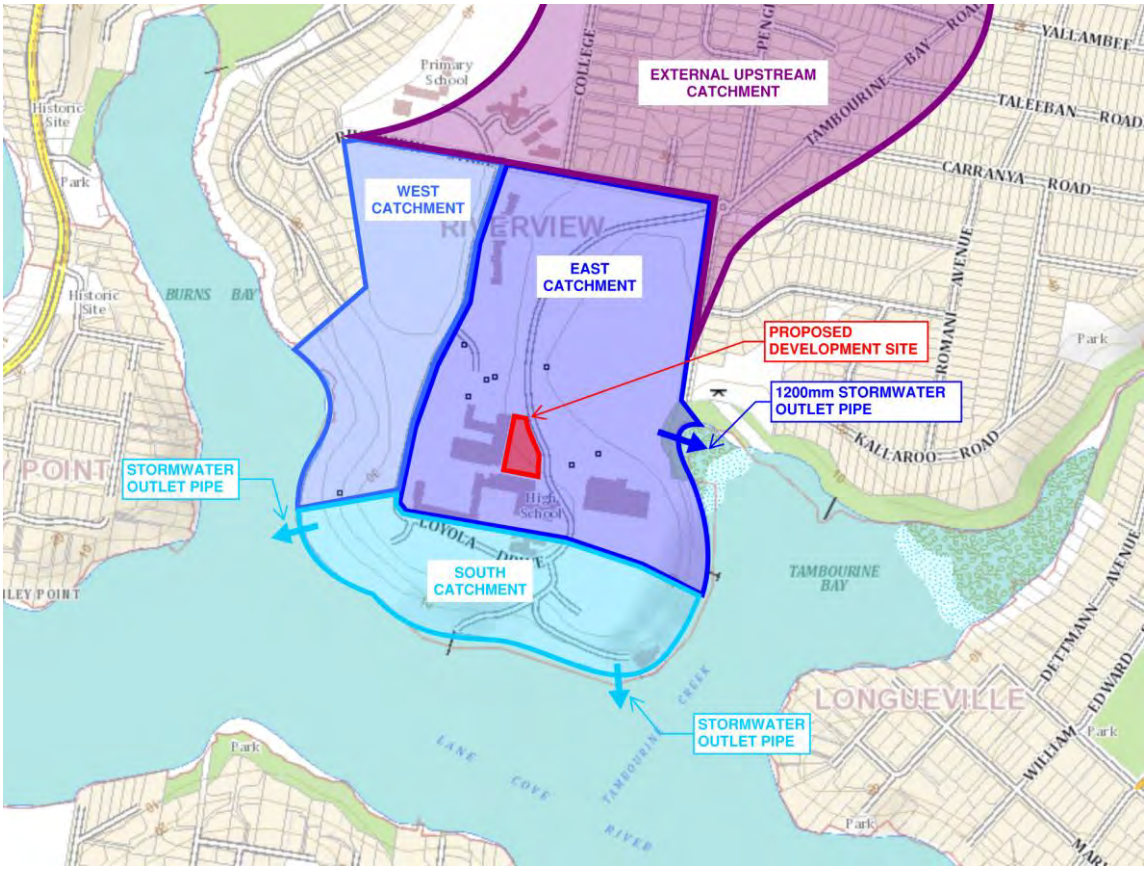

Figure 3 - Catchment areas and existing stormwater discharge locations

3.0 Drainage

The purpose of this section is to address the following items relating to SEARs Condition 16 - Drainage;

- Detail measures to minimise operational water quality impacts on surface waters and groundwater.
- Stormwater plans detailing the proposed methods of drainage without impacting on the downstream properties.

3.1 Pre-Development Stormwater Management Approach

Much of the proposed development area is covered by existing hardstand playing courts and surrounded by grassed or landscaped areas. Surveying works carried out in 2016 and 2020 reveals an extensive network of stormwater pits and pipes servicing the area around the proposed development. Surface drainage from the playing courts and road pavement is collected via grated inlet pits and drains into a 375mm diameter pipe running along the western edge of Loyola Drive. This runoff passes through an existing gross pollutant trap (GPT) adjacent to existing pavilion to remove trash and other pollutants. Runoff then exits the GPT a via 600mm pipe and runs to downstream junction pit at the edge of the playing fields, from here the runoff discharges freely into Tambourine Bay via a 1200mm diameter pipe.

Roof and surface drainage from the Wallace, Vaughan and Therry buildings is collected via pits and pipes and passes underneath the existing playing courts. A steep 375mm diameter pipe then conveys this upstream runoff to the stormwater receiving point at Tambourine Bay.

3.2 Proposed Stormwater Management Approach

Lane Cove Council DCP Part O requires the proposed piped flow conveyance for up to a 50 year Annual Recurrence Interval (ARI), equivalent to a 2% Annual Exceedance Probability (AEP) under Australian Rainfall Runoff 2016. Overland flowpaths are to be designed for the 100 year ARI, equivalent to 1% AEP. Roof water is collected in roof gutters and downpipes and conveyed via a separate pipe system into the 10kL rainwater tank located in the basement for re-use. Surface stormwater runoff will be collected through site grading, overland flowpaths and inlet pits and conveyed by in-ground pipe system into the trunk main discharging to Tamborine Bay.

3.1 Design Average Recurrence Intervals

Drainage systems shall be designed to provide both minor and major flow conveyance systems as detailed in Australian Rainfall and Runoff (AR&R).

Element of Stormwater System	Design ARI
All pipes and associated components for:	
single occupancy developments	20 Year
Residential flat buildings, commercial and industrial developments	50 Year
Overland flowpaths	100 Year

Figure 4 - Design Average Recurrence Intervals (Source: LCC DCP. 2010)

The existing 375mm pipe from the Vaughan and Therry Buildings and the 300mm pipe from the Wallace Building will be reconstructed to a new alignment to allow for the basement structure. Both pipes will reconnect into the downstream 375mm pipe.

In order to reduce the risk of flooding the basement in the event of a blockage downstream, a surcharge pit with an top of grate level 150mm below the basement finished floor level will be provided adjacent to Loyola Drive. This will allow any stormwater surcharging in the system to safely discharge across the oval towards Tamborine Bay instead of inundating the basement.

Refer to Stormwater Management Plans in Appendix A.

3.3 Stormwater Quantity

Appendix 12 of the Lane Cove Council DCP Part O identifies the site of the proposed development as exempt from on-site detention requirements due to proximity to the Lane Cove River foreshore. This has also been confirmed directly with Lane Cove Council's stormwater development engineer.

Although the new building structure will utilise the footprint of the hardstand playing courts, the additional paved areas shown in proposed landscaping plans will result in an overall reduction in the pervious area compared the existing site condition. One of the key issues for the development was ensuring that all minor storm events up to the 50-year storm can still be conveyed by the piped system.

As there are no downstream developments from the project site, there is no risk of flooding to other buildings, habitable or otherwise. However, in major storm events up to the 100-year storm, overland flows paths will need to be designed to safely discharge any excess runoff into Tamborine Bay.

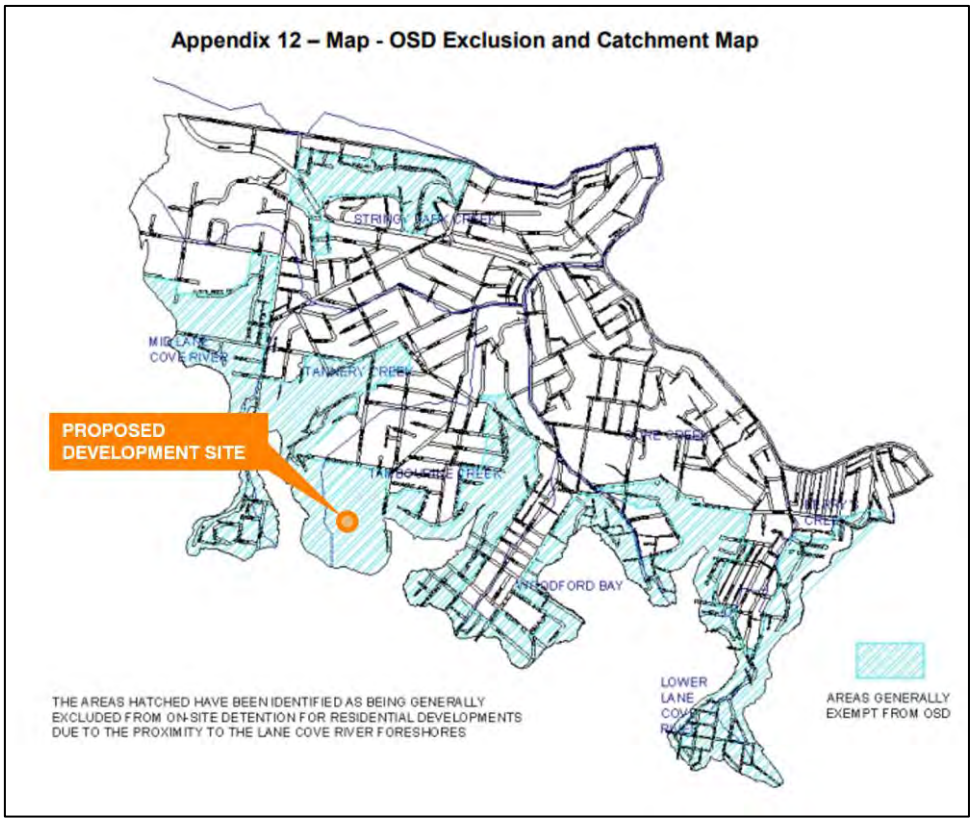

Figure 5 - OSD Exemption Areas (Source: LCC DCP, 2010)

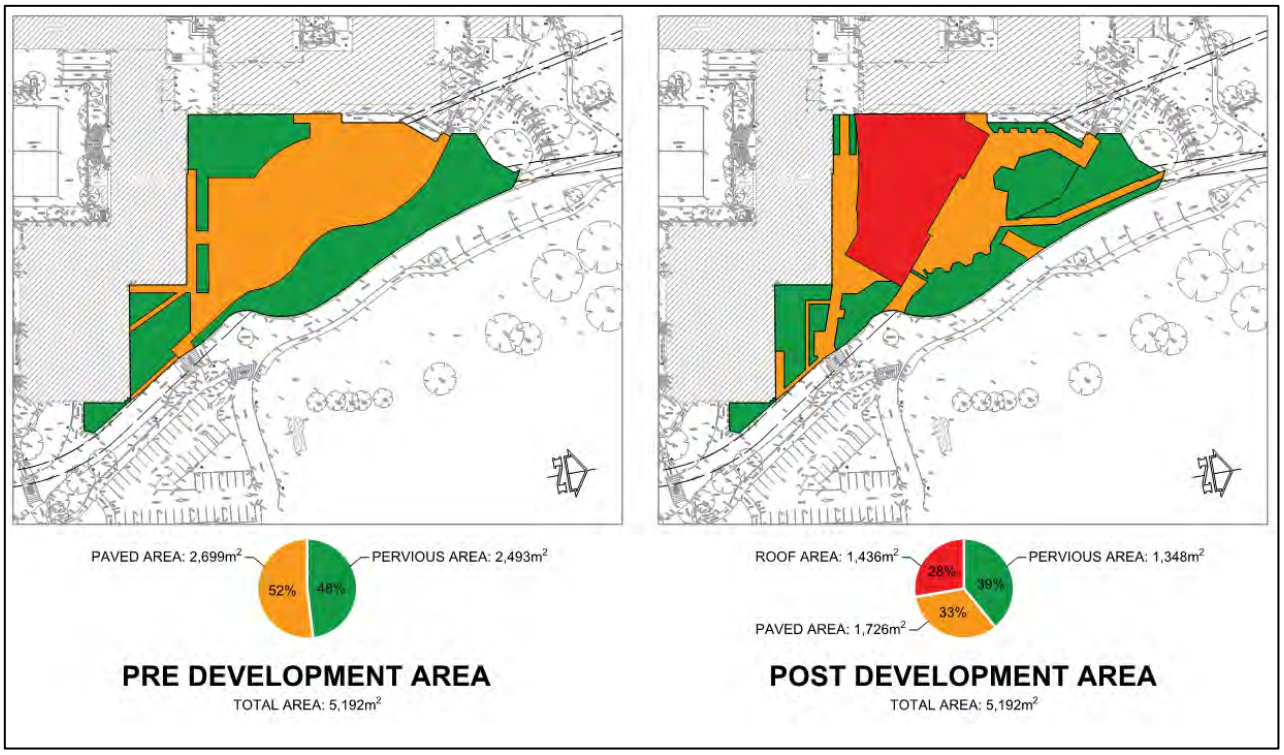

Figure 6 - Comparison of Pre and Post Development Catchment Areas

3.4 Stormwater Quality

As a requirement stated in Lane Cove Council DCP Part O, a gross pollutant trap (GPT) is to be installed downstream on the development site. One existing GPT is currently located north of the development site adjacent to the pavilion structure and will be utilised to filter surface runoff collected from the road pavement and external areas of the development site. An additional GPT will be positioned alongside Loyola Drive at the connection point into the existing 375mm diameter pipe which will filter additional external area runoff and roof water. A suitable proprietary GPT product would be the Ocean Protect OceanSave OS1515 which has the following treatment specifications:

	OceanSave OS1515	**Post Development Flows at GPT location**
Treatable Flow Rate	290 L/s	247 L/s (1 in 1 year storm event)
Maximum Total Flow Rate	690 L/s	605 L/s (1 in 100 year storm event)

The selected GPT unit will be able to capture all litter, debris and sediment particles greater than 5mm in size. A submerged outlet also allows for grease and to oil remain trapped in the GPT. Where possible in the external catchment areas, surface drainage will be conveyed by grassed swales - this method increases infiltration in pervious areas, reduces runoff entering the roadway and assists in filtering sediment.

3.4.2 Gross Pollutant Traps

GPT's are installed to remove contaminants such as sediment, oil and other pollutants from the stormwater before it discharges into the receiving system.

GPT's must be installed for the following developments:

a) Residential developments with more than six dwellings.

b) All Commercial Developments that may involve the use, storage or transportation of contaminants.

c) Commercial developments on allotments greater than 5,000m^2.

d) All industrial developments.

Figure 7 - Requirements for Gross Pollutant Traps (Source: LCC DCP, 2010)

3.5 DRAINS Modelling

Roof and surface run-off have been modelled using DRAINS modelling software. Blockage factors have been applied as specified in Lane Cove Council DCP Part O.

9.1.3 Pit Inlet Capacities

The inlet capacity of on grade and sag inlet pits shall be determined using equations given in Australian Rainfall & Runoff. Allowances shall be made for blockage in accordance with the following table.

Inlet Type	% Capacity Blockage
Side Entry	10%
Grated	+30%
Combination	100% Side Inlet Capacity only
Letterbox	50%

Figure 8 - Blockage Factors (Source: LCC DCP, 2010)

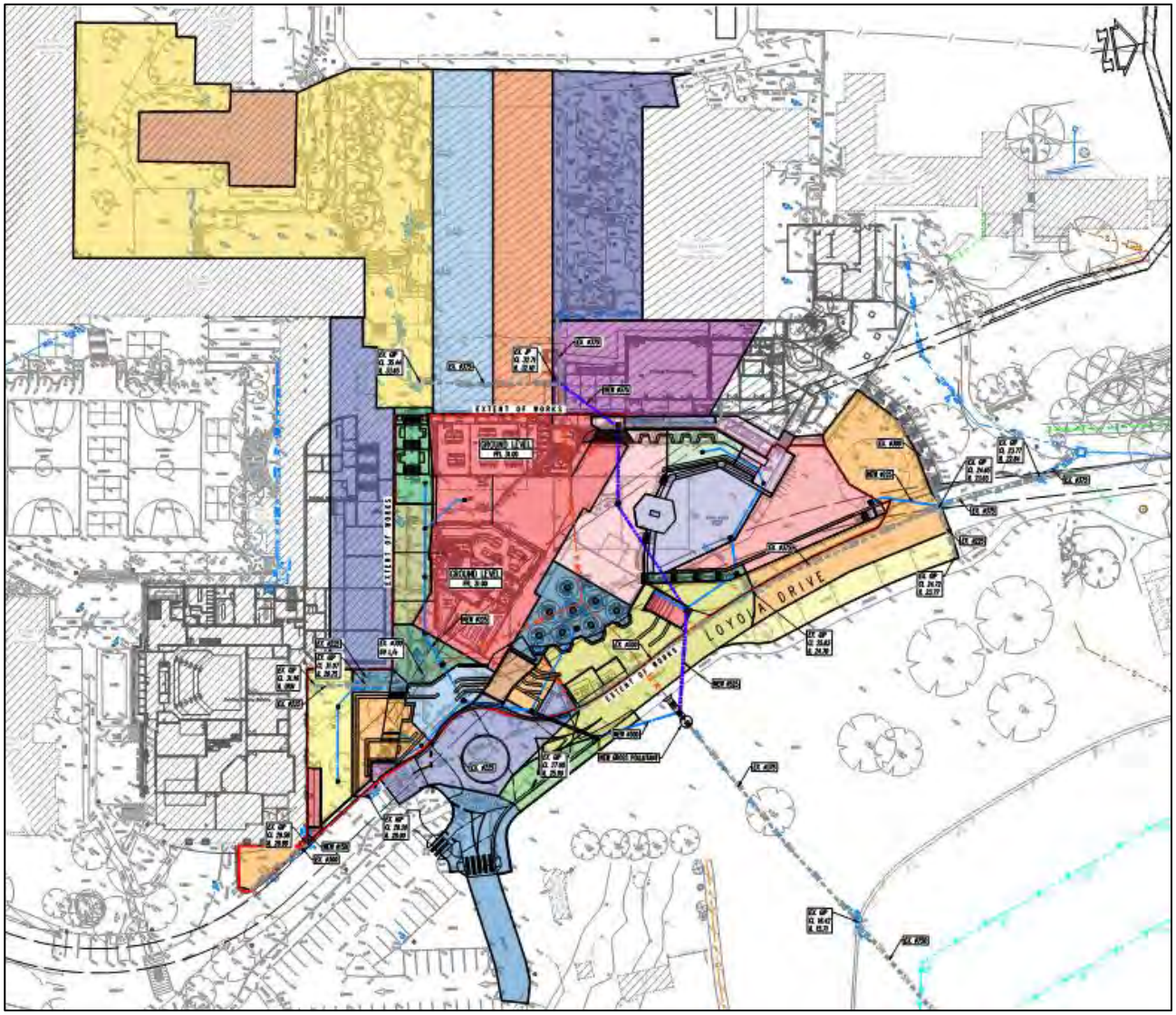

Figure 9 - Plan of Contributing Sub-catchments for DRAINS modelling

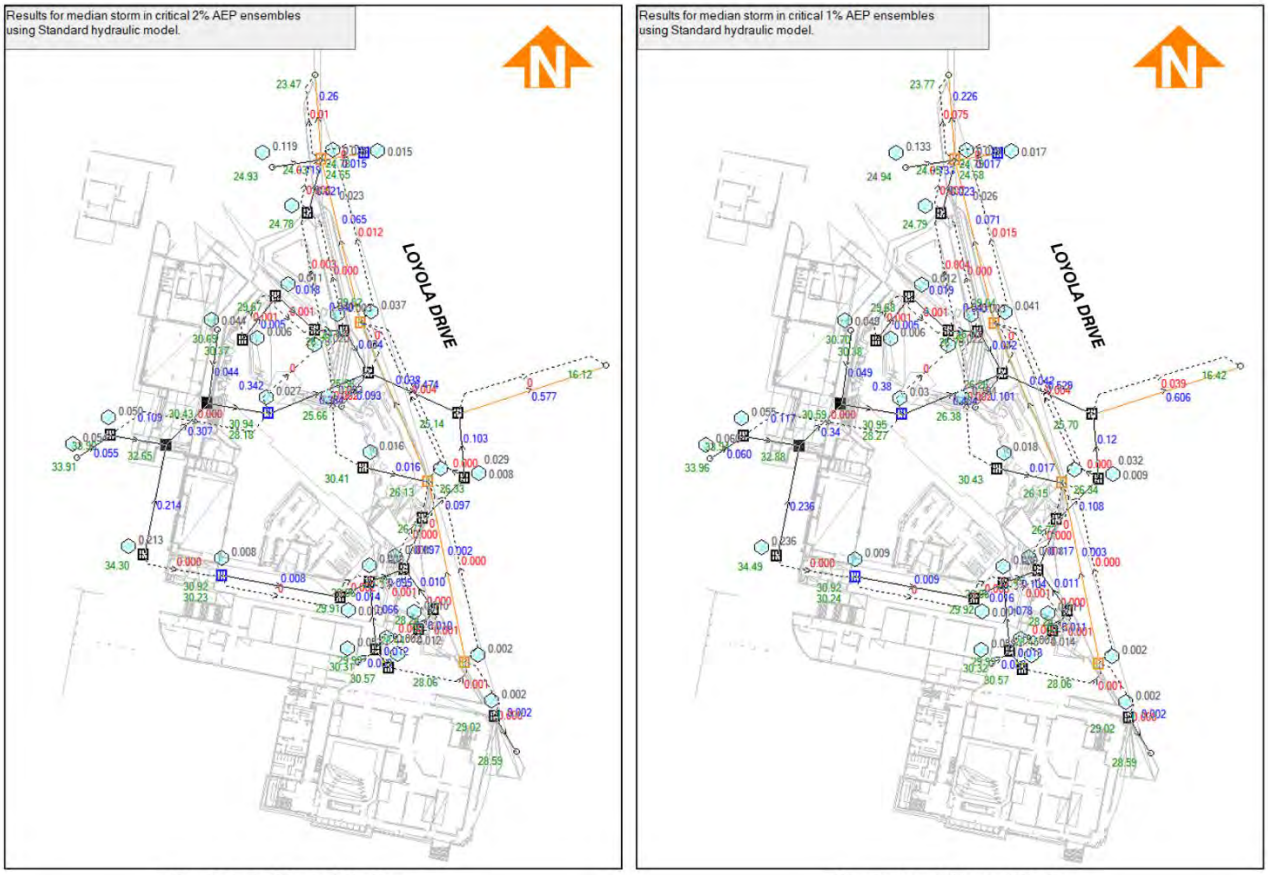

Figure 10 - Results from DRAINS modelling

Results from the DRAINS model demonstrates for the 50 year ARI storm stormwater runoff is fully conveyed by the in-ground system without upwelling. Results for the 100 year storm shows that any surcharging stormwater in safely conveyed via overland flow path towards Tamborine Bay.

4.0 Flooding

The purpose of this section is to address the following items relating to SEARs Condition 17 - Flooding;

- Identify flood risk on-site (detailing the most recent flood studies for the project area) and consideration of any relevant provisions of the NSW Floodplain Development Manual (2005), including the potential effects of climate change, sea level rise and an increase in rainfall intensity. If there is a material flood risk, include design solutions for mitigation.

The is no risk of flooding due to the high elevation of the development site above the Lane Cove River. Lane Cove Council LEP does not identify the project site falling within any flood planning area. As such no additional flood planning controls or mitigation measures will be implemented for the proposed development. This has also been confirmed directly with Lane Cove Council's stormwater development engineer.

Design considerations have been made for any existing overland flow paths to ensure there is no significant water ingress or erosion damage through the development site. As outlined in Lane Cove Council DCP Part O Section 10.5 a minimum of 150mm freeboard will be provided between finished floor levels and adjacent finished surfaces. A minimum of 150mm freeboard will also be provided at the basement loading dock entry and exit ramps to limit the ingress of stormwater runoff into the basement.

5.0 Sediment and Erosion Control

The purpose of this section is to address the following items relating to SEARs Condition 19 - Sediment, Erosion and Dust Controls:

- Detail measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles.

5.1 Strategies

Refer to Sediment and Erosion Control Plan in Appendix A. The proposed sedimentation and erosion control measures to manage runoff and ensure no detriment to the receiving environments have been divided into temporary and permanent strategies as summarised below.

STRATEGY	DESCRIPTION
Temporary	Temporary strategies generally refer to the control of sediment erosion and water pollution during the construction phase. The primary risks occur when soil is excavated and exposed to the elements during construction works. It is at this stage that suspended solids and other construction activity associated pollutants can be washed into the receiving stormwater network and subsequently the downstream waterways. The strategies that are implemented to prevent potential soil degradation and pollution of waterways include the adequate provision of sedimentation and erosion control measures. Generally the measures outlined in this report form a minimum basis that should be considered and further documented by the contractor prior to commencement of the works through a Soil and Water Management Plan (SWMP). The temporary controls that are proposed in the concept plans by TTW will limit the displacement of sediment caused by runoff from disturbed areas, and are designed to remove sediment prior to discharging from site.
Permanent	For the permanent water quantity and quality measures refer to Section 3 of this report.

5.2 Installation of Measures

The measures are to be installed as per the requirements outlined below:

- Clearly visible barrier, site fencing and hoarding shall be installed at the discretion of the Superintendent to ensure site security, safety of the public, manage traffic control and prohibit any unnecessary site disturbance. Vehicular access to the site shall be limited to only what is essential for the construction activities and shall enter the site only through the stabilised access points.
- All disturbed areas are to be stabilised within 14 working days of the completion of earthworks. All disturbed areas are to be protected so that the land is permanently stabilised within six months.
- Proprietary silt fencing shall be installed by the Contractor in accordance with the final approved Sedimentation and Erosion Control Plan and elsewhere at the discretion of the site superintendent to contain sedimentation to as near as possible to the original source.
- Sediment removed from any sediment trapping device shall be relocated where further pollution to downslope lands and waterways cannot occur.
- Stockpiles shall be located by the Contractor in accordance with the final approved Sedimentation and Erosion Control Plan and elsewhere at the discretion of the Project Manager and/or Superintendent. Where stockpiles are to be in place longer than 30 days they shall be stabilised.
- Water shall be prevented from entering the permanent drainage system unless it is sediment free. Drainage pits are to be protected in accordance with the final approved Sediment and Erosion Control Plan.
- Temporary sediment traps located at pits shall be retained throughout the early works stage and until the appropriate replacement measures for the subsequent stages are installed.

5.3 Land Disturbance

Where practicable, the soil erosion hazard shall be kept as low as possible. Limitations to access are to be in accordance with the following table:

Land Use	Limitation
Access areas	Access is to be limited to the designated work zones via the stabilised site access.
Truck cleaning areas	Any truck exiting out of the site shall be thoroughly cleaned and limit the exportation of soil and sediment on public roads.
Remaining undisturbed areas.	Access to any undisturbed areas and remaining lands is only permitted with permission from the Project Manager and/or Superintendent.

- Any spilled material shall be immediately removed from areas subject to runoff or concentrated flow;
- Trapped sediment shall be removed where the capacity of the sedimentation trapping device falls below 60%;
- Sedimentation traps are to be inspected after each rainfall event and/or weekly to;
    - Ensure that all sediment is removed once the sediment storage zone is full;
    - Ensure that outlet and emergency spillway works are maintained in a fully operational condition at all times;
    - Ensure rehabilitated lands have effectively reduced the erosion hazard and initiate upgrading or repair as appropriate;
- Additional erosion or sediment control works may be required to be constructed as appropriate to ensure the protection of downslope lands and waterways;
- Erosion and sediment control measures are to be maintained in a fully functioning condition at all times until the site is rehabilitated or secondary stage measures are installed;
- Revegetation schemes are to be adhered to and that any grass coverings are kept healthy, including watering and mowing;
- The removal of the temporary soil conservation and sedimentation control structures is to be the last activity in the rehabilitation program.
-

5.4 Air Quality and Dust Management

Prior to construction, the Contractor shall prepare a Construction Environmental Management Plan (CEMP), which will include a section on Air Quality and/or Dust Management). The CEMP will include but not be limited to:

- Plant and equipment emissions shall be as per the relevant regulations and standards;
- Areas of exposed soil shall be minimised and long term stockpiles shall be stabilized with vegetation or covered;
- A water cart shall be available at all times for surface spraying exposed soil surfaces to reduce dust generation;
- The site compound and haul roads are to be covered with gravel or kept moist (by spraying with water cart) to reduce dust generation;
- Materials transported in open trucks shall be covered to prevent possible dust generation;
- Tailgates of all vehicles transporting soil materials to and from the construction site shall be securely fixed so as to prevent soil spilling which in turn could generate dust;
- The burning of materials is not permitted on site at any time

6.0 Conclusion

To summarise the findings of this civil report, stormwater for the redevelopment can be managed in accordance with Council requirements. The proposed development poses no adverse flooding impacts to downstream developments. The implementation of an additional gross pollutant trap will reduce the amount of common pollutants entering Council's receiving stormwater system. Any risk of flooding or water ingress into the building entry points has been minimised through suitable overland flow path design in accordance with Council requirements. Sedimentation and erosion can be mitigated during the construction and operation of the development to reduce adverse impacts on the receiving Tambourine Bay and Lane Cove River environments.

The findings in this report represent a SSDA level assessment based on current available information and correspondence undertaken at the time of writing. As more information on existing drainage infrastructure becomes available and design development continues, a more detailed assessment will be undertaken.

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Appendix A

Civil Engineering Drawings

ST IGNATIUS' COLLEGE RIVERVIEW - STAGE 2

TAMBOURINE BAY ROAD, LANE COVE

CIVIL WORKS

GENERAL NOTES

1. Contractor must verify all dimensions and existing levels on site prior to commencement of works. Any discrepancies to be reported to the Engineer .
2. Strip all topsoil from the construction area. All stripped topsoil shall be disposed of off-site unless directed otherwise.
3. Make smooth connection with all existing works.
4. Compact subgrade under buildings and pavements to minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1. Compaction under buildings to extend 2m minimum beyond building footprint.
5. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority, the Contractor is to ensure that the drawings used for construction have been approved by all relevant authorities prior to commencement site.
6. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority is to be carried out in accordance with the requirements of the relevant Authority. The Contractor shall obtain these requirements from the Authority. Where the requirements of the Authority are different to the drawings and specifications, the requirements of the Authority shall be applicable.
7. For all temporary batters refer to geotechnical recommendations.

REFERENCE DRAWINGS

1. These drawings have been based from, and to be read in conjunction with the following Consultants drawings. Any conflict to the drawings must be notified immediately to the Engineer.

Consultant	Dwg Title	Dwg No	Rev	Date
PMDL (ARCH)	LEVEL -1 PLAN	DA1.30	P4	11.09.20
	LEVEL 0 PLAN	DA1.31	P4	11.09.20
ARCADIA (LANDSCAPE)	LANDSCAPE CONCEPT	101	A	13.07.20
LTS LOCKLEY (SURVEY)	PLAN OF DETAILS AND LEVELS	43468 004DT	A	26.05.20
DOUGLAS PARTNERS (GEOTECH)	GEOTECHNICAL INVESTIGATION	85108.04 R.001	0	03.03.20

SURVEY AND SERVICES INFORMATION

SURVEY

Origin of levels : RL37.82, NAIL IN CONC. (SMEC DWG 75099.18D06)
Datum of levels : A.H.D. AUSTRALIAN HEIGHT DATUM
Coordinate system : MGA
Survey prepared by : LTS LOCKLEY
Setout Points : CONTACT THE SURVEYOR

Taylor Thomson Whitting does not guarantee that the survey information shown on these drawings is accurate and will accept no liability for any inaccuracies in the survey information provided to us from any cause whatsoever.

UNDERGROUND SERVICES - WARNING

The locations of underground services shown on Taylor Thomson Whittings drawings have been plotted from diagrams provided by service authorities. This information has been prepared solely for the authorities own use and may not necessarily be updated or accurate.

The position of services as recorded by the authority at the time of installation may not reflect changes in the physical environment subsequent to installation.

Taylor Thomson Whitting does not guarantee that the services information shown on these drawings shows more than the presence or absence of services, and will accept no liability for inaccuracies in the services information shown from any cause whatsoever.

The Contractor must confirm the exact location and extent of services prior to construction and notify any conflict with the drawings immediately to the Engineer/Superintendent.

The contractor is to get approval from the relevant state survey department, to remove/adjust any survey mark. This includes but is not limited to; State Survey Marks (SSM), Permanent Marks (PM), cadastral reference marks or any other survey mark which is to be removed or adjusted in any way.
Taylor Thomson Whitting plans do not indicate the presence of any survey mark. The contractor is to undertake their own search.

SAFETY IN DESIGN

Contractor to refer to Appendix B of the Civil Specification for the Civil Risk and Solutions Register.

EXISTING SERVICES

Contractor to be aware existing services are located within the site. Location of all services to be verified by the Contractor prior to commencing works. Contractor to confirm with relevant authority regarding measures to be taken to ensure services are protected or procedures are in place to demolish and/or relocate.

EXISTING STRUCTURES

Contractor to be aware existing structures may exist within the site. To prevent damage to existing structure(s) and/or personnel, site works to be carried out as far as practicably possible from existing structure(s).

EXISTING TREES

Contractor to be aware existing trees exist within the site which need to be protected. To prevent damage to trees and/or personnel, site works to be carried out as far as practicably possible from existing trees. Advice needs to be sought from Arborist and/or Landscape Architect on measures required to protect trees.

GROUNDWATER

Contractor to be aware ground water levels are close to existing surface level. Temporary de-watering may be required during construction works.

EXCAVATIONS

Deep excavations due to stormwater drainage works is required. Contractor to ensure safe working procedures are in place for works. All excavations to be fenced off and batters adequately supported to approval of Geotechnical Engineer.

GROUND CONDITIONS

Contractor to be aware of the site geotechnical conditions. Refer to geotechnical report by Douglas Partners (Rpt No. 85108.04 R.001) for details.

HAZARDOUS MATERIALS

Existing asbestos products & contaminated material may be present on site. Contractor to ensure all hazardous materials are identified prior to commencing works. Safe working practices as per relevant authority to be adopted and appropriate PPE to be used when handling all hazardous materials. Refer to geotechnical/environmental report by Douglas Partners (Rpt No. 85108.04 R.001) for details.

CONFINED SPACES

Contractor to be aware of potential hazards due to working in confined spaces such as stormwater pits, trenches and/or tanks. Contractor to provide safe working methods and use appropriate PPE when entering confined spaces.

MANUAL HANDLING

Contractor to be aware manual handling may be required during construction. Contractor to take appropriate measures to ensure manual handling procedures and assessments are in place prior to commencing works.

WATER POLLUTION

Contractor to ensure appropriate measures are taken to prevent pollutants from construction works contaminating the surrounding environment.

SITE ACCESS/EGRESS

Contractor to be aware site works occur in close proximity to footpaths and roadways. Contractor to erect appropriate barriers and signage to protect site personnel and public.

VEHICLE MOVEMENT

Contractor to supply and comply with traffic management plan and provide adequate site traffic control including a certified traffic marshall to supervise vehicle movements where necessary.

BOUNDARY AND EASEMENT NOTE

The property boundary and easement locations shown on Taylor Thomson Whitting drawing's have been based from information received from : **No boundary information received. Refer architect for boundary information and locations**

Taylor Thomson Whitting makes no guarantees that the boundary or easement information shown is correct.
Taylor Thomson Whitting will accept no liabilities for boundary inaccuracies. The contractor/builder is advised to check/confirm all boundaries in relation to all proposed work prior to the commencement of construction. Boundary inaccuracies found are to be reported to the superintendent prior to construction starting.

DBYD SERVICES NOTE

"Public Service Utility information shown on plan has been complied from information received from Dial Before You Dig inquiry, reference Number 14788291, which was obtained on 21/08/2018.
Unless specifically shown otherwise, this location and depth of services shown on this plan have not been verified.

The location of services shown on this drawing have been plotted as accurately as possible from diagrams provided by service authorities and should be confirmed by site inspection."

STORMWATER DRAINAGE NOTES

1 Stormwater Design Criteria :
(A) Average exceedance probability –
1% AEP for roof drainage to first external pit
2% AEP for paved and landscaped areas
(B) Rainfall intensities –
Time of concentration: 5 minutes
1% AEP = 18.0 mm
2% AEP = 16.1 mm
(C) Rainfall losses –
Impervious areas: IL = 1.5 mm , CL = 0 mm/hr
Pervious areas: IL =23.1 mm , CL = 1.6 mm/hr

2. Pipes 300 dia and larger to be reinforced concrete Class " 2 " approved spigot and socket with rubber ring joints U.N.O.
3. Pipes up to 300 dia may be sewer grade uPVC with solvent welded joints, subject to approval by the engineer
4. Equivalent strength VCP or FRP pipes may be used subject to approval.
5. Precast pits may be used external to the building subject to approval by Engineer
6. Enlargers, connections and junctions to be manufactured fittings where pipes are less than 300 dia.
7. Where subsoil drains pass under floor slabs and vehicular pavements, unslotted uPVC sewer grade pipe is to be used.
8. Grates and covers shall conform with AS 3996–2006, and AS 1428.1 for access requirements.
9. Pipes are to be installed in accordance with AS 3725. All bedding to be type H2 U.N.O.
10. Care is to be taken with invert levels of stormwater lines. Grades shown are not to be reduced without approval.
11. All stormwater pipes to be 150 dia at 1.0% min fall U.N.O.
12. Subsoil drains to be slotted flexible uPVC U.N.O.
13. Adopt invert levels for pipe installation (grades shown are only nominal).

RETAINING WALLS

1. Drainage shall be provided as shown on the drainage drawings.
2. Backfilling shall be carried out after grout or concrete has reached a minimum strength of 0.85 f'c. Backfilling shall be approved granular material compacted in layers not exceeding 200mm to 95% Standard compaction unless noted otherwise.
3. Provide waterproofing to back of walls as specified or noted.
4. Where retaining walls rely on connecting structural elements for stability, do not backfill against the wall unless it is adequately propped or the elements have been constructed and have sufficient strength to withstand the loads.
5. For all temporary batters obtain geotechnical engineers recommendations.

SITEWORKS NOTES

1. All basecourse material to comply with RMS specification No 3051 and compacted to minimum 98% modified standard dry density in accordance with AS 1289 5.2.1.
2. All trench backfill material shall be compacted to the same density as the adjacent material.
3. All service trenches under vehicular pavements shall be backfilled with an approved select material and compacted to a minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1

CONCRETE FINISHING NOTES

1. All exposed concrete pavements are to be broomed finished.
2. All edges of the concrete pavement including keyed and dowelled joints are to be finished with an edging tool.
3. Concrete pavements with grades greater than 10 % shall be heavily broomed finished.
4. Carborundum to be added to all stair treads and ramped crossings U.N.O.

KERBING NOTES

Includes all kerbs, gutters, dish drains, crossings and edges.

1. All kerbs, gutters, dish drains and crossings to be constructed on minimum 75mm granular basecourse compacted to minimum 98% modified maximum dry density in accordance with AS 1289 5.2.1.
2. Expansion joints (EJ) to be formed from 10mm compressible cork filler board for the full depth of the section and cut to profile. Expansion joints to be located at drainage pits, on tangent points of curves and elsewhere at 12m centres except for integral kerbs where the expansion joints are to match the joint locations in slabs.
3. Weakened plane joints to be min 3mm wide and located at 3m centres except for integral kerbs where weakened plane joints are to match the joint locations in slabs.
4. Broomed finished to all ramped and vehicular crossings, all other kerbing or dish drains to be steel float finished.
5. In the replacement of kerbs –
Existing road pavement is to be sawcut 900mm from lip of gutter. Upon completion of new kerbs, new basecourse and surface is to be laid 900mm wide to match existing materials and thicknesses.
Existing allotment drainage pipes are to be built into the new kerb with a 100mm dia hole.
Existing kerbs are to be completely removed where new kerbs are shown.

SURVEY LEGEND

+18.48	Surface level
19	Contour
	Kerb line
	Batter
	Retaining wall
SW	Stormwater drainage line
T	Telecommunications line
G	Gas line
W	Water main
S	Sewer line
E	Electrical line
EASEMENT FOR ____(__m WIDE)	Easement
	Fence
	Tree to be removed/be retained
	Boundary
SGN	Sign
H	Hydrant
MH	Manhole
G	Gas
SV	Stop Valve
W	Water
TEL	Telecommunications
TRAP	Trap
	Gully
	Grate
S	Sewer Manhole
E	Electricity
ELP	Electric Light Pole
TL	Traffic Light
TLL	Traffic Light Lid
TLB	Traffic Light Box
TB	Telephone Box
PKM	Parking Meter
PM 1234	Permanent Mark
BM 51.10	Bench Mark
BH 0	Borehole
TP No	Test Pit

EXISTING SERVICES LEGEND

S	Existing sewer
W	Existing water
EU	Existing underground electrical
EA	Existing aerial electrical
T	Existing communications
G	Existing gas
SW	Existing stormwater

MASONRY NOTES

1. Temporary bracing shall be provided by the contractor to keep the masonry stable at all times.
2. Masonry to be in accordance with AS 3700
3. Masonry units shall comply with AS/NZS 4455 and as follows:

Type of masonry unit	Characteristic unconfined compressive strength (fuc)	Characteristic lateral modulus of rupture (fut)
Clay & Calcium silicate	15 MPa	0.8 MPa
Concrete (used in non-loadbearing internal walls)	4.5 MPa (hollow units) 3.0 MPa (solid or cored units)	0.8 MPa
Concrete (used in unreinforced loadbearing walls, reinforced masonry and non-loadbearing external walls)	15 MPa (hollow units) 10 MPa (solid or cored units)	0.8 MPa

4. Mortar shall consist of the following:
M3 for general applications
1 part Type GP cement: 5 parts sand plus water thickener
M4 for elements in interior environments subject to saline wetting and drying; below a damp-proof course or in contact with ground in aggressive soils; in severe marine environments; in saline or contaminated water including tidal splash zones; and within 1km of an industry producing chemical pollutants.
1 part Type GP cement: 4 parts sand plus water thickener
5. Provide vertical control joints in masonry over permanent floor joints and as per the architectural drawings.
6. Masonry walls shown on the structural plans are load–bearing UNO. Non–loadbearing walls shall be separated from the concrete structure above with 20mm compressible filler. Masonry walls supporting slabs shall have a layer of mortar troweled smooth on top. Provide M.E.T. slip-joint to separate floor slabs and masonry. Provide Hercules HERCUSLIP COMPOSITE to separate roof slabs and masonry.
7. Other than what is allowed in the specification no chasing or rebates may be made in masonry walls without written approval.
8. The contractor shall provide records that demonstrate all masonry bed joint reinforcement, masonry ties and masonry wall stiffeners have been installed in accordance with the drawings and specification.
9. All load bearing concrete masonry walls shall have all cores filled with grout UNO. Core filling grout shall be thoroughly compacted. Grout to be in accordance with AS3700 and as follows:

Location	f'cg MPa	Specified Slump	Maximum Agg. Size
Grout	20	230	10

10. All core filled blockwalls shall be constructed with "Double U" blocks
11. In core filled blockwalls cleanout openings shall be provided at the bottom of each core and shall be cleaned of mortar protrusions before grouting.
12. All core filled block walls shall have all cores filled with grout UNO. Core filling grout to be in accordance with note 9.
13. Cover to reinforcement to be 50mm to face of block UNO.
14. Provide bed joint reinforcement as follows
M.E.T., galvanized masonry reo where M3 mortar is used (supplied by DUNSTONE MAZE in NSW)
Ancon CCL stainless steel where M4 mortar is used and locate as follows
– in 2 bed joints below and above head and sill flashings to openings
– in 2 bed joints below and above openings
– in third bed joint above bottom of wall
– in second bed joint below top of wall

REINFORCEMENT NOTES

1. Fix reinforcement as shown on drawings. The type and grade is indicated by a symbol as shown below. On the drawings this is followed by a numeral which indicates the size in millimetres of the reinforcement.

N. Hot rolled ribbed bar grade D500N
R. Plain round bar grade R250N
SL. Square mesh grade 500L
RL. Rectangular mesh grade 500L

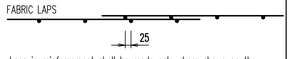
2. Provide bar supports or spacers to give the following concrete cover to all reinforcement unless otherwise noted on drawings.

Footings – 50 top, 50 bottom, 50 sides.

Walls – 30 generally.
– 30 when cast in forms but later exposed to weather or ground.
– .. when cast directly in contact with ground.

3. Cover to reinforcement ends to be 50 mm u.n.o.
4. Provide N12–450 support bars to top reinforcement as required, Lap 500 U.N.O.
5. Maintain cover to all pipes, conduits, reglets, drip grooves etc
6. All cogs to be standard cogs unless noted otherwise.
7. Fabric end and side laps are to be placed strictly in accordance with the manufacturers requirements to achieve a full tensile lap. Fabric shall be laid so that there is a maximum of 3 layers at any location.

FABRIC LAPS

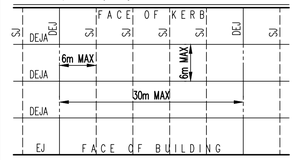


8. Laps in reinforcement shall be made only where shown on the drawings unless otherwise approved. Lap lengths as per table below.

JOINTING NOTES

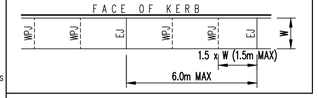
Vehicular Pavement Jointing

1. All vehicular pavements to be jointed as shown on drawings.
2. Keyed construction joints should generally be located at a maximum of 6m centres.
3. Sawn joints should generally be located at a maximum of 6m centres or 1.5 x the spacing of keyed joints, where key joint spacing is less than 4m, with dowelled expansion joints at maximum of 30m centres.
4. Provide 10mm wide full depth expansion joints between buildings and all concrete or unit pavers.
5. The timing of the saw cut is to be confirmed by the contractor on site. Site conditions will determine how many hours after the concrete pour before the saw cuts are commenced. Refer to the specification for weather conditions and temperatures required.
6. Vehicular pavement jointing as follows.



Pedestrian Footpath Jointing

1. Expansion joints are to be located where possible at tangent points of curves and elsewhere at max 6.0m centres.
2. Weakened plane joints are to be located at a max 1.5 x width of the pavement.
3. Where possible joints should be located to match kerbing and / or adjacent pavement joints.
4. All pedestrian footpath jointings as follows (uno).



DRAWING SCHEDULE

DWG No	Drawing Title
SKC00	COVER SHEET AND GENERAL NOTES
SKC10	CONCEPT SEDIMENT & EROSION CONTROL PLAN
SKC20	CONCEPT SITE PLAN
SKC21	CONCEPT STORMWATER MANAGEMENT PLAN - BASEMENT LEVEL
SKC22	CONCEPT STORMWATER MANAGEMENT PLAN - GROUND LEVEL
SKC50	DETAILS SHEET

FileName: SKC00.dwg - USER: dunncam - Plot File Created: Oct 15, 2020 - 6:34pm

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P3	PRELIMINARY	DM	DM	15.10.20
P2	DRAFT FOR APPROVAL	DM	DM	30.07.20
P1	ISSUE FOR QS	DM	DM	08.07.20

Architect
PMDL
17 / 124 WALKER STREET,
NORTH SYDENY, NSW 2060

Engineer
TTW Structural Civil Traffic Façade
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

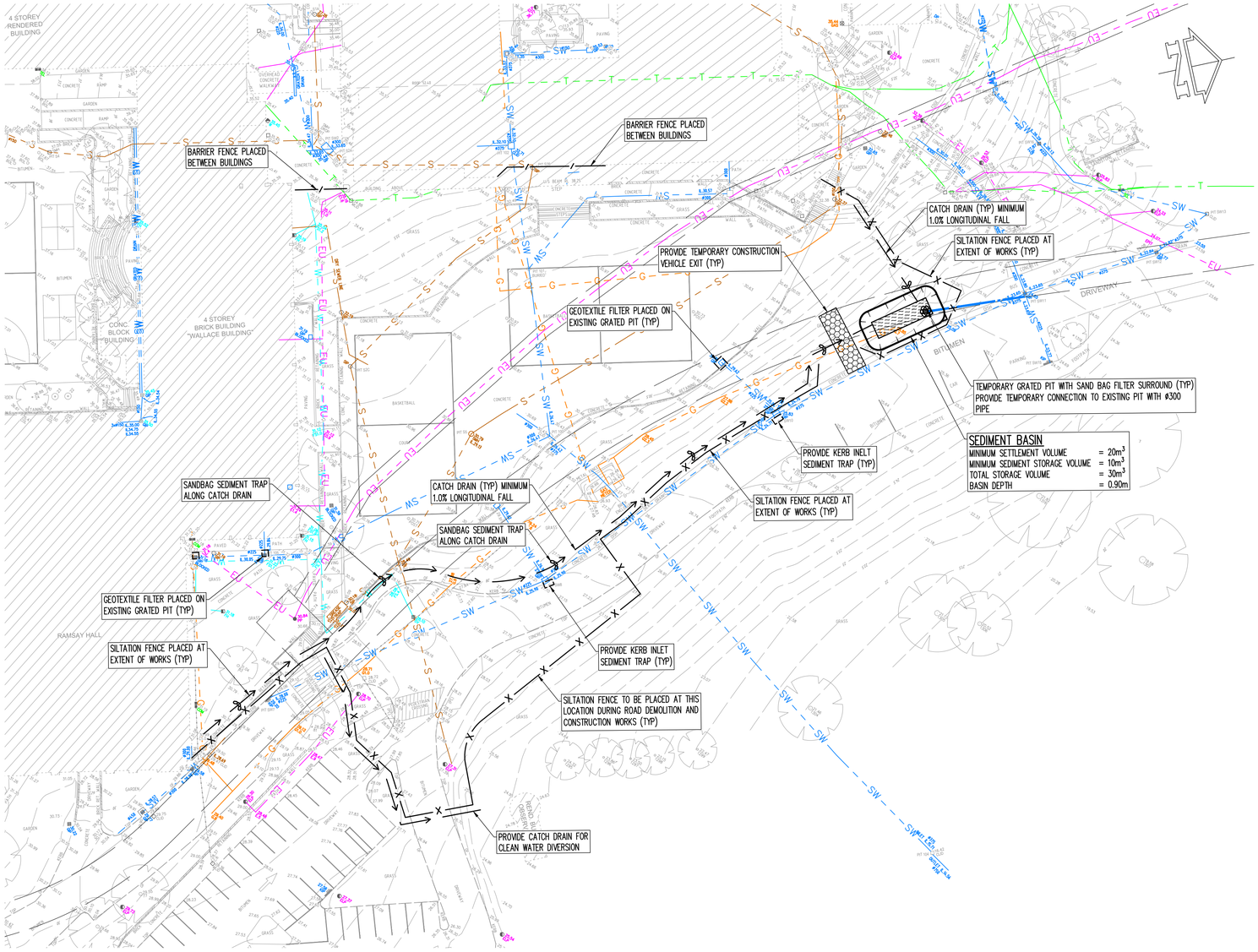
Project
SAINT IGNATIUS' COLLEGE RIVERVIEW - STAGE 2

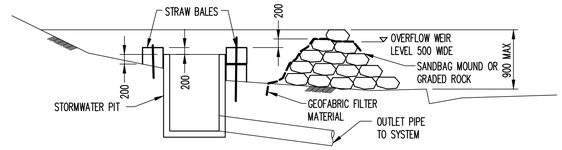
Sheet Subject
COVER SHEET AND GENERAL NOTES

Scale : A1 NTS
Drawn DM
Authorised -
Job No 191740
Drawing No SKC00
Revision P3
Plot File Created: Oct 15, 2020 - 6:34pm

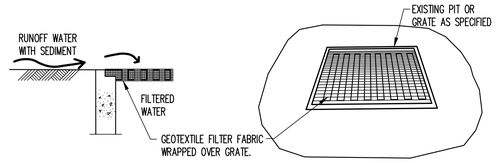
PRELIMINARY
NOT TO BE USED
FOR CONSTRUCTION

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C01





SEDIMENTATION TRAP
NTS



GEOTEXTILE PIT FILTER
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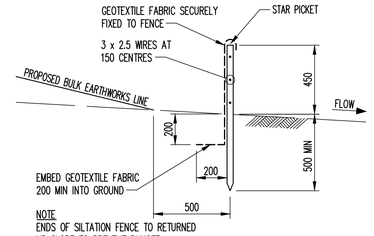
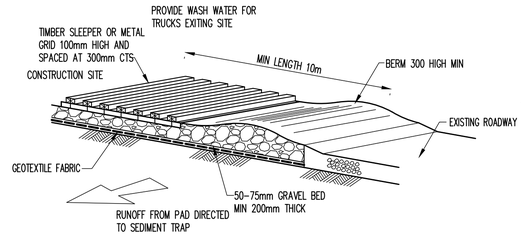
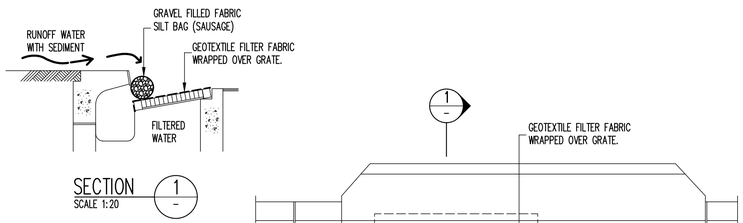


NOTE:
ENDS OF SILTATION FENCE TO RETURNED UP SLOPE TO PREVENT RUNOFF

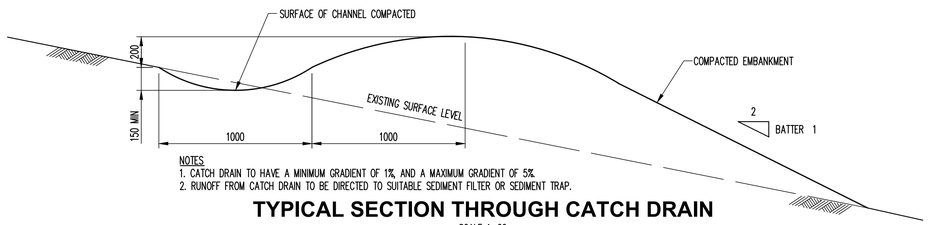
SILTATION FENCE DETAIL
SCALE 1: 20



TEMPORARY CONSTRUCTION VEHICLE EXIT
NTS



KERB INLET SEDIMENT TRAP
SCALE 1: 20



NOTES
1. CATCH DRAIN TO HAVE A MINIMUM GRADIENT OF 1%, AND A MAXIMUM GRADIENT OF 5%.
2. RUNOFF FROM CATCH DRAIN TO BE DIRECTED TO SUITABLE SEDIMENT FILTER OR SEDIMENT TRAP.

TYPICAL SECTION THROUGH CATCH DRAIN
SCALE 1: 20

EROSION AND SEDIMENT CONTROL LEGEND

- Batter
- Siltation fence
- Barrier fence
- Stormwater pit with Geotextile filter surround
- Hay bale barriers
- Sandbag sediment trap
- Catch drain
- Overland flow path

EROSION AND SEDIMENT CONTROL NOTES

1. All work shall be generally carried out in accordance with
   (A) Local authority requirements,
   (B) EPA – Pollution control manual for urban stormwater,
   (C) LANDCOM NSW – Managing Urban Stormwater: Soils and Construction ("Blue Book").
2. Erosion and sediment control **drawings and notes are** provided for the whole of the works. Should the Contractor stage these works then the design may be required to be modified. Variation to these details may require approval by the relevant authorities.
   The erosion and sediment control **plan** shall be implemented and adapted to meet the varying situations as work on site progresses.
3. Maintain all erosion and sediment control devices to the satisfaction of the superintendent and the local authority.
4. When stormwater pits are constructed prevent site runoff entering the pits unless silt fences are erected around pits.
5. Minimise the area of site being disturbed at any one time.
6. Protect all stockpiles of materials from scour and erosion. Do not stockpile loose material in roadways, near drainage pits or in watercourses.
7. All soil and water control measures are to be put back in place at the end of each working day, and modified to best suit site conditions.
8. Control water from upstream of the site such that it does not enter the disturbed site.
9. All construction vehicles shall enter and exit the site via the temporary construction entry/exit.
10. All vehicles leaving the site shall be cleaned and inspected before leaving.
11. Maintain all stormwater pipes and pits clear of debris and sediment. Inspect stormwater system and clean out after each storm event.
12. Clean out all erosion and sediment control devices after each storm event.

Sequence Of Works

1. Prior to commencement of excavation the following soil management devices must be installed.
1.1. Construct silt fences below the site and across all potential runoff sites.
1.2. Construct temporary construction entry/exit and divert runoff to suitable control systems.
1.3. Construct measures to divert upstream flows into existing stormwater system.
1.4. Construct sedimentation traps/basin including outlet control and overflow.
1.5. Construct turf lined swales.
1.6. Provide sandbag sediment traps upstream of existing pits.
2. Construct geotextile filter pit surround around all proposed pits as they are constructed.
3. On completion of pavement provide sand bag kerb inlet sediment traps around pits.
4. Provide and maintain a strip of turf on both sides of all roads after the construction of kerbs.

WATER QUALITY TESTING REQUIREMENTS

Prior to discharge of site stormwater, groundwater and seepage water into council's stormwater system, contractors must undertake water quality tests in conjunction with a suitably qualified environment consultant outlining the following:

- Compliance with the criteria of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)
- If required subject to the environmental consultants advice, provide remedial measures to improve the quality of water that is to be discharged into Councils storm water drainage system.This should include comments from a suitably qualified environmental consultant confirming the suitability of these remedial measures to manage the water discharged from the site into Councils storm water drainage system. Outlining the proposed, ongoing monitoring, contingency plans and validation program that will be in place to continually monitor the quality of water discharged from this site. This should outline the frequency of water quality testing that will be undertaken by a suitably qualified environmental consultant.

0 4 8 12 16 20 24 28 32m
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FOR CONSTRUCTION CERTIFICATE

Rev	Description	Eng	Draft	Date
B	FOR CC1 EARLY WORKS ISSUE	DM	SH	08.12.22
A	FOR TENDER ISSUE	DM	SH	27.07.22

Architect
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PMDL ARCHITECTURE + DESIGN HK (LIMITED)
PMDL ARCHITECTURE + DESIGN PTY LTD ABN 56 062 961 317
NSW NOMINATED ARCHTECTS: ANDREW PENDER 5317
DAVID MORRIS 5865 VICKI VAN DIJK 9476

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Project
SAINT IGNATIUS' COLLEGE
RIVERVIEW - IGNIS STAGE 2

Sheet Subject
CONCEPT SEDIMENT AND EROSION CONTROL SITE PLAN

Scale : A1	Drawn	Authorised
1:400	DM	SB

Job No	Drawing No	Revision
191740	C10	B

Plot File Created: Dec 08, 2022 - 7:21pm

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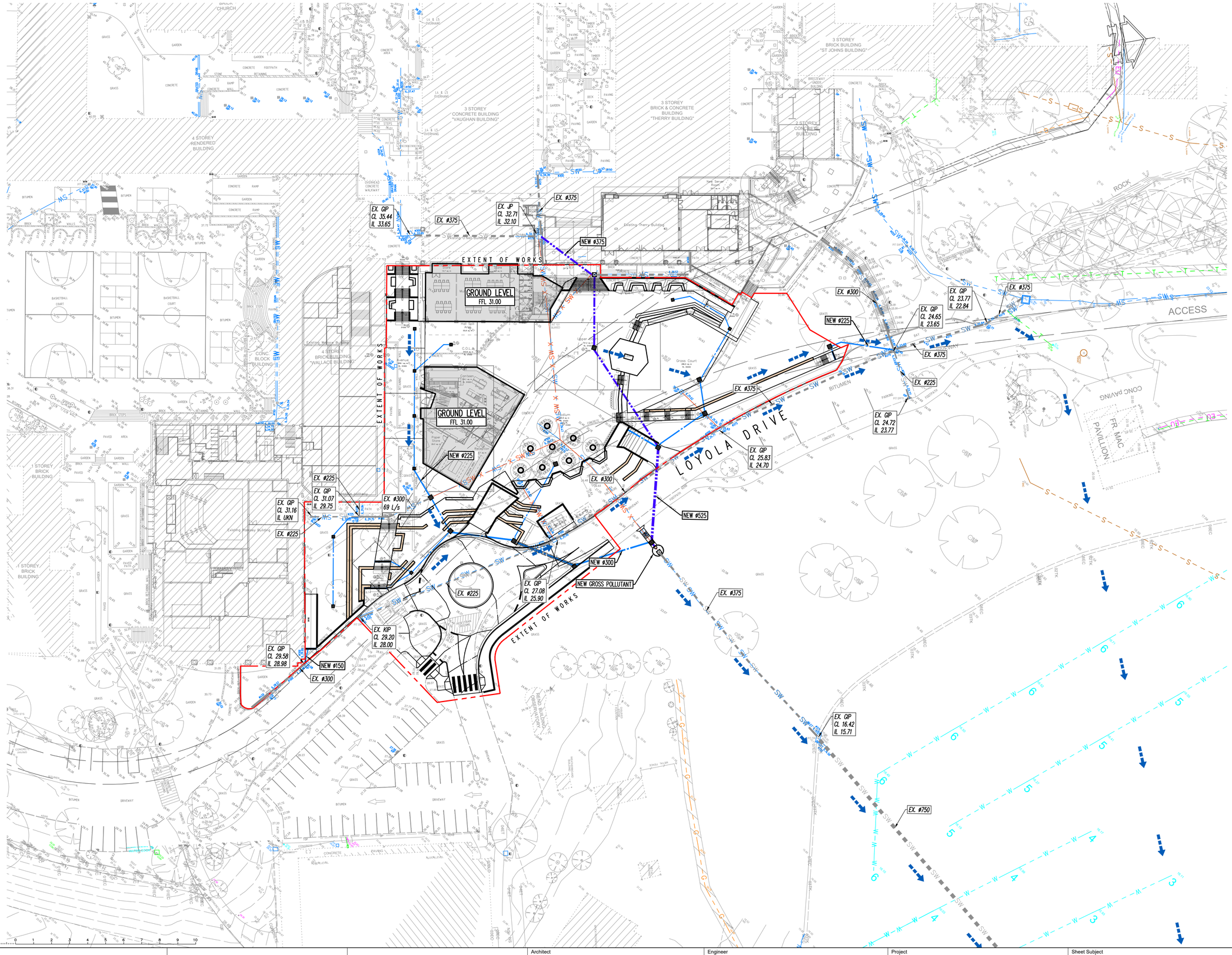

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PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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P4	FOR COORDINATION	DM	DM	14.10.20
P3	ISSUE FOR INFORMATION	DM	DM	06.10.20
P2	DRAFT FOR APPROVAL	DM	DM	30.07.20
P1	PRELIMINARY	DM	DM	26.03.20

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Project
SAINT IGNATIUS' COLLEGE
RIVERVIEW - STAGE 2

Sheet Subject
CONCEPT LOCALITY PLAN

Scale : A1 1:400
Drawn DM
Authorised -
Job No 191740
Drawing No SKC20
Revision P5
Plot File Created: Oct 16, 2020 - 12:31pm

FileName: SKC20.dwg - USER: dunncm - Plot File Created: Oct 16, 2020 - 12:31pm

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STORMWATER LEGEND

- F22.20 — Finished surface level
- F22.00 — Finished contour
- IL6.04 / ø375 'Z' / 0.5% / 25 L/s / IL5.84 — Stormwater pit, flow direction and line; Invert level upstream; Pipe size and class; Pipe grade; Flow rate (Litres per second); Invert level downstream
- IR — Intermediate riser with subsoil drainage line (100 dia)
- FP — Flushing point with subsoil drainage line (100 dia)
- DP — Downpipe
- RWO — Rainwater outlet
- Surface water drainage
- Roof water drainage
- Stormwater diversion
- SW — Existing stormwater to be retained
- X SW X — Existing stormwater to be removed
- GD — Grated drain
- RW — Blockwork retaining wall
- Extent of structure above
- Extent of structure below

4 STOREY BRICK BUILDING "WALLACE BUILDING"

BASEMENT LEVEL FFL 26.50

DOWNPIPE COLLECTOR

EXISTING STORMWATER PIPE TO BE REMOVED

10kL RAINWATER TANK

300ø uPVC

150ø uPVC

375ø PIPE FROM GROUND LEVEL

225ø PIPE FROM GROUND LEVEL

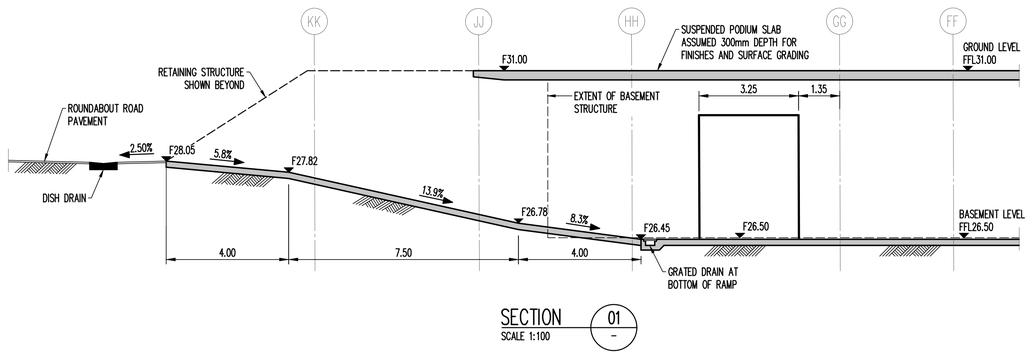
IL 25.50 ø300 6.7% 93 L/s IL24.50

525ø PIPE TO GPT. REFER GROUND LEVEL PLAN

EXTENT OF BUILDING ABOVE

EXTENT OF PODIUM ABOVE

01 SKC21



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P5	ISSUE FOR QS	DM	DM	13.07.20
P4	ISSUE FOR QS	DM	DM	08.07.20
P3	PRELIMINARY	DM	DM	05.06.20
P2	PRELIMINARY	DM	DM	26.03.20
P1	PRELIMINARY	DM	DM	12.03.20
P10	PRELIMINARY	DM	DM	15.10.20
P9	FOR COORDINATION	DM	DM	14.10.20
P8	FOR INFORMATION ONLY	DM	DM	06.10.20
P7	FOR INFORMATION ONLY	DM	DM	29.09.20

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Project
SAINT IGNATIUS' COLLEGE
RIVERVIEW - STAGE 2

Sheet Subject
CONCEPT STORMWATER MANAGEMENT PLAN
BASEMENT LEVEL

Scale : A1	Drawn	Authorised
1:200	DM	-

Job No	Drawing No	Revision
191740	SKC21	P10

Plot File Created: Oct 15, 2020 - 6:35pm

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C01

STORMWATER LEGEND

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- F22.00 — Finished contour
- IL6.04 ⌀375 '2' 0.5% 25 L/s IL5.84 — Stormwater pit, flow direction and line; Invert level upstream; Pipe size and class; Pipe grade; Flow rate (Litres per second); Invert level downstream
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- FP — Flushing point with subsoil drainage line (100 dia)
- DP — Downpipe
- RWO — Rainwater outlet
- Surface water drainage
- Roof water drainage
- Stormwater diversion
- SW — Existing stormwater to be retained
- X SW X — Existing stormwater to be removed
- Overland flow path
- GD — Grated drain
- RW — Blockwork retaining wall
- Extent of structure above
- Extent of structure below

GROUND LEVEL FFL 31.00

DEMOLISH EXISTING STORMWATER PIPE AND PROVIDE NEW DIVERSION PIPE

DEMOLISH PIT. REROUTE ANY INLET CONNECTIONS TO NEW PIT

DEMOLISH PIT. REROUTE ANY INLET CONNECTIONS TO NEW PIT

CONNECTION FROM BASEMENT LEVEL

PROPOSED SUBSTATION LOCATION

NEW ⌀525 PIPE TO PASS UNDER EXISTING PIPE.

SURCHARGE PIT

APPROXIMATE LOCATION OF EXISTING ⌀375 PIPE.

577 L/s

GROSS POLLUTANT TRAP TO BE DESIGNED

NEW ⌀300 PIPE TO PASS OVER EXISTING PIPE. ALLOW FOR CONCRETE ENCASEMENT FOR REDUCED PIPE COVER.

GAS MAINS TO BE ADJUSTED

LOYOLA DRIVE

BITUMEN

0 2 4 6 8 10 12 14 16m

1:200 A1 1:400 A3

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Rev	Description	Eng	Draft	Date
P6	DRAFT FOR APPROVAL	DM	DM	30.07.20
P5	ISSUE FOR QS	DM	DM	13.07.20
P4	ISSUE FOR QS	DM	DM	08.07.20
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P2	PRELIMINARY	DM	DM	26.03.20
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P10	PRELIMINARY	DM	DM	15.10.20
P9	FOR COORDINATION	DM	DM	14.10.20
P8	FOR INFORMATION ONLY	DM	DM	06.10.20
P7	FOR INFORMATION ONLY	DM	DM	29.09.20

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SAINT IGNATIUS' COLLEGE
RIVERVIEW - STAGE 2

Sheet Subject
CONCEPT STORMWATER MANAGEMENT PLAN
GROUND LEVEL

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Job No	Drawing No	Revision
191740	SKC22	P10

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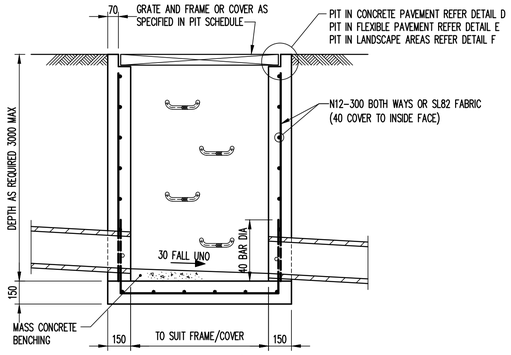

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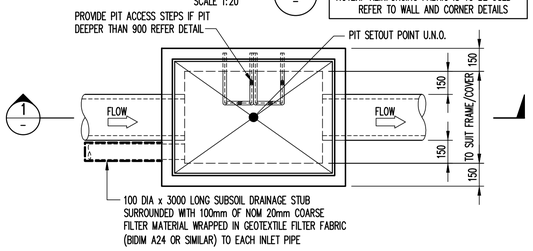
NOTE:IF REINFORCING FABRIC IS TO BE USED REFER TO WALL AND CORNER DETAILS



PLAN
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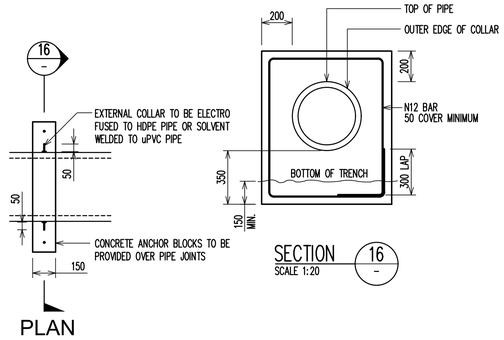
PIT TYPE A & B



PLAN

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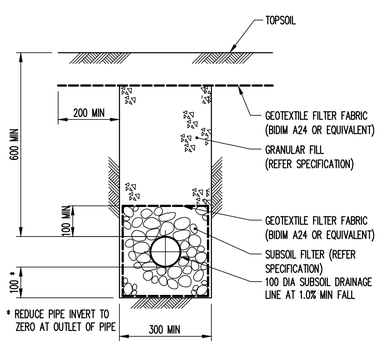

SUBSOIL IN LANDSCAPED AREAS
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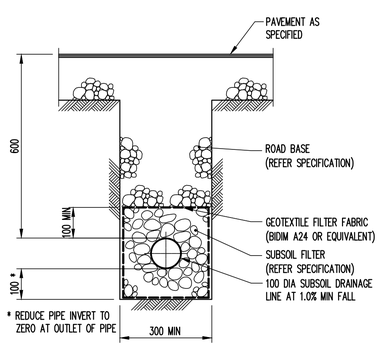

SUBSOIL IN PAVED AREAS
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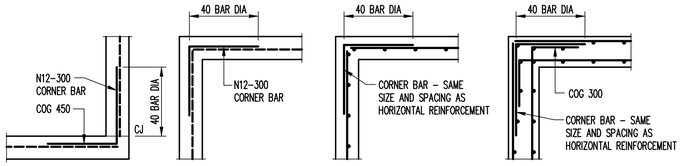
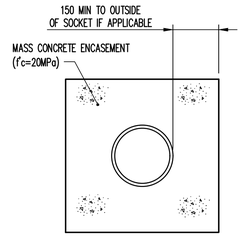


ELEVATION AT BASE | PLAN | PLAN-SINGLE LAYER | PLAN-DOUBLE LAYER

FABRIC REINFORCEMENT

PIT CORNER DETAILS
SCALE 1: 20



CONCRETE ENCASEMENT DETAIL
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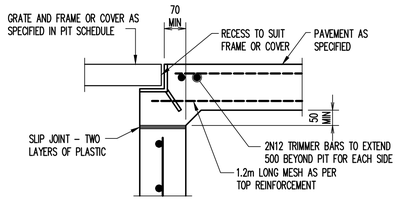
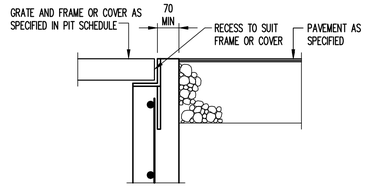


DETAIL D
SCALE 1: 10



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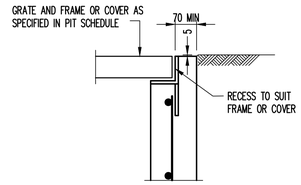

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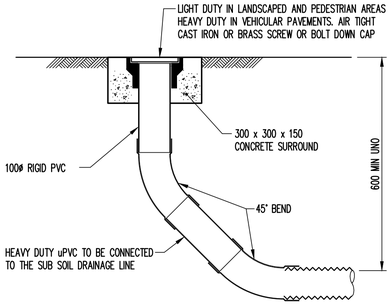

FLUSHING POINT (FP)
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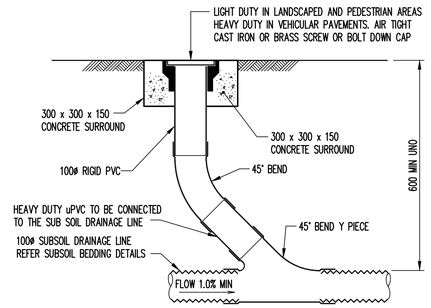
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



INTERMEDIATE RISER (IR)
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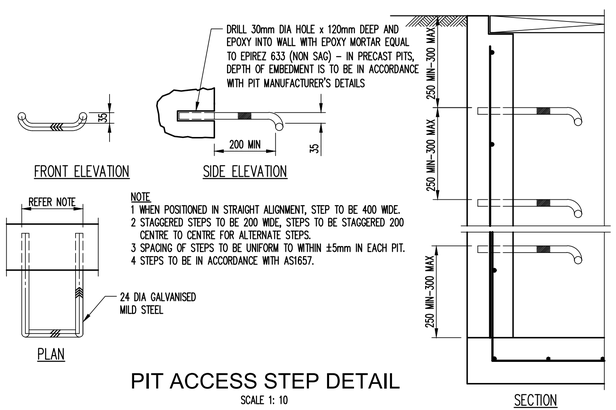
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



PIT ACCESS STEP DETAIL
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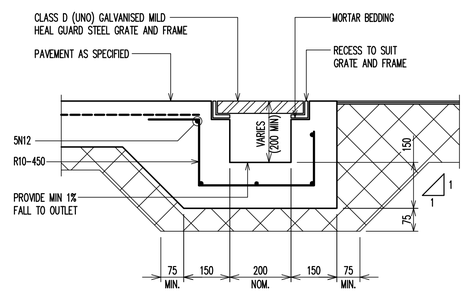

GRATED DRAIN TYPE C (GDC)
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Rev	Description	Eng	Draft	Date
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P2	DRAFT FOR APPROVAL	DM	SH	30.07.20
P1	PRELIMINARY	DM	SH	xx.07.20

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Project
SAINT IGNATIUS' COLLEGE
RIVERVIEW - STAGE 2

Sheet Subject
DETAILS SHEET

Scale : A1 AS SHOWN | Drawn SH | Authorised -

Job No 191740 | Drawing No SKC50 | Revision P3

Plot File Created: Oct 15, 2020 - 6:35pm

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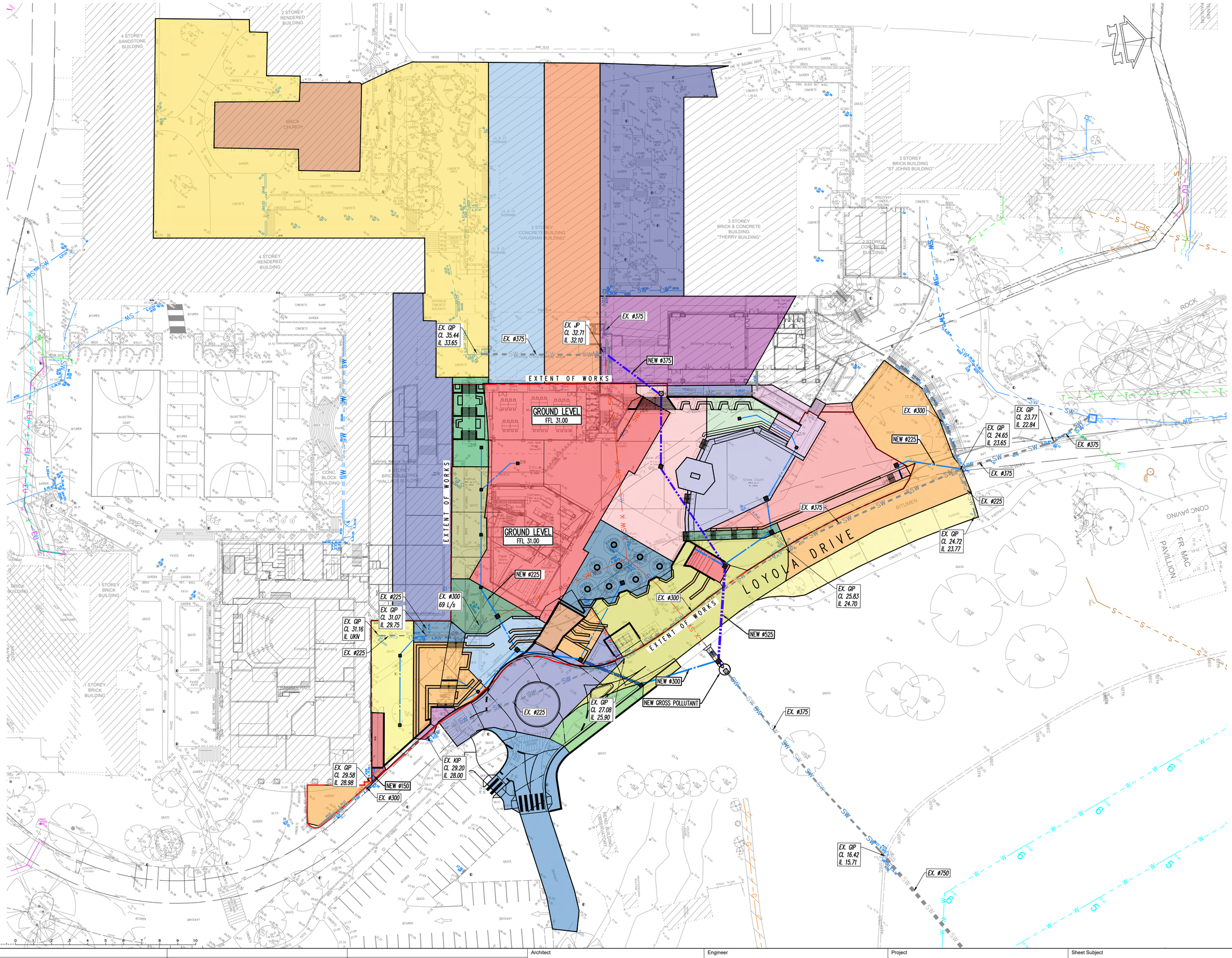

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PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Rev	Description	Eng	Draft	Date
P1	FOR INFORMATION ONLY	DM	DM	15.10.20

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Project
SAINT IGNATIUS' COLLEGE
RIVERVIEW - STAGE 2

Sheet Subject
STORMWATER CATCHMENT PLAN

Scale : A1	Drawn	Authorised
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Job No	Drawing No	Revision
191740	SKC92	P2

Plot File Created: Oct 15, 2020 - 6:35pm

FileName: SKC92.dwg - USER: dunnm - Plot File Created: Oct 15, 2020 - 6:35pm

A1 0 1 2 3 4 5 6 7 8 9 10

ANNEXURE 9 - DEMOLITION AND CONSTRUCTION WASTE MANAGEMENT PLAN

Saint Ignatius College Riverview

Demolition & Construction Waste Management Plan September 2020

Table of Contents

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2. Background 3
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4. Other Standards and Legislative Requirements 4
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6. Waste Management Strategy 6
   6.1 Waste Management Principles 7
   6.2 Record Keeping 8
   6.3 Materials Storage 8
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7. Demolition Phase 9
8. Construction Phase 10
9. Work Plan 12
10. Contractor Management 13
11. Training and Education 13

1. Introduction

This Operational Waste Management Plan report for EPM Projects has been prepared by Waste Audit & Consultancy Services (Aust) Pty Ltd for Saint Ignatius College Riverview to provide guidance on environmentally sound and cost-effective management of waste and recyclable materials during the demolition and construction phases of the proposed development, including excavation works.

The aim of this report is to ensure that all waste resulting from construction and demolition activities is managed in an effective and environmentally aware manner, specifically:

- To minimise the generation of waste to landfill
- To maximise waste avoidance and reuse of materials on site
- To ensure that an efficient recycling procedure is applied to waste materials
- To make employees and subcontractors aware of their waste management responsibilities

This report supports a State Significant Development Application (SSDA) submitted to the Department of Planning, Infrastructure and Environment (DPIE) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act), for the proposed redevelopment of new building and surrounding landscapes of Saint Ignatius College Riverview at Tambourine Bay Rd, Lane Cove.

This application is SSD by way of clause 8 and schedule 1 under State Environmental Planning Policy (State and Regional Development) 2011 on the basis that the development is for the purpose of an existing school and has a Capital Investment Value of more than $20 million.

2. Background

The College Site comprises some 40 hectares, including the Main Campus (Senior School) and Regis Campus (Junior School). The Site is legally described as Lot 10 DP 1142773 and is owned by The Trustees of the Jesuit Fathers (ABN 80 167 682 043), a body corporate by virtue of the Roman Catholic Church Communities' Land Act 1942 No 23 (NSW). The College leases the Site from the landowner. The Site is currently used as an Educational Establishment for boys with an overall capacity of 1,640 students across the Main Campus and the Regis Campus. Boarding student numbers fluctuate each year to a maximum of 365. The staff numbers fluctuate to a maximum of 350, and this includes full time and part time staff. A total of 47 residences are located on site. The following objectives have been identified as forming the basis of the proposed development of the existing educational establishment.

- Create an education precinct to create a high-quality teaching and learning environment for staff and students;
- Establish additional floor space to increase availability and efficiency of teaching functions for Saint Ignatius' College Riverview;
- Upgrade the public domain to create visually interesting transitions through the campus, and promote the heritage elements of the campus;
- Ensure minimal environmental impact; Ensure the development is compatible with the approved Concept Master Plan and Ensure development is compatible with surrounding development and the local context.

The Site and proposed design are considered to meet the objectives of the project as it allows for development on land that has been previously used for educational purposes.

3. SEARS Requirements

This report has been prepared having regard to the Secretary's Environmental Assessment Requirements issued for the project by DPIE, ref no SSD-10424 issued on the 5th February 2020.

Preparation of this Demolition and Construction Waste Management Plan has been undertaken with reference to the relevant SEARs requirement 20. Waste below, as well as industry best practices.

Identify, quantify and classify the likely waste streams to be generated during construction and operation and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site.

4. Other Standards and Legislative Requirements

Compliance with *Australian Standard AS2601: The Demolition of Structures* is required under the Environmental Planning and Assessment Regulation 2000, which:

- Sets out requirements for the planned demolition of buildings and certain other structures so that the risk of injury to workers, other site personnel and the public, and the risk of damage to adjacent property and the immediate environment is minimised;
- Covers the methods and safety procedures applicable to demolition work in general as well as procedures for some types of structures;
- Deals with manual and mechanical demolition techniques including those employing specialised earth-moving type machinery;
- Includes appendices covering the demolition of pre-stressed concrete structures, some contractual considerations, a checklist for contractors and qualifications for site personnel;
- Addresses safety and health issues under the headings of:

- Health and safety of the public - covering general requirements, lighting, falling materials, fencing, hoardings and warning notices, scaffolding, overhead protection for footpaths, and hazardous materials and conditions;
- Health and safety of site personnel - covering general safety, personal protective clothing and equipment, cutting and welding, fire protection, first aid, amenities, removal of hazardous material and electrical safety;
- Protection of adjoining buildings and protection of immediate environment - covering requirements relating to access and egress, damage and structural integrity, vibration and concussion, weatherproofing, burning, dust control, noise control, protection of public roads and protection of sewers and water courses; and
- General protection of the site.

Section 143 of the *Protection of the Environment Operations Act 1997* requires waste to be transported to a place that can lawfully accept it. It will be the responsibility of the site's developer to ensure that all contractors:

- Provide details of their operating licence to transport waste
- Clearly specify where all wastes are to be transported
- Confirm the capacity of the nominated facilities to receive/manage the waste
- Retain demolition, excavation, and construction waste/recycling dockets on site to confirm which authorised waste/recycling facilities received the material for recycling and disposal
- Provide reports on management aspects (types, quantities and disposal pathways).

Note: The testing and classification of excavated material is not covered in this report. If necessary, the development will arrange for such testing to be conducted. If acid sulphate soils are found on site, a separate plan will need to be prepared for the handling and disposal of such soil.

5. The Site

5.1 Background & Site Description

The Site is located in the suburb of Riverview within the Lane Cove Local Government Area. The Site is bounded by Riverview Street to the north, Tambourine Bay Road to the east and the Lane Cove River to the south and west which is a prime waterfront position on the Lane Cove River. The existing campus, like many school campus developments, is characterised by a collection of buildings and facilities, which have been developed in isolation, without maximising opportunities for collaboration or connection. The College is separated by Riverview Street into two campuses being the Main Campus (Senior School) and Regis Campus (Junior School).

Of significance the College includes amongst other buildings and land uses the following: Chapel; Administration Buildings; Classrooms and Learning Spaces; Library; Halls Refectory, Kitchen and Canteen; Boarding Houses; Health Centre; Long Day Care Centre Sporting facilities including playing fields, gymnasium, swimming pool, rowing sheds, sailing club, basketball , cricket nets, mountain biking track and tennis courts; Observatory; Wharf connecting to the Lane Cove River; Staff and Jesuit residences; Weather station; Storage, maintenance, loading and waste management facilities. A range of built form and building heights exists across the College, which is typical of an Educational Establishment.

A vehicular/pedestrian loop road also exists through the Main Campus (Senior School) of the College providing two entrances and exits at Riverview Street. A further entrance and exit from Riverview Street services the Regis Campus (Junior School). The locational context of the School is illustrated at Figure1. Figure 2 provides an aerial map of the School and its immediate surrounds. Within the School campus, the site of this SSDA is illustrated in Figure 3. The site proposed for a new building is on top of the basketball courts, as shown in blue. The site proposed for demolition works and associated façade redevelopment and landscaping works is shown in green and is limited to a portion of the existing O'Neil Building. It is anticipated that the construction works will be staged, so the construction site for any given stage will be smaller than the overall site identified in Figure 3.

Figure 1 – Saint Ignatius College Riverview Location Context Plan

Figure 2 – Aerial Map of the Saint Ignatius College Riverview Campus

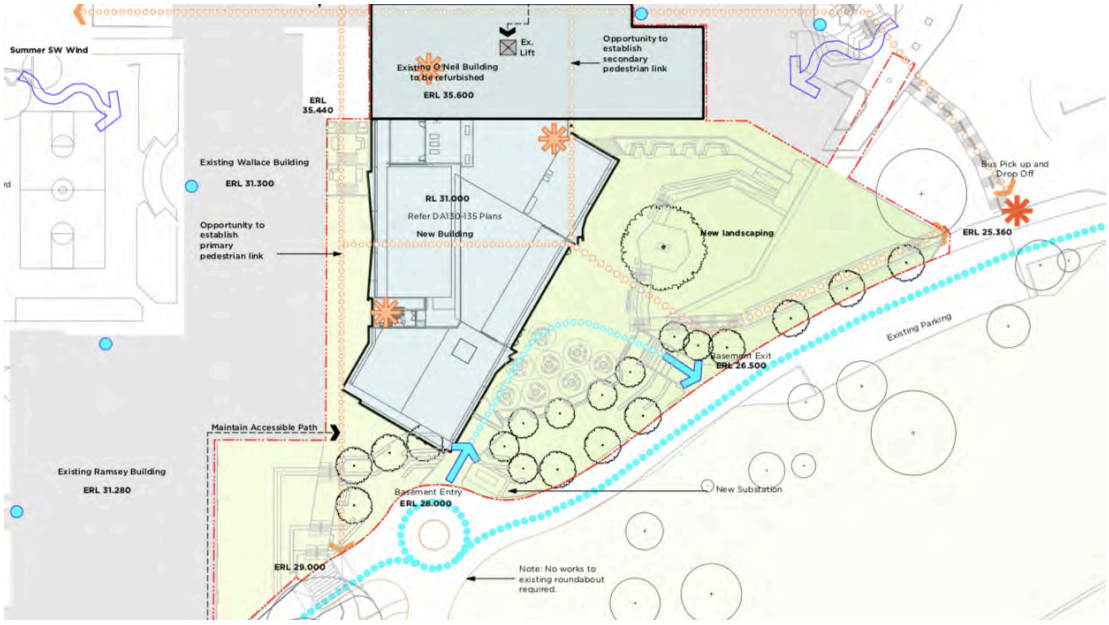

Figure 3 – Project Scope

Figure 4 – Key Plan

5.2 Overview of Proposed Development

This SSDA includes detailed plans for a new learning precinct, refurbishment of the existing O'Neil Building and surrounding landscapes. Accordingly, consent is sought for the following:

- Construction of new five (5) storey building with a maximum RL52.00 at the heart of the Campus to accommodate modern, flexible teaching and learning spaces;
- Provide improved learning opportunities for Science, Technology, Engineering, Mathematics and PDHPE as a STEMP facility, along with six (6) Pastoral Care House areas, and staff rooms;
- The ground floor will accommodate a C.O.L.A, multi-purpose Hall and Canteen (Food and Beverage) with servicing by a loading area on basement level;
- Refurbishment of existing O'Neil Building to allow integration of New Ignis Stage 2 STEMP Building to connect to existing fabric;
- New North Landscaped Area; New Landscaped Area between the existing Wallace Building and the New Ignis Stage 2 STEMP Building;
- Upgrade courtyard to improve the integration of the learning space and create a sense of place.

Overall, the proposed built form approval seeks to provide a framework for the future physical development of the Campus to ensure the best teaching and learning outcomes, and ongoing evolution of the School.

6. Waste Management Strategy

6.1 Waste Management Principles

The waste management hierarchy below has been used to guide the waste management plan:

Avoid
Adopt sound work practices during the demolition and construction processes that avoid the creation of waste products in the first place

Reduce
Reduce the use of materials during the demolition process that require treatment or disposal

Reuse
Ensure that wherever possible, materials are reused either on site or offsite:

- Identify and put systems in place to separate and store materials that can be reused onsite
- Identify the potential applications for reuse offsite and facilitate this process

Recycle/Recover
Identify all recyclable waste products to be produced on site:

- Provide systems for separating and stockpiling of recyclables
- Provide clear signage to ensure recyclable materials are separated
- Process the material for recycling either onsite or offsite

Note: In some cases it may be more economical to send the unsorted waste to specialised waste contractors who will separate and recycle materials at an offsite location.

Treat/Dispose
Waste products which cannot be reused or recycled will be removed and treated/disposed of at appropriately licensed facilities, ensuring the following:

- Chosen waste disposal contractor complies with OEH requirements
- Bins to be monitored for fullness and collected on an efficient schedule minimising transport

6.2 Record Keeping

Records will be required to be kept of all wastes and recyclables generated and either re-used on site or transported off-site. It will be a condition of appointment that all contractors provide these records and that they also contain details of the facilities that the materials are transported to. These records will be made available to relevant authorities on request.

6.3 Materials Storage

All waste and recycling materials will be stored in bins provided by the appointed contractor(s). These bins will be appropriately coloured and signed to indicate what materials are to be deposited into them and located so as to maximise the recovery of reusable/recyclable materials.

6.4 Liquid Waste

- Ensure water is used in moderation and no taps are left continuously running
- Use any grey water produced on site for irrigation or for dust suppression
- Only discharge clean water into storm water
- Manage all wastewater and runoff in accordance with Sydney Water requirements

6.5 Asbestos

Should any materials be suspected of being (or containing), asbestos, the following process will be followed:

i. Treat the material as asbestos unless proven otherwise
ii. Do not disturb the material (i.e., shift or place into a container)
iii. Seek advice from a suitably qualified laboratory to test the material(s) to determine if it is or is not asbestos
iv. If determined not to be asbestos, then it can be managed as an inert waste
v. If determined to be asbestos then it must be managed by a licenced contractor for packaging, removal and disposal
vi. If the material has accidently been uncovered, then the area should be cleared, barriers erected to prevent access, NSW WorkCover and EPA notified, and if the material is broken, it should be covered with a fine spray/mist of water.

For what has been conclusively identified as asbestos-containing materials (including soils), a specialist/licensed asbestos contractor will be used. As required, only workers trained in asbestos removal techniques will be allowed to manage the removal of asbestos-contaminated soil and any material contained in the buildings.

In regard to disposal of asbestos containing materials, there are regulatory requirements under Clause 42 of the Protection of the Environment Operations (Waste) Regulation 2005 that apply to the management of asbestos waste, including:

- Waste must be stored on the premises in an environmentally safe manner.
- Non-friable asbestos material must be securely packaged at all times.
- Friable asbestos material must be kept in a sealed container.
- Asbestos-contaminated soil must be wetted down.
- All asbestos waste must be transported in a covered, leak-proof vehicle.
- It is illegal to re-use, recycle or dump asbestos waste.

7. Demolition Phase

Table 1 shows estimated quantities in m^3 of demolition waste to be generated, and the recommended management strategy for each type of material. Please note that this phase includes excavation of the basketball courts/recreational area, which will produce a significant volume of material requiring disposal.

It is recommended that opportunities for reusing this material either on site or at an off-site location, or locations, be further investigated.

Specific disposal/recycling facilities have not been shown, as a waste contractor has not yet been appointed for the project. All contractors and sub-contractors, once appointed, will be required to detail all intended and actual disposal facilities used, in order to ensure the guiding principles of the waste hierarchy are upheld and maximum diversion from landfill is achieved.

Table 1: Demolition Waste - Expected Materials Streams

Materials on Site		Destination/Treatment		
Type of Material	**Estimated Volume (m^3)**	**Onsite (Reuse/Recycle)**	**Offsite (Reuse/Recycle)**	**Disposal (Landfill)**
Excavation Material	**2,516 m^3**	Retained onsite for reuse as fill where possible	For excavation materials leaving the site, soil will be collected and used as clean fill by waste contractor with notification of location and end use	Material that cannot be reused will be disposed of at landfill facility
Garden Organics	**56 m^3**	No onsite reuse or recycling	Collected by contractor and taken to recycling facility	No disposal to landfill
Bricks/Pavers	**43 m^3**	No onsite reuse or recycling	Removed if still serviceable and sold for reuse to an appropriate contractor, or collected by specialist contractor for recycling	No disposal to landfill
Structural Steel	**12 m^3**	No onsite reuse or recycling	Collected by contractor and taken to recycling facility	No disposal to landfill
Misc. General Waste	**10 m^3**	No onsite reuse or recycling	Separated onsite into dedicated receptacles and collected by the waste contractor for disposal	Disposal to landfill
Plumbing Pipework, Fixtures	**4 m^3**	No onsite reuse or recycling	Collected by contractor and taken to recycling facility	No disposal to landfill
Wood	**3 m^3**	No onsite reuse or recycling	Collected by contractor and taken to recycling facility	No disposal to landfill
Cabinetry	**3 m^3**	No onsite reuse or recycling	Removed if still serviceable and sold for reuse to an appropriate contractor, or collected by specialist contractor for recycling	No disposal to landfill
Carpet	**2 m^3**	No onsite reuse or recycling	Disposed of into a designated bin and collected for recycling if of the required quality, or disposal to landfill if not	Material that cannot be recycled will be disposed of at landfill facility
Plasterboard	**2 m^3**	No onsite reuse or recycling	Separated and stockpiled onsite and collected by contractor for recycling. Possible use as soil improver with gypsum removed by recycler	Material that cannot be recycled will be disposed of at landfill facility

Materials on Site		Destination/Treatment		
Type of Material	**Estimated Volume (m^3)**	**Onsite (Reuse/Recycle)**	**Offsite (Reuse/Recycle)**	**Disposal (Landfill)**
Electrical Pipework, Fixtures	**2 m^3**	No onsite reuse or recycling	Removed if still serviceable and sold for reuse to an appropriate contractor, or collected by specialist contractor for recycling	No disposal to landfill
Window Glass	**2 m^3**	No onsite reuse or recycling	Collected by contractor and taken to recycling facility	No disposal to landfill
Bathroom Tiles	**2 m^3**	No onsite reuse or recycling	Removed if still serviceable and sold for reuse to an appropriate contractor, or collected by specialist contractor for recycling	No disposal to landfill
Glass	**2 m^3**	No onsite reuse or recycling	Collected by contractor and taken to recycling facility	No disposal to landfill
Cardboard Packaging (from deliveries)	**2 m^3**	No on-site reuse or recycling	Separated onsite into dedicated receptacles and collected by the waste contractor for recycling	No disposal to landfill
Electrical Wiring	**1 m^3**	No onsite reuse or recycling	Collected by contractor and taken to recycling facility	No disposal to landfill
Metal Ductwork, Lighting Fixtures	**1 m^3**	No onsite reuse or recycling	Collected by contractor and taken to recycling facility	No disposal to landfill
Ceiling Tiles	**1 m^3**	No onsite reuse or recycling	Separated and stockpiled onsite and collected by contractor for recycling. Possible use as soil improver with gypsum removed by recycler	Material that cannot be recycled will be disposed of at landfill facility
TOTAL VOLUME OF MATERIALS	**2,662 m^3**			
POTENTIAL RECOVERY	**>99%**			

In total, the development's demolition phase will produce around **2,662 cubic metres** of waste materials, of which **99% by volume** can potentially be diverted from landfill if the demolition process is properly managed. It is critical that every effort be made to identify a sustainable disposal method for this material. Ideally this would involve reuse at another suitable nearby site, to minimise the environmental impacts of transportation and disposal.

Waste Audit will be available to provide assistance with this initiative, once the timing of commencement of excavation works has been confirmed.

8. Construction Phase

Table 2 shows estimated quantities in m^3 of construction waste to be generated, and the recommended management strategy for each type of material.

Specific disposal/recycling facilities have not been shown, as a waste contractor has not yet been appointed for the project. All contractors and sub-contractors, once appointed, will be required to detail all intended and actual disposal facilities used, in order to ensure the guiding principles of the waste hierarchy are upheld and maximum diversion from landfill is achieved.

Table 2: Construction Waste - Expected Materials Streams

Materials on Site		Destination		
Type of Material	**Estimated Volume (m^3)**	**Onsite (Reuse or Recycle)**	**Offsite (Reuse or Recycle)**	**Disposal (Landfill)**
Excavation Material	**840 m^3**	Retained onsite for reuse as fill where possible	For excavation materials leaving the site, soil will be collected and used as clean fill by waste contractor with notification of location and end use	Material that cannot be reused will be disposed of at landfill facility
Used Pallets	**15 m^3**	Reused on site for storage where possible	Collected by contractor and disposed of at recycling facility	No disposal to landfill
Mixed Recyclables	**15 m^3**	No on-site reuse or recycling	Separated onsite into dedicated receptacles and collected by the waste contractor for recycling	No disposal to landfill
General Waste (All Other Materials)	**15 m^3**	No on-site reuse or recycling	Separated onsite into dedicated receptacles and collected by the waste contractor for disposal	Disposal to landfill
Paper/Cardboard Recycling	**10 m^3**	Reuse cardboard boxes for storage where possible	Separated onsite into dedicated receptacles and collected by the waste contractor for recycling	No disposal to landfill
Timber Offcuts	**10 m^3**	Reuse for formwork where possible	Untreated recyclable timber will be collected and recycled at appropriate timber yard. Unrecyclable (treated) timber will be disposed of at landfill	Material that cannot be recycled will be disposed of at landfill facility
Plasterboard Offcuts	**10 m^3**	No on-site reuse	Material to be separated and stockpiled onsite and collected by the waste contractor for recycling for use as soil improver with gypsum etc. removed by recycler	Material that cannot be recycled will be disposed of at landfill facility
Concrete (Excess)	**10 m^3**	Separated on site and crushed for use in temporary access road construction	Collected by contractor and taken to concrete recycling facility	No disposal to landfill
Glass (Excess)	**5 m^3**	No on-site reuse	Recyclers consulted as to potential for recycling	No disposal to landfill
Floor Coverings	**5 m^3**	No on-site reuse	Collected in designated bin and sent for recycling if of required quality; otherwise sent to landfill	Material that cannot be recycled will be disposed of at landfill facility
Metal Offcuts, Roof Sheeting, Wiring, etc.	**5 m^3**	No on-site reuse	Collected by specialist metal subcontractor for separation into different metal types for recycling	No disposal to landfill
TOTAL VOLUME OF MATERIALS	**935 m^3**			
POTENTIAL RECOVERY	**>98%**			

In total, the development's construction phase will produce around **935 cubic metres** of waste materials, of which **over 98%** should be able to be diverted from landfill disposal, either by being reused on or off site, or recycled off-site at a specialised facility.

9. Work Plan

The following summarises the principles for the Work Plan to be provided for demolition activities for the development; a comprehensive Work Plan will be developed and submitted to the relevant authorities after the demolition contractor(s) have been appointed.

Following this appointment, more detail as to the demolition process will be known, and this will be evaluated to ensure that all applicable requirements are met. It will be optional of appointment that the contractor(s) will develop a Work Plan and the requirement for submitting it following the appointment should be conditioned in the DA for lodgment with the reviewing authority.

A copy of AS 2601-2001 *The Demolition of Structures* will be kept on site, and during site induction all workers will be advised as to the requirements contained within the Standard.

It is recommended that the following requirements are included in the Work Plan:

Proposed Demolition Methods

- The contractor will be required to detail all machinery that will be used on-site as well as for transporting materials off-site, including vehicles to be used by waste/recycling contractors
- All operators of machinery will be required to provide evidence of licences and insurances to operate machinery
- All machinery will have to be demonstrated to be in good working order
- Safe work method statements will be required for all aspects of the demolition

Estimated Time for Work to be Completed

It is difficult to state with accuracy the actual time for the demolition activities to occur (i.e., be completed), due to issues such as weather and other unforeseen issues. Once the contractor(s) have been appointed a timeframe for demolition activities will be developed.

Hours of Operation

Hours of all demolition activities will be restricted to what is required by Lane Cove Council and any other relevant obligations.

There are a large number of residences in close proximity to the site, so all contractors will be required to ensure that hours of operation, noise, dust and other adverse impacts, do not cause nuisance to these other premises.

Sediment Control Measures

All drains located on or off-site that could have any sediment flow to them will be protected by bunding. The type of bunding used will depend on the location.

Contractors will be responsible for undertaking activities that minimise sediment generation and this will be required to be included in their Work Plan as to the methodologies to be used. All measures used for sediment control will be inspected daily.

Site Access

The site will be protected by fencing, and all gates locked when the site is not occupied. Access during working hours will be controlled by a gatekeeper, and there will be clearly signed and controlled entry and exit points. Site access will only be granted to those who have attended site induction and/or required to be on site due to their employing organisations' requirements (e.g., Council or WorkCover officers).

10. Contractor Management

Each subcontractor working on the site will be required to adhere to this Waste Management Plan. The Head Contractor will ensure each subcontractor:

- Takes practical measures to prevent waste being generated from their work
- Implements procedures to ensure any waste that is created will be actively managed and where possible recycled, as part of the overall site recycling strategy or separately
- Ensures that the right quantities of materials are ordered, minimally packaged and where practical pre-fabricated, and any oversupplied materials are returned to the supplier
- Implements source separation of off-cuts to facilitate reuse, resale or recycling

The Site Manager will be responsible for:

- Ensuring there is a secure location for on-site storage of materials to be reused on site, and for separated materials for recycling off site
- Engaging qualified contractors to remove waste and recycling materials from the site
- Coordinating subcontractors to maximise on site reuse of materials
- Regular monitoring of bins by site supervisors to detect any contamination or leakage
- Ensuring the site has clear signs directing staff to the correct location for recycling and stockpiling, and that each bin/skip/stockpile is clearly signposted
- Providing training to all site employees and subcontractors regarding the WMP as detailed in Section 11 below

Should a subcontractor cause a bin to be significantly contaminated, the Site Manager will be advised through a non-conformance report and the offending subcontractor will then be required to take corrective action, at their own cost. The non-conformance process would be managed by the Head Contractor's Quality Management System.

11. Training and Education

All site employees and sub-contractors will be required to attend an induction that will outline the components of the WMP and explain the site-specific practicalities of the waste reduction and recycling strategies outlined in the WMP.

All employees are to have a clear understanding of which products are being reused/recycled on site, and where they are stockpiled, and are also to be made aware of waste reduction efforts in regard to packaging.

This report has been prepared by:

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September 25, 2020
Document No: 1
Revision # 1

ANNEXURE 10 - COMMUNITY COMMUNICATION STRATEGY

SAINT IGNATIUS' COLLEGE RIVERVIEW REDEVELOPMENT STAGE 2

Community Consultation and Complaints Handling Strategy

Prepared for:

EPM Projects
Suite 7.02, 67 Albert Avenue Chatswood NSW 2067

SLR Ref: 660.30256.00000-R01
Version No: -v1.0
October 2022

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with EPM Projects (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
660.30256.00000-R01-v1.0	18 October 2022	Kiera Plumridge	Andrew O'Brien	

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Appendix A: Complaints Register

1 Introduction

1.1 Background

Saint Ignatius' College Riverview Redevelopment Stage 2 sought approval for the development of Stage 2 of an approved Concept Proposal for the Saint Ignatius' College site, involving the construction of a new five-storey building (new Ignis Building) with learning areas, canteen and multi-purpose hall, refurbishment of the existing O'Neil Building, new landscaped areas, and an upgraded courtyard. The proposal would not result in an increase to student numbers (see **Figure 1**). The Proponent, Saint Ignatius' College Riverview Limited, obtained State Significant Development approval for Saint Ignatius' College Riverview Redevelopment Stage 2 (SSD-10424) in October 2021.

This Community Consultation and Complaints Handling Strategy (CCCHS) has been prepared to specifically address Stage 2 works and details how contractors and subcontractors engaged to construct Stage 2 of the Saint Ignatius' College Riverview Redevelopment will engage and interact with relevant stakeholders and the community. The CCCHS integrates with the Construction Environmental Management Plan (CEMP) and associated suite of documents to provide a comprehensive guide and benchmark for the construction process that aligns with the Development Consent conditions applicable to Saint Ignatius' College Riverview Redevelopment Stage 2.

1.2 Purpose

The CCCHS includes the following key aspects:

- Identification of consultation triggers and methods with adjacent landowners and residents, key stakeholders, relevant agencies, and the wider community;
- The tools and actions to be undertaken throughout the construction program to disseminate information through notification of relevant stakeholders;
- Enquiry and Complaint management protocols; and
- Monitoring and feedback mechanisms.

The CCCHS will be updated as the Project progresses to account for variations in the construction program and methodology and modifications to SSD-10424 which materially modify the scope or requirements of the development relevant to communications, engagement, notification, or complaints. The CCCHS will also be updated, if needed, should significant change occur to identified stakeholders and/or stakeholder interests with these articulated through the feedback mechanisms.

SSD-10424 contains the following conditions of relevance to this CCCHS used to benchmark the contents:

- A25 – Access to Information;
- C6 – Community Communication Strategy;
- C9 – Construction Environmental Management Plan.

The details of these conditions are identified within **Table 1** below, along with a cross reference to the relevant section of this CCCHS.

Table 1 Relevant Conditions of Consent

Condition Number	Condition Detail	Report Reference
A25	At least 48 hours before the commencement of construction until the completion of all works under this consent, or such other time as agreed by the Planning Secretary, the Applicant must: (a) make the following information and documents (as they are obtained or approved) publicly available on its website: (vii) contact details to enquire about the development or to make a complaint; (viii) a complaints register, updated monthly;	
C6	No later than two weeks before the commencement of any construction, a Community,Communication Strategy must be submitted to the Planning Secretary for approval and approved by the Planning Secretary prior to the commencement of construction or within another timeframe agreed with the Planning Secretary. The Community Communication Strategy must provide mechanisms to facilitate communication between the Applicant, the relevant Council, and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the construction of the development and for a minimum of 6 months following the completion of construction. The Community Communication Strategy must: (a) identify people to be consulted during the construction phase; (b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development; (c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development; (d) set out procedures and mechanisms: (i) through which the community can discuss or provide feedback to the Applicant; (ii) through which the Applicant will respond to enquiries or feedback from the community; and (iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.	This Report
C9	C9. Prior to the commencement of any construction (including internal demolition works), the Applicant must submit a Construction Environmental Management Plan (CEMP) to the Certifier and provide a copy to the Planning Secretary. The CEMP must include, but not be limited to, the following: (a) Details of: (vii) community consultation and complaints handling as set out in the Community Communication Strategy required by condition C6;	This Report

1.3 Community Communications and Complaints Handling Strategy Scope

The CCCHS applies to works undertaken by the engaged contractor and all sub-contractors engaged in construction activities for Saint Ignatius' College Riverview Redevelopment Stage 2. This CCCHS outlines the method, triggers and timing of consultation, notification and complaints and queries handling required during the construction of the development and arising from the requirements of the relevant consent conditions outlined in **Table 1.**

1.4 Project Description

SSD-10424 was approved on 25 October 2021, granting approval for Saint Ignatius' College Riverview Limited comprising demolition works, removal of services and construction of new five storey building (Ignis building), internal demolition works and refurbishment of the O'Neil Building, redevelopment of the courtyard area and inclusion of a covered outdoor learning area and associated landscaping upgrade works.

The development as approved under SSD-10424 is outlined in **Table 2** below:

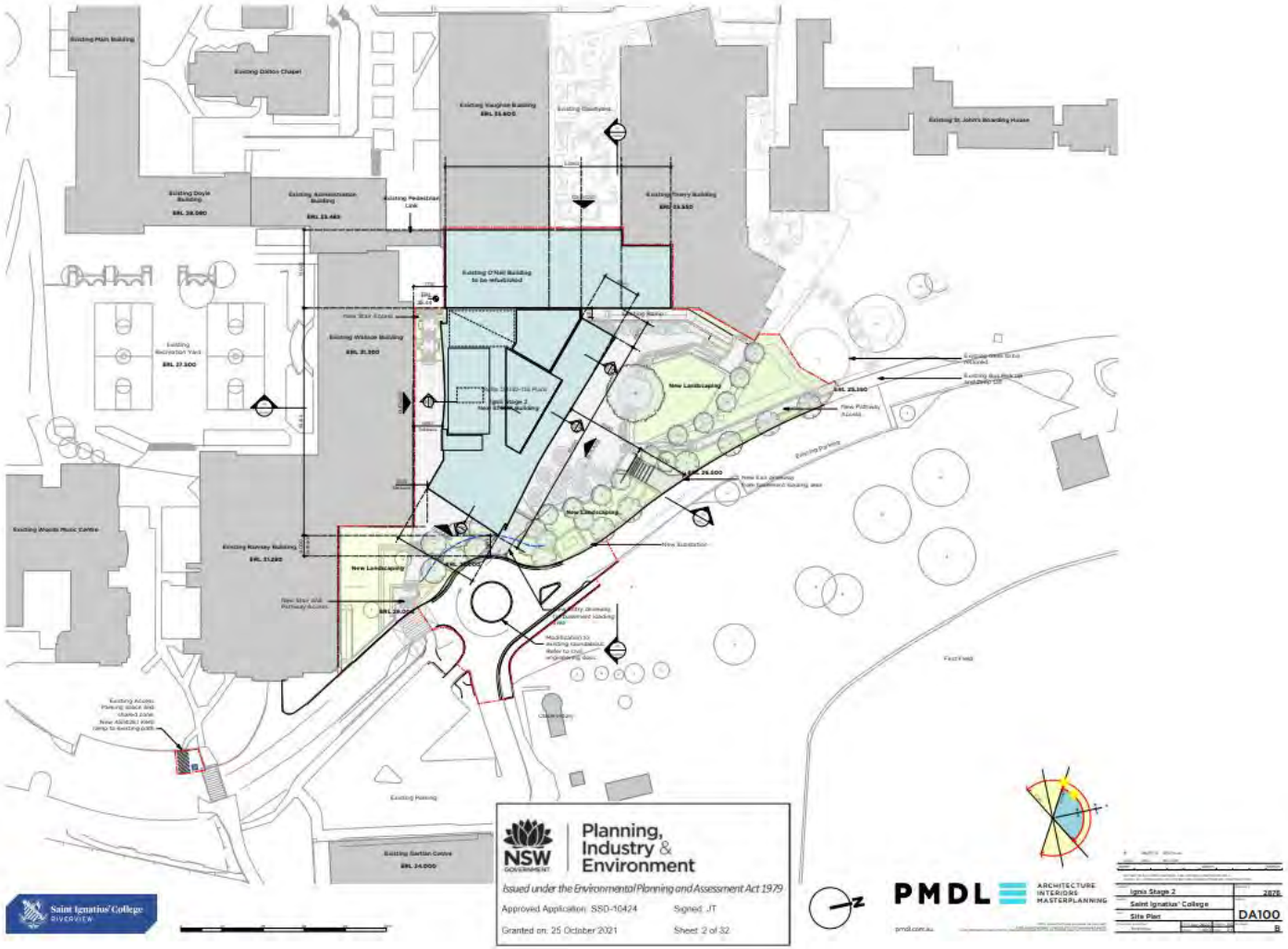
Table 2 Approved Development

Application Number	Development Description
SSD-10424	Stage 2 of the of Saint Ignatius' College Riverview development comprising: • demolition works, removal of services and construction of new five storey building (Ignis building) to accommodate flexible teaching and learning facilities, six pastoral care areas, staff rooms, multipurpose hall, canteen and basement service level; • internal demolition works and refurbishment of the O'Neil Building • to integrate with the new building; • redevelopment of the courtyard area and inclusion of a covered outdoor learning area; and • associated landscaping upgrade works.

This CCCHS has been prepared to address all works approved under SSD 10424 relevant to Saint Ignatius' College Riverview Redevelopment Stage 2 including site preparation, infrastructure, and built form. All contractors and sub-contractors involved in delivering the Project will be required to comply with the approved CCCHS.

Figure 1 below identifies the Ignis Stage 2 Saint Ignatius College site plan.

Figure 1 Ignis Stage 2 Saint Ignatius College Site Plan



2 Key Stakeholders and Potential Issues

2.1 Key Stakeholders

The key stakeholders likely to require consultation, notification and or likely to raise comment or complaint in the course of the construction of the Project include (but are not limited to):

- Attendees of Saint Ignatius College;
- Adjacent or nearby property owners or occupiers;
- Lane Cove Council (Council);
- NSW Government Architect (GA);
- State Government departments, offices, or agencies, including:
- Environment Protection Authority (EPA)
- Transport for NSW (TfNSW)
- Department of Planning and Environment (DPE), specifically the:
  - Environment, Energy and Science Group (EESG);
  - Heritage Division of the Department of Premier and Cabinet (Heritage NSW);
  - Heritage NSW – Aboriginal Cultural Heritage (ACH);
- Utility and Services Providers, including:
  - Telstra
  - Ausgrid
  - Sydney Water; and
- Other Interested Parties.

2.2 Previous Consultation

The Proponent and their representatives have previously undertaken consultation with agencies, the community, and stakeholders during the development of the Project EIS for SSD-10424.

In response to public notification of SSD-10448, a total of nine (9) submissions were received, eight (8) were from government or public authorities and one (1) was from the general public. In response to the issues raised, the Proponent provided further information relating to the concept approval, building design, amenity impact, visual impact, and traffic management to inform the Response to Submissions Report (Willowtree Planning, 2021).

For more information, refer to the Major Project's webpage at: https://www.planningportal.nsw.gov.au/major-projects/projects/saint-ignatius-college-riverview-redevelopment-stage-2.

Consultation has also been undertaken to date with relevant stakeholders to the Project to satisfy Consent Conditions of SSD-10424 and to inform the preparation of required management plans.

2.3 Potential Issues and Strategies

The engaged contractor is committed to ongoing proactive consultation with the community and stakeholders while understanding the importance of addressing potential issues and minimising construction related impacts. **Table 3** outlines potential Project issues that are likely or known to be of interest or concern to the community and stakeholders, as specified in Consent Condition C6(e). The table also details communications related measures and strategies that the Engaged Contractor or Proponent will undertake to manage and mitigate impacts.

Where an incident or non-compliance arises relating to environmental management and beyond the scope of matters relating to consultation, the Saint Ignatius' College Riverview Redevelopment Stage 2 CEMP identifies management and mitigation measures to address those matters, with reference to be made to Section 4.5 outlining Incident and Non-Compliance Response and Handling Procedure.

Saint Ignatius' College will appoint a Contractor for the construction of the Saint Ignatius' College Riverview Redevelopment Stage 2 in November, with the CEMP prepared at this time anticipated to be reviewed and integrated within this CCCHS as required following this appointment to integrate Contractor recommendations.

Table 3 Issue Identification and Mitigation

Potential Issue	Potential Key Impacts	Mitigation Strategy
Traffic	A temporary increase in traffic movements may be experienced associated with the import of fill material, the movement of construction machinery to and from the site, and the movement of workers light vehicles.	The Project CEMP and supporting Construction Traffic and Pedestrian Management Sub-Plan (Condition C11) identify specific mechanisms to manage and mitigate these impacts including the development and implementation of a Driver Code of Conduct to be adhered to by all vehicle operators undertaking works in relation to the Site.
Noise and vibration	Truck, machinery, and light vehicle movements within, to and from the site, along with civil works have potential to result in negative impacts associated with noise, vibration, and dust.	Sensitive receivers and affected stakeholders will be consulted prior to actions likely to generate high levels of noise or vibration in accordance with Section 4 of this CCCHS. Up to date information on current works will be accessible to stakeholders and the wider public on the Project web page. Additionally, should any works be likely to generate impacts beyond those identified within the approval's documentation consultation would be undertaken with the applicable managing agency.

Potential Issue	Potential Key Impacts	Mitigation Strategy
		The Project CEMP, along with the supporting Construction Noise and Vibration Management Sub-Plan (Condition C12) contain specific measures to manage these impacts. These management plans have been informed by commitments contained within the SSD approvals package, EPA standards, and guidelines.
Visual impact and amenity	Visual impacts of earthwork and construction activities, along with potential impacts on the privacy of adjacent sensitive receivers.	Potentially affected receivers would be advised of works with the potential for impact via letter box drop and phone contact (if appropriate) and with these items discussed as they arise via the construction phoneline, in accordance with Section 4 of this CCCHS. The Project CEMP and supporting Landscape Plan (Condition B5) identifies specific mechanisms to manage and mitigate these impacts.
Flora and Fauna	The Project approval requires minimal impact to native and exotic flora and fauna to facilitate the development, with the associated potential for impacts on safety of immediately adjacent receivers, along with biodiversity and visual amenity.	Potentially affected receivers would be advised of works with the potential for impact via letter box drop and phone contact (if appropriate) and with these items discussed as they arise via the construction phoneline, in accordance with Section 4 of this CCCHS. The Project CEMP and supporting Landscape Plan (Condition B5) identifies specific mechanisms to manage and mitigate these impacts.
Soil and water	High rainfall events could result in localised flooding. Construction could result in impacts to local water quality, associated with sediment laden runoff.	Surrounding sensitive receivers will be consulted in relation to adjacent works regarding flooding and water quality issues, with these items discussed as they arise via the construction phoneline, in accordance with Section 4 of this CCCHS. The Project CEMP, along with the supporting Construction Soil and Water Management Sub-Plan (Condition C13) identify specific mechanisms to manage and mitigate these impacts in accordance with relevant Council standards and commitments within the SSD approvals package.
Contamination	There is the potential for encountering contamination during ground disturbance works.	The Project CEMP and supporting unexpected contamination procedure identify specific mechanisms to manage and mitigate these impacts.
Heritage	There is the potential for encountering items of Aboriginal heritage during excavation.	Monitoring of works by appropriately qualified personnel, along with the implementation of an unexpected finds protocol in consultation with Aboriginal stakeholders and Heritage Division of DPE.

Potential Issue	Potential Key Impacts	Mitigation Strategy
		The Project CEMP identifies specific mechanisms to manage and mitigate these impacts.
Misinformation and Misunderstanding	Lack of Project awareness within the wider community may result in complaints being raised by those unaware of the extent of the approval, with these complaints not directed through the appropriate project hotline. Unauthorised release of Project information by the Project team to the media, stakeholders or the community has potential to impact on Project perception in the community.	The CCCHS includes measures at Section 4.3 to provide regular updates in plain language, supported by imagery to stakeholders and the wider community through public and private media. Contact details will be provided on site, the Project web page and in all information issued. Information on Project works, reporting and compliance is to be maintained and updated on the Project website.
Emergency Event	Unforeseen emergency with the potential to impact on the community either directly, or indirectly through out of hours activities that may generate additional traffic or noise.	The CCCHS includes measures at Section 4.4 to provide updates in emergency events, with the Project CEMP identifying specific mechanisms to manage and mitigate these impacts from an environmental management perspective.

3 Communications and Community Liaison Representative

The Proponent for Saint Ignatius' College Riverview Redevelopment Stage 2 has nominated a Communications and Community Liaison Representative (CCLR) for the Project who provides the community and stakeholders with a single point of contact for all aspects of the Project and is responsible for receiving and disseminating information requests and complaints, along with addressing any interface issues. The CCLR will also facilitate property access should it be required.

For the purposes of continuity and the provision of a centralised point of contact, the Saint Ignatius' College Riverview Redevelopment Stage 2 CCLR will cover the Project in its entirety, inclusive of the construction of the Project.

The CCLR is available for contact by local residents and the community at all reasonable times to answer any questions and address any concerns relating to the project. The CCLR will have up-to-date information on:

- Emerging stakeholders;
- Planned construction activities;
- Planned traffic arrangements;
- Current landowner discussions with members of staff;
- Planned community and stakeholder consultation;
- Complaints or enquiries received;
- Duties and accountabilities of staff; and
- Commitments to stakeholders made by the Proponent.

The CCLR is responsible for recording, actioning and providing response to comments, queries or complaints received with relation to the construction of the project and maintains the Complaints Register, including provision of periodic summary reports to the Environmental Representative in accordance with **Section 5.2** of this strategy.

At the time of writing, the contact details for the Saint Ignatius' College Riverview Redevelopment Stage 2 CCLR are as follows:

- Damian Lorenzutta, Capital Works Manager; and
- Peter Ibrahim, EPM Projects.

4 Community and Stakeholder Engagement

4.1 Objectives

The key objectives of the strategy are to meet the requirements of Condition C6 of SSD-10424 and:

- Keep the local community and key stakeholders informed of the progress of works relating to Saint Ignatius' College Riverview Redevelopment Stage 2;
- Ensure that enquires and complaints received from the community or key stakeholders are addressed and responded to in a timely and effective manner;
- Inform relevant parties in advance of potential disturbances and events likely to cause impact;
- Be good students, neighbours, and members of the local community throughout the duration of the Project's lifespan;
- Providing an open two communications channel to allow ongoing, iterative engagement; and
- Seek opportunities for improvement throughout the construction of the Project.

4.2 Conduct

In their communications and consultation with the community and key stakeholders, the Engaged Contractor and their representatives/sub-contractors will comply at all times with the requirements of the *Privacy and Personal Information Protection Act 1998 (NSW)* and the *Privacy Act 1988 (Cth)*.

4.3 Communication, Management and Mitigation Tools

A range of tools and techniques will be used to inform and engage with the community and stakeholders regarding the construction of Saint Ignatius' College Riverview Redevelopment Stage 2. **Table 4** below provides an overview of the mechanisms to be utilised to notify and consult with local community and key stakeholders and measures to mitigate potential issues throughout the development.

Table 4 Communication Management and Mitigation Tools

Tool/ Technique	Description	Person Responsible	Audience	Frequency/timing	Specifications
Consultation Meetings	Meetings held to notify, discuss or consult on matters arising of relevance to community and or key stakeholders. Meetings to be held either face to face or on virtual platform(s)	CCLR and the Proponent	The wider community and key stakeholders.	Meetings to be held on an as needs basis dependant on matters to be discussed and appropriate timing of discussions	Details and matters to be discussed to be tailored to the purpose and aims of the meeting. Record of conversation (informal) or minutes of meeting (formal) to be recorded, retained by the CCLR and provided to all attendees following the meetings. A record of the discussion shall be included in the Complaints Register and actioned as required.
Complaints Register	Recording community and stakeholder interactions (including notification, consultation, queries, comments and complaints), along with associated remedial actions as required.	CCLR	The wider community and key stakeholders.	Project duration	The maintenance of the Complaints Register is required to satisfy the requirements of Condition A25 (a)(viii) of SSD-10448. The register will be continually updated to record community engagement, including information provided by the Proponent, feedback received, and remedial action undertaken where required.
Agency Meetings	Meetings with agencies to discuss matters relevant to their agency	CCLR and/or the Proponent	Relevant Agency	As required.	Meetings will be held as required to address matters relevant to specific agencies including the satisfaction of conditions of consent. These shall be undertaken either directly by the proponent or facilitated by the CCLR at the Proponent's discretion.

Tool/ Technique	Description	Person Responsible	Audience	Frequency/timing	Specifications
Notification Letterbox Drop	Letters would be provided to specific receivers identified as being potentially affected by construction. This may be undertaken in tandem with door knocking.	CCLR	Landowners and occupiers of the immediate area.	As required for the project duration.	Letterbox drop details to be recorded in the Complaints Register. Timing of construction activity to be identified along with relevant contact details.
Email and phone	Where agreed to by the stakeholder and contact details provided, contact is made via email, phone and/or text message to notify or respond to query or complaint	CCLR	The wider community and key stakeholders.	As required for the project duration.	With the stakeholders consent, contact details shall be utilised to provide notification or further contact to respond to query or complaint. Recorded contact details are to kept private and used exclusively for the purpose of consultation on the Project.
On Site Signage	Project information details.	CCLR	Visitors to the site and residents of the immediate area.	Project duration.	Contain key Project contact details including the hotline and web page, along with relevant project and safety information.
Project Information and Complaints Number	Phone number to be contacted should information on the project be required or complaint lodged.	CCLR	The wider community and key stakeholders.	Project duration.	Phone number to be included on site signage, the web page and all project information material. Feedback provided to be incorporated into the Complaints Register and actioned as required.
Staff and Visitor Induction and Training	Project information details.	Site Forman and Management Staff	Staff and visitors to the site.	Project duration.	Key Project safety information, contact details, emergency procedures and site information.

Tool/ Technique	Description	Person Responsible	Audience	Frequency/timing	Specifications
Toolbox and Prestart Meetings	Project information details.	Site Forman and Management Staff	Staff and visitors to the site.	Project duration.	Task specific safety information, emergency procedures and relevant Project updates. All staff and subcontractors to be made aware of external and internal communications procedures
Website	A web page shall be established for the project	The Proponent	The wider community and key stakeholders.	Project duration.	Website address and phone number located on site signage and all Project information material. Web page to provide all details outlined in **Section 4.3.1** below.

4.3.1 Project Website

The Proponent will establish a website to be accessible from at least 48 hours prior to commencement of construction until the completion of all works approved under SSD-10424. The following information will be made available on the website and updated monthly or more frequently when necessary and as required by SSD-10424 Condition A25:

- The documents referred to in condition A2 of the consent;
- All current statutory approvals for the development;
- All approved strategies, plans and programs required under the conditions of this consent;
- Regular reporting on the environmental performance of the development in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent;
- A comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;
- A summary of the current stage and progress of the development;
- Contact details to enquire about the development or to make a complaint;
- A complaints register, updated monthly;
- Audit reports prepared as part of any independent audit of the development and the Applicant's response to the recommendations in any audit report; and
- Any other matter required by the Planning Secretary.

4.4 Notification Procedure

Where notification is required pursuant to Condition(s) of SSD-10424, notification shall be undertaken within the timeframes outlined within the Consent. Where notification is required due to a potential impact or issue, notification shall be undertaken in accordance with **Table 5** below.

Saint Ignatius' College will appoint a Contractor for the construction of the Saint Ignatius' College Riverview Redevelopment Stage 2 in November, with the CEMP prepared at this time anticipated to be reviewed and integrated within this CCCHS as required following this appointment to integrate Contractor recommendations.

Table 5 Notification of Potential Impact or Issue

Potential Impact or Issue	Method of Contact/Consultation	Timeframe
Outside of hours work	Email, Text Message or Letterbox drop – notifying of expected commencement, duration and affected hours	Before undertaking the activities or as soon as is practical afterwards
High noise generating work	Email, Text Message or Letterbox drop – notifying of expected commencement, duration and affected hours	No less than 24 hours prior to the activity
Vibration intensive activity	Email, Text Message or Letterbox drop – notifying of expected commencement, duration and affected hours	No less than 24 hours prior to the activity
Traffic management disruption	Email, Text Message or Letterbox drop – notifying of expected commencement, duration and affected hours Variable Message Signs	No less than 24 hours prior to the activity

Potential Impact or Issue	Method of Contact/Consultation	Timeframe
Respite offerings	Email or phone calls will be undertaken to determine whether respite is required and appropriate scheduling and duration for respite periods	No less than 24 hours prior to the activity
Emergency Event	Email, Text Message or Letterbox drop – notifying of expected commencement, duration and affected hours	As soon as possible

4.5 Complaints Procedure

The Engaged Contractor is committed to the timely and effective management of enquiries and complaints relating to construction activities for the Project. To this end, the following complaints procedure will be adhered to, enabling the receipt and recording of enquiries and complaints, along with the methods of response and resolution of issues raised.

The complaints handling procedure outlined below and illustrated in **Figure 2**.

4.5.1 Receiving and Recording Enquiries and Complaints

The Proponent will establish a Project email address and nominate a phone number for the receipt of enquiries and complaints relating to the development. The email account will be regularly monitored to receive and respond to customer feedback and enquiries. The phone number will be available for contact from the commencement of works. The CCLR will manage the phoneline from the commencement of the project until the completion of works. Where calls are received during hours of construction work (including out of hours works) all calls will be answered by the CCLR. Where calls are received outside of hours of construction works the caller will be invited to leave a message. All approaches from the community and stakeholders will be registered in the project's Complaints Register. The facilities established for receiving enquiries and complaints about the project during construction are shown in **Table 6**.

Table 6 Enquires and Complaints Facilities

Facility	Purpose	Detail
Phone number	A contact phone number and associated contact name (the CCLR) for questions/enquiries and the lodgement of complaints relating to the development.	Damian Lorenzutta - +61 2 9882 8175 Peter Ibrahim - +61 2 9452 8300
Email Address	An email address for questions/enquiries and the lodgement of complaints relating to the development.	Damian Lorenzutta - dlorenzutta@riverview.nsw.edu.au Peter Ibrahim - pibrahim@epmprojects.com.au
In person verbal	Verbal enquiries and complaints can be made formally during meetings or may be made informally where staff interact with members of the public in informal settings.	Where enquiry or complaint is made face to face to persons other than the CCLR, staff will immedicably notify the Contractor's Project Manager who will then contact the CCLR. Record of the conversation (including the recording of contact details with consent) will be made by the staff member and provided to the CCLR immediately

The Proponent has established a Complaints Register to record all complaints and enquiries received by the above means. The Complaints Register will be maintained on a regular basis. The Complaints Register shall include the following details for all complaints or enquiries received:

- Date and time of complaint or enquiry;
- Method by which the complaint or enquiry was made;
- Name, address, contact telephone number of complainant (if no such details were provided, a note to that effect);
- Nature of complaint or enquiry;
- Action taken in response including follow up contact with the complainant;
- Any monitoring to confirm that the complaint or enquiry has been satisfactorily resolved; and
- If no action was taken, the reasons why no action was taken by you.

An example of the Complaints Register is included at **Appendix A**.

4.5.2 Responding to and Resolving Enquiries and Complaints

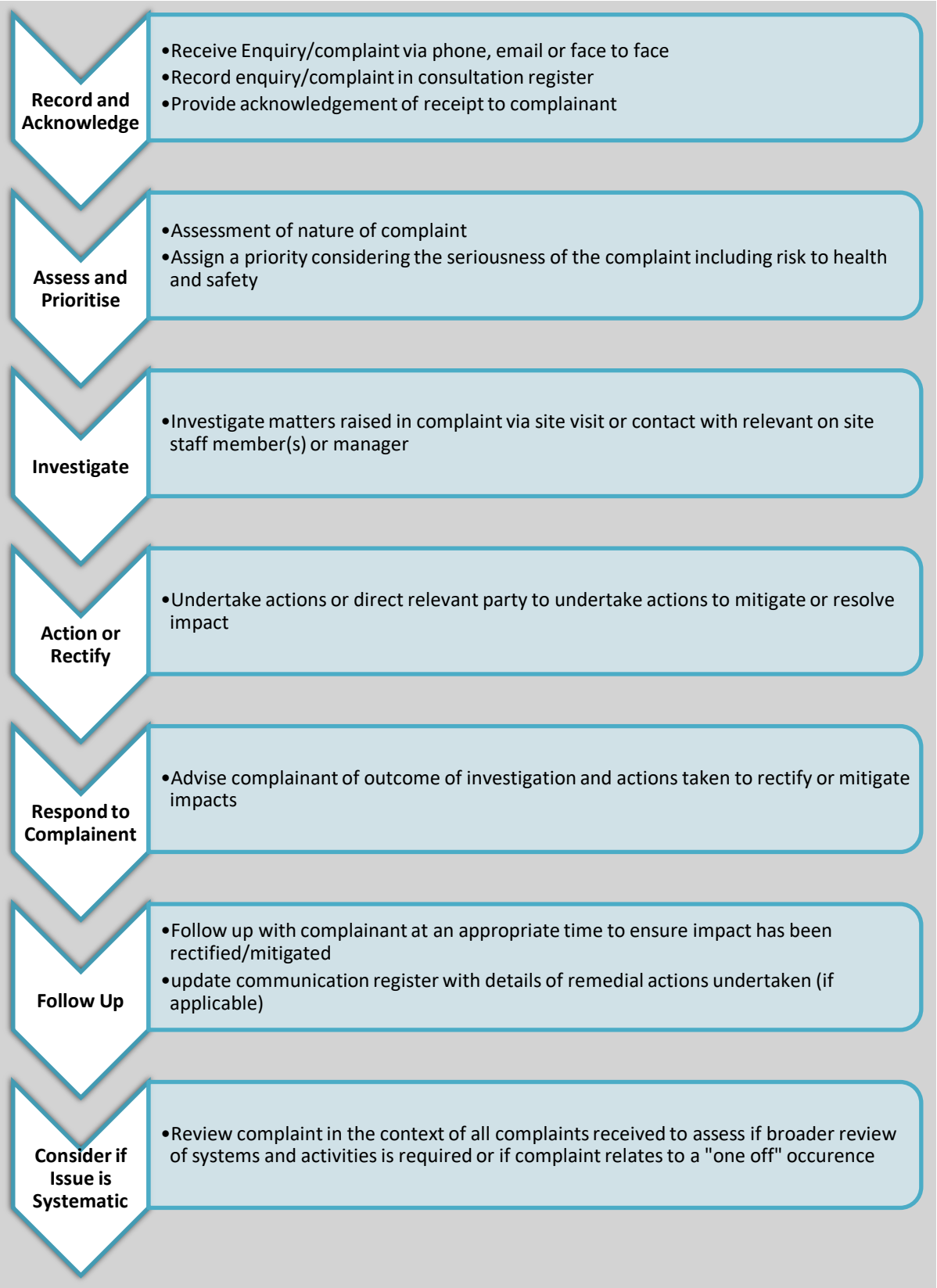
Where a complaint or enquiry is received the CCLR will attempt to provide an immediate response, if possible, via phone or email. Where a complaint or enquiry cannot be responded to immediately the CCLR will assess and prioritise the submission and provide the complainant or enquirer with a follow up verbal response on what action is proposed within two hours during construction works (including night and weekend works) and 24 hours at other times. Where a complaint or enquiry cannot be resolved by the initial or follow-up verbal response, a written response will be provided to the complainant or enquirer within ten days.

In the event of a complaint, the CCLR will assess whether the complaint is founded or unfounded and if necessary, delegate the resolution of the issue to the project manager for action or to the relevant project engineer. The CCLR will oversee the rectification of the issue and respond to the complainant once the issue has been resolved.

In the event of an enquiry, the CCLR will endeavour to provide an immediate response where they are in possession of the relevant information. Where more specific or detailed information is required, the CCLR will liaise with the project manager or relevant project engineer to obtain the information required to respond to the enquiry and provide this information to the enquiring party once in hand.

Where the above protocol is unsuccessful in resolving complaints, mediation may be undertaken at the discretion of the Proponent to facilitate negotiation between affected parties. This shall be performed with the assistance of the ER and potentially via an independent person (mediator) appointed by the Proponent as required. A summary of complaints and enquiries will be provided on a monthly basis with records made publicly available.

Figure 2 Complaints Handling Procedure



4.5.3 Unreasonable Complainant Conduct

The NSW Ombudsman provides guidelines which define unreasonable complaint conduct as:

> *"any behaviour by a current or former complainant which, because of its nature or frequency, raises substantial health, safety, resource or equity issues for the parties to a complaint."*

Whilst it is not envisioned that the project will attract complainants that exhibit this behaviour, where a complainant is seen to potentially have a negative impact on the CCLR or Project team's health, safety, resourcing, or equity of service, The Proponent shall adhere to the procedures and practices outlined within the NSW Ombudsman's "*Managing Unreasonable Complainant Conduct Practice Manual 2nd Edition"*.

4.6 Contingency Management Plan

A contingency management plan has been developed to outline the management of unpredicted impacts and their consequences. Details of these events, their severity, and response are detailed in **Table 7** below:

Table 7 Contingency Management Plan

Key Element	Trigger/ Response	Condition Green	Condition Amber	Condition Red
Submission	Trigger	General feedback/comment (no complaint or query).	Enquiry made by formal or informal channels.	Complaint made by formal or informal channels.
	Response	Acknowledge receipt and record in Complaints Register. No further response required.	Acknowledge receipt and record in Complaints Register. Direct enquiry to relevant person for actioning and response within 5 days.	Acknowledge receipt and record in Complaints Register. Respond to complaint immediately, if possible, if not direct enquiry to relevant person for actioning and provide complainant with a follow up verbal response on what action is proposed within two hours during construction works (including night and weekend works) and 24 hours at other times.
Media	Trigger	Positive story in print, online, radio or television.	Neutral or advisory story in print, online, radio or television.	Negative story in print, online, radio or television.
	Response	Record in Complaints Register and advise the proponent media/marketing team. No further response required.	Record in Complaints Register and advise the proponent media/marketing team. No further response required.	Record in Complaints Register and advise the proponent Project Team for further action and response. Contact relevant person for actioning and response within 48 hours

Key Element	Trigger/ Response	Condition Green	Condition Amber	Condition Red
Unscheduled Event	Trigger	Event occurring outside of plan or schedule without impact or potential impact.	Event occurring outside of plan or schedule with minor impact or potential impact.	Event occurring outside of plan or schedule with major impact or potential impact.
	Response	No response required. Identify opportunities for improvement to manage potential future events.	Contact relevant person for actioning and response within 48 hours. Acknowledge in Complaints Register. Identify opportunities for improvement to manage potential future events.	Contact relevant person for actioning and response immediately. Acknowledge in Complaints Register. Identify opportunities for improvement to manage potential future events.
Political Interest	Trigger	General or non-specific enquiry by Local, State or Federal political representative.	Enquiry or complaint relating to minor issue by Local, State or Federal political representative.	Enquiry or complaint relating to major issue by Local, State or Federal political representative.
	Response	CCLR in conjunction with The Proponent Project Team to prepare and provide response or assign response task to relevant staff member for comment. Record in Complaints Register.	CCLR in conjunction with the proponent Project Team to prepare and provide response within 48 hours. Record in Complaints Register.	CCLR in conjunction with the proponent Project Team to prepare and provide response within 24 hours. Record in Complaints Register.

5 Monitoring, Reporting and Evaluation

Monitoring, reporting, and evaluation will be undertaken to measure the effectiveness of community consultation, stakeholder engagement and responses to complaints and enquiries. Opportunities for improvement will be sought on a continuous basis, with an annual review of the CCCHS undertaken to formalise these incremental improvements.

5.1 Monitoring

The performance of this strategy will be monitored monthly based upon an assessment of the following data:

- Total number of monthly complaints;
- Review of number of monthly complaints relating to lack of consultation/misinformation/confusion;
- Review of number of monthly enquiries relating to information previously disseminated to the community through other channels;
- Monthly review of enquiries or complaints of a similar nature or theme indicative of underlying systematic issues with the project or communication strategy; and
- Response timeframes, including initial acknowledgement and the response to enquiries or remediation of issue(s).

The parameters of monitoring and performance criteria are outlined in **Table 8** below.

Table 8 Summary of Monitoring Data

Monitoring Parameter	Rationale	Performance Criteria	Monitoring Frequency
Total number of complaints	The number of complaints received in total is indicative of the community's satisfaction with the project.	A reduction in number of complaints, baseline determined by number of complaints received in preceding months.	Monthly
Number of complaints relating to lack of consultation/misinformation/ confusion	Number of complaints relating to lack of consultation/ misinformation/ confusion is indicative of the effectiveness and clarity of communication tools utilized.	A reduction in number of complaints, baseline determined by number of complaints received in preceding month.	Monthly
Number of enquiries relating to information previously disseminated	Number of enquiries relating to information previously disseminated is indicative to the effectiveness of the delivery of information.	A reduction in number of enquiries, baseline determined by number of enquiries received in preceding month.	Monthly
Number of complaints/enquiries within defined categories based on theme or subject	A large number of complaints or enquiries relating to a single issue may be indicative of a systematic issue to be addressed as a priority.	A reduction in number of complaints, baseline determined by number of complaints received in preceding month.	Monthly

Monitoring Parameter	Rationale	Performance Criteria	Monitoring Frequency
Response timeframes	Response to enquiries and complaints should be timely to ensure effective responsiveness and rectification of issues and to encourage trust within the community.	Enquiries and complaints acknowledged within 48 hours. Urgent enquiries and complaints responded to within 48 hours of receipt, non-urgent enquiries and complaints responded to within 5 days.	Monthly

5.2 Reporting

As per Condition A25 of SSD-10424, at least 48 hours before the commencement of construction until the completion of all works under the consent, or such other time as agreed by the Planning Secretary, the Applicant must make the following information and documents (as they are obtained or approved) publicly available on its website and keep such information up to date, to the satisfaction of the Planning Secretary, and publicly available for 12 months after the commencement of operations:

- Contact details to enquire about the development or to make a complaint; and
- A complaints register, updated monthly.

5.3 Evaluation and Review

Review of this strategy shall be undertaken in accordance with the provisions of the Project CEMP.

Where performance criteria are not being satisfied, review of this strategy and its implementation will be undertaken by the CCLR and changes to the strategy may be made to rectify the short fall. Where systematic issues are identified associated with construction activities, the project manager will be advised and immediate rectification of the issue will be requested.

This strategy will be reviewed in accordance with Condition A32 of SSD-10424 and where necessary updated or revised in accordance with Condition A33 of SSD-10424.

6 References

NSW Ombudsman (2012) Managing Unreasonable Complainant Conduct Practice Manual 2nd Edition

Willowtree Planning (2020) Environmental Impact Statement New Ignis Stage 2 STEMP Building Project Development

Willowtree Planning (2021) Response to Submissions - SSDA 10424

Appendix A:

Complaints Register

Date	Time	Responsible Party	In/Out	Initial Communication Method/Tool	Contact Name/ Organisation	Contact Details	Documentation Location (if applicable)	Communication Type: Complaint/ Enquiry/ Communication	Summary of Issues/ Details	Action Taken	Further Action/ Monitoring to Confirm Resolution

ASIA PACIFIC OFFICES

ADELAIDE
60 Halifax Street
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F: +61 7 3858 4801

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Sub Base Platypus
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New Zealand
T: +64 2181 7186

SINGAPORE
39b Craig Road
Singapore 089677
T: +65 6822 2203

Department of Planning and Environment

Our ref: SSD-10424-PA-3

Philip Dean
Director of Operations
Saint Ignatius' College Riverview Ltd
2-60 Riverview Street and Tambourine Bay Road
Riverview, New South Wales 2066

Attn: Sophie Litherland (Slitherland@willowtp.com.au)

15/11/2022

Subject: Saint Ignatius' Riverview Redevelopment Stage 2 (SSD-10424)
Community Communication Strategy, Condition C6

Dear Mr Dean,

I refer to the Community Consultation and Complaints Handling Strategy submitted to the Planning Secretary under condition C6 of the project development consent for the Saint Ignatius' Riverview Redevelopment Stage 2 (SSD-10424).

I note the above Strategy:

- has been reviewed by the Applicant, and no issues have been raised with the Department;
- contains the information required by condition C6 of the consent; and
- has been submitted two weeks before the commencement of any construction works at the project site.

Accordingly, as nominee of the Planning Secretary, I approve the Community Consultation and Complaints Handling Strategy, Version 1 dated 18 October 2022, under Schedule 2, Condition C6 of SSD-10424.

I advise you to change the name of the strategy to 'Community Communication Strategy' in line with condition C6 of SSD-10424, and submit a copy to the Planning Secretary for information.

Please note that if there are any inconsistencies between the submitted document and the conditions of consent, then the requirements of the conditions of consent will prevail.

Also, please make the approved strategy publicly available on the project website at the earliest convenience.

If you have any questions or wish to discuss this matter further, please contact Lincoln de Haas at Lincoln.deHaas@dpie.nsw.gov.au.

Yours sincerely

Dominic Crinnion

Acting Director
Infrastructure Management

As nominee of the Planning Secretary

ANNEXURE 11 - HERITAGE MANAGEMENT PLAN FOR UNEXPECTED FINDS PROTOCOL

artefact

Unexpected Finds Protocol – Archaeological items

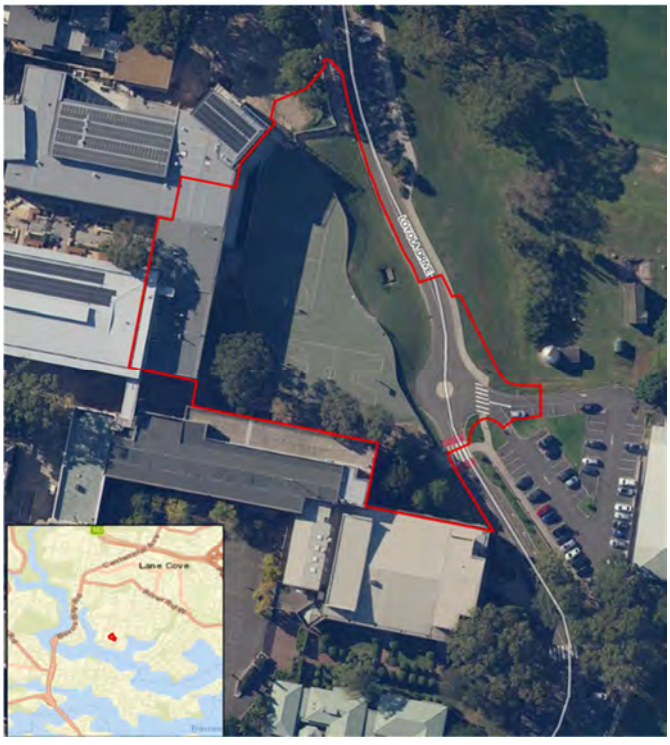
Saint Ignatius College Riverview SSD-10424 Site: 2-60 Riverview Street and Tambourine Bay Road, Riverview Unexpected Finds Protocol	**Date:** 6 February 2023

Project Background

This document refers to approved Stage 2 development within the State Significant Development (SSD) 10424 at 2-60 Riverview Street & Tambourine Bay Road, Riverview, Saint Ignatius College Riverview. On 25 October 2021 consent for the proposed Stage 2 works was granted by the Secretary of the NSW Department of Planning and Environment. The development consent is for a State Significance Development (SSD), reference number 10424, referred to as SSD 10424.

This document provides an Unexpected Finds Protocol (UFP), as required by the Condition of Approval (CoA) D24 and D25 for the proposed demolition works, removal of services and construction of new five storey building (Ignis building) to accommodate flexible teaching and learning facilities, six pastoral care areas, staff rooms, multi-purpose hall, canteen and basement service level; internal demolition works and refurbishment of the O'Neil Building to integrate with the new building; redevelopment of the courtyard area and inclusion of a covered outdoor learning area; and associated landscaping upgrade works. The area subject to this UFP is shown in Figure 1.

Figure 1: Area subject to this UFP



Artefact has prepared this UFP to satisfy the relevant CoA, as listed in Table 1: Unexpected Finds Protocol.

Table 1: Unexpected Finds Protocol

Condition #	Condition	Action
C16	*Prior to the commencement of any construction, an induction must provided to all construction staff, employees, contractors and sub-contractors in respect of Aboriginal heritage protection and their responsibilities under the National Park Act 1974 by a suitably qualified archaeologist. A written induction must also be provided and included in all environmental and safety documentation for future reference*	The content of this Unexpected Finds procedure must be outlined to all onsite contractors and workers as part of the induction provided as part of CoA C16.
D24	*In the event that surface disturbance identifies a new Aboriginal object, all works must halt in the immediate area to prevent any further impacts to the object(s). A suitably qualified archaeologist and the registered Aboriginal representatives must be contacted to determine the significance of the objects. The site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) which is managed by EES Group and the management outcome for the site included in the information provided to AHIMS. The Applicant must consult with the Aboriginal community representatives, the archaeologists and EES Group to develop and implement management strategies for all objects/sites. Works shall only recommence with the written approval of EES Group.*	Refer to this UFP
D25	*If any unexpected archaeological relics are uncovered during the work, then all works must cease immediately in that area and the Heritage NSW contacted. Depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area. Works may only recommence with the written approval of the Heritage NSW.*	Refer to this UFP
D26	*The registered Aboriginal sites within Saint Ignatius' College, Riverview campus must be protected at all times and not impacts* [sic] *in any way during the construction of the proposed works approved under this development consent.*	Refer to this UFP

This UFP must be implemented if any potentially significant Aboriginal object or historical archaeological remains are identified during proposed groundworks.

Examples of types of unexpected archaeological finds include:

- Potential Aboriginal flaked items
- Concentrations of Aboriginal artefacts – this may take the form of a number of artefacts concentrated in a single location, such as stone artefacts; concentrations of shell material
- Concentrations of historical artefacts, such as complete or broken glass bottles and ceramic items, animal bone and other domestic items
- Structural remains i.e. brick or stone footings, areas of buried paving

NSW Heritage Legislation and Protection

Three Acts afford protection to cultural heritage and archaeology in NSW:

- National Parks and Wildlife Act 1974 (NPW Act)
- Heritage Act 1977 (Heritage Act)
- Environmental Planning and Assessment Act 1979 (EP&A Act).

Aboriginal sites are protected by all three acts. It is an offence to knowingly or unknowingly damage or disturb an Aboriginal site without the appropriate approval. If an Aboriginal site or object is damaged or disturbed prosecution may result.

Historical archaeological sites in NSW are protected by the Heritage Act 1977. Sections 139-145 of the Heritage Act prevent the excavation or disturbance of land known or likely to contain Historic Archaeological Relics, unless in accordance with an excavation permit or with the conditions of approval for a State Significant Development. If an archaeological site or object is damaged or disturbed prosecution may result.

Unexpected Finds Protocols

Staff involved with ground disturbing works must be made aware of the potential for archaeological remains to be present. Clear lines of communication must be established for the reporting of any such finds and for procedures to be rapidly implemented. Unexpected Finds Procedures must be made clear to all staff. Images to assist with the identification of potential finds are provided at the end of this document.

Human Remains

In the event that skeletal remains are encountered which may be human remains, the following steps must be followed:

- All ground-disturbing works within 20m of the remains will cease immediately following the discovery. The discoverer of the remains will notify machinery operators in the area to ensure work is halted
- The remains will not be moved or removed from the area or disturbed in any other way

- The area will be secured by use of protective barriers to ensure no harm can occur to the remains
- A qualified Forensic Anthropologist or archaeologist must be engaged to assist in the identification of human remains
- If it is determined that the suspected remains are not human, work can recommence
- If it is determined that the remains are human, or are likely to be human remains, NSW Police must be notified
- The NSW Police and NSW Coroner will determine if the suspected human remains are human and if they represent a crime scene. If the human remains are determined to represent a criminal act, the NSW Police and NSW Coroner will direct proceedings, including deciding when works may continue.
- If NSW Police and NSW Coroner determine that the suspected human remains fall under the legislative requirements of either the *National Parks and Wildlife Act 1974* or *Heritage Act 1977*, Heritage NSW will be responsible for determining the next course of action, including deciding when works may continue.
- If it emerges that the remains are ancestral Aboriginal remains, the Registered Aboriginal Parties and Local Aboriginal Land Council must be notified
- Works must not recommence until the relevant authority has provided written approval and/or permit

Aboriginal Heritage

Aboriginal heritage unexpected finds may include stone artefacts, shell material, rock platforms with engravings or grinding grooves. In the event that suspected Aboriginal archaeological material is identified, the following steps must be followed:

- All ground disturbing work within at least 10m of the find must cease
- The find must not be moved.
- The find must be appropriately protected from potential harm
- A qualified archaeologist and registered Aboriginal parties must be contacted to assist in:
    - Assessment of the identified Aboriginal object(s)
    - Determine the significance of the identified Aboriginal object(s)
    - Submit a site card to the Aboriginal Heritage Information Management System (AHIMS)
    - Provide management recommendations, which may include the need for further assessment and archaeological investigation
- The Applicant must consult with the Aboriginal community representatives, the archaeologists, and DPE, to develop and implement management strategies for all objects/sites
- **Works shall only recommence with the written approval of DPE**
- Update the AHIMS site card with management outcome information for the site

Registered Aboriginal Parties

The Registered Aboriginal Parties identified in the Aboriginal Cultural Heritage Assessment Report (ACHAR) that was submitted to DPE as part of the SSD 10424 approvals process must be consulted as part of the Aboriginal heritage unexpected finds procedure.

The proponent must maintain a contact list for each Registered Aboriginal Party throughout works.

The relevant ACHAR is identified below:

Comber Consultants, September 2020. 'Saint Ignatius College, Riverview: Aboriginal Cultural Heritage Assessment Report'. Prepared for Saint Ignatius College, Riverview

Protection of registered Aboriginal sites within Saint Ignatius College

The registered Aboriginal sites within Saint Ignatius College Riverview must be protected at all times and not impacted in any way during construction of the proposed works approved under SSD 14024.

The location of registered Aboriginal sites on the AHIMS site register is shown in Figure 10 and Figure 11. The AHIMS site register search was undertaken on 3 February 2023. An updated AHIMS site register search must be updated every 12 months during the works.

The location of registered Aboriginal sites must be marked on site plans as no go areas with a buffer zone of 50m. No works vehicles, compound facilities, stockpiles, or any other activities associated with works approved under SSD 14024 must not come within 50m of the registered location of recorded Aboriginal sites on the AHIMS site register.

The location and details of Aboriginal sites are considered culturally sensitive information. It is recommended that this information including AHIMS data and GIS imagery, is removed if this UFP or any document containing information regarding the location of AHIMS registered sites is to enter the public domain.

Historical Archaeology

Historical archaeology is likely to take the form of historical footings or infrastructure and associated historical relics such as complete or broken glass bottles and ceramic items, animal bone and other domestic items. In the even that such items are identified the following steps must be followed:

- All ground disturbing work within at least 10m of the remains must cease.
- The finds must not be moved.
- The find must be appropriately protected from potential harm
- A qualified archaeologist must be engaged to:
    - Assess of the identified find(s)
    - Determine the significance of the identified find(s). The significance of unexpected finds will be assessed against the seven heritage criteria as outlined in the NSW Heritage Manual, including historical, associative, aesthetic or technical, social, research potential, rarity, and representativeness criterion. The aim of assessing significance to identify if an unexpected find is of local or state significance.
- Depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area
- **Works may only recommence with the written approval of Heritage NSW**

Figure 2: Example of Aboriginal stone artefacts

Figure 3: Example of Aboriginal shell midden

Figure 4: Example of Aboriginal shell midden

Figure 5: Example of Aboriginal grinding grooves

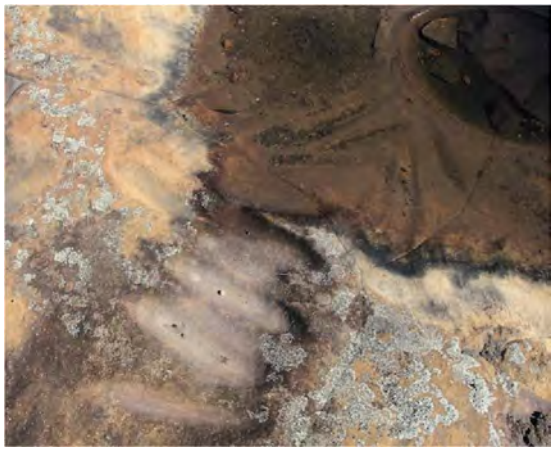


Figure 6: Example of historical relics

Figure 7: Example of historical footings

Figure 8: Example of historical footings

Figure 9: Area subject to this UFP

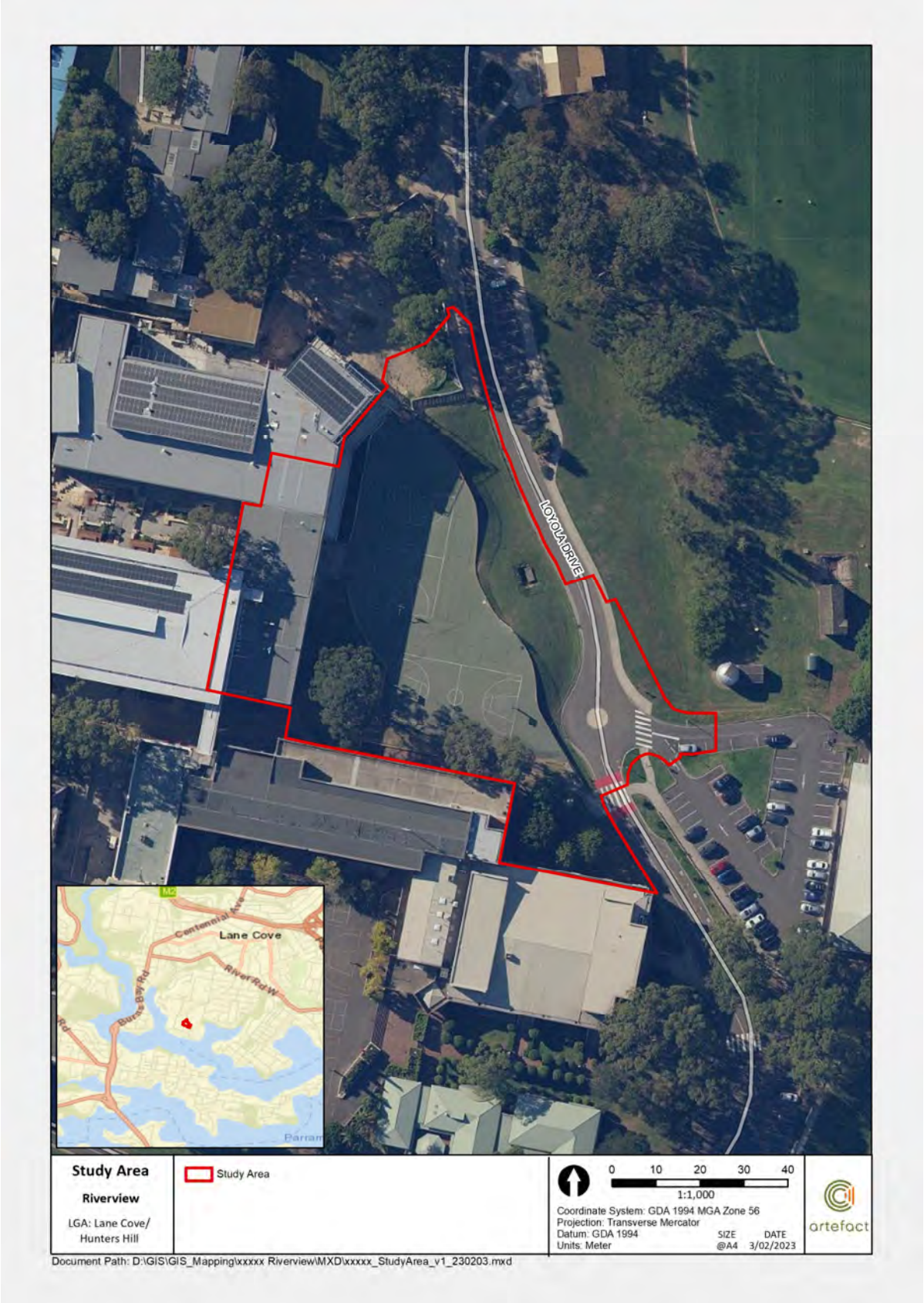


Figure 10: Location of registered Aboriginal sites on the AHIMS site register

Figure 11: Location of registered Aboriginal sites on the AHIMS site register within Saint Ignatius College Riverview

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Form D1.1

TOOLBOX TALK/MEETING RECORD

Revision Date: 03/05/2021

Project:	Wingaru STEMP	**Project No:**	C22011
Location:	Site	**Date:**	07-Feb-23
Presenter:	Brett Drew	**Duration:**	2 hours
Subject (s):	Unexpected Finds Protocol – Archa	**SWMS Reviewed Name:**	N/A

Check Applicable Boxes			
☐	Awareness of Site Rules	☐	PPE
☐	SWMS review	☐	Electrical Safety (T&T)
☐	SDS requirements	☐	Housekeeping
☑	Competency/Training	☐	Plant and equipment
☐	Access issues	☐	Principal Contractor Issues
☐	**I have asked the subcontractor if they need an interpreter to fully understand the toolbox topic?**		
☐	**Translator required? (Tick box if yes)**		
	Translators Name:	**Translators Signature:**	

Hazard/Topics Discussed	**Method of Control**
Unexpected Finds Protocol – Archaeological items Induction	Unexpected finds protocol

Corrective Action	**Action By**	**Action Complete**	
		Sign Off	**Date**

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Attendance Record

The following workers attended the toolbox talk:

No.	Name	Company	Signature
1.	Loui Abouhamad	Belmadar	
2.	James Blackburne	Belmadar	
3.	Brandon You	Belmadar	
4.	Ahmad Bayad	Belmadar	
5.	Brett Drew	Belmadar	
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JOSH SYMONS
TECHNICAL DIRECTOR

Years of experience
20 years in archaeology and cultural heritage management.

Education
BA (Hons 1) Historical and Prehistoric Archaeology, University of Sydney

Key qualifications and experience
Josh's 20 years plus experience in cultural heritage management and archaeology for both Aboriginal and historical heritage provides him with a unique set of skills required for assessment and identification of Aboriginal cultural heritage values and archaeological objects. This competence ensures that archaeological assets are managed wholistically and with a minimum risk to projects.

Josh has worked extensively with stakeholders such as Local Aboriginal Land Councils and Native Title groups to facilitate best practice heritage outcomes. Josh has prepared heritage assessments, excavation reports, cultural heritage assessment reports, and has contributed to heritage management plans and large-scale archaeological projects. Josh has experience with GIS software and has prepared mapping information for use in fieldwork and inclusion in reports. He has an excellent knowledge of relevant NSW heritage guidelines and legislation.

Experience (selected recent projects)
- Wickham Transport Interchange (TfNSW – GHD and Laing O'Rourke) - assessment for REF, pre-construction and construction mitigation works (Aboriginal)
- Sydney Metro - Chatswood to Sydenham (Arcadis/RPS/Jacobs) – assessment for EIS and high level advice (Aboriginal).
- Sydney CBD to South East Light Rail (Laing O'Rourke)– early works heritage consultancy and archaeological services (Aboriginal)
- Albion Park Rail Bypass (RMS/Arcadis/ Cardno) – provision of heritage advice and archaeological services for all stages of the Albion Park Rail Bypass project, including heritage assessments, consultation, archaeological excavation and preparation of EIS chapters (Aboriginal and historical).
- The Northern Road upgrade/ The Northern Road and Bringelly Road intersection upgrade (GHD/RMS) – heritage assessment, field survey, consultation, permit applications, archaeological excavation for proposed upgrade of The Northern Road (Stages 1 and 2) and upgrade of The Northern Road and Bringelly Road intersection (Aboriginal and historical).
- The Northern Road Stage 2 (Jacobs/RMS) – Aboriginal heritage assessment, permit applications and advice

Professional history

2012-present	Artefact Heritage – Senior Archaeologist/Principal
2007-2012	Kelleher Nightingale Consulting – Archaeologist
2006	Pre-Construct Archaeology, London – Archaeologist
2004-2005	Australian Museum Business Services – Technical Officer
2002-2004	Environmental Resources Management – Graduate Archaeologist

ANNEXURE 12 - CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT PLAN

2-60 Riverview St & Tambourine Bay Rd, Riverview

St Ignatius' College, Riverview – Stage 2 Construction Traffic and Pedestrian Management Plan

Client Name: Belmadar
Reference: 23019
Issue: Final D (August 2023)

Transport Strategies

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Appendix F – Curriculum Vitae

1.0 Introduction

1.1 Background

A Stage Significant Development Application (SSD-10424) has been approved by the Minister for Planning and Public Spaces for Stage 2 of the Saint Ignatius' College Riverview development.

The approved development is located at Lot 10 DP 1142773, 2-60 Riverview Street and Tambourine Bay Road, Riverview.

A CTMP was submitted for the enabling and CC1 works in April 2023 and approved by the Principal Certifying Authority (PCA).

This CTMP is now updated following a review of the latest site conditions and post-CC1 works (CC2 through CC4) which is expected to commence on the 20 September 2023.

1.2 Purpose of this Plan

Based on the above, Belmadar has commissioned Transport Strategies to prepare the updated Construction Traffic Management Plan (CTMP) plan in accordance with the C11 requirements:

> *C11. The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must be prepared to achieve the objective of ensuring safety and efficiency of the road network and address, but not be limited to, the following:*
>
> *(a) be prepared by a suitably qualified and experienced person(s);*
> *(b) be prepared in consultation with Council and TfNSW/TfNSW(RMS);*
> *(c) be consistent with the Preliminary Construction Traffic and Pedestrian Plan prepared by Positive Traffic Pty Ltd dated October 2020 submitted with the EIS;*
> *(d) include details of predicted number of construction vehicle movements per day and detail*
> *of vehicle types, noting that vehicle movements are to be minimised during peak traffic periods;*
> *(e) include assessment of potential impacts to general traffic, cyclists, pedestrians and bus services within the vicinity of the site from construction vehicles during the construction of the proposed works;*

(f) include details to demonstrate the construction vehicle access arrangements and student / staff access to the site during construction works to ensure safe operation of the school at all times;
(g) detail the measures that are to be implemented to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services;
(h) detail the measures regarding existing students and operation; and
(i) detail heavy vehicle routes, access and parking arrangements.

The conditions and associated sections, page numbers, and appendices are provided in the table below.

Consent Satisfaction Table Condition		
Condition	Requirements	Document reference
C11.	The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must be prepared to achieve the objective of ensuring safety and efficiency of the road network and address, but not be limited to, the following:	
a	be prepared by a suitably qualified and experienced person(s);	See Section 1.2 and Appendix F for Curriculum Vitae.
b	be prepared in consultation with Council and TfNSW/TfNSW(RMS);	See Section 3.9.
c	be consistent with the Preliminary Construction Traffic and Pedestrian Plan prepared by Positive Traffic Pty Ltd dated October 2020 submitted with the EIS;	See Section 1.2.
d	include details of predicted number of construction vehicle movements per day and detail of vehicle types, noting that vehicle movements are to be minimised during peak traffic periods;	See Sections 4.3, 4.4 and 4.5.
e	include assessment of potential impacts to general traffic, cyclists, pedestrians and bus services within the vicinity of the site from construction vehicles during the construction of the proposed works;	See Section 5.
f	include details to demonstrate the construction vehicle access arrangements and student / staff access to the site during construction works to ensure safe operation of the school at all times;	See Sections 4.3.

g	detail the measures that are to be implemented to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services;	See Section 5.
h	detail the measures regarding existing students and operation; and	See Section 5.
i	detail heavy vehicle routes, access and parking arrangements.	See Sections 3.6, 4.3, 4.4 and 4.5.

This Plan has been prepared by a suitably qualified and experienced civil (traffic) engineer with 17 years of professional experience and holds the SafeWork NSW Prepare a Work Zone Traffic Management Plan accreditation, detailed as follows:

Siew Hwee Kong - card no. TCT1030659

This Plan has also been prepared to be generally consistent with the Preliminary Construction Traffic and Pedestrian Plan prepared by Positive Traffic Pty Ltd dated October 2020.

The structures of the Plan are as follows:

- Chapter 2: Describes the existing site and transport conditions
- Chapter 3: Describes the approved development and details the construction program and processes
- Chapter 4: Details the construction traffic management plan
- Chapter 5: Assesses the impacts of the construction activities

Transport Strategies

2.0 Existing Transport Conditions

2.1 Existing Site

The site is located within the existing St Ignatius College Riverview Senior School campus at 2-60 Riverview St & Tambourine Bay Rd, Riverview. The School has two main entries from the Public Road network. The first entry is in the North East Corner of the Site where the internal road (Loyola Drive) forms part of an intersection with Tambourine Bay Road and Riverview Street. The second is located along the northern boundary of the campus off Riverview Street.

The Stage 2 Development site is located wholly within the Campus grounds approximately 450m South along Loyola Drive from the intersection with the Public Road network. The Stage 2 Development site boundaries are shown in Figure 2.1.

Figure 2.1: Development site

The site is accessed from the roundabout at Riverview Street, Pengilly Street and Tambourine Bay Road. Traffic towards the site is restricted to this North Eastern entry. All traffic to the site travel down Loyola Drive.

The site layout and surrounding environs are shown in Figure 2.2.

Figure 2.2: Location Map

2.2 Road Network

The surrounding road network is detailed below:

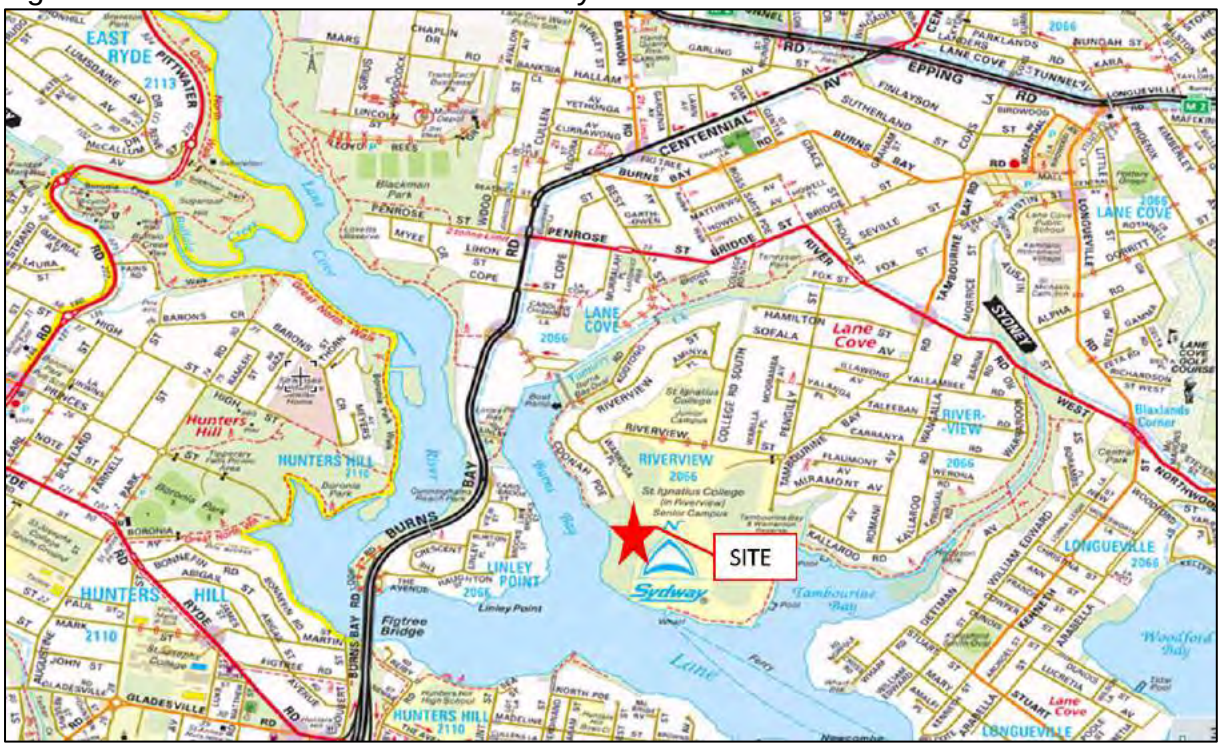
- Tambourine Bay Road – is a local collector road providing access to River Road West in the north and the school in the south. It generally includes a single travel lane in each direction with unrestricted parallel parking on either side of the street. The intersection of Tambourine Bay Road / River Road West includes traffic signals. The street has a posted speed limit of 60km/hr with a 40km/hr school zone is in place commencing at Pengilly Street.

- Riverview Street – is a local street that provides frontages to both the Junior School and Senior School of St Ignatius Riverview College. Whilst considered a local street (as it provides access to adjacent residential properties) it is expected peak hour traffic flows would be higher than that which would be typical for a local street. During school peak periods, a 40km/hr speed zone is in place. Outside these periods the street includes a posted speed limit of 50km/hr. On-street parking is not permitted on the street. However, off-street parking in a grassed area adjacent to the Junior School is available.

- River Road - is an east–west sub arterial through the area linking Burns Bay Road (sub-arterial) in the west with Pacific Highway (arterial road) in the east. It carries large volumes of traffic in both the AM and PM peak periods. It generally includes two travel lanes in each direction and parallel parking available in certain locations along the corridor.

The surrounding road network is shown in Figure 2.3.

Figure 2.3: Road network in the vicinity of the site



2.3 Key Intersections

The key intersections in the vicinity of the site comprise:

- the signalised intersections at River Road West / Tambourine Bay Road
- the priority intersection at Riverview Street / Loyola Drive
- the roundabout at River Road West / Tambourine Bay Road / Riverview Street / Loyola Drive

2.4 Public Transport

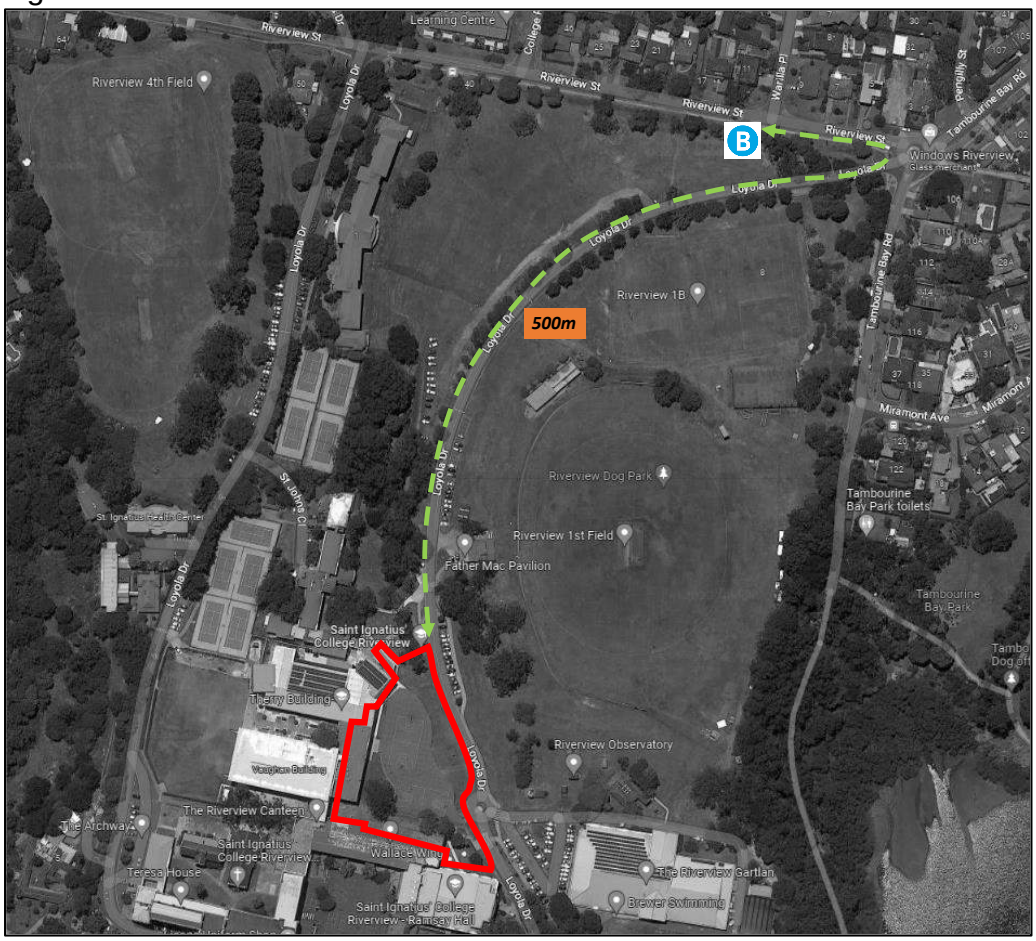
Public Bus

The site is well-serviced by public buses. The existing route buses which operate from the bus stops within a convenient walking distance to the School are as follows:

- 253 - Riverview to City Wynyard via Freeway
- 254 - Riverview to McMahons Point

The location of existing route bus stops within a convenient walking distance to the School campuses is shown in Figure 2.4.

Figure 2.4: Public Bus Access



Details of the bus services are detailed in Appendix A.

School Bus

There is an existing bus stop (Stop Id 2067108, St Ignatius' College, School Grounds, St John House) just to the north of the construction site within the College Grounds for the following school bus routes (687w, 688w, 690w, and 692w). These buses operate during school drop-off (8 am – 8.30 am) and pick-up times (3.36 pm – 5.10 pm). Bus arrives from Loyola Drive (from the south), enter the designated bus bay (See the following figure) and exit the bay in a forward direction onto Loyola Drive towards Riverview Street.

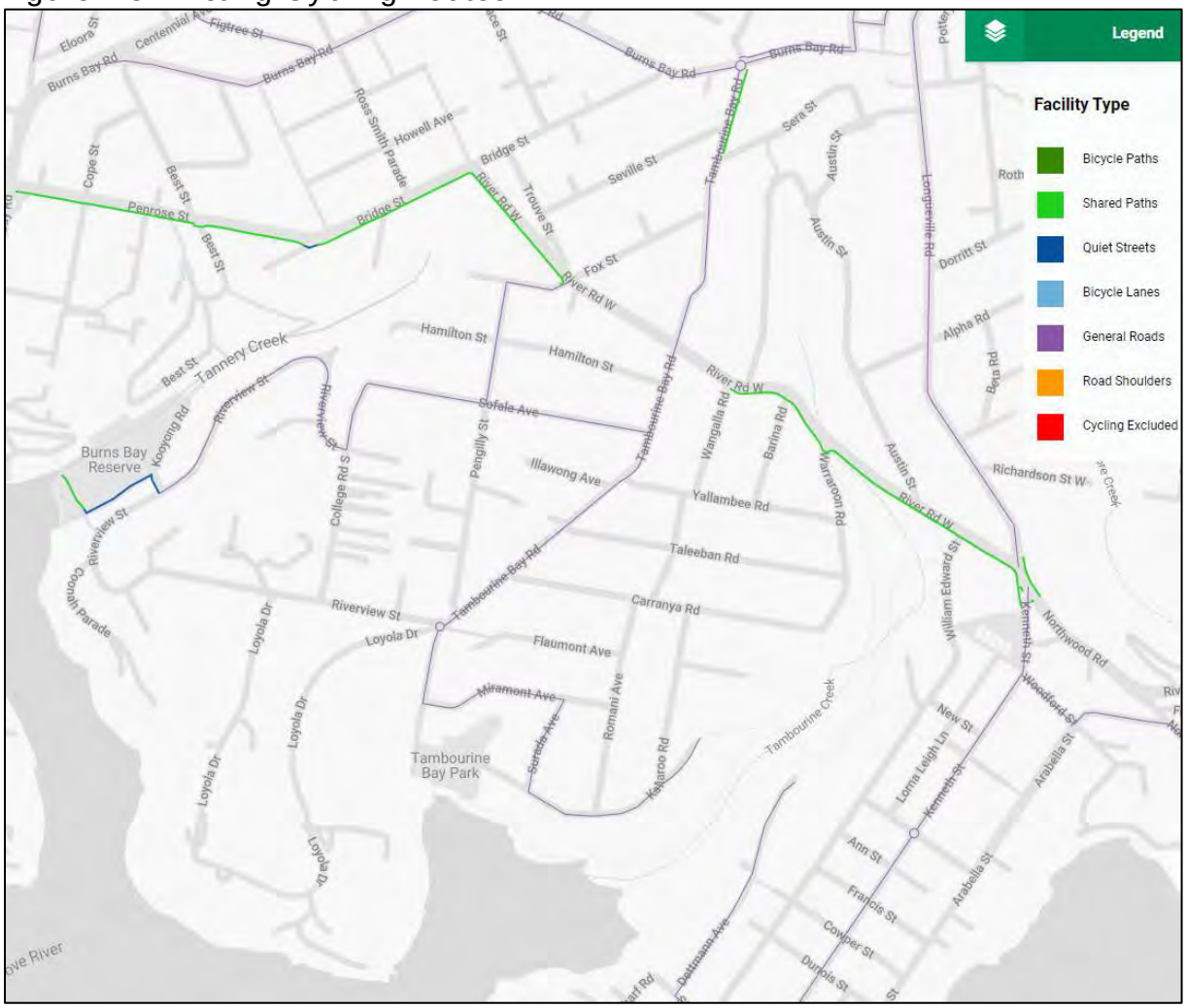
Outside of the above hours, there is no bus movement and parking activities at the bay.

2.5 Active Transport

Footpaths are provided on the southern side of Riverview Street, the western side of Tambourine Bay Road, and the eastern side of Loyola Drive West.

There are currently on-road bicycle routes along Tambourine Bay Road south of Riverview Street. See Figure 2.5.

Figure 2.5: Existing Cycling Routes



Transport Strategies

3.0 Approved Development and Proposed Construction Scheme

3.1 Approved Development

The approved Stage 2 of the Saint Ignatius' College Riverview works comprises:

- demolition works, removal of services, and construction of a new five-storey building (Ignis building) to accommodate flexible teaching and learning facilities, six pastoral care areas, staff rooms, multi-purpose hall, canteen, and basement service level;
- internal demolition works and refurbishment of the O'Neil Building to integrate with the new building;
- redevelopment of the courtyard area and inclusion of a covered outdoor learning area; and
- associated landscaping upgrade works.

See the plans prepared by PMDL in Appendix B.

3.2 Construction Program

The construction is tentatively scheduled as follows (subject to stakeholders' approval):

- Enabling Works (02/2023 – 03/2023)
- CC1 - Service Relocation, Bulk Excavation, Shoring and Piling (9/12/2022 – 20/09/2023)
- CC2 - Structural works to Wingaru (20/09/2023 – 14/09/2024)
- CC3 – Structural works including internal demolition to O'Neil, Main Works including Services, Finishes and Façade (8/02/2024 – 22/04/2025)
- CC4 - External Works including Landscaping (13/02/2024 – 22/04/2025)

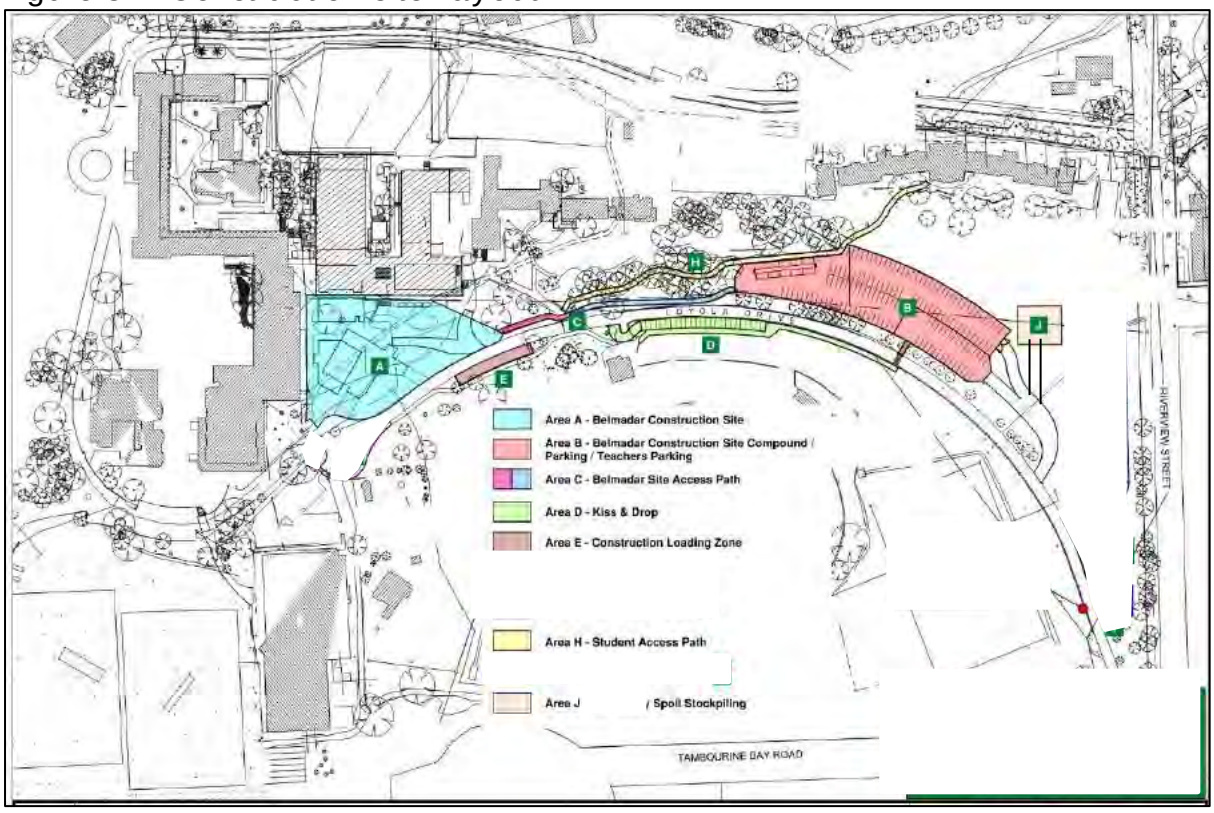
3.3 Construction Stages and Site Layout

- Enabling works includes site establishment and sediment controls
- CC1 - Service Relocation, Bulk Excavation, Shoring and Piling: Extent of this certificate localised clearing of Therry Courts, relocation of services within the building footprint and subsequent shoring and piling works to allow the structure erection.

- CC2 - Structural works to Wingaru
- CC3:
  - Structural works including internal demolition to O'Neil: Includes the erection of structure, subsequent connections into the O'Neil Building adjacent to the Development along with the strip-out of O'Neil.
  - Main Works Including Services, Finishes and Façade: Includes the balance of works not covered by CC1 or CC2 but excludes associated landscape works.
- CC4 - External Works including Landscaping: Landscaping works including hardscape and soft scape along with external awnings.

The construction site layout is shown in Figure 3.1.

Figure 3.1: Construction Site Layout



3.4 Construction Activities

The following activities have been completed to enable the commencement of construction including:

A. Installation of hoarding for construction site
B. All-weather carpark and access (150mm thick compacted DGB20)

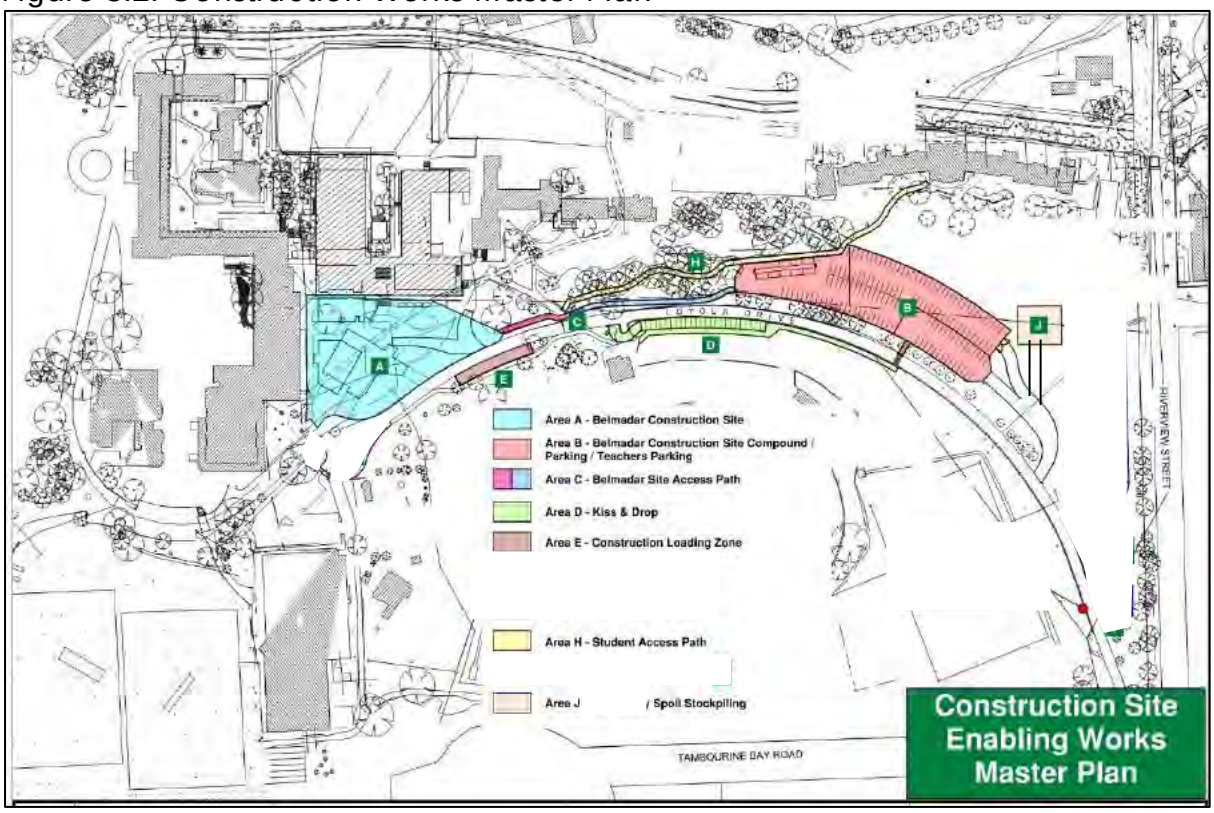
C. Construction of site access path
D. Relocation of the existing "Kiss & Drop" and all-weather pedestrian access
E. Construction of loading zone
F. Construction of stockpile area
G. Construction of a scaffold bridge over the student access path
H. Construction of a temporary roundabout immediately south of the relocated "Kiss and Drop"

All construction vehicle movements are controlled in accordance with the "Traffic Control Plan".

The process is as follows:

1. Pre-Booking and confirmation for delivery
2. Delivery driver to contact Site Manager (or representative) prior to arrival a minimum of 48 hours and advise haulage vehicle routes 5 days prior.
3. All trucks are to proceed to the loading zone (Area E) for the waiting bay.
4. Traffic controller meets delivery driver at the loading zone (Area E) and grants access to the site.
5. All delivery vehicles are instructed to proceed to the site.
6. Traffic controller directs delivery driver to area of delivery.
7. All drivers drive at 5km per hour.
8. Once delivery is complete driver is instructed to exit the site onto Tambourine Bay Road

Figure 3.2: Construction Works Master Plan



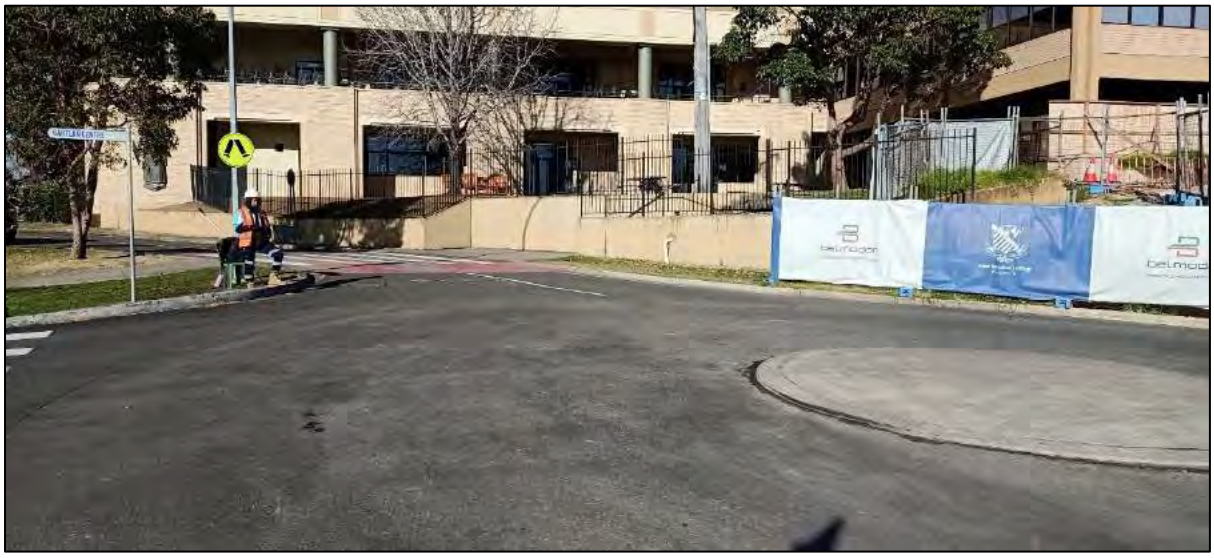
Area A – Installation of Hoarding (Completed)

Temporary fencing/ hoarding has been installed around the perimeter of the construction site during the commencement of the "Enabling Works".

On completion of the temporary fencing/hoarding, commencement of sediment and erosion controls have been installed in accordance with "TTW Concept Sediment and Erosion control plan".

These works include the excavation of the "All Weather Truck Access Ramps".

These works were executed during the school holiday period to avoid interface with students and staff.

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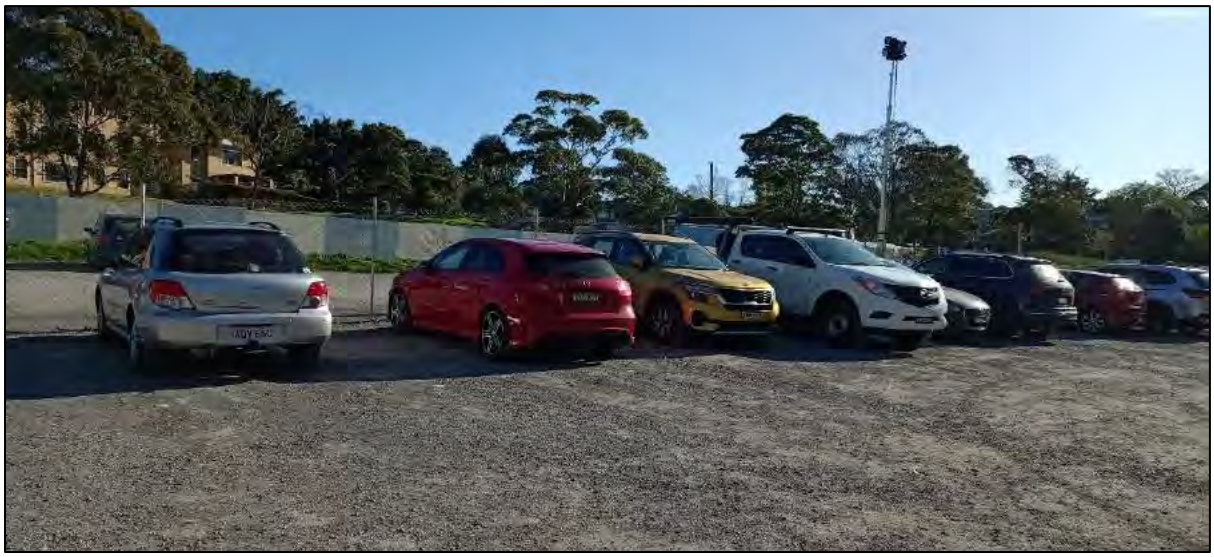
Area B- All-Weather Carpark, Site Compound & Staff Parking (Completed)

With the loss of the existing available car parking spaces allocated to the proposed construction loading zone and temporary kiss and drop described above, a temporary all-weather car parking facility, complete with an all-weather access road, are constructed to provide faculty car parking for the duration of the project.

The temporary all-weather carpark provides a minimum of 25 car parking spaces and be established on the western side of Loyola Drive to the northern end of the campus area. The access road is linked the carpark with Loyola Drive to the north.

The carpark and access road surface consist of approximately 150mm thick compacted DGB20.

Figure 3.3: All-Weather Carpark and Access Road



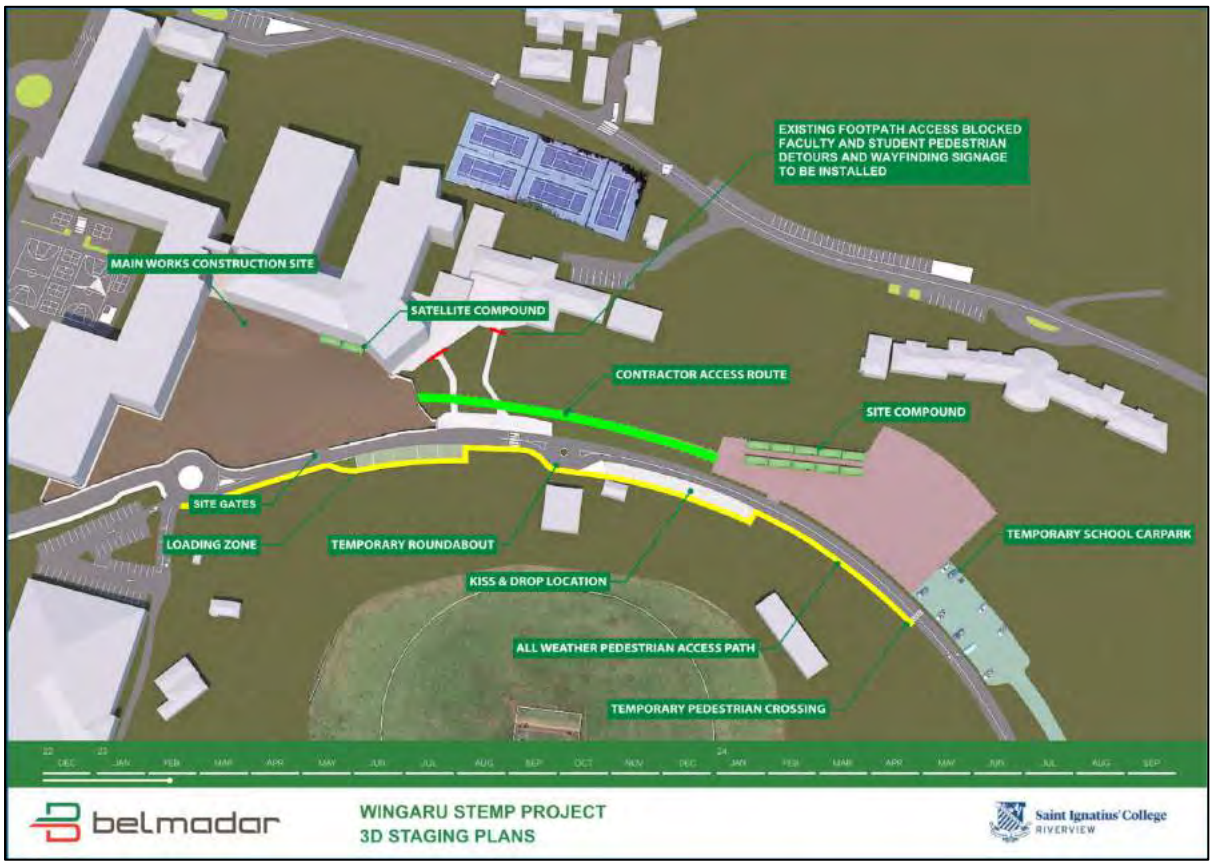
The sequence of works is as follows:

1. Erect cyclone fence panel to the perimeter of the area required to construct the hardstand to the compound.
2. Located on the high side of the bank, along the west perimeter Belmadar excavated and formed a catch drain, to divert and slow the flow of any surface water.
3. Located on the low side of the site compound, Belmadar installed a siltation fence along the eastern, western, and northern boundary.

Area C- All-Weather Contractor Access link to site compound Zone A (Completed)

To link the temporary all-weather carpark and Site compound, Belmadar has constructed a temporary footpath to the western side of Loyola Drive. The footpath extends from the proposed site compound at the southern end of the carpark and connects with Belmadar's site as indicated in Figure 3.4.

Figure 3.4: All-Weather Pedestrian Access



Area D & E- Relocated Kiss and Drop and Temporary Roundabout (Completed)

The existing kiss and drop facility are located immediately northeast of the site, on the eastern side of Loyola Drive. This area is proposed to be re-purposed as the construction loading zone and therefore a temporary kiss and drop is established using the existing carpark, on the eastern side of Loyola Drive, immediately north of the Farther Mac Pavilion.

Establishment of the temporary kiss and drop involves:

1. Traffic controllers to establish signage and stop/go stations as required in the traffic control plan for site boundary establishment.
2. The perimeter of the work area is established by erecting temporary site fencing, bracing, shade-cloth, and safety signage to segregate from common areas.
3. Siltation fencing is to be positioned on the eastern side of the lower contour of the land. Silt/gravel bags
4. Removal of existing carpark line marking
5. Plant to be loaded off within the construction loading zone and tracked over to excavate and prepare substrate for concrete works to footpath widening.

To facilitate safe vehicular movement out of the new temporary kiss and drop, an adequate turning area has been provided. To achieve this, Belmadar completed the following works on the site:

1. Demolition of the existing concrete kerbs to the southern end of the former parking bay
2. Demolition of the existing concrete kerb to the northern side of the existing driveway entry to the Farther Mac Pavilion carpark
3. Minor re-grading and boxing out of the existing grassed slope between the former carparking bay and the driveway.
4. Boxing out of the existing grassed area between the southern side of the driveway and the existing sewer manhole
5. Installation of subgrade material to the slope between the former carparking bay and the driveway
6. Installation of subgrade material to the area between the southern side of the driveway and the existing sewer manhole
7. Installation of asphalt to both areas described above.
8. On completion of footpath-works line marking is carried out to identify new zones. Also, directional/wayfinding line marking is incorporated.
9. Relocation of existing signage and allowance for temporary configuration of any additional signage are completed.

10. Temporary fencing is dismantled under traffic control conditions and road use re-instated for normal public use.

Figure 3.5: Temporary Turning Bay Construction

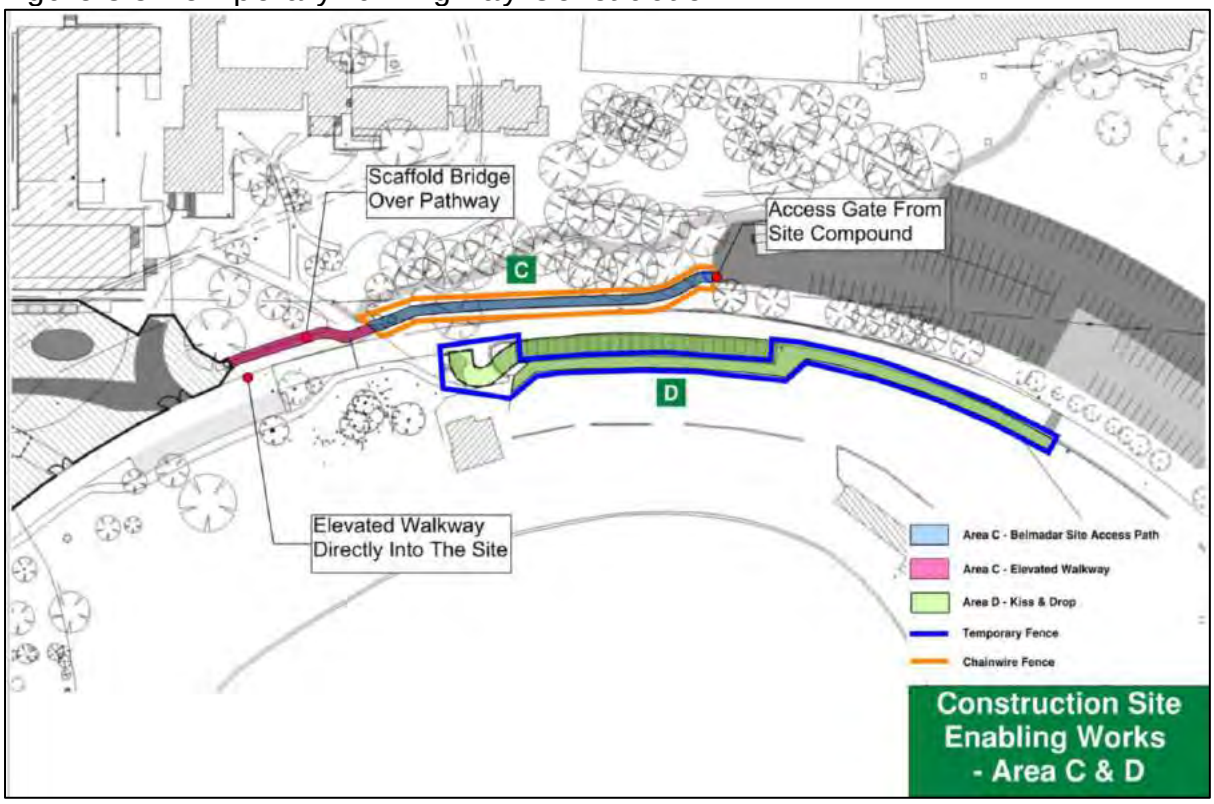
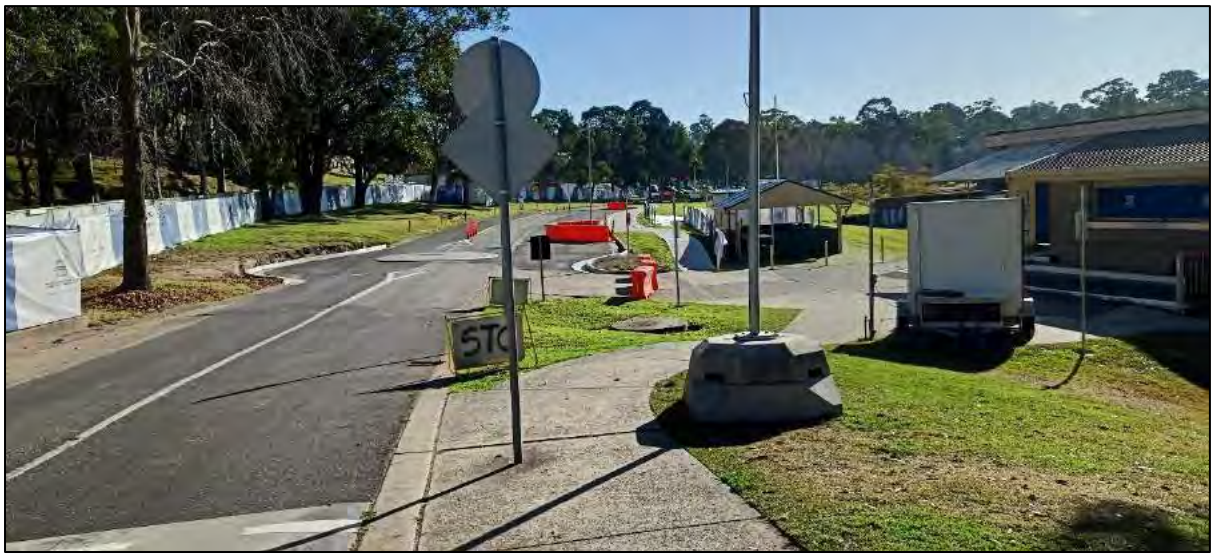


Figure 3.6: Temporary Roundabout



Vehicles enters the kiss & drop at the northern end. When leaving the kiss & drop, vehicles continue south, make a U-turn via the roundabout on Loyola Drive and head north to Gate 1 where they exit the campus.

Area E -Fencing – Construction Loading Zone (Completed)

Belmadar established a construction loading zone during traffic-controlled conditions as mentioned above in the location of the existing kiss and drop facility. Temporary construction fencing is installed to separate the construction loading zone from the surrounding operational areas (footpath) while fence top water filled barriers are installed to separate the loading zone from the adjacent Loyola Drive.

Area F- Spoil Stockpile Area (Completed)

To assist in the efficient removal of excavation spoil, a truck marshalling area is established on the northern side of Loyola Drive, northeast of the all-weather carpark access.

This entails an enclosure consisting of a sequence of:

1. Semi-permanent cyclone fencing to the northern boundary & temporary fencing to the east/south/west boundaries.
2. Safety and identifying signage are fixed to perimeter fencing for daily co-ordination.
3. Located on the high side of the bank, along the west perimeter Belmadar excavated and formed a catch drain, to divert and slow the flow of any surface water.
4. Located on the low side of compound F, Belmadar installed a siltation fence along the Northern, eastern, and western boundary.
5. Temporary construction vehicle Grid crossing is to be established at the entry of Area F and connected by 200 deep DGB road base to Loyola Drive.

Trucks lay up in the marshalling area until such time they are ready to be loaded.

Area G- Temporary Roundabout Widening (To be Completed)

For widening works to the roundabout, the sequence of works will begin by:

1. Establishing traffic controllers and signage to control passing vehicles.
2. Set up temporary fencing to create a site compound.
3. Back-fill area and level for substate preparation.
4. Complete all kerb & paving placement.
5. On completion of works, line marking is carried out to identify the roundabout.

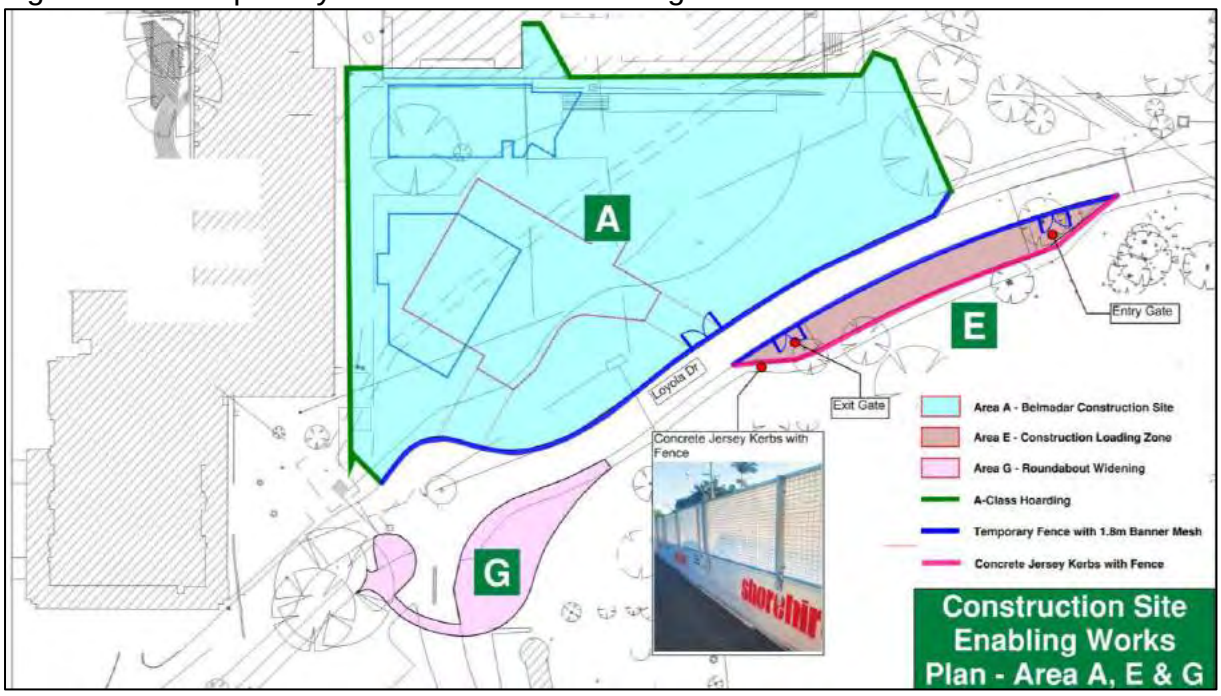
In lieu of trucks traversing the entire campus, Belmadar proposes the entry and exit of all trucks via gate at the corner of Riverview Street & Tambourine Road/Loyola Drive:

1. Entry/deliveries will be booked in advance and call the Site Manager on arrival.
2. Trucks will wait at loading zone E or at Entry Area F till permission is granted by Belmadar's Site Manager.
3. Trucks will enter the campus and proceed south along Loyola Drive. The truck will then complete a full revolution of the roundabout before exiting the campus via Gate 1.

To facilitate single movement truck manoeuvring, Belmadar proposes the widening of the existing roundabout. These works will involve the early installation of subgrade material necessary for the final augmentation of the

roundabout during the latter stages of the project. Following installation and compaction of the subgrade material, a spray seal will be installed to act as a temporary wearing surface until such time the final roundabout works are undertaken.

Figure 3.7: Temporary Roundabout Widening



Area H- Public Access Pathway (Completed)

The existing pathway is topped up and extended with crushed rock to achieve general access through St Ignatius College. To achieve the work:

1. Temporary barricades and danger tape are installed to isolate areas for work to be carried out.
2. Small machines are tracked over from the site compound and scrape topsoil level.
3. Small machine spreads crushed rock to Area H.

3.5 Construction Hours

The approved construction and work hours are in accordance with Consent D4, D5, D6, and D7:

D4. Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

(a) between 7 am and 6 pm, Mondays to Fridays inclusive; and
(b) between 8 am and 1 pm, Saturdays.

No work may be carried out on Sundays or public holidays.

D5. Construction activities may be undertaken outside of the hours in condition D4 if required:

(a) by the Police or a public authority for the delivery of vehicles, plant, or materials; or
(b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or
(c) where the works are inaudible at the nearest sensitive receivers; or
(d) where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.
D6. Notification of such construction activities as referenced in condition D5 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.
D7. Rock breaking, rock hammering, sheet piling, pile driving and similar activities must be scheduled during the hours as identified in the CNVMSP, unless otherwise agreed within the Planning Secretary.

Belmadar shall ensure that all sub-contractors are aware of the permitted hours of operation and shall ensure that all activity occurs strictly within the hours stipulated by the Conditions of Consent.

3.6 Construction Workers Parking

The following number of workers are anticipated on-site during the construction stage:

- an average of 60 workers
- a maximum of 120 workers.

All site staff related to the works who need to drive to/from the site are to park at the Contractor Parking Area (which provide up to 120 car spaces) which is 150m north of the site. See Figure 3.8.

Contractors are able to drop off tools/materials in the allocated loading zones upon arriving at the site before proceeding to the allocated parking area.

The on-site parking is available, and workers will not be permitted to use the existing paved carpark within the Site.

While there is ample off-street parking, construction workers will be encouraged to use public transport or carpool to access the Site, if possible, given the Site is in close proximity to well-established and high-frequency public bus services.

A tool drop-off and storage facility will be provided within the Site. This would allow tradespeople to drop off and store their tools and machinery, allowing them to use public transport to travel to/ from the Site on a daily basis.

This will be incorporated into the site induction program.

Figure 3.8: On-Site Contractor Carpark

3.7 On-Street Works Zone

No on-street works zone will be required on the public roads during construction. Should one be required, a separate application for the works zone will be submitted to the Council to organise appropriate approvals for the proposed works zone prior to the start of works, as well as the parking and traffic changes.

3.8 Cranage and Materials Handling

A tower crane would be required for the construction-related works for materials handling within the on-site material handling zone (Area I) during Stages 2 & 3 Structure Works / Fit-out works. All light materials will be loaded/unloaded directly to/from trucks using either forklifts or trolleys. All materials will be stored on the site, with any surplus demolished and excavated materials removed from the site.

3.9 Site Inspections and Record-Keeping

The construction work will be monitored to ensure that it proceeds as set out in the Indicative Construction Management Plan provided by Belmadar. A daily inspection before the start of the construction activity should take place to ensure that conditions accord with those stipulated in the Plan and that there are no potential hazards. Any possible adverse impacts will be recorded and dealt with as they arise.

3.10 Consultation, Communication and Liaison

Belmadar has submitted the CTMP to both Transport for NSW and Council for review and approval. Transport for NSW has endorsed the original CTMP in May 2023. See Appendix C.

Belmadar has submitted the CTMP to Council in February 2023 and followed up in April, May and July 2023 and is currently waiting to hear back from Council. See Appendix C.

Belmadar will submit this revised CTMP to TfNSW and Council for further review and approval.

In addition to the above stakeholders, Belmadar has also liaised/coordinated with the School and adjacent landowners and will continue this liaison/continuation until the end of construction activities.

Belmadar has a Community Liaison Officer to consult, communicate and liaise with neighbours. A sign with a phone number and email address is installed on the hoarding to allow the general public to make inquiries or complaints regarding traffic control for the site.

3.11 Public Notifications

Belmadar would prepare notification letters, under the approval of the Council, which would be delivered to adjoining property owners to advise of the construction works and timeframes for completion of each phase of the process.

3.12 Contact Person

Belmadar's contact person who are assigned to liaise with all the stakeholders and have authority without reference to other persons to comply with instructions issued by the Council's Traffic Engineer would be:

Loui Abouhamad
Senior Project Manager
M 0417 425 539
Loui.Abouhamad@belmadar.com.au

3.13 Site Induction and Occupational Health and Safety

All workers and sub-contractors employed on the site are required to undertake a formal 'site induction' process prior to the undertaking of any task, and all the inductions are performed specifically for each trade according to Workplace Health and Safety requirements.

During the construction of this program, workers are advised that parking are provided on-site. All site staff related to the works are to park in a designated off-street area or be encouraged to use public transport and not park on the public road".

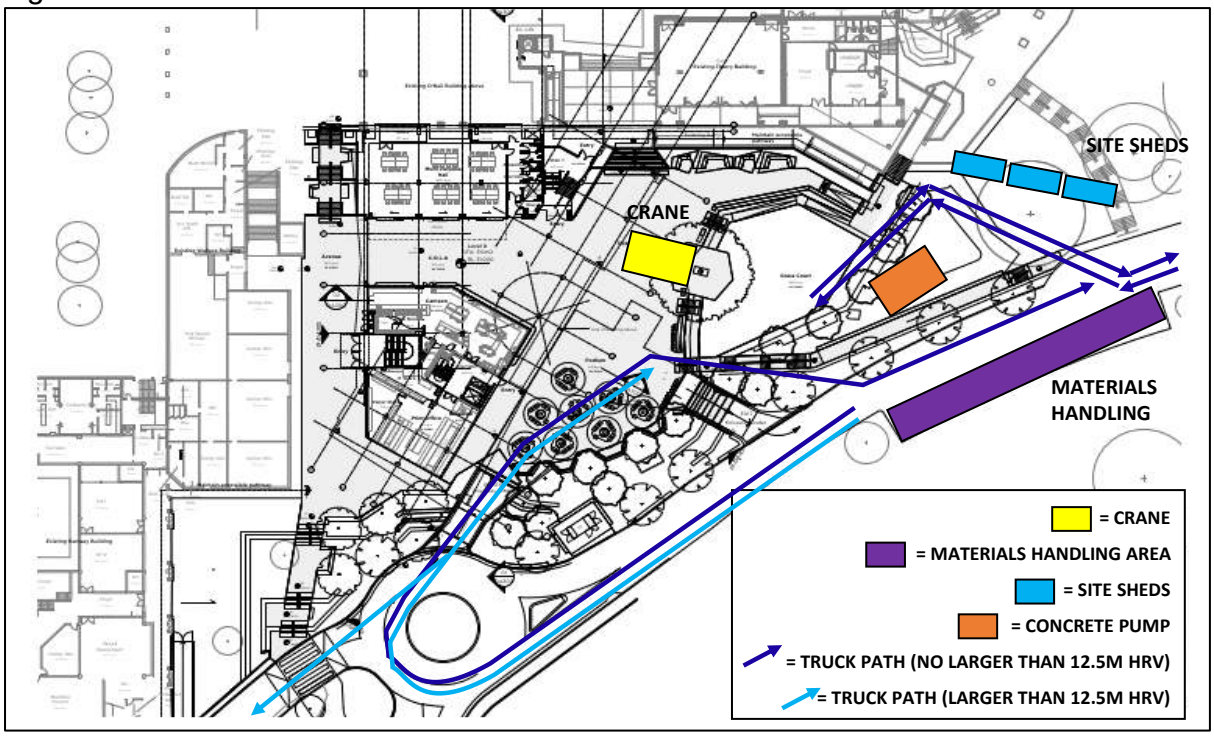
Timetables for all bus routes servicing the site and each corridor on the CityRail network are also be provided for the perusal of workers at various locations within the site (e.g., meal rooms).

4.0 Proposed Construction Traffic Management Plan

4.1 Construction Site Access

Site access to the construction site is proposed via Loyola Drive, as shown in Figure 4.1.

Figure 4.1: Construction site access



Sufficient manoeuvring area are/will be provided on-site to ensure construction vehicles (up to 12.5m HRV) can enter and exit in a forward direction, whenever possible.

All vehicles entering and exiting construction zones within the Site are completed under the management of traffic controllers.

The process of truck arrival is as follows:

1. Pre-Booking and confirmation for delivery
2. Delivery driver to contact Site Manager prior to arrival.
3. Site Manager meets the delivery driver at the loading zone and grants access to the site.
4. Site Manager directs the delivery driver to area of delivery.
5. All drivers will have flashing beacons and drive at 5km/hr.
6. Once delivery is complete, driver will be instructed to exit the site from Loyola Drive to Riverview Street

4.2 Pedestrian Access

Access to the site is provided via PA gates. All personnel entering the site are required to undertake an induction program.

Pedestrian activities are removed from the construction area by a combination of:

- temporary chain wire fencing complete with shade cloth wrap
- ATF fencing with shade cloth wrap
- waterfilled jersey kerb barriers with fencing
- A-Class Hoarding.

Accredited traffic controllers are present at the site access/construction zone to manage pedestrian movements and assist with vehicle ingress and egress.

4.3 Construction Traffic Haulage Route

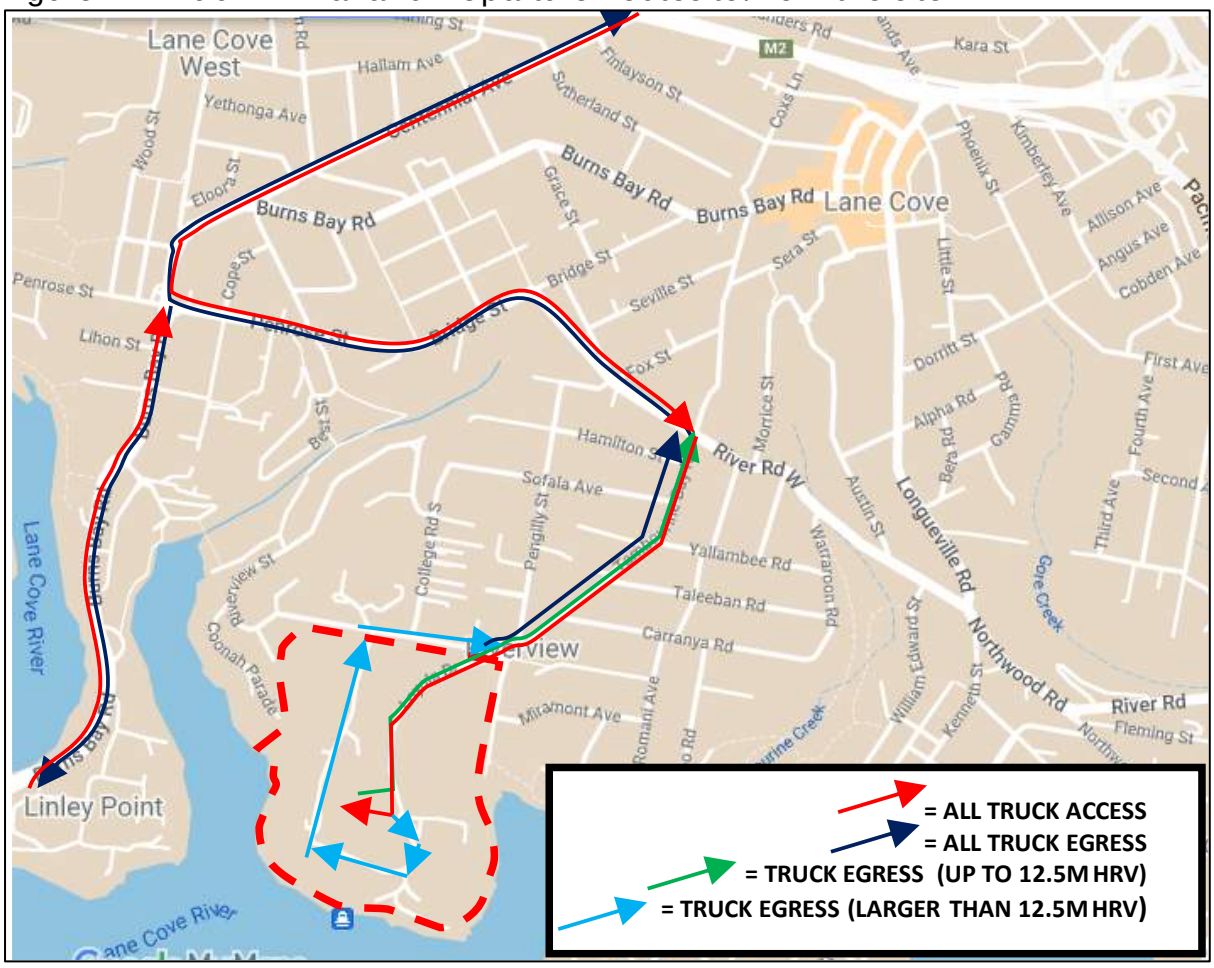
Generally, construction vehicles have origins and destinations from a wide variety of locations throughout Sydney. However, all construction vehicles are be restricted to the State and Regional Road network.

Dedicated construction vehicle routes (including vehicles associated with spoil removal, material delivery, and machine floatage) have been developed with the aim to provide the shortest distances to/from the arterial road network

while minimising the impact of construction traffic on streets within the vicinity of the site.

As such, the dedicated construction vehicle routes use Burns Bay Road as much as possible, with access to/from Loyola Drive, as indicated in Figure 4.2.

Figure 4.2: Truck Arrival and Departure Routes to/from the site



Construction vehicle movements are limited during the school's peak periods, AM (7.00 am-9.30 am) and PM (2.30 pm-5.30 pm), to reduce impacts on any bus operations and traffic flow.

Truck drivers have been advised of the designated truck routes to/ from the site. A truck marshalling area has been set up on Loyola Drive.

No queuing or marshalling of trucks are permitted on Loyola Drive (outside the designated TMA), Riverview Street, and Tambourine Bay Road in the vicinity of the site.

Accredited traffic controllers ensure they are in mobile/radio contact with truck drivers, thus ensuring each vehicle's arrival is anticipated and planned.

Such a process is important in managing truck activity to ensure access to the construction site is available at all times and to remove any likelihood of construction vehicles queuing and waiting along Riverview Street to enter the site, causing delays on surrounding roads.

4.4 Construction Vehicle Types

The construction works involve the following heavy vehicle types:

- 5.8m Small Skip (Single Axel) 10 tonne
- 7m Medium Skip (Single Axel) 16 tonnes
- 8.5m Large Skip (Bogie) 23.5 tonne
- 9m Hooklift (8-wheeler) 27.5 tonne
- Concrete trucks: up to 8.8m
- Rigid trucks: up to 12.5m
- Articulated vehicles: up to 19m semi

Swept path assessments of the relevant vehicles are provided in Appendix D.

4.5 Truck Movements

The average daily peak truck movements are, noting they only occur between 9 am to 2:30 pm:

- Stage 1: 12 trucks
- Stage 2: 16 trucks
- Stage 3: 12 trucks
- Stage 4: 8 trucks

A truck marshalling area is set up on the loading zone/material handing area on Loyola Drive to avoid any congestion back into Tambourine Bay Road.

4.6 Driver Code of Conduct

Impacts of Earthworks and Construction

Belmadar is committed to protecting the environment and preventing air, water and noise pollution. The operators of all construction-related vehicles are subject to environmental regulations relating to vehicle emission and product spills and to minimise the impacts of earthworks and construction on the local

and regional road network.

Belmadar also understands and appreciate the seriousness of polluting the environment and the consequences of any carelessness or neglect of responsibilities may cause personal injury, loss of life, property damage, substantial fines, and adverse publicity for the company.

All drivers of vehicles transporting loose materials are required to ensure the entire load is covered using a tarpaulin or similar impervious material. The vehicle driver needs to take all precautions to prevent any excess dust or dirt particles from depositing onto the roadway during travel to and from the site. Wheel wash station shall be positioned at the exit point of all gates to ensure all materials to be kept inside the site. The respective trades are inducted by Belmadar into the above procedures and monitor all trucks exiting the site to ensure the procedures are met.

Conflicts with Other Road Users

The existing road are utilised accessing the site and therefore, it is Belmadar' requirement that the heavy vehicle operators display courtesy and restraint towards other road users to minimise conflicts with other road users.

Public roads and access points are not be obstructed by any materials, vehicles, refuse skips or the like under any circumstances. All deliveries and works are carried out within the site or at the designated material handling area/loading zone. If there is a requirement to operate any material handling machinery on public access roads, Belmadar will seek separate Council/Police/TfNSW/Sydney Buses approval prior to the event.

Road Traffic Noise

Generating excessive noise is governed by legislation and is an offence. Heavy trucks generate a higher level of noise than light vehicles. The amenity of surrounding road users/residents is to be maintained as far as practical during the construction process. Vehicles traveling to, from and within the site shall not create unreasonable or unnecessary noise or vibration to minimise interference to adjoining building operations. No tracked vehicles will be permitted or required on any paved roads. All heavy vehicle operators are required to adhere to the following during the course of their duty:

- If possible, minimise road traffic noise by not using engine brakes near residences and built-up areas.
- All vehicles must be fitted with audible reversing alarms. These are

essential for the safety of all personnel. Reversing alarms are, however, the source of potential noise complaints from neighbouring residents, so all drivers should be aware of this and try to minimise reversing when possible.
- Avoid loading and unloading of materials/deliveries outside of daytime hours.
- Compounds and work areas should be designed as one way to minimise the need for vehicles (up to 19m semi) to enter and exit the site in a forward direction.
- Trucks should not idle near residential receivers.
- Stationary sources of noise, such as generators, should be located away from sensitive receivers.
- Project personnel, including relevant sub-contractors, to acquaint themselves with noise and vibration requirements and the location of sensitive receivers during inductions and toolbox talks.
- Delivery vehicles should be fitted with straps rather than chains for unloading, wherever possible.
- Truck drivers should avoid compression-braking as far as practicable.
- Where night-time works are required, trucks should use broadband reversing alarms.

Specified Routes

All trucks must enter and exit the works via the site gates. Where possible, drivers should always:

- Use main roads,
- Use bypasses,
- Avoid communal areas, schools, e.g. (particularly during school start and finish times), parks, etc.

The heavy vehicle operators must stick to the defined routes laid down unless there are exceptional circumstances. Such exceptional circumstances may be:

- Normal route blocked, e.g., flooded,
- A revised route was agreed upon in writing.

4.7 Occupational Health and Safety

Any workers required to undertake works or traffic control within the public domain are suitably trained and covered by adequate and appropriate insurance. All traffic control personnel are required to hold RMS accreditation

in accordance with Section 8 of Traffic Control at Worksites.

4.8 Traffic Guidance Scheme

The Traffic Guidance Scheme (TGS) presents the principles of traffic management, with detailed information for worksite operations contained in the Traffic Control at Work Sites Technical Manual Version 6.1 dated February 2022. The control of traffic at work sites must be undertaken with reference to WorkCover requirements and Belmadar's Constructions Workplace Health and Safety Manuals.

The TGS is prepared by a Certified Traffic Controller (under RMS regulations) in accordance with Australian Standards 1742.3 and includes:

- The proposed works site and area
- Accredited traffic controllers at the site vehicle access
- Truck (crossing and entering) and traffic controller signage

The TGSs for the construction processes are provided in Appendix E.

4.9 Oversized Vehicles

No oversized or over-massed vehicles (see details on this link) are required for the construction works. If an oversized or over-massed vehicle is needed, a separate application would be submitted to Council and Transport for NSW.

4.10 Road Serviceability

Belmadar is responsible for monitoring and ensuring that the road and footpath along Loyola Drive is remain in a serviceable state during the course of the construction. Under the direction of the Council, Belmadar will restore any roadside facilities affected by the construction works, footpaths, road pavement, etc., to the Council's satisfaction, at no cost to Council.

4.11 Pedestrian Management

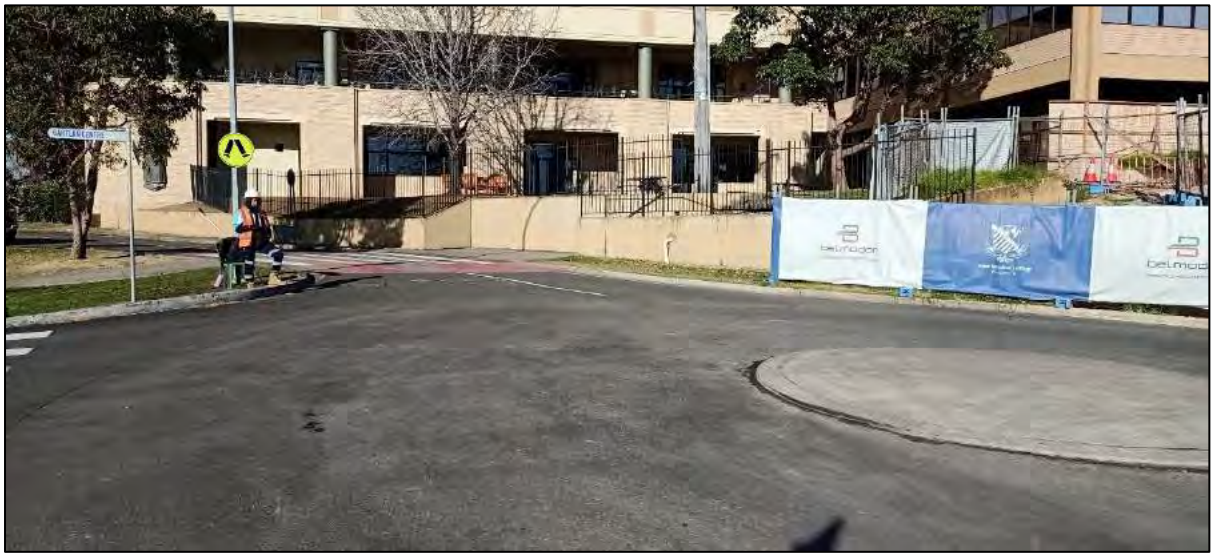
Pedestrian and cycling access to the College and along Tambourine Bay Road and Riverview Street remain unchanged.

These routes will also remain unchanged during major concrete pours, however, to maintain pedestrian safety, RMS accredited traffic controllers are utilised at the intersection of Tambourine Bay Road and Riverview Street during major concrete pours.

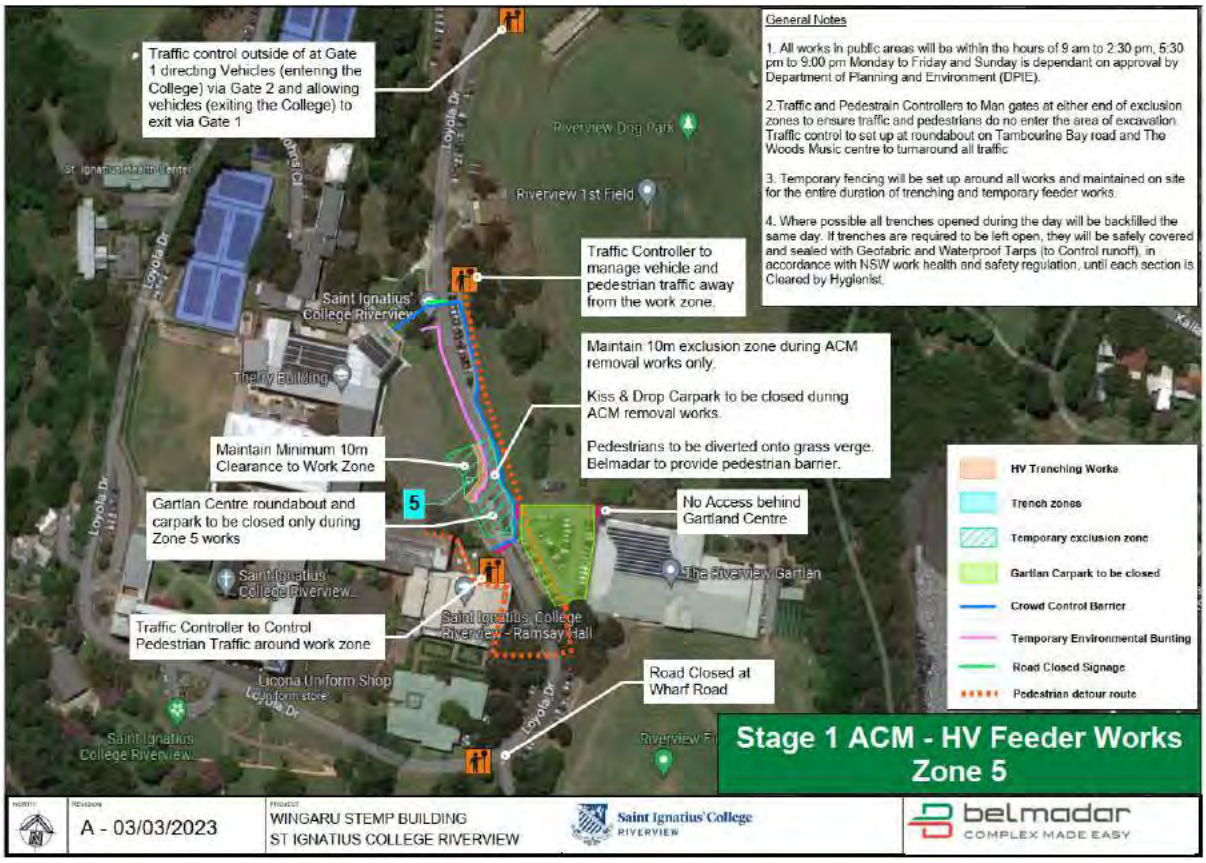
The existing Loyola Drive footpath are retained throughout the building construction works.

Pedestrians walking along the Loyola Drive footpath along the site's frontage are protected by a mix of A-Class and temporary construction chainwire fencing. RMS accredited traffic controllers currently supervise all vehicle movements into and out of the site at all times.

The egress path of pedestrians from the Wallace Building & Ramsay Hall to the car parking areas on the other side of Loyola Drive, including the access to the crossing, to the south of the Gartlan Roundabout remains unimpeded (as per the CTMP) for the duration of the works (including widening the roundabout)except during the landscaping works on the southern part of the site (outside of the existing A-Class hoarding). See the following photo.



The pedestrian crossing will only be closed during CC4 (Landscaping) Works. Belmadar has issued the following plan to the School for the roundabout closure.



TGS associated with the above closure is included in Appendix E.

4.12 Spoil Management

To ensure that soil/excavated material is not transported on wheels or tracks of vehicles or plants and deposited on surrounding roadways, a cattle grid is positioned at the exit point.

5.0 Construction Impacts

5.1 Impact of Construction Traffic

Truck volumes would be in the order of up to 16 vehicles (32 movements) per day, which would occur between 9 am to 2:30 pm to minimise traffic (pedestrian, bus, and traffic flows) impacts and associated road network delays.

Construction truck drivers are reminded that there should be no idling on and the use of Loyola Drive (outside the designated TMA), Riverview Street, and Tambourine Bay Road as a TMA.

With the above measures, it is not expected that this level of traffic movement would create any adverse impact on the surrounding road network.

5.2 Impact on On-Street Parking

All vehicles are kept within the campus grounds and there is no loss of on-street parking.

This is in accordance with Condition C15 as follows:

C15. Prior to the commencement of construction, the Applicant must provide sufficient parking facilities on-site, including for heavy vehicles and for site personnel, to ensure that construction traffic associated with the development does not utilise public and residential streets or public parking facilities.

As such, the construction activities are not anticipated to have an adverse impact on parking in the area.

5.3 Impact on Public Bus Services

The heavy vehicle haulage routes are largely be limited to arterial and sub-arterial roads, which are designed to accommodate heavy vehicle movements. As such, the impacts on public transport services are minimal on the approach/departure routes.

While the truck route overlaps with this bus route during the construction period, it is not expected that traffic generation of no more than 60 vehicle visitations per day (no more than 12 trucks an hour) would be adverse to the efficiency of the existing bus service.

5.4 Impact on School Bus Services

Access to the existing indented bus bay by the school buses is retained throughout the construction activities.

5.5 Impact on Pedestrians/Cyclists

During construction, pedestrian/cyclist movements along Loyola Drive are maintained at all times.

It is noted that traffic controllers would be present during construction hours to manage construction vehicle entry and exit and pedestrian movements at the site access/construction zone, noting that pedestrian/cyclist priority would be given.

Outside of construction hours, gates would be installed to prevent pedestrians from entering the construction site.

To minimise disruption to pedestrian and cycle movements, it is advised that truck movements are managed, to occur between 9 am to 2:30 pm.

5.6 Impact on Emergency Vehicle Access

Access to the site and neighbouring sites by emergency vehicles would not be affected by the proposed construction zones, which are within the bounds of the construction site and the construction zone.

Emergency protocols on the site would indicate a requirement for the traffic controller to assist with emergency access from Loyola Drive. All truck movements to the site construction zone and the incident point would be suspended and cleared. Consequently, any potential impacts on emergency access would be effectively managed throughout the works.

The liaison would be maintained with the police and emergency services agencies throughout the construction period, and a 24-hour contact would be made available for 'out-of-hours' emergencies and access.

Thus, there would be no adverse impacts on the provision of existing emergency vehicle access to the site or other neighbouring properties as a result of the proposed construction activities.

5.7 Traffic Movements in Adjoining Council Areas

No adverse effects are expected from the movement of heavy vehicles through adjacent council areas.

5.8 Impact on Neighbouring Properties

Access to neighbouring properties is maintained at all times. Workers/ subcontractors are directed not to park their vehicles in the driveways of the neighbouring properties.

This has been incorporated into the site induction program. Belmadar would take appropriate action if informed of this activity occurring.

5.9 Cumulative Construction Traffic Impact (Existing and Approved/Planned Construction Activities)

There are currently no active construction sites within 400m of the site.

Should there are major construction sites that will overlap with the construction activities within 400m of the site, Belmadar will maintain regular contact with the surrounding project contractors to identify any potential overlap of major construction works and cooperate to ensure such overlaps are minimised during the lifecycle of the works.

With the above measures, it is not expected that this level of traffic movement would create any adverse impact on the surrounding road network.

Transport Strategies

Appendix A
Public Transport Provisions

North West Sydney Bus Network Map - Effective: 12 December 2022

Busways

113	Chatswood to Royal North Shore Hospital via Pacific Hwy
115	Chatswood to City, Bridge St via North Sydney
120	Chatswood to City QVB (Loop Service)
202	Northbridge to City, Bridge St via North Sydney
203	Castlecrag to Milsons Point via North Sydney
204	Northbridge to City, Bridge St via Freeway
205	East Willoughby to City, Bridge St via Freeway
206	East Lindfield to City, Bridge St via Freeway
207	East Lindfield & Garden Village to City, Bridge St via North Sydney
208	East Lindfield & Garden Village to City, Bridge St via North Sydney
209	East Lindfield to Milsons Point via North Sydney
251	Lane Cove West to City, Wynyard via Freeway
252	Gladesville to City, King St Wharf via North Sydney
253	Riverview to City, Wynyard via Freeway
254	Riverview to McMahons Point
255	Chatswood to Colwell Cres (loop service)
256	Chatswood to Fullers Rd (loop service)
258	Chatswood to Mars Rd
259	Macquarie Centre to Chatswood via North Ryde
261	Lane Cove to City, King St Wharf via Longueville Rd
265	Lane Cove to North Sydney via Greenwich
267	Chatswood to Crows Nest
269	McMahon's Point (loop) via North Sydney Station & Kirribilli
275	Castlecrag to Chatswood
285	Lane Cove West, Mars Rd to City, Wynyard via Freeway
286	Denistone East to Milsons Point via St Leonards & North Sydney
287	Ryde to Milsons Point via St Leonards & North Sydney
288	Epping to City, Erskine St
290	Epping to City Erskine St via Macquarie University & North Sydney
291	Epping to McMahons Point
292	Marsfield to City, Erskine St via Macquarie Park
293	Marsfield to Wynyard via Lane Cove Tunnel & Freeway
294	Epping to Wynyard via Freeway
295	North Epping to Epping (loop service)
297	Denistone East to Wynyard via Tunnel & Freeway
501	Parramatta to Central, Pitt St via Victoria Rd
505	Woolwich to City, Town Hall
506	Macquarie University to City, Domain via East Ryde
507	Meadowbank to Gladesville & City, Hyde Park
513	Carlingford to West Ryde
515	Eastwood to Ryde
517	Macquarie Centre to Ryde
518	Macquarie University to Meadowbank Wharf
521	Parramatta to Eastwood
523	West Ryde to Parramatta
524	Ryde to Parramatta via West Ryde
525	Parramatta to Strathfield via Sydney Olympic Park
533	Sydney Olympic Park to Chatswood via Rhodes & North Ryde
536	Gladesville to Chatswood via Hunters Hill
538	Gladesville to Woolwich
540	Auburn to Newington
541	Epping to Eastwood
543	Eastwood to West Ryde
544	Macquarie Centre to Auburn via Eastwood
545	Parramatta to Macquarie Park (Lachlan's Estate)
546	Parramatta to Epping via Oatlands & North Rocks
549	Parramatta to Epping via North Rocks
550	Parramatta to Macquarie Park via Epping
551	Eastwood to Busaco Rd
552	Parramatta to Oatlands
553	North Rocks to Beecroft
500N	Parramatta to City, Hyde Park via Victoria Rd (Night Service)
500X	West Ryde to City, Hyde Park (Express Service)
N80	Hornsby to City, Town Hall via Strathfield (Night Service)
N81	Parramatta to City, Town Hall via Sydney Olympic Park (Night Service)
N90	Hornsby to City, Town Hall via Chatswood (Night Service)
N91	Bondi Junction to Macquarie Park via City, Town Hall (Night Service)

Via Lane Cove Tunnel: 293 297

Via Epping Road: 270 274 287 291 533 288 292

Chatswood Street Legend
1. Whitton Rd
2. Oliver Rd
3. Lone Pine Ave

Newington Street Legend
1. Wilson Park 1-way
2. Avenue of Africa
3. Avenue of the Americas
4. Avenue of Europe
5. Avenue of Asia
6. Avenue of Oceania

Riverview Street Legend
1. College Rd South
2. Warrawon Rd

Wollstonecraft Street Legend
1. Morton St
2. Newlands St
3. Crows Nest Rd
4. Lower Serpentine Rd

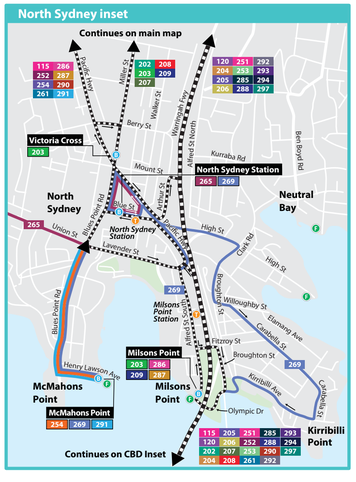
Middle Cove Street Legend
1. Cawarrah Rd
2. Penshurst Dr

Crows Nest Street Legend
1. Holterman St
2. Alexander St
3. Burlington St

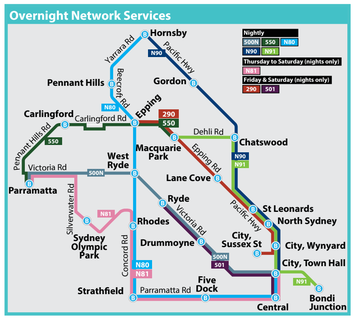
Legend
- Multiple Routes
- Common Route
- Occasional Diversion
- Route Number
- Terminus
- Metro Station
- Train Station & Line
- Ferry Wharf
- Shopping Centres
- Hospitals

Sydney CBD inset

North Sydney inset

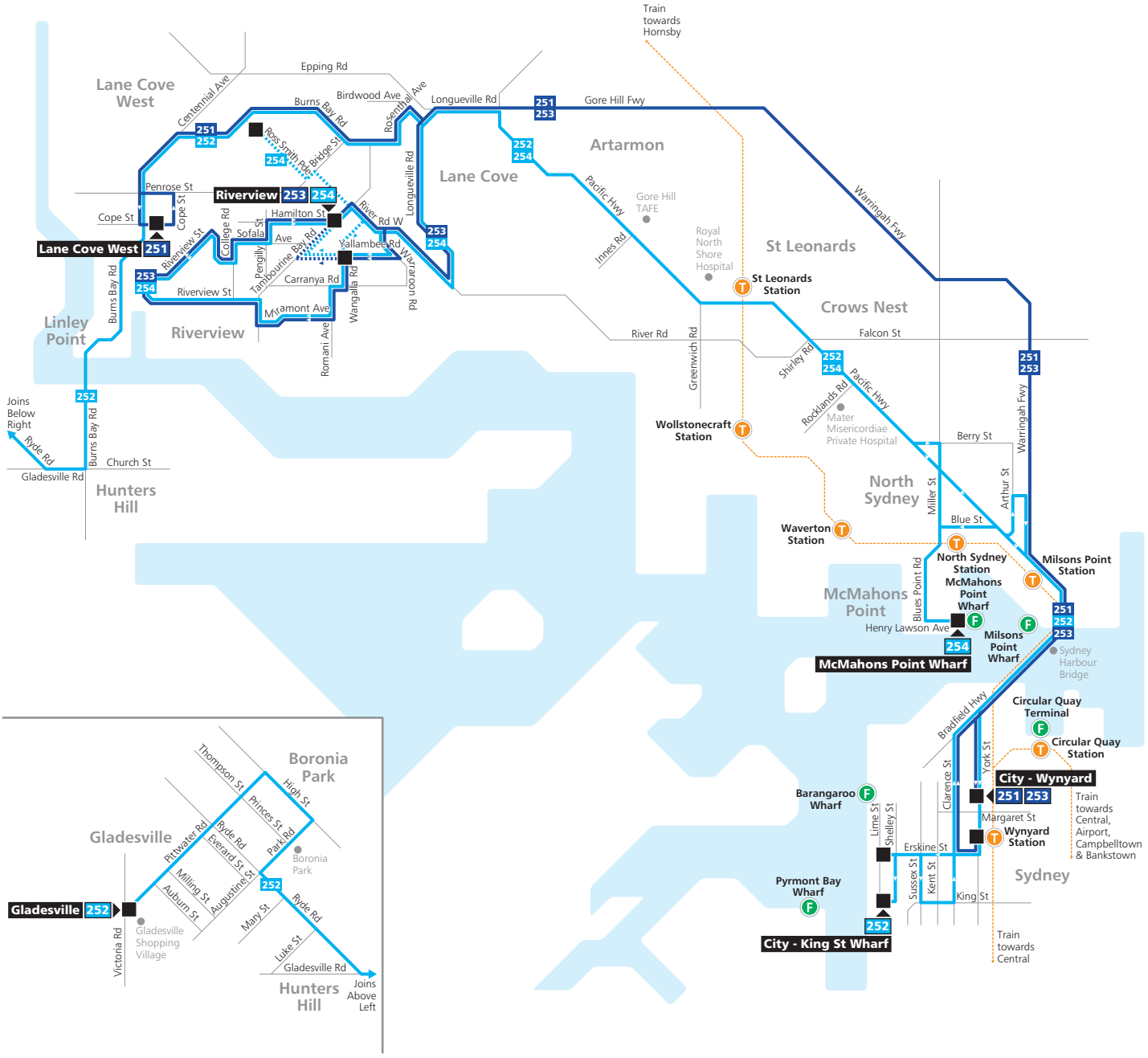


Overnight Network Services



Routes 251, 252, 253, 254

B



Legend

- Bus route
- Diversion/extended route
- 252 Bus route number
- Bus route start/finish
- Train line/station
- Ferry wharf

Diagrammatic Map Not to Scale

North

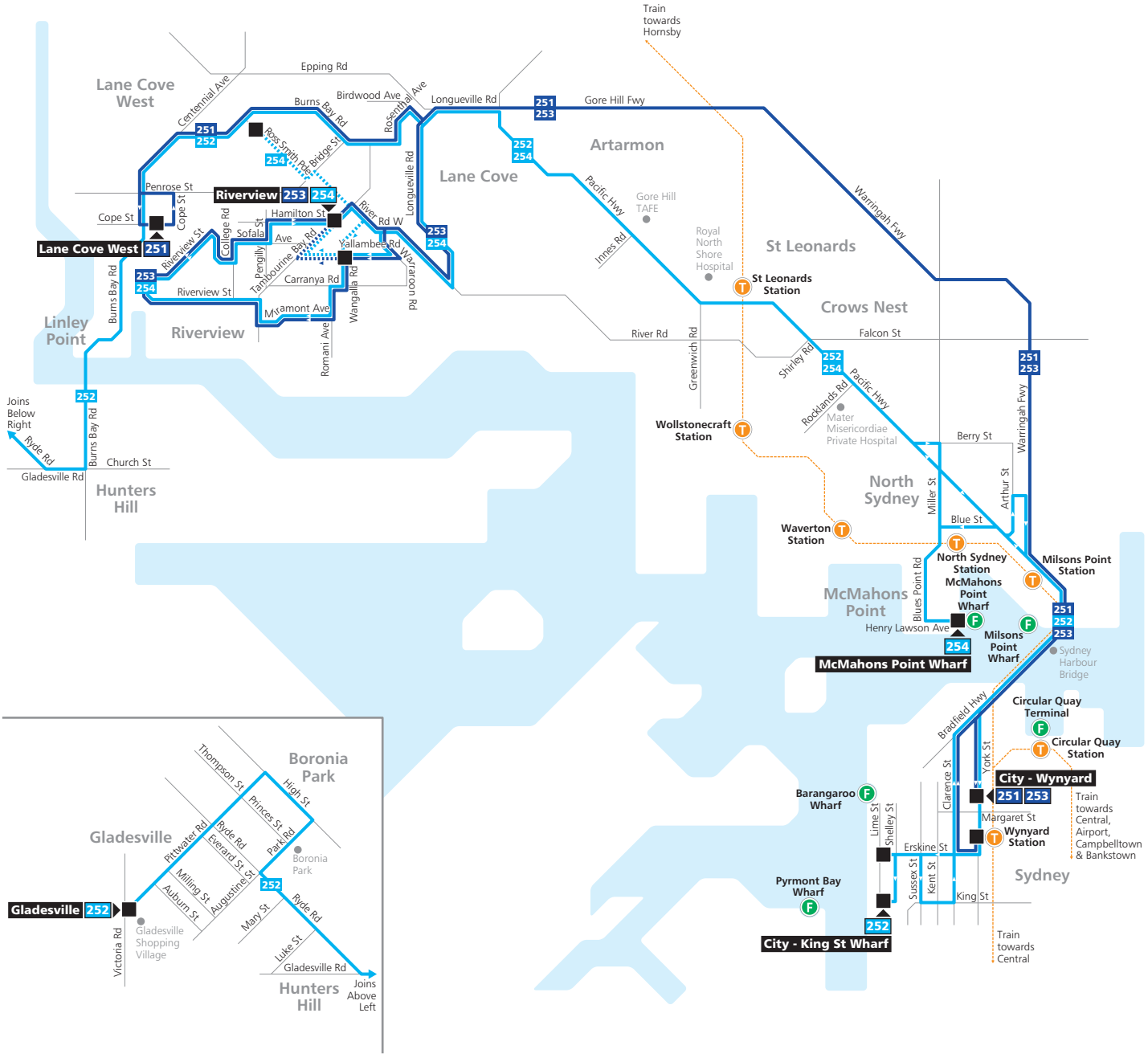
NSW GOVERNMENT

Transport

transportnsw.info

Routes 251, 252, 253, 254

B



Legend

- Bus route
- Diversion/extended route
- 252 Bus route number
- Bus route start/finish
- Train line/station
- Ferry wharf

Diagrammatic Map Not to Scale

North

NSW GOVERNMENT

Transport

transportnsw.info

Transport Strategies

Appendix B
Architectural Plans

Existing Main Building

Existing Dalton Chapel

Existing Vaughan Building
ERL 35.600

Existing Courtyard

Existing St John's Boarding House

Existing Doyle Building
ERL 38.090

Existing Administration Building
ERL 35.485

Existing Pedestrian Link

Existing Therry Building
ERL 35.550

54890

02/DA202

01/DA200

Existing O'Neil Building to be refurbished

9870

7710

ERL 35.44

19025

New Stair Access

Existing Wallace Building
ERL 31.300

2310

Existing Ramp

6870

Existing Recreation Yard
ERL 37.500

02/DA200

55415

01/DA200

Refer DA130-135 Plans
Ignis Stage 2
New STEMP Building

01/DA202

6955 Setback

New Landscaping

ERL 25.360

Existing trees to be retained

Existing Bus Pick up and Drop Off

New Pathway Access

01/DA200

19245

01/DA200

56400

01/DA201

12430

Existing Parking

ERL 26.500

New Exit driveway from basement loading area

3325 Setback

LOYOLA DRIVE

01/DA200

New Landscaping

Existing Woods Music Centre

02/DA201

New Substation

Existing Ramsey Building
ERL 31.280

5000 Setback

New Landscaping

20680

5000

ERL 28.000

New Stair and Pathway Access

ERL 29.000

New Entry driveway for basement loading area

Modification to existing roundabout. Refer to civil engineering docs.

01/DA200

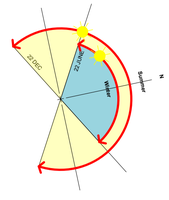
First Field

Existing Access Parking space and shared zone. New AS1428.1 Kerb ramp to existing path

Observatory

Existing Parking

Existing Gartlan Centre
ERL 24.000



Saint Ignatius' College RIVERVIEW

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PROJECT: Ignis Stage 2	PROJECT #: 2876
CLIENT: Saint Ignatius' College	DWG #: DA100
DWG: Site Plan	REVISION: B
CLIENT REF & CONTACT: Riverview	DATE: Apr 2020 DRAWN: BS SCALE: 1:400 CHKD: DY

Existing Wallace Building above

Existing O'Neil Building above

Existing Therry Building above

Existing Ramsey Building above

Existing Wallace Building extent above

Existing Ramsey Building extent above

02/DA202

01/DA202

01 DA300

02 DA300

Cleaner's Store 26.8 sq m

Cleaner's Office 28.5 sq m

RL 26650

Main Switch Room 41.4 sq m

Comms 18.8 sq m

2.4x5.5m Vehicle space

13x3.2m Bus/Coach space

M. WC/Shw 8.3 sq m

Basement 344.3 sq m RL 26500

RSD

Lockers 2.4 sq m

Staging 34.5 sq m

Entry

Undercover Hardstand

Level -1

RL 26.500

F.WC/Shw 3.6 sq m

Acc WC/Shw LH 3.6 sq m

Lift

Cage 7.6 sq m

Entry

Store 27.6 sq m

RL 26450

RL 26070

RL 26330

RL 26360

RL 26560

Rainwater Tank 90000L

2000L O.A.

1000L O.P.

2.5m x 5.5m Vehicle space

1200 (1750)

SPV's Lightning Guard

Driveway above 430 sq m

20-Class FH

Driveway Entry

Driveway Exit

EX. GAS MAIN

New 1500KVA Substation

Loyola Drive

New Roundabout to Civil Eng.'s details

02/DA201

01/DA201

02 DA300

01 DA300

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Saint Ignatius' College RIVERVIEW

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PROJECT: Ignis Stage 2	PROJECT # 2876
CLIENT: Saint Ignatius' College	DWG # DA130
DWG: Level -1 Plan	
CLIENT REF & CONTACT: Riverview	DATE Apr 2020 DRAWN BS SCALE 1:200 CHKD DY
	REVISION B

Existing O'Neil Building above

Existing Wallace Building

Existing Ramsey Building

Existing Therry Building

Ex. Lift

Level 0
GFA: 310m2
RL 31.000

Entry

Store 13.7 sq m

Store 9.9 sq m

Clnr 3.6 sq m

Multi Purpose Hall
200.7 sq m
RL 31000

Amenities 15.1 sq m

Corridor 22.1 sq m

Acc W/C 7.8 sq m

Elec 3 sq m

Stair 1
41.5 sq m
RL 32500

Hall Spill Area 154.5 sq m

Existing Ramp

Maintain accessible pathway

Upper Court
721.8 sq m
RL 31000

Grass Court
296.5 sq m
RL 30000

Avenue
907.6 sq m
RL 31000

C.O.L.A
330 sq m
RL 31000

Canteen
160 sq m
RL 31000

Freezer 7.5 sq m

Cool Room 11.5 sq m

Dry 7.6 sq m

Stair 2

Corridor 19.8 sq m

IT Store 25.4 sq m

Paper Store 27.3 sq m

Print Office 91.2 sq m RL 31000

Reception 15.7 sq m

Lift

Entry

Podium
490.9 sq m
RL 31000

Line of Building above

Basement dashed under

EXIT
Driveway under

ENTRY
Driveway under

Maintain accessible pathway

01/DA202

02/DA202

01/DA201

02/DA201

01 DA300

02 DA300

Photog. Std. 12.6 sq m

Photog. Std. 5.8 sq m

Photog. Std. 9.1 sq m

Dark Room 40.8 sq m

Staff Str. 10.7 sq m

Str. 13.3 sq m

Foyer 17.8 sq m

D.T. Staff Off. 29.6 sq m

Str. 12.9 sq m

Office 13.4 sq m

Foyer 11.7 sq m

Comp. Rm. 49.5 sq m

Yr12 Wood Wshop 139.7 sq m

Comp. Rm. 53.2 sq m

Comp. Rm. 70.6 sq m

Off. 32.1 sq m

Off. 17.3 sq m

WC 18.6 sq m

Comp. Rm. 23.7 sq m

Comp. Rm. 52.3 sq m

Shr/WC 9.1 sq m

Shr/WC 9.1 sq m

Costume 34.3 sq m

Dress. Rm 20.3 sq m

Dress. Rm 20.3 sq m

Corridor 68.6 sq m

Lobby 21 sq m

Str.? 2.1 sq m

Str. 7.4 sq m

DT1 74.2 sq m

Elec. S.R. 10.3 sq m

I.T. Data Rm. 13.2 sq m

DT 2 63.1 sq m

Str. 6 sq m

Foyer 27.7 sq m

Comp. Rm. 31.8 sq m

Wood Workshop? 82.7 sq m

Str. 13.5 sq m

Machine Room? 68.9 sq m

Duct Extractor Rm. 19.4 sq m

Store 88.6 sq m

New Server Room 43.1 sq m

Store 21.7 sq m

Corridor 7.9 sq m

Chaplain 12 sq m

Foyer 58 sq m

Chapel 30.7 sq m

Saint Ignatius' College RIVERVIEW

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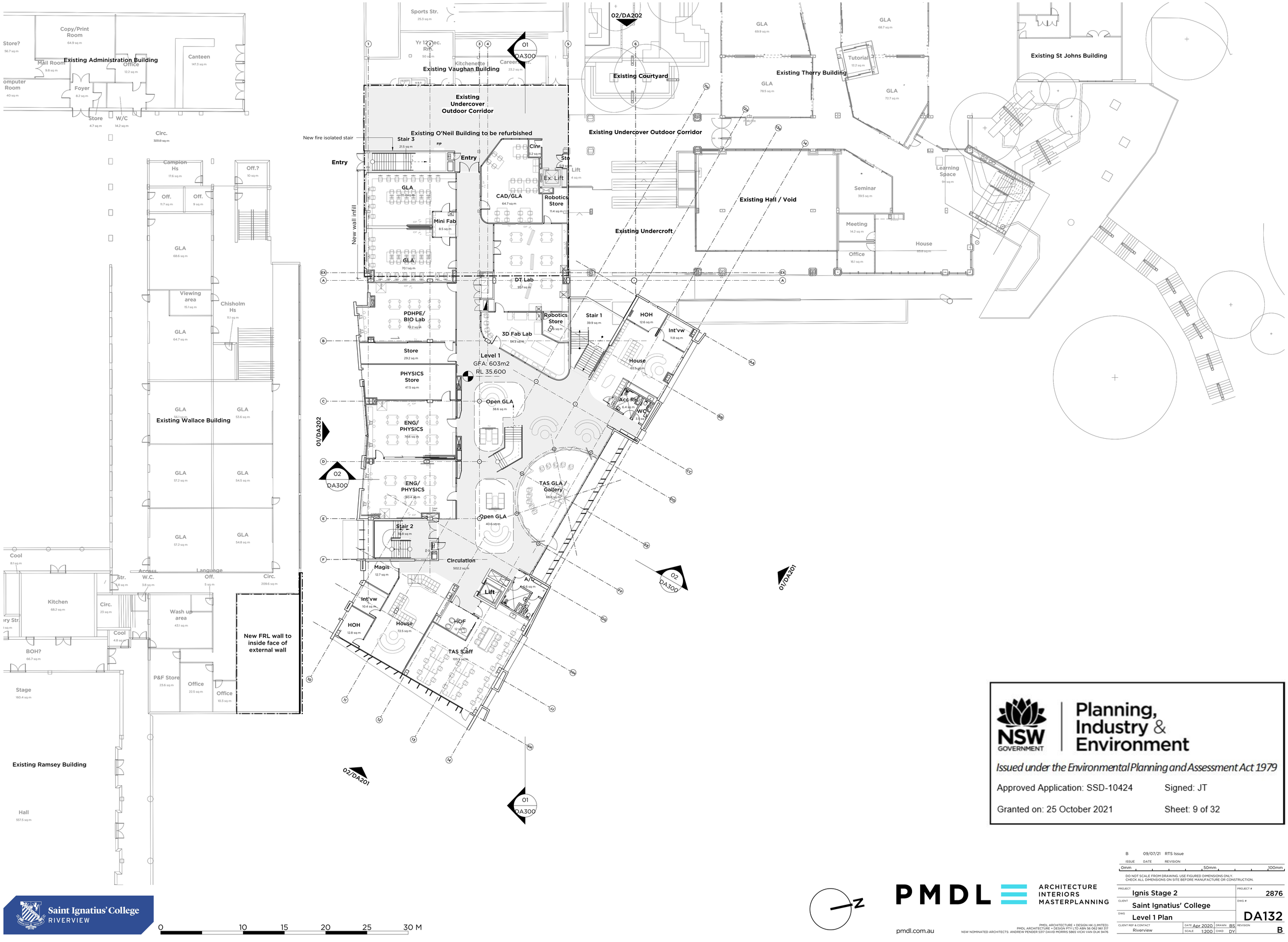
PROJECT	Ignis Stage 2	PROJECT #	2876
CLIENT	Saint Ignatius' College	DWG #	DA131
DWG	Level 0 Plan		
CLIENT REF & CONTACT	Riverview	DATE Apr 2020 / SCALE 1:200	DRAWN BS / CHKD DY
		REVISION	B



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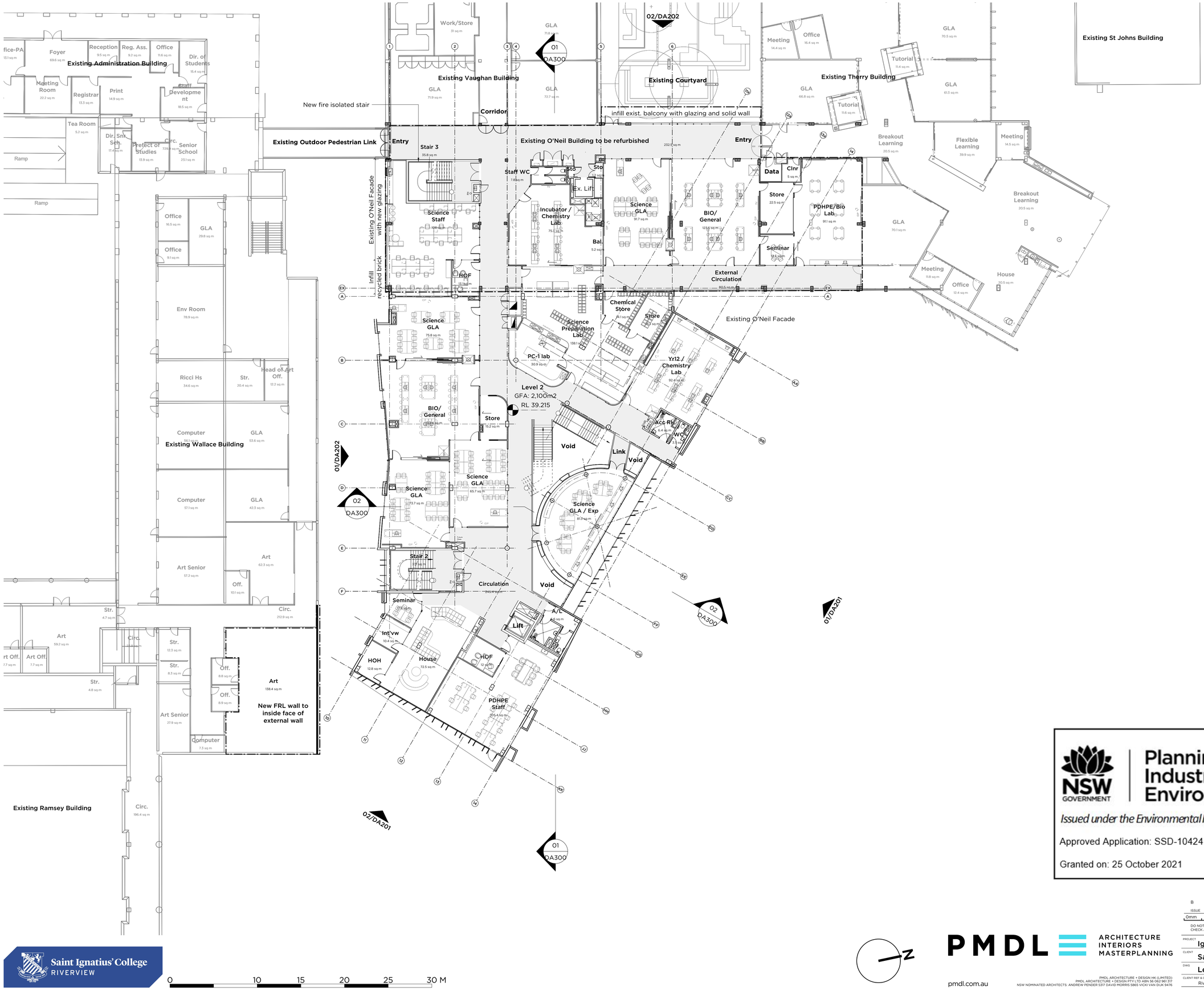
PROJECT: Ignis Stage 2			PROJECT #: 2876
CLIENT: Saint Ignatius' College			DWG #: DA132
DWG: Level 1 Plan			
CLIENT REF & CONTACT: Riverview	DATE: Apr 2020	DRAWN: BS	REVISION: B
	SCALE: 1:200	CHKD: DY	



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PROJECT	Ignis Stage 2	PROJECT #	2876
CLIENT	Saint Ignatius' College	DWG #	DA133
DWG	Level 2 Plan		
CLIENT REF & CONTACT	Riverview	DATE Apr 2020 / DRAWN BS	REVISION B
		SCALE 1:200 / CHKD DY	

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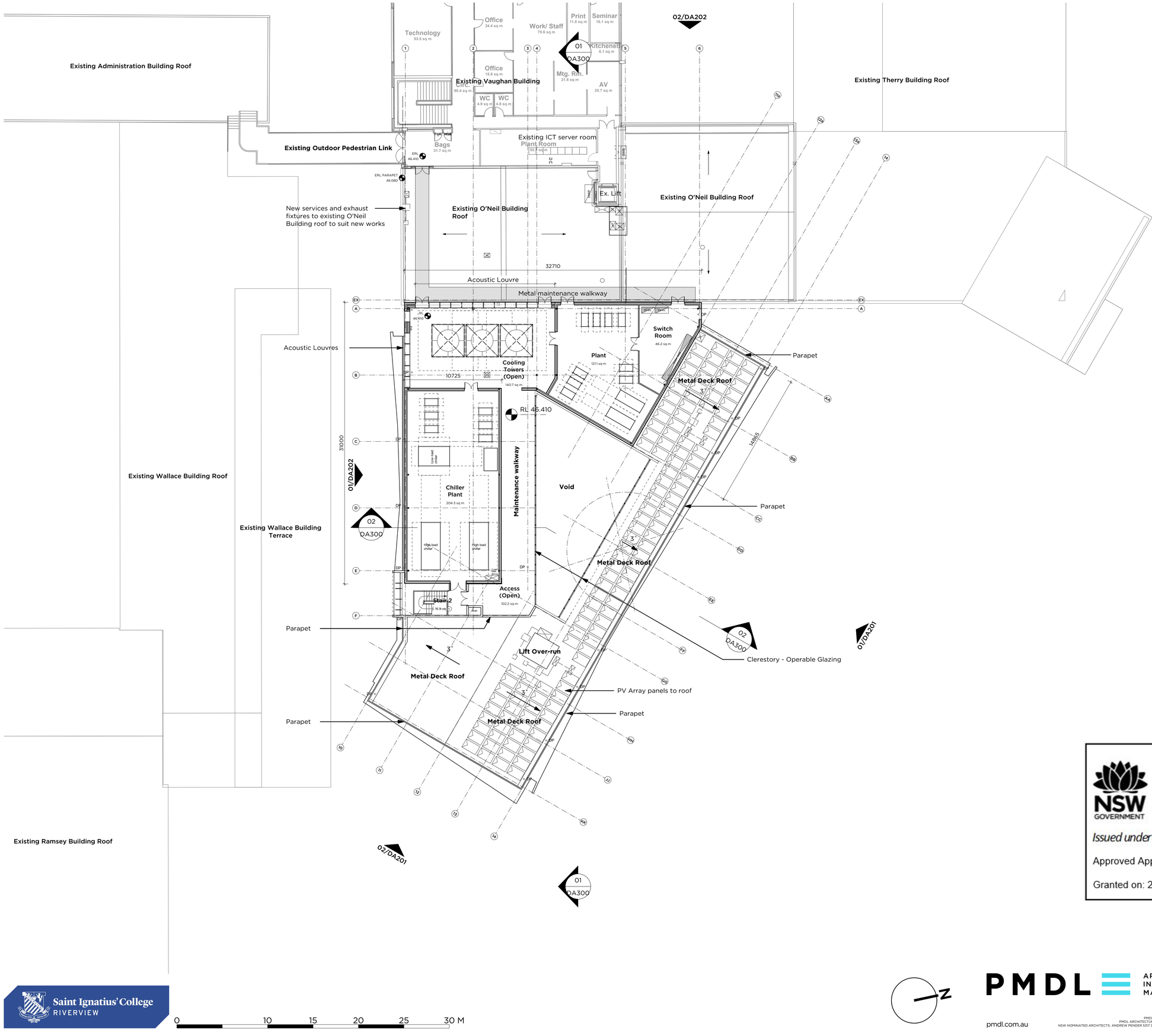
PROJECT	Ignis Stage 2	PROJECT #	2876
CLIENT	Saint Ignatius' College	DWG #	DA134
DWG	Level 3 Plan		
CLIENT REF & CONTACT	Riverview	DATE Apr 2020 / SCALE 1:200	DRAWN BS / CHKD DY
		REVISION	B



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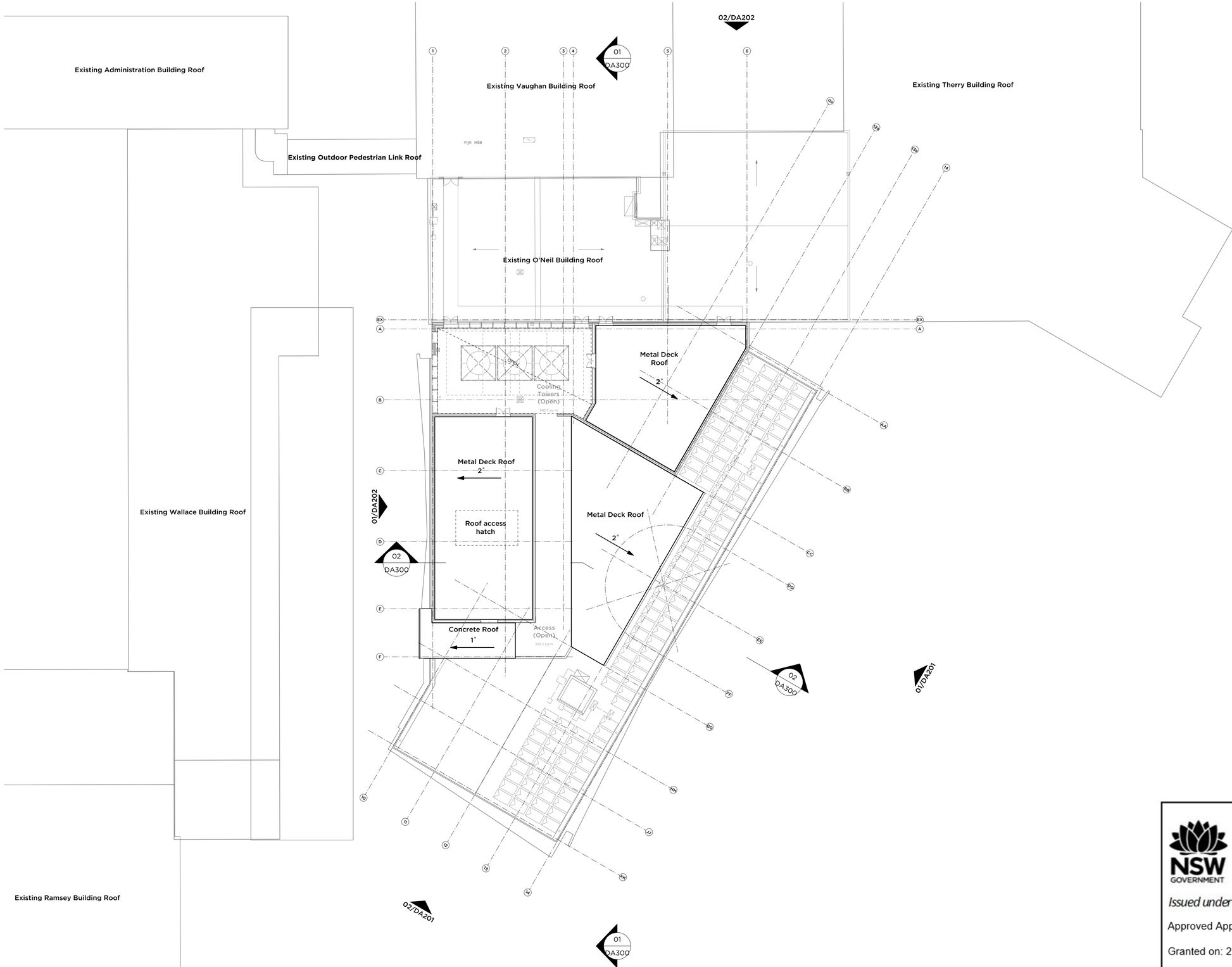
PROJECT	Ignis Stage 2	PROJECT #	2876
CLIENT	Saint Ignatius' College	DWG #	DA135
DWG	Roof Plan		
CLIENT REF & CONTACT	Riverview	DATE Apr 2020 / DRAWN BS / SCALE 1:200 / CHKD DV	REVISION B



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NSW NOMINATED ARCHITECTS: ANDREW PENDER 5317 DAVID MORRIS 5865 VICKI VAN DIJK 9476

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PROJECT	Ignis Stage 2		PROJECT # 2876
CLIENT	Saint Ignatius' College		DWG # DA136
DWG	Roof Upper Plan		
CLIENT REF & CONTACT	Riverview	DATE Apr 2020 DRAWN BS SCALE 1:200 CHKD DY	REVISION B

Transport Strategies

Appendix C
TfNSW and Council Liaison

technical@transportstrategies.com.au

From: Development Applications <Developments.CJP@transport.nsw.gov.au>
Sent: Tuesday, 9 May 2023 12:59 PM
To: technical@transportstrategies.com.au; Development Applications; Development CTMP CJP
Cc: Brett Drew; 'Loui Abouhamad'; 'Raza Muhammad'; 'Jackson Soong'; Dennis Anthonysamy; Sam Morley
Subject: RE: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

Transport for NSW (TfNSW), Greater Sydney Division has reviewed the CTMP for 2-60 Riverview street, Riverview and endorse the proposed temporary construction arrangements, subject to the following conditions:

- Any Traffic Guidance Schemes (TGS) prepared are to comply with AS1742.3 and Transport for NSW's "Traffic Control at Worksites" manual and be signed by a person with TfNSW certification to prepare a TGS.
- Access to be maintained for local residents, businesses and emergency vehicles at all times.
- No marshalling or queuing of construction vehicles is to occur on public roads. Arriving vehicles that are not able to use parking bay/work zone must continue to a holding point until space becomes available.
- When heavy vehicles are entering or leaving the site a traffic controller is to be provided to manage any conflicts between pedestrians and heavy vehicles.
- Transport for New South Wales reserve the right to alter the CTMP Conditions at any time to maintain safe and efficient traffic and pedestrian movements in this area
- Any approved Works Zone should only be used for work activities. No infrastructure, including bins, tanks or traffic control equipment should be left on the road when the works zone is not in use by a vehicle. All non-vehicular items must be contained with the work area and not on the carriageway. When a work zone is not in use, the area/lane must be opened up to allow for normal trafficable conditions
- Should TfNSW Network and Asset Management, Network Operations, CJP Operations, Network and Safety or other TfNSW business area determine that that more information is to be provided for review and acceptance, including other TCS locations, this information must be submitted prior to the CTMP being implemented, or otherwise agreed upon.

Endorsement of the CTMP is not an approval to the type of traffic management or delineation devices used, nor is it an approval to any traffic guidance schemes depicted within the CTMP. It is assumed that the proponent has used type approved devices and has developed its traffic guidance schemes in accordance with the relevant Australian Standards and Guidelines.

The proponent is to ensure local residents, businesses, schools and other stakeholders in the affected area as well as emergency service organisations are notified of the changes associated with the CTMP, prior to its implementation.

Please ensure this CTMP is shared and adhered to by all contractors. If the CTMP changes, please forward a copy to Developments.CJP@transport.nsw.gov.au or further review and endorsement.

Operational Change| Customer Journey Planning | Greater Sydney
25 Garden Street Eveleigh NSW 2015
Transport for NSW

From: technical@transportstrategies.com.au <technical@transportstrategies.com.au>
Sent: Wednesday, 26 April 2023 2:33 PM
To: Development Applications <Developments.CJP@transport.nsw.gov.au>; Development CTMP CJP <development.CTMP.CJP@transport.nsw.gov.au>
Cc: Brett Drew <brett.drew@belmadar.com.au>; 'Loui Abouhamad' <Loui.Abouhamad@belmadar.com.au>; 'Raza Muhammad' <raza@transportstrategies.com.au>; 'Jackson Soong' <jackson@transportstrategies.com.au>; Dennis Anthonysamy <DAnthonysamy@lanecove.nsw.gov.au>
Subject: RE: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

Hi CJP

Thank you for your comments.

Please download the revised CTMP from the link below:

https://www.dropbox.com/t/0PlJrGxRj1K4zzEm

Feel free to contact me should you have any questions.

Kind regards

Meg Kong
Transport Strategist
Transport Strategies
Transport Strategies Alliance Pty Ltd
Mobile: 04 2400 7141
Email: technical@transportstrategies.com.au
Address: 207A/30 Campbell Street, Blacktown NSW 2148

From: Development Applications <Developments.CJP@transport.nsw.gov.au>
Sent: Wednesday, February 22, 2023 5:50 PM
To: technical@transportstrategies.com.au; Development Applications <Developments.CJP@transport.nsw.gov.au>; Development CTMP CJP <development.CTMP.CJP@transport.nsw.gov.au>
Cc: Brett Drew <brett.drew@belmadar.com.au>; 'Loui Abouhamad' <Loui.Abouhamad@belmadar.com.au>
Subject: RE: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

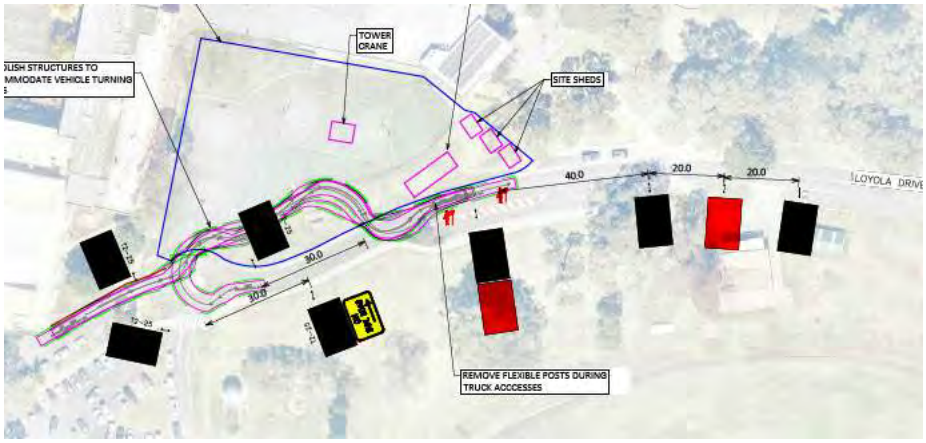
Thank you for providing Transport for NSW with a copy of the Construction Traffic Management Plan (CTMP). Please note the following additional information is required before we can review the document:

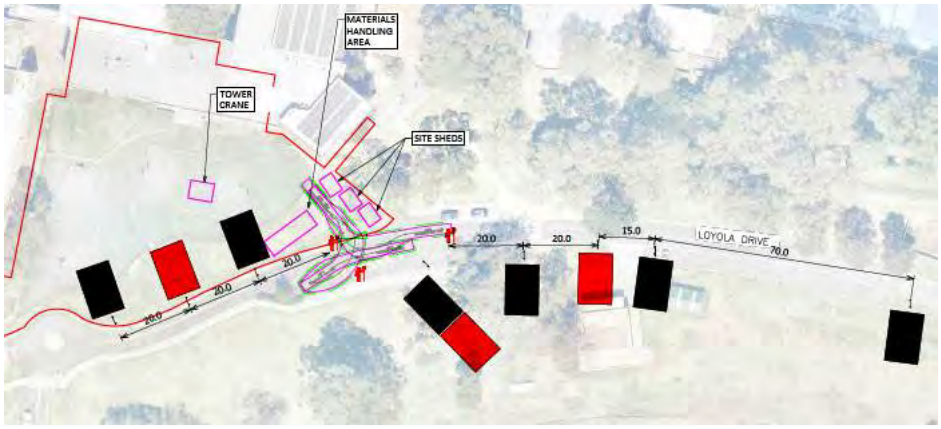
Please see below the following comments, requests for additional information and/or issues to note:

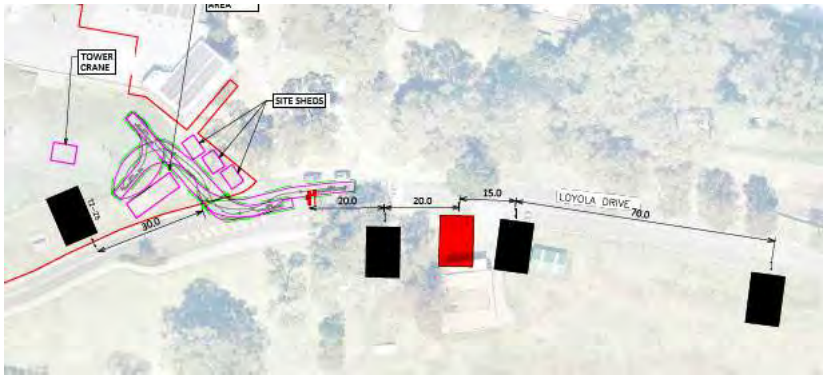
- Please clarify if the details in section 4.5 Truck Movements are accurate, as these truck volumes are very high for daily movements. If these are not daily truck movements can you please confirm what they will be in an updated document.

- Please provide swept paths for the largest vehicle expected entering and exiting at the intersection of River Rd W & Tambourine Bay Rd.

- Please clarify if the TGS are meant to have signs in the black & red boxes, see snip-it's below:







Upon making the required amendments, please forward an updated copy your submission to Developments.CJP@transport.nsw.gov.au for further review and endorsement.

Project & Service Changes | Customer Journey Planning | Greater Sydney
25 Garden Street Eveleigh NSW 2015
Transport for NSW

Transport for NSW

From: technical@transportstrategies.com.au <technical@transportstrategies.com.au>
Sent: Thursday, 16 February 2023 8:34 PM
To: Development Applications <Developments.CJP@transport.nsw.gov.au>; Development CTMP CJP <development.CTMP.CJP@transport.nsw.gov.au>
Cc: Brett Drew <brett.drew@belmadar.com.au>; 'Loui Abouhamad' <Loui.Abouhamad@belmadar.com.au>
Subject: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

Hi CJP Officer

Hope you are well.

Condition C11b requires us to prepare the CTMP in consultation with TfNSW. Please download from the link below:

https://www.dropbox.com/t/NUFSYdMk446dfQET

Appreciate TfNSW's review and comments. Feel free to contact me if you have any questions.

Kind regards

Meg Kong
Transport Strategist
Transport Strategies
Transport Strategies Alliance Pty Ltd
Mobile: 04 2400 7141
Email: technical@transportstrategies.com.au
Address: 207A/30 Campbell Street, Blacktown NSW 2148

technical@transportstrategies.com.au

From: technical@transportstrategies.com.au
Sent: Monday, 24 July 2023 9:45 AM
To: 'Dennis Anthonysamy'; service@lanecove.nsw.gov.au
Cc: 'Loui Abouhamad'; 'Jackson Soong'; 'Raza Muhammad'
Subject: RE: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

Hi Dennis

Hope you are well and had a good weekend.

May we please follow up on the status of our CTMP? The link from the May email has expired so please refer to the link below if you have not downloaded from the earlier link.

https://www.dropbox.com/t/8mSgSyydHhGHgt6N

Thank you. Feel free to contact us if you have any questions or concerns.

Kind regards

Meg Kong
Founder/Transport Strategist
Licence Number: Traffic Control Work Card TCT1030659
Design Practitioner Registration Number: DEP0000127
Professional Engineer Registration Number: PRE0000121
Transport Strategies
Transport Strategies Alliance Pty Ltd
Mobile: 04 2400 7141
Email: technical@transportstrategies.com.au
Address: 207A/30 Campbell Street, Blacktown NSW 2148

From: technical@transportstrategies.com.au <technical@transportstrategies.com.au>
Sent: Friday, May 5, 2023 3:39 PM
To: 'Dennis Anthonysamy' <DAnthonysamy@lanecove.nsw.gov.au>
Cc: 'Loui Abouhamad' <Loui.Abouhamad@belmadar.com.au>; 'Jackson Soong' <jackson@transportstrategies.com.au>; 'Raza Muhammad' <raza@transportstrategies.com.au>
Subject: RE: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

Hi Dennis

Please download from the link below

https://www.dropbox.com/t/9qFXPpNpPsE014Nx

Thank you.

Kind regards

Meg Kong
Transport Strategist
Transport Strategies

Transport Strategies Alliance Pty Ltd
Mobile: 04 2400 7141
Email: technical@transportstrategies.com.au
Address: 207A/30 Campbell Street, Blacktown NSW 2148

From: Dennis Anthonysamy <DAnthonysamy@lanecove.nsw.gov.au>
Sent: Thursday, May 4, 2023 12:53 PM
To: technical@transportstrategies.com.au
Cc: 'Loui Abouhamad' <Loui.Abouhamad@belmadar.com.au>; 'Jackson Soong' <jackson@transportstrategies.com.au>; 'Raza Muhammad' <raza@transportstrategies.com.au>
Subject: FW: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

Hi Meg,

The link you sent is expired. Could you please resend it.

Thanks,

Dennis

Dennis Anthonysamy | *Development Engineer Traffic*

A: 48 Longueville Road Lane Cove
P: 9911 3623
E: DAnthonysamy@lanecove.nsw.gov.au

From: technical@transportstrategies.com.au <technical@transportstrategies.com.au>
Sent: Wednesday, 26 April 2023 2:34 PM
To: Dennis Anthonysamy <DAnthonysamy@lanecove.nsw.gov.au>
Cc: 'Loui Abouhamad' <Loui.Abouhamad@belmadar.com.au>; 'Jackson Soong' <jackson@transportstrategies.com.au>; 'Raza Muhammad' <raza@transportstrategies.com.au>
Subject: RE: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

Hi Dennis

I have just issued the revised CTMP back to TfNSW.

https://www.dropbox.com/t/0PlJrGxRj1K4zzEm

Will you please review the revised CTMP and provide your comments while I wait for TfNSW's comments and endorsement (should there be no further comments).

Thank you.

Kind regards

Meg Kong
Transport Strategist
Transport Strategies
Transport Strategies Alliance Pty Ltd
Mobile: 04 2400 7141
Email: technical@transportstrategies.com.au
Address: 207A/30 Campbell Street, Blacktown NSW 2148

From: technical@transportstrategies.com.au <technical@transportstrategies.com.au>
Sent: Monday, April 24, 2023 4:05 PM
To: 'Dennis Anthonysamy' <DAnthonysamy@lanecove.nsw.gov.au>
Cc: 'Loui Abouhamad' <Loui.Abouhamad@belmadar.com.au>
Subject: RE: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

Hi Dennis

Thanks for your prompt response. We have reached out earlier to TfNSW and got the attached comments.

We are just waiting for Council's comments prior to reissuing the updated CTMP.

Hope the above is helpful.

Thank you.

Kind regards

Meg Kong
Transport Strategist
Transport Strategies
Transport Strategies Alliance Pty Ltd
Mobile: 04 2400 7141
Email: technical@transportstrategies.com.au
Address: 207A/30 Campbell Street, Blacktown NSW 2148

From: Dennis Anthonysamy <DAnthonysamy@lanecove.nsw.gov.au>
Sent: Monday, April 24, 2023 9:51 AM
To: technical@transportstrategies.com.au
Cc: 'Loui Abouhamad' <Loui.Abouhamad@belmadar.com.au>
Subject: RE: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

Hi Meg,

I am waiting for the TfNSW to get back to me. Hopefully, they will get back to me early next week.

Regards,

Dennis

Dennis Anthonysamy | *Development Engineer Traffic*

A: 48 Longueville Road Lane Cove
P: 9911 3623
E: DAnthonysamy@lanecove.nsw.gov.au

From: technical@transportstrategies.com.au <technical@transportstrategies.com.au>
Sent: Monday, 24 April 2023 6:52 AM
To: Dennis Anthonysamy <DAnthonysamy@lanecove.nsw.gov.au>
Cc: 'Loui Abouhamad' <Loui.Abouhamad@belmadar.com.au>; lccouncil <service@lanecove.nsw.gov.au>
Subject: RE: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

> You don't often get email from technical@transportstrategies.com.au. Learn why this is important

Hi Dennis

Hope you had a good weekend.

May I please follow up on my email below?

Thank you.

Kind regards

Meg Kong
Transport Strategist
Transport Strategies
Transport Strategies Alliance Pty Ltd
Mobile: 04 2400 7141
Email: technical@transportstrategies.com.au
Address: 207A/30 Campbell Street, Blacktown NSW 2148

From: technical@transportstrategies.com.au <technical@transportstrategies.com.au>
Sent: Thursday, February 16, 2023 8:43 PM
To: 'Dennis Anthonysamy' <DAnthonysamy@lanecove.nsw.gov.au>
Subject: FW: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

Hi Dennis

Will you be able to assist in Sashika's absence?

Thank you.

Kind regards

Meg Kong
Transport Strategist

Transport Strategies Alliance Pty Ltd
Mobile: 04 2400 7141
Email: technical@transportstrategies.com.au
Address: 207A/30 Campbell Street, Blacktown NSW 2148

From: technical@transportstrategies.com.au <technical@transportstrategies.com.au>
Sent: Thursday, February 16, 2023 8:41 PM
To: bwilson@lanecove.nsw.gov.au; service@lanecove.nsw.gov.au
Cc: 'Brett Drew' <Brett.Drew@belmadar.com.au>; 'Loui Abouhamad' <Loui.Abouhamad@belmadar.com.au>; sperera@lanecove.nsw.gov.au
Subject: SSD-10424 - CTMP - 2-60 Riverview St & Tambourine Bay Rd, Riverview

Hi Bruce

Hope you are well.

Condition C11b requires us to prepare the CTMP in consultation with Council. Please download from the link below:

https://www.dropbox.com/t/NUFSYdMk446dfQET

Appreciate Council's review and comments. Feel free to contact me if you have any questions.

Kind regards

Meg Kong
Transport Strategist
Transport Strategies Alliance Pty Ltd
Mobile: 04 2400 7141
Email: technical@transportstrategies.com.au
Address: 207A/30 Campbell Street, Blacktown NSW 2148

Transport Strategies

Appendix D
Swept Path Assessments

WORKSITE

TOWER CRANE

SITE SHEDS

LOYOLA DRIVE

MATERIALS HANDLING AREA

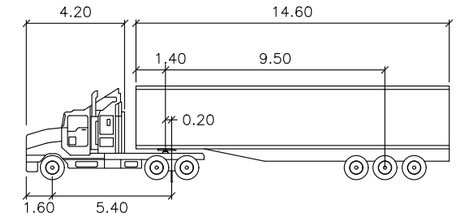
PM_S_19M AUSTROADS 2013 (AU)

PM_S_19M AUSTROADS 2013 (AU)

PM_S_19M AUSTROADS 2013 (AU)

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY



AV

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50		

C:\Transport Strategies Dropbox\siew hwee kong\PC\Desktop\TS PROJECT\2023\23019 - 2-60 Riverview St & Tambourine Bay Rd, Riverview\DRAWING\230211 TCP\23019-01-V1 - Standard\23019-02-V2-SP.dwg

Plotted by Anthony Nowma

ST IGNATIUS' COLLEGE RIVERVIEW
SITE ACCESS
SWEPT PATH ASSESSMENTS

Transport Strategies
207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
PHONE 0424 007 141

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

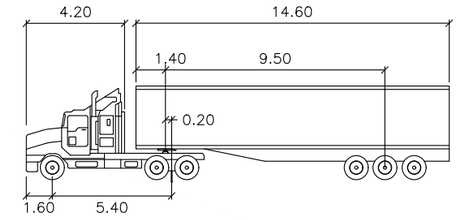
23019-02-V2-SP
01A
31 July 2023

DESIGNED BY S.YOU
APPROVED BY M.KONG

SCALE A3 0 5.0 10.0 1:500

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY



AV

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50		

WORKSITE

TOWER CRANE

SITE SHEDS

LOYOLA DRIVE

MATERIALS HANDLING AREA

P.M. S-19M AUSTROADS 2013 (AU)

P.M. S-19M AUSTROADS 2013 (AU)

C:\Transport Strategies Dropbox\siew hwee kong\PC\Desktop\TS PROJECT\2023\23019 - 2-60 Riverview St & Tambourine Bay Rd, Riverview\DRAWING\230211 TCP\23019-01-V1 - Standard\23019-02-V2-SP.dwg

Plotted by Anthony Newma

ST IGNATIUS' COLLEGE RIVERVIEW
SITE ACCESS
SWEPT PATH ASSESSMENTS

Transport Strategies

207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148

ABN 13 254 028 433

PHONE 0424 007 141

PRELIMINARY PLAN

FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23019-02-V2-SP

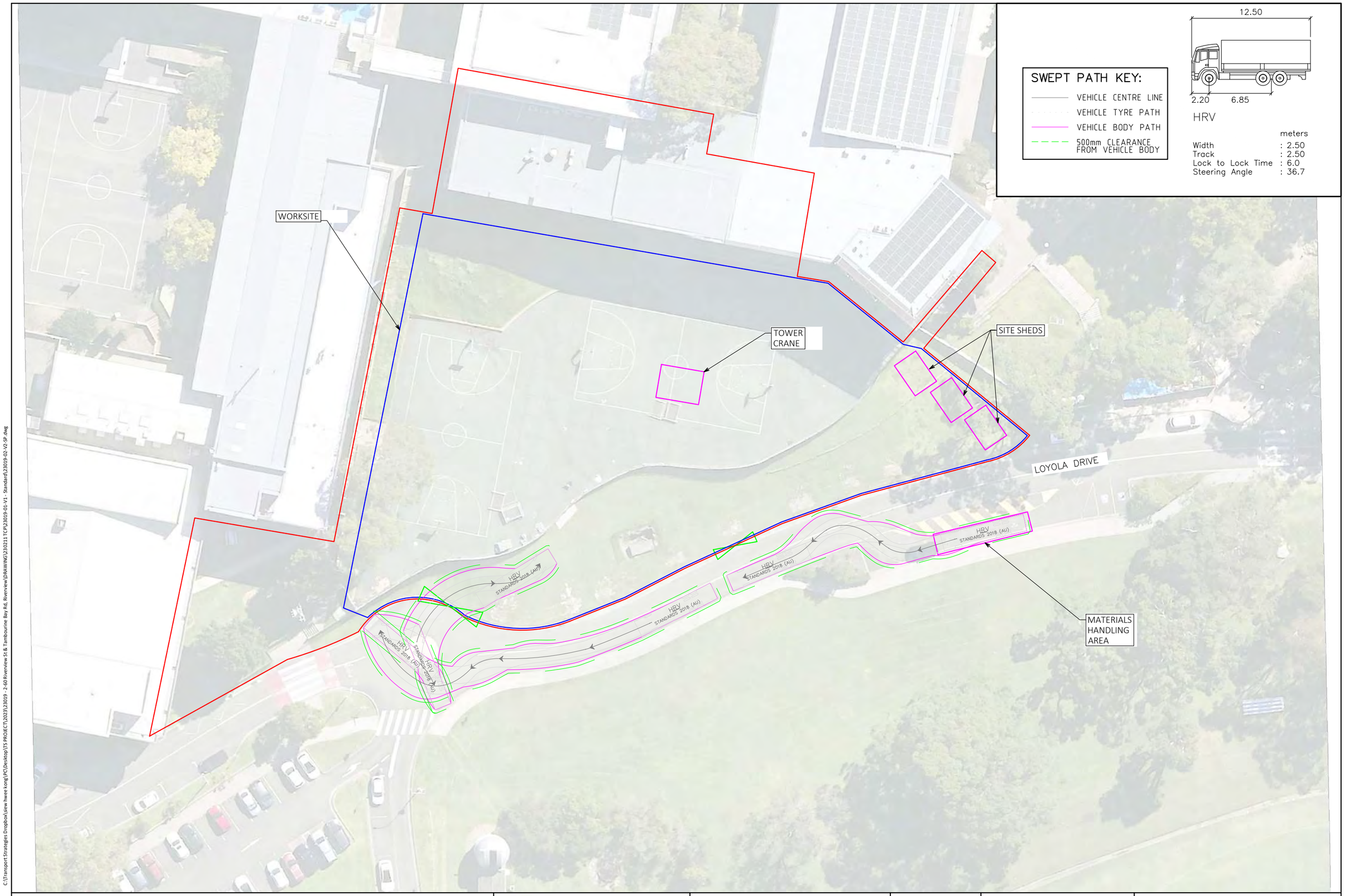
01B

31 July 2023

DESIGNED BY S.YOU

APPROVED BY M.KONG

SCALE A3 — 0 5.0 10.0 — 1:500



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Plotted by: Anthony Nowma

ST IGNATIUS' COLLEGE RIVERVIEW
SITE ACCESS
SWEPT PATH ASSESSMENTS

Transport Strategies

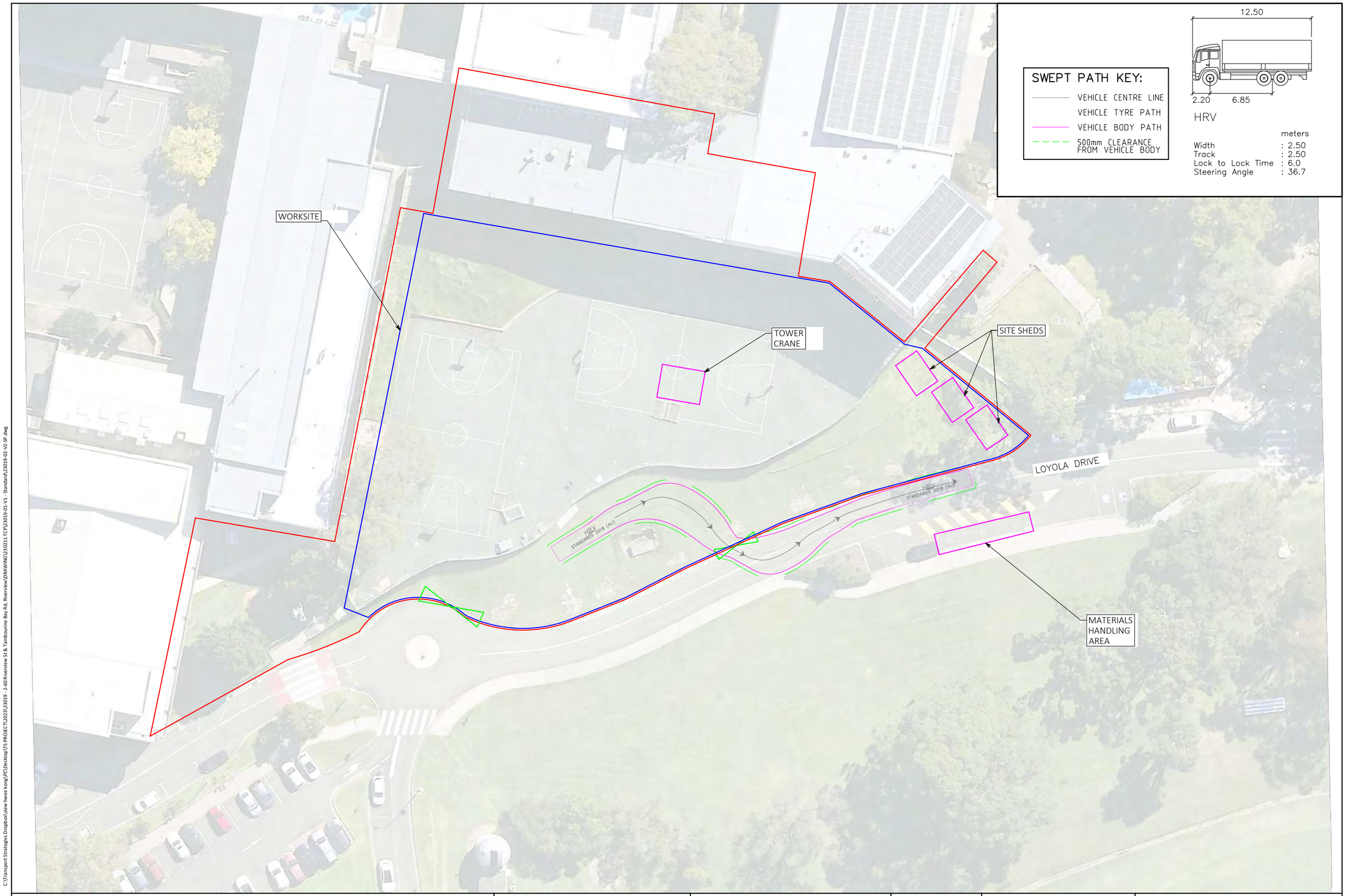
207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
PHONE 0424 007 141

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23019-02-V2-SP
02A
31 July 2023

DESIGNED BY S.YOU
APPROVED BY M.KONG

SCALE A3
0 5.0 10.0
1:500



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Plotted by Anthony Nkwina

ST IGNATIUS' COLLEGE RIVERVIEW
SITE ACCESS
SWEPT PATH ASSESSMENTS

Transport Strategies

207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
PHONE 0424 007 141

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23019-02-V2-SP
02B
31 July 2023

DESIGNED BY S.YOU
APPROVED BY M.KONG

SCALE A3
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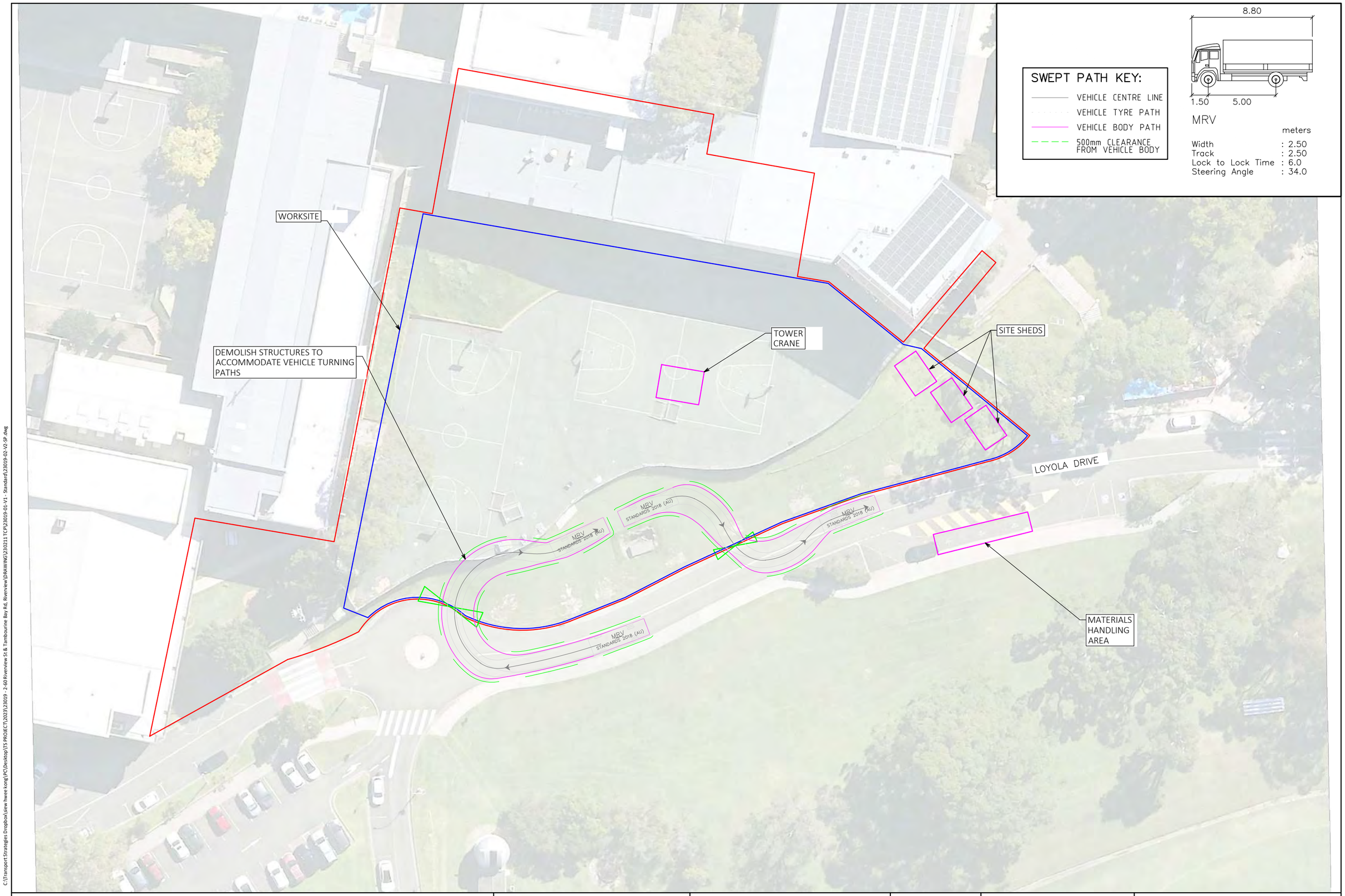
1:500



C:\Transport Strategies Dropbox\siew kwee kong\PC\Desktop\TS PROJECTS\2023\23019 - 2-60 Riverview St & Tambourine Bay Rd, Riverview\DRAWING\230211 TCP\23019-01-V1 - Standard\23019-02-V2-SP.dwg

Plotted by: Anthony Nowma

ST IGNATIUS' COLLEGE RIVERVIEW
SITE ACCESS
SWEPT PATH ASSESSMENTS

Transport Strategies

207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
PHONE 0424 007 141

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23019-02-V2-SP
03
31 July 2023

DESIGNED BY S.YOU
APPROVED BY M.KONG

SCALE A3 0 5.0 10.0 1:500

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

PM S 19M

meters

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

C:\Transport Strategies Dropbox\xiaew hweе kong\PC\Desktop\TS PROJECT\2023\23019 - 2-60 Riverview St & Tambourine Bay Rd, Riverview\DRAWINGS\23019-01-V1.dwg

Plotted by Muhammad Raza

2-60 RIVERVIEW STREET & TAMBOURINE BAY ROAD, RIVERVIEW
SWEPT PATH ASSESSMENT

Transport Strategies
207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
PHONE 0424 007 141

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23019-01-V1
01 OF 02
26 APRIL 2023

DESIGNED BY S.YOU
APPROVED BY M.KONG

SCALE A3
0 5.0 10.0
1:500

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

PM S 19M

meters

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

2-60 RIVERVIEW STREET & TAMBOURINE BAY ROAD, RIVERVIEW
SWEPT PATH ASSESSMENT

Transport Strategies
207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
PHONE 0424 007 141

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23019-01-V1
02 OF 02
26 APRIL 2023

DESIGNED BY S.YOU
APPROVED BY M.KONG

SCALE A3 0 5.0 10.0 1:500

Transport Strategies

Appendix E
Traffic Guidance Schemes

LEGEND:

- WORK SITE
- TRAFFIC CONTROLLER
- SIGN
- SITE ACCESS

CERTIFICATION
THE UNDERSIGNED HAS COMPLETED AND OBTAINED "PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN"
CERTIFICATE NO. TCT1030659
PREPARE A WORK ZONE TMP CARD
SIEW HWEE KONG

TGS GENERAL NOTES

- ALL PUBLIC ROADS WILL HAVE A SPEED LIMIT OF 50KM/H UNLESS IDENTIFIED OTHERWISE
- NOT ALL DIMENSIONS SHOWN ARE TO SCALE
- LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY
- ALL SIGNS ARE TO BE MINIMUM SIZE A
- ALL SIGNS ARE TO BE CLASS 1 RETROREFLECTIVE
- ALL TRAFFIC GUIDANCE SCHEMES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH TFNSW'S TRAFFIC CONTROL AT WORK SITES TECHNICAL MANUAL ISSUE 6.1 (RELEASED 2022), AMENDMENT TO TDT0003:2022 AND AUSTRALIAN STANDARDS AS1742.3:2019 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS
- THIS TRAFFIC CONTROL PLAN MUST BE SET UP BY A PERSON HOLDING AN "IMPLEMENT TRAFFIC MANAGEMENT PLAN" TICKET AND TFNSW'S TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION

- THE ACCREDITED PERSONNEL SHALL IMPLEMENT THE APPROVED TGS BEFORE ANY PHYSICAL WORK COMMENCES AND ENSURE A COPY OF THE TGS IS KEPT ON-SITE. THE ACCREDITED PERSONNEL SHALL ALSO DRIVE THROUGH THE SITE BEFORE WORKS BEGIN TO ENSURE THAT THE TGS HAS BEEN IMPLEMENTED CORRECTLY AND THAT THE IT WILL WARN, INSTRUCT AND GUIDE ROAD USERS AS DESIGNED. ANY VARIATIONS TO THE PLAN MUST BE MARKED ON THE PLAN AND INITIALED BY THE ACCREDITED PERSONNEL
- IT IS THE RESPONSIBILITY OF THE AN ACCREDITED PERSONNEL WITH A 'PREPARE A WORK ZONE TRAFFIC GUIDANCE SCHEMES' TO ENSURE THE FOLLOWING:

* THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURE THROUGH TO THE FINAL REMOVAL. THIS INCLUDES DAILY CHECKS OF ALL SIGNS AND DEVICES. THE CORRESPONDING RECORDS OF CHECKS SHALL BE KEPT ON FILE FOR AUDITING PURPOSES.
* VEHICULAR ACCESS AND SERVICING REQUIREMENTS ARE TO BE MAINTAINED AT ALL TIMES TO ADJACENT PROPERTIES AFFECTED BY TRAFFIC CONTROL MEASURES
* AT ALL TIMES AN UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES TECHNICAL MANUAL" SHALL BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE

- ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN
- IF THE WORKSITE IS LEFT UNATTENDED IT IS THE CONTRACTOR'S DUTY TO ENSURE THAT THE APPROPRIATE MEASURES ARE TAKEN TO PROVIDE A SAFE ENVIRONMENT FOR VEHICLES AND PEDESTRIANS TO RELEVANT AUSTRALIAN STANDARDS
- TRAFFIC CONTROLLER (T1-34) AND PREPARE TO STOP (T1-18) SIGNS ARE TO BE COVERED OR REMOVED WHEN TRAFFIC CONTROLLER/S ARE NOT ON SITE.
- ALL SIGNAGE IS TO BE CLEAN, CLEARLY VISIBLE AND NOT OBSCURED
- ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2019
- ALL DISTANCES BETWEEN SIGNS ARE TO BE IN ACCORDANCE WITH SECTION 2.5.2 OF AS1742.3:2019. HOWEVER, MODIFICATIONS CAN BE MADE TO SUIT SITE CONDITIONS
- IF REQUIRED, A TGS MUST BE SELECTED, DEVELOPED AND IMPLEMENTED BY A SUITABILITY QUALIFIED PERSON (PWZTMP AND ITCP QUALIFICATIONS)

WORKSITE

TOWER CRANE

TRAFFIC CONTROLLER TO HOLD TRAFFIC ON LOYOLA DRIVE TO ALLOW TRUCK TO ENTER AND EXIT THE SITE

SITE SHEDS

DEMOLISH STRUCTURES TO ACCOMMODATE VEHICLE TURNING PATHS

LOYOLA DRIVE

PREPARE TO STOP

PREPARE TO STOP

PREPARE TO STOP

PREPARE TO STOP

PREPARE TO STOP

25.0

25.0

20.0

25.0

25.0

50.0

25.0

25.0

MATERIALS HANDLING AREA

TRAFFIC CONTROLLER TO PLACE A TRAFFIC CONE TO HOLD TRAFFIC FROM CARPARK TO ALLOW TRUCK TO ENTER AND EXIT THE SITE

TRAFFIC CONTROLLER TO HOLD TRAFFIC ON LOYOLA DRIVE TO ALLOW TRUCK TO ENTER AND EXIT THE SITE

ST IGNATIUS' COLLEGE RIVERVIEW
SITE ACCESS
TRAFFIC GUIDANCE SCHEME

Transport Strategies
207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
PHONE 0424 007 141

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23019-02-V2-TCP
01
31 July 2023

DESIGNED BY S.YOU
APPROVED BY M.KONG
SCALE A3 0 8.0 16.0 1:800

LEGEND:

WORK AREA

PEDESTRIAN ACCESS

SIGN

CERTIFICATION
THE UNDERSIGNED HAS COMPLETED AND OBTAINED
"PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN"
CERTIFICATE NO. TCT1030659
PREPARE A WORK ZONE TMP CARD
SIEW HWEE KONG

TGS GENERAL NOTES

- ALL PUBLIC ROADS WILL HAVE A SPEED LIMIT OF 50KM/H UNLESS IDENTIFIED OTHERWISE
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- LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY
- ALL SIGNS ARE TO BE MINIMUM SIZE A
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- ALL TRAFFIC GUIDANCE SCHEMES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH TFNSW'S TRAFFIC CONTROL AT WORK SITES TECHNICAL MANUAL ISSUE 6.1 (RELEASED 2022), AMENDMENT TO TDT0003:2022 AND AUSTRALIAN STANDARDS AS1742.3:2019 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS
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ROAD CLOSED
T2-4
ROAD WORK AHEAD
T1-31
30
20
40
LOYOLA DRIVE
Existing Vaughan Building ERL 35.600
Existing Pedestrian Link
Existing Therry Building ERL 35.550
Existing O'Neil Building to be refurbished
New Stair Access
Existing Wallace Building ERL 31.300
Existing Recreation Yard ERL 37.500
Existing Ramsey Building ERL 31.280
Refer DA130-135 Plans New STEM+E Building
New Landscaping
New Substation
New Entry driveway for basement loading area
Modification to existing roundabout. Refer to civil engineering docs.
New Exit driveway from basement loading area
New Pathway Access
Existing Parking
Existing Bus Pick-up and Drop Off
First Field

ST IGNATIUS' COLLEGE RIVERVIEW
FULL ROAD CLOSURE OF LOYOLA DRIVE
TRAFFIC GUIDANCE SCHEME

Transport Strategies

207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
PHONE 0424 007 141

PRELIMINARY PLAN
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23019-02-V2-TCP_FULL CLOSURE 2
01
31 July 2023

DESIGNED BY S.YOU
APPROVED BY M.KONG
SCALE A3
0 8.0 16.0
1:800

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Standard230316-01 V1a
Plotted by Meg Kong

LEGEND:

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- TRAFFIC CONTROLLER
- SIGN
- SITE ACCESS

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WORKSITE
TOWER CRANE
SITE SHEDS
LOYOLA DRIVE
PREPARE TO STOP
20.0
25.0
25.0
25.0
25.0
35.0
MATERIALS HANDLING AREA
TRAFFIC CONTROLLER TO HOLD TRAFFIC ON LOYOLA DRIVE TO ALLOW EASTBOUND TRAFFIC TO PASS ON LOYOLA DRIVE
TRAFFIC CONTROLLER TO HOLD TRAFFIC ON LOYOLA DRIVE TO ALLOW WESTBOUND TRAFFIC TO PASS ON LOYOLA DRIVE
TRAFFIC CONTROLLER TO PLACE A TRAFFIC CONE TO HOLD TRAFFIC FROM CARPARK TO ALLOW TRUCK TO ENTER AND EXIT THE SITE
TRAFFIC CONTROLLER TO HOLD TRAFFIC FROM EXISTING THE CARPARK TO ALLOW EASTBOUND/WESTBOUND TRAFFIC TO PASS ON LOYOLA DRIVE

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Plotted by Meg Kong

ST IGNATIUS' COLLEGE RIVERVIEW
SINGLE LANE CLOSURE ON LOYOLA DRIVE
TRAFFIC GUIDANCE SCHEME

Transport Strategies
207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
PHONE 0424 007 141

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23019-02-V2-TCP_RA
A2
31 July 2023

DESIGNED BY S.YOU
APPROVED BY M.KONG
SCALE A3
0 8.0 16.0
1:800

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- TRAFFIC CONTROLLER
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- SITE ACCESS

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CERTIFICATE NO. TCT1030659
PREPARE A WORK ZONE TMP CARD
SIEW HWEE KONG

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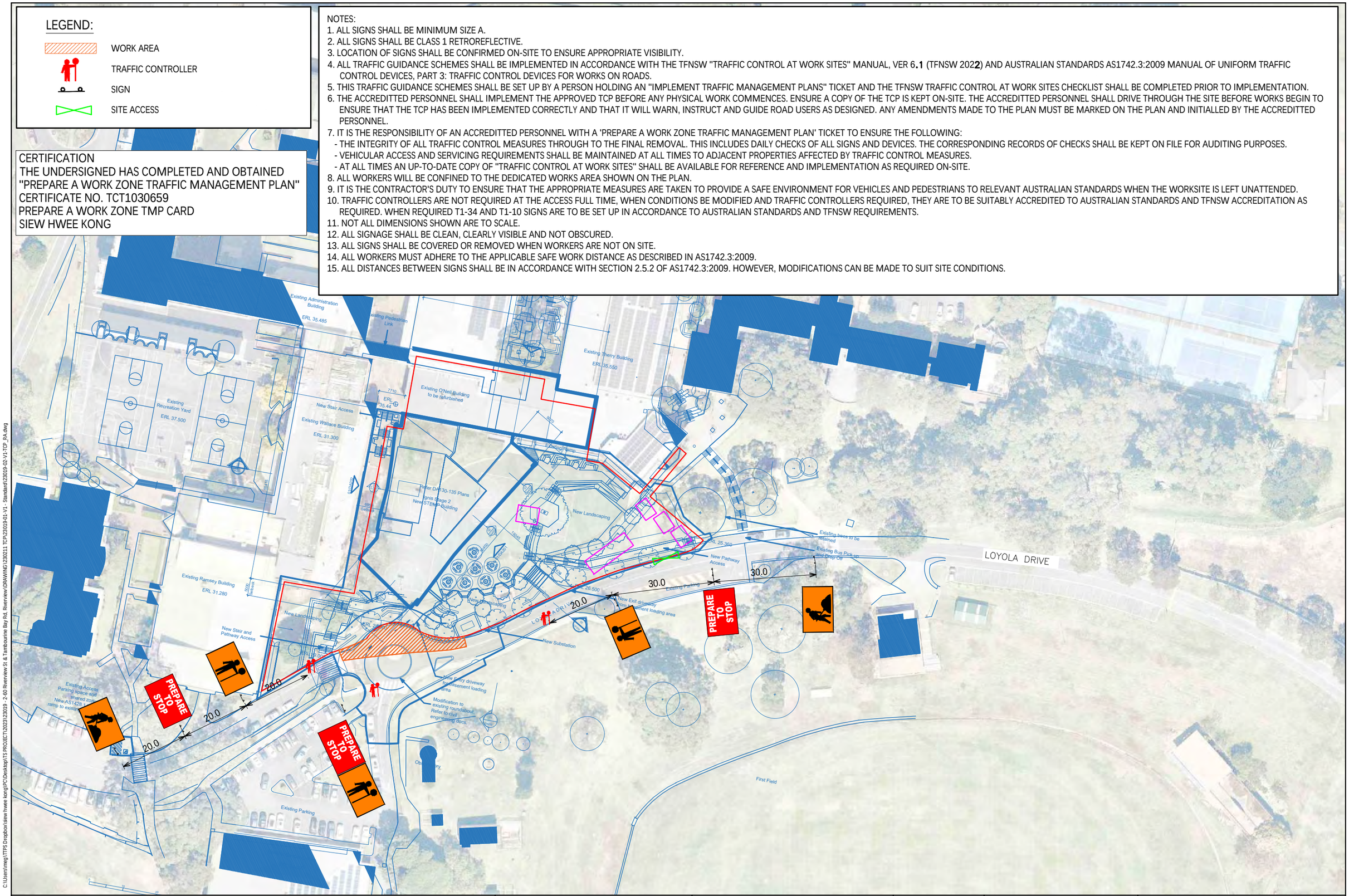

ST IGNATIUS' COLLEGE RIVERVIEW
ROUNDABOUT CONSTRUCTION (NORTHERN SECTION)
TRAFFIC GUIDANCE SCHEME

Transport Strategies

207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
PHONE 0424 007 141

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23019-02-V1-TCP_RA
A
24 February 2023

DESIGNED BY S.YOU
APPROVED BY M.KONG
SCALE A3 1:1000

Plotted by Meg Kong
C:\Users\meg\TTPS Dropbox\siew hwee kong\PC\Desktop\TS PROJECT\2023\23019 - 2-60 Riverview St & Tambourine Bay Rd, Riverview\DRAWING\230211 TCP\23019-01-V1 - Standard\23019-02-V1-TCP_RA.dwg

LEGEND:

- WORK AREA
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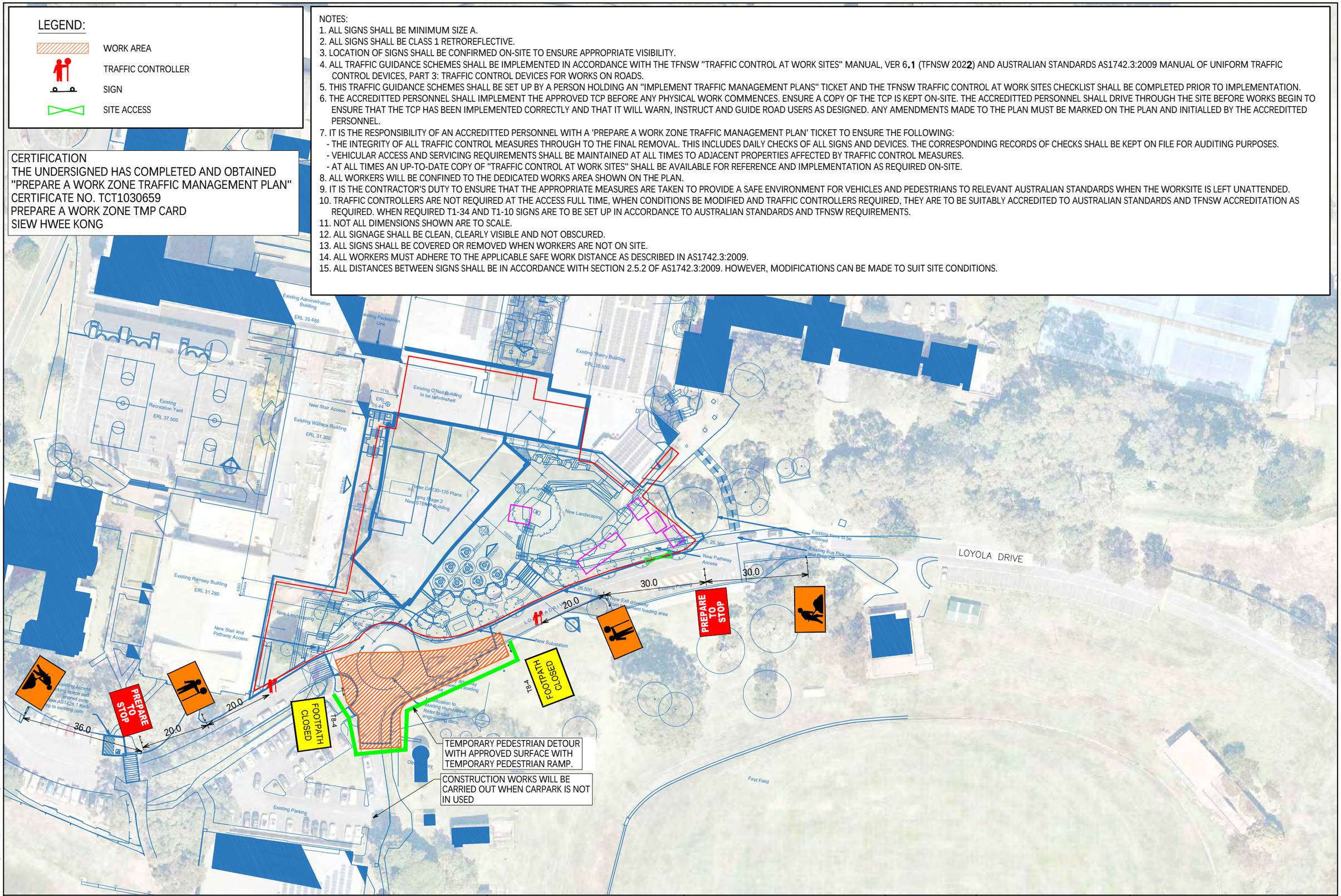

ST IGNATIUS' COLLEGE RIVERVIEW
ROUNDABOUT CONSTRUCTION (SOUTHERN SECTION)
TRAFFIC GUIDANCE SCHEME

Transport Strategies
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CONSTRUCTION WORKS GENERAL NOTES

1.ALL WORKS IN PUBLIC AREAS WILL BE WITHIN THE HOURS OF 9 AM TO 2:30 PM, 5:30 PM TO 9:00 PM MONDAY TO FRIDAY AND SUNDAY IS DEPENDANT ON APPROVAL BY DEPARTMENT OF PLANNING AND ENVIRONMENT (DPIE).

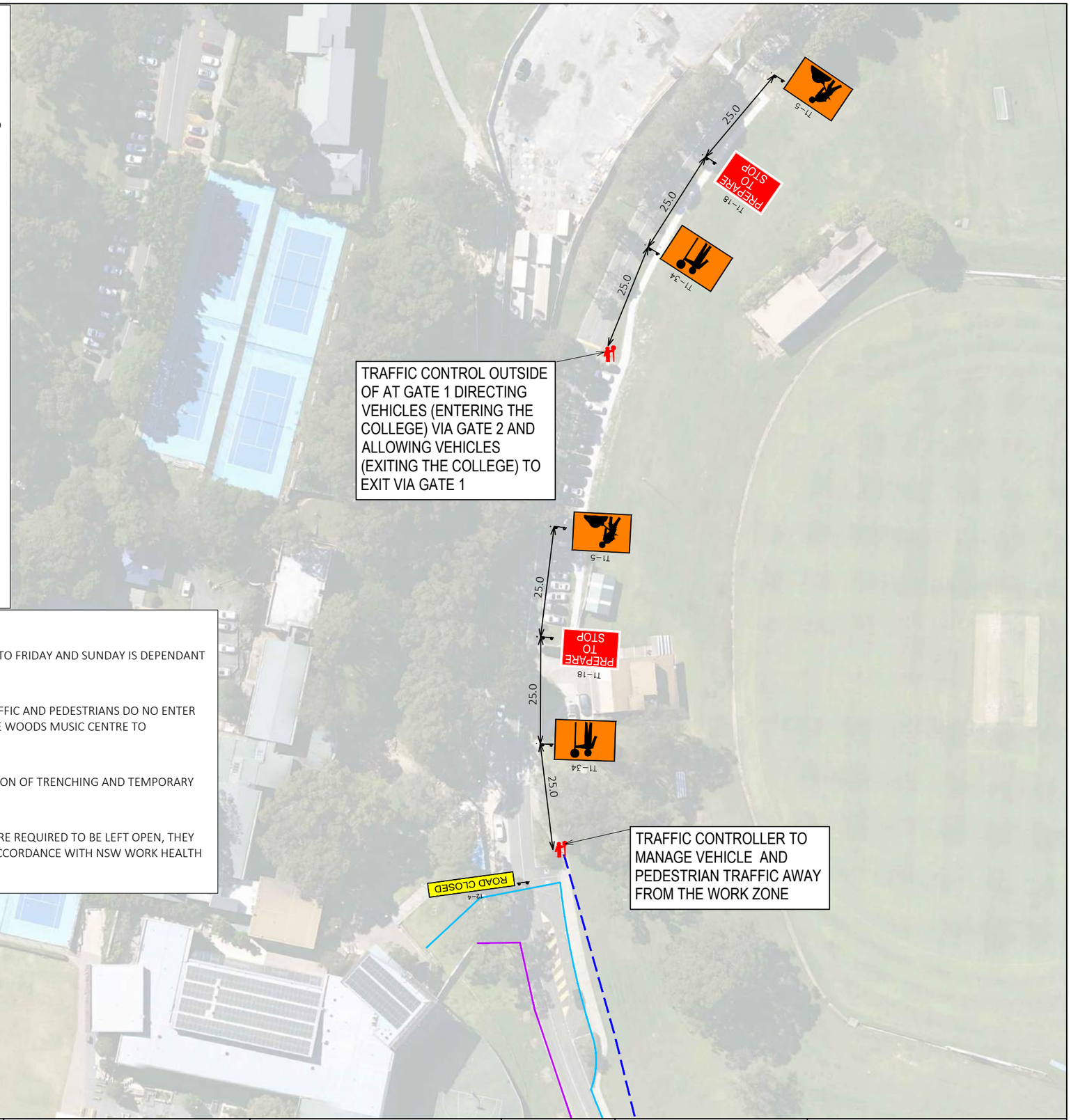
2.TRAFFIC AND PEDESTRIAN CONTROLLERS TO MAN GATES AT EITHER END OF EXCLUSION ZONES TO ENSURE TRAFFIC AND PEDESTRIANS DO NO ENTER THE AREA OF EXCAVATION. TRAFFIC CONTROL TO SET UP AT ROUNDABOUT ON TAMBOURINE BAY ROAD AND THE WOODS MUSIC CENTRE TO TURNAROUND ALL TRAFFIC

3.TEMPORARY FENCING WILL BE SET UP AROUND ALL WORKS AND MAINTAINED ON SITE FOR THE ENTIRE DURATION OF TRENCHING AND TEMPORARY FEEDER WORKS.

4.WHERE POSSIBLE ALL TRENCHES OPENED DURING THE DAY WILL BE BACKFILLED THE SAME DAY. IF TRENCHES ARE REQUIRED TO BE LEFT OPEN, THEY WILL BE SAFELY COVERED AND SEALED WITH GEOFABRIC AND WATERPROOF TARPS (TO CONTROL RUNOFF), IN ACCORDANCE WITH NSW WORK HEALTH AND SAFETY REGULATION, UNTIL EACH SECTION IS CLEARED BY HYGIENIST.

LEGEND:

- HV TRENCHING WORKS
- TEMPORARY EXCLUSION ZONE
- GARTLAN CARPARK TO BE CLOSED
- CROWD CONTROL BARRIER
- TEMPORARY ENVIRONMENTAL BUNTING
- TEMPORARY CONSTRUCTION SIGN
- PEDESTRIAN DETOUR ROUTE



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2-60 RIVERVIEW STREET & TAMBOURINE BAY ROAD, RIVERVIEW
STAGE 1 ACM ZONE 5 WORKS
TRAFFIC GUIDANCE SCHEME

Transport Strategies
207A/30 CAMPBELL STREET, BLACKTOWN NSW 2148
ABN 13 254 028 433
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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

23019-01-V1_TCP
01 OF 02
4 August 2023

DESIGNED BY R. MUHAMMAD
APPROVED BY M.KONG
SCALE A3 0 10.0 20.0 1:1000

TGS GENERAL NOTES

- ALL PUBLIC ROADS WILL HAVE A SPEED LIMIT OF 50KM/H UNLESS IDENTIFIED OTHERWISE
- NOT ALL DIMENSIONS SHOWN ARE TO SCALE
- LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY
- ALL SIGNS ARE TO BE MINIMUM SIZE A
- ALL SIGNS ARE TO BE CLASS 1 RETROREFLECTIVE
- ALL TRAFFIC GUIDANCE SCHEMES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH TFNSW'S TRAFFIC CONTROL AT WORK SITES TECHNICAL MANUAL ISSUE 6.1 (RELEASED 2022), AMENDMENT TO TDT0003:2022 AND AUSTRALIAN STANDARDS AS1742.3:2019 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS
- THIS TRAFFIC CONTROL PLAN MUST BE SET UP BY A PERSON HOLDING AN "IMPLEMENT TRAFFIC MANAGEMENT PLAN" TICKET AND TFNSW'S TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION

- THE ACCREDITED PERSONNEL SHALL IMPLEMENT THE APPROVED TGS BEFORE ANY PHYSICAL WORK COMMENCES AND ENSURE A COPY OF THE TGS IS KEPT ON-SITE. THE ACCREDITED PERSONNEL SHALL ALSO DRIVE THROUGH THE SITE BEFORE WORKS BEGIN TO ENSURE THAT THE TGS HAS BEEN IMPLEMENTED CORRECTLY AND THAT THE IT WILL WARN, INSTRUCT AND GUIDE ROAD USERS AS DESIGNED. ANY VARIATIONS TO THE PLAN MUST BE MARKED ON THE PLAN AND INITIALED BY THE ACCREDITED PERSONNEL
- IT IS THE RESPONSIBILITY OF THE AN ACCREDITED PERSONNEL WITH A 'PREPARE A WORK ZONE TRAFFIC GUIDANCE SCHEMES' TO ENSURE THE FOLLOWING:

* THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURE THROUGH TO THE FINAL REMOVAL. THIS INCLUDES DAILY CHECKS OF ALL SIGNS AND DEVICES. THE CORRESPONDING RECORDS OF CHECKS SHALL BE KEPT ON FILE FOR AUDITING PURPOSES.
* VEHICULAR ACCESS AND SERVICING REQUIREMENTS ARE TO BE MAINTAINED AT ALL TIMES TO ADJACENT PROPERTIES AFFECTED BY TRAFFIC CONTROL MEASURES
* AT ALL TIMES AN UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES TECHNICAL MANUAL" SHALL BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE

- ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN
- IF THE WORKSITE IS LEFT UNATTENDED IT IS THE CONTRACTOR'S DUTY TO ENSURE THAT THE APPROPRIATE MEASURES ARE TAKEN TO PROVIDE A SAFE ENVIRONMENT FOR VEHICLES AND PEDESTRIANS TO RELEVANT AUSTRALIAN STANDARDS
- TRAFFIC CONTROLLER (T1-34) AND PREPARE TO STOP (T1-18) SIGNS ARE TO BE COVERED OR REMOVED WHEN TRAFFIC CONTROLLER/S ARE NOT ON SITE.
- ALL SIGNAGE IS TO BE CLEAN, CLEARLY VISIBLE AND NOT OBSCURED
- ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2019
- ALL DISTANCES BETWEEN SIGNS ARE TO BE IN ACCORDANCE WITH SECTION 2.5.2 OF AS1742.3:2019. HOWEVER, MODIFICATIONS CAN BE MADE TO SUIT SITE CONDITIONS
- IF REQUIRED, A TGS MUST BE SELECTED, DEVELOPED AND IMPLEMENTED BY A SUITABILITY QUALIFIED PERSON (PWZTMP AND ITCP QUALIFICATIONS)

CONSTRUCTION WORKS GENERAL NOTES

1.ALL WORKS IN PUBLIC AREAS WILL BE WITHIN THE HOURS OF 9 AM TO 2:30 PM, 5:30 PM TO 9:00 PM MONDAY TO FRIDAY AND SUNDAY IS DEPENDANT ON APPROVAL BY DEPARTMENT OF PLANNING AND ENVIRONMENT (DPIE).

2.TRAFFIC AND PEDESTRIAN CONTROLLERS TO MAN GATES AT EITHER END OF EXCLUSION ZONES TO ENSURE TRAFFIC AND PEDESTRIANS DO NO ENTER THE AREA OF EXCAVATION. TRAFFIC CONTROL TO SET UP AT ROUNDABOUT ON TAMBOURINE BAY ROAD AND THE WOODS MUSIC CENTRE TO TURNAROUND ALL TRAFFIC

3.TEMPORARY FENCING WILL BE SET UP AROUND ALL WORKS AND MAINTAINED ON SITE FOR THE ENTIRE DURATION OF TRENCHING AND TEMPORARY FEEDER WORKS.

4.WHERE POSSIBLE ALL TRENCHES OPENED DURING THE DAY WILL BE BACKFILLED THE SAME DAY. IF TRENCHES ARE REQUIRED TO BE LEFT OPEN, THEY WILL BE SAFELY COVERED AND SEALED WITH GEOFABRIC AND WATERPROOF TARPS (TO CONTROL RUNOFF), IN ACCORDANCE WITH NSW WORK HEALTH AND SAFETY REGULATION, UNTIL EACH SECTION IS CLEARED BY HYGIENIST.

LEGEND:

- HV TRENCHING WORKS
- TEMPORARY EXCLUSION ZONE
- GARTLAN CARPARK TO BE CLOSED
- CROWD CONTROL BARRIER
- TEMPORARY ENVIRONMENTAL BUNTING
- TEMPORARY CONSTRUCTION SIGN
- PEDESTRIAN DETOUR ROUTE

CERTIFICATION
THE UNDERSIGNED HAS COMPLETED AND OBTAINED "PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN"
CERTIFICATE NO. TCT1030659
PREPARE A WORK ZONE TMP CARD
SIEW HWEE KONG

TRAFFIC CONTROLLER TO MANAGE VEHICLE AND PEDESTRIAN TRAFFIC AWAY FROM THE WORK ZONE

ROAD CLOSED T2-4

MAINTAIN 10M EXCLUSION ZONE DURING ACM REMOVAL WORKS ONLY

KISS & DROP CARPARK TO BE CLOSED DURING ACM REMOVAL WORKS

PEDESTRIAN TO BE DIVERTED ONTO GRASS VERGE BELMADAR TO PROVIDE PEDESTRIAN BARRIER

MAINTAIN MINIMUM 10M CLEARANCE TO WORK ZONE

NO ACCESS BEHIND GARTLAN CENTRE

GARTLAN CENTRE ROUNDABOUT AND CARPARK TO BE CLOSED ONLY DURING ZONE 5 WORKS

TRAFFIC CONTROLLER TO CONTROL PEDESTRIAN TRAFFIC AROUND WORK ZONE

LOYOLA DRIVE

T1-5

PREPARE TO STOP T1-18

T1-34

ROAD CLOSED T2-4

25.0

25.0

25.0

LOYOLA DRIVE

TRAFFIC CONTROLLER TO DIRECT ALL TRAFFIC TO TURN AROUND AS REQUIRED

ROAD CLOSED AT WHARF LANE

WHARF LANE

2-60 RIVERVIEW STREET & TAMBOURINE BAY ROAD, RIVERVIEW
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Transport Strategies

Appendix F
Curriculum Vitae

Curriculum Vitae

Transport Strategies

1 Curriculum vitae for Meg Kong

Current position	Director
Name of organisation	Transport Strategies Alliance Pty Ltd
Address	207A/30 Campbell Street, Blacktown 2148
Phone	0424 007 141
Email	technical@transportstrategies.com.au
No. of years' experience relevant to this position	16 years

2 Summary and key attributes

Meg Kong is a civil engineer with higher academic credentials in transport planning, traffic engineering, transport economic, and transportation design. She has a combined 18 years of rich research and practical experience in the field of transport planning and traffic engineering in Australia, United States, Singapore and Malaysia. Meg has been involved in various traffic impact assessment, transport master planning studies, road feasibility studies, comprehensive urban and regional transportation studies, and traffic management plans. She has gained an insight into actual handling of tasks in various projects of varying scope and dimensions for both local and international clients in both the private and public sectors.

3 Professional Experience

Period			Company	Position	Project Description
2022	to	Current	Transport Strategies Alliance	Director	Key projects of relevance include: - 31 Fox Street, Lane Cove - 180 River Rd, Lane Cove - 13-19 Canberra Avenue, St Leonards - 235 Burns Bay Road, Lane Cove - 47a Penrose Street, Lane Cove - 2 Apollo Place, Lane Cove West - 640, 642 & 646 Mowbray Road, Lane Cove North - 47 & 51 Mindarie Street, Lane Cove North - 1a Epping Road, Lane Cove - 1b Bridge Street, Lane Cove - 2 Canberra Ave, St Leonards - 320-322 Pacific Highway, Lane Cove

Curriculum Vitae

Transport Strategies

Period			Company	Position	Project Description
2022	to	Current	Ason Group (contractor)	Principal – Traffic Management & Operations	Key projects of relevance include: - Various Rapid Transport Assessments, and Transport Planning Assessment for School Infrastructure NSW (NSW Department of Education) for over 5 public school projects - Soper Place Redevelopment Project for Penrith City Council - Ivanhoe Estate Redevelopment Project (Frasers Property's Midtown project) Stages 2 and 3
2022	to	Current	Trafek (contractor)	Construction Traffic Manager	Key projects of relevance include: - Sydney Metro Southwest and Sydenham Station Upgrade - Botany Rail Duplication - MTMS Stage 2 – South Works Package
2018	to	2022	Transport and Traffic Planning Associates	Associate	Key projects of relevance include: - Sydney Modern Project – Art Gallery NSW - Walsh Bay Arts Precinct Redevelopment - Kent Road Public School Upgrade - Majors Bay Road Commercial Parking Study and Assessment - Drummoyne Commercial Parking Study and Assessment - Nepean Private Hospital Expansion Stage 1 - Prestons Logistics Estate - Lachlan's Line, Epping Road, North Ryde
2016	to	2018	GTA Consultants	Associate	Key projects of relevance include: - Langston Place - 2 Percy Street, Auburn - Wagga Wagga Base Hospital (WWBH) Redevelopment - Biala Wind Farm
2014	to	2016	Gamuda, Malaysia	Manager - Transport Planning	Key projects of relevance include: - Penang State Transport Masterplan - Penang South Islands Masterplan - Gamuda Cove, Tanjung Dua Belas Township - Gamuda Gardens, Serai Masterplan - Bandar Botanic Township

2013	to	2014	Sinclair Knight Merz/Jacobs, Malaysia	Senior Transport Planner	Key projects of relevance include: - Kinrara–Damansara Expressway - Mass Rail Transit Line Transport Management Plan - Petaling Jaya Sentral Transport Masterplan - Bandar Malaysia Masterplan
2012	to	2013	Atur Trafik, Malaysia	Senior Traffic & Transport Consultant	Key projects of relevance include: - Mines Wonderland - Bandar Malaysia Masterplan
2008	to	2012	Y&C Transportation, USA	Senior Transport Engineer	Key projects of relevance include: - I-680 HOT Lane in Alameda and Santa Clara Counties - I-580 HOT Lane in Alameda County - US 101 HOV Lane in Sonoma County - Lane in the City of Palo Alto - I-880 HOV Lane in City of San Leandro - I-580 Extension Reno, 8 miles of 8-lane freeway including 2 interchanges
2007	to	2008	Kimley-Horn & Associates, USA	Transport and Traffic Analyst	Key projects of relevance include: - Tri-State Rail Passenger Demand Study, Florida

4 Academic qualifications

Academic Qualifications	Institution	Year of Graduation
MSc, Civil Engineering	Purdue University, USA	2007
BSc, Civil Engineering	Purdue University, USA	2005
Minor, Psychology	Purdue University, USA	2005

5 Professional qualifications and memberships

Qualification	Certificate Number	Expiry Date
SafeWork NSW 'Prepare a Work Zone Traffic Management Plan'	TCT1030659	NIL
Design Practitioner Registration Number:	DEP0000127	July 2024
Professional Engineer Registration Number:	PRE0000121	July 2024

Transport Strategies