RICHARD CROOKES
CONSTRUCTIONS

CHATSWOOD EDUCATION PRECINCT - UCPSCHS
SSD 9483

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

2 June 2021

CONTENTS

GLOSSARY

Term	Definition
Approved disturbance area	The area identified as such on the development layout
CEMP	Construction Environmental Management Plan
Conditions of consent	Conditions contained in Schedule 2 of the Development Consent for SSD 9483
Department	NSW Department of Planning, Industry and Environment.
EIA	Environmental impact assessment. This includes the approved documents prepared to support an application for consent or approval of a project, and any subsequent modifications to the application or proposed project, including (as relevant) further environmental impact assessments and responses to submissions.
EIS	Environmental impact statement prepared by the proponent for a state significant project application.
Environmental aspect	As defined by AS/NZS ISO 14001:2015 as an element of an organisation's activities, products or services that can interact with the environment. They can be direct or indirect.
Environmental control map or plan	A plan or map that identifies the location of physical protection measures, work method controls and monitoring requirements to minimise the impact of project activities on the environment and community in and adjoining a specific work area.
Incident	An occurrence or set of circumstances that causes, or threatens to cause, material harm and which may or may not be or cause a non-compliance.
Material harm	Harm that: • involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial • Results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000, (such 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).
Minister	NSW Minister for Planning and Public Spaces (or delegate or nominee, including the Secretary of the Department of Planning, Industry and Environment)
Mitigation	Actions or measures to reduce the impacts of a project.
Non-conformance	Failure to comply with an environmental requirement, standard, or procedure.
Non-compliance	An occurrence and/or set of circumstances that breach the conditions of consent and/or any other legal requirement.
Phase	A distinct period in the project (for example construction, operation, decommissioning).
Project (or 'The Project)	The construction process required to complete the works described in the SSD 9483 Conditions of Consent.
Proponent	The person or entity that is referred to as the proponent in an approval or the applicant in a consent or any other person carrying out any part of the development to which the approval or consent applies.
Planning Secretary	Planning Secretary under the Environmental Planning and Assessment Act 1979, or nominee. (Note references to the Planning Secretary in legislation now refer to the 'Secretary of the Department of Planning, Industry and Environment)

PMP	Project Management Plan – RCC internal project management document
RCC	Richard Crookes Constructions Pty Ltd
Stage	A discrete sequence of activities undertaken to complete one or many activities within the project scope. A project can have several stages which can extend throughout multiple phases.
SSD	State Significant Development

REVISION REGISTER

REVISION DATE	REVISION DESCRIPTION	PREPARED BY	APPROVED BY
27/04/2021	Revision 1 – For SI Comment	Obadiah Williams (RCC – Project Engineer)	Andrew Buchanan (RCC – Project Director)
02/06/2021	Revision 2 – For SI Comment	Obadiah Williams (RCC – Project Engineer)	Andrew Buchanan (RCC – Project Director)

Project Stage – This EMP relates specifically to the Construction of the SSD 9483 – Chatswood Education Precinct development. Staged construction is not proposed (as per the staging report), therefore this CEMP relates to all construction works.

Project Phase – This EMP relates specifically to the Construction phase of the SSD 9483 – Chatswood Education Precinct development.

CEMP CONDITION COMPLIANCE TABLE

Each Sub-Plan has an included Condition Compliance Table, with specific section and page number references. The below table is high level, and directs to each appendix/sub-plan.

Condition	Condition Requirements	Document/Sub-Plan Reference
B19	Prior to the commencement of construction, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the Certifier and provide a copy to the Planning Secretary for information. The CEMP must include, but not be limited to, the following:	
	(a) Details of:	Section 2.4, Page 20
	(i) hours of work;	
	(ii) 24-hour contact details of site manager;	
	(iii) management of dust and odour to protect the amenity of the neighbourhood;	Appendix 6.9, CSWMSP
	(iv) external lighting in compliance with AS 4282-2019 Control of the obtrusive effects of outdoor lighting;	Appendix 6.10, Design Certificates
	(v) community consultation and complaints handling as set out in the Community Communication Strategy required by condition B14;	Appendix 6.11, CCS
	(b) an unexpected finds protocol for contamination and associated communications procedure to ensure that potentially contaminated material is appropriately managed;	Appendix 6.5
	(c) an unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communications procedure;	Appendix 6.6
	(d) Construction Traffic and Pedestrian Management Sub-Plan (see condition B20);	Appendix 6.7
	(e) Construction Noise and Vibration Management Sub-Plan (see condition B21); and	Appendix 6.8
	(f) Construction Soil and Water Management Sub-Plan (see condition B23).	Appendix 6.9

Condition	Condition Requirements	Document/Sub-Plan Reference
B20	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:	Appendix 6.7
	(a) be prepared by a suitably qualified and experienced person(s);	
	(b) be prepared in consultation with Council and TfNSW;	
	(c) 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;	
	(d) detail heavy vehicle routes, access and parking arrangements;	
	(e) implement a public information campaign to inform the community of any road changes well in advance of the changes;	
	(f) confine temporary road closures to weekends and off-peak hour times;	
	(g) prior to implementation of any road closure during construction, Council must be advised of these changes and a Traffic Control Plan must be submitted to Council for approval;	
	(h) a Traffic Control Plan must include times and dates of changes, signage, road markings and any temporary traffic control measures; and	
	(i) construction access from the Pacific Highway is not permitted unless otherwise approved by TfNSW.	
	(j) a construction zone is not permitted on the Pacific Highway unless otherwise approved by TfNSW.	

Condition	Condition Requirements	Document/Sub-Plan Reference
B21	The Construction Noise and Vibration Management Sub-Plan must address, but not be limited to, the following:	Appendix 6.8
	(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);	
	(c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;	
	(d) include strategies that have been developed with the community for managing high noise generating works;	
	(e) describe the community consultation undertaken to develop the strategies in condition B21(d);	
	(f) include a complaints management system that would be implemented for the duration of the construction; and	
	(g) include a program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the implemented management measures in accordance with the requirements of condition B18.	
B23	The Applicant must prepare a Construction Soil and Water Management Sub-Plan (CSWMSP) and the plan must address, but not be limited to the following:	Appendix 6.9
	(a) be prepared by a suitable qualified expert, in consultation with Council;	
	(b) measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;	
	(c) describe all erosion and sediment controls to be implemented during construction, including as a minimum, measures in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th Edition, Landcom 2004) commonly referred to as the 'Blue Book';	
	(d) provide a plan of how all construction works will be managed in a wet-weather events (i.e., storage of equipment, stabilisation of the Site);	
	(e) detail all off-Site flows from the Site; and	
	(f) describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to 1 in 5-year ARI and 1 in 100-year ARI.	

Condition	Condition Requirements	Document/Sub-Plan Reference
The below conditions are not strictly required to be included in the CEMP as per Condition B19 but have been included for information as they relate to the contents and intent of the CEMP Sub-Plans. See condition specific wording for submission and approval requirements.		
B24	A Driver Code of Conduct must be prepared and communicated by the Applicant to heavy vehicle drivers and must address the following:	Appendix 6.7
	(a) minimise the impacts of earthworks and construction on the local and regional road network;	
	(b) minimise conflicts with other road users;	
	(c) minimise road traffic noise; and	
	(d) ensure truck drivers use specified routes.	
B35	Prior to the commencement of construction, evidence of compliance of construction parking and access arrangements with the following requirements must be submitted to the Certifier:	Appendix 6.7
	(a) all vehicles must enter and leave the site in a forward direction;	
	(b) the swept path of the longest construction vehicle entering and exiting the site in association with the new work, as well as manoeuvrability through the site, is in accordance with the latest version of AS 2890.2;	
	(c) the safety of vehicles and pedestrians accessing adjoining properties, where shared vehicle and pedestrian access occurs, has been addressed; and	
	(d) no construction vehicle access is permitted from the Pacific Highway vehicular entrance unless otherwise approved in writing by TfNSW.	

1 INTRODUCTION

1.1 PURPOSE AND SCOPE

This Construction Environmental Management Plan (CEMP) has been prepared by Richard Crookes Constructions Pty Ltd for the Chatswood Education Precent Stage 3 Project (Upgrades to Chatswood High School & Public School)

This CEMP and its sub-plans have been developed in accordance with the SSD 9483 Conditions of Consent, Richard Crookes Constructions' environmental management systems, the relevant project approval documentation and the Environmental Management Plan Guideline: Guideline for Infrastructure Projects DPIE April 2020).

The purpose of this Construction Environmental Management Plan is to:

- Identify the environmental issues (aspects and impacts) for this project;
- Maintain Compliance with the SSDA;
- Establish, communicate & implement environmental operational controls to reduce any adverse impacts on the environment from RCC's activities, products and services.
- Implement and Monitor compliance by RCC and its suppliers & subcontractors with the requirements of all relevant environmental legislation, conditions of any applicable licence, approval and permit, regulatory requirements and this EMP.
- Action any outcomes from incidents or accidents, project audits or other identified non-conformances to continually improve the RCC environmental management system.

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1.2 OBJECTIVES

The principal objectives of the CEMP are:

- Ensure that the construction works are carried out in accordance with the appropriate environmental statutory requirements
- Ensure that the works are carried out in such a way as to minimise potential environmental degradation by the implementation of environmental best practice
- Ensure that personnel engaged in the work comply with the CEMP
- Respond to changes in environmental conditions during the proposed works through review, monitoring and control programs
- Ensure corrective actions are implemented in a timely manner

This CEMP is the overarching document for environmental management of the Project, with a number of supporting management documents. It is applicable to all personnel associated with the completion of the Project works, including Project Managers, Contractors and Sub-Contractors.

1.3 ENVIRONMENTAL POLICY

Richard Crookes Constructions Pty Ltd implements an Environmental Management System that is certified by Global mark as meeting the requirements of AS/NSW ISO 14001:2016 Environmental Management Systems. RCC's Environmental Policy can be found in Appendix 6.10 of this CEMP. It is provided as an Appendix so that it may be updated in isolation as required.

This CEMP is not staged, as it applies to the entire construction phase of the Project.

2 PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW

Both Chatswood Public School (CPS) and Chatswood High School (CHS) have seen significant enrolment growth with resulting pressure on available space and facilities at each school given their reputation for educational excellence, including opportunity classes at the Public School and a selective stream at the High School.

The Chatswood Public School SSD 9483 works include new Buildings P1, P2, G and V.

Specifically, the Project will provide:

- 53 Classrooms (comprising 25 existing, 28 new spaces);
- Four (4) x special program classrooms (music, language etc);
- Three (3) x special support unit classrooms;
- Increased quality play spaces;
- Retention of heritage buildings A and B;
- New hall;
- New car parking facilities and
- Associated site works and landscaping.

The Chatswood High School SSD 9483 works include new Buildings S, Q and T.

Specifically, the Project will provide:

- 118 Classrooms (comprising 18 existing, 18 upgraded and 82 new spaces);
- Four (4) x special support unit classrooms;
- New administration and staff facilities;
- New hall; and
- Associated site works and landscaping.

2.2 SITE LOCATION PLAN

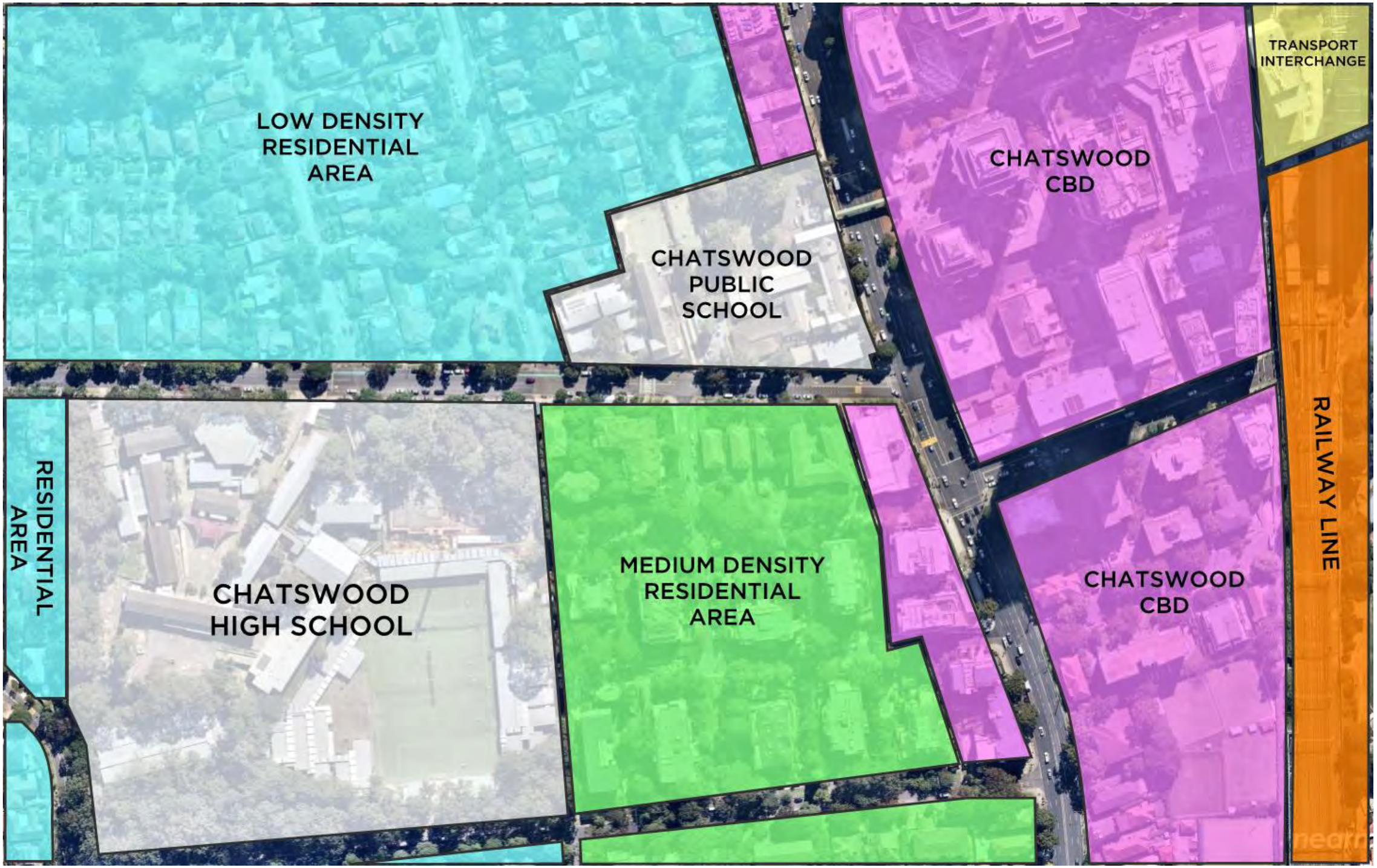
As the Project includes works across two separate sites on a large footprint, this CEMP includes several site context plans to comprehensively communicate the relevant information in a clear manner.

Please find overleaf:

- **Site Context – Major Roads**
- **Site Context – Surrounding Land Use**
- **Site Context – Works Description**
- **Site Context – Construction setup (HS)**
- **Site Context – Construction Setup (PS)**

Site Context – Major Roads

Site Context – Surrounding Land Use



Site Context – Works Description

Public School

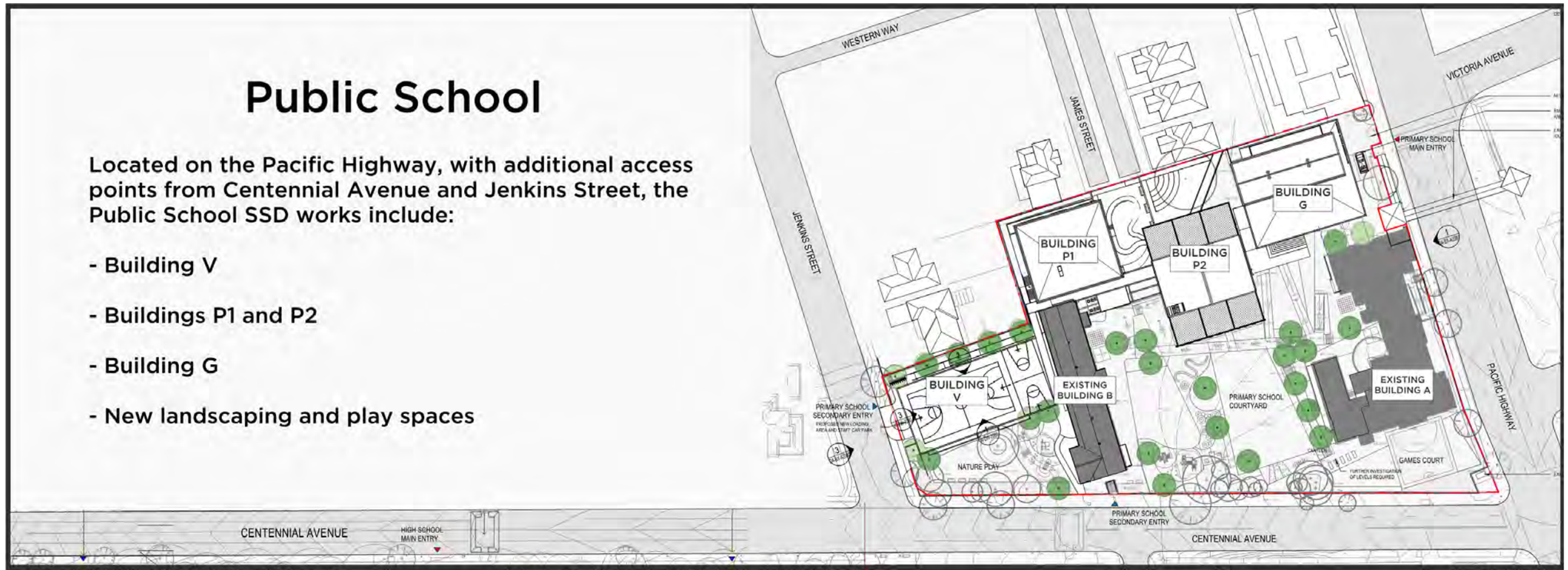
Located on the Pacific Highway, with additional access points from Centennial Avenue and Jenkins Street, the Public School SSD works include:

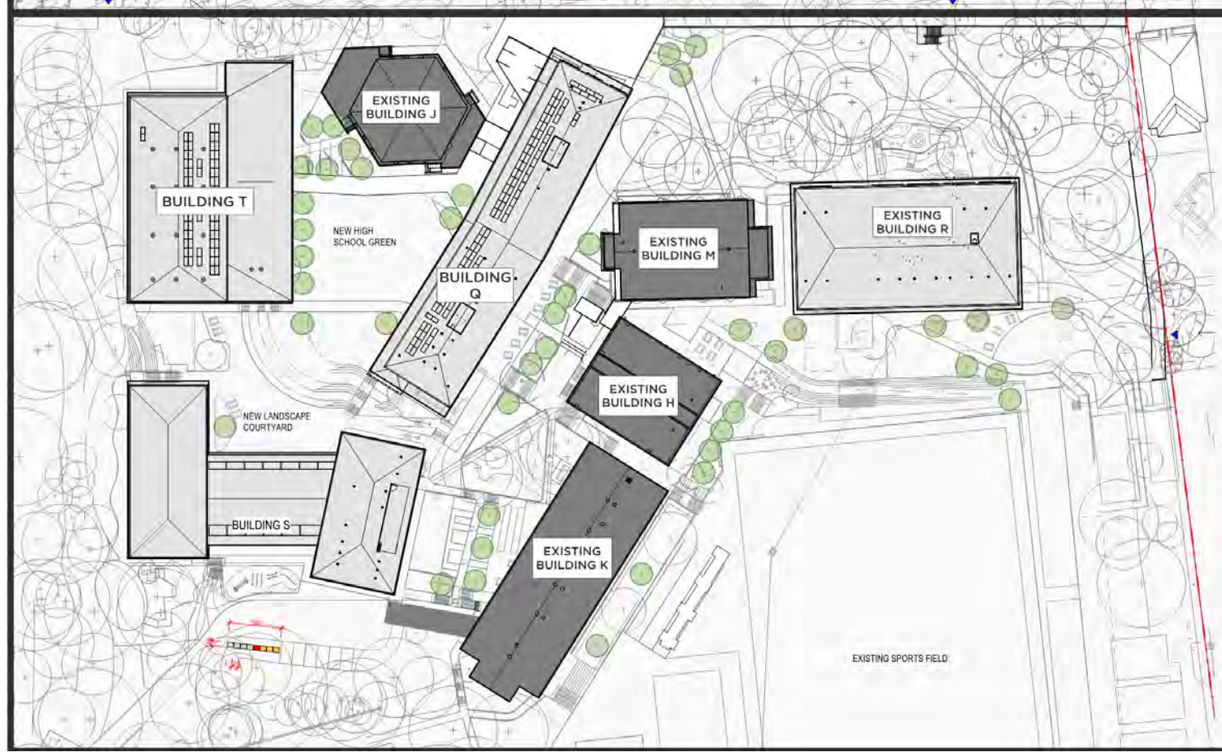
- Building V

- Buildings P1 and P2

- Building G

- New landscaping and play spaces





High School

Located on Centennial Avenue, with additional access points from De-Villiers Avenue, Eddy Road, Freeman Road and Oliver Road, the High School SSD works include:

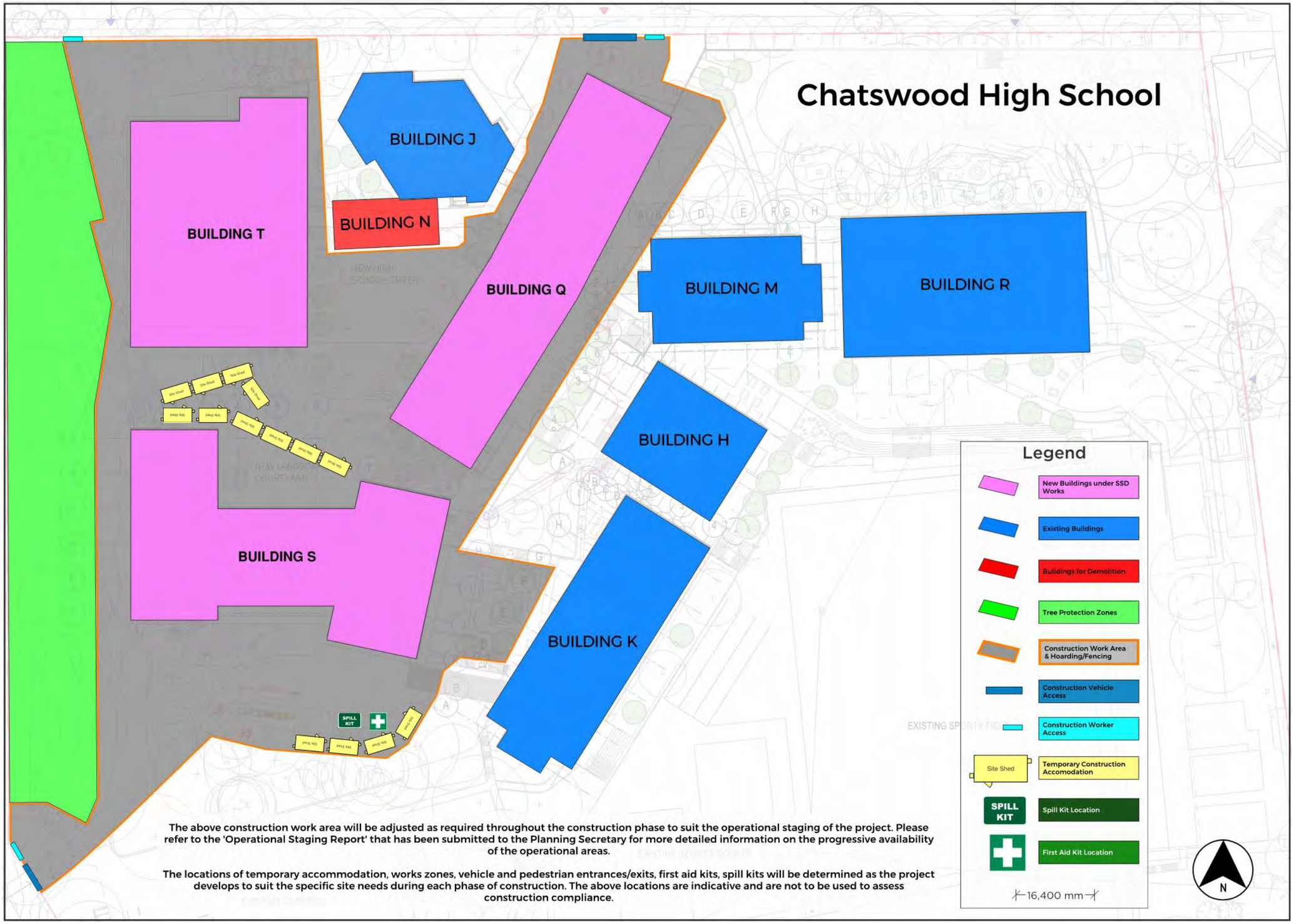
- Buildings S

- Building Q

- Building T

- New landscaping

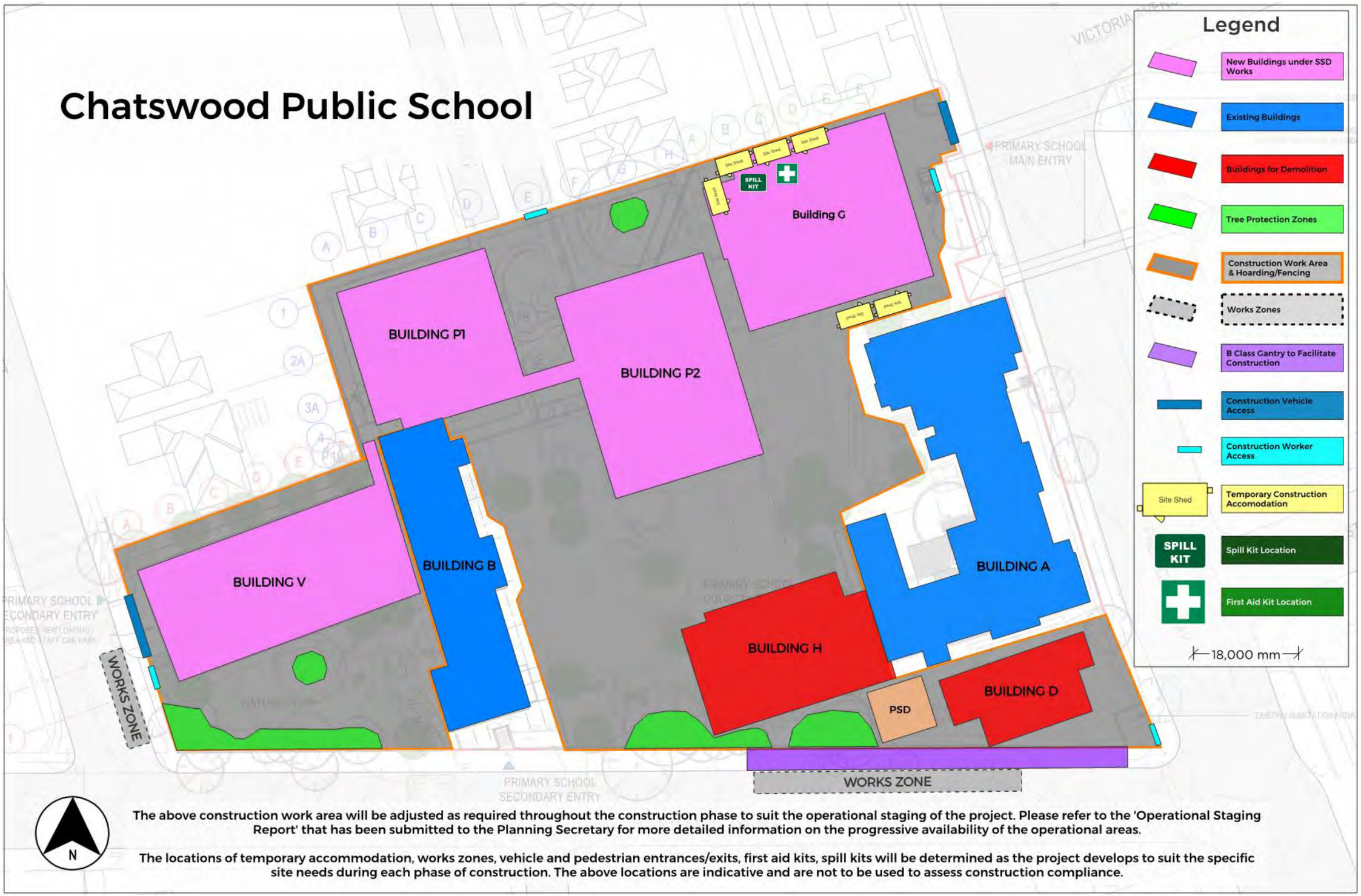
Site Context – Construction Setup (HS)



The above construction work area will be adjusted as required throughout the construction phase to suit the operational staging of the project. Please refer to the 'Operational Staging Report' that has been submitted to the Planning Secretary for more detailed information on the progressive availability of the operational areas.

The locations of temporary accommodation, works zones, vehicle and pedestrian entrances/exits, first aid kits, spill kits will be determined as the project develops to suit the specific site needs during each phase of construction. The above locations are indicative and are not to be used to assess construction compliance.

Site Context – Construction Setup (PS)



2.3 SCOPE OF WORKS

Scope of Works

The scope of works of this development include:

1. Demolition of existing Buildings I, H and D on the Public School.
2. Construction of Buildings P1, P2, G and V on the Public School site, as well as new landscaped areas adjacent to these buildings and across the site.
3. Progressive remediation of the Public School site.
4. Construction of Buildings S, Q and T on the High School, as well as extensive new landscaping adjacent to these buildings.

This CEMP will apply to all construction activities relating to the project, including:

- Site establishment and installation of hoardings
- Tree removal
- Installation of scaffolding and hoarding
- Removal of demountables and trees
- Earthworks and site remediation
- Erect tower crane for loading and unloading purposes
- Construct new school buildings and learning spaces
- Construct car park and sports court areas
- Install services and internal finishes
- Finalise external and internal works and landscape

Limits of Activities

The construction activities will be limited to a construction area that is isolated from the operational school sites, and will be sequenced in a fashion that minimises the live construction works, mitigating the associated risks from conducting the entire package of works at one time.

indicative plant and equipment

- *Excavators*
- *Rollers*
- *Mobile Cranes*
- *Piling machines*
- *Trucks (deliveries, haulage etc.)*
- *Concrete trucks*
- *Concrete pumps*
- *Tower Cranes*
- *Generators*

The above list is indicative only. All plant and equipment required to complete the Project works will be used.

2.4 TIMING OF ACTIVITIES

Hours of Work

Construction activities will be carried out in accordance with the following approved work hours in accordance with SSDA consent conditions C4 to C8:

C4. Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

(a) between 7am and 6pm, Mondays to Fridays inclusive; and

(b) between 8am and 1pm, Saturdays.

No work may be carried out on Sundays or public holidays.

C5. Notwithstanding condition C4, provided noise levels do not exceed the existing background noise level plus 5dB, works may also be undertaken during the following hours:

(a) between 6pm and 7pm, Mondays to Fridays inclusive; and

(b) between 1pm and 4pm, Saturdays.

C6. Construction activities may be undertaken outside of the hours in condition C4 and C5 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.

C7. Notification of such construction activities as referenced in condition C6 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

C8. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:

(a) 9am to 12pm, Monday to Friday;

(b) 2pm to 5pm Monday to Friday; and

(c) 9am to 12pm, Saturday.

24 Hour Contact Details

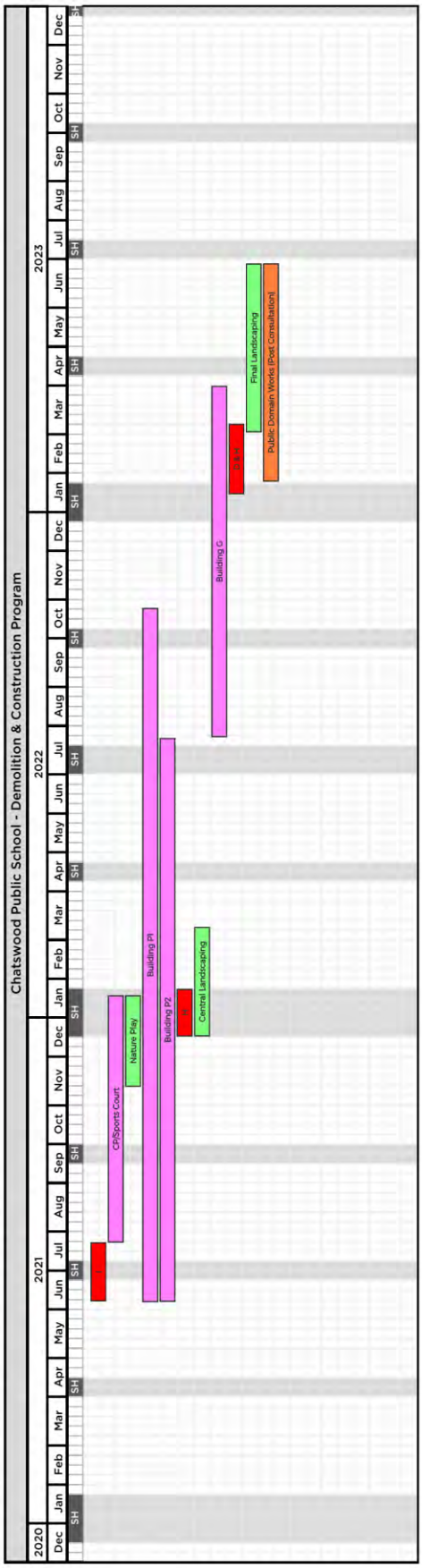
Name	Title	Phone Number
John Peacock	Site Manager	0414 601 547
Thomas Price	Project Engineer	0438 475 262
Obadiah Williams	Project Engineer	0416 224 282

Sequencing of Works

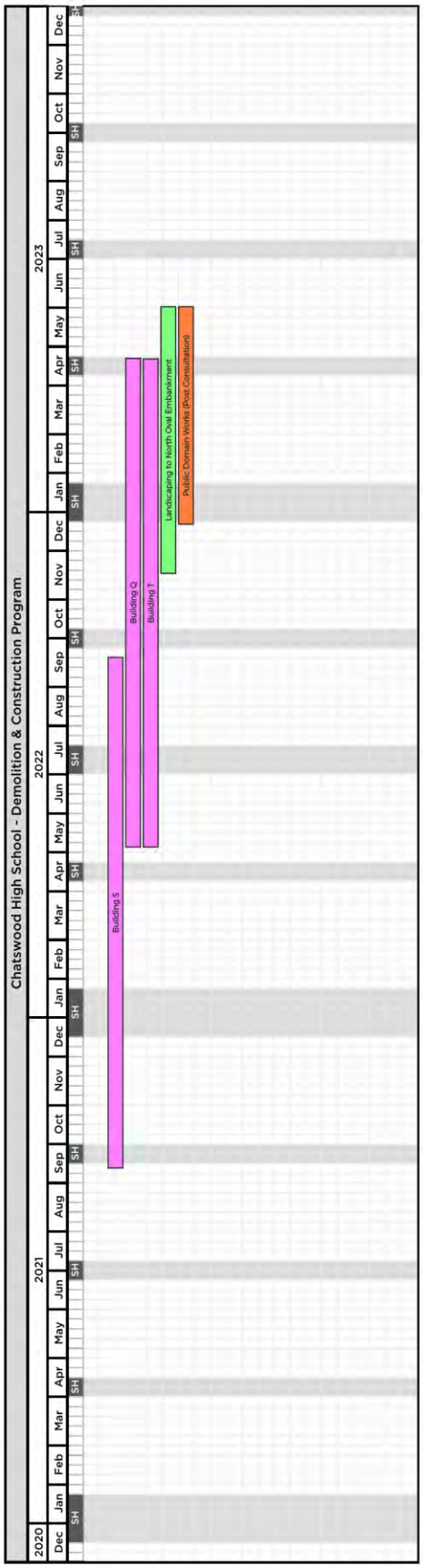
The Public School and High School works will be undertaken separately of each other, as the occupation and operation of the individual buildings will occur independently of each other between the sites.

Further detail can be found in the Operational Staging Report that has been submitted to DPIE for review and approval, but a summary of the sequence is shown in the below graphic:

Public School - Construction Program



High School - Construction Program



(Red tasks = Demolition, Purple tasks = New Buildings and adjacent landscaping to those buildings, Green tasks = General landscaping).

*The above graphic is indicative only, and subject to change as required by the Project.

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3 COMMUNITY AND STAKEHOLDER ENGAGEMENT

A Community Communication Strategy has been prepared as required by, and in accordance with SSD Condition B14.

This will be submitted to the Planning Secretary and will be made available on the School Infrastructure NSW website as required.

All information pertaining to community and stakeholder engagement for the SSD 9483 works can be found in this strategy.

4 ENVIRONMENTAL MANAGEMENT FRAMEWORK

4.1 RELATIONSHIP TO AN EXISTING ENVIRONMENTAL MANAGEMENT SYSTEM

This CEMP is a supplementary document to RCC's Environmental Management System that is certified by Global mark as meeting the requirements of AS/NSW ISO 14001:2016 Environmental Management Systems.

RCC's Environmental Management Plan itself is included within RCC's Project Management Plan (PMP).

Some information has been copied into this CEMP for clarity, any reference in this CEMP to the PMP, QAP's or various forms is a reference to RCC's internal management system.

4.2 ENVIRONMENTAL MANAGEMENT STRUCTURE AND RESPONSIBILITIES

	Site Responsibility/Management															RCC Business Systems Management									
Project Environmental Roles & Responsibilities *Insert More Roles/Responsibilities as the Project develops*	Project Manager	Site Manager	Engineer	Contract Manager/Administrator	Design Manager	Cadet	Foreman	QA Officer /Finishes Foreman	WHS & Env Coordinator	Leading Hand	Construction worker	Subcontractors				Construction Director//Manager	Business Systems QA.ENV Manager	Human Resources Manager	WHS Manager	Rehabilitation Coordinator	Commercial Manager	External Auditors			
ENVIRONMENTAL MANAGEMENT																									
Identification of project environmental risks (aspects & impacts) and development of the EMP to document controls		•							•																
Planning & conducting training incl. inductions																	•	•	•						
Inspections, monitoring & testing		•							•								•		•						
Compliance with the EMP, corrective & preventative action		•							•								•					•			
Verification of compliance (audits) and review of system effectiveness (i.e. is it working as planned?)	•	•							•								•					•			
Incident management & emergency response		•							•								•		•						
Environmental Policy, objectives & targets		•							•							•	•								
Allocation of resources for Environmental management		•							•							•									
Compliance with legal & other requirements		•							•							•	•								
Keeping abreast of changes in legal & other requirements	•	•							•								•								
Acquire & disseminate environmental management information		•							•								•								
Develop & implement procedures		•							•								•								
Assessing suppliers/subcontractors' abilities to comply with the EMS		•							•								•								
Ensuring compliance with RCC procedures and site rules		•							•			•					•								
Monitoring or technological changes & management practices		•							•							•	•								
Liaise with regulatory authorities (Local Council, Heritage Office, DECCW etc.)	•	•							•								•								
Management of community complaints	•	•							•							•									

4.3 LEGAL AND COMPLIANCE REQUIREMENTS

Legislation	Objectives & Application	Relevance
Federal		
Environment Protection and Biodiversity Conservation Act 1999	The Environment Protection and Biodiversity Conservation Act (EPBC) 1999 aims to: • Provide for the protection of the environment, especially matters of national environmental significance • Conserve Australia's biodiversity • Protect biodiversity internationally by controlling the international movement of wildlife • Provide a streamlined environmental assessment and approvals process where matters of national environmental significance are involved • Protect our world and national heritage • Promote ecologically sustainable development.	The Project has a consent requirement to purchase biodiversity offset credits, see Conditions B27-B32.
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	The purposes of this Act are the preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters, being areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition.	This Act is applicable to the Project in the event of an Unexpected Find of an Aboriginal object.
National Environmental Protection Council Act 1994	The object of this Act is to ensure that, by means of the establishment and operation of the National Environment Protection Council: • People enjoy the benefit of equivalent protection from air, water, or soil pollution and from noise, wherever they live in Australia; and • Decisions of the business community are not distorted, and markets are not fragmented, by variations between participating jurisdictions in relation to the adoption or implementation of major environment protection measures.	The Council may make national environment protection measures that will influence the completion of the Project. See Act for further detail.

Legislation	Objectives & Application	Relevance
Federal		
National environmental Protection measures (Implementation) Act 1998	The objects of this Act are: • to make provision for the implementation of national environment protection measures in respect of certain activities carried on by or on behalf of the Commonwealth and Commonwealth authorities; and • to protect, restore and enhance the quality of the environment in Australia, having regard to the need to maintain ecologically sustainable development; and • to ensure that the community has access to relevant and meaningful information about pollution.	Under this Act, the Environment Minister may (subject to considerations of national interest or administrative efficiency): • Apply State laws to the activities of the Commonwealth or Commonwealth authorities in Commonwealth places • Apply State or Territory laws to the activities of the Commonwealth or Commonwealth authorities in other places.
NTC Brochure: Load Restraint Guide 2004	The Load Restraint Guide 2018 provides truck drivers, operators, and everyone in the transport chain of responsibility with basic safety principles for the safe carriage of loads.	All drivers (where relevant) must follow this guide when transporting goods to and from the Project.

Legislation	Objectives & Application	Relevance
State		
Waste Avoidance and Resource Recovery Act 2001	The objects of this Act are as follows: • To encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of • ecologically sustainable development, • To ensure that resource management options are considered against a hierarchy of the following order: (i) Avoidance of unnecessary resource consumption, (ii) Resource recovery (including reuse, reprocessing, recycling and energy recovery), (iii) Disposal, • To provide for the continual reduction in waste generation, • To minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste, • To ensure that industry shares with the community the responsibility for reducing and dealing with waste, • To ensure the efficient funding of waste and resource management planning, programs and service delivery, • To achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis, • To assist in the achievement of the objectives of the Protection of the Environment Operations Act 1997.	Waste Avoidance and Resource Recovery Act 2001 Establishes the waste hierarchy. Promotes waste avoidance and resource recovery by developing waste avoidance and resource recovery strategies. Provides requirements for waste avoidance and resource recovery

Legislation	Objectives & Application	Relevance
State		
State Environmental Planning Policy No 55 - Remediation of Land	The object of this Policy is; • To provide for a State-wide planning approach to the remediation of contaminated land. In particular, this Policy aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment: • By specifying when consent is required, and when it is not required, for a remediation work, and • By specifying certain considerations that are relevant in rezoning land and in determining development applications in general and development applications for consent to carry out a remediation work in particular, and • By requiring that a remediation work meet certain standards and notification requirements.	The site is to be remediated in accordance with State Environmental Planning Policy 55 – Remediation of Land (SEPP 55).

Legislation	Objectives & Application	Relevance
State		
Protection of the Environmental Operations Act 1997	An Act to protect, restore and enhance the environment in NSW and to promote public access to information and involvement in environment protection. The Act: - Designates the EPA (Environment Protection Authority) as the regulatory authority. See epa.nsw.gov.au for further information. Objectives of the Act are: • To protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development, • To provide increased opportunities for public involvement and participation in environment protection, • To ensure that the community has access to relevant and meaningful information about pollution, • To reduce risks to human health and prevent the degradation of the environment by the use of mechanisms that promote the following: • Pollution prevention and cleaner production, • The reduction to harmless levels of the discharge of substances likely to cause harm to the environment, • The elimination of harmful wastes, • The reduction in the use of materials and the re-use, recovery or recycling of materials, • The making of progressive environmental improvements, including the reduction of pollution at source, • The monitoring and reporting of environmental quality on a regular basis, • To rationalise, simplify and strengthen the regulatory framework for environment protection, • To improve the efficiency of administration of the environment protection legislation, • To assist in the achievement of the objectives of the Waste Avoidance and Resource Recovery Act 2001.	There is a duty to report pollution incidents under section 148 of the Protection of the Environment Operations Act 1997 (POEO Act). Schedule 1 of the POEO defines activities that require an Environmental Protection Licence. The POEO Act Classifies Environmental Offences and Penalties.

Legislation	Objectives & Application	Relevance
State		
Protection of the Environment Operations (Noise Control) Regulation 2017	The object of this Regulation is to repeal and remake, with minor amendments, the provisions of the Protection of the Environment Operations (Noise Control) Regulation 2000. This Regulation creates offences (maximum penalty $11,000 for corporations and $5,500 for individuals) for selling or driving a vehicle with a temporary noise reduction device or with temporary noise reduction packing or for modifying or repairing a vehicle so as to include any such device or packing. A person is not guilty of any such offence if the conduct alleged to give rise to the offence occurs within 6 months after the commencement of this Regulation. This Regulation also makes provision with respect to the following: a) the selling or using of certain classes of motor vehicles and motor vehicle accessories that are capable of emitting noise levels above a prescribed level, b) the use of motor vehicle horns and motor vehicle intruder alarms, c) the times during which it is not permissible to use certain motor vehicles if they emit noise that can be heard in other residential premises, d) the sounding of sirens and similar devices and the use of sound systems on vessels, e) the emission of noise from the engines or exhausts of motor vehicles and vessels, f) the maintenance of noise control equipment on motor vehicles and vessels, g) the issue of defective vehicle notices and defective vessel notices, h) the prohibition on selling certain articles that are capable of emitting noise levels above a prescribed level, i) the obligation to label certain articles, j) the times during which it is not permissible to use certain articles (including musical instruments) if they emit noise that can be heard in any residential premises, k) the inspection and testing procedures for the purpose of determining noise emission levels of certain motor vehicles, motor vehicle accessories, vessels, articles or equipment. See epa.nsw.gov.au for further information.	Equipment used during the Project construction works must be in compliance with this regulation.

Legislation	Objectives & Application	Relevance
State		
Protection of the Environment Operations (Waste) Regulation 2014	The Waste Regulation improves the EPA's ability to protect human health and the environment, and paves the way for a modern and fair waste industry in NSW. See epa.nsw.gov.au for further information.	Construction waste must be managed in accordance with this regulation.
Protection of the Environment Operations (Clean air) Regulations 2010	This Regulation: • Provides for the certification of domestic solid fuel heaters; • Controls burning generally by imposing an obligation to prevent or minimise emissions, by prohibiting the burning of certain articles and requiring approval for certain fires/incinerators; • Requires the fitting of anti-pollution devices to certain motor vehicles and prescribes an offence of emitting excessive air impurities; • Imposes certain requirements and standards on the supply of petrol; • Prescribes standards for certain groups of plant and premises to regulate industry's air impurity emissions; and • Imposes requirements on the control, storage and transport of volatile organic liquids. See epa.nsw.gov.au for further information.	The construction works associated with the project must be conducted in such a way that does not contravene this regulation. Regulates atmospheric pollutants including dust and odour onsite

Legislation	Objectives & Application	Relevance
State		
Crown Lands Act 2016	For the purposes of this Act, the principles of Crown land management are— (a) that environmental protection principles be observed in relation to the management and administration of Crown land; (b) that the natural resources of Crown land (including water, soil, flora, fauna and scenic quality) be conserved wherever possible; (c) that public use and enjoyment of appropriate Crown land be encouraged; (d) that, where appropriate, multiple use of Crown land be encouraged; (e) that, where appropriate, Crown land should be used and managed in such a way that both the land and its resources are sustained in perpetuity; and (f) that Crown land be occupied, used, sold, leased, licensed or otherwise dealt with in the best interests of the State consistent with the above principles.	The Project site is Crown Land, which influences the management of works, certification and applicability of legislation.
Fire Brigades Act 1989	This Act applies to; • Land-based hazardous material incidents (and to any fires that may result from them) that occur anywhere in the State except on State waters, as defined in the Marine Pollution Act 2012. • A hazardous material incident that occurs in or on a building, bridge or other structure or on any body of water (not being part of State waters) is taken to be land-based.	Applies to emergency incidents and accidents involving hazardous materials
Local Government Act 1993	The purposes of this Act are as follows: • To provide the legal framework for an effective, efficient, environmentally responsible and open system of local government in New South Wales, • To regulate the relationships between the people and bodies comprising the system of local government in New South Wales, • To encourage and assist the effective participation of local communities in the affairs of local government,	Referenced and assessed during Approval Process

Legislation	Objectives & Application	Relevance
State		
Contaminated Land Management Act 1997	Objects of this Act: • The general object of this Act is to establish a process for investigating and (where appropriate) remediating land that the EPA considers to be contaminated significantly enough to require regulation under Division 2 of Part 3. • Particular objects of this Act are: • To set out accountabilities for managing contamination if the EPA considers the contamination is significant enough to require regulation under Division 2 of Part 3, and • To set out the role of the EPA in the assessment of contamination and the supervision of the investigation and management of contaminated sites, and • To provide for the accreditation of site auditors of contaminated land to ensure appropriate standards of auditing in the management of contaminated land, and • To ensure that contaminated land is managed with regard to the principles of ecologically sustainable development	Contamination on site must be assessed and managed in accordance with this act

Legislation	Objectives & Application	Relevance
State		
Environmental Planning and Assessment Act 1979	The objectives of this Act are to encourage: • The proper management, development, and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment, • The promotion and co-ordination of the orderly and economic use and development of land, • The protection, provision and co-ordination of communication and utility services, • The provision of land for public purposes, • The provision and co-ordination of community services and facilities, and • The protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and • Ecologically sustainable development, and • The provision and maintenance of affordable housing, and to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and • To provide increased opportunity for public involvement and participation in environmental planning and assessment.	Planning approval for the project is regulated by the DPE under the Environmental Planning and Assessment Act 1979.

4.4 TRAINING AND AWARENESS

Project specific environmental training and awareness will be conducted/enforced throughout the duration of construction. The key avenues for the implementation of this training and awareness are **Site Inductions**, **Toolbox Talks**, **Pre-Start Meetings** and **General Awareness** measures.

Additional training may be conducted on an as-required basis as the works progress.

Site Inductions

All workers will complete a Project specific induction prior to accessing site/commencing works. In addition to the compulsory WHS information, this induction will provide all construction personnel with site specific environmental training. The training will include environmental concerns, management measures and other protocols in place to satisfy the Conditions of Consent and other environmental obligations.

Toolbox Talks

Tool box talks will be conducted regularly by RCC and sub-contractors, to address specific WHS and environmental concerns. These toolbox talks will address specific activities, the hazards associated with them, and the management measures required to be put in place to maintain compliance and minimise/eliminate environmental harm.

Examples of specific environmental issues that will be addressed in tool box talks include:

- Erosion and sediment control
- Hours of work
- Emergency and spill response
- Noise
- Housekeeping and waste
- Dust control
- Construction traffic management

Tool box talk attendance is mandatory and all those in attendance will be required to sign in to the discussion and outcomes on an attendance form. RCC will maintain records of all Toolbox talks.

Pre-Start Meetings

Pre-start meetings are a daily training and awareness protocol that will be implemented to inform the daily activities of the construction workforce.

The upcoming construction activities will be reviewed daily, and prior to the day commencing, the pre-start meeting will review and inform the required WHS practices, environmental management measures, work area hazards and other task specific concerns.

The pre-start meeting will be conducted by an RCC representative responsible for the work area that is being discussed. Sub-contractors will be encouraged to share and discuss WHS and environmental concerns in relation tot heir specific works for that day.

Attendance is mandatory and all in attendance will be required to sign in to the discussion and outcomes on an attendance form. RCC will maintain records of all pre-start topics, dates and attendees.

General Awareness Training

General awareness of environmental obligations, risks and management measures will be enforced through site notice boards, posters, environmental bulletins and sub-contractor engagement (i.e. contractual) information packages.

4.5 ENVIRONMENTAL RISK MATRIX/ASSESSMENT

A copy of the Environmental Risk Matrix/Assessment has been included as an appendix to this CEMP. This is a live document that will be continuously revised as the Project progresses.

It will be supplementary to a monthly High Risk Project Assessment, that will be completed and provided to all construction workers.

4.6 HOLD POINTS

Other than the specific requirements of the SSD 9483 Conditions of Consent, there are no additional hold points applicable to the construction works of the Project.

The key hold points from the consent are:

- Unexpected Finds Procedure for contamination.
- Unexpected Finds procedure for Aboriginal Heritage.
- Unexpected Finds procedure for Non-Aboriginal Heritage.

Specific unexpected finds protocols for these hold points have been completed and are supplied with this CEMP as required by the Conditions of Consent.

4.7 ENVIRONMENTAL MANAGEMENT MEASURES, INSPECTIONS AND MONITORING

The following table outlines the environmental management measures, inspection and monitoring process that will be followed as part of RCC's existing Environmental Management System.

This is a live document that will be continuously updated as required throughout the duration of construction works.

Environmental Aspect		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
1	Dust Generation Particulate Emissions (General)	• Install shade cloth on perimeter fencing • Vehicle corridors will be clearly identified and restricted to control vehicle access onsite. • Limit vehicle speed onsite to 20km/hr • Fixed and mobile (water tanker) water sprays • Reduce work activities /stop work during moderate to high wind velocity periods. • Maintain equipment. Smokey plant to be stopped until repair works completed. Turn off vehicle engines whilst not in use (no long periods of idling)	✓	✓	✓		Daily	Weekly		As required		SS
1	Dust Generation (Demolition)	Breakers and crushing equipment to be fitted with dust filtration equipment or water sprays to control dust emissions.			✓		Daily	Weekly during works	✓	As required		SS
1	Dust Generation (Construction)	• Minimise areas of site disturbed, and stage works where possible. • Dust suppression strategies to be used, i.e., water sprays, soil binders, hydro mulching, controlled speed onsite, road base + shaker grids. • Stockpiled topsoils and rubble will be restricted to 4m high. Stabilise if in-situ for >4-6months. On site drilling or coring operations will be undertaken by equipment fitted with air filtration equipment.	✓	✓			Daily	Weekly		As required		SS
2	Odour	• If odorous materials uncovered, recover immediately. • Seek advice from consultant regarding soil /materials management.		✓		✓	Daily	Weekly		As required		SS
3	Greenhouse	• Ensure purchased electrical products/whitegoods products comply with specification for CFCS & energy ratings • Low solvent paints to be used as a priority • Building to conform to AGBR or Green Star performance criteria • Deliveries / transport from site effectively planned to limit inefficient transport, assist back loading etc		✓						As required	✓	CA SS

Environmental Aspect		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
4	Stormwater (Discharge from sedimentation basins, flooding)	• Water quality to meet ANZECC Water Quality Guidelines. → Conduct water quality test (external test company) NTU and TSS to determine the best treatment and acceptable levels – (Generally) PH 6.5- 8.5, Turbidity <50NTU, No visible oil & grease • Obtain advice for use of flocculants to settle sediment from water. • Sedimentation pond to be maintained at low levels to ensure capacity during rainfall event. • DO NOT DISCHARGE IF CONTAMINANTS SUSPECTED. Obtain advice.	✓	EP-001		✓	Daily during discharge	Weekly		As required	✓	SS
5	Adjoining waterways (dewatering, soil erosion & runoff)	• Temporary drainage systems will be established to divert clean waters around the land development areas as appropriate. • Erect silt fences, bunds and construct swale drains. • Concrete Bunded washouts plastic lined • Inspect at least weekly & after rainfall.		EP-001		✓	Daily during discharge	Weekly		As required	✓	SS
5	Adjoining waterways (dewatering, soil erosion & runoff)	• Maintain and/or replace as required. • Refer NSW Department of Housing's Managing Urban Stormwater (2004). • Street sweepers will be employed on regular basis.										
6	Sewer (Trade waste)	• No paints or other chemical to be poured down drains. • If required, obtain trade waste licence for discharge or local council approval.		EP-001		✓				As required	✓	SS
7	Land (Acid sulphate soils, contaminated soils, imported fill)	• Stop work if unexpected potentially contaminated soils are encountered. • Obtain waste classification from consultant in accordance with EPA guidelines Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-Liquid Wastes (June 2004) www.environment.nsw.gov.au/waste/envguidlns/index.htm.	✓		✓	✓	Daily	Weekly	✓	As required	✓	SS

Environmental Aspect		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
		• Where required a Remediation Action Plan will be developed and implemented. • Sign off by Site Auditor may be required to validate clean-up. • Any groundwater or ponded rainwater will be tested and classified by consultants prior to disposal. • Check Geotech requirements. Ensure soil classification suitable for land use i.e. Schools, residential, commercial etc.	✓	EP-002	✓	✓	Daily	Weekly	✓	As required	✓	SS
7	Land	• Potential for acid sulphate soils will be assessed based on the sites proximity to low-lying coastal areas e.g., coastal plains, wetlands and mangroves where the surface elevation is less than five metres above mean sea level. • If odorous soils (rotten egg gas) or grey/yellowed mottled soils encountered, stop work. • If suspected, consultant to prepare Acid Sulphate Soil Management Plan (ASSMP). • Excavation and neutralisation to be supervised by consultants as per ASSMP. • The requirements to import fill will be minimised by utilising on site cut material wherever possible. • All analysis certificates shall be handed over as part of the completion documents to the client. • Record all imported fill on Form 25.08 - Product Identification & Traceability. • Mark up locations where fill compacted in site plan. Survey if required.										
8	Resources - water, materials, energy	• For design and construct jobs, refer to the design specification for ESD requirements and product choices. • Buy local wherever possible to reduce impacts of transport on environment.		✓		✓					✓	PM
9	Noise	• Refer to DA for noise restrictions and working hours. • Use hoarding or acoustic mats as required. • Situate generators and plant away from sensitive receivers. • Turn off machinery. Maintain equipment and stop noisy plant until repaired. • No early deliveries.	✓		✓	✓	Daily	Weekly	✓	As required	✓	SS

Environmental Aspect		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
10	Vibration	• Conduct dilapidation report prior to work starting. • Limit the use of vibratory rollers, rock breakers, impact piling etc adjacent to buildings (>7m). • Regenerated noise may also transfer through bedrock and building structures. • Obtain advice if required.	✓		✓	✓	Daily	Weekly	✓	As required	✓	SS
11	Community Concerns	• Provide information (e.g., Signage, letterbox drops) to community on programmed works • Provide contact name for inquires. • Advice locals of "noisy" work. • If required in noise sensitive areas and/or in response to complaints, engage consultants to undertake monitoring at nominated receivers. • Vehicles will not be permitted to queue outside the site or in residential areas unless a defined area is established which does not adversely impact on neighbours.	✓				Daily	Weekly		As required		PM SS
12	Flora	• Review planning documentation to determine the presence of any protected, threatened or significant flora. Obtain approvals as required. • Engage arborist to develop tree management plan or refer DA and arborist reports. • Education and training at site toolbox meetings and induction. • Report all sightings to the site manager. • Fence or barricade protected flora at the drip zone. Erect Keep Out signage. • Do not stack materials under/against trees. • The potential for reuse of vegetative wastes by mulching, chipping or on-site placement of trunks or limbs shall be reviewed for each project.	✓	✓		✓	Daily	Weekly		As required	✓	SS
13	Fauna	• All native animals protected. • Review planning documentation to determine the presence of any protected, threatened or significant fauna. Obtain approvals as required. • Site rules/induction to include information regarding of the • For injured animals, to relocate call WIRES	✓	✓		✓	Daily	Weekly	✓	As required	✓	SS

Environmental Aspect		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
14 15	Waste Litter	• Hazardous materials surveys to be completed. • Materials to be removed prior to demolition • Registers and waste disposal requirements as per Work Cover and EPA requirements for removal, storage, transport and disposal. • General site wastes –use one bin system and sort in contractors' yard to produce quantities of material for recycling, reuse, disposal etc. • Empty drums are to be taken off-site for disposal. • Empty drums shall be crushed prior to recycling/disposal. • Do not overfill skip bins. Provide plenty for use. Cover where potential for windblown litter.	✓	EP-002	✓	✓	Daily	Weekly	✓	As required	✓	SS
16	Landfilling	• Reduce, reuse and then dispose • Landfill space scare leading to increased tipping costs • Dispose of hard construction wastes for recycled gravels and sands • Do not send soil to landfill until alternatives for beneficial reuse have been explored as per consultant's advice. • Consideration should be given to chipping of the vegetation and reuse • Reuse packaging to protect works		EP-002			Daily	Weekly		As required	✓	SS

Environmental Aspect		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
17	Chemicals	• Chemicals to be stored in bunded areas (impervious + 110% of largest container) away from stormwater drains & pits. • Refer Workcover Code of Practice for Storage & Handling of Dangerous Goods, EPA Guidelines for Bunding & Spill Management. Appropriate chemicals storage is in conformance with: → AS 1940 The Storage and Handling of Flammable and Combustible Liquids → Storage and Handling of Dangerous Goods workover Code of Practice 2005– refer p. 86 • EPA requirements http://www.environment.nsw.gov.au/mao/bundingspill.htm • Ponded water within bunds will not be discharged to stormwater. • Fuel and hydraulic leaks to be cleaned up immediately. • Drilling muds to be contained within bunds and reused. • Liquid paints NOT to be poured down drains. Spread on waste cardboard or similar and leave to dry. Paint brushes to be rinsed and paint solids allowed to settle. Container of paint solids to be disposed to liquid waste facility. • Construct concrete washout pit for washout, away from stormwater drains. Send back to batch plant where possible.	✓	EP-002 EP-005 EP-006	✓		Daily	Weekly	✓	As required		SS
	Chemicals	• Concrete cuttings to be contained and wetvac to prevent runoff into stormwater drains. • Storage of bulk fuels (>200L) on site is prohibited. All refuelling shall be undertaken by a mobile facility with appropriate spill control and containment control equipment. • MSDS's must be provided to the Site supervisor prior to a chemical being received on site and by subcontractors using chemicals/products.	✓	EP-002 EP-005 EP-006	✓		Daily	Weekly	✓	As required		SS

Environmental Aspect		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
18	Traffic	• Develop and implement traffic management plans. Submit to local council as required. • Signage and notices regarding disruptions. • Use crushed concrete, mulches etc along site access roads. • Install shakers and wheel wash as required. • Organise regular street sweeping. • Haulage routes and rules will be provided to subcontractors prior to commencing on site. • All loads of soil, demolition wastes, general wastes etc are to be tarped.	✓	TMPs		✓	Daily	Weekly		As required		SS
19	Aboriginal heritage	• Education and training at site toolbox meetings and induction. • It is illegal to destroy heritage items. • Review local or regional environmental plans, or on the State Heritage Register is to be consulted prior to work starting onsite. • Obtain excavation permit issued by the Heritage Council of NSW if required. • Any heritage relics or sites discovered during construction shall be reported to the NSW Heritage Office. • Work in the subject area to cease until specialist advice is obtained. • The area will be fenced, and signs erected to restrict access. • Heritage consultants may be required to provide advice on demolition/construction processes and finishes.	✓	✓		✓	Daily	Weekly		As required	✓	SS
20	European heritage	• Education and training at site toolbox meetings and induction. • It is illegal to destroy heritage items. • Check the Aboriginal Heritage Information Management System (AHIMS). • Also check the register of the National Estate. • Obtain approval from NPWS (Section 90 consent).	✓	✓		✓	Daily	Weekly		As required	✓	SS

Environmental Aspect		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
21	Emergency Preparedness:	• Spill kit onsite. • Refer to the MSDS for advice and procedures. • All spills must be reported to the FM & cleaned up. Complete RCC Accident /Incident report. • Sed pond pumped out regularly to maintain capacity in case of emergency • Ensure you know where stormwater drains are and have materials to block them in case of a fire.	✓	✓			Daily	Weekly		As required		SS

4.8 ENVIRONMENTAL CONTROL MAPS OR PLANS

The environmental control maps and/or plans that are relevant to the Project construction works are:

- Site context plans provided within this CEMP.
- Tree protection zones, shown within the arborist report for both sites.
- Sensitive receivers relating to the noise and vibration impacts of the construction works, presented in the Construction Noise & Vibration Management Sub-Plan.
- Erosion and sediment control measures, shown on the erosion and sediment control plans within the Construction Soil & Water Management Sub-Plan.

4.9 ENVIRONMENTAL MANAGEMENT DOCUMENTS

The environmental management documents that will be implemented as part of the environmental management system include:

- Environmental Site Inspection Checklist
- Complaints Register
- Hazardous substances register
- Waste register
- High Risk Works Project Assessment
- Asbestos (Hazmat) Register
- Imported/Exported Materials Register
- Sub-Contractor high risk safe work method statement (where environmental risks are present)

4.10 COMPLIANCE MONITORING AND REPORTING

As this EMP is a CEMP, and only applicable to the construction phase of the development, the post approval compliance monitoring and reporting requirements (which apply to operation/occupation) do not apply.

An operational management plan will be prepared by the Applicant, which will address the post approval compliance monitoring and reporting requirements of the project.

4.11 ENVIRONMENTAL AUDITING

This development will be audited in accordance with the Department's Independent Audit Post Approval Requirements.

4.12 ENVIRONMENTAL INCIDENT AND EMERGENCY PLANNING, PREPAREDNESS AND RESPONSE

Project Personnel Responsible for Managing Environmental Incidents and Emergencies

- Project Manager

- Site Manager
- WHS&E Manager
- Business Systems & Environmental Manager

Contact Details for Emergency Services (ambulance, fire brigade, police, spill clean-up services and others if relevant)

ORGANISATION	NAME	PHONE (W)	PHONE (M)
WorkCover	-	Hotline for incident reporting 13 10 50	
Fire Brigade/HAZMAT	Emergency	000	
Police	Emergency	000	
Environment Protection Authority (EPA)	-	02 9211 4723 Head Office 02 9995 5000 Parramatta	After Hours Pollution line 131 555
SSD – Dept of Planning Compliance contact	-		

Location of On-Site information on hazardous materials, including safety data sheets and spill containment materials

Information on hazardous materials, including safety data sheets and spill containment materials will be located in or adjacent to the project first aid shed. This will be located in the location deemed most suitable for the progress/status of works at any time.

4.13 CORRECTIVE AND PREVENTATIVE ACTIONS

incident management and reporting

Incident reporting and Investigation refer to internal management system.

Definitions:

Class 1: Dangerous occurrence, or actual harm to an ecosystem, property loss or clean up exceeds $10,000 (as prescribed in 2.1.) Class 1 incidents and some cases Class 2 (as determined by senior management) will be investigated, as directed by BS Environmental Manager, WHS Head of Safety and/or where required initiate the RCC Business Continuity Plan

Form 03 0 Investigation Report will be completed by the BS Environmental Manager or Senior Safety Advisors and the original forwarded to the Project Manager and reviewed by the BS Environmental Manager WHS Head of Safety and reported to Senior management and Executives/Board.

Class 2: Major Leak, spill or escape off site of liquids, near miss/dangerous occurrence i.e. plant/equip damage, disruption to services. Note: Some Class 2 will be investigated at the discretion of the BSM / WHS Head of Safety

Class 3: Minor Leak, spill or escape off site of liquids all less than >10lts, Dust, Vibration

The Site Manager/Supervisor will ensure that all Class 2 and Class 3 incidents in or around the site, involving RCC personnel, subcontractors, visitors or passers-by, external authorities, Unions etc. are reported regardless of how minor they appear at the time of the occurrence.

Duty to Notify Environment Protection Authority (EPA) of Pollution Incident – notifiable incident

Pollution Incident means an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed on the premises, but it does not include an incident or set of circumstances involving only the emission of noise.

Incidents that require a (Duty to Notify) to the regulatory authorities EPA Pollution line (phone 131 555) under section 148 of the Protection of the Environmental Operations Act 1997 (POEO Act) are:

- If the actual or potential harm to the health or safety of human beings or ecosystems is not trivial,
- If actual or potential loss or property damage (including clean-up costs) associated with a pollution incident may exceed $10,000

  For all Notifiable Incidents, the following activities should be undertaken:

- The incident site must not be disturbed until an inspector arrives at the scene or directs otherwise, this may include plant, substance, structure or thing associated with the incident. The person with management or control of the workplace is responsible for preserving the incident site, so far as reasonably practicable
- The incident site will be preserved unless it prevents any action needed to:
  - minimise the risk of further notifiable incident
  - facilitate a EPA investigation

For Regulator "reportable incidents", the Supervisor will notify the Project Manager, Business Systems Environmental Manager and or WHS Head of Safety to seek advice, then immediately prepare the submission of Notification to the regulator.

Business Systems Environmental Manager and or WHS Head of Safety will confirm and organise legal representation to assist in the preparation of the reports and initiate the RCC Business Continuity Plan

In some contracts it is a requirement to notify the Client's Representative immediately e.g. GC21 Contracts and relevant DPIE SSD reportable incidents

incident debrief / closure

Where an investigation is undertaken and it is determined that an "incident debrief " is to be carried out using Form 04.10, the Incident debrief will be distributed to all relevant stakeholders and Senior / Executive Management.

Outcomes of Investigations / findings may initiate an internal Alert for distribution.

Non Conformance

In the event of breach in the requirements of the EMP, such as:

- Non compliance with the RCC/ subcontractors SWMS or other environmental procedures;
- Non complying activities noted during site inspections (high risk or potential for legal breach);

- Following concerns regarding potential breaches in environmental legislation raised by RCC, the client or other stakeholders such as local council or the EPA;
- Changes to the RCC system or subcontractors procedures, as a result of corrective or preventative action following and environmental incident, inspection or external audit.

Form 31.1 – Non Conformance Report or via Aconex will be completed and issued to the offending party.

Non Conformances will be registered in Form 31.2 Non Conformance Report Register or on soft copy.

A copy of the Non Conformance Notice will be forwarded to the Project Manager and the subcontractor, who will implement appropriate corrective action.

Additionally Contractors Notices or Main Contractor Notices may be issued in certain circumstances, as described in Section 2 of the PMP.

5 CEMP REVIEW AND REVISION PROCESS

To ensure this CEMP remains current and relevant to the project, it will be reviewed in accordance with Conditions A29 and A30 of the **SSD 9483 Conditions of Consent**.

Conditions A29 and A30 are shown below:

A29. Within three months of:
~~a) the submission of a compliance report under condition A32;~~ [A29 a) has been crossed out as it is not applicable to this CEMP, as compliance reporting applies only to operation].
b) the submission of an incident report under condition A25;
c) the submission of an Independent Audit under condition C41 or C42;
d) the approval of any modification of the conditions of this consent; or
e) the issue of a direction of the Planning Secretary under condition A2 which requires a review,
the strategies, plans and programs required under this consent must be reviewed, and the Planning Secretary and the Certifier must be notified in writing that a review is being carried out.
A30. If necessary to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans, programs or drawings required under this consent must be revised, to the satisfaction of the Planning Secretary and Certifier (where previously approved by the Certifier). Where revisions are required, the revised document must be submitted to the Planning Secretary and Certifier for approval and information (where relevant) within six weeks of the review. *Note: This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.*

Where a review is required, the **CEMP Review Checklist (provided overleaf)** will be used. This will determine why a review is required, who needs to be involved in the review, if revision is required as a result of the review, and what the revision is, if required.

If this CEMP is revised, it will be submitted to the Department (and/or other party as required by the conditions of consent) for assessment and approval in accordance with the requirements of the relevant conditions of consent and the review process that was documented and approved in the earlier version/s.

The revised version of the revised EMP will be provided to the Department, and accompanied by information that identifies:

- what has changed and why it has been changed
- the proposed timeframe to implement the change.

A brief summary of the changes made and the circumstance/s that triggered the review and revision will also be included in the version control information.

Complete this checklist if a review of this CEMP or its sub-plans is triggered (see section 5 for applicable triggers).

CEMP Review Checklist		
	Person Completing Checklist:	**Date:**
1	Why is a review required? *Outline what has triggered the review. Use the triggers from Condition A29 & A30 of the SSD Consent.*	
2	What sections of the CEMP and/or Sub-Plans require a review? *List all that apply.*	
3	Notify the Planning Secretary that a review is being carried out, with a description of the extent of the review. *Provide evidence of notification.*	
4	Who is required to be involved in the review? *Identify the relevant consultants, project staff and/or authorities who may need to be involved in the review.*	
5	Conduct review. Do the CEMP sections and/or Sub-Plans being reviewed still address the specific requirements of the development? **If Yes**, no revision is required. State why no revision is required and file a completed copy of this checklist for reference. No further action is required. **If no**, revision is required. Go to step 6. *Note – if a review has been triggered, the specific trigger will generally highlight what information in the CEMP or it's Sub-Plans is not adequately addressing the specific requirements of the development.*	
6	Revise CEMP and/or relevant Sub-Plans. Engage with relevant stakeholders where required. Consult with relevant parties about revision where required.	

CEMP Review Checklist		
7	Issue updated CEMP and/or Sub-Plans to the Planning Secretary (and/or other party as required by the conditions of consent) for assessment and approval (if approval is required).	
8	Provide a summary that identifies: - What has changed and why it has been changed - The proposed timeframe to implement the change	
9	Ensure revision information and the circumstances that triggered the review is included in the version control information of the revised document.	

6 APPENDICES

6.1 EMP PREPARATION CHECKLIST

Requirement	Plan Reference	Yes/No/Not Applicable
Document preparation and endorsement		
Has the EMP been prepared in consultation with all relevant stakeholders as per the requirements of the conditions of consent? (Section 4.1)	Appendix 6.2	Yes
Have the views of the relevant stakeholders been taken into consideration? Have appropriate amendments been made to the EMP and does the EMP clearly identify the location of any changes? (Section 4.1)	Throughout, Sub-Plans.	Yes
Has the EMP been internally approved by an authorised representative of the proponent or contractor? (Section 4.2)	Revision Register, Page 5	Yes
Version and content		
Does the EMP describe the proponent's Environmental Management System (EMS) (if any), and identify how the EMP relates to other documents required by the conditions of consent? (Section 3.5.1)	Section 4.1, Page 23	Yes
Does the EMP include the required general content and version control information? (Section 3.1)	Pages 2-5	Yes
Does the EMP have an introduction that describes the project, scope of works, site location and any staging or timing considerations? (Section 3.2)	Section 1, Page 10	Yes
Does the EMP reference the project description? (Section 3.3)	Section 2, Page 12	Yes
Does the EMP reference a Community and Stakeholder Engagement Plan (or similar) or include community and stakeholder engagement actions (if required)? (Section 3.4)	Section 3, Page 22	Yes
Have all other relevant approvals been identified? Has appropriate information been provided regarding how each approval is relevant? (Section 4)	N/A	N/A
Has the environmental management structure and responsibilities been included? (Section 3.5.2)	Section 4, Page 24	Yes
Does the EMP include processes for training of project personnel and identify how training and awareness needs will be identified? (Section 3.5.3)	Section 4.4, Page 35	Yes

Does the EMP clearly identify the relevant legal and compliance requirements that relate to the EMP? (Section 3.5.3)	Section 4.3, Page 25	Yes
Does the EMP include all the conditions of consent to be addressed by the EMP and identify where in the EMP each requirement has been addressed? (Section 3.5.13)	CEMP Condition Compliance Table, Pages 6-9	Yes
Have all relevant guidelines, policies and standards been identified, including details of how they are relevant? (Section 3.5)	N/A	N/A
Is the process that will be adopted to identify and analyse the environmental risks included? (Section 3.5.5)	Appendix 6.3	Yes
Have all the environmental management measures in the EIA been directly reproduced into the EMP? (Section 3.5.7)	Throughout, Sub-Plans	Yes
Have any additional environmental management measures been included in the EMP? (Section 3.5.7)	N/A	N/A

6.2 RECORD OF CONSULTATION

CEMP Consultation Requirements		
#	Condition	Location
B20	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: (b) be prepared in **consultation** with Council and TfNSW;	A Sub-Plan specific consultation summary for Condition B20 has been prepared and provided with the Construction Traffic and Pedestrian Management Sub-Plan. See Appendix 6.7.
B21	The Construction Noise and Vibration Management Sub-Plan must address, but not be limited to, the following: (d) include strategies that have been developed with the community for managing high noise generating works; (e) describe the community **consultation** undertaken to develop the strategies in condition B21(d);	A Sub-Plan specific consultation summary for Condition B21 has been prepared and provided with the Construction Noise and Vibration Management Sub-Plan. See Appendix 6.8.
B23	The Applicant must prepare a Construction Soil and Water Management Sub-Plan (CSWMSP) and the plan must address, but not be limited to the following: (a) be prepared by a suitably qualified expert, in **consultation** with Council;	A Sub-Plan specific consultation summary for Condition B23 has been prepared and provided with the Construction Soil and Water Management Sub-Plan. See Appendix 6.9.
C29	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 Heritage NSW 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 Heritage NSW to develop and implement management strategies for all objects/sites. Works shall only recommence with the written approval of Heritage NSW.	A consultation summary has not been prepared for this item as it has not been triggered at the time the CEMP was prepared. In the event that surface disturbance identifies a new Aboriginal object, the Applicant will consult with the Aboriginal community representatives as required, and a consultation summary will be prepared.

6.3 PROJECT ENVIRONMENTAL RISK MATRIX/ASSESSMENT

The Project Environmental Risk Matrix/Assessment is not embedded in this document; it is provided as an attached appendix so that it can be displayed/updated/revised in isolation if required.

RICHARD CROOKES CONSTRUCTIONS

Appendix 1 Environmental Risk Matrix/Assessment

Project: Chatswood E

Construction

RCC Objectives and Targets / KPIs:
<3 Environmental Notices issued by EPA or Local Council annually
Action community complaints within 24 hours, no repeat complaints for same issue
Investigate non effective operational controls / environmental incidents and report

RICHARD CROOKES CONSTRUCTIONS

Developed by:

Environmental Aspect - also consider if any legislation applies to activity or environmental aspect. See Intranet Legal and Other Requirements Table

Activity, Product or Service	Assessment of Significant Environmental Impact (no controls)	1 dust	2 odour	3 greenhouse	4 stormwater	5 Adjoining waterways	6 sewer	7 land	8 resources/water	9 resources/materials	10 resources/energy	11 noise	12 vibration	13 community concerns	14 flora	15 fauna	16 waste / chemicals	17 landfilling	18 litter	19 traffic	20 aboriginal heritage	21 European heritage	Impact - No Controls. Refer to EMPs or Operational Controls Table Appendix 4 of PMP		
Site Set Up	likelihood	R			R	R	A								L	R				R				14. loss of habitat	
	consequence	2			1	1	3								4	1				1					
	risk	3			3	3	1								1	3				3					
	Signif y=yes, n=no	N			N	N	Y								Y	N				N			6. pollution of aquatic ecosystem		
Demolition	likelihood	L			R							L	L	L			R	A	R	L		R	1. photochemical smog, visual amenity	13. stakeholder interactions	19. community disturbance, mud tracking on public roads
	consequence	3			1							3	3	3			1	3	1	4		1			
	risk	2			3							2	2	2			3	1	3	1		3	11. community disturbance	17. reduction in landfill space, loss of recyclables	
	Signif y=yes, n=no	Y			N							Y	Y	Y			N	Y	N	Y		N	12. human discomfort, damage to buildings		
Hazardous Materials Removal - Asbestos, Lead Paint, SMF	likelihood	R			R									R			R	R	R			R	1. photochemical smog, visual amenity	17. reduction in landfill space, loss of recyclables	
	consequence	3			1									3			3	3	3			1		18. visual amenity, pollution	
	risk	2			3									2			2	2	2			3	13. stakeholder interactions		
	Signif y=yes, n=no	Y			N									Y			Y	Y	Y			N	16. non efficient use of materials, chemical pollution	18. visual amenity, pollution	
Site Stripping & Bulk Earthworks, Transport of spoil, Importation of fill	likelihood																						#N/A	#N/A	#N/A
	consequence																						#N/A	#N/A	#N/A
	risk	###		#N/A	#N/A	#N/A					#N/A	###	#N/A	#N/A	###	#N/A		#N/A		#N/A	#N/A		#N/A	#N/A	#N/A
	Signif y=yes, n=no	###		#N/A	#N/A	#N/A					#N/A	###	#N/A	#N/A	###	#N/A		#N/A		#N/A	#N/A		#N/A	#N/A	#N/A
Remediation	likelihood																					R	#N/A	#N/A	#N/A
	consequence																					1	#N/A	#N/A	#N/A
	risk	###	###	#N/A	#N/A	#N/A						###	#N/A	#N/A			#N/A	#N/A		#N/A	#N/A	3	#N/A	#N/A	#N/A
	Signif y=yes, n=no	###	###	#N/A	#N/A	#N/A						###	#N/A	#N/A			#N/A	#N/A		#N/A	#N/A	N	#N/A	#N/A	
Dewatering	likelihood																						#N/A	#N/A	
	consequence																						#N/A		
	risk	###			#N/A	#N/A	#N/A		#N/A														#N/A		
	Signif y=yes, n=no	###			#N/A	#N/A	#N/A		#N/A														#N/A		
Detailed excavation / In ground Services	likelihood																						#N/A	#N/A	
	consequence																						#N/A	#N/A	
	risk	###			#N/A	#N/A						###					#N/A	#N/A					#N/A		
	Signif y=yes, n=no	###			#N/A	#N/A						###					#N/A	#N/A					#N/A		
Foundations - piering / anchors	likelihood																						#N/A	#N/A	
	consequence																						#N/A		
	risk	###			#N/A							###	#N/A	#N/A									#N/A		
	Signif y=yes, n=no	###			#N/A							###	#N/A	#N/A									#N/A		
Foundations - piling	likelihood																						#N/A	#N/A	
	consequence																						#N/A	#N/A	
	risk	###			#N/A	#N/A						###	#N/A	#N/A			#N/A	#N/A					#N/A	#N/A	
	Signif y=yes, n=no	###			#N/A	#N/A						###	#N/A	#N/A			#N/A	#N/A					#N/A	#N/A	

RICHARD CROOKES CONSTRUCTIONS

Appendix 1 Environmental Risk Matrix/Assessment

Project: Chatswood E

Construction

RCC Objectives and Targets / KPIs:
<3 Environmental Notices issued by EPA or Local Council annually
Action community complaints within 24 hours, no repeat complaints for same issue
Investigate non effective operational controls / environmental incidents and report

RICHARD CROOKES CONSTRUCTIONS

Developed by:

Environmental Aspect - also consider if any legislation applies to activity or environmental aspect. See Intranet Legal and Other Requirements Table

Activity, Product or Service	Assessment of Significant Environmental Impact (no controls)	1 dust	2 odour	3 greenhouse	4 stormwater	5 Adjoining waterways	6 sewer	7 land	8 resources/water	9 resources/materials	10 resources/energy	11 noise	12 vibration	13 community concerns	14 flora	15 fauna	16 waste / chemicals	17 landfilling	18 litter	19 traffic	20 aboriginal heritage	21 European heritage	Impact - No Controls. Refer to EMPs or Operational Controls Table Appendix 4 of PMP		
Structure - formwork, reinforcement, concrete & curing, post tensioning	likelihood																						#N/A	#N/A	
	consequence																						#N/A		
	risk				#N/A	#N/A						###	#N/A				#N/A			#N/A			#N/A		
	Signif y=yes, n=no				#N/A	#N/A						###	#N/A				#N/A			#N/A			#N/A		
Wet trades: Blockwork, brickwork, render, waterproof membranes	likelihood																						#N/A		
	consequence																						#N/A		
	risk				#N/A					#N/A							#N/A					#N/A	#N/A		
	Signif y=yes, n=no				#N/A					#N/A							#N/A					#N/A	#N/A		
Services - hydraulic, electrical, mechanical, incl. cable chasing, concrete coring	likelihood																						#N/A	#N/A	
	consequence																						#N/A	#N/A	
	risk	###			#N/A							###					#N/A		###			#N/A	#N/A		
	Signif y=yes, n=no	###			#N/A							###					#N/A		###			#N/A	#N/A		
Roofing	likelihood																						#N/A		
	consequence																						#N/A		
	risk									#N/A		###					#N/A		###				#N/A		
	Signif y=yes, n=no									#N/A		###					#N/A		###				#N/A		
Finishes - Internal: partitions, ceilings, joinery, door hanging Wet trades: Gyprocking, painting, tiling, floor finishes,	likelihood																						#N/A	#N/A	
	consequence																						#N/A		
	risk									#N/A		###	#N/A				#N/A		###				#N/A		
	Signif y=yes, n=no									#N/A		###	#N/A				#N/A		###				#N/A		
External works - pavements, landscaping, lighting	likelihood	M																					1. photochemical smog, visual amenity	#N/A	#N/A
	consequence																						#N/A	#N/A	#N/A
	risk	1			#N/A	#N/A			#N/A			###	#N/A		###		#N/A	#N/A		#N/A		#N/A	#N/A	#N/A	#N/A
	Signif y=yes, n=no	Y			#N/A	#N/A			#N/A			###	#N/A		###		#N/A	#N/A		#N/A		#N/A	#N/A	#N/A	

6.4 ENVIRONMENTAL POLICY

The Richard Crookes Constructions Pty Ltd Environmental Policy is not embedded in this document, it is provided as an attached appendix so that it can be displayed/updated/revised in isolation if required.

ENVIRONMENTAL
POLICY

Richard Crookes Constructions Pty Limited promotes and encourages a sustainable environment throughout our business activities and sources our supplies and services in ways that prevent pollution and promote compliance with legal and other requirements.

The company implements Environmental Management System to aid us in meeting our corporate responsibilities. The System is certified by Global-Mark as meeting the requirements of AS/NZS ISO 14001:2016 Environmental Management Systems.

These form part of the company's Project Management Plans and are supported by company procedures and guidelines.

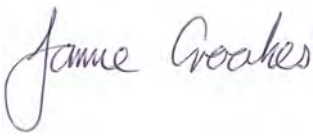
Management intends that all employees of our company, relevant subcontractors and suppliers, are made aware of their environmental responsibilities and the environmental impacts associated with their activities, products and services.

Our company objectives for continual improvement in environmental management include:

- Reducing the number of environmental notices issued on the projects by implementing a program of inductions, training and monitoring.
- Minimising the impacts to the community through the development of project specific Environmental, Traffic management plans, stakeholder consultation plans and by timely and appropriate response to complaints.
- Minimising impacts on the environment using dust, soil and water, waste and chemical management practices that are regularly inspected and maintained.
- Achieve a waste minimisation figure of 85% through monthly reporting

The Continual improvement of the project environmental management plans and progress with achieving the company's objectives will be reviewed during management meetings, project reviews and following the results of internal and external audits.

The Policy will be made available to the public and interested parties on request. This Policy will be reviewed every two years.



Jamie Crookes
Managing Director
26th February 2020

6.5 UNEXPECTED FINDS PROTOCOL – CONTAMINATION

The unexpected finds protocol for contamination and associated communications procedure has been prepared by Coffey/Tetra Tech for the Project.

It is not embedded in this document; it is supplied as an attached appendix so that it can be displayed/updated/revised in isolation if required.

Level 19, Tower B, Citadel Tower, 799 Pacific Highway
Chatswood
NSW 2067 Australia

t: +61 2 9406 1000
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coffey.com

6 May 2021

Our ref: Chatswood Schools Unexpected Finds Protocol 06052021

Richard Crookes Constructions

Level 3, 4 Broadcast Way

Artarmon, NSW 2064

Attention: Obi Williams

Dear Obi,

Unexpected Finds Protocol for Contamination – Chatswood Schools Project.

At the request of Richard Crookes Constructions, the following unexpected finds protocol has been drafted. This document was drafted to fulfil the requirements stipulated in SSD 9483 Condition B19 b.

This document is to be read in conjunction with site safety plans and procedures.

Please Note: As per NSW Work Health & Safety Regulation, 2017 for air monitoring and clearance inspections for friable asbestos containing material A Licensed Asbestos Assessor is required for all works.

If you have any questions or need additional information, please contact the undersigned on 0413 945 538.

For and on behalf of Coffey

R. Wilkinson

Richard Wilkinson

National NATA Accreditation Manager (ISO17020/ISO17025)

UNEXPECTED FINDS PROCEDURE

1

STOP WORK

Cease disturbance of the affected portion of the site. Stop work in the potentially hazardous area and exit in a safe manor. Notify the Project Manager, Site Manager and site Hygienist.

2

ASSESS RISK

Site Hygienist to inspect the area if safe to do so. Immediately implement controls if it is considered that the unexpected find may pose an immediate risk of harm to human health or the environment, and it is safe to do so. Notify the relevant authorities if required (i.e. NSW EPA, SafeWork NSW), site auditor.

3

ISOLATE/CONTROL

A Licensed Asbestos Assessor (LAA) to conduct an assessment of the location and extent of the unexpected find, if safe to do so.
Work Health and Safety (WHS) and environmental controls shall be established based on initial observations, if required. These may include but not be limited to:
Controlling access by establishment of barricades and warning signs.
Encapsulating with plastic or geofabric.
Engage a suitably qualified hygienist (or LAA if required) to conduct NATA accredited air monitoring and associated analysis.
Delineate an exclusion zone around the affected area using fencing and/or appropriate barriers and signage. Additional control measures may be required for odours and/or volatile compounds (e.g. odors suppression, no ignition source etc.).

4

INSPECTION

Further visual assessment and sample collection and analysis shall be carried out by a suitably qualified hygienist (or LAA if required), if required. If necessary, samples shall be collected and analysed at a laboratory for contaminants of potential concern using National Association of Testing Authorities (NATA) accredited methods.

5

ADVICE/DIRECTION

Depending on the outcome of the assessment by the hygienist (or LAA if required) the unexpected find may need to be further assessed, managed, remediated or disposed offsite in accordance with regulatory requirements.
A meeting/workshop shall be held by the Principal Contractor. The hygienist (or LAA if required) and key stakeholders shall attend the meeting to determine an appropriate course of action. This should include discussions around the handling, treatment and disposal of material; Workplace Health and Safety considerations; and how the affected area shall be validated. Consideration shall be given to amending training/induction procedures and Site Safety Plan/Site Work Method Statements.

6

RESUME WORKS

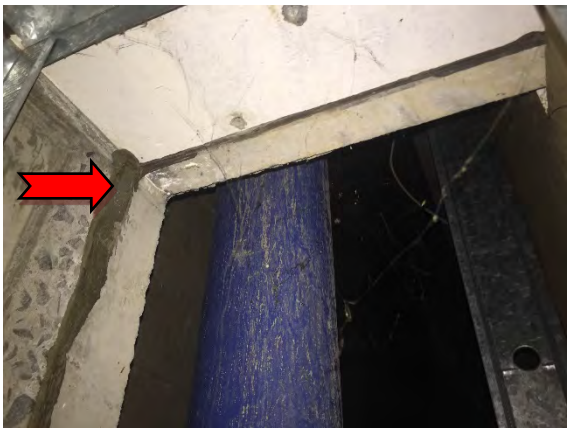
Affected areas shall be reopened for works following a visual clearance inspection of the location by a suitably qualified hygienist (or LAA if required) in association with NATA accredited air monitoring and analysis, with issuance of a clearance report by the hygienist and/or instruction from the Principal Contractor If it is deemed safe to do so.

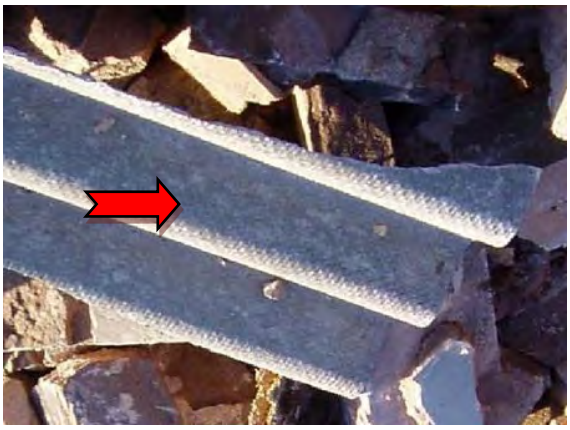
ASBESTOS IDENTIFICATION

Products suspected of containing asbestos and requiring identification are to be referred to the Project Manager, Site Manager and Hygienist who will arrange for sample analysis to be undertaken.

WHEN IN DOUBT TREAT THE PRODUCT AS ASBESTOS CONTAINING MATERIAL UNTIL IDENTIFIED AS OTHERWISE.

The following photos are examples of asbestos products:

Photograph 1: Asbestos containing caulking to window frames. 	**Photograph 2:** Asbestos containing bituminous backing boards. 
Photograph 3: Asbestos containing construction joint mastic. 	**Photograph 4:** Asbestos containing fibre cement sheeting. 

Photograph 5: Asbestos containing roof sheet. 	**Photograph 6:** Asbestos containing fibre cement debris. 
Photograph 7: Asbestos containing pipework. 	**Photograph 8:** Asbestos containing fibre cement debris. 

Any unexpected finds encountered should be listed on a UFP register, which should include the action taken and the status of the unexpected find. A suitable register is attached.
Prior to closing out an unexpected find it will be important to ensure the appropriate documentation is obtained, such as: photographs, the UFP form, laboratory certificates and a validation report or letter.

UNEXPECTED FINDS PROTOCOL FORM

To be completed by the Site Supervisor/ Occupational Hygienist Representative

Form Completed By	
Company Name	
Contact Details	
Date Form Completed	
Date Unexpected Find Identified	
UFP Reference Number	
Location of Unexpected Find including a site sketch	
Description of Unexpected Find	
Persons Contacted / Notified	
Unexpected finds isolated	Yes ☐ No ☐
Description of controls established	
Photographs taken	Yes ☐ No ☐
Further Assessment Required	Yes ☐ No ☐
Other Comments	

Unexpected Finds Register					
UFP Reference Number	Date UFP Identified	Suspect Material	Recorded on UFP Form	Action Taken	Status
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		
			Yes ☐ No ☐		

6.6 UNEXPECTED FINDS PROTOCOL – ABORIGINAL AND NON-ABORIGINAL HERITAGE

The unexpected finds protocol for Aboriginal/Non-Aboriginal Heritage and associated communications procedure has been prepared by Heritage 21 and Biosis for the Project.

It is not embedded in this document; it is supplied as an attached appendix so that it can be displayed/updated/revised in isolation if required.

Chatswood Public School and High School, Chatswood: Unexpected Finds Protocol

Final Report

Prepared for Heritage 21

4 May 2021

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Document information

Report to:	Heritage 21
Prepared by:	Anthea Vella
Biosis project no.:	35205
File name:	35205.Chatswood.Public.School.and.High.School.Unexpected.Finds.Protocol.FIN01.20210504
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Document control

Version	Internal reviewer	Date issued
Draft version 01	Taryn Gooley	04/05/2021
Final version	Taryn Gooley	04/05/2021

Acknowledgements

Biosis gratefully acknowledges the contributions of the following people and organisations in preparing this report:

- Heritage 21: Sue Rappoport.

Biosis staff involved in this project were:

- Lucy Wilson (mapping).

Contents

Figures

Glossary

AHIMS	Aboriginal Heritage Information Management System
Heritage Act	*Heritage Act 1977*
Heritage NSW	Heritage NSW, Department of Premier and Cabinet
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
SSD	State Significant Development
The study area	5 Centennial Avenue and 24 Centennial Avenue, Chatswood, New South Wales (Lot 1 DP 812207, Lot 2 DP 812207, Lot C DP 346499, Lot 1 DP 725204, Lots 20-23, Section 6 in DP 2273, Lots 18-21, Section 7 DP 2273, Lots 16-20, Section 8, DP 2271)

Phone Numbers

NSW Police Assistance Line	131 444
Heritage NSW	131 555 or (02) 9995 5000
Site Manager	TBC
Biosis Archaeologist	Anthea Vella – 0427 463 834

1 Introduction

This unexpected finds protocol has been prepared for the redevelopment of Chatswood Public School and Chatswood High School in line with Conditions B19 (c), C29, and C30 of the State Significant Development (SSD) Consent (SSD 9483). This document addresses protocols for unexpected finds of Aboriginal and non-Aboriginal heritage. The study area is located at 5 Centennial Avenue and 24 Centennial Avenue, Chatswood, New South Wales (Lot 1 DP 812207, Lot 2 DP 812207, Lot C DP 346499, Lot 1 DP 725204, Lots 20-23, Section 6 in DP 2273, Lots 18-21, Section 7 DP 2273, Lots 16-20, Section 8, DP 2271) (Figure 1 and Figure 2).

This unexpected finds protocol should be read in conjunction with:

- Statement of Heritage Impact: Chatswood Primary School, 5 Centennial Avenue, Chatswood NSW. Upgrades to Chatswood Public School and Chatswood High (Nimbus 2020a).
- Statement of Heritage Impact: Chatswood High School, 24 Centennial Avenue, Chatswood NSW. Upgrades to Chatswood Public School and Chatswood High School (Nimbus 2020b).
- Upgrades to Chatswood Public School and Chatswood High School. Appendix 10 - Aboriginal Cultural Heritage Assessment (Eco Logical Australia 2020a).
- Upgrades to Chatswood Public School and Chatswood High School. Appendix 20 - Archaeological Assessment (Eco Logical Australia 2020b).

The assessments listed above concluded that there is low potential for Aboriginal and previously unidentified non-Aboriginal heritage to remain within the study area. This document does not include management or mitigation procedures associated with previously recorded non-Aboriginal heritage values identified by Nimbus (2020a and 2020b). Management of known or previously recorded non-Aboriginal heritage values within the study area will be managed outside of this procedure. In the event that Aboriginal or previously unidentified non-Aboriginal heritage is identified within the study area during construction the unexpected finds procedure in Section 2 must be followed.

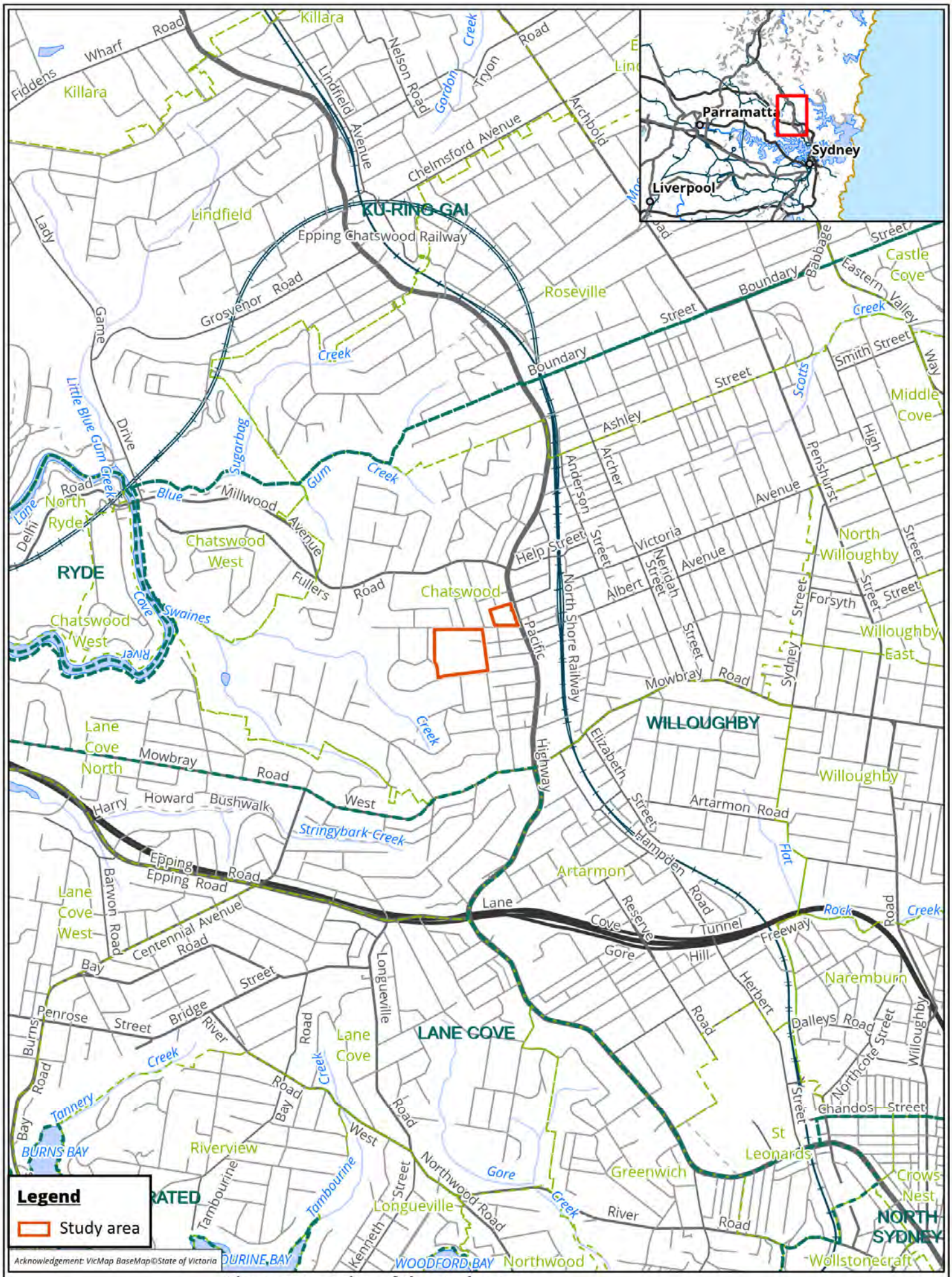


Figure 1 Location of the study area

biosis

Matter: 35204,
Date: 03 May 2021 ,
Prepared for: AV, Prepared by: LW, Last edited by: lwilson
Layout: 35205_F1_Locality
Project: P:\35200s\35205\Mapping\35205_Cwood_Mapping.aprx

0 200 400 600 800 1,000
Metres
Scale: 1:25,000 @ A4
Coordinate System GDA 1994 MGA Zone 56

N

Legend

- Study area
- Lot

Figure 2 Study area detail

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

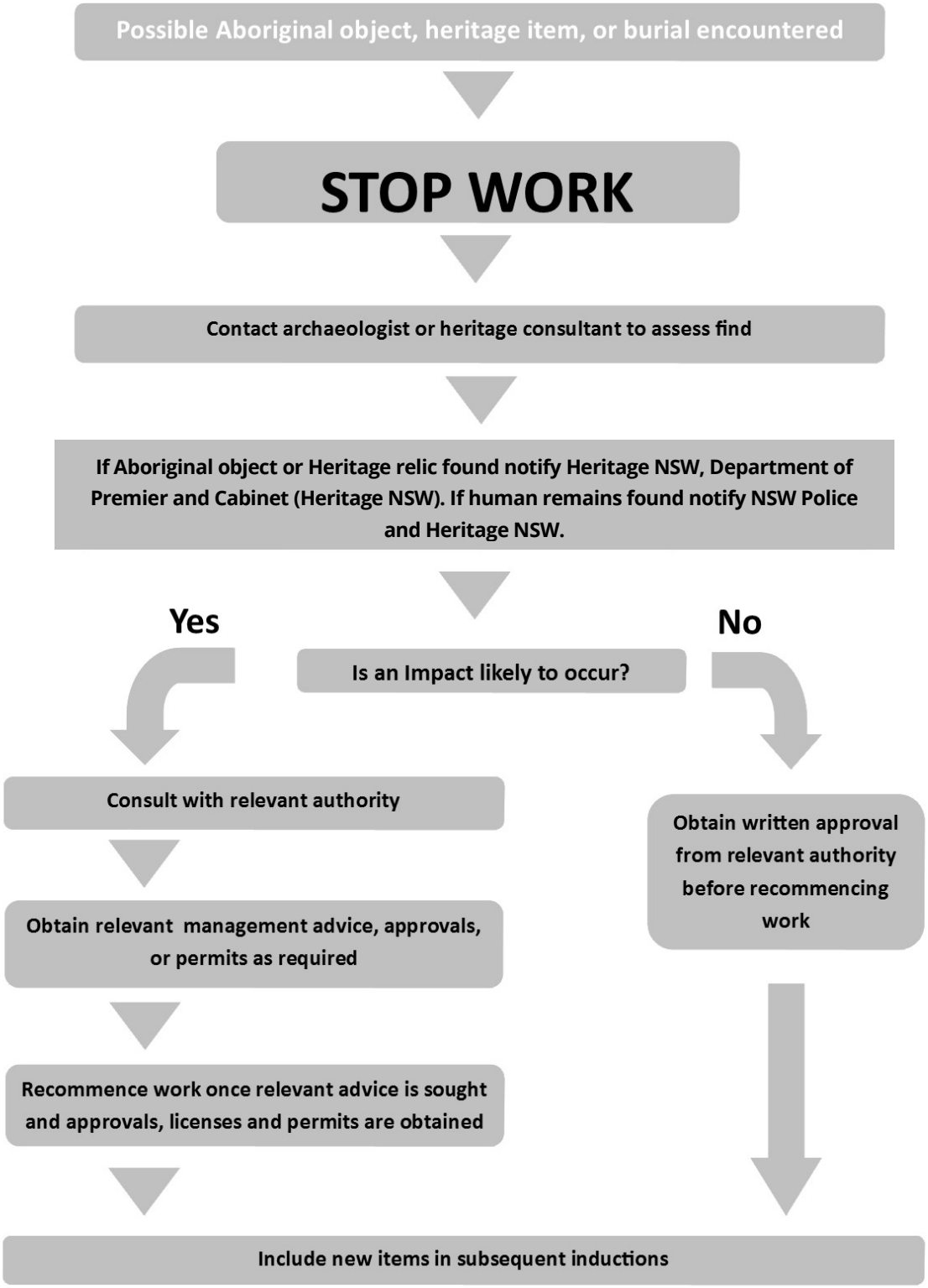
Coordinate System: GDA 1994 MGA Zone 56

N

biosis

Matter: 35205,
Date: 03 May 2021
Prepared for: AV, Prepared by: LW, Last edited by: lwilson
Layout: 35205_F2_StudyArea
Project: P:\35200s\35205\Mapping\35205_Cwood_Mapping.aprx

2 Unexpected finds procedures



2.1 Unexpected Aboriginal find procedure

In the event that unexpected Aboriginal objects or sites are located, an assessment will need to be made as to the significance of the object. The *National Parks and Wildlife Act 1974* defines an Aboriginal object as:

> *"...any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains..."*

An example of Aboriginal objects can be found in Section 2.4.1.

The following process is to be followed should any Aboriginal objects (or potential object) be encountered during works:

1. **Cease work** in the vicinity, the find should not be moved until assessed by a qualified archaeologist.
2. **Establish a no-go zone** until the area can be inspected.
3. **Contact a qualified archaeologist**. The archaeologist will investigate and assess the Aboriginal object to determine the nature, extent and significance of the find. This will enable recommendations to be provided on how work can proceed and whether any further work is required. The archaeologist must supply written advice to the Project Manager stating:
    a. Determination of whether the find is an Aboriginal object.
    b. Advice on how the project is to proceed and whether the establishment of any no-go areas is necessary.
    c. Recommendation on further works that may be required and timeframe for completion of these works.
4. **Notify Heritage NSW and Aboriginal stakeholders** if required. This will include a statement concerning the find, management measures implemented and notification of any further works arising. Aboriginal stakeholders are to be involved in any further assessments or works as required. Heritage NSW can be contacted through the Environmental Line on 131 555 as soon as practical.
5. **Register the site on Aboriginal Heritage Information Management System (AHIMS)** if required**.** If the find is determined to be an Aboriginal object a site card will need to be created on AHIMS. This will need to include the management outcome for the site.
6. **Hold works.** Works will not be able to recommence within the location of the find until written approval confirmation from Heritage NSW is obtained.

2.2 Unexpected non-Aboriginal heritage items

Non-Aboriginal heritage items may include archaeological 'relics' or other historical items (i.e. works, structures, buildings or movable objects). The *Heritage Act 1977* defines a relics as:

> *...any deposit, artefact, object or material evidence that relates to the settlement of the area that comprises NSW, not being Aboriginal settlement; and is of State or local heritage significance...*

This includes non-Aboriginal human remains with heritage value. Headstones, grave enclosures, grave goods and associated objects may also be considered relics under the Heritage Act. An example of non-Aboriginal heritage items can be found in Section 2.4.2.

The following process must be followed with respect to unexpected historical heritage items:

1. **Immediately cease work in the vicinity** if any suspected historical heritage items are encountered during works associated with this development. The find should not be moved until assessed by a qualified archaeologist.

2. **Secure the location** by cordoning off an appropriate exclusion zone. This will need to be established in consultation with a qualified archaeologist who will also need to assess the find.
3. Photograph the find and send the photograph to the project archaeologist.
4. **The archaeologist will investigate** and assess the item to determine the nature, extent and significance of the find. This will enable recommendations to be provided on how work can proceed and whether any further work is required.
5. **Notify Heritage NSW** if the find is considered to be of heritage significance. This will include a statement concerning the find, its significance, and the established management measures to avoid further impact.
6. **Relevant approvals** may need to be obtained under the *Heritage Act 1977* before works can recommence.
7. **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.

2.3 Discovery of human remains procedure

In the event that suspected human remains are discovered, the following process must be followed:

1. **Immediately cease all work** at that location and not further move or disturb the remains.
2. **Notify the NSW Police** Assistance Line on 131 444.
3. **Notify Heritage NSW** as soon as practicable. This will include a statement concerning the find, management measures implemented and notification of any further works arising. Heritage NSW can be contacted through the Environmental Line on 131 555.
4. **Notify Aboriginal stakeholders** if required. If the remains are identified are Aboriginal ancestral remains, Aboriginal stakeholders are to be involved in any further assessments or works as required.
5. **Establish a no-go zone** until the area can be inspected. This will need to be established in consultation with NSW Police, Heritage NSW and if necessary a qualified archaeologist.
6. **Hold works.** Works will not be able to recommence within the location of the find until confirmation from NSW Police and Heritage NSW is obtained. If the remains are confirmed as not being human then works may recommence. In the event that remains are human then consultation with NSW Police, Heritage NSW and the Aboriginal stakeholders (if required) to establish a plan of management will be required.
7. **Prepare Plan of Management.** Works in the vicinity of the find will only be able to commence once the plan of management has been established and approval has been obtained from all relevant parties.

2.4 Basic identification skills

2.4.1 Examples of Aboriginal objects and site types

Isolated stone artefact

Stone artefacts are any items of stone material made or modified by people, including any debris left behind when such tools were made. Materials used to make stone artefacts may be found locally, or traded across long distances

Stone artefact scatter

Stone artefact scatter sites comprise groups of stone tools, debris and the tools used in manufacture (i.e. stone anvils and hammerstones). Artefact scatters can range from high-density concentrations of flaked stone and ground stone artefacts to sparse, low-density 'background' scatters and isolated finds.

Shell midden

Shell middens are the remains of food production and processing areas, where people would have sat down to eat, cook or prepare food. Shell middens occur commonly in coastal areas, however they also occur near inland watercourses where freshwater mussels and other edible mollusc species may be present.

Modified tree

A modified tree is any tree from which the back has been cut or harvested for the manufacture of containers (coolamon), canoes, shields, weapons and medicines. Scarring also occurred where toeholds were cut to allow people to climb trees to hunt possums, reptiles, birds or harvest wild honey.

Burial

Burials comprise any human skeletal remains, intact or fragmentary. If any suspected human remains are encountered, the procedure set out in Section 2.3 must be followed.

Aboriginal gathering and resource location

Resource gathering locations are places where food, medicines and plant material used as twine, in weaving or tool making by Aboriginal people exist. Many such locations are still accessed by contemporary Aboriginal people.

Hearth

A hearth is the remains of a campfire, an oven or other food cooking and processing areas. Hearths commonly contain baked clay, termite mound fragments broken up and used as 'heat retainers', small stones used in cooking, charcoal, burnt bone, shell and other food remnants.

2.4.2 Identification of non-Aboriginal heritage items

If any historical relics are identified then the unexpected finds process must be followed. As stated above, non-Aboriginal heritage items may include archaeological 'relics' or other historical items (i.e. works, structures, buildings or movable objects).

Historical heritage items/objects can consist of the following materials:

- Ceramic.
- Glass.
- Organic material.
- Leather.
- Metal.
- Synthetic.

Historical relics can consist of single items, dense archaeological deposits, built structures and landscapes. Examples of heritage items are included below.

Photo 1 Ceramic plate fragments

Photo 2 Glass artefacts

Photo 3 Ceramic artefacts

Photo 4 Cesspit filled with ash

Photo 5 A drainage system

Photo 6 Wall footings

Photo 7 Dense artefact deposits

Photo 8 Historic well

Photo 9 Beehive well

References

Eco Logical Australia 2020a, Upgrades to Chatswood Public School and Chatswood High School. Appendix 10 - Aboriginal Cultural Heritage Assessment. Report prepared for School Infrastructure NSW, Department of Education.

Eco Logical Australia 2020b, Upgrades to Chatswood Public School and Chatswood High School. Appendix 20 - Archaeological Assessment. Report prepared for School Infrastructure NSW, Department of Education.

Nimbus 2020a, Statement of Heritage Impact: Chatswood Primary School 5 Centennial Avenue, Chatswood NSW 2067. Upgrades to Chatswood Public School and Chatswood High School for School Infrastructure NSW C/-Johnstaff Projects.

Nimbus 2020b, Statement of Heritage Impact: Chatswood High School 24 Centennial Avenue, Chatswood NSW 2067. Upgrades to Chatswood Public School and Chatswood High School for School Infrastructure NSW C/-Johnstaff Projects.

6.7 CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT SUB-PLAN

The Construction Traffic & Pedestrian Management Sub-Plan has been prepared by TTPP Traffic Engineers for the Project.

It is not embedded in this document; it is supplied as an attached appendix so that it can be displayed/updated/revised in isolation if required.

Chatswood Education Precinct

Construction Traffic and Pedestrian Management Sub-Plan

Prepared for:

Richard Crookes Constructions

20 April 2021

The Transport Planning Partnership

Chatswood Education Precinct

Construction Traffic and Pedestrian Management Sub-Plan

Client: Richard Crookes Constructions

Version: V08

Date: 20 April 2021

TTPP Reference: 20182

Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
V01	24/02/21	Lalaine Malaluan, Jessica Ng	Jessica Ng	Jason Rudd	Jason Rudd
V02	01/03/21	Lalaine Malaluan, Jessica Ng	Jessica Ng	Jason Rudd	Jason Rudd
V05	08/04/21	Lalaine Malaluan, Jessica Ng	Jessica Ng	Jason Rudd	Jason Rudd
V06	08/04/21	Lalaine Malaluan, Jessica Ng	Jessica Ng	Jason Rudd	Jason Rudd
V07	19/04/21	Lalaine Malaluan, Jessica Ng	Jessica Ng	Jason Rudd	Jason Rudd
V08	20/04/21	Lalaine Malaluan, Jessica Ng	Jessica Ng	Jason Rudd	

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C. SWEPT PATHS (STATE ROADS)

D. TRAFFIC CONTROL PLANS

E. DRIVER'S CODE OF CONDUCT

1 Introduction

1.1 Project Background

On 30 November 2020, development consent was issued for the redevelopment of Chatswood Public School and Chatswood High School (SSD 9483). The project involves the demolition of selected buildings and construction of new buildings, refurbishment of existing buildings, changes to vehicular access and car parking, tree removal, landscaping, earthworks and site remediation.

The Transport Planning Partnership (TTPP) has prepared this Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) on behalf of Richard Crookes Constructions (RCC) to satisfy consent condition B20 for SSD 9483.

1.2 Purpose of Report

The purpose of this CTPMSP is to assess the traffic and pedestrian implications and outline how vehicular, cyclist and pedestrian traffic and access will be managed during the construction period. This CTPMSP provides a structured approach to manage traffic and access during construction to provide a safe road environment, minimise impact on the surrounding road network and maintain access for all road users and the local community.

Specifically, the purpose of this CTPMSP is to:

- maintain vehicle and pedestrian access to/from adjacent properties at all times
- restrict construction vehicle movements to designated routes to/from the site
- manage and control construction vehicle activity in the vicinity of the site
- provide an appropriate and convenient environment for pedestrians and cyclists around the construction site
- minimise the impact of construction activity on traffic flows, emergency vehicle access, pedestrian movements and during peak school operations
- maintain appropriate public transport access
- carry out construction activity in accordance with the approved work hours.

This report has been prepared by engineers who hold the Roads and Maritime *Prepare a Works Zone Traffic Management Plan* certification. Details of the accredited engineers are provided as follows:

- Jessica Ng (Szeto) – Certification No. 0051973487
- Lalaine Malaluan – Certification No. 0052310614
- Karl Magistrado – Certification No. TCT 1008289

1.3 SSDA Condition Consent

This CTPMSP has been prepared to satisfy consent condition B20, B24 and B35 in the SSDA approval.

Table 1.1: Development Consent SSD 9483 Condition B20, B24 and B35

CEMP Condition Satisfaction Table		
Condition	**Condition Requirements**	**Document/Sub-Plan Reference**
B20	B20. 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:	SSD 9483 – B20 – CTPMSP – 20 Apr 21
	(a) be prepared by a suitably qualified and experienced person(s);	Refer to Section 1.2, p1
	(b) 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;	Refer to Section 4, p27-34
	(c) be prepared in consultation with Council and TfNSW;	Refer to Section 1.4, p3-4
	(d) detail heavy vehicle routes, access and parking arrangements;	Refer to Section 4.8, 3.4 and 3.8, p32-33, p18-19 and p23
	(e) implement a public information campaign to inform the community of any road changes well in advance of the changes;	The Schools will be responsible for all public information campaigns
	(f) confine temporary road closures to weekends and off-peak hour times;	Refer to Section 3.12, p26
	(g) prior to implementation of any road closure during construction, Council must be advised of these changes and a Traffic Control Plan must be submitted to Council for approval;	Noted.
	(h) a Traffic Control Plan must include times and dates of changes, signage, road markings and any temporary traffic control measures; and	Refer to Section 4.1, p27
	(i) construction access from the Pacific Highway is not permitted unless otherwise approved by TfNSW.	Refer to Section 3.4, p18-19
	(j) a construction zone is not permitted on the Pacific Highway unless otherwise approved by TfNSW.	Refer to Section 3.11, p24-26
The below conditions are not strictly required to be included in the CEMP as per Condition B19 but have been included for information as they relate to the contents and intent of the CEMP. See condition specific wording for submission and approval requirements.		
B24	A Driver Code of Conduct must be prepared and communicated by the Applicant to heavy vehicle drivers and must address the following: (a) minimise the impacts of earthworks and construction on the local and regional road network; (b) minimise conflicts with other road users; (c) minimise road traffic noise; and (d) (d) ensure truck drivers use specified routes.	Refer to Section 4.9 and Appendix F, p33
	C10. All construction vehicles (excluding site personnel vehicles) are to be contained wholly within the site, except if located in an approved on-street	Refer to Sections 3.5 and 3.11, p20-21 and p24-26

CEMP Condition Satisfaction Table		
Condition	**Condition Requirements**	**Document/Sub-Plan Reference**
	work zone, and vehicles must wholly enter the site or an approved on-street work zone before stopping.	
	E11. All driveways, footways and parking areas must be unobstructed at all times. Driveways, footways and car spaces must not be used for the manufacture, storage or display of goods, materials, refuse, skips or any other equipment and must be used solely for vehicular and/or pedestrian access and for the parking of vehicles associated with the use of the premises	Refer to Sections 3.9 and 4.3, p23 and p28-29
	E12. During operation of the development, the Pacific Highway vehicular entrance must:	Refer to Section 3.4, p18-19
	(a) only be used by ambulance vehicles and service / delivery vehicles which are not larger than an ambulance vehicle; and	
	(b) only be used by service / delivery vehicles outside of school hours.	Refer to Section 3.4, p18-19
B35	Prior to the commencement of construction, evidence of compliance of construction parking and access arrangements with the following requirements must be submitted to the Certifier:	Refer to Section 3.5, p20-21
	(a) all vehicles must enter and leave the site in a forward direction;	
	(b) the swept path of the longest construction vehicle entering and exiting the site in association with the new work, as well as manoeuvrability through the site, is in accordance with the latest version of AS 2890.2;	Refer to Appendix B and C
	(c) the safety of vehicles and pedestrians accessing adjoining properties, where shared vehicle and pedestrian access occurs, has been addressed; and	Refer to Section 4.3, p28-29
	(d) no construction vehicle access is permitted from the Pacific Highway vehicular entrance unless otherwise approved in writing by TfNSW.	Refer to Section 3.4, p18-19

1.4 Consultation Summary

This report has also been prepared in consultation with relevant authorities as outlined in Table 1.2. In addition to this, RCC has liaised with the schools to develop the construction methodology and staging accordingly. RCC will also continue to regularly consult the schools to address any issues / concerns arising during construction.

Table 1.2: Consultation Summary

Agency	Date	Type of Consultation	Purpose of Consultation	Person Contacted
TfNSW	10/04/19	Meeting	Project overview and requirements	TfNSW – Ken Ho, Mark Ozinga, Allan Borg RMS – Pahee Rathan, Zhaled Alamouti
Council	16/04/19	Meeting	Project overview and requirements	Ian Arnott (Planning Manager), Ritu Shankar (Planning Team Leader), Daniel Sui (Senior Traffic Engineer)

Agency	Date	Type of Consultation	Purpose of Consultation	Person Contacted
Council	29/11/19	Meeting	Project update – revised masterplan	Ian Arnott (Planning Manager), Ritu Shankar (Planning Team Leader)
TfNSW	18/10/19	Email	Project update – revised masterplan	Ken Ho (TfNSW)
TfNSW	04/02/21	Tele-meeting	Pacific Highway Access Approval	Pahee Rathan (TfNSW)
TfNSW	03/03/21	Email	Issue Draft CTPMSP for review	Pahee Rathan (TfNSW)
Council	03/03/21	Email	Issue Draft CTPMSP for review	Gordon Farrelly (Council)
Council	26/03/21	Meeting	Explanation of project staging methodology	German Barragan, Daniel Sui (Council)
Council	01/04/21	Meeting	Council comments on Draft CTPMSP	German Barragan, Daniel Sui (Council)
TfNSW	20/04/21	Meeting	TfNSW comments on Draft CTPMSP	Zakaria Ahmad, Peter Carruthers and Malgy Coman (TfNSW)

Agency feedback obtained during the consultation process has been incorporated into this document accordingly.

1.5 Consultation Feedback

The draft CTPMSP was submitted to TfNSW and Council to seek initial feedback on the draft report ahead of the formal submission. This CTPMSP has been updated based on agency feedback as shown in Table 1.3 and Table 1.4.

Table 1.3: TfNSW Feedback

TfNSW Comments (dated 24/03/2021)	Response
1. Access to Pacific Highway restriction peak hours should be set to 3-7pm.	RCC will restrict all construction trucks at the Pacific Highway access between 3pm and 7pm where possible. The exception to this would be concrete trucks if concrete pours are not completed by 3pm as it would not be feasible to halt a concrete pour once it has commenced. RCC will however endeavour to complete all concrete placement by 3pm where possible. In addition to this, bin delivery/pick up vehicles may require access after 3pm to ensure bins are emptied/removed prior to the start of the next work day. This however would be minimal – say a maximum of 1 vehicle per day after 3pm and therefore, would have little impact on traffic flow. See Section 3.7 for full details.
2. Can we please get a breakdown of the construction traffic volumes for each access point (especially Pacific Highway).	This report has been updated accordingly. See Section 3.7 for full details.
3. Please provide work zone hours for the two proposed work zones.	The work zone hours will be subject to Council approval. It is however proposed to seek approval of the work zone during SSDA approved work hours, i.e. Monday to Friday 7am-6pm and Saturday 8am-1pm. RCC has also discussed the proposed work zone locations and requirements with the schools, who have raised no objections and have

TfNSW Comments (dated 24/03/2021)	Response
	agreed to the proposed works zone arrangements. See Section 3.11 for full details.
4. Please provide swept paths for vehicle movements on Centennial to Dardanelles Rd and De Villiers to Eddy Road. Swept paths required for vehicle movements to local roads, not just at the driveways.	This has been included accordingly. See Appendix B.
5. Oliver Road has a 3T weight limit, consult with council to gain access. Please provide swept paths for vehicle movements through Oliver Rd and Whitton Road to Centennial.	This has been included accordingly. See Appendix B.
6. Egress movements on Jenkins Street tracking over the wrong side of the road.	A number of options have previously been considered to cater for construction activities near Building V (near Jenkins Street). However, based on existing site constraints, the only feasible location to undertake concrete pour works (and larger deliveries near this building) is via an on-street works zone on Jenkins Street. Based on the existing topography, TTPP is of the view that using Edgar Street from Fullers Road is not suitable for larger trucks. This is also consistent with Council feedback regarding truck access via Edgar Street – i.e. this road should be limited by utes and vans only. As such, the only other option to access the Jenkins Street works zone would be via Centennial Avenue to cater for essential construction works near Building V. As discussed with Council, these truck movements will be appropriately managed by relevant traffic control to ensure safety of all road users at all times. See TCP provided in Appendix D.
7. Reversing movement from Centennial Avenue to Jenkins St loading zone is not supported.	A number of options have previously been considered to cater for construction activities near Building V (near Jenkins Street). However, based on existing site constraints, the only feasible location to undertake concrete pour works (and larger deliveries near this building) is via an on-street works zone on Jenkins Street. Based on the existing topography, TTPP is of the view that using Edgar Street from Fullers Road is not suitable for larger trucks. This is also consistent with Council feedback regarding truck access via Edgar Street – i.e. this road should be limited by utes and vans only. As such, the only other option to access the Jenkins Street works zone would be via Centennial Avenue to cater for essential construction works near Building V. As discussed with Council, these truck movements will be appropriately managed by relevant traffic control to ensure safety of all road users at all times. See TCP provided in Appendix D.
8. Concerned with the kerb encroachment on Pacific Highway on egress movements. Egress movements also encroaches onto all three lanes of Pacific Highway. This is not supported.	RCC has reviewed access off Pacific Highway and confirms that this driveway can be widened to 6.5m during construction to improve construction truck access out of the site onto Pacific Highway. It is however noted that all vehicles will only exit the site when safe to do so (i.e. suitable gaps in traffic to exit the site). Any vehicles longer than 7.5m which need to encroach into Lane 2 to turn left onto Pacific Highway will display "DO NOT OVERTAKE TURNING VEHICLE" as per Australian Road Rules 2014.
9. Movement from Victoria Avenue to the driveway on Pacific Highway cannot be undertaken from kerbside lane (Lane 1) as this lane must turn left at the intersection.	This has been updated accordingly. See Appendix C.

TfNSW Comments (dated 24/03/2021)	Response
10. Traffic controllers may be required on Pacific Highway to assist pedestrians (only) when heavy vehicles access Pacific Highway driveway.	This has been updated in the TCP accordingly. See Appendix D.
11. Additional warning signs required on Pacific Highway to warn pedestrians of heavy vehicle access on Pacific Highway.	This has been updated in the TCP accordingly. See Appendix D.
TfNSW Comments (dated 19/04/2021)	**Response**
1. The developer may need to enter into a Works Authorisation Deed (WAD) to modify the kerb on the Pacific Highway access as it is in very close proximity to utilities and traffic signals.	Noted.
2. Transport for NSW requires the minimisation of impacts to the number of lanes an egress movement requires. Pacific Highway egress for 12.5m and 8.8m is very close to encroaching lane 3. Similarly this is also true for 6.4m Small rigid. Can this be mitigated by widening the driveway?	The site access gate will be widened as far as practicable to maximise turning space for vehicles during construction, and to suit the SSDA approved design. All construction vehicles will only be permitted to exit the site when safe to do so, i.e. when safe traffic gaps are available. Site personnel will be positioned at the site access gate to guide pedestrian and construction vehicles near the gates where necessary.
3. Is council satisfied with the swept paths provided for De Villers Avenue and Eddy Road. Is traffic controllers being employed here to manage vehicles tracking over the opposite side of the road?	The CTPMSP has been prepared in consultation with Council. All feedback received from Council has been satisfactorily addressed in the CTPMSP accordingly.
4. Has council accepted the swept paths on the local road network?	The CTPMSP has been prepared in consultation with Council. All feedback received from Council has been satisfactorily addressed in the CTPMSP accordingly.

Table 1.4: Council Feedback

Council Comments (dated 30/03/2021)	Response
<u>Construction Vehicle Traffic Generation</u> • Pg. 17 states that a maximum of 20 deliveries will be received per day per gate during the general construction stage. Council notes that all 5 proposed gates will not be used simultaneously; however, there will be periods were 4 gates will be used at once (i.e. during the Construction of Buildings P1,P2 and S). Based on the trip estimation, there will be a peak heavy vehicle generation of 160 combined daily trips. The truck movements on Table 3.1 appear to be underestimated • The concrete pour trips estimated on Table 3.1 contradict the number of trucks expected. The applicant must clarify if it is expected 40 concrete trucks or trips per day.	The construction traffic generation has been updated accordingly. See Section 3.7 for full details.
<u>Traffic generation and street parking</u> • The Construction Worker and Staff Transportation Strategy to be developed and submitted to Council for review • Section 4.5 details the parking survey results on a 400 metre radius of the development site. The survey estimates on average a 50 percent of on-street parking availability	The CWSTS has been included in the updated CTPMSP. See Appendix E. The car parking surveys were undertaken in March 2019. It may be the case that parking conditions have since changed from the day of the surveys.

Council Comments (dated 30/03/2021)	Response
during a weekday and over 55 percent during a Saturday. Council requires further information as to parking survey methodology, roads surveyed, parking restrictions ,etc. Site inspections showed the on-street parking capacity is significantly less than the reported surveys results.	An updated survey will be completed during construction and the CTPMSP will amended accordingly. Current work/COVID environment would not provide accurate results so a survey during construction would be most beneficial in tracking the impact on the area. Notwithstanding this, RCC will implement appropriate management measures to manage all construction worker and staff car parking to minimise the impact on surrounding streets. A Complaint Management System will also be implemented to report issues with school staff and/or construction workers using the local surrounding roads for parking. This Complaint Management System will include a Complaints Register to record all complaints received associated with parking and will form part of the CWSTS, as provided in Appendix E.
<u>Construction vehicle types, demand, access routes to the site</u> • Pg. 17 notes that on "one off" occasions articulated truck and dogs might be used subject to application to Council and/or HNVR for assessment and relevant permit issue. All large vehicles/trucks must be addressed in the CTMP and this arrangement maintained during the course of all construction stages • Undertake all truck swept path analysis on all nominated routes including truck and dog, if proposed and be included in the CTMP • Council cannot support the heavy vehicle reverse inbound movement into Jenkins Street work zone at this stage, this movement is deemed unsafe for all road users and will require to temporary stop all traffic on the intersection of Centennial Avenue with Jenkins Street. • Council cannot support truck routes using Edgar Street and Jenkins Street from Fullers Road. Edgar Street and Fullers Road have multiple speed calming devices and/or on a high slope and are not considered adequate to be used by heavy vehicles. These roads must be limited to be used by Utes and Vans.	All large vehicles/trucks (e.g. vehicles larger than a 12.5m HRV) will be subject to a separate application to Council. This shall be included as part of any large vehicle application, which will be subject to a separate application to Council. A number of options have previously been considered to cater for construction activities near Building V (near Jenkins Street). However, based on existing site constraints, the only feasible location to undertake concrete pour works (and larger deliveries near this building) is via an on-street works zone on Jenkins Street. Based on the existing topography, TTPP is of the view that using Edgar Street from Fullers Road is not suitable for larger trucks. This is also consistent with Council feedback regarding truck access via Edgar Street – i.e. this road should be limited by utes and vans only. As such, the only other option to access the Jenkins Street works zone would be via Centennial Avenue to cater for essential construction works near Building V. As discussed with Council, these truck movements will be appropriately managed by relevant traffic control to ensure safety of all road users at all times. See TCP provided in Appendix D. Reverse movements will only be permitted from 9:30am to 3:30pm, and after 4:30pm (i.e. outside the school drop-off and pick up times), excluding concrete trucks (see Section 3.11 for more details).
<u>Proposed Work Zone on Jenkins Street and Centennial Avenue</u> • The existing parking 5-minute parking restrictions on the proposed work zone locations on Jenkins Street and Centennial Avenue should be maintained during the main pick up and drop off periods as the parking opportunities nearby the site are scarce. Work zone parking restrictions will apply outside of pick up/drop off periods	It is proposed to seek approval of the work zone during SSDA approved work hours, i.e. Monday to Friday 7am-6pm and Saturday 8am-1pm. It is the intention to retain existing parking facilities during drop off and pick up times where possible. RCC has liaised with the schools on the proposed works zone locations, who have not raised any objections regarding the works zone locations, as well as the temporary loss of some 5 minute drop off areas when each work zone is active (i.e. the works zone will never be operating at the same time as each other).

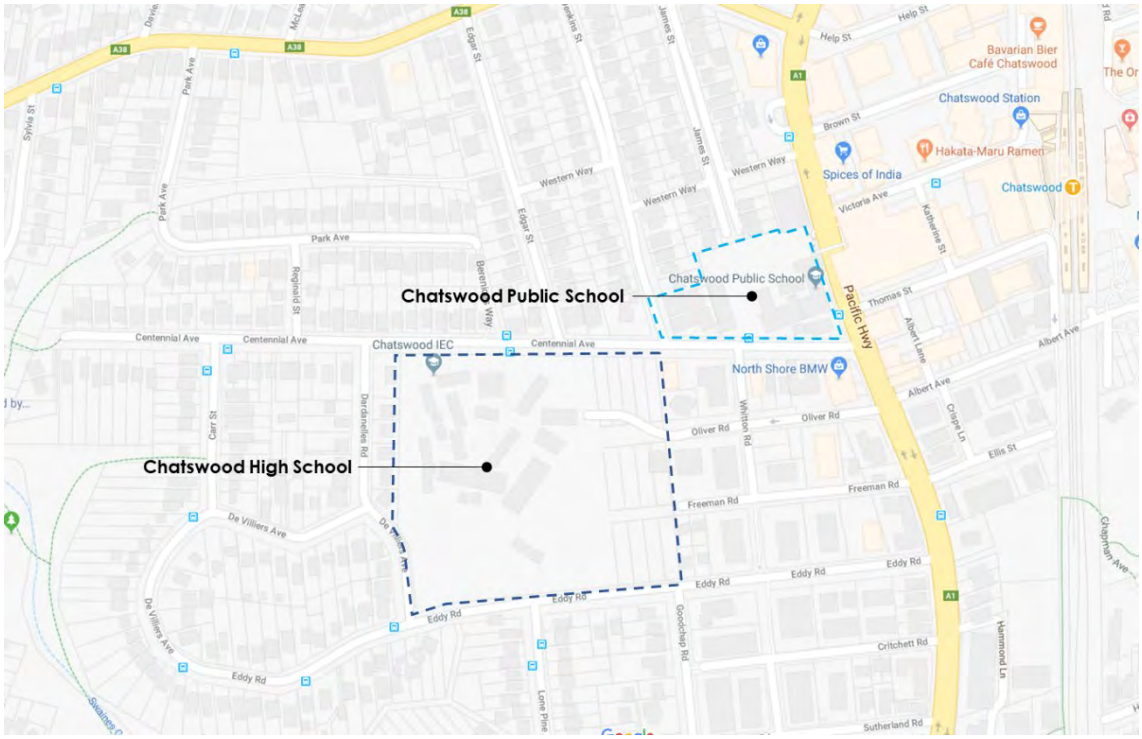
Council Comments (dated 30/03/2021)	Response
	It is however noted 60 per cent of the school population has been relocated to the High School site. On this basis, there should be sufficient drop off and pick up spaces available during construction and therefore, the works zones are considered acceptable and have been agreed upon by the school. See Section 3.11 for full details.
Monitoring and Communication strategies • Development of the Monitoring Program • Review of the CTMP to occur periodically • Track all sites deliveries against estimated delivery movements • Ensuring all TCPs are updated for work zones traffic management pan • Regular checks to ensure all loads are leaving the sites covered and free from debris • Undertake community, Progress Association and wider key stakeholders consultations and notifications for all stages of works/changes including temporary road network changes	Noted – this detail has been included in Section 4.13. RCC will be responsible to review and manage construction activities as per the CTPMSP accordingly. It is also noted that SINSW has a dedicated complaints and feedback hotline and that SINSW will be handling all complaints.

2 Site Context

2.1 Site Description

Chatswood Public School and Chatswood High School are located at 5 Centennial Avenue and 24 Centennial Avenue, Chatswood respectively. These sites are generally bound by Pacific Highway, Centennial Avenue and Eddy Road, as shown in Figure 2.1.

Figure 2.1: Locality Map



Source: Google Maps Australia

2.2 Abutting Road Network

The sites are surrounded by a network of state and local roads including Pacific Highway, Centennial Avenue, Jenkins Street, Oliver Road, Freeman Road, Eddy Road and De Villiers Avenue, as shown in Figure 2.2. A brief description of these roads is provided in Table 2.1.

Figure 2.2: Road Network Classification Map

Source: Transport for NSW <https://www.rms.nsw.gov.au/classification/map/cartomap, accessed on 22/02/21>

Table 2.1: Road Network

Road Name	Road Classification	Speed Limit	Description
Pacific Highway	State	60km/h (with 40km/h school zone restrictions)	Pacific Highway travels along the eastern boundary of Chatswood Public School and serves as a major north-south arterial link, providing connectivity between the Warringah Freeway and M1 Pacific Motorway. The road is generally configured with six traffic lanes, with three traffic lanes in each direction, across an 18m wide road carriageway. No kerbside car parking is permitted on either side of the road.
Centennial Avenue	Local	50km/h (with 40km/h school zone restrictions)	Centennial Avenue is a two-way, two-lane road with on-street car parking provided on both sides of the road. It has an east-west alignment and predominately serves access to/from key drop off areas associated with both Chatswood Public School and Chatswood High School.
Jenkins Street	Local	50km/h (with 40km/h school zone restrictions)	Jenkins Street functions as a two-way road, generally aligned in a north-south direction. The road predominately serves residential access to properties along Jenkins Street, particularly between Western Way and Fullers Road, as well as school drop off/pick up activities.

Road Name	Road Classification	Speed Limit	Description
Oliver Road	Local	50km/h (with 40km/h school zone restrictions)	Oliver Road is a one-lane local road aligned in an east-west direction. Oliver Road is configured as a one-way westbound road between Pacific Highway and Whitton Road, and two-way between Whitton Road and the school entrance. A dedicated marked bicycle lane is provided on the north side of the road. Unrestricted kerbside car parking provided on the south side of the road. The road provides good connectivity between Pacific Highway and Whitton Road, including to/from the Chatswood Public School Bush Campus staff park at the west end of the road.
Freeman Road	Local	50km/h	Freeman Road is a two-way cul-de-sac road with an east-west alignment. Access to the road is generally provided via Pacific Highway on the western end of the road. Kerbside car parking provided on the north side of the road. No Parking restrictions during school hours are provided on the south side of the road.
Eddy Road	Local	50km/h (with 40km/h school zone restrictions)	Eddy Road is generally aligned in an east-west direction along the southern boundary of the Centennial Avenue site. Access to this road is generally provided off Pacific Highway on the western end of the road. Kerbside car parking is generally made available on one or both sides of the road.
De Villiers Avenue	Local	50km/h (with 40km/h school zone restrictions)	De Villiers Avenue is generally aligned in a north-south direction along the western boundary of the Centennial Avenue site. This road provides vehicle access to the staff car park within the Centennial Avenue site. No kerbside car parking is generally made available on either side of the road between De Villiers Avenue and Eddy Road.

2.3 Public Transport

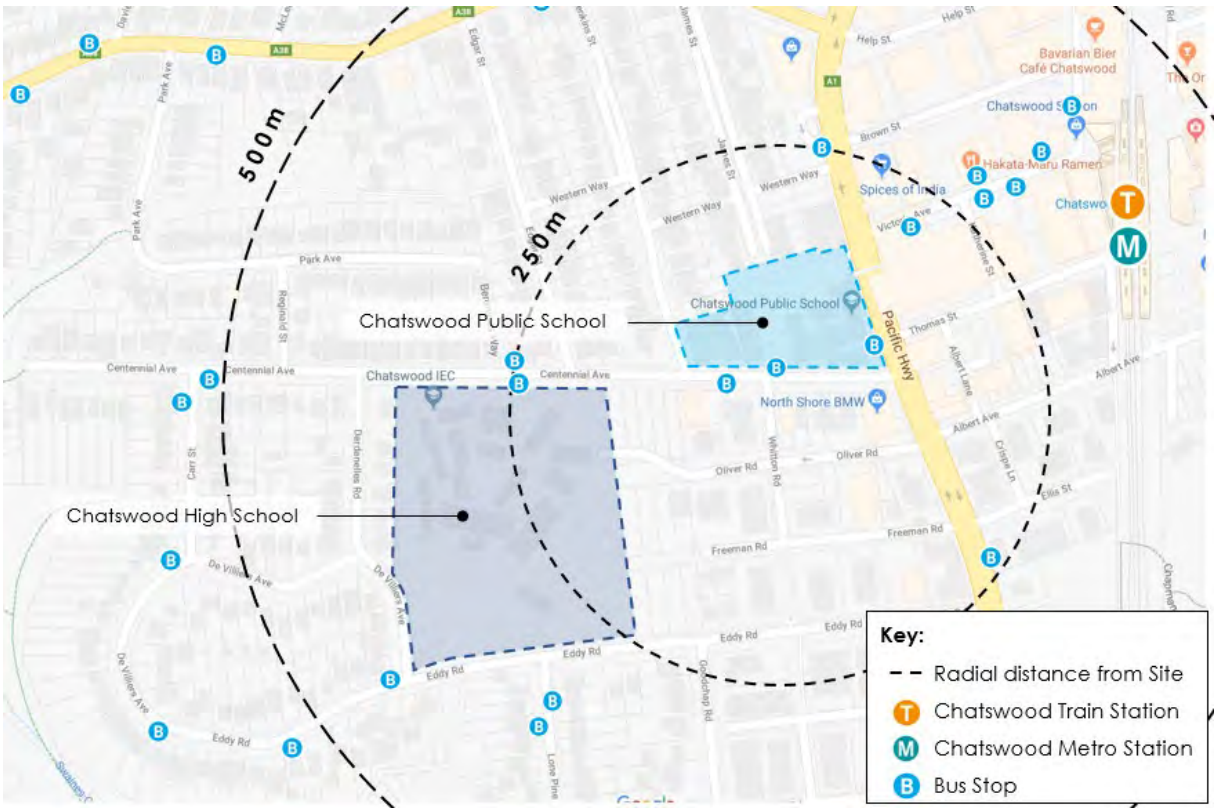
The sites benefit from good connectivity to public transport facilities being located within a five-to-ten-minute walk from the Chatswood Interchange.

The Chatswood Interchange services over 62 routes, including various metro, train and bus services.

During peak hours, T1 trains traveling from Chatswood to Sydney CBD, northern and western suburbs arrive at the station approximately every two minutes. The Sydney Metro trains arrive every four minutes during peak hours and every 10-minutes outside of peak hours.

The sites proximity to existing public transport facilities are shown in Figure 2.3.

Figure 2.3: Proximity to Public Transport Facilities



Source: Google Maps Australia

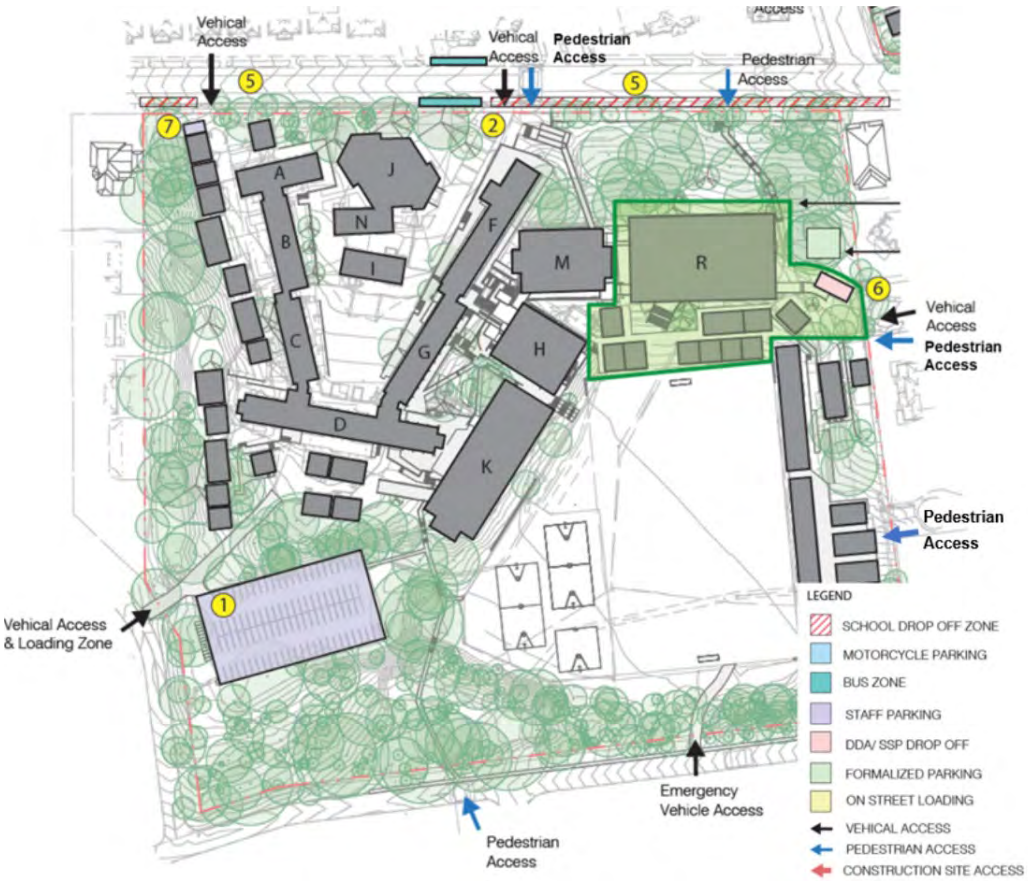
2.4 Existing Site Access Arrangements

The location of the existing vehicle access and pedestrian access points is shown in Figure 2.4 and Figure 2.5. All loading and unloading associated with both schools are conducted on-site. Deliveries and waste collection activities are conducted within the staff car parking areas, with access provided off Pacific Highway for Chatswood Public School and off De Villiers Avenue for Chatswood High School.

Figure 2.4: Chatswood Public School Vehicle and Pedestrian Access - Existing

Source: Architectus

Figure 2.5: Chatswood High School Vehicle and Pedestrian Access - Existing



Source: Architectus

2.5 Car Parking

The sites currently have on-site car parking dedicated for staff. At present, there are some 18 spaces on the Chatswood Public School site (16 off Pacific Highway and 2 off Jenkins Street) and 104 spaces off De Villiers Avenue on the Chatswood High School site. It is however noted that demountables have been installed on both sites, which has restricted some car parking spaces.

2.6 Pedestrian and Cyclist Infrastructure

Well-established pedestrian facilities are available in the immediate vicinity of the site with a network of paved footpaths on both sides of the roads. Victoria Avenue, Pacific Highway and Centennial Avenue are the most utilised roads in terms of pedestrian activity as these roads provide direct connection to the Chatswood Transport Interchange.

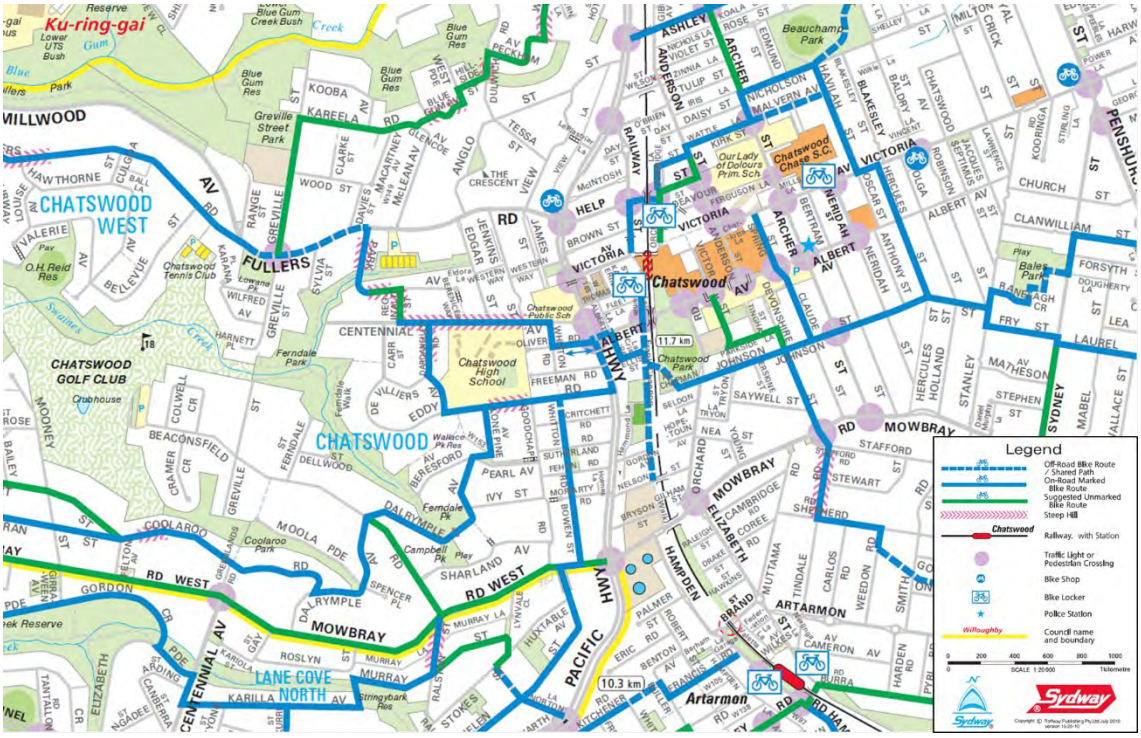
Dedicated pedestrian facilities are provided within the vicinity of the school, including a pedestrian footbridge on Pacific Highway. The pedestrian footbridge has escalators on both ends which provides safe access over Pacific Highway and reduces that number of pedestrians waiting to cross at Pacific Highway-Victoria Road signalised intersection. However, it is noted that the pedestrian footbridge has no disabled access.

Further to this, a good cycle network is currently provided within the immediate vicinity of the site, generally in the form of on-road cycle paths, as shown in Figure 2.6.

Figure 2.6: Existing Cycling Facilities

The existing bicycle network within the vicinity is shown in Figure 2.7.

Figure 2.7: Cycling Network



Source: Northern Sydney Cycling Map

3 Construction Activities and Assessment

3.1 Description of Construction Activities

RCC has been commissioned to conduct demolition and construction works to deliver new and refurbished innovative learning and teaching spaces, as well as increased quality active play space and new sports, recreational and administration facilities for both the primary and high school.

Construction activities will primarily involve the following works:

- site establishment including installation of scaffolding and hoarding
- remove demountables and trees
- earthworks and site remediation
- erect tower crane for loading and unloading purposes
- construct new and refurbish existing school buildings
- construct car park and sports court areas
- install services and internal finishes
- finalise external and internal works and landscape.

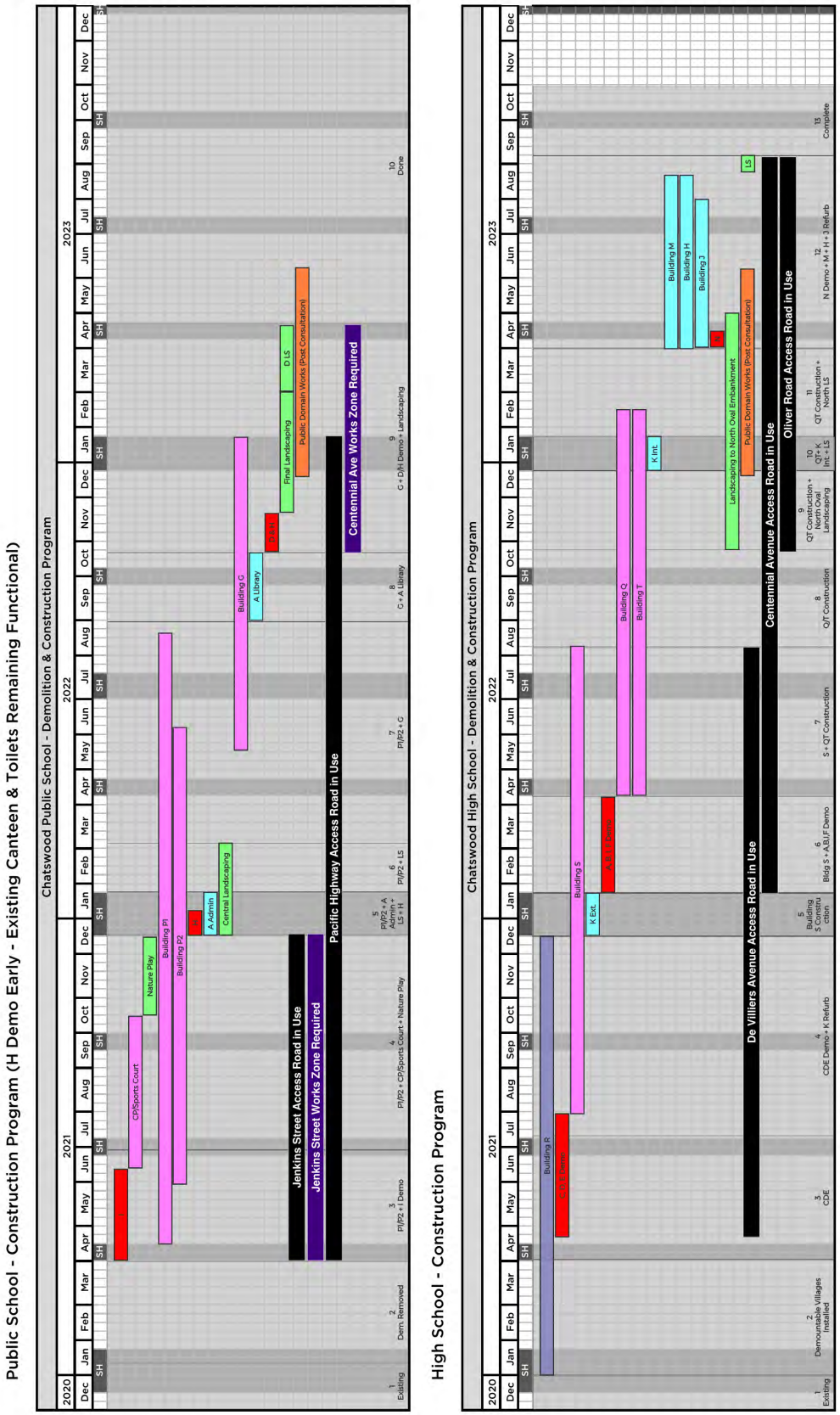
Full construction staging and details are provided in Appendix A.

3.2 Construction Timeline

The construction works are expected to commence in April 2021, with both sites expected to be completed in September 2023. Construction of both the sites will occur simultaneously.

The projected construction timeline is shown in Figure 3.1.

Figure 3.1: RCC Projected Construction Timeline



These are graphical representations of the RCC Construction Program that has been provided in the Main Works Offer. If in any case the Construction Program differs to this document, the Construction Program is to take precedence over this file.

3.3 Work Hours

Construction activities will be carried out in accordance with the following approved work hours in accordance with SSDA consent conditions C4 to C8:

- Construction, including the delivery of materials to and from the site:
  - Monday to Friday 7am to 6pm
  - Saturday 8am to 1pm
  - Sunday and Public Holiday No work.
- Works with noise levels exceeding the existing background noise level plus 5dB:
  - Monday to Friday 6am to 7pm
  - Saturday 1pm to 4pm
- Rock breaking, rock hammering, sheet piling, pile driving and similar activities:
  - Monday to Friday 9am to 12pm, 2pm to 5pm
  - Saturday 9am to 12pm

Work outside of the approved hours shall only occur with approval if required:

- by the Police or a public authority for the delivery of vehicles, plant or materials; or
- in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or
- where the works are inaudible at the nearest sensitive receivers; or
- where a variation is approved in advance in writing by the Planning Secretary or his
- nominee if appropriate justification is provided for the works.

RCC will be responsible to liaise with relevant authorities to obtain all necessary permit approvals.

3.4 Site Access Arrangements

Vehicle access to the site will be provided off existing vehicle access points off Pacific Highway and Jenkins Avenue for the Chatswood Public School site and off Centennial Avenue, Oliver Road and De Villiers Avenue for the Chatswood High School site.

Due to topographical and existing building constraints, construction access off Pacific Highway is required to facilitate construction works. This matter was discussed with TfNSW on 4 February 2021, where TfNSW raised no issues with construction access of Pacific Highway, but requested construction access be restricted to occur outside of peak periods.

RCC will restrict construction access off Pacific Highway outside of the following peak times accordingly:

- PM: 3pm-7pm

The exception to this would be concrete trucks if concrete pours are not completed by 3pm as it would not be feasible to halt a concrete pour once it has commenced. RCC will however endeavour to complete all concrete placement by 3pm where possible.

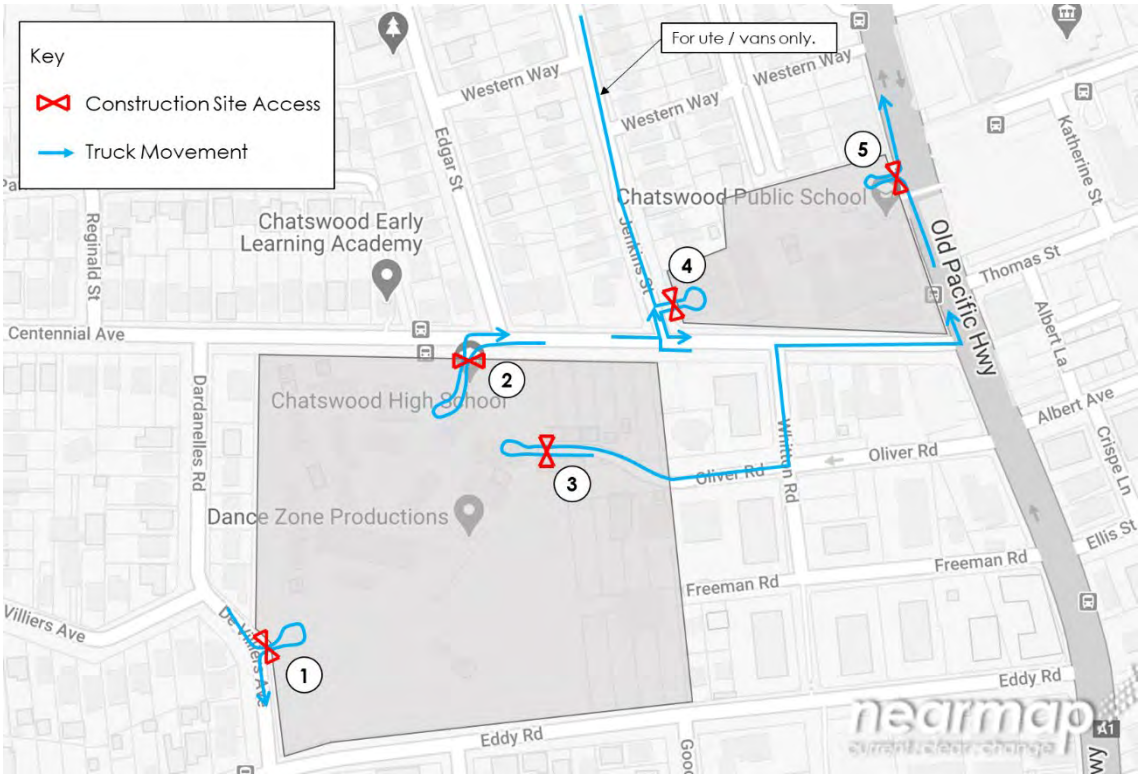
In addition to this, bin delivery/pick up vehicles may require access after 3pm to ensure bins are emptied/removed prior to the start of the next work day. This however would be minimal – say a maximum of one vehicle per day after 3pm and therefore, would have little impact on traffic flow.

Appropriate fencing and hoarding will be in place around the site areas accordingly to minimise disruption to existing school operations.

Figure 3.1 also includes the timing when each access will need to be used during construction, as shown in black.

The locations of the construction site access points are shown in Figure 3.2.

Figure 3.2: Proposed Construction Site Access Points



3.5 Construction Vehicle Routes

Construction vehicles will have origins and destinations throughout Sydney. Dedicated construction vehicle routes have been developed to provide the shortest distances to/from the arterial road network, whilst minimising the impact of construction traffic on streets within the immediate vicinity of the site.

All truck drivers will be advised of the designated truck routes to/from the site and be required to adhere to the nominated routes. Generally, it is proposed to use Pacific Highway and Centennial Avenue to access the site. Heavy rigid vehicles will also access Pacific Highway driveway via Victoria Road.

The designated construction arrival and departure vehicle routes are presented in Figure 3.3 and Figure 3.4 respectively.

Figure 3.3: Construction Arrival Truck Routes

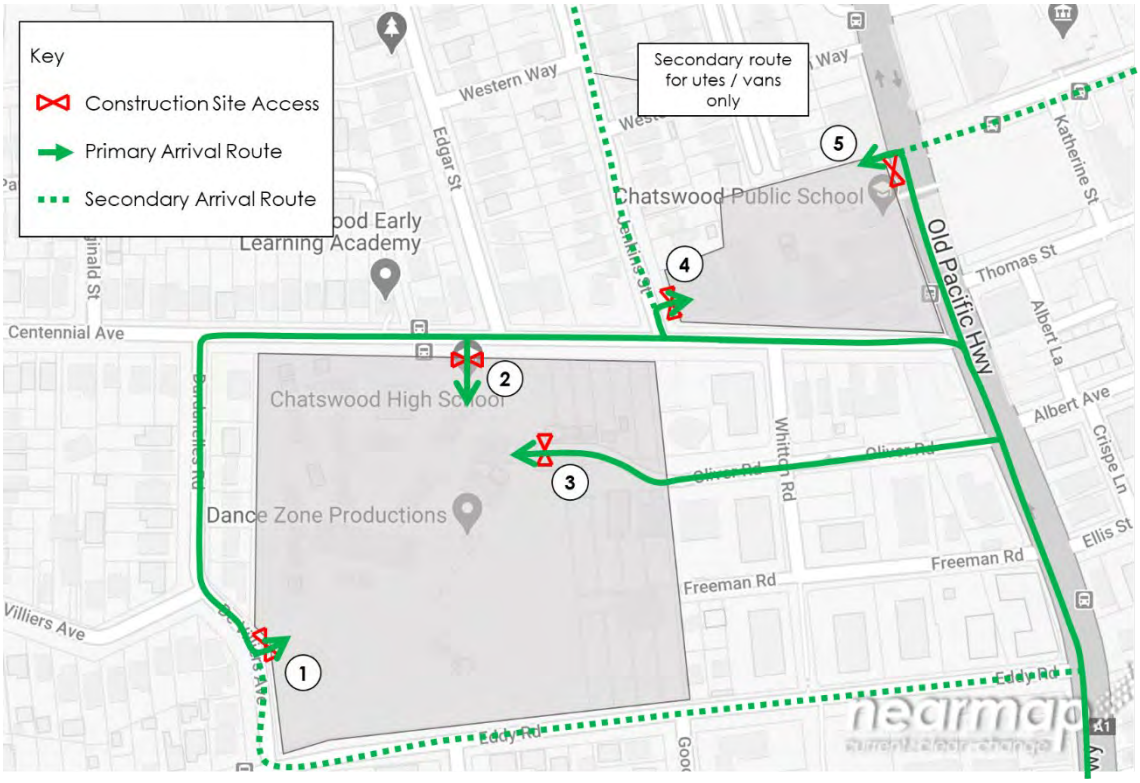
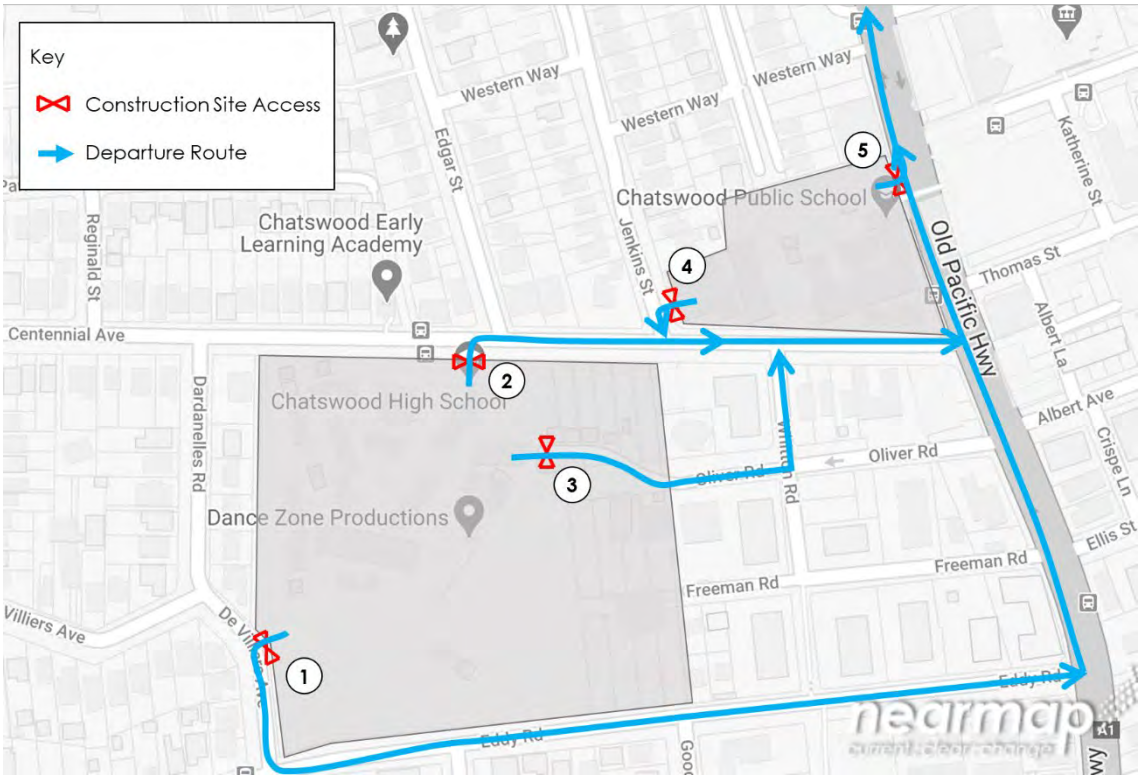


Figure 3.4: Construction Departure Truck Routes



No queuing or marshalling/parking will be permitted on public streets, unless otherwise approved. Construction vehicles are to radio or call on approach to ensure adequate access to the site is made available. Additionally, all site deliveries will be allocated and coordinated using a project dedicated site logistics app. The app will be used to book in deliveries in allocated approved time slots.

All construction vehicles are required to enter and exit the site in a forward direction, unless otherwise approved.

3.6 Construction Vehicle Type

All construction activities will generally be carried out by small to heavy rigid vehicles, no larger than a 12.5-metre-long heavy rigid vehicle. It is however expected the majority of vehicles used during construction will be medium rigid vehicles. Similar arrangements have been successfully implemented on the recent Alexandria Park Community School project.

Turn tables will also be installed to increase safety and efficiency of the site working area. Vehicles can still enter and exit the site in a forward direction in the absence of turntable, or if the turntable is not functional at any point. Notwithstanding, these turn tables can also be pushed manually should it break down.

Swept path analysis has been undertaken using a 12.5m long heavy rigid vehicle (HRV), 8.8m long medium rigid vehicle (MRV) and 6.4m long small rigid vehicle (SRV). The swept path analysis indicates that appropriate vehicle access can be accommodated to/from the site.

Swept path diagrams show that the trucks reversing from Centennial Avenue to Jenkins Street would not cross over the centreline of Centennial Avenue. Thus, the westbound traffic movements will not be interrupted.

This swept path analysis is provided in Appendix B and C.

In addition to this, it may be necessary that a truck and dog / articulated vehicle may be required during bulk excavation works or major building works. All large vehicles (i.e. larger than a 12.5m long HRV) for any "on-off" occasions such as crane delivery will be subject to a separate application to Council.

RCC will be responsible for obtaining all relevant permits and/or approvals from the relevant authorities for such "one-off" occasions.

3.7 Construction Traffic Volumes

On a typical work day, a maximum of 20 delivery vehicles per day per gate is expected. Deliveries will be scheduled in 30-minute blocks of time via the use of the site logistics app.

During peak concrete pour days, a maximum of 40 concrete trucks is expected (or a maximum of five trucks per hour). On an average pour day, 20 concrete trucks per day is expected (or three trucks per hour). Concrete pour works are expected to occur 3-4 days a week during peak structural works.

As an indication, a summary of the expected traffic movements during each key construction activity at each site access point is provided below. These numbers may be refined once the construction methodology progresses further by RCC.

- **Pacific Highway and Centennial Avenue Gate**
  - Bulk Excavation – Average 12, Max 25 trips per day.
  - Structural Work – Average 12, Max 20 trips per day.
  - Fitout and Finishes – Average 10, Max 20 trips per day.
  - Concrete Pour – Average 12, max 30 trips per day.
- **Jenkins Street Gate**
  - Bulk Excavation – Average 10, Max 20 trips per day.
  - Structural Work – Average 10, Max 20 trips per day.
  - Fitout and Finishes – Average 10, Max 15 trips per day.
  - Concrete Pour – Average 10, max 25 trips per day.

- **De-Villers Avenue Gate**
  - Bulk Excavation – Average 12, Max 20 trips per day.
  - Structural Work – Average 12, Max 20 trips per day.
  - Fitout and Finishes – Average 10, Max 20 trips per day.
  - Concrete Pour – Average 12, max 30 trips per day.
- **Oliver Road Gate**
  - Bulk Excavation – Average 5, Max 15 trips per day.
  - Structural Work – Average 5, Max 15 trips per day.
  - Fitout and Finishes – Average 10, Max 15 trips per day.
  - Concrete Pour – Average 8, max 15 trips per day.

During peak concrete pour days, up to 40 trucks per day in total could be expected on the road network. These works are expected to occur outside of peak periods and will be managed by relevant traffic control accordingly.

RCC will limit construction vehicles and any major construction activities during peak drop off and pick up times, at the required locations/gates to minimise its impact on school operations.

3.8 Construction Worker Parking

No onsite vehicle parking will be provided. All workers will be encouraged and expected to use public transport and/or carpool to travel to/from the site. This will be incorporated in the workers induction program to ensure minimal parking impact on surrounding streets.

If necessary, workers who will need to drive to site will be encouraged to park on the streets further from the site and discouraged to park on streets within the immediate vicinity of the school. This is to minimise impact to the school drop-off and pick-up activities which generally occur on streets near the school entrance gates.

A Construction Worker and Staff Transportation Strategy has been prepared to outline the management of construction worker and staff transportation to/from the site. In particular, to manage construction worker and staff car parking to minimise demand of parking in nearby public and residential streets during construction of the project. This is provided in Appendix D.

3.9 Materials and Handling Area

All materials handling and plant equipment, including waste storage will be wholly stored on-site within the works site.

3.10 Road Occupancy License Requirements

Any construction activities that will impact on the operational efficiency of the State road network will require a road occupancy license (ROL) prior to the commencement of such construction activities. RCC will be responsible to obtain all relevant ROL's as required.

3.11 Works Zone Requirements

Due to site constraints, works zones will be required on Jenkins Street and Centennial Avenue to assist with concrete pour activities and other loading activities that cannot be satisfactorily accommodated within the Chatswood Public School site.

No works zone is proposed on Pacific Highway. However, if required, RCC will be responsible to liaise with TfNSW for relevant approvals / permits for any special "one off occasions" accordingly.

The locations of the works zones are shown in red in Figure 3.5 and Figure 3.6.

Figure 3.5: Centennial Avenue Works Zone

Figure 3.6: Jenkins Street Works Zone

These works zones will result in the loss of eight to nine car parking spaces during the works zone hours, that being two spaces on Jenkins Street and 6-7 spaces on Centennial Avenue.

It is however noted that these parking spaces are generally not expected to be required by the school as 60 per cent of the school population has been relocated to the High School site. Further to this, the works zone will never be operating at the same time as each other.

It is the intention to retain existing parking facilities during drop off and pick up times where possible. RCC has also liaised with the schools on the proposed works zone locations, who have not raised any objections regarding the works zone locations, as well as the temporary loss of some 5 minute drop off areas when each work zone is active.

The proposed works zone along Jenkins Street will only be required whilst the car park facility is under construction. Once this is complete, construction vehicles will not need to use Jenkins Street works zone.

Truck movements to/from Jenkins Street works zone which would require reverse manoeuvres will only be undertaken outside the school drop-off and pick-up periods for pedestrian and road users safety, as well as to minimise impact to road network performance. Reverse movements will only be permitted during these hours and will be booked using the vehicle booking system:

- 9:30am to 3:30pm
- After 4:30pm

The exception to this would be concrete trucks during concrete pours. RCC will however endeavour to manage arrival of concrete trucks and to complete all concrete placement

within the permitted times where possible. It is anticipated that a maximum of two concrete trucks will arrive during the restricted times.

Based on the locations of the current school population, there should be sufficient drop off and pick up spaces available during construction and therefore, the works zones are considered acceptable and have been agreed upon by the school.

RCC will be responsible to liaise with Council and obtain all relevant permit approvals.

3.12 Road Closure

Road closures are not expected as part of the known works at this stage. If required, RCC will be responsible to liaise with the relevant authorities for approvals / permits accordingly.

4 Construction Traffic Management

4.1 Traffic Control Plan

The construction truck movements to/from the site access points will be accompanied by advisory traffic control signage to minimise the traffic impact on the surrounding road network. The relevant traffic control plans (TCPs) are provided in Appendix D.

It is noted that appropriate traffic control will be provided to ensure safety of all road users at all times during construction. Additionally, site personnel will be positioned at all site access gates to guide pedestrians and construction vehicles where necessary.

Pedestrian gates will also be installed at the Pacific Highway and Jenkins Street site access point, as per TfNSW and Council requirements.

At no time will traffic controllers be permitted to stop traffic on the public streets to facilitate trucks entering or exiting the site, unless necessary to ensure appropriate road safety. Traffic controllers will only be able to assist, manage and guide construction trucks out of the site under suitable gaps in traffic.

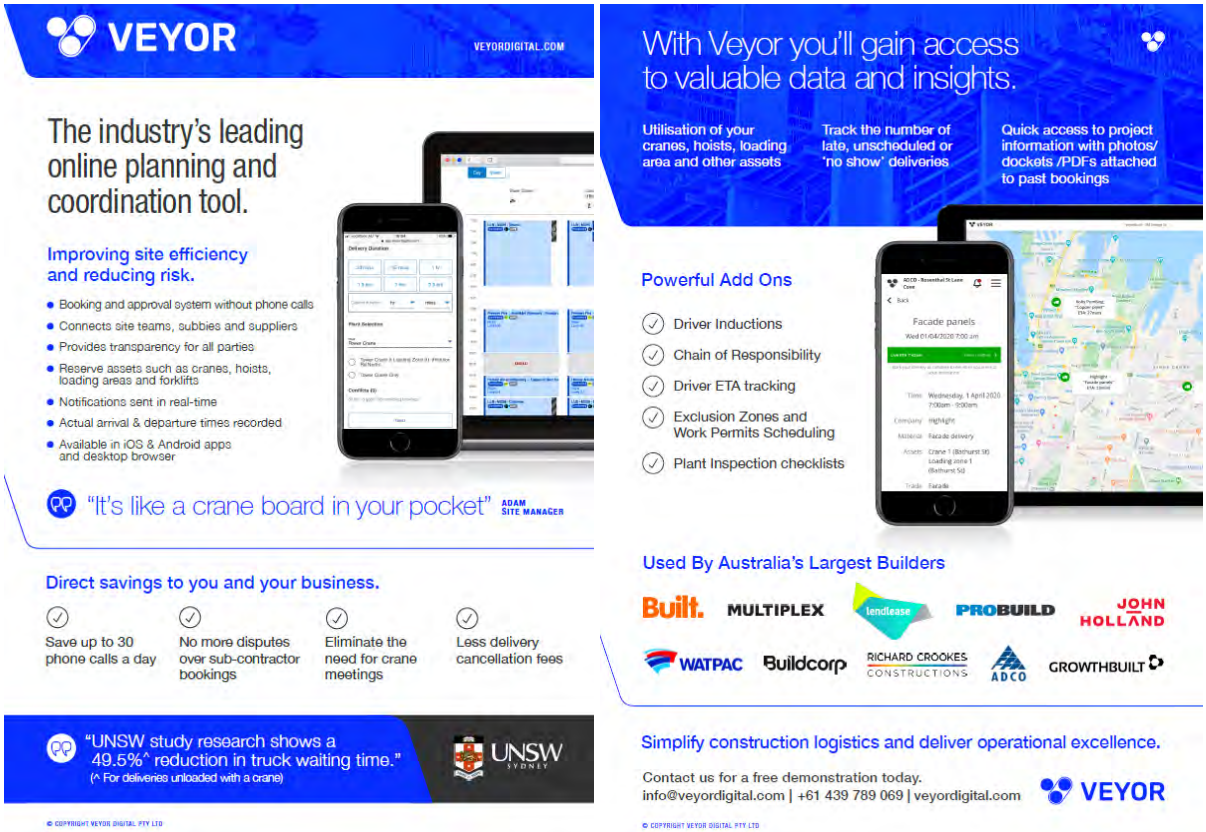
All advisory road signage will be installed in accordance with AS1742.3 Manual of uniform traffic control devices - Traffic control devices for works on roads and the Roads and Maritime Services Traffic Control at Worksites Manual. Signs will be installed and maintained throughout the construction period.

4.2 Site Access Management

RCC will implement a 'vehicle booking' system to ensure all contractors arrive and depart during their allocated slot. This will also enable RCC to coordinate any construction vehicle movements as required in consultation with the school, as well as to track the location of key construction/delivery vehicles via GPS.

RCC intends to use the vehicle booking system 'Veyor', which allows all construction staff to download and book a time slot via an app. This app will also provide notifications in real-time and record actual arrival and departure times, as shown in Figure 4.1..

Figure 4.1: Veyor App



4.3 Pedestrian and Cyclist Management

Pedestrian and cycle access will be maintained as per existing conditions during the project. It may be necessary to temporarily close some pedestrian access points to the school, with appropriate alternate pedestrian access provided during certain stages of the project. Generally, closure of pedestrian access points will coincide with closures of sections of the school for construction works, with students temporarily being relocated to other parts of the school.

High visible signages will be installed at each site entrance and exit point to enhance construction vehicle drivers' awareness of the presence of pedestrians. Traffic controllers will also be assigned at each site access point to assist trucks entering and exiting the site and to manage any potential conflict between construction vehicle movements and pedestrians.

Pedestrian boom gates will be located at site access points with high pedestrian activity (i.e. Pacific Highway access) to ensure pedestrian safety when construction vehicles are entering and exiting. These boom gates will be managed by accredited traffic controllers.

All relevant site hoarding and fencing shall be installed to ensure pedestrian safety from the work site. All relevant permit approvals will be obtained from Council prior to the commencement of any work.

4.4 Public Transport Management

The proposed construction activities are not expected to result in any changes to existing public transport services. Consultation with the schools will be continually undertaken to ensure minimal disruption to the surrounding road network, particularly existing special school bus services.

4.5 Car Parking Management

The existing 18 spaces on the Chatswood Public School site will be removed during construction. All staff will be notified and advised to use public transport and/or other transport modes such as walking and/or cycling as no car parking will be made available during construction. These parking spaces will be made available again in Building V once construction is complete.

Car parking surveys were conducted within a 400-metre radius catchment from the school sites on Thursday 14 March 2019 between 7am and 5:30pm and on Saturday 16 March 2019 between 10am and 4.30pm, as shown in Figure 4.2.

Figure 4.2: Parking Survey Map

Source: nearmap Australia

A summary of the hourly car parking profiles during the survey period on Thursday and Saturday are illustrated in Figure 4.3 and Figure 4.4 respectively.

Figure 4.3: Weekday On-Street Parking Occupancy

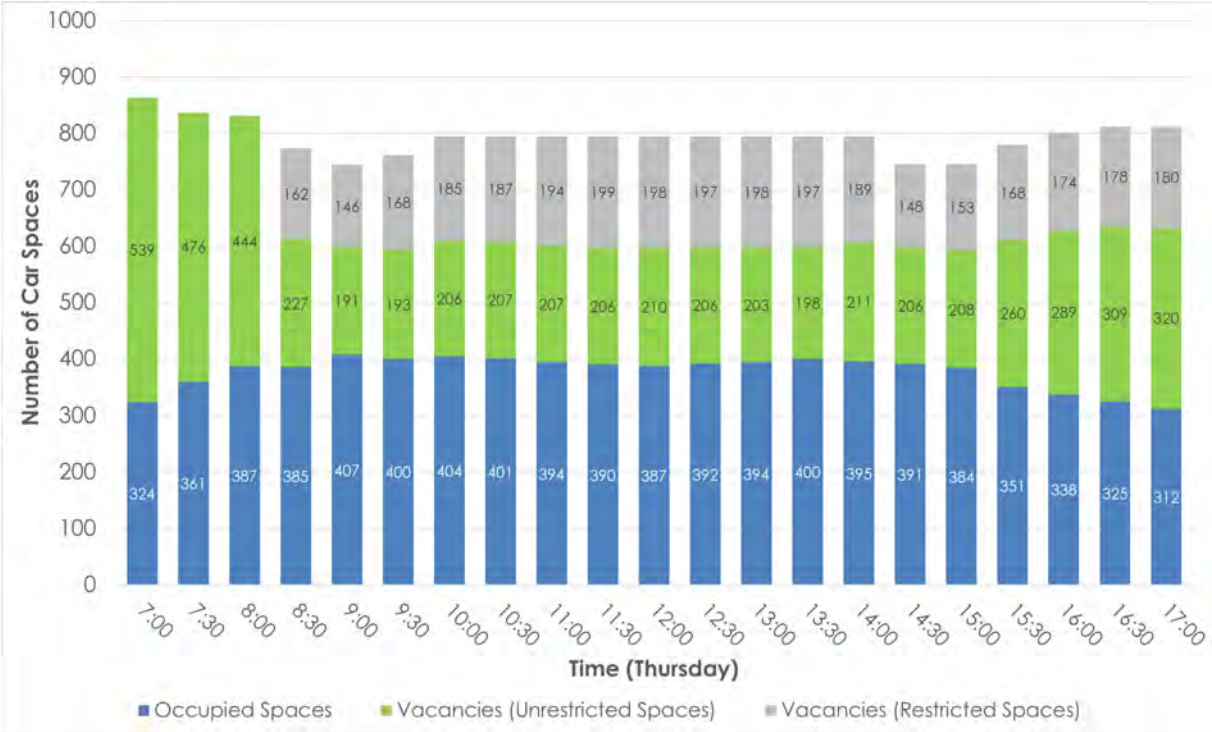
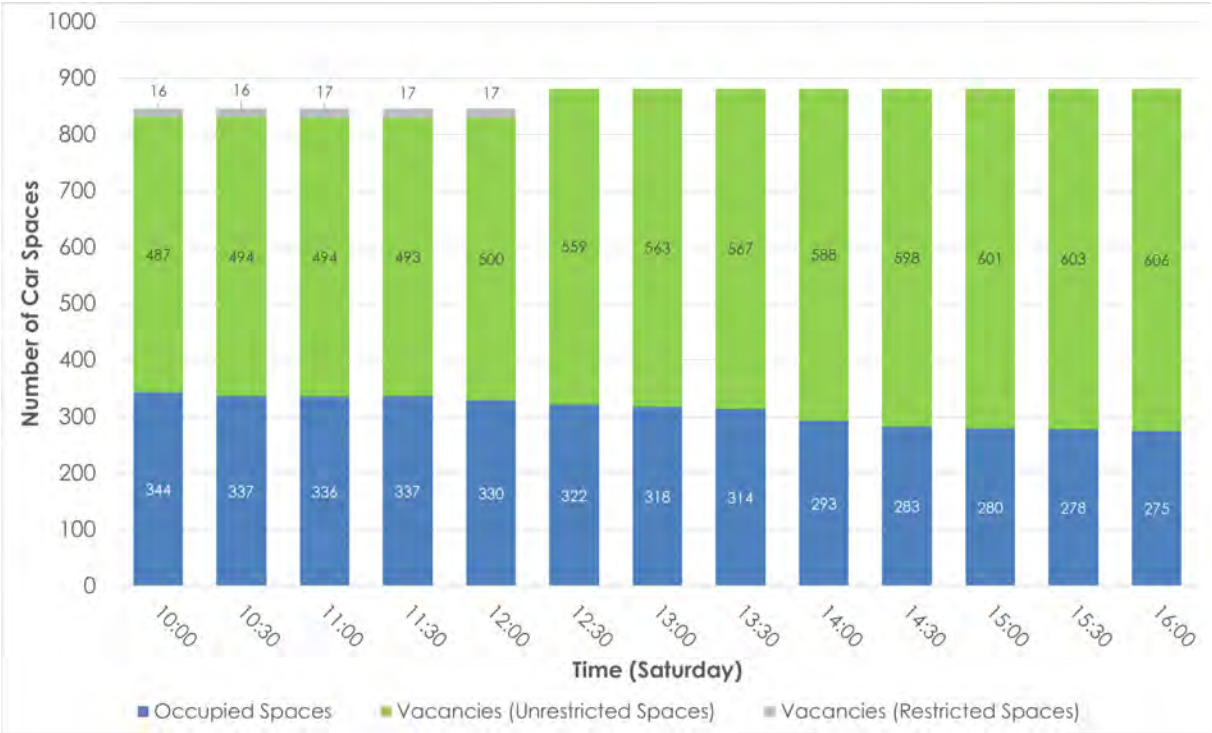


Figure 4.4: Saturday On-Street Parking Occupancy



Note: The total parking supply varies throughout the day due to timed parking restrictions.

Based on the parking surveys, the peak parking accumulation occurred during the weekday at 9am with 407 parked vehicles, which is 55 per cent of its capacity (337 remaining vacancies – 191 unrestricted and 146 restricted spaces). It is noted that the majority of the parking vacancies were observed to be located further away from the site such as along De Villiers Avenue, Pearl Avenue, Lone Pine Avenue, Beresford Avenue, Ivy Street.

On this basis, the parking surveys indicate that there is spare capacity to cater any additional car parking demand arising from the temporary loss of car parking during the works. During the peak parking period, there are 191 unrestricted parking spaces available which is adequate to accommodate the temporary loss parking spaces.

It is however noted that these parking areas are generally located further afield from the school sites, which may not be "convenient" for staff. Notwithstanding this, all staff will be encouraged not to travel to the site by car during construction.

As discussed in Section 3.8, no onsite vehicle parking will be provided and workers will be encouraged and expected to use public transport to travel to/from the site. However, should workers need to drive to site for some reasons, they would be instructed to park on the streets further from the site and would be discouraged to park on streets within the immediate vicinity of the school.

The remaining on-street parking vacancy as the result of temporary loss of staff parking would be about 73 unrestricted spaces during the peak parking period. The anticipated number of construction workers are not yet known at this stage however it is unlikely that the parking demand of construction workers would be significantly high enough to occupy all the remaining on-street parking spaces.

On the above basis, it is anticipated that the surrounding on-street parking supply would be sufficient to accommodate both the temporary loss of staff parking as well as minimal use from construction workers. Nonetheless, both the staff and construction workers will be encouraged to use public transport to the site to minimise parking demand.

Based on Council feedback, RCC intends to undertake an updated survey during construction, whereby the CTPMSP will amended accordingly. Current work/COVID environment would not provide accurate results so a survey during construction would be most beneficial in tracking the impact on the area.

The parking survey will be retaken within three months of commencement to validate the results obtained from the survey undertaken in 2019.

To manage construction worker parking, RCC proposes to implement the following measures:

- **Park& Ride** – encourage use of Transport for NSW's Park&Ride facilities, which allows users to park for free for up to 18 hours at dedicated Transport Park&Ride car parks. This information can be found on TfNSW's website https://transportnsw.info/travel-info/ways-to-get-around/drive/parking/transport-parkride-car-parks.

- **Public Car Parks** – encourage use of public car parking facilities, e.g. nearby Secure Parking and Wilson Parking providers.
- **Carpooling** – recommend carpooling between staff to reduce single occupancy car trips.
- **Tool Storage Facility** – provide an on-site tool drop-off and storage facility to allow tradespeople to drop off and store their tools/specific machinery for the project.
- **Induction and Regular Management Meetings** – inform staff during the induction and regular management meetings that no car parking will be made available on-site and that there is limited on-street car parking surrounding the site.
- **Alternative Transport Options** – instruct and encourage staff to use public transport to access the site during the induction and regular management meetings.
- **Public Transport Noticeboards** – display public transport timetable information and details of the TfNSW NSW Trip Planner website at key locations within the sites and ensure that it is easily accessible by staff.

Notwithstanding the above, a Construction Worker and Staff Transport Strategy (the Strategy) has been prepared to outline the management of construction worker and staff transportation to/from the site. This Strategy has been prepared to manage construction worker and staff car parking to minimise demand of parking in nearby and residential streets during construction of the project.

4.6 Emergency and Heavy Vehicles

No special provisions for emergency service vehicles or heavy vehicles are required as part of the proposed construction works. Emergency and heavy vehicle access shall be maintained at all times.

4.7 Local Access and Amenity

The proposed construction works will not impact existing local access to/from properties. Local access to properties will be maintained at all times during the works.

4.8 Truck Routes

Protocols must be in place to ensure:

- site induction to include procedures for accessing the site
- drivers adhere to the nominated truck routes, as shown in Figure 3.3 and Figure 3.4
- drivers are aware that pedestrians and cyclists are in the vicinity of the site
- drivers are aware of the sign posted speed limits, and

- driver code of conduct will be in place and will be communicated to all workers and drivers.

4.9 Driver's Code of Conduct

All drivers employed on the project, whether direct employees or not, have a responsibility to drive safely, comply with State road regulations and the Australian Road Rules and any other directives issued by RCC. In particular, before any deliveries are undertaken all heavy vehicle drivers will be required to read and endorse the Driver's Code of Conduct. Copies of the Driver's Code of Conduct will be issued to all subcontractors and suppliers in advance for issue to all delivery drivers and copies signed by drivers will be required.

To reinforce these obligations, a Driver's Code of Conduct has been prepared and is included in Appendix F.

4.10 Heavy Vehicle Loads

All drivers will be required to adhere with the posted vehicle load limits on all roads and not overload vehicles beyond its maximum loading limits and/or relevant approvals.

4.11 Site Inspections and Record Keeping

The construction operation would be monitored to ensure that it proceeds as set out in the Construction Management Plan provided by the Contractor. A daily inspection before the start of construction activity is to take place to ensure that conditions accord with those stipulated in the plan and that there are no potential hazards. Any possible adverse impacts are to be recorded and dealt with as they arise.

4.12 Site Induction

All staff employed on the site by the appointed Contractor will be required to undergo a site induction. The induction will include permitted access routes to and from the works site for site staff and delivery vehicles as well as standard environmental, OH&S, driver protocols and emergency procedures. The workers are to be informed to use public transport to access the site during the induction.

4.13 Monitoring and Communication Strategies

RCC will be responsible to review and manage construction activities as per the CTPMSP accordingly. The CTPMSP will be reviewed periodically, with all site deliveries tracked against the estimated delivery movements.

The Construction Worker and Staff Transport Strategy (the Strategy) will be regularly monitored as per the requirements of the SSDA and the Planning Secretary. The Strategy has been submitted to the Planning Secretary for approval.

Regular consultation shall also be undertaken to notify relevant stakeholders for all stages of work/changes including temporary road network changes.

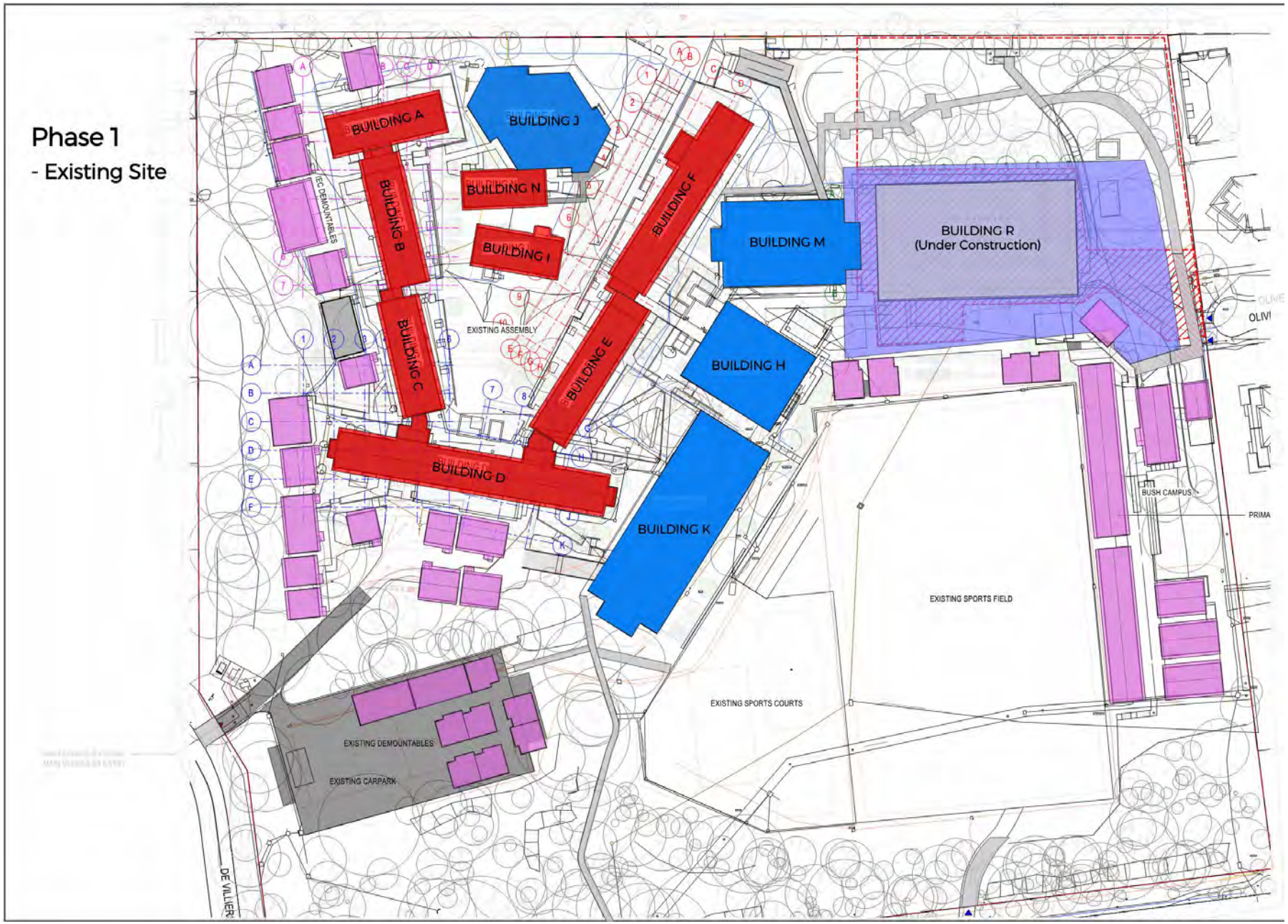
It is understood that Council will monitor the pedestrian management especially at the Centennial Avenue works zone and at vehicle access gates to determine if boom gates would need to be installed at these locations for pedestrian safety. RCC will seek advice form Council whilst/after monitoring takes place.

A Complaint Management System will also be implemented to report issues with school staff and/or construction workers using the local surrounding roads for parking. This Complaint Management System will include a Complaints Register to record all complaints received associated with parking and will form part of the Construction Worker and Staff Transportation Strategy

SINSW has a dedicated complaints and feedback hotline/email dedicated to this project which will be fully staffed by SINSW communications team. SINSW will be handling all complaints regarding the project construction.

Appendix A

Staging Plans

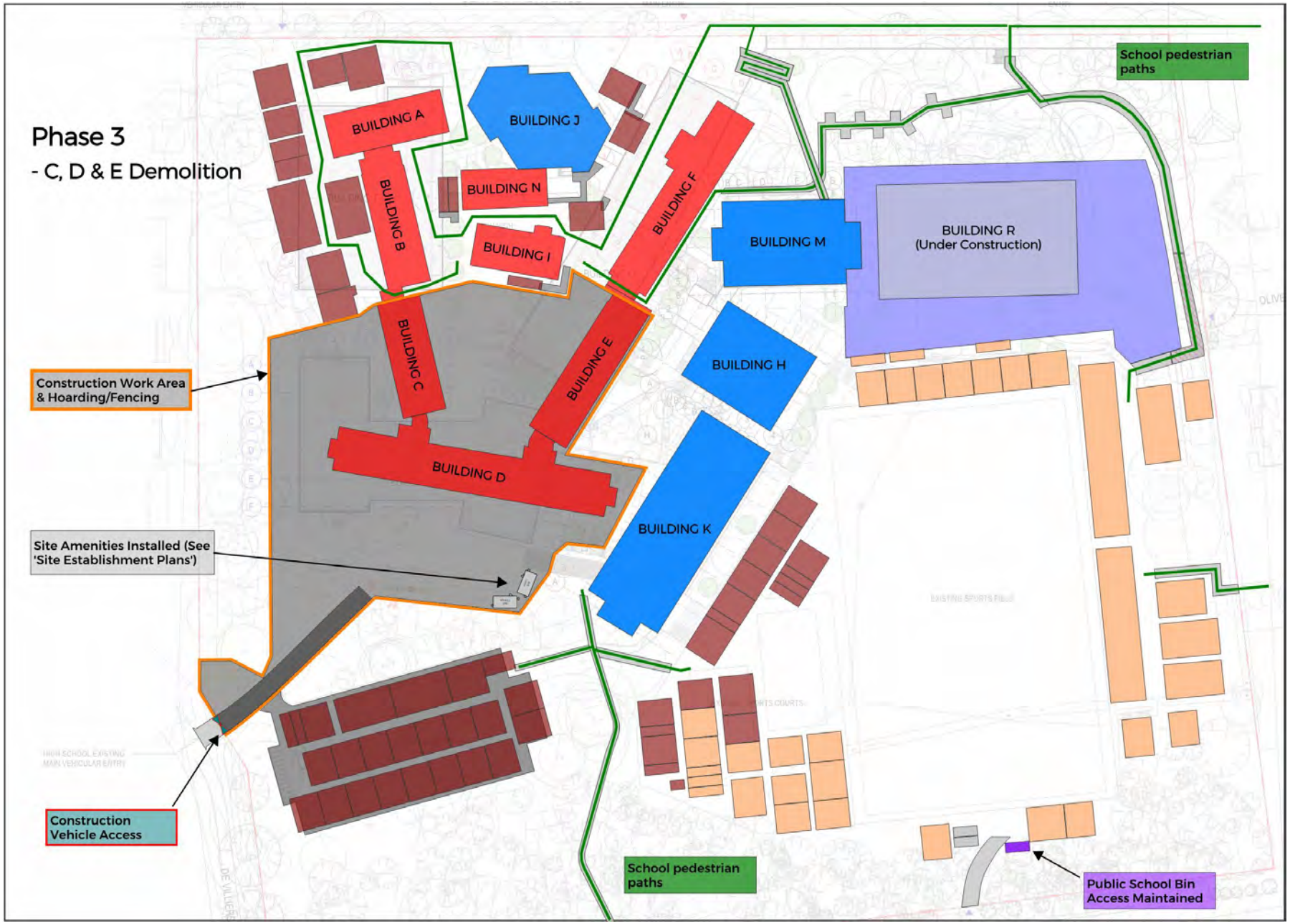


HIGH SCHOOL – CONSTRUCTION PHASING PLANS

RICHARD CROOKES
CONSTRUCTIONS

HIGH SCHOOL – CONSTRUCTION PHASING PLANS

RICHARD CROOKES
CONSTRUCTIONS



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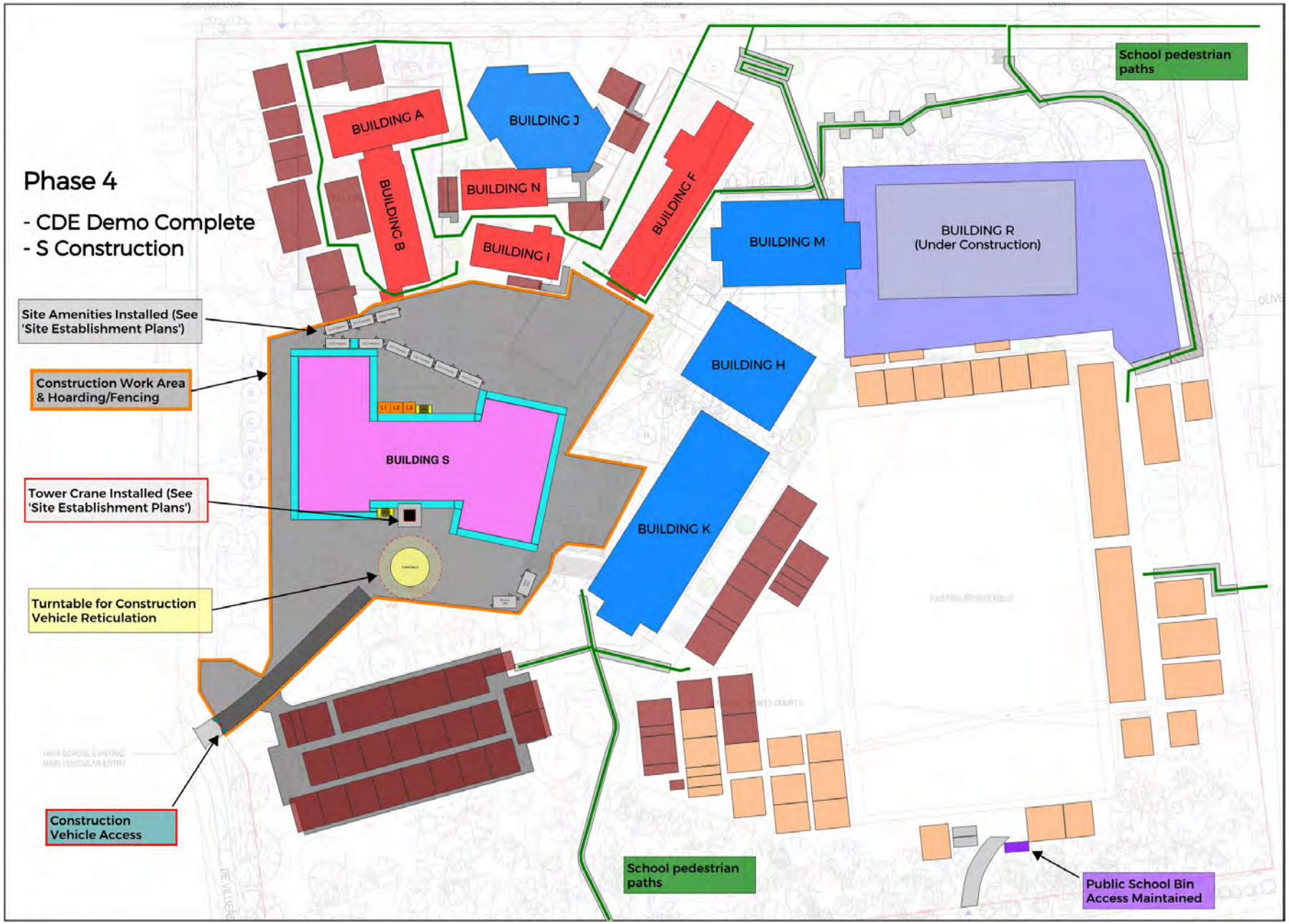

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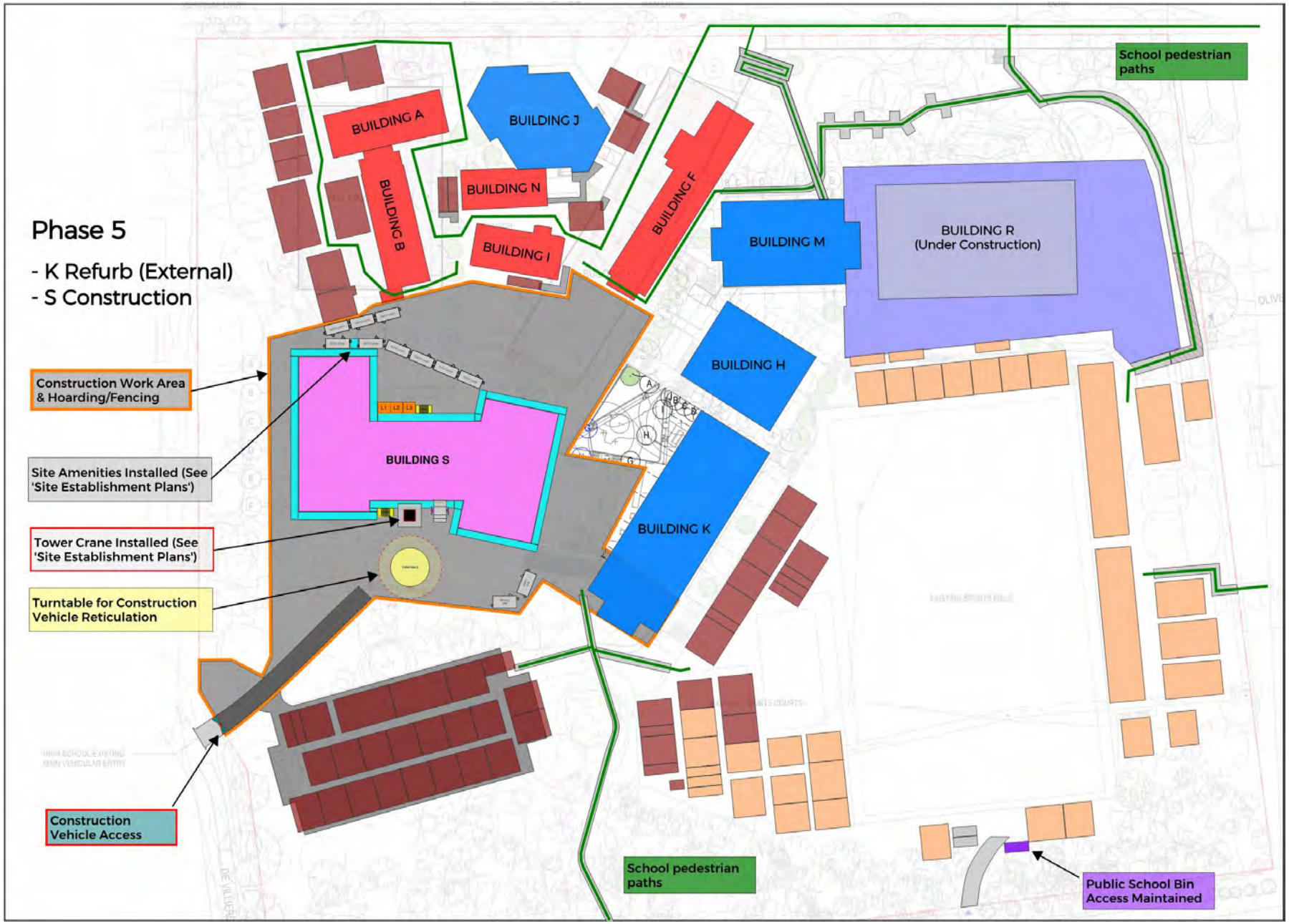

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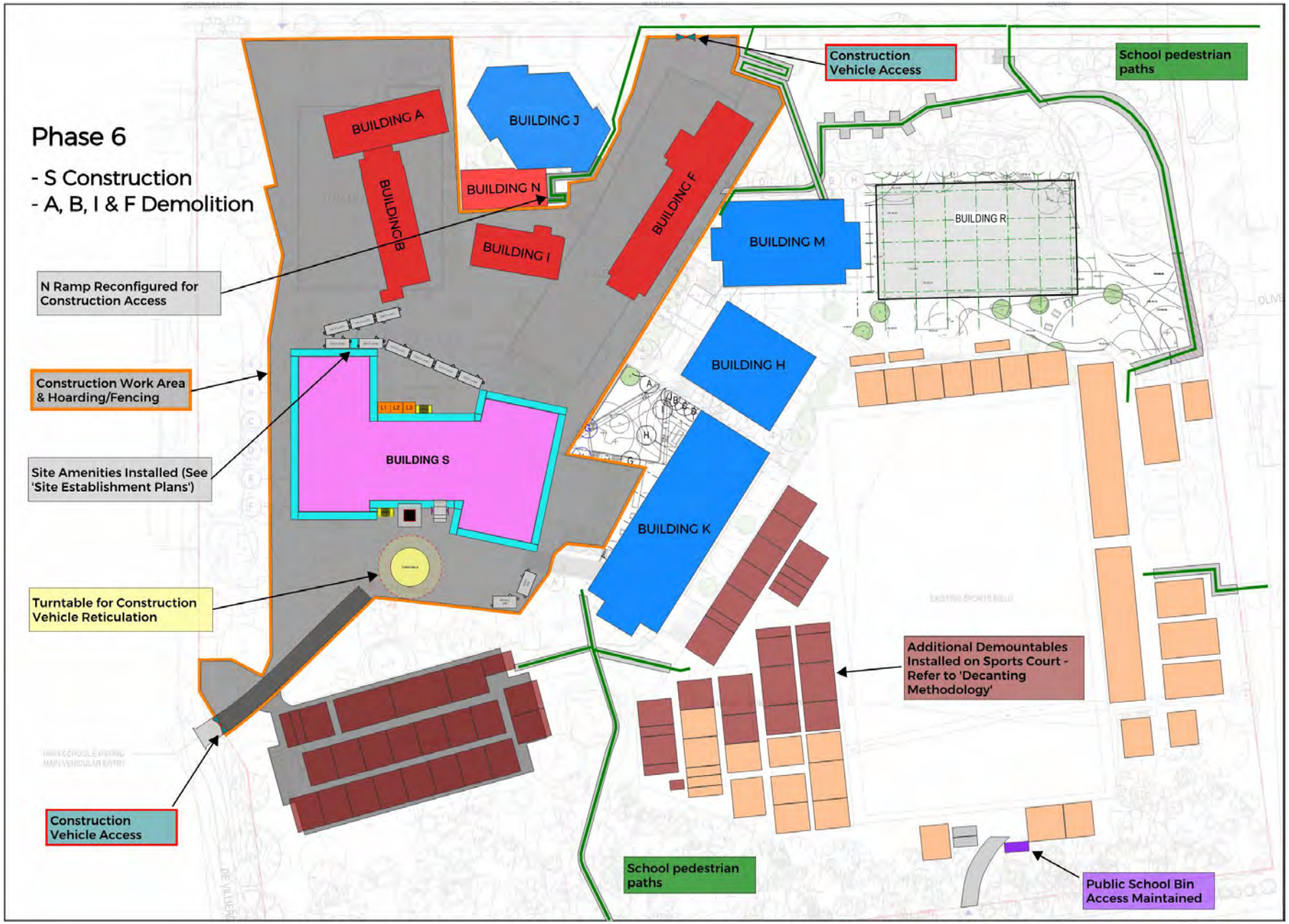

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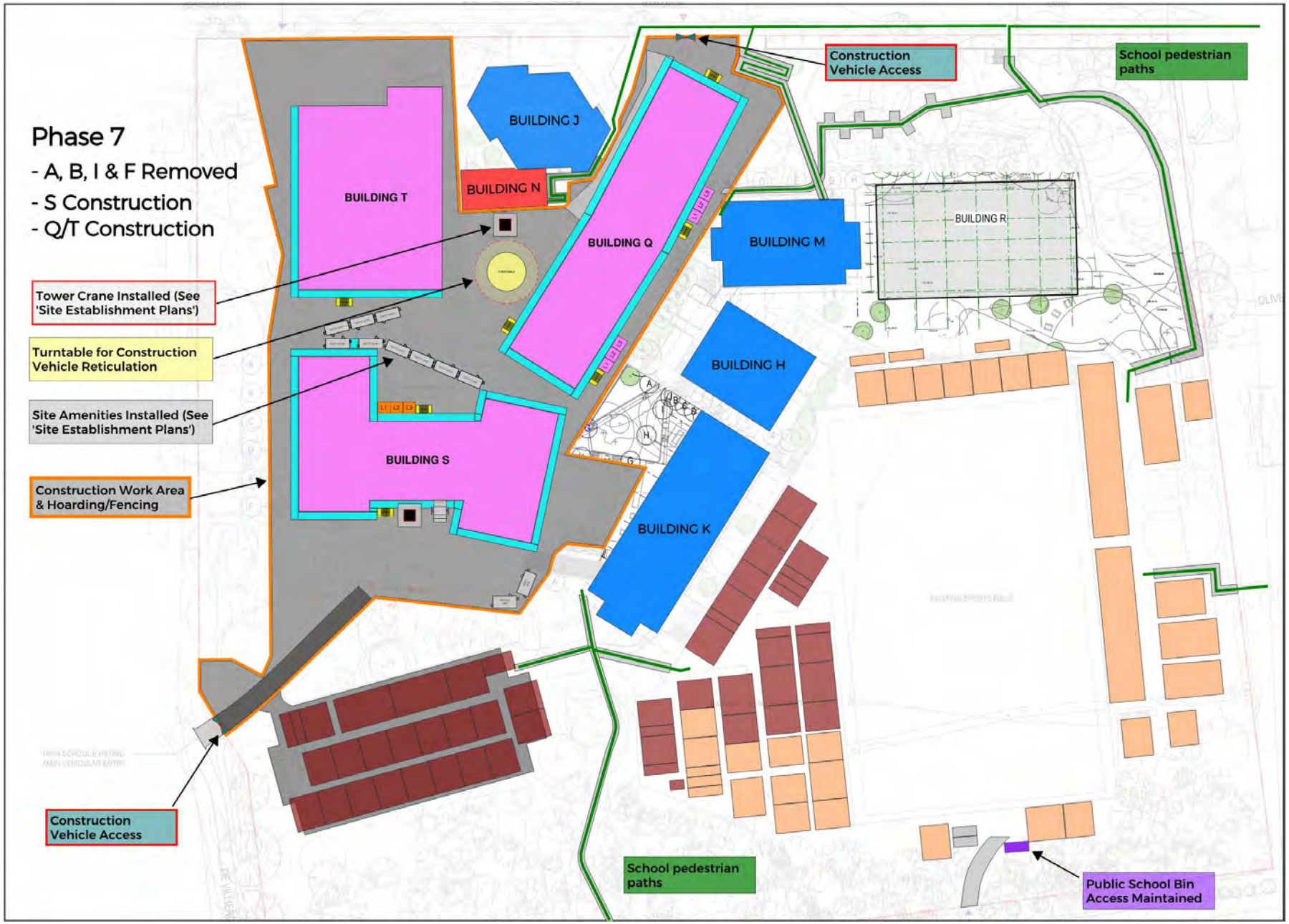

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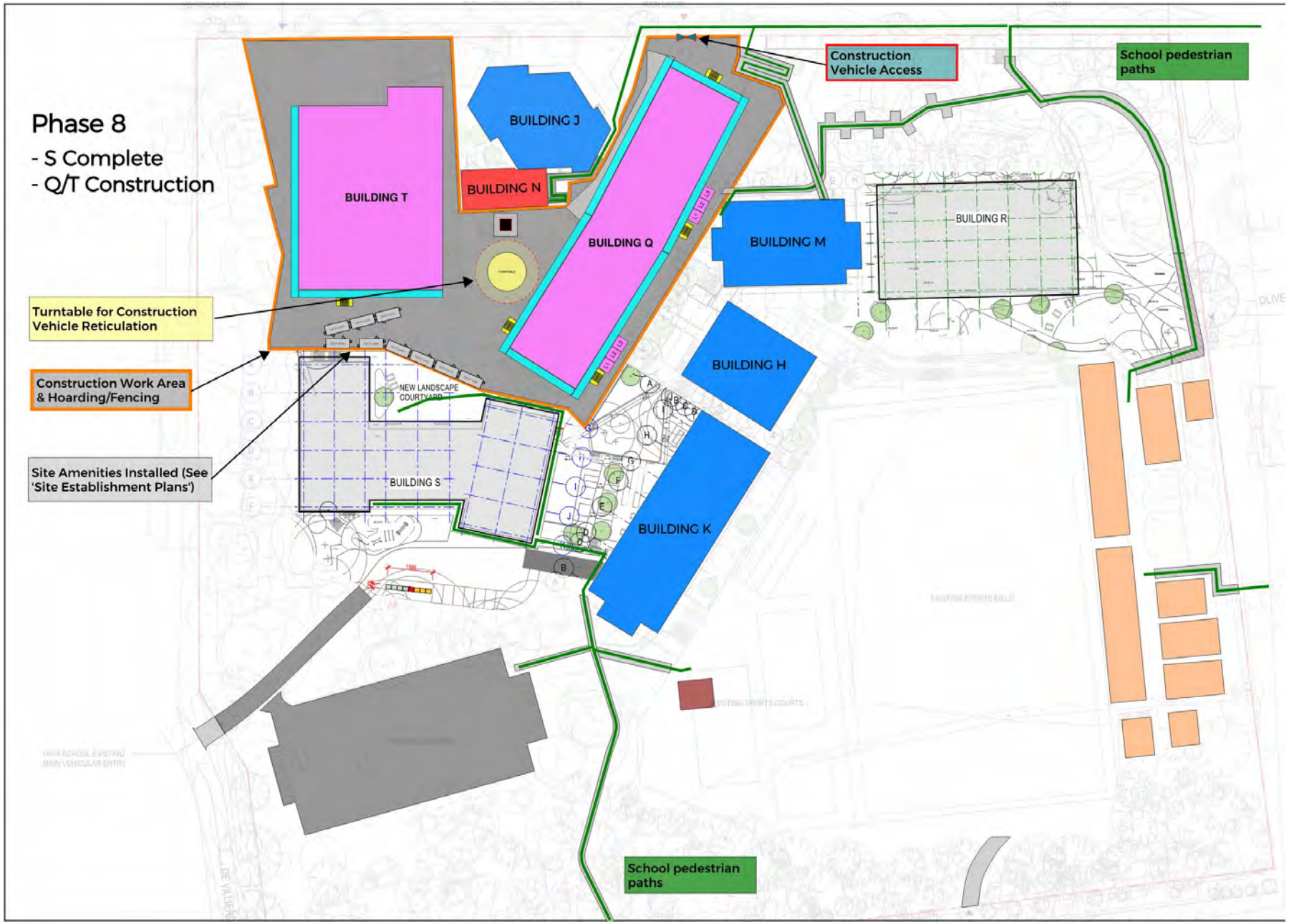

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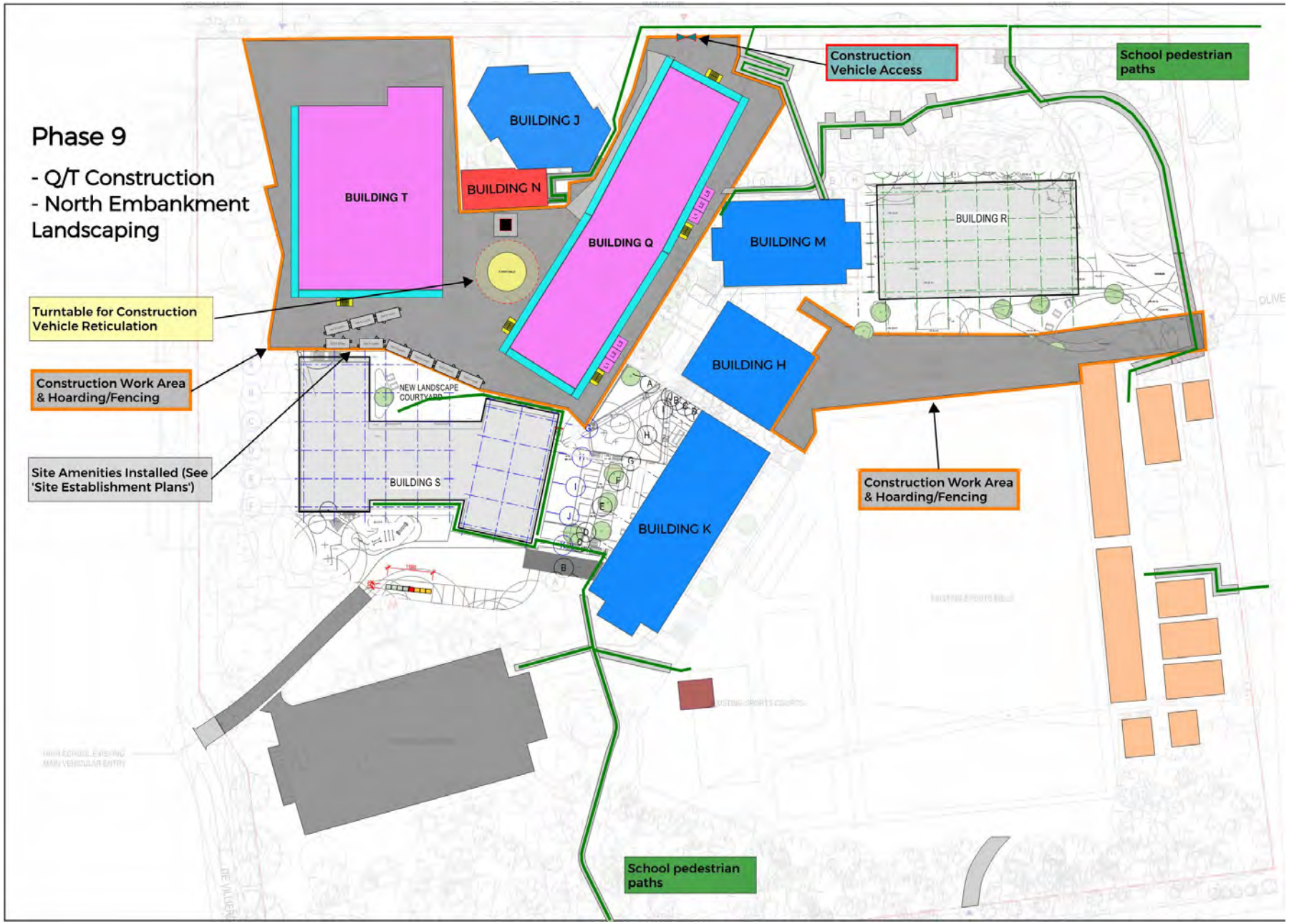

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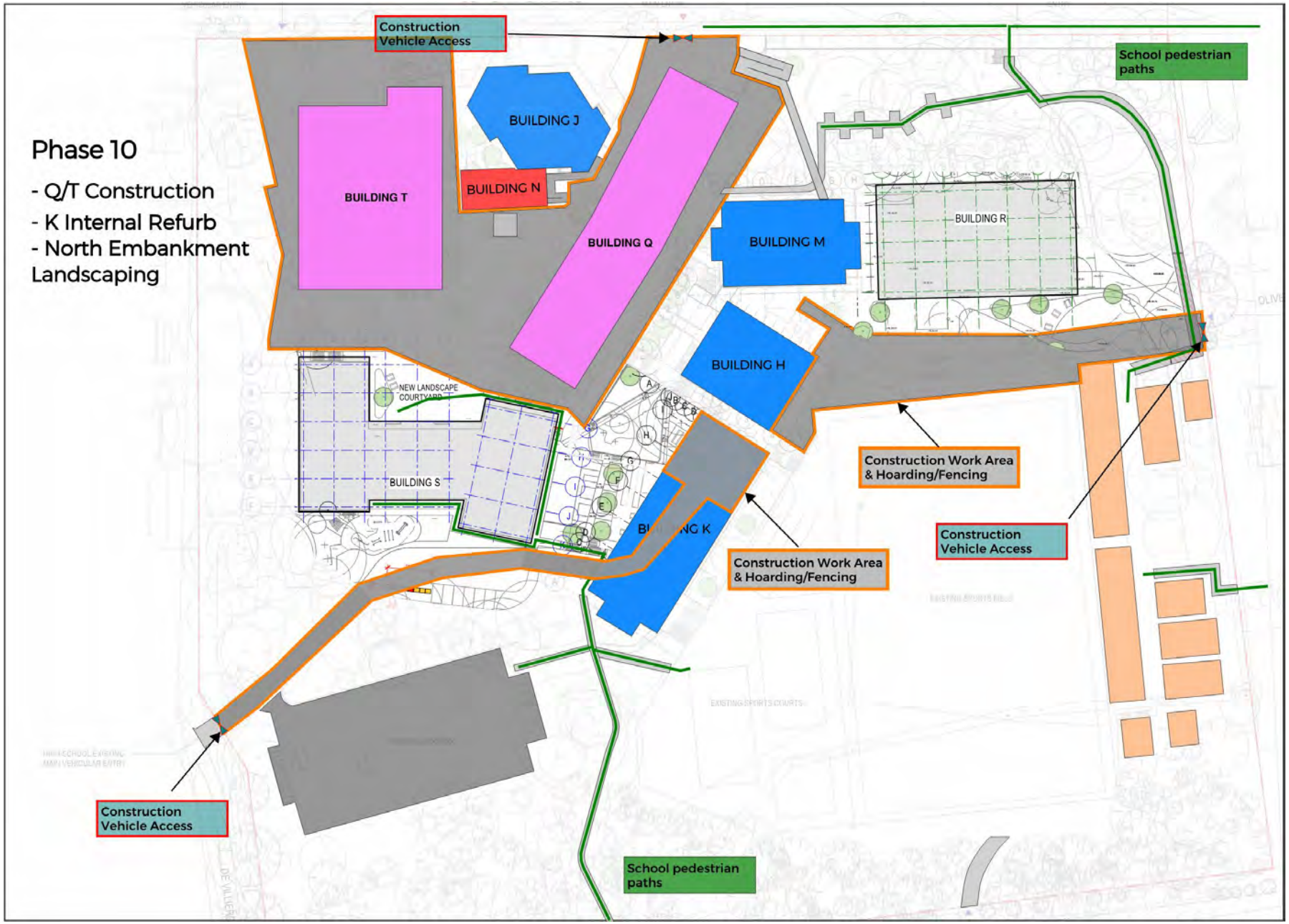

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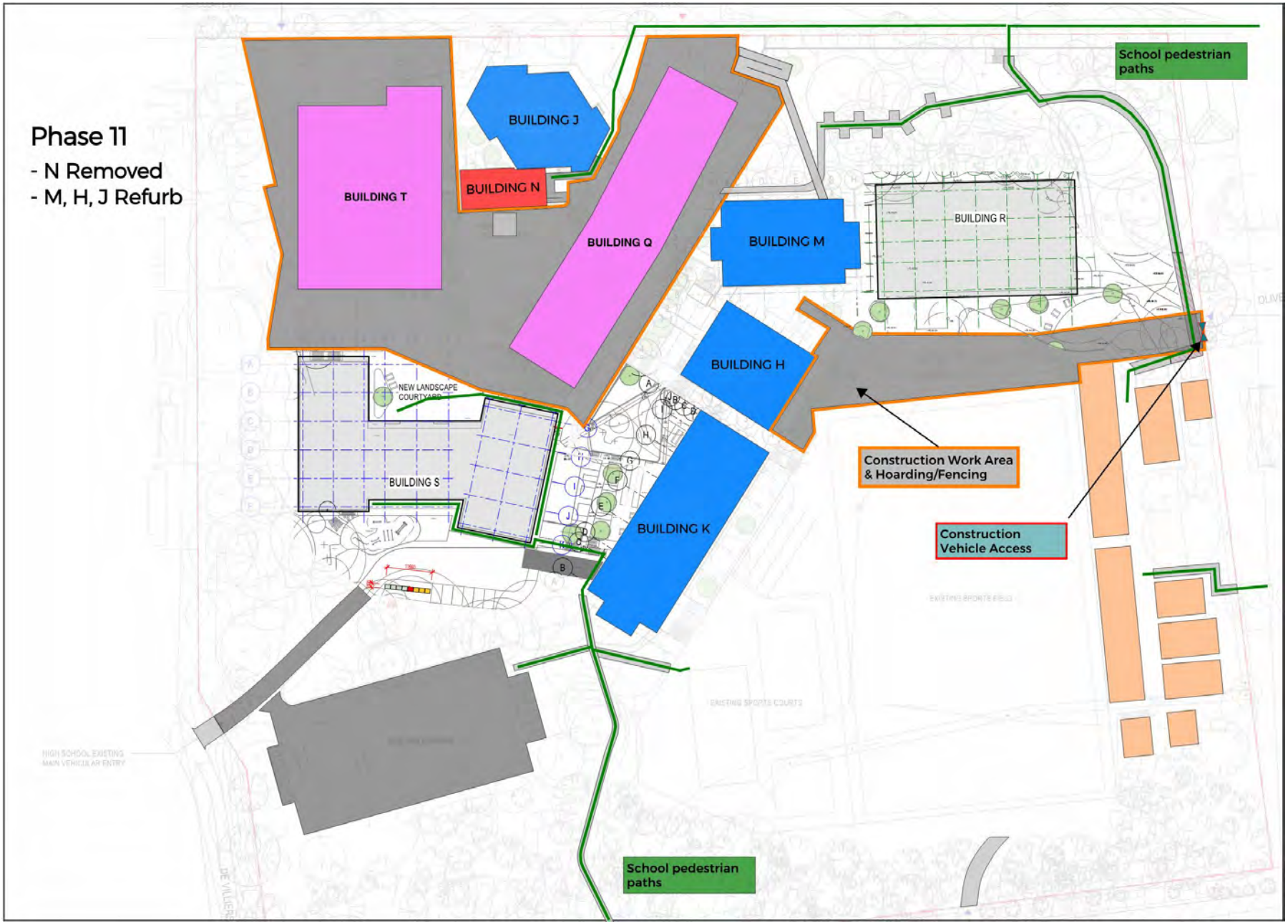

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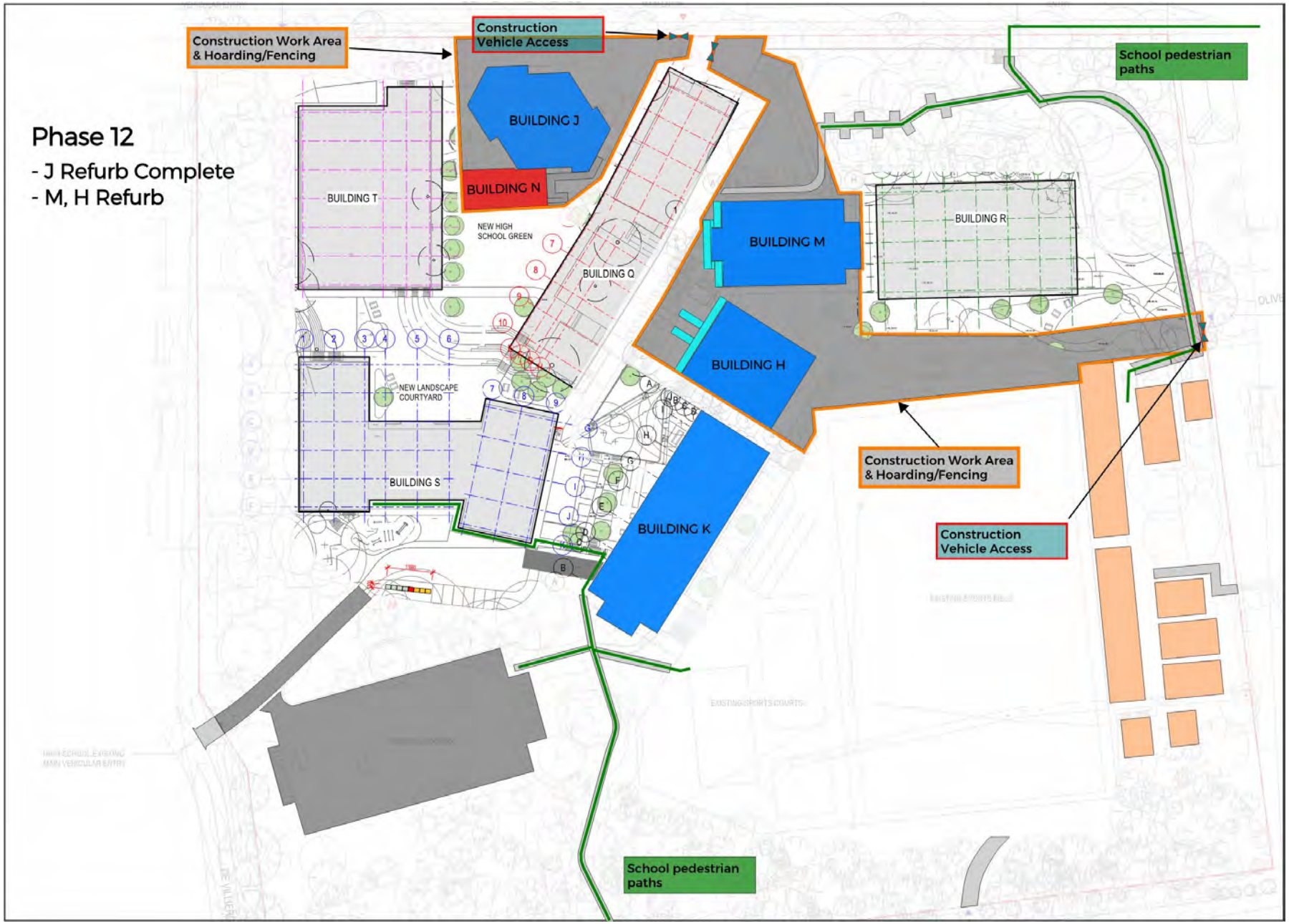

HIGH SCHOOL – CONSTRUCTION PHASING PLANS

RICHARD CROOKES CONSTRUCTIONS

HIGH SCHOOL – CONSTRUCTION PHASING PLANS

RICHARD CROOKES
CONSTRUCTIONS

PUBLIC SCHOOL – CONSTRUCTION PHASING PLANS

RICHARD CROOKES
CONSTRUCTIONS

PUBLIC SCHOOL – CONSTRUCTION PHASING PLANS

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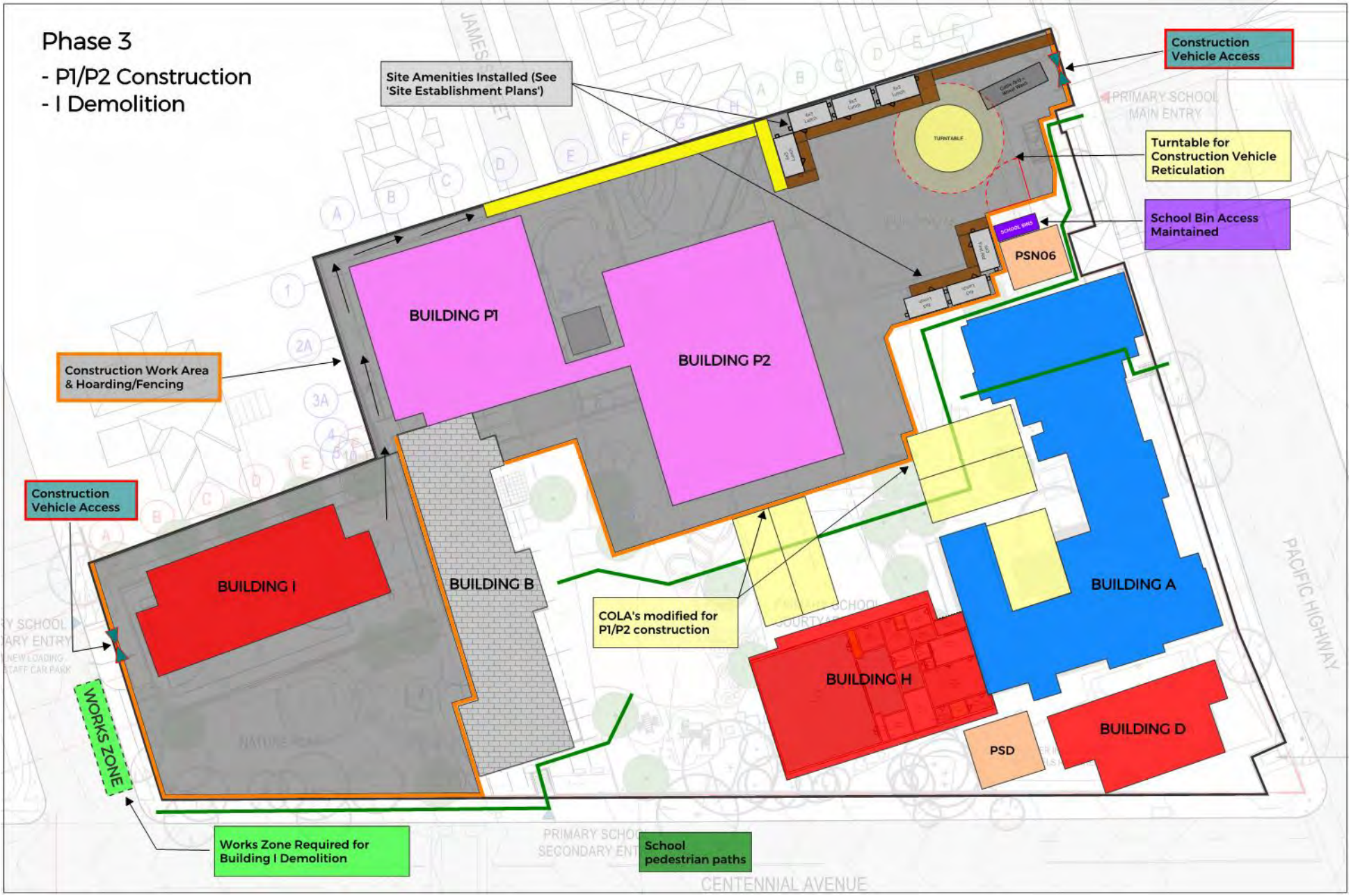

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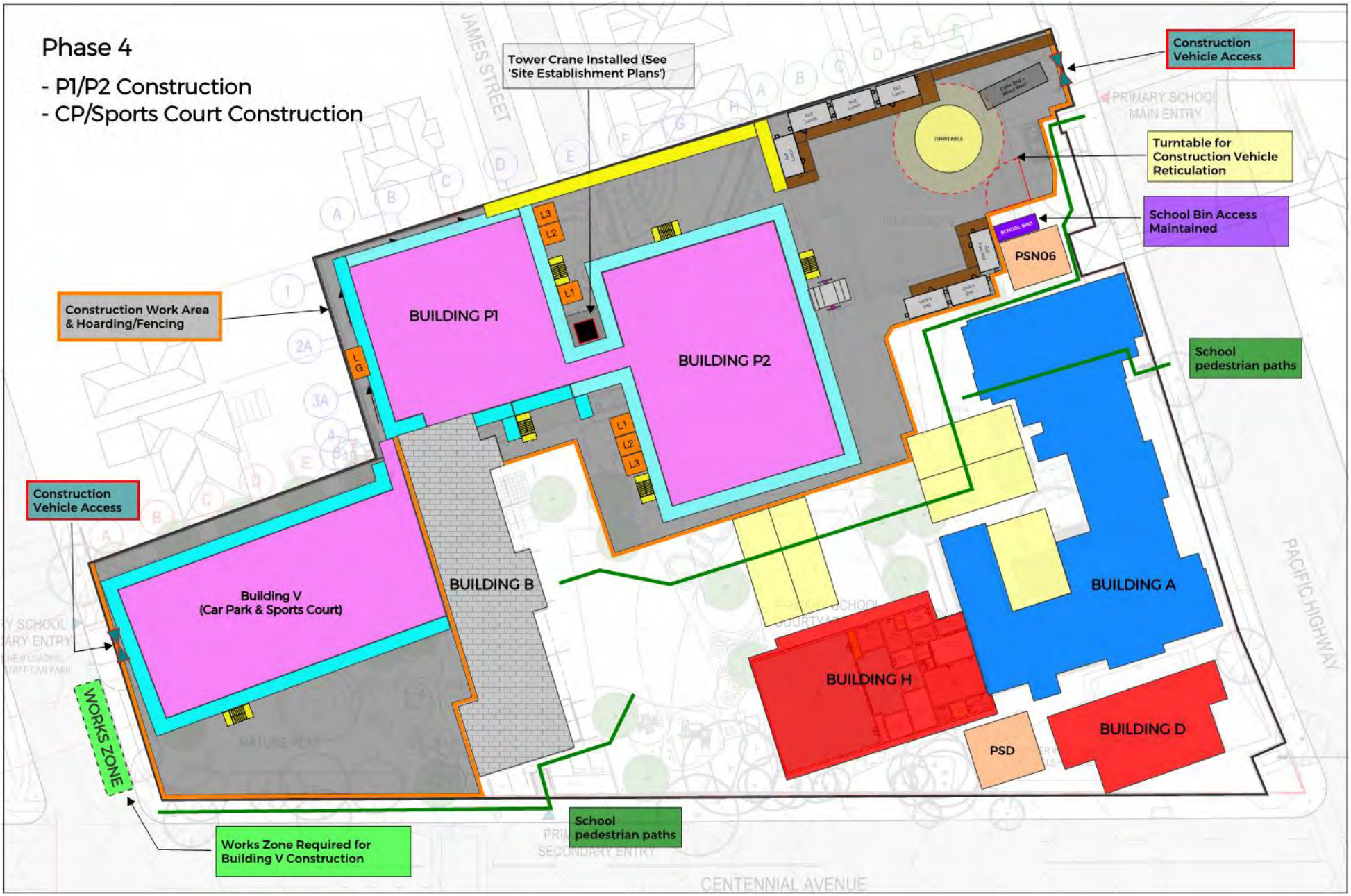

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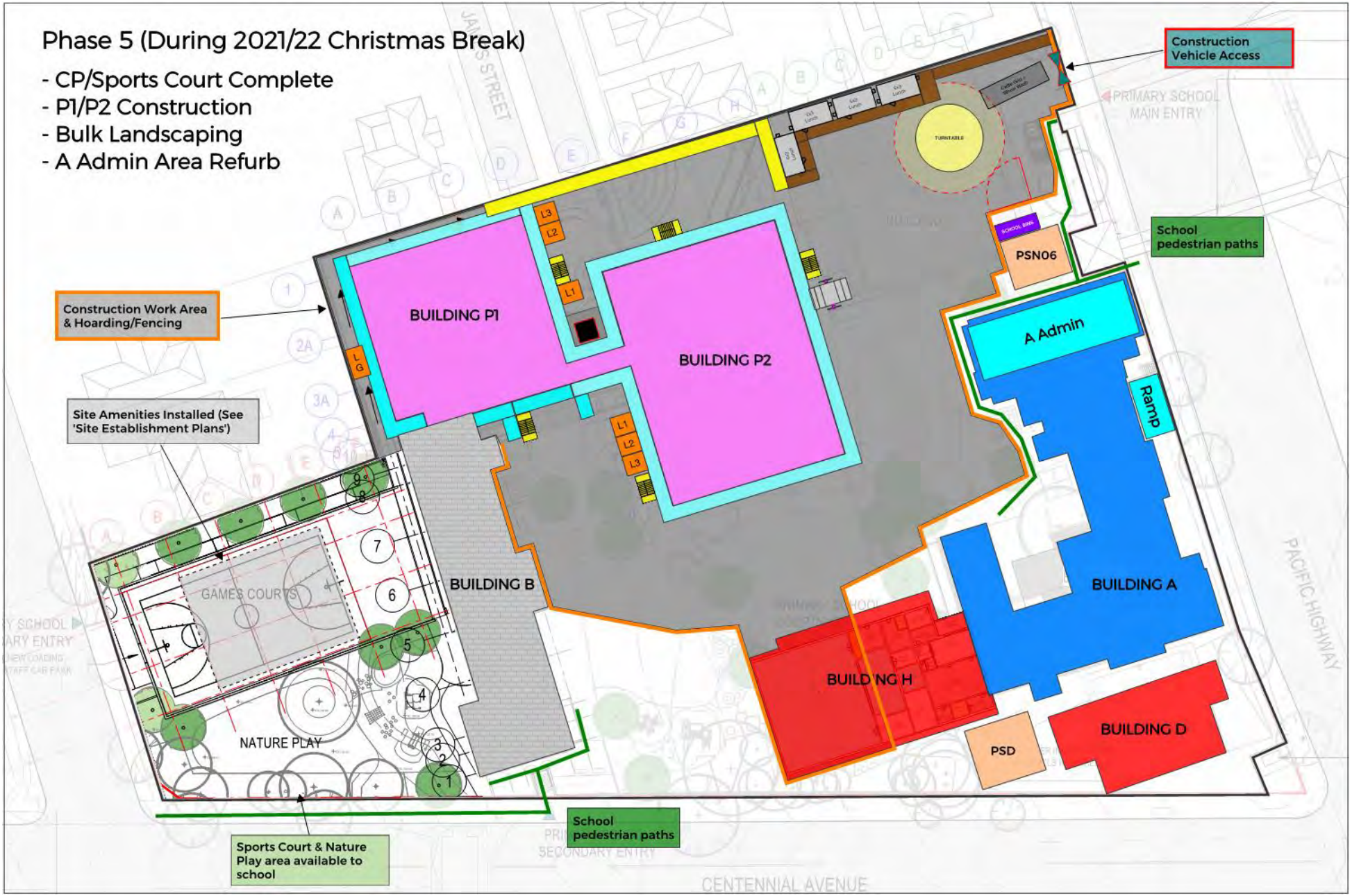

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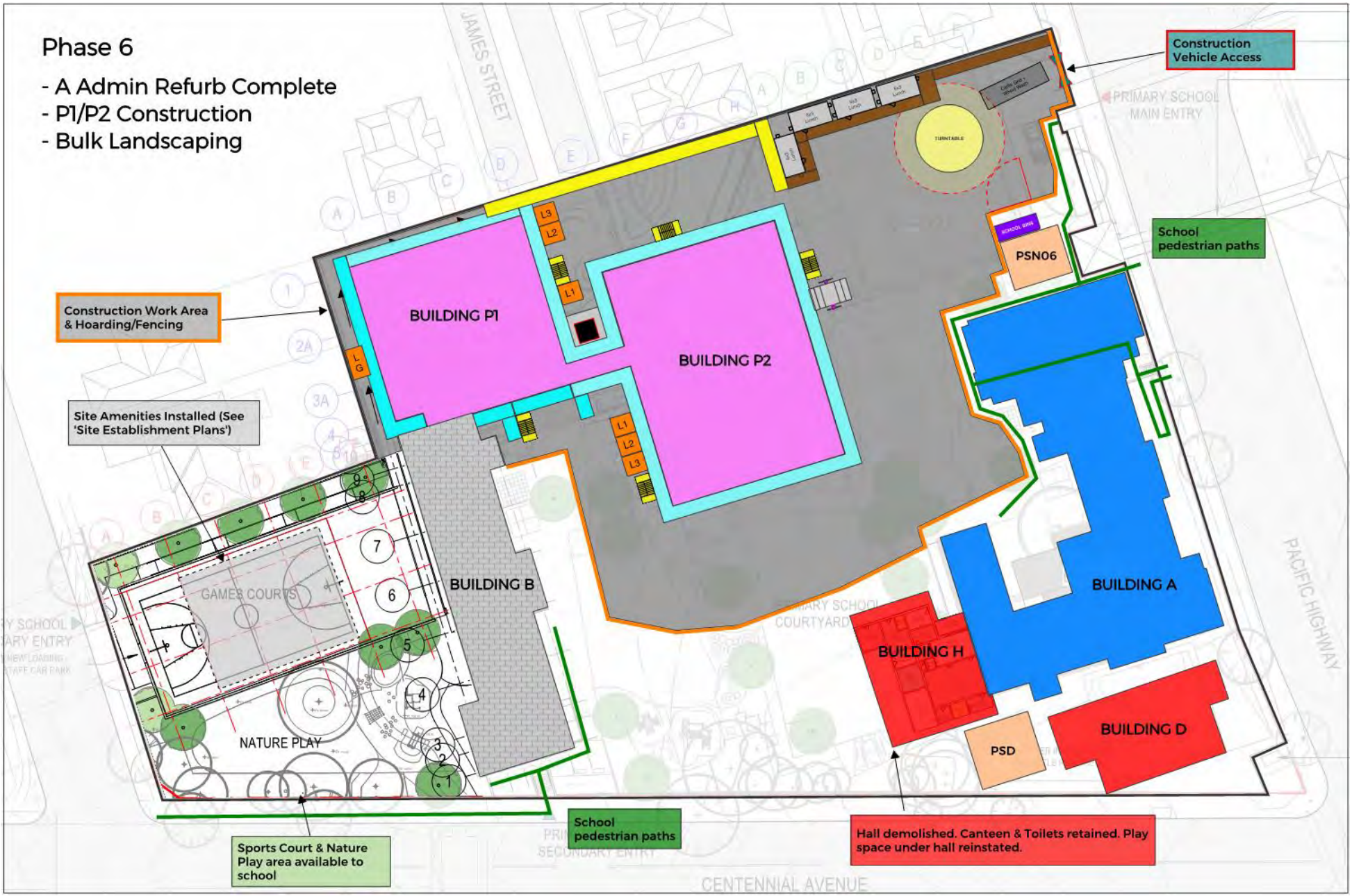

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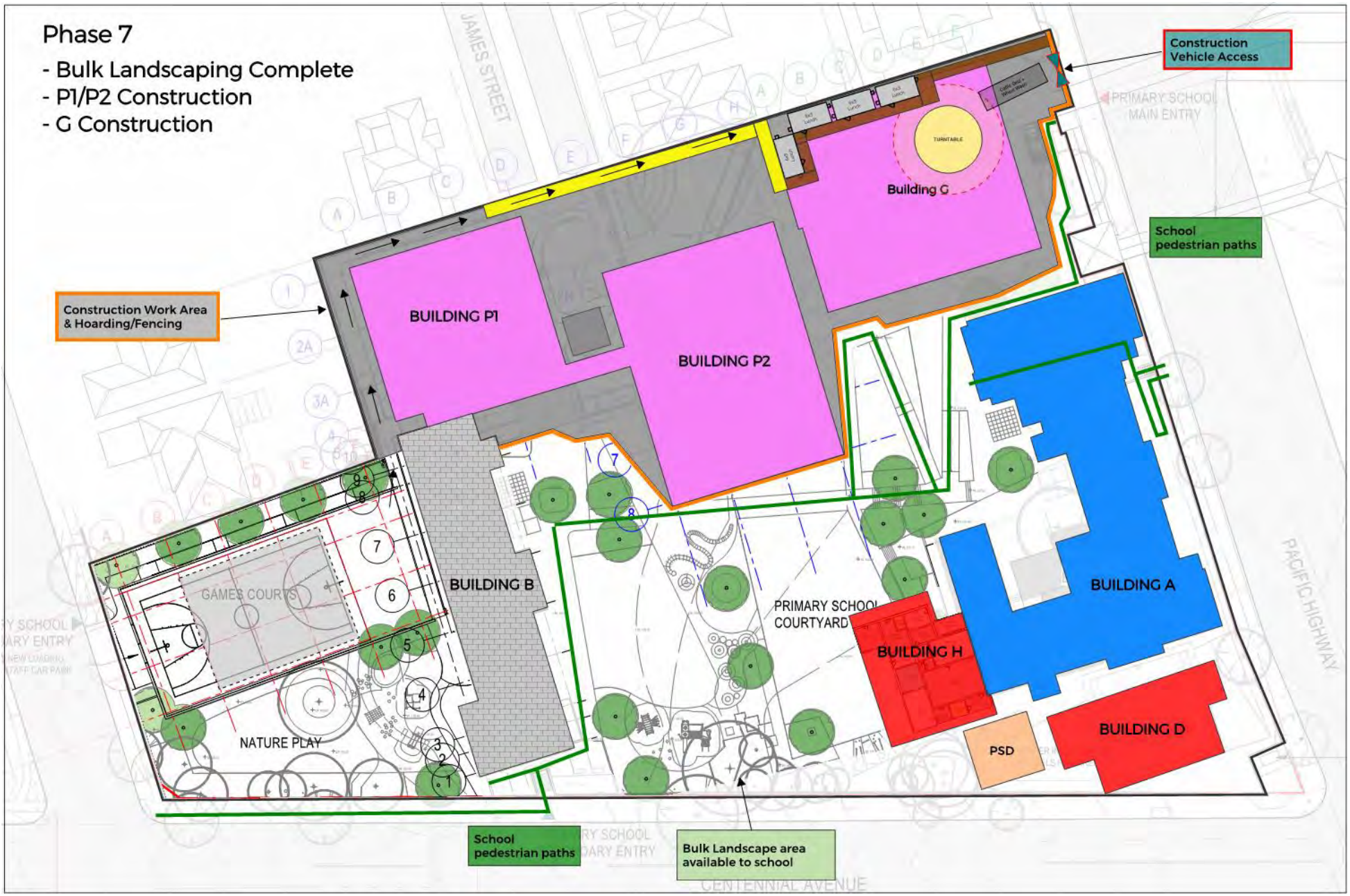

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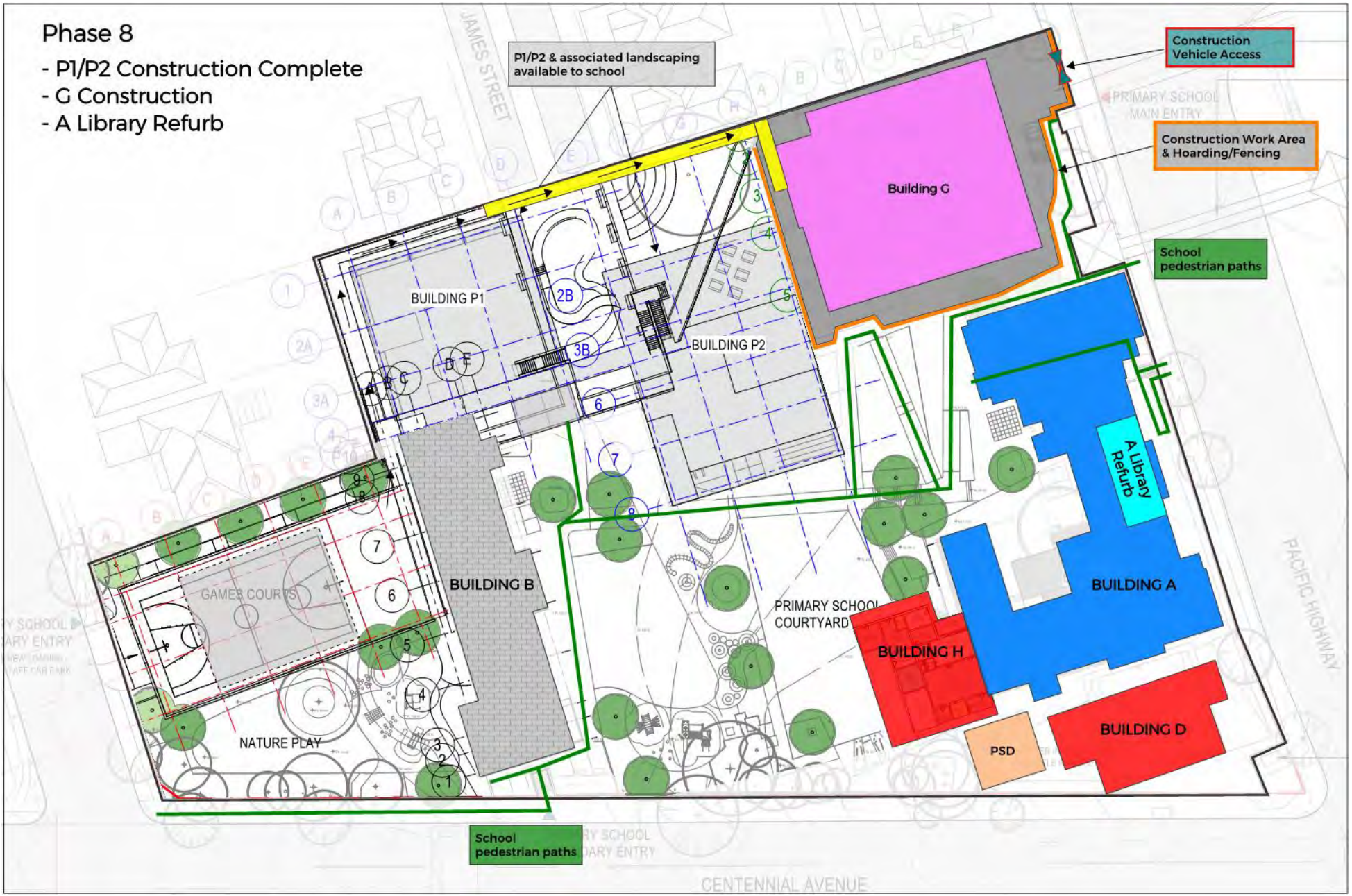

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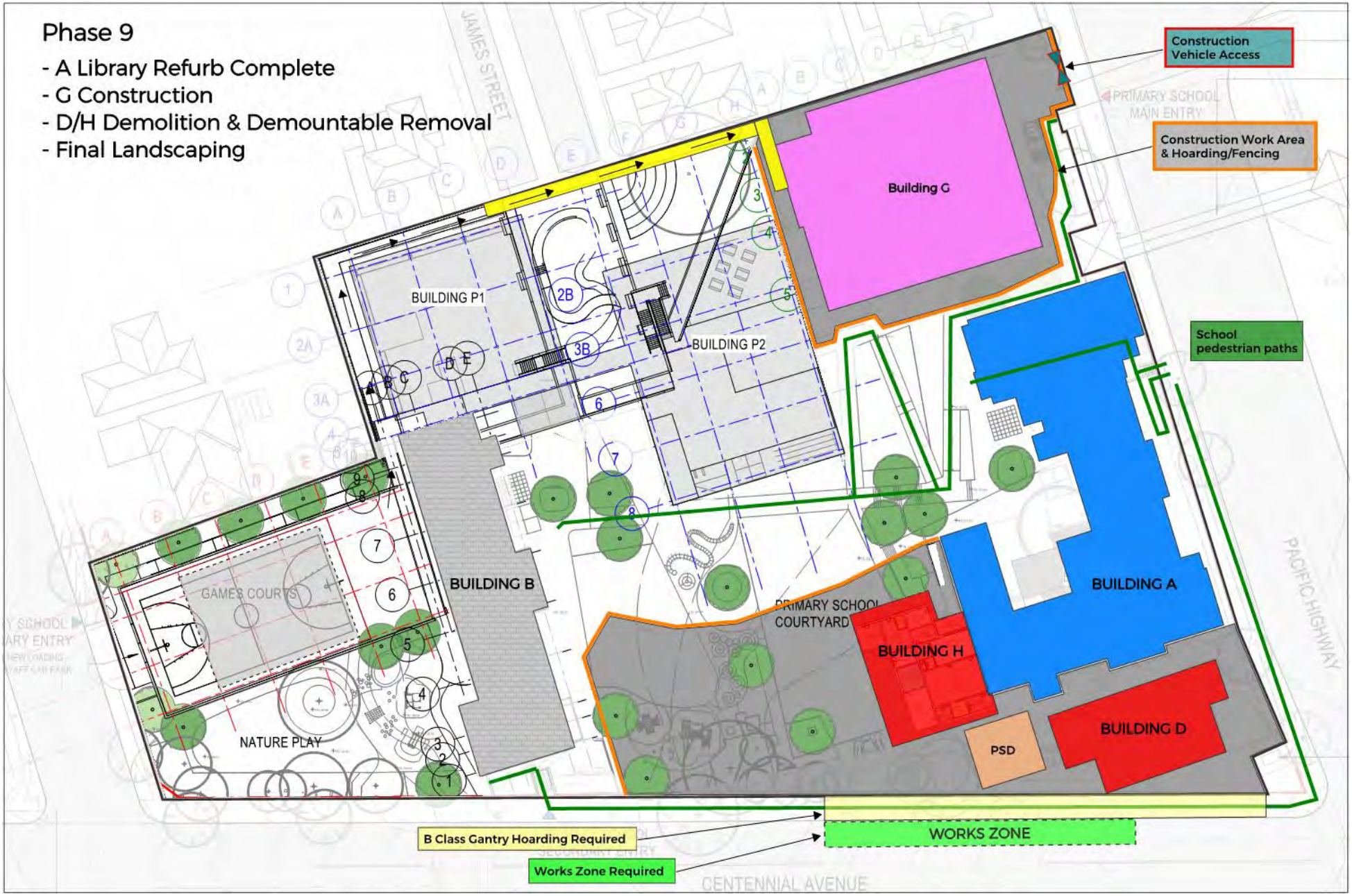

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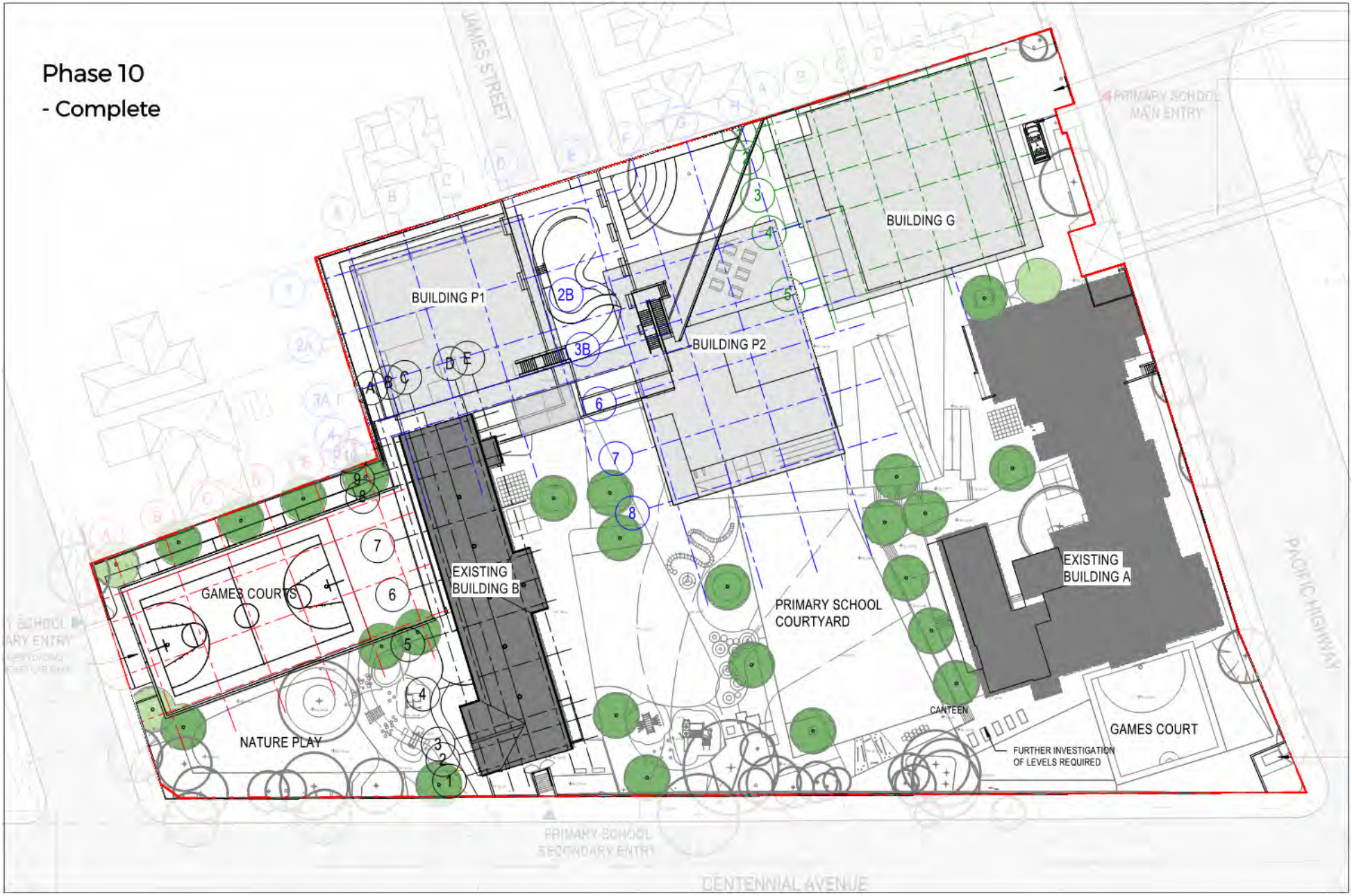

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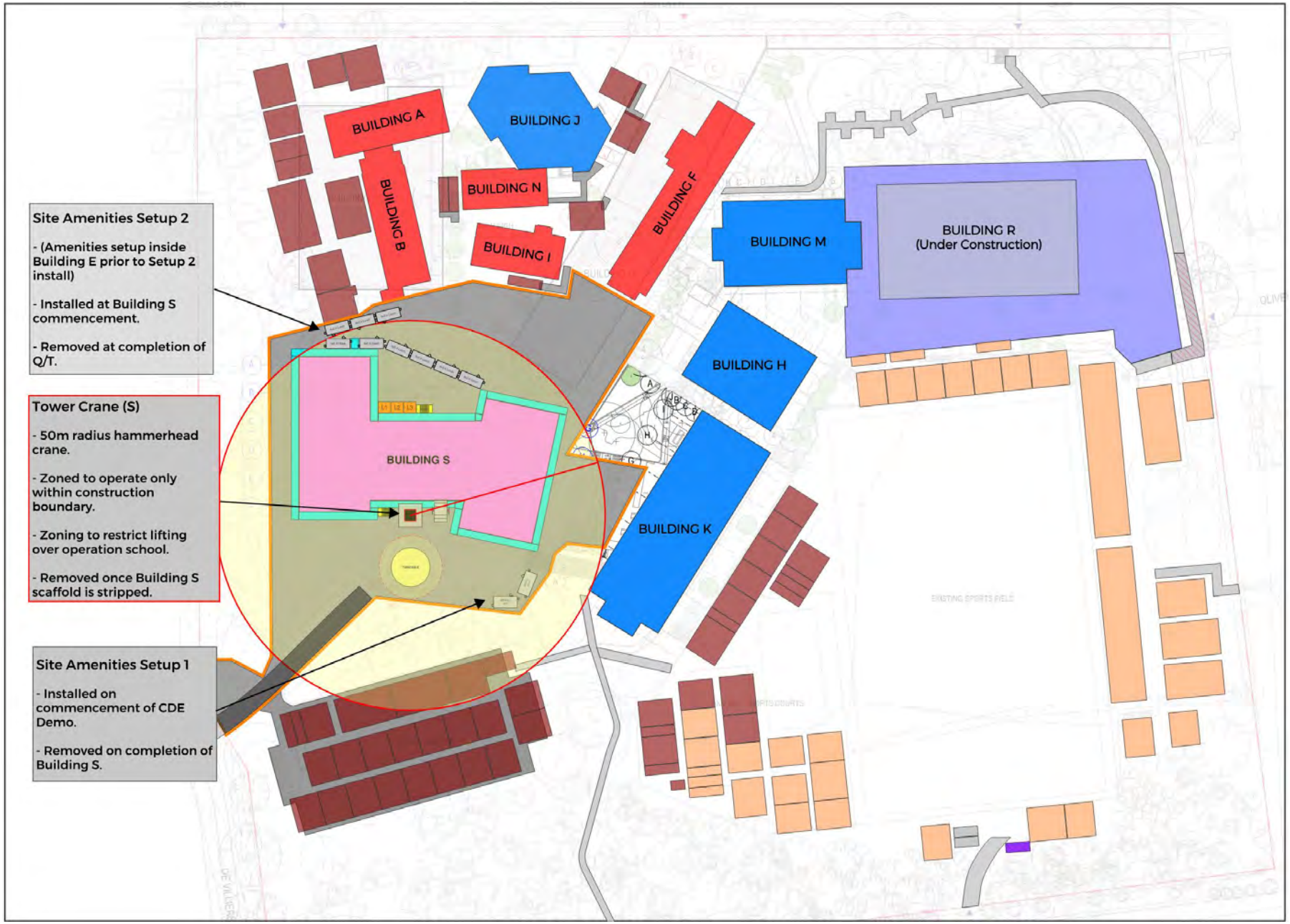

HIGH SCHOOL – SITE ESTABLISHMENT PLANS

RICHARD CROOKES
CONSTRUCTIONS

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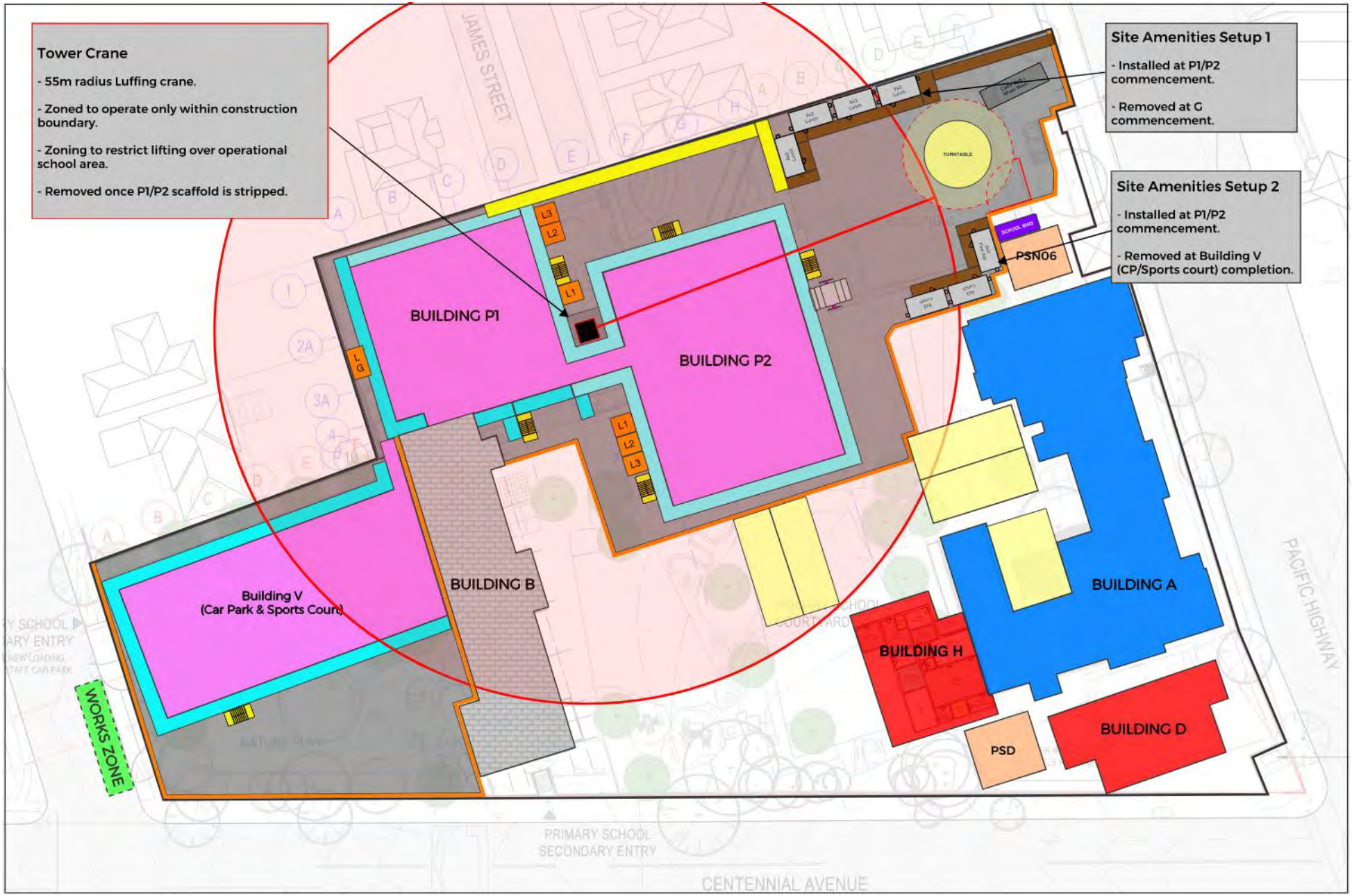
CONSTRUCTIONS



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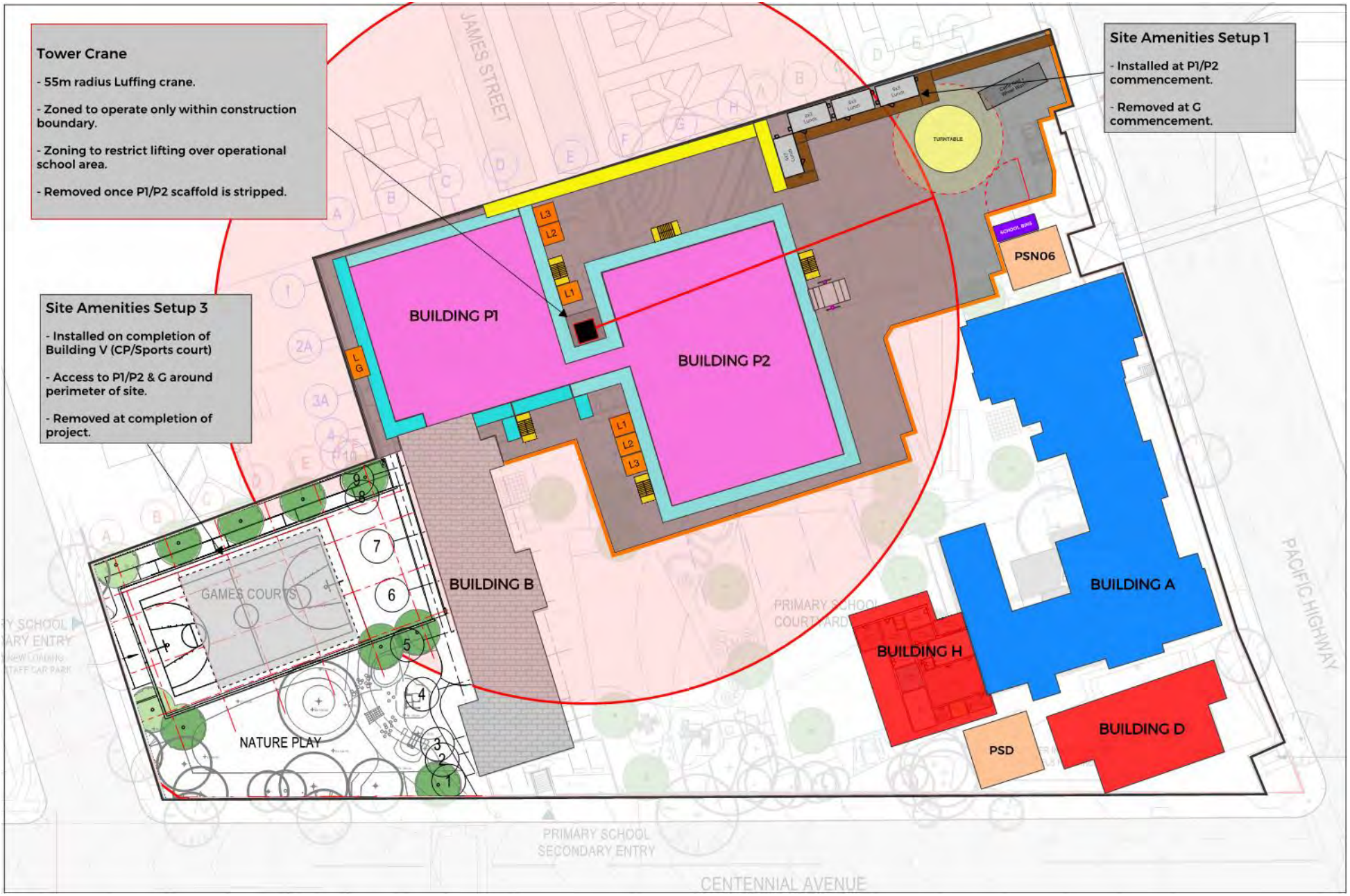
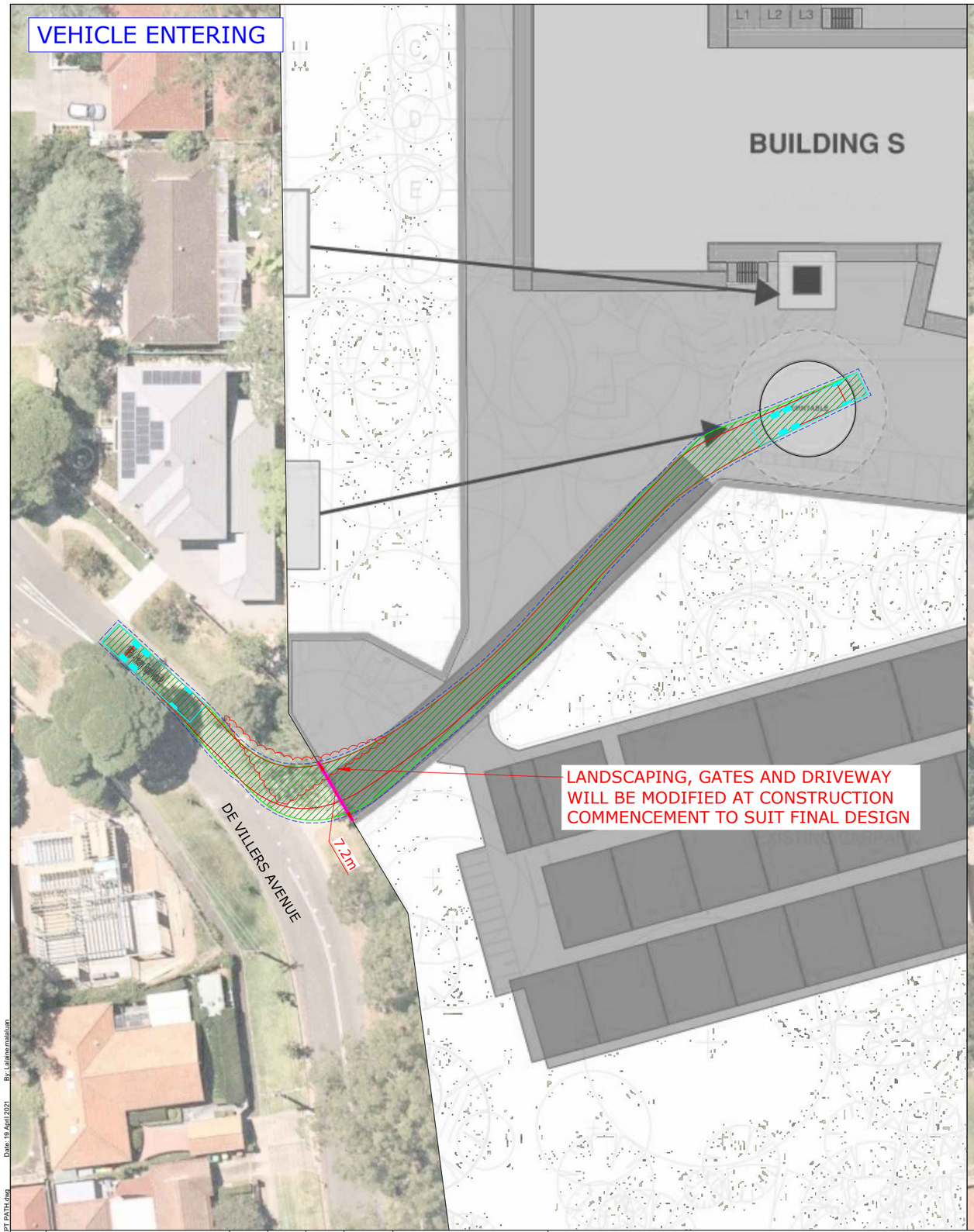


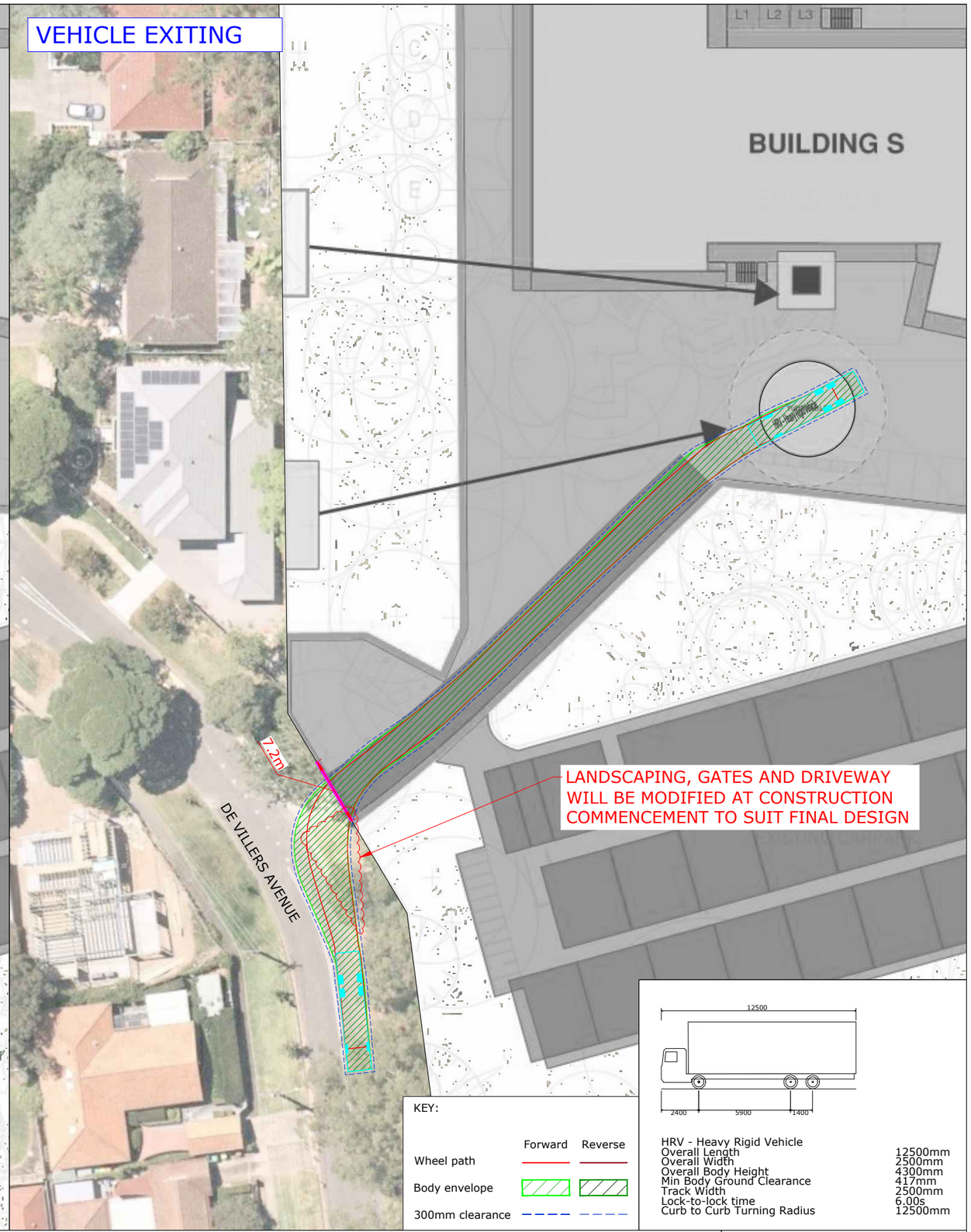
PUBLIC SCHOOL – SITE ESTABLISHMENT PLANS

RICHARD CROOKES CONSTRUCTIONS

Appendix B

Swept Paths (Local Roads)





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Date: 19 April 2021
By: Lafarge.malaluan

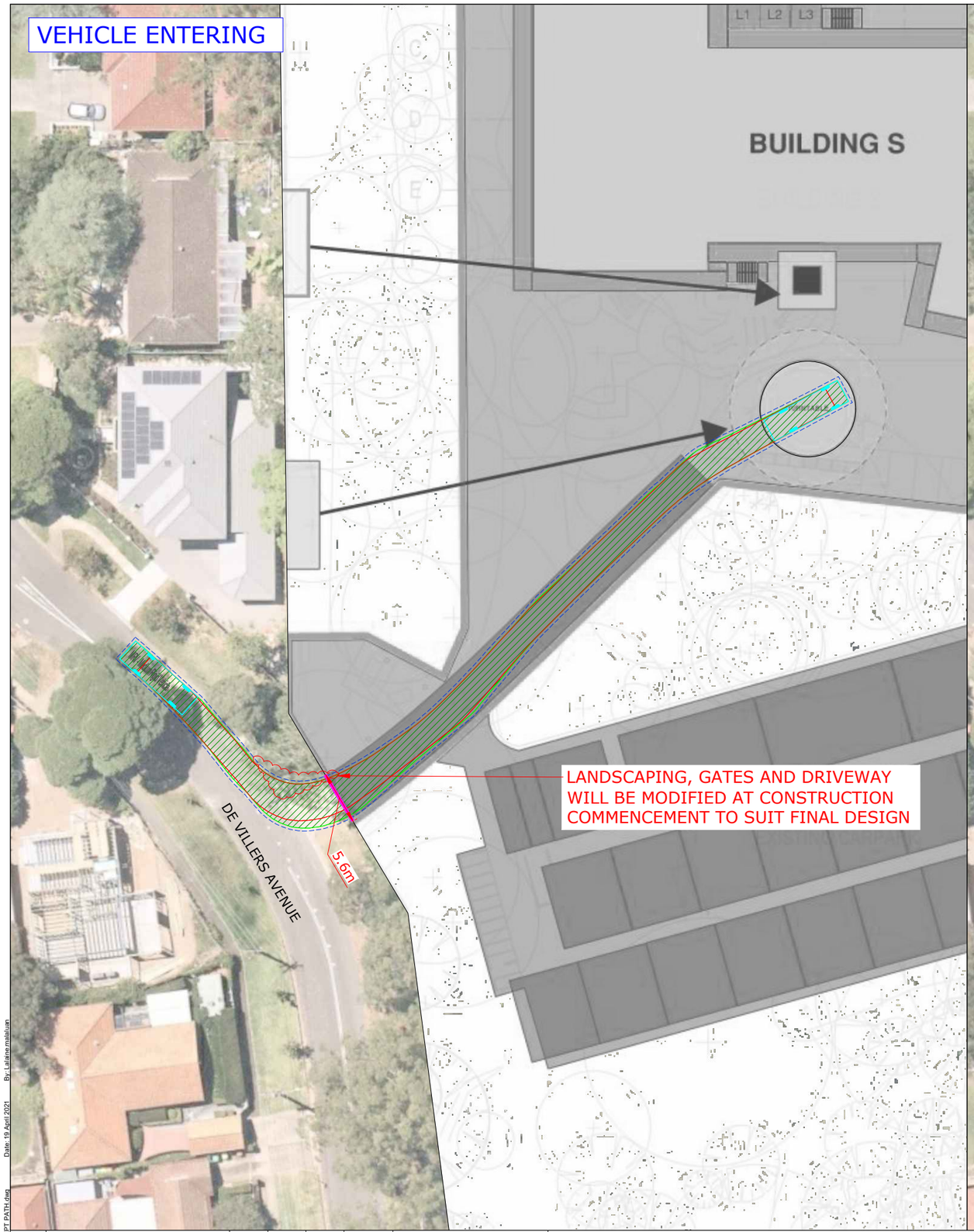
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

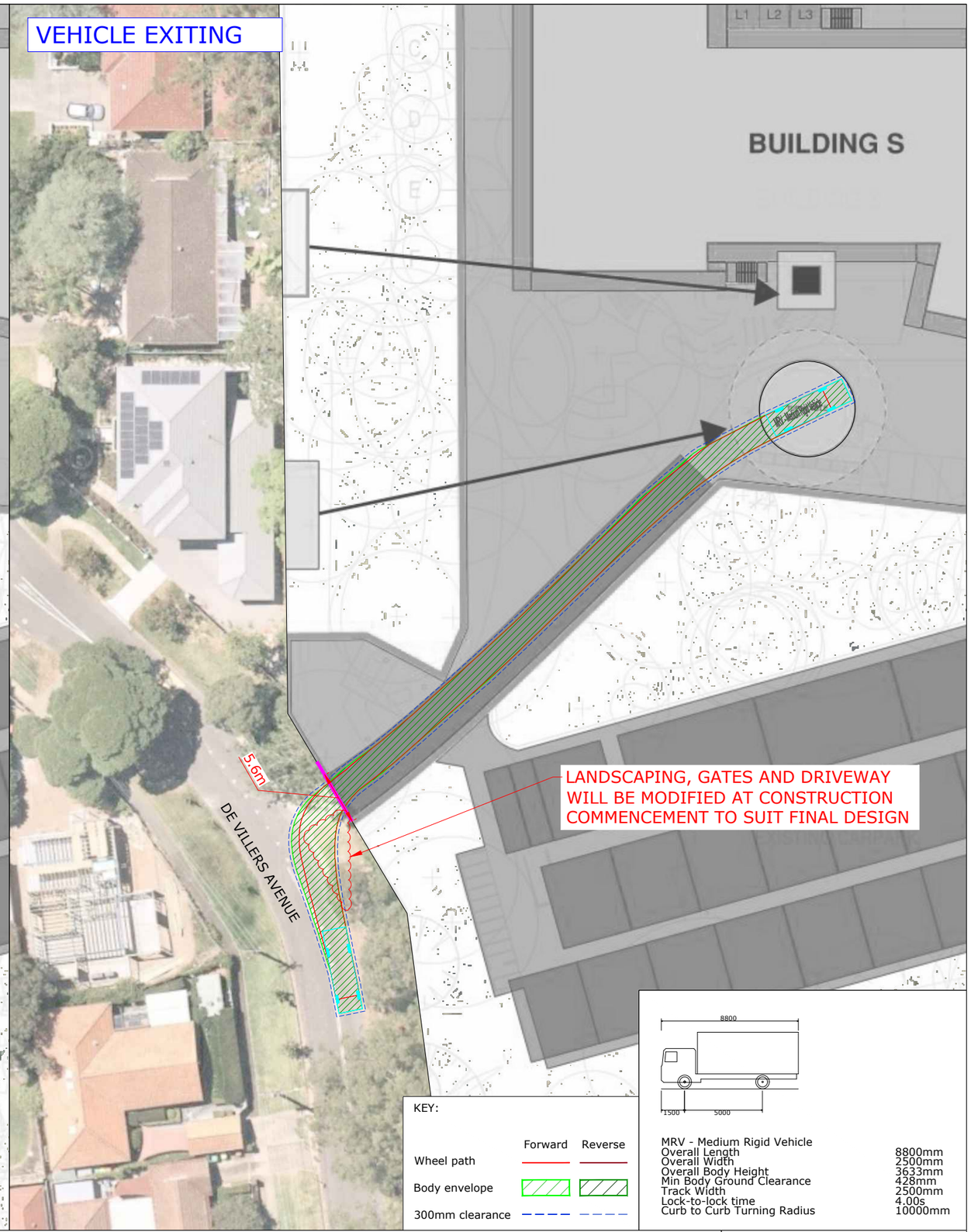
ttpp transport planning

PROJECT
CHATSWOOD SCHOOLS TENDER

TITLE
SWEPT PATH ANALYSIS - CHATSWOOD HIGH SCHOOL - DE VILLIERS ACCESS
AS2890.2 12.5m HEAVY RIGID VEHICLE

DWG No. 20182CAD020 FIGURE 1
DATE STAMP 19 APRIL 2021
PROJECT No. 20182
SCALE 1:500 @A3
REV. A





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

MRV - Medium Rigid Vehicle

Overall Length	8800mm
Overall Width	2500mm
Overall Body Height	3633mm
Min Body Ground Clearance	428mm
Track Width	2500mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT

CHATSWOOD SCHOOLS TENDER

TITLE

SWEPT PATH ANALYSIS - CHATSWOOD HIGH SCHOOL - DE VILLIERS ACCESS
AS2890.2 8.8m MEDIUM RIGID VEHICLE

DWG No. 20182CAD020 FIGURE 2

DATE STAMP 19 APRIL 2021

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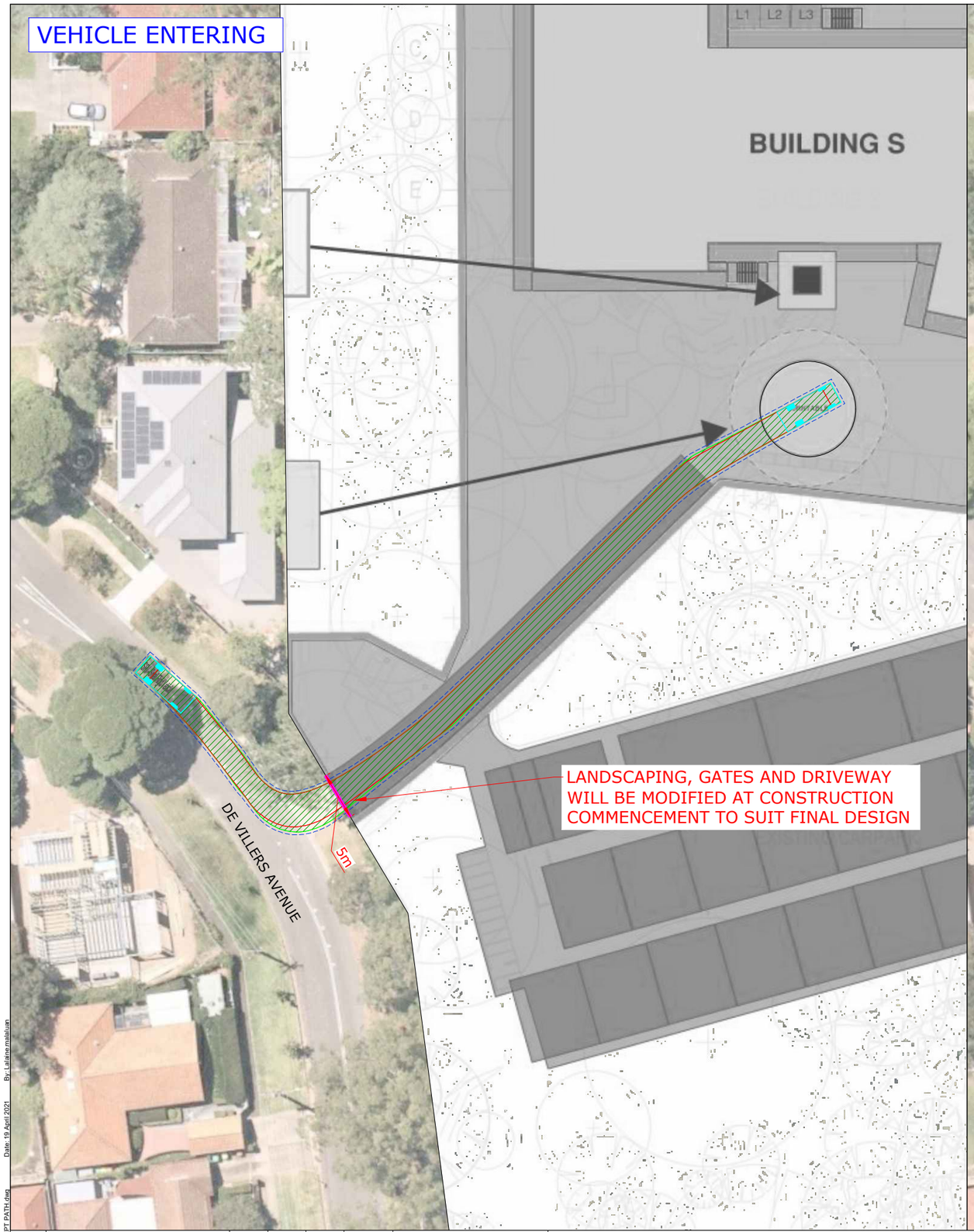

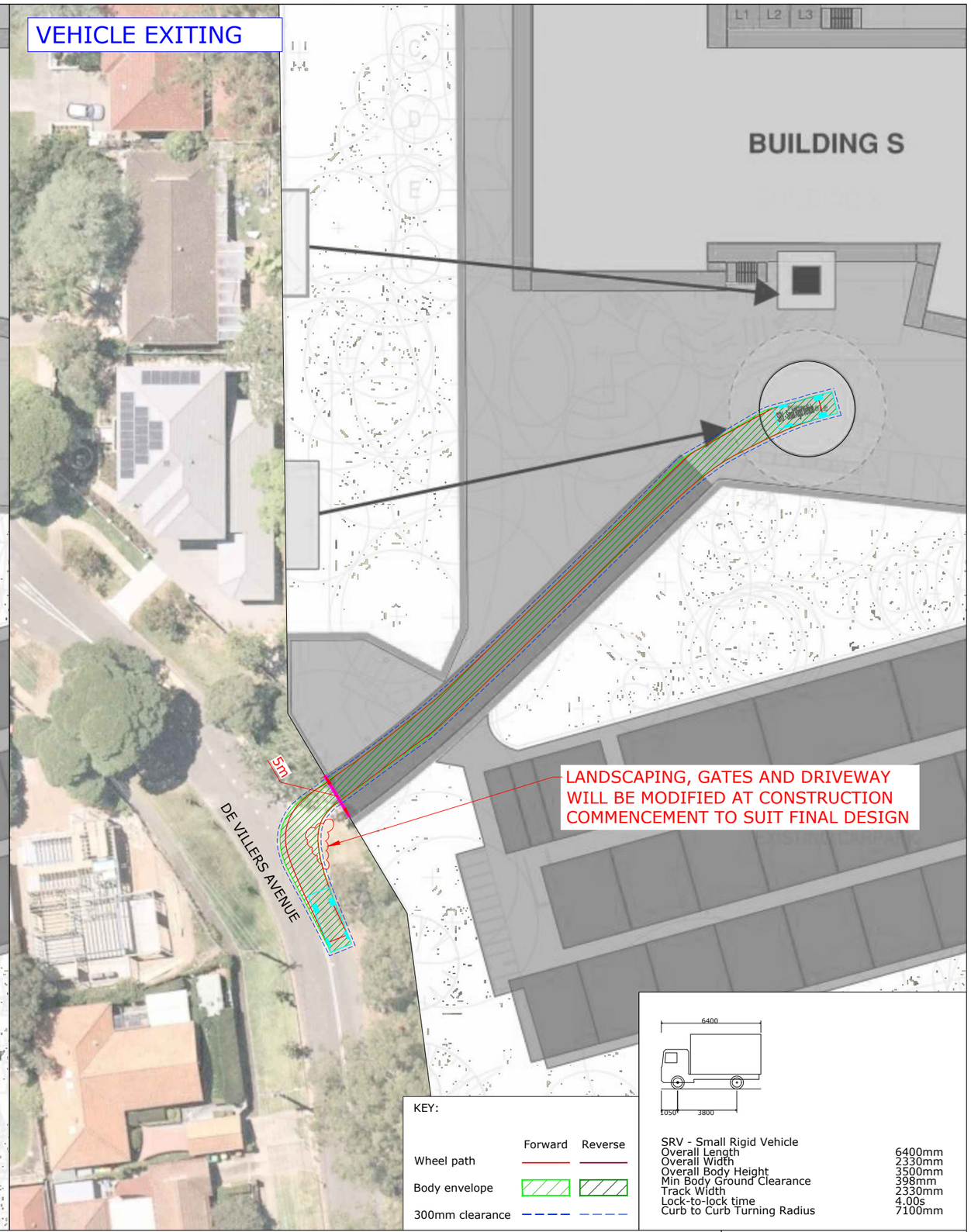

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

SRV - Small Rigid Vehicle

Overall Length	6400mm
Overall Width	2330mm
Overall Body Height	3500mm
Min Body Ground Clearance	398mm
Track Width	2330mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7100mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

TITLE: SWEPT PATH ANALYSIS - CHATSWOOD HIGH SCHOOL - DE VILLIERS ACCESS
AS2890.2 6.4m SMALL RIGID VEHICLE

DWG No. 20182CAD020 FIGURE 3

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
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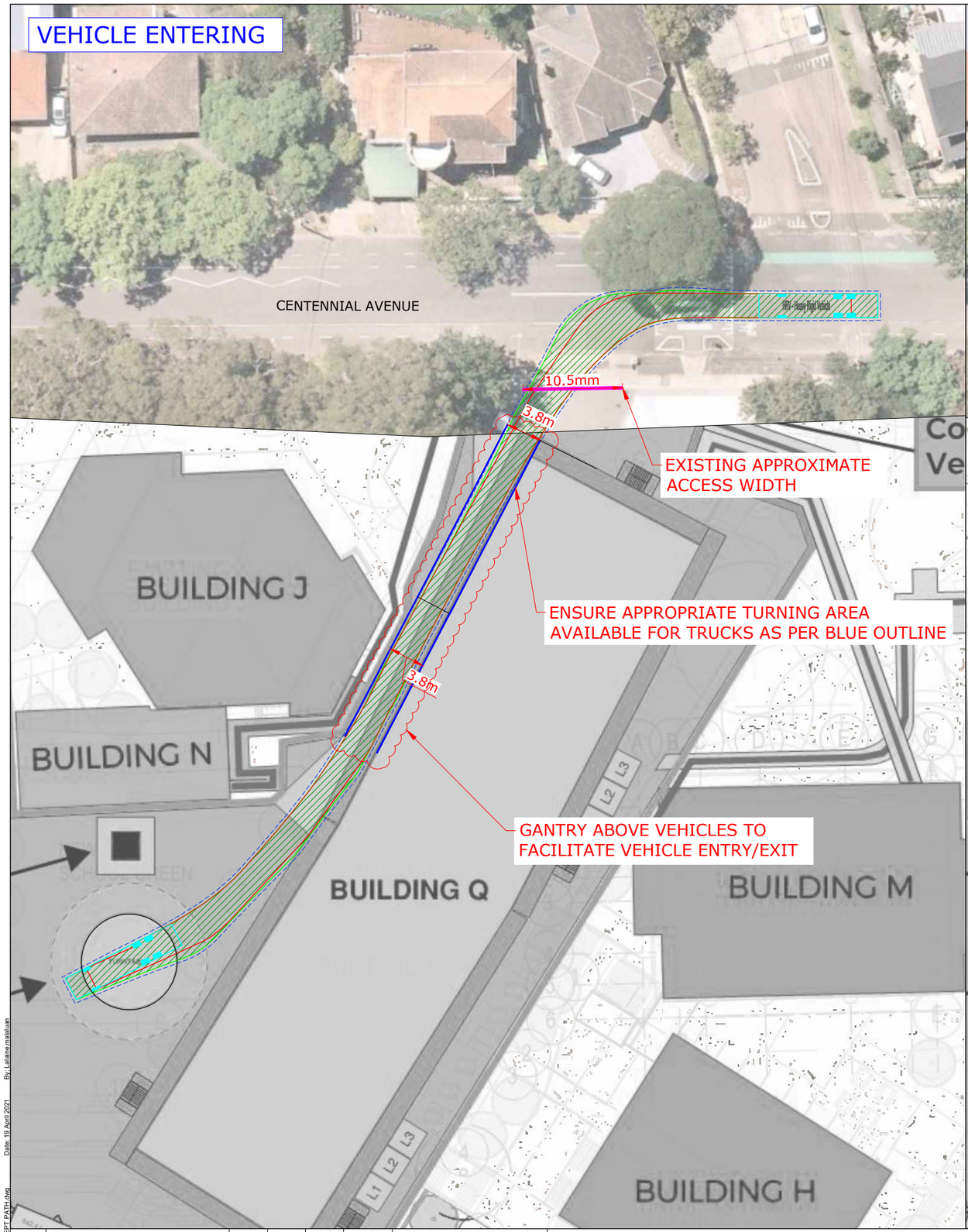

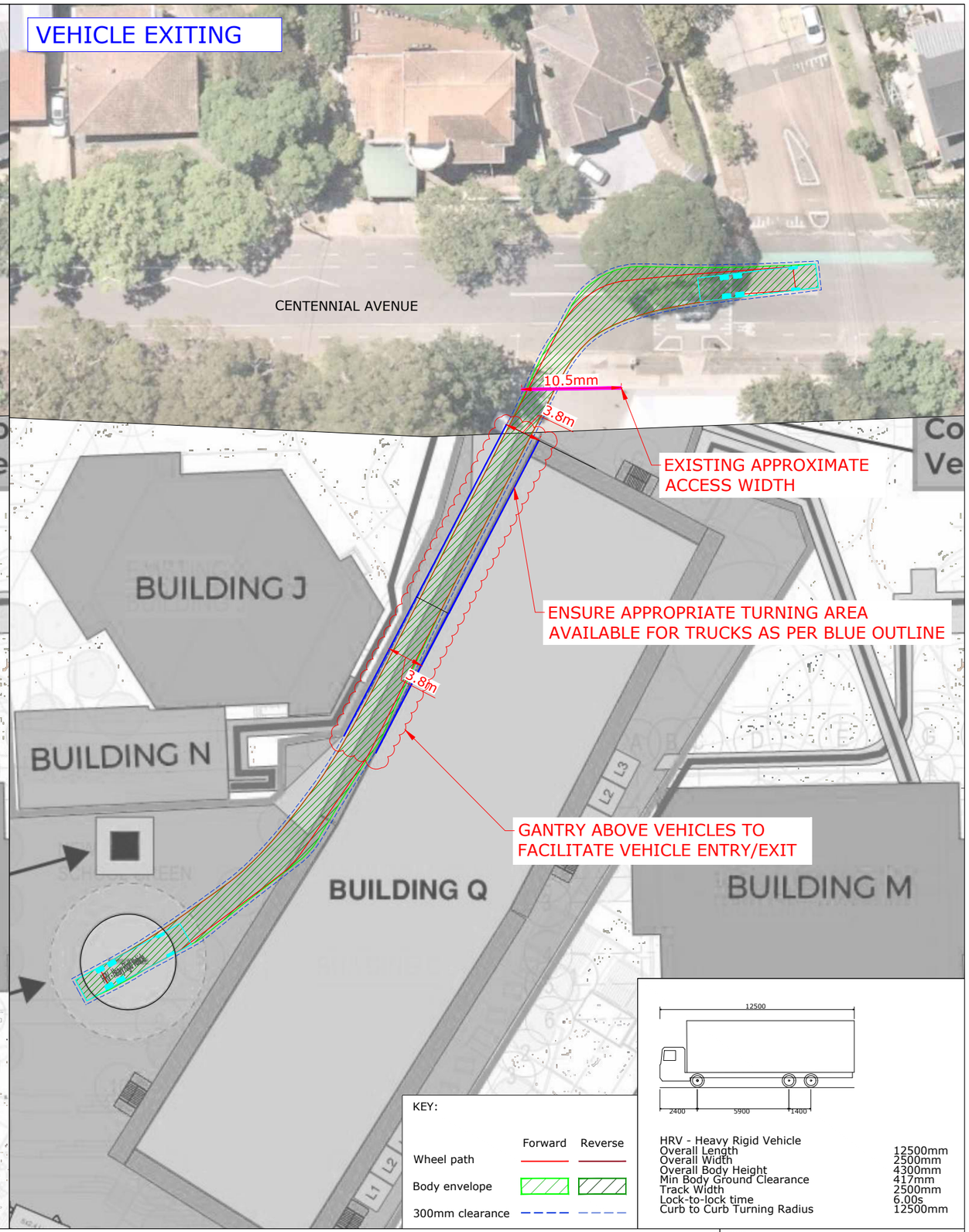

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

HRV - Heavy Rigid Vehicle

Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	417mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

TITLE: SWEPT PATH ANALYSIS - CHATSWOOD HIGH SCHOOL - CENTENNIAL AVENUE ACCESS
AS2890.2 12.5m HEAVY RIGID VEHICLE

DWG No. 20182CAD020 FIGURE 4

DATE STAMP 19 APRIL 2021

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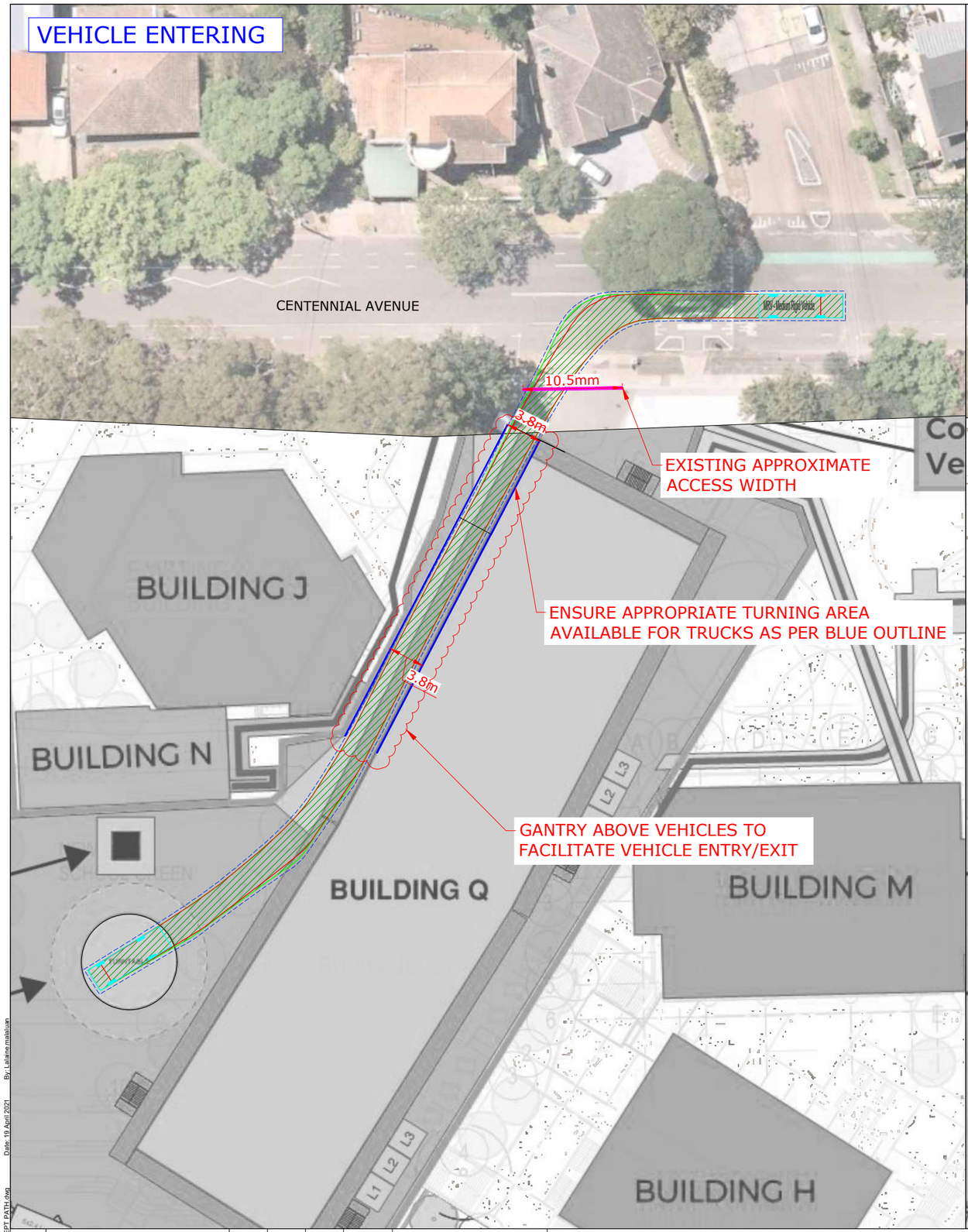

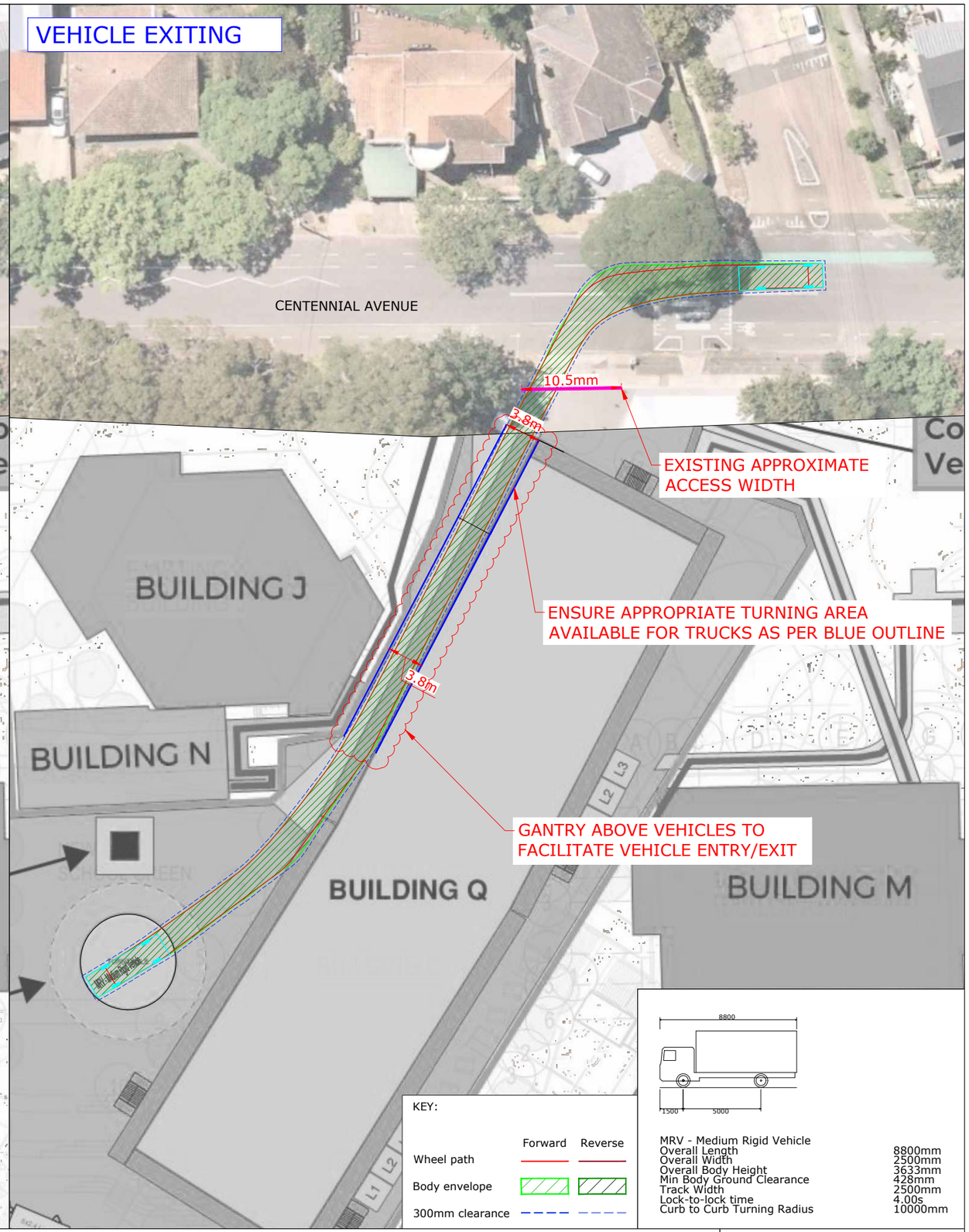

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

MRV - Medium Rigid Vehicle

Overall Length	8800mm
Overall Width	2500mm
Overall Body Height	3633mm
Min Body Ground Clearance	428mm
Track Width	2500mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

TITLE: SWEPT PATH ANALYSIS - CHATSWOOD HIGH SCHOOL - CENTENNIAL AVENUE ACCESS
AS2890.2 8.8m MEDIUM RIGID VEHICLE

DWG No. 20182CAD020 FIGURE 5

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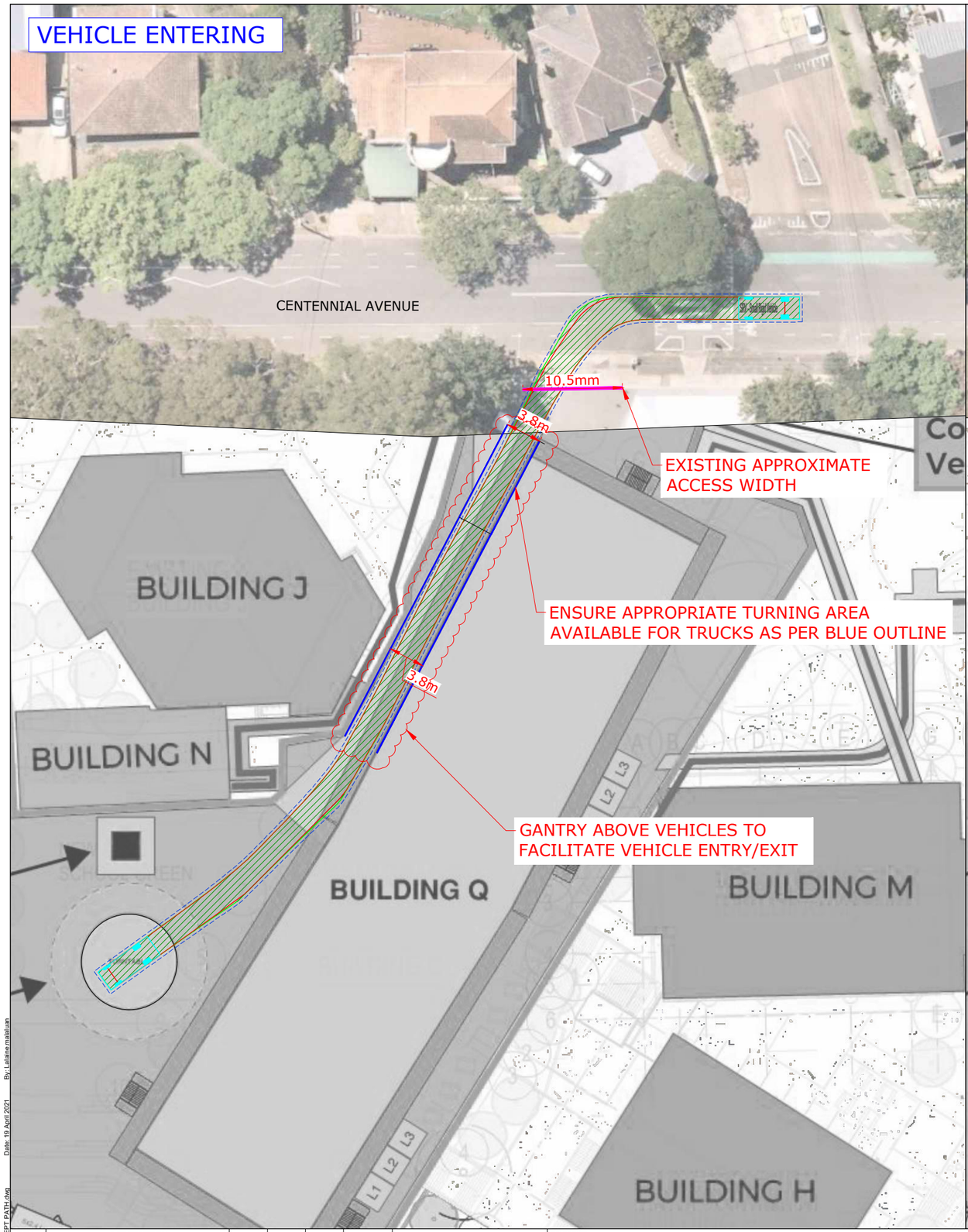
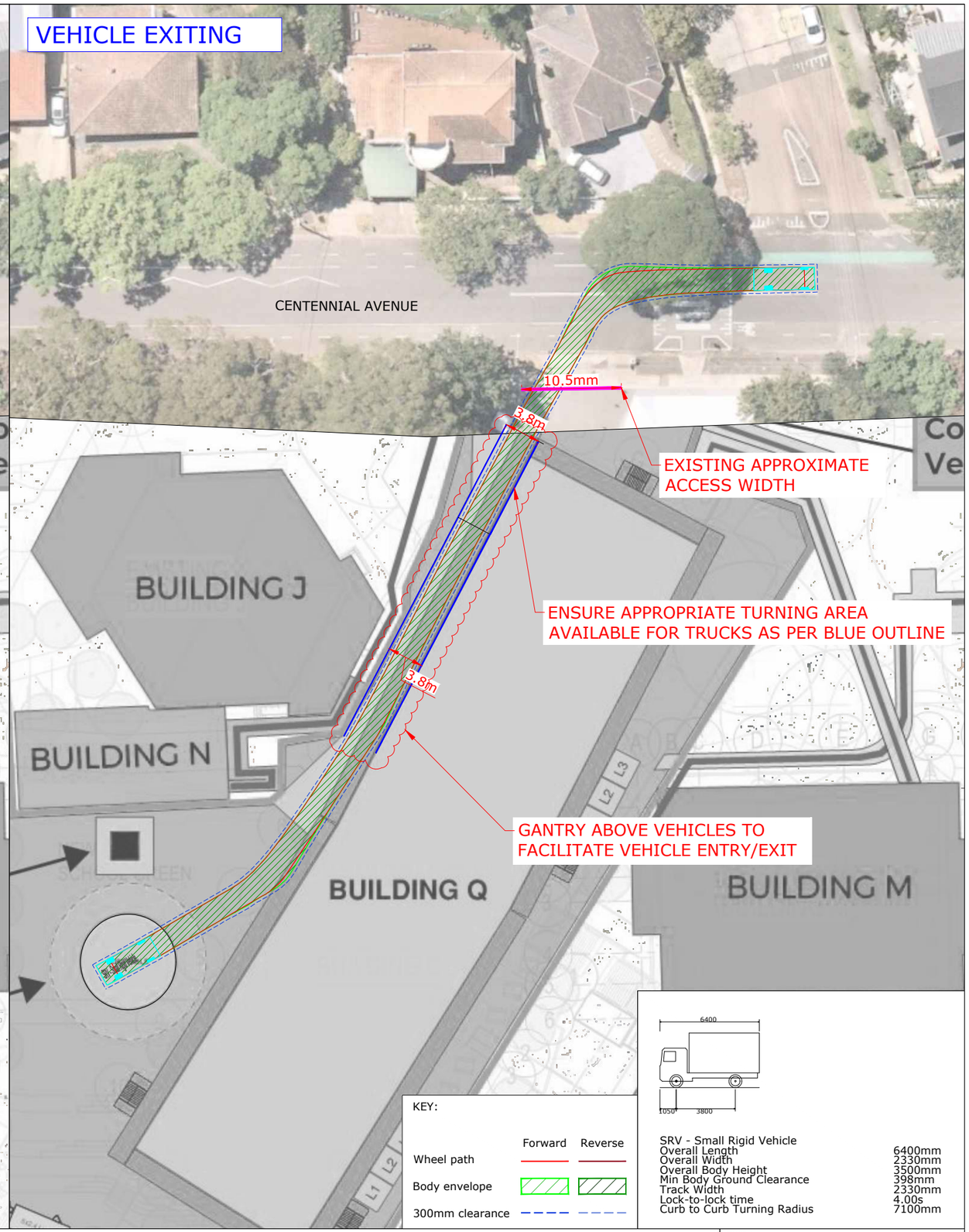
Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Latrice malaluan





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

SRV - Small Rigid Vehicle

Overall Length	6400mm
Overall Width	2330mm
Overall Body Height	3500mm
Min Body Ground Clearance	398mm
Track Width	2330mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7100mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

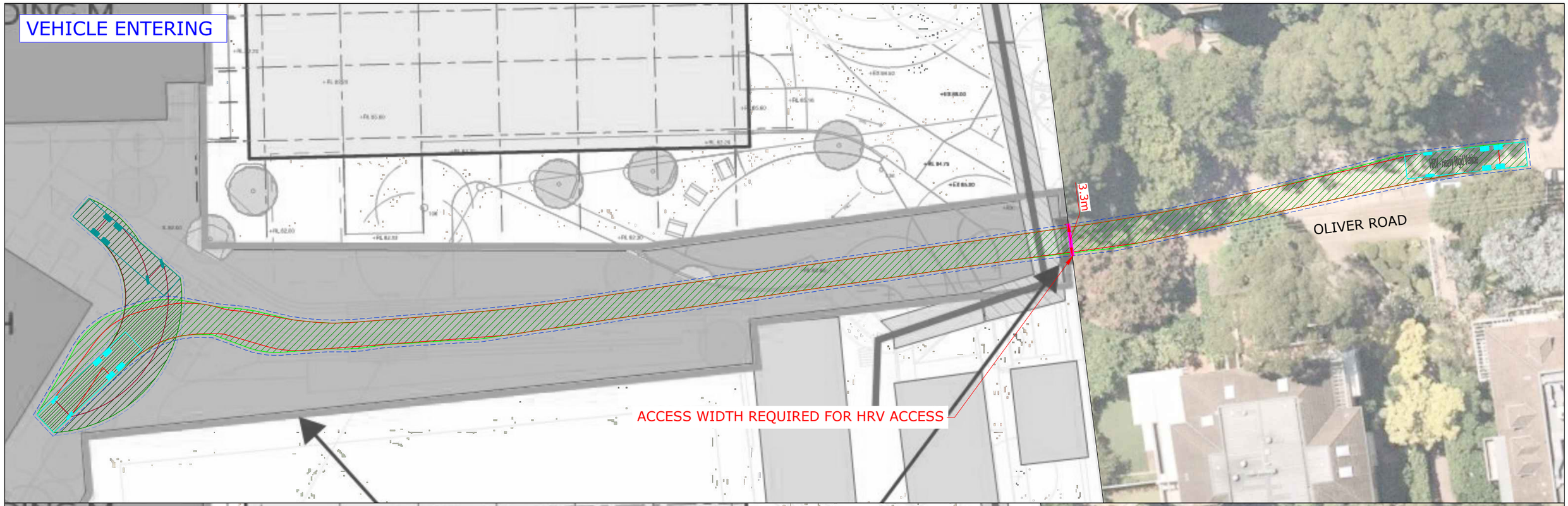
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD HIGH SCHOOL - CENTENNIAL AVENUE ACCESS
AS2890.2 6.4m SMALL RIGID VEHICLE

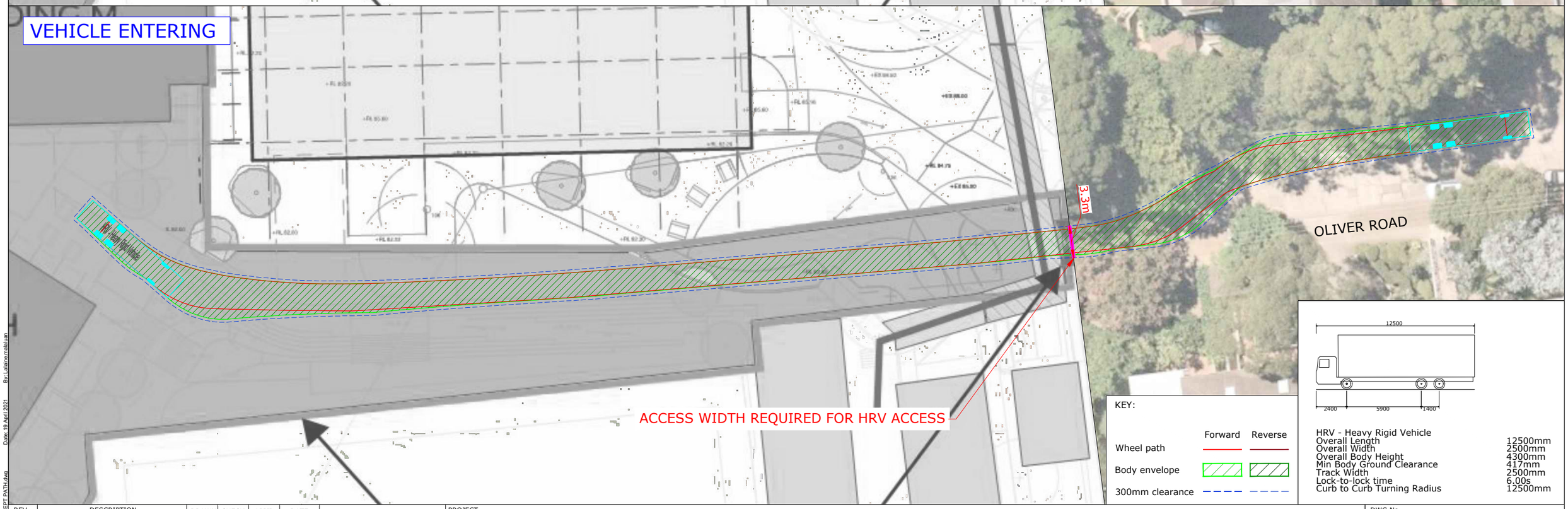
DWG No. 20182CAD020 FIGURE 6

DATE STAMP 19 APRIL 2021

PROJECT No. 20182 | SCALE 1:500 @A3 | REV. A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Latarise malaluan





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

HRV - Heavy Rigid Vehicle

Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	417mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

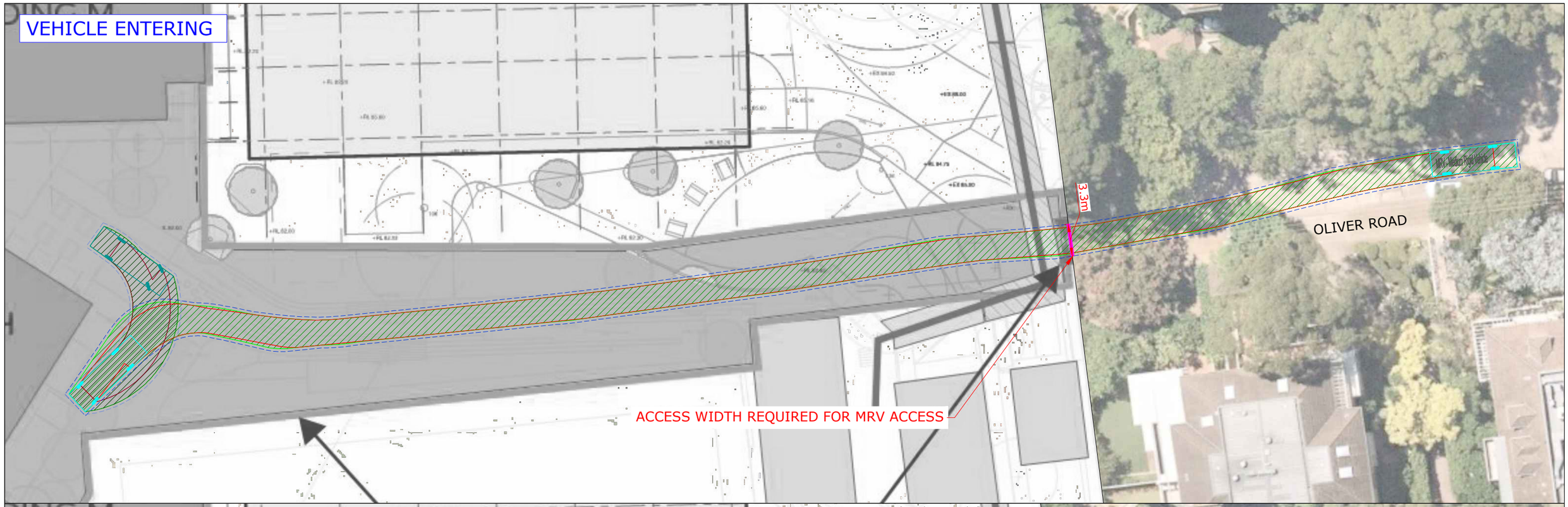
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD HIGH SCHOOL - OLIVER ROAD ACCESS
AS2890.2 12.5m HEAVY RIGID VEHICLE

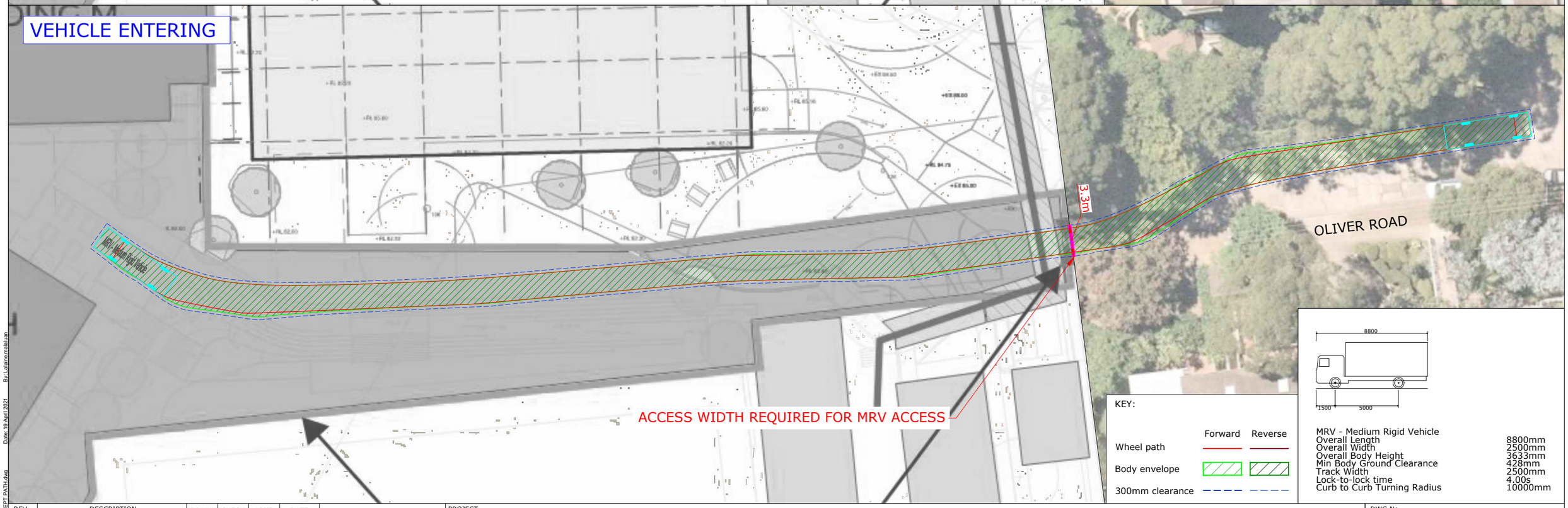
DWG No. 20182CAD020 FIGURE 7

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:400 @A3	A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Latrine malaluan





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

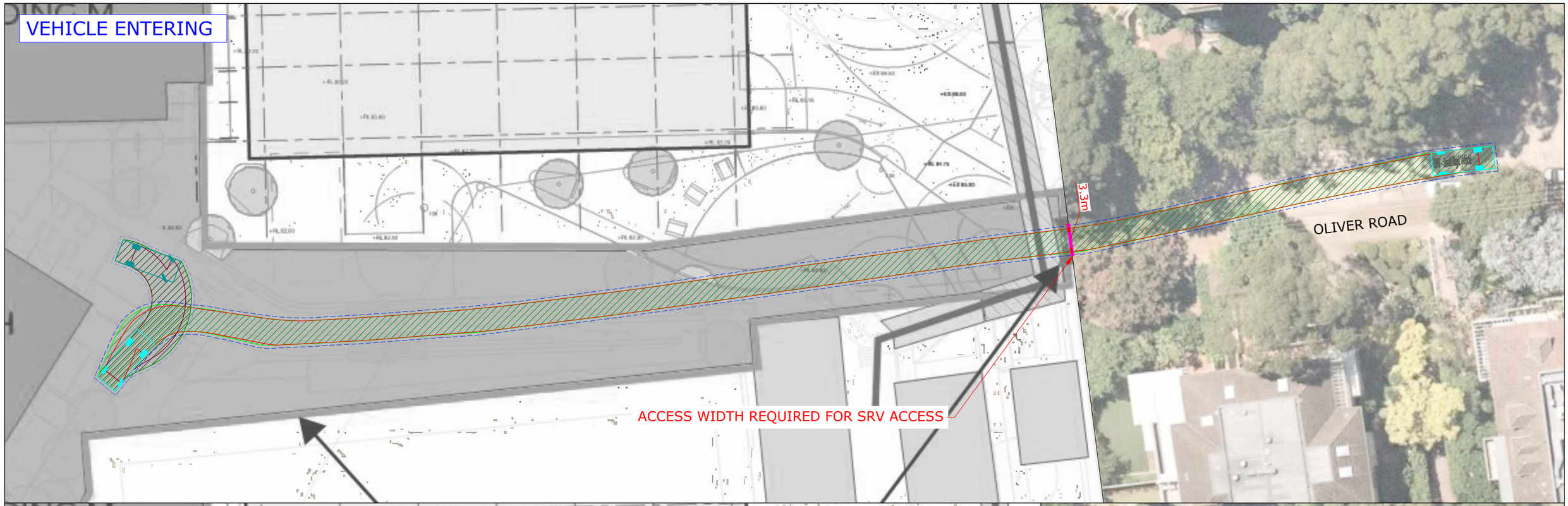
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD HIGH SCHOOL - OLIVER ROAD ACCESS
AS2890.2 8.8m MEDIUM RIGID VEHICLE

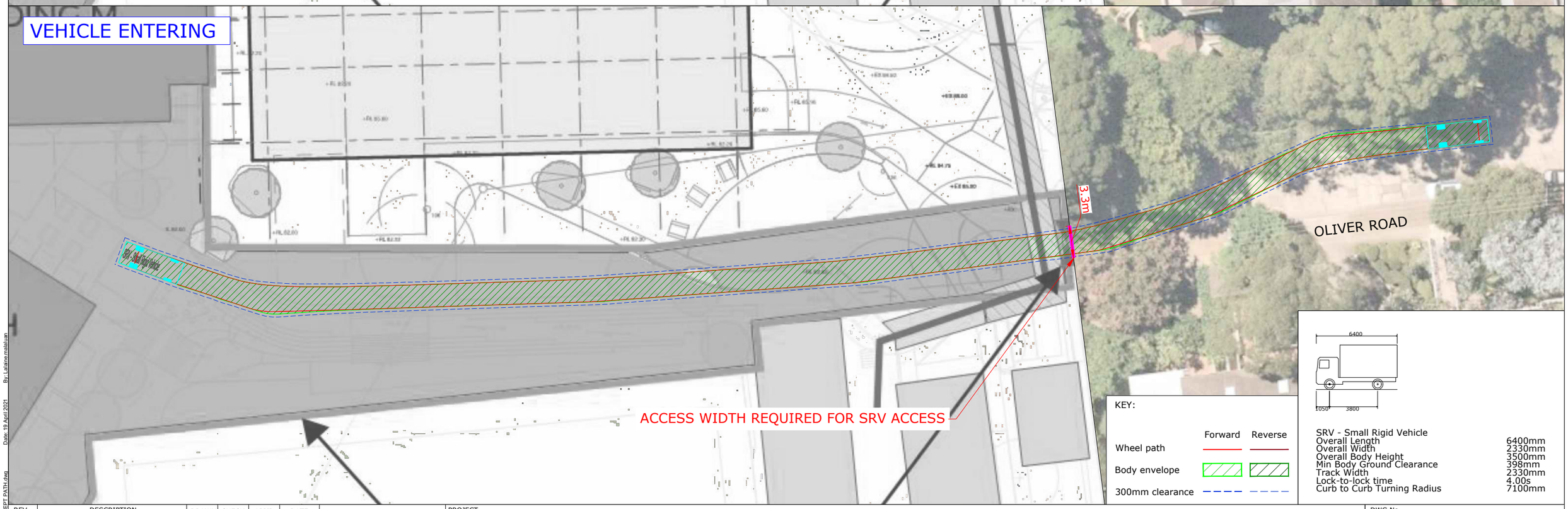
DWG No. 20182CAD020 FIGURE 8

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:400 @A3	A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Latrine malaluan





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

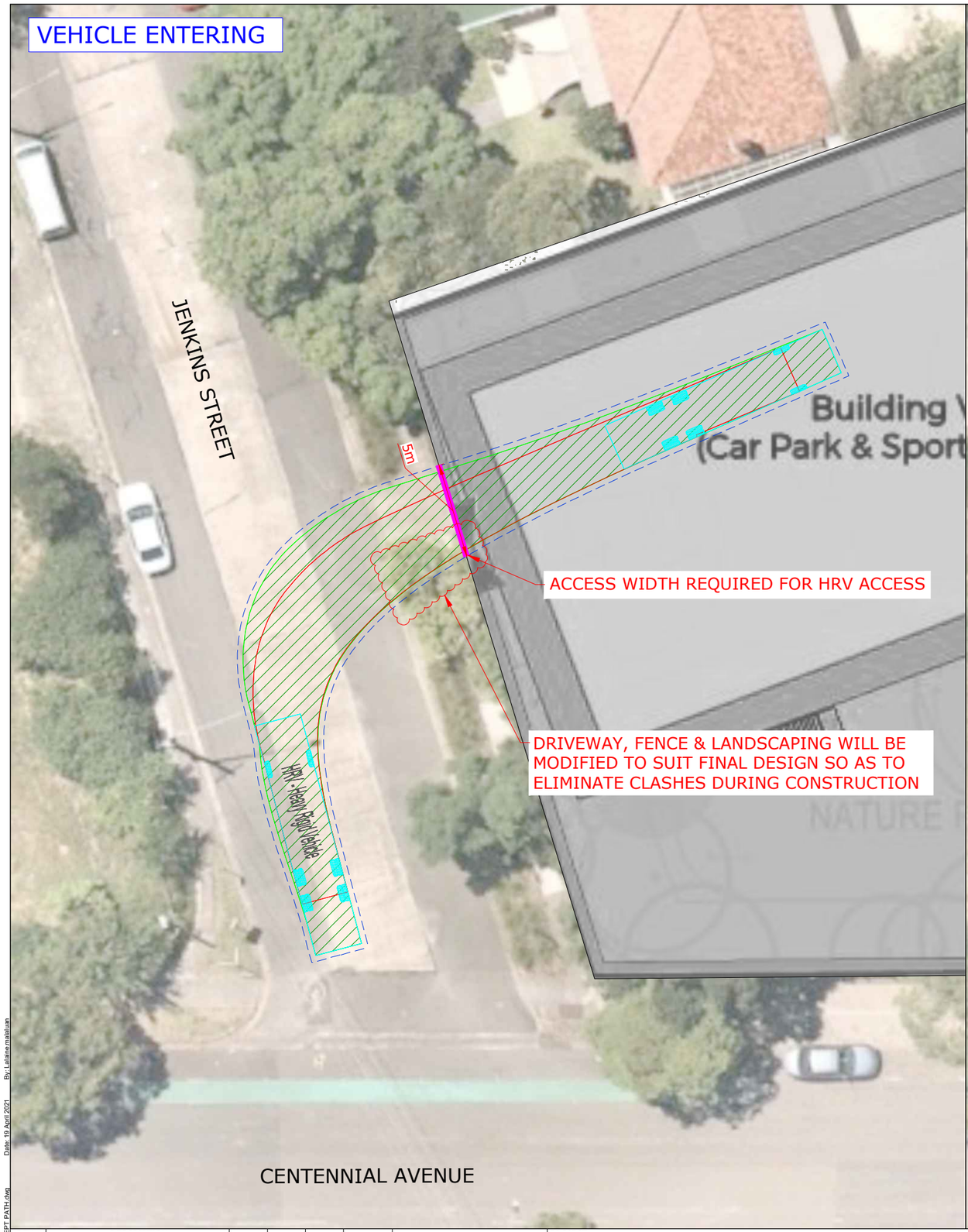
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD HIGH SCHOOL - OLIVER ROAD ACCESS
AS2890.2 6.4m SMALL RIGID VEHICLE

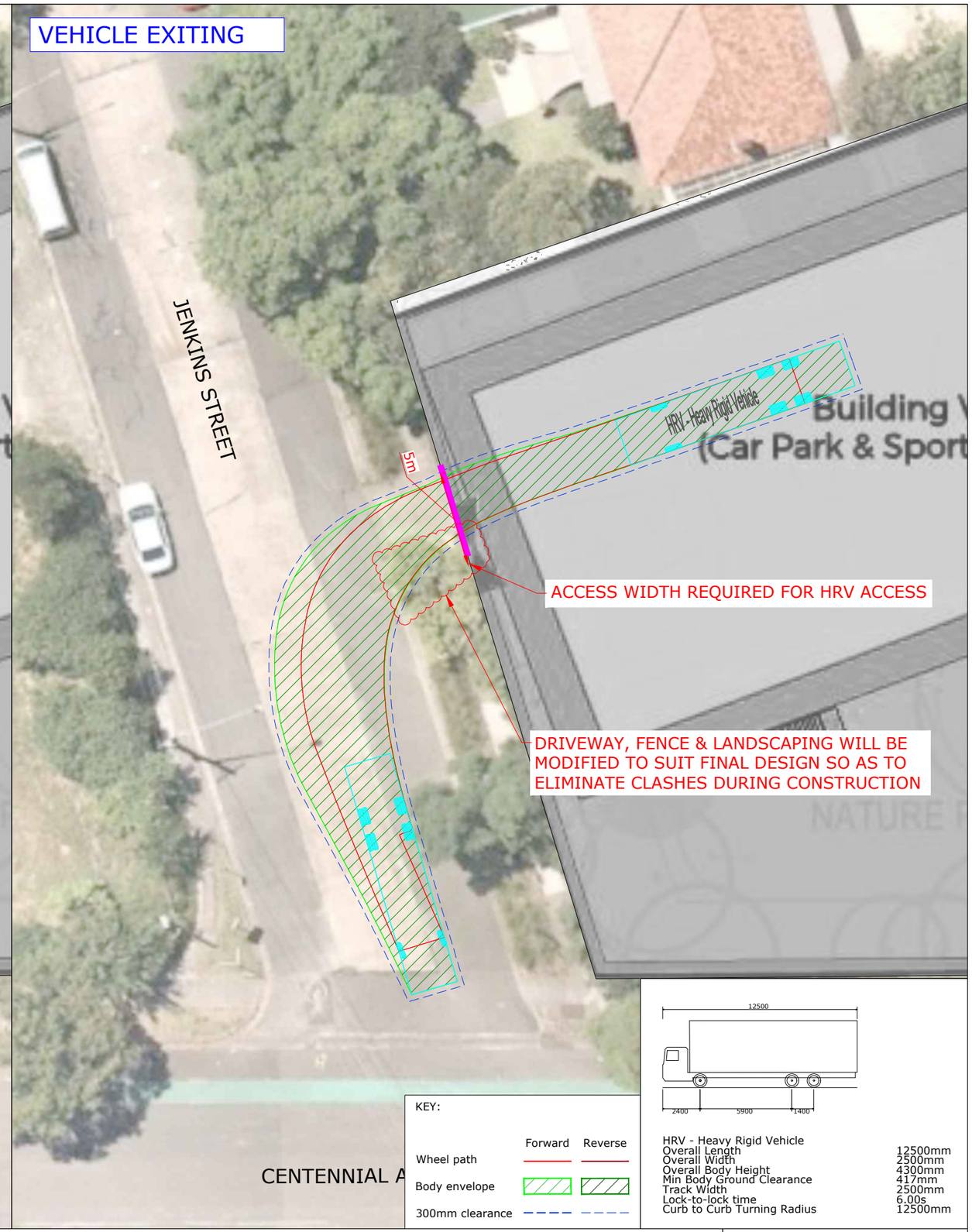
DWG No. 20182CAD020 FIGURE 9

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:400 @A3	A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Latrine malaluan





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

HRV - Heavy Rigid Vehicle

Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	417mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

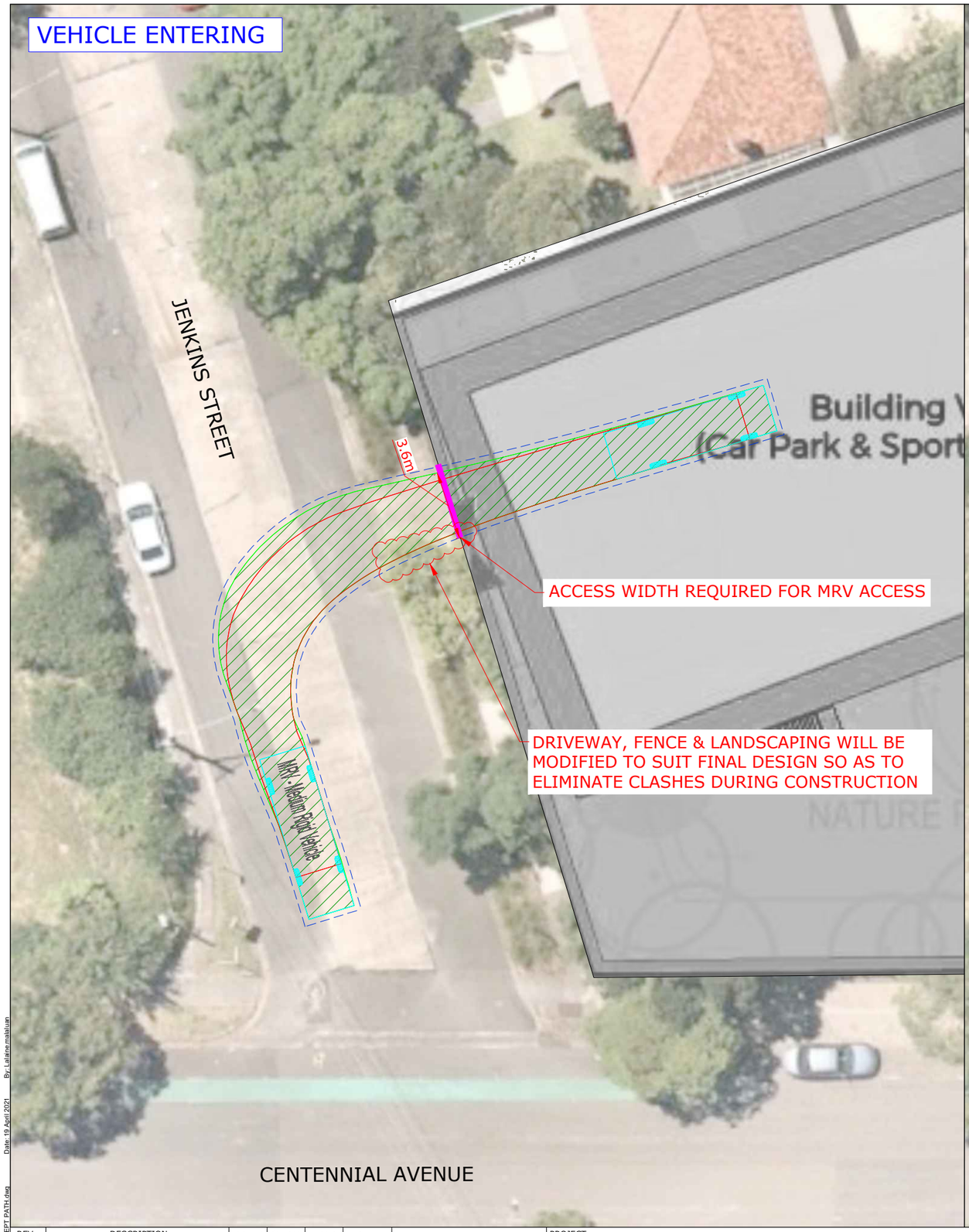
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - JENKINS STREET ACCESS
AS2890.2 12.5m HEAVY RIGID VEHICLE

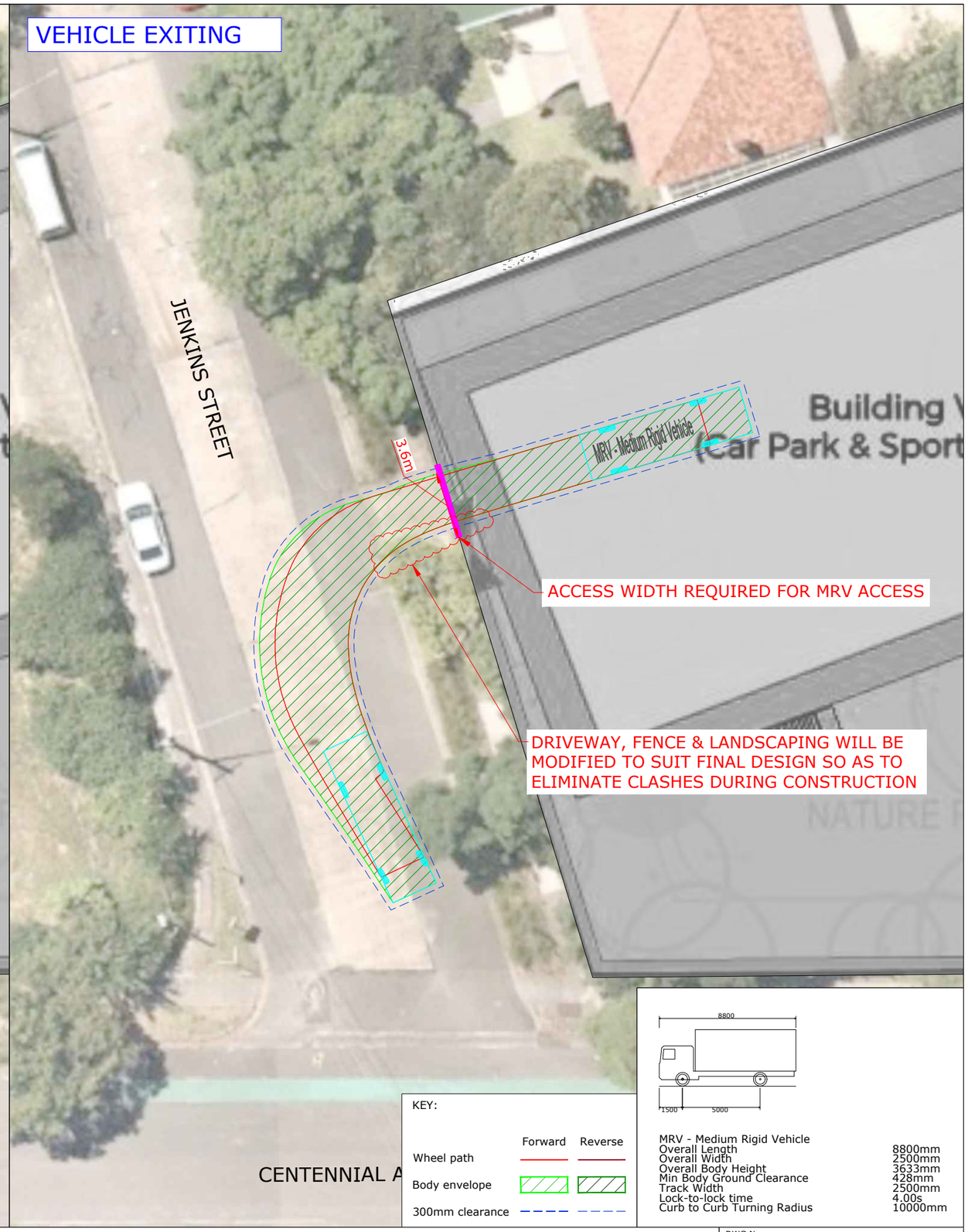
DWG No. 20182CAD020 FIGURE 10

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:250 @A3	A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Lallane.malatuan





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

MRV - Medium Rigid Vehicle

Overall Length	8800mm
Overall Width	2500mm
Overall Body Height	3633mm
Min Body Ground Clearance	428mm
Track Width	2500mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

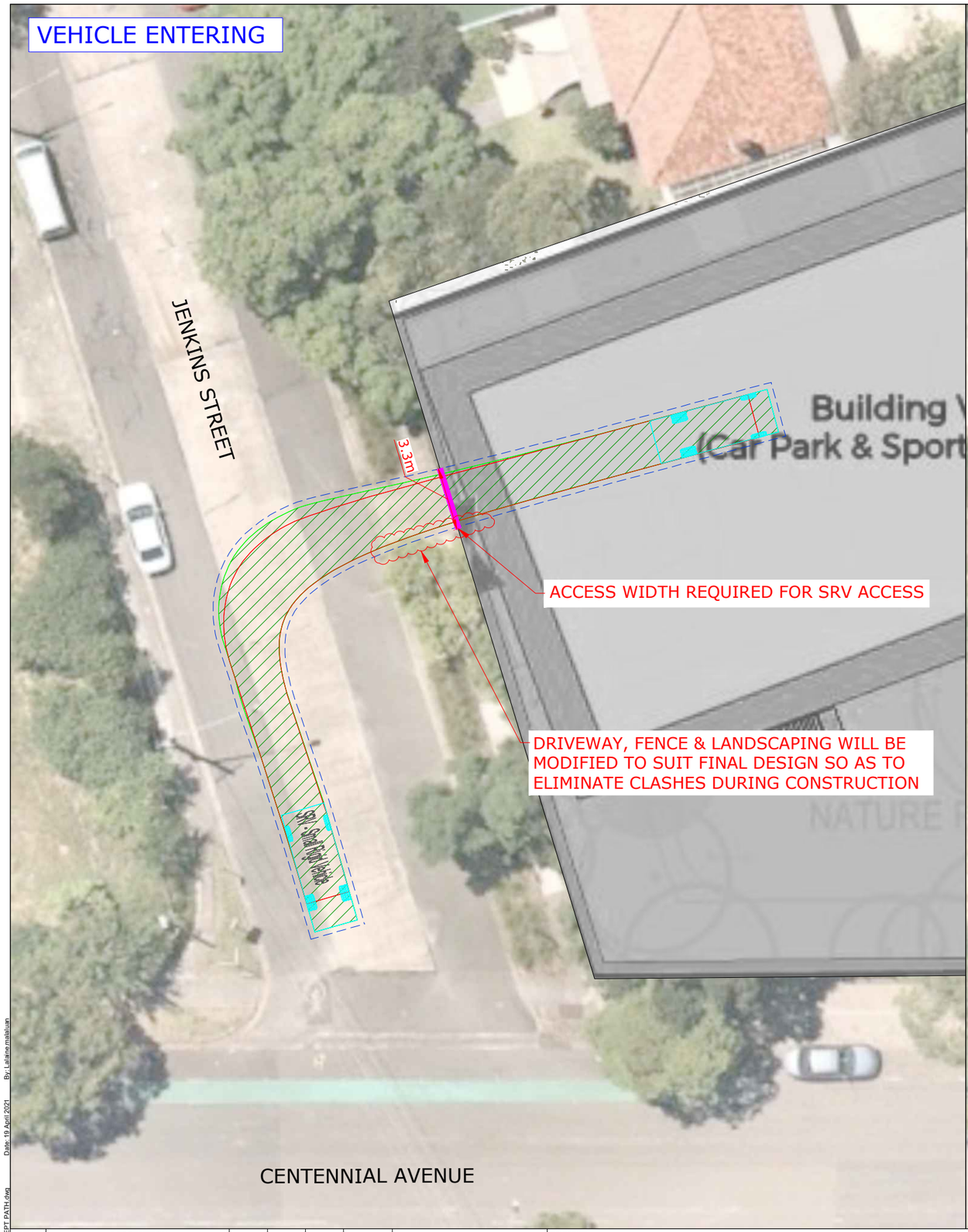
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - JENKINS STREET ACCESS
AS2890.2 8.8m MEDIUM RIGID VEHICLE

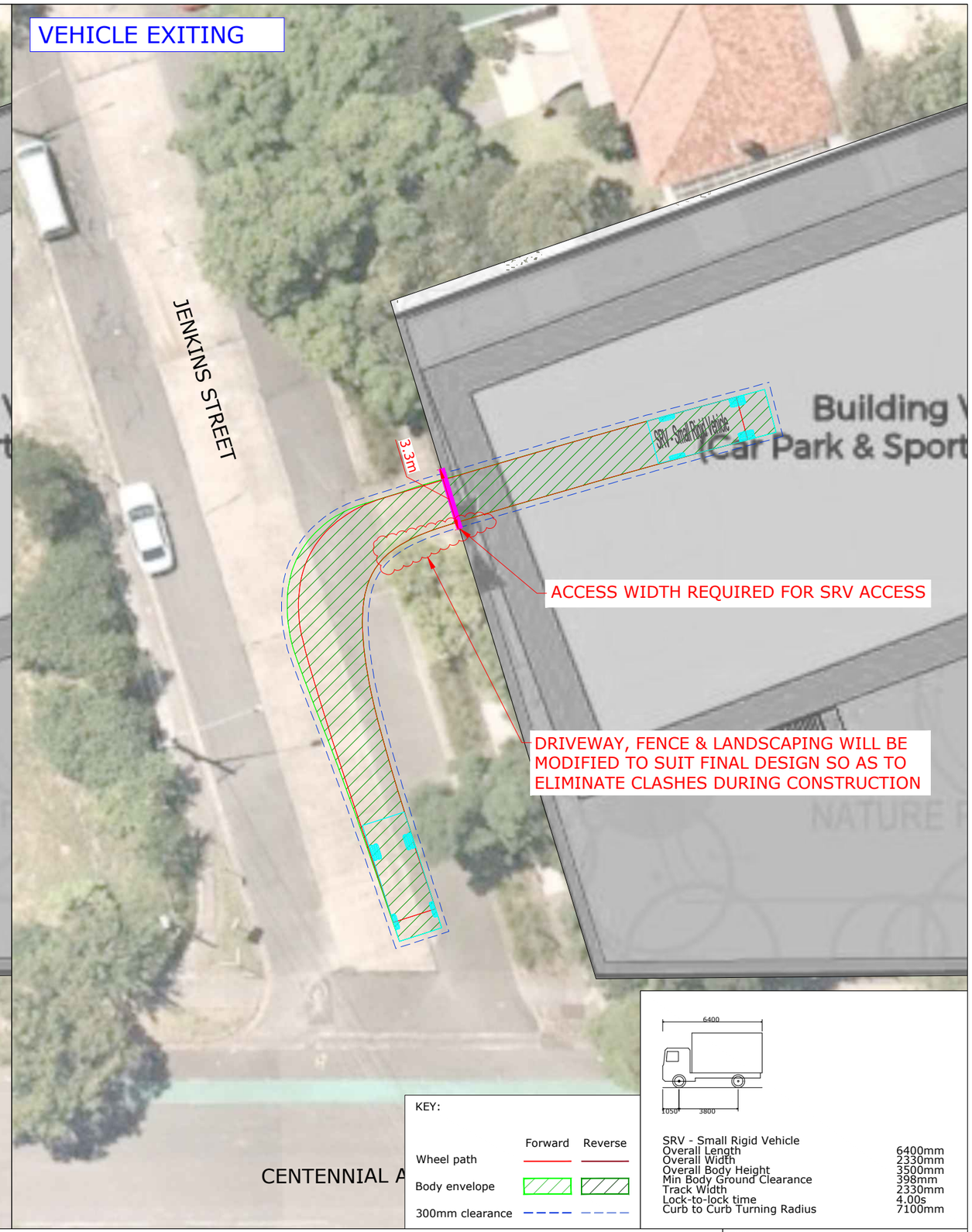
DWG No. 20182CAD020 FIGURE 11

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:250 @A3	A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Liliane.malaluan





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

SRV - Small Rigid Vehicle

Overall Length	6400mm
Overall Width	2330mm
Overall Body Height	3500mm
Min Body Ground Clearance	398mm
Track Width	2330mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7100mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

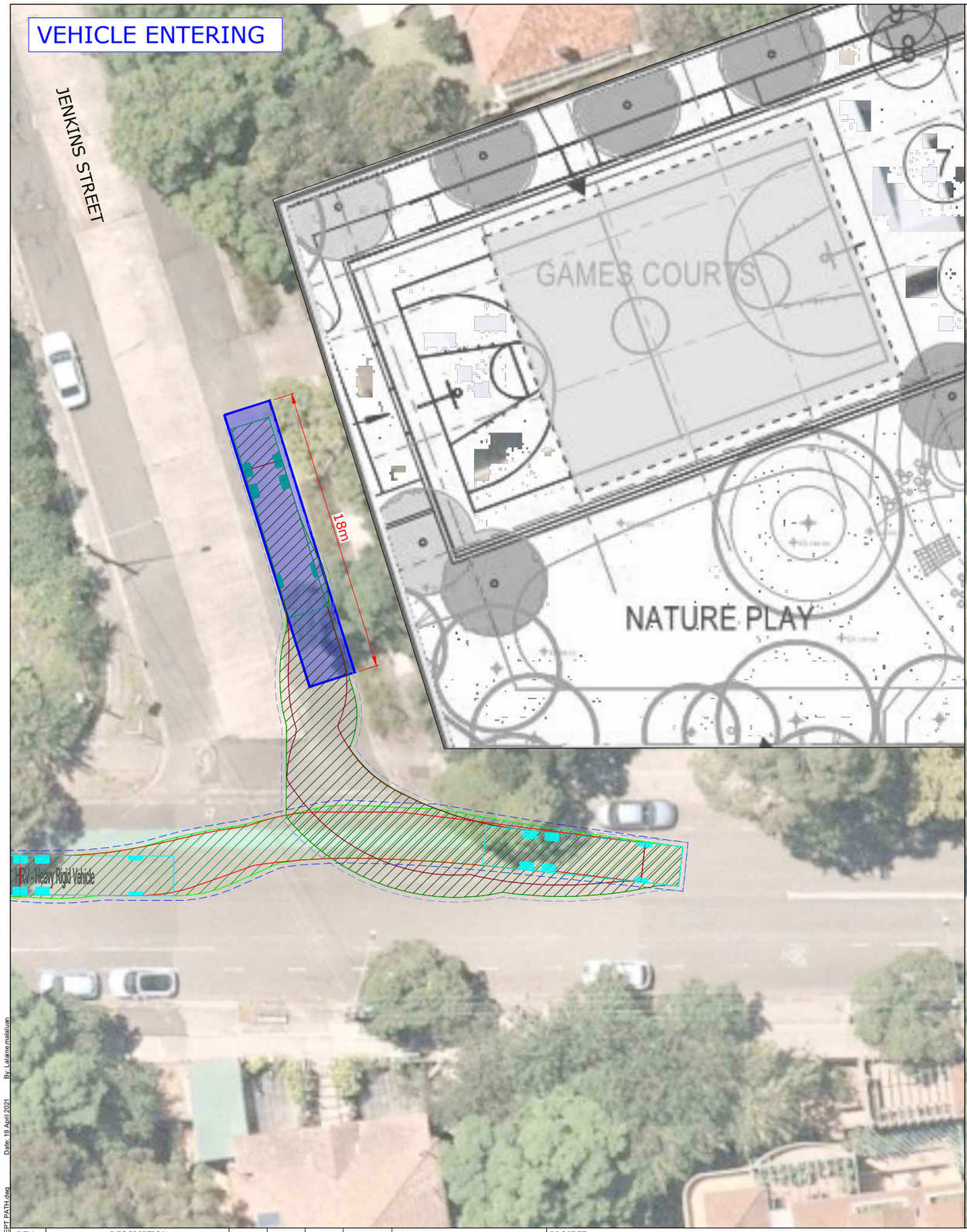
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - JENKINS STREET ACCESS
AS2890.2 6.4m SMALL RIGID VEHICLE

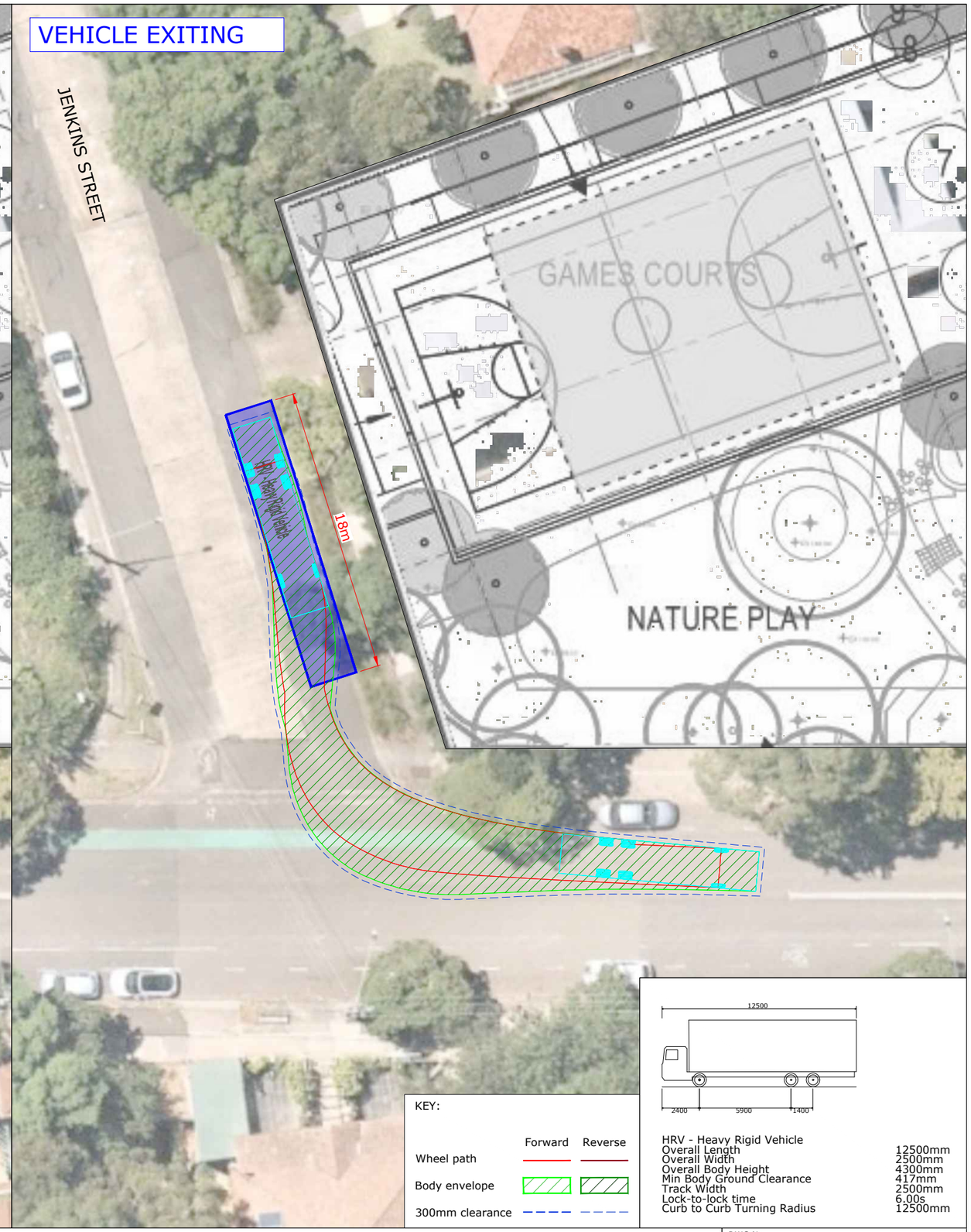
DWG No. 20182CAD020 FIGURE 12

DATE STAMP 19 APRIL 2021

PROJECT No. 20182 | SCALE 1:250 @A3 | REV. A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Lallane.malatuan





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

HRV - Heavy Rigid Vehicle

Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	417mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN/LM	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

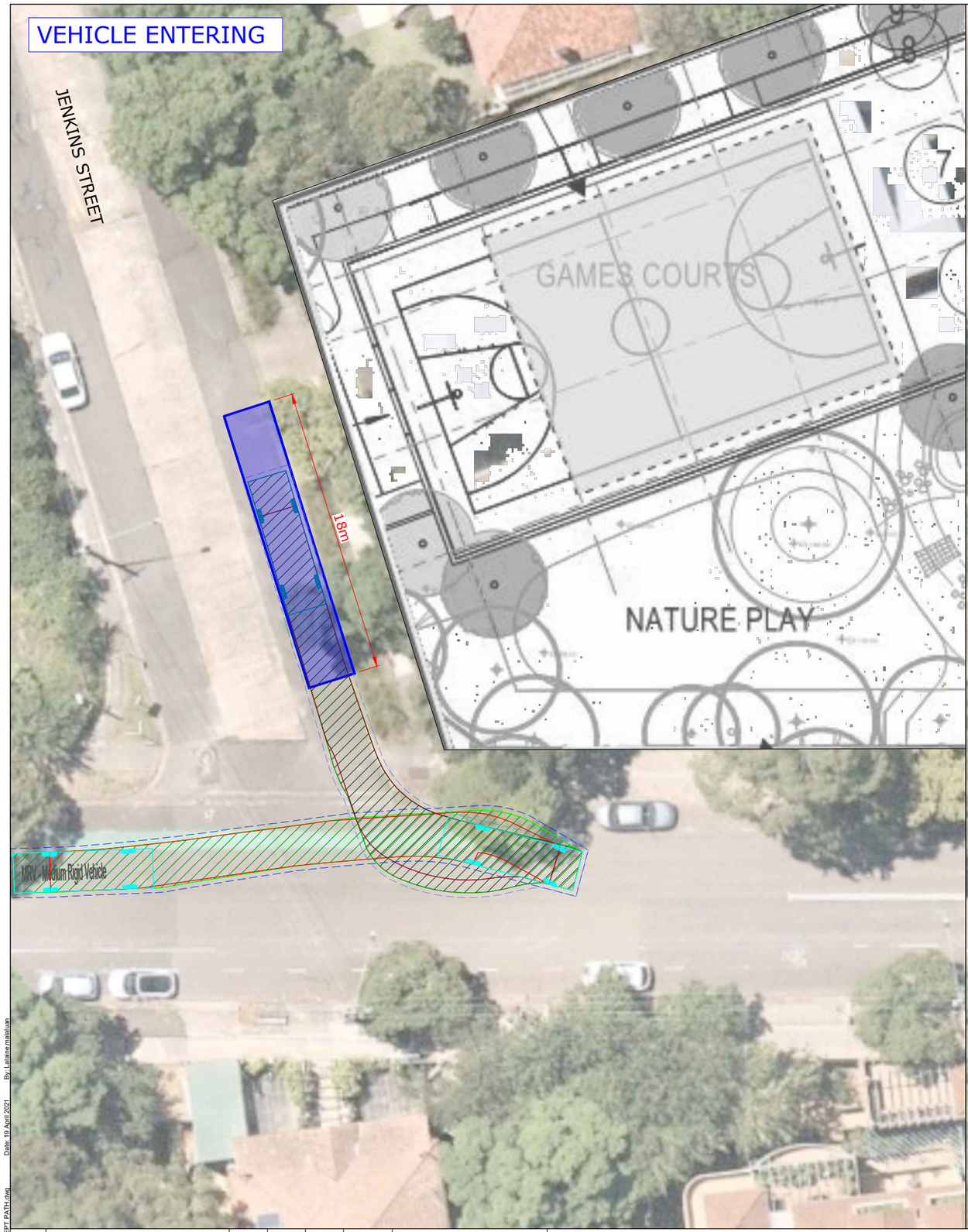
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - JENKINS STREET WORK ZONE - OPTION 1
AS2890.2 12.5m HEAVY RIGID VEHICLE

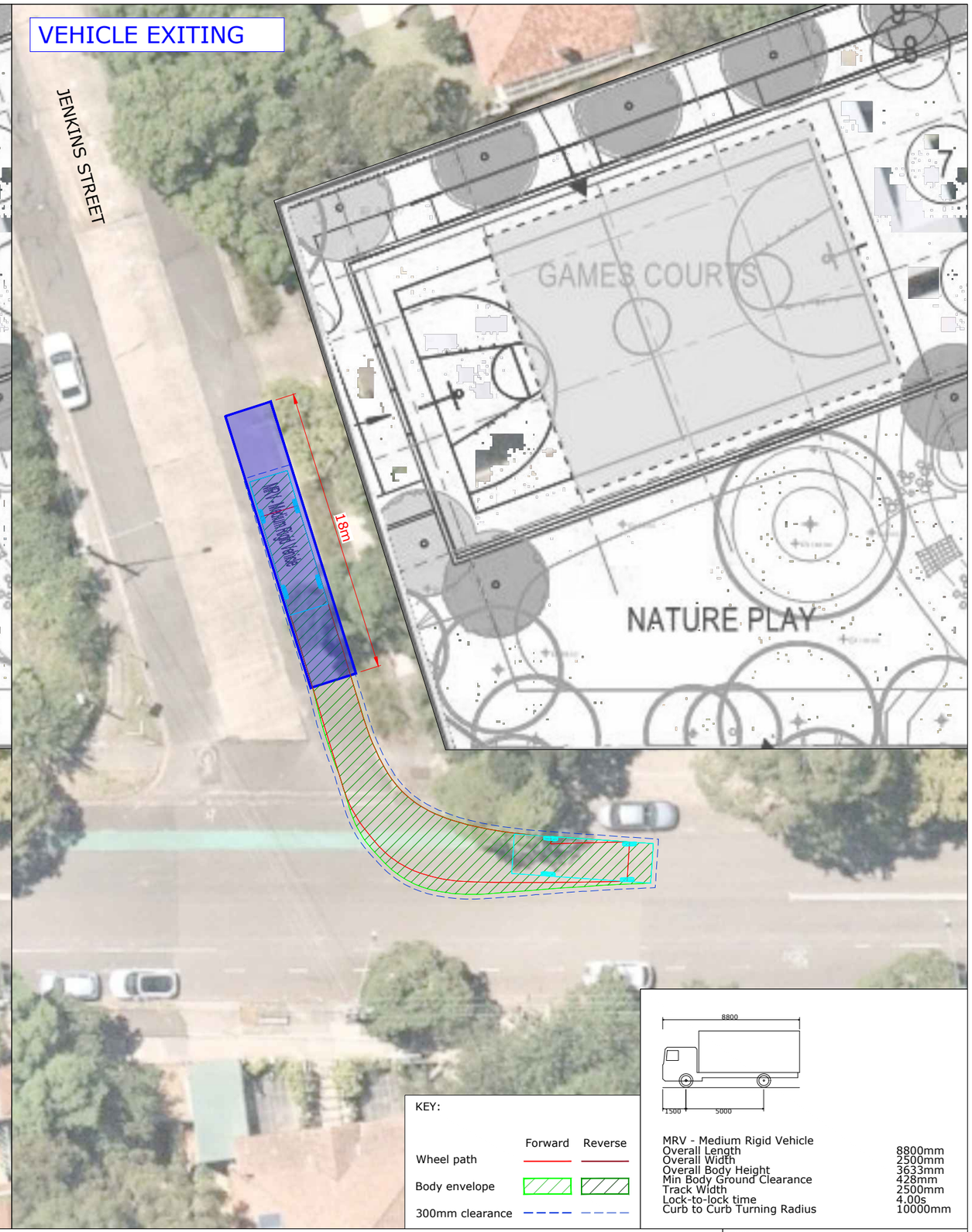
DWG No. 20182CAD020 FIGURE 13

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:300 @A3	A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Lalaine malaluan





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

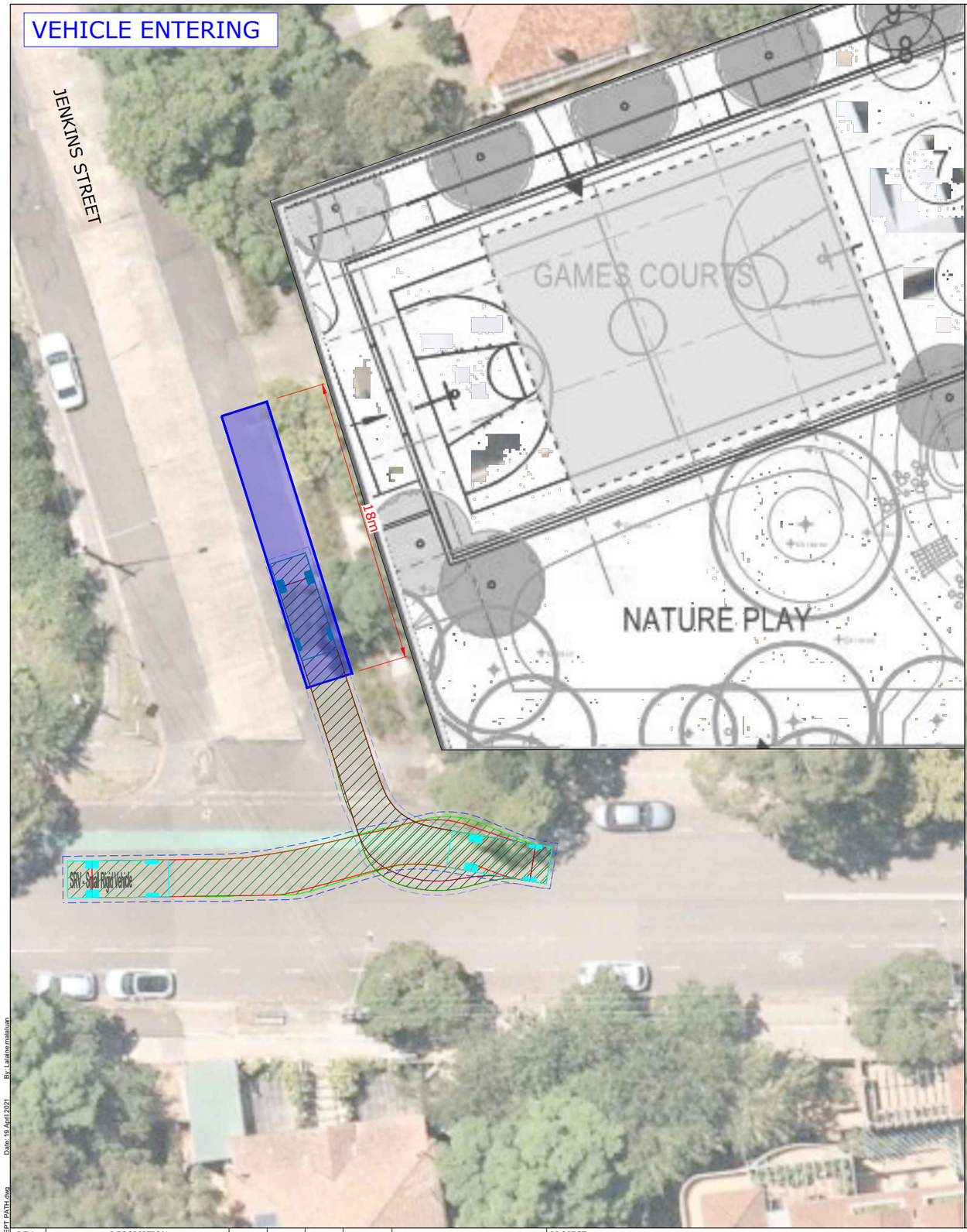
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - JENKINS STREET WORK ZONE - OPTION 1
AS2890.2 8.8m MEDIUM RIGID VEHICLE

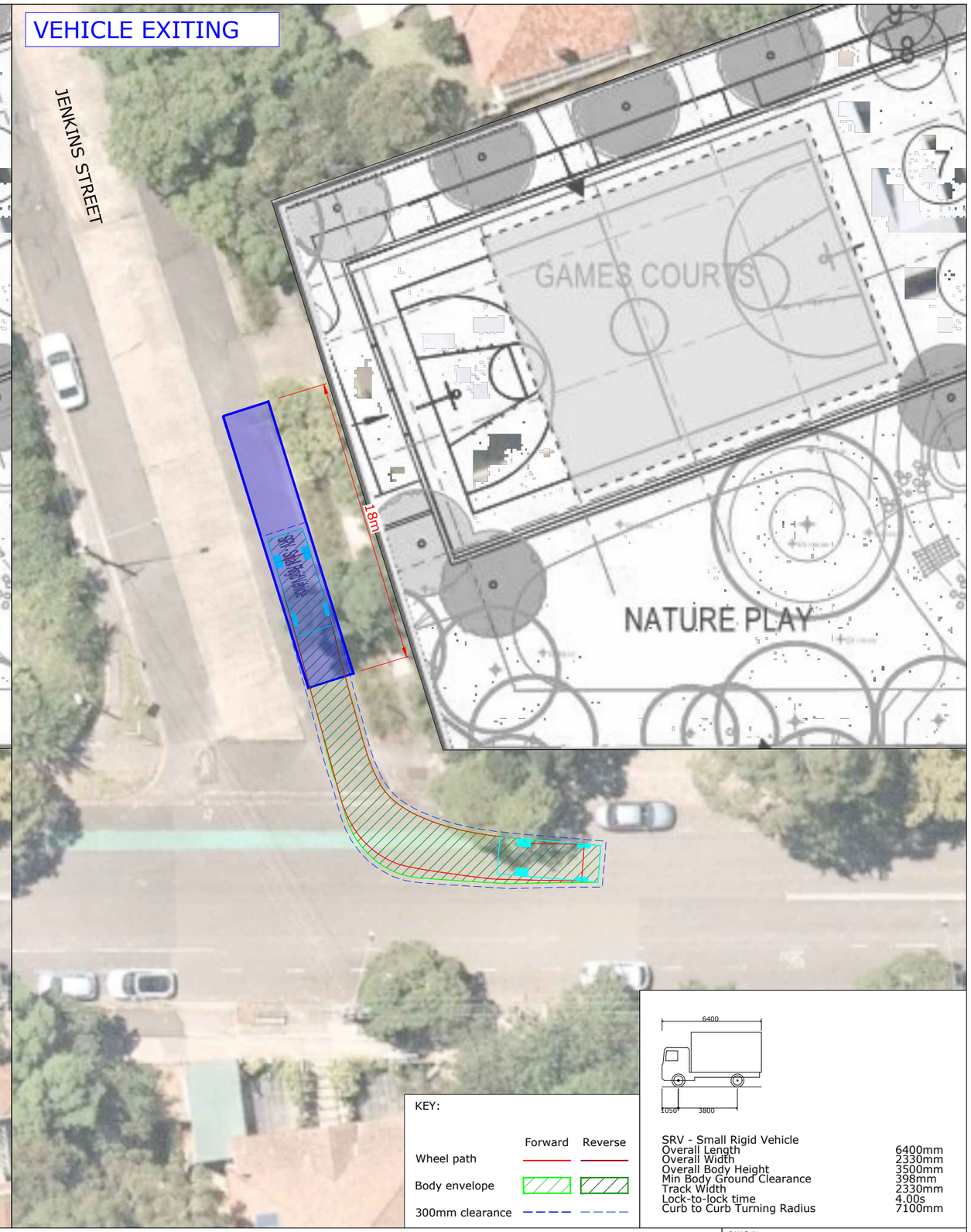
DWG No. 20182CAD020 FIGURE 14

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:300 @A3	A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Lalaine.maliluan





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

SRV - Small Rigid Vehicle

Overall Length	6400mm
Overall Width	2330mm
Overall Body Height	3500mm
Min Body Ground Clearance	398mm
Track Width	2330mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7100mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

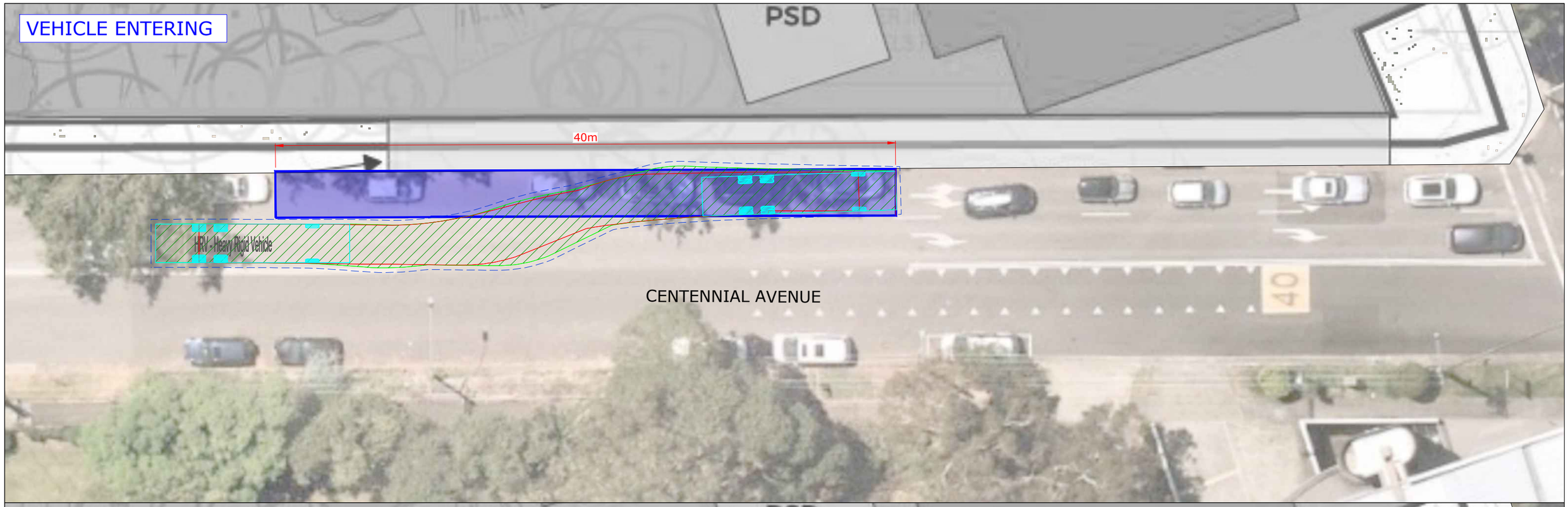
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - JENKINS STREET WORK ZONE - OPTION 1
AS2890.2 6.4m SMALL RIGID VEHICLE

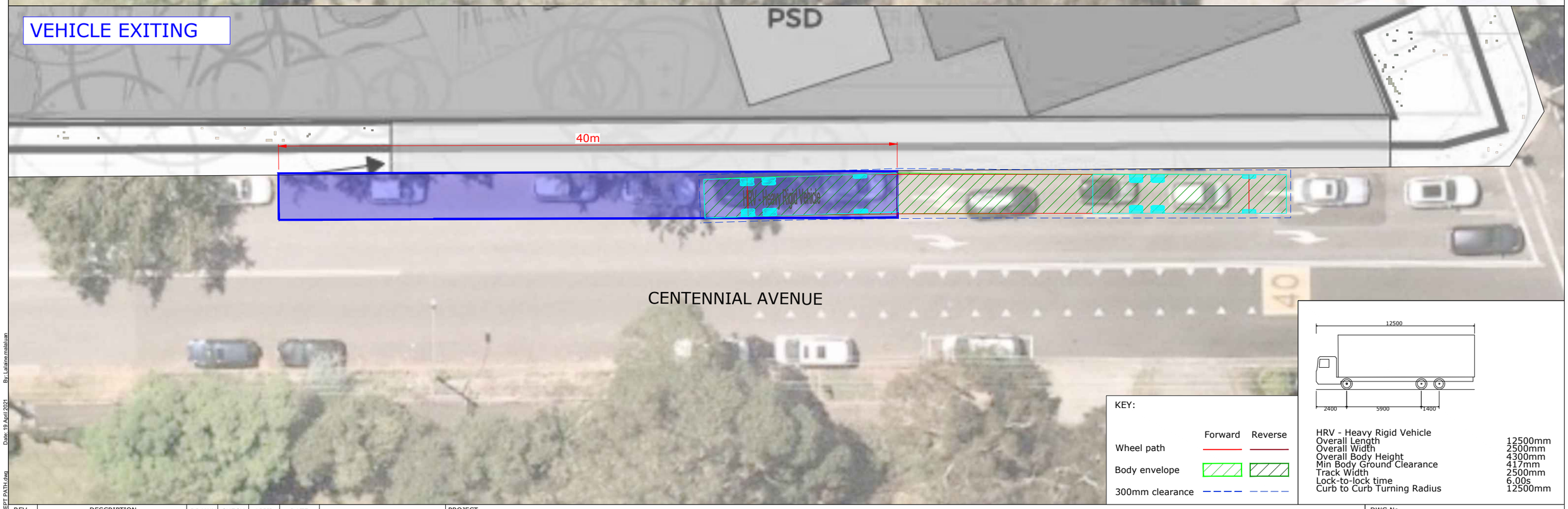
DWG No. 20182CAD020 FIGURE 15

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
20182	Custom @A3	A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Lallane mallluan





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

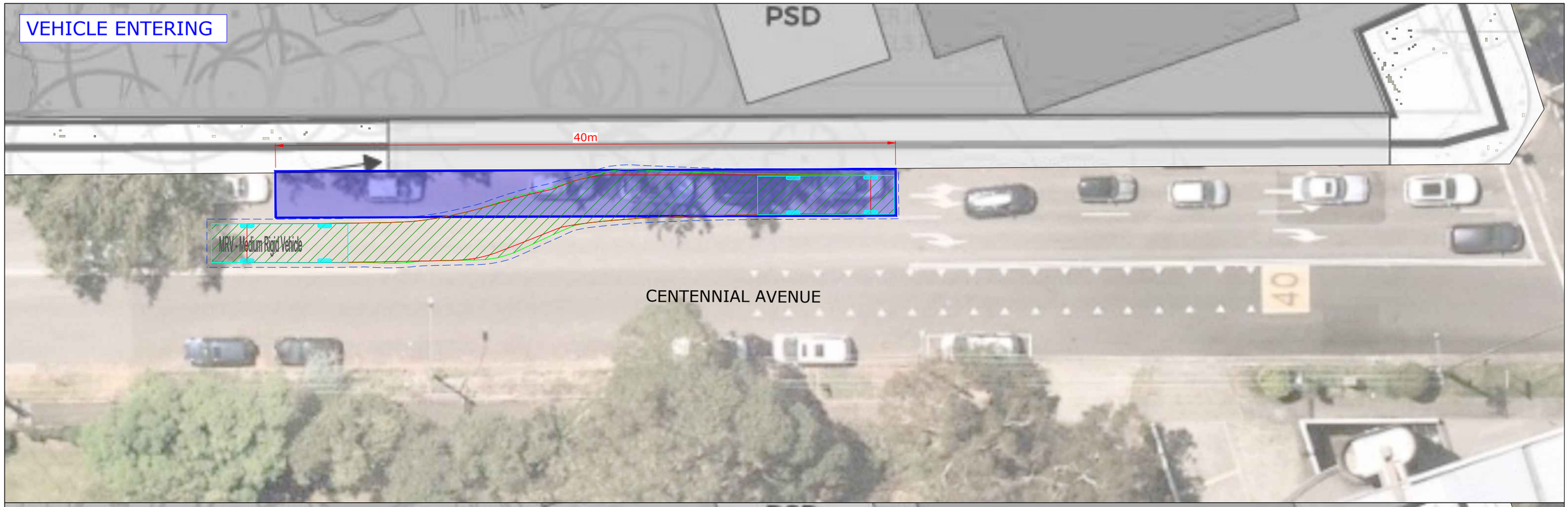
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - CENTENNIAL AVENUE WORK ZONE
AS2890.2 12.5m HEAVY RIGID VEHICLE

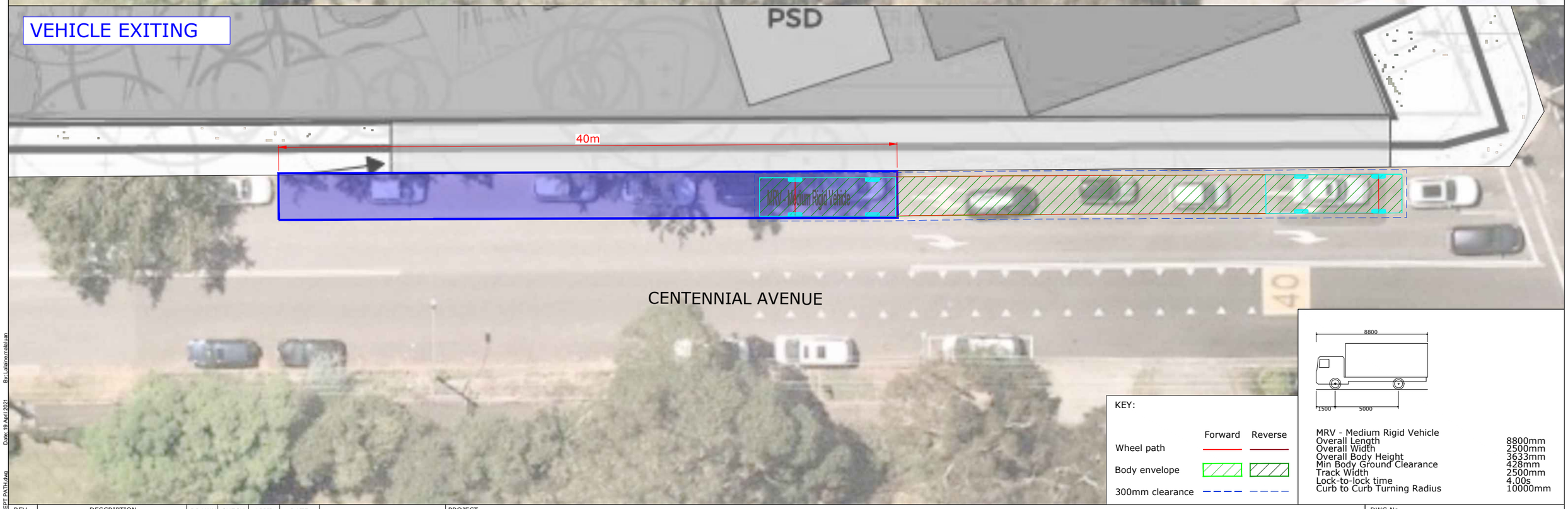
DWG No. 20182CAD020 FIGURE 16

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:250 @A3	A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Lalitane.malaliuan





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

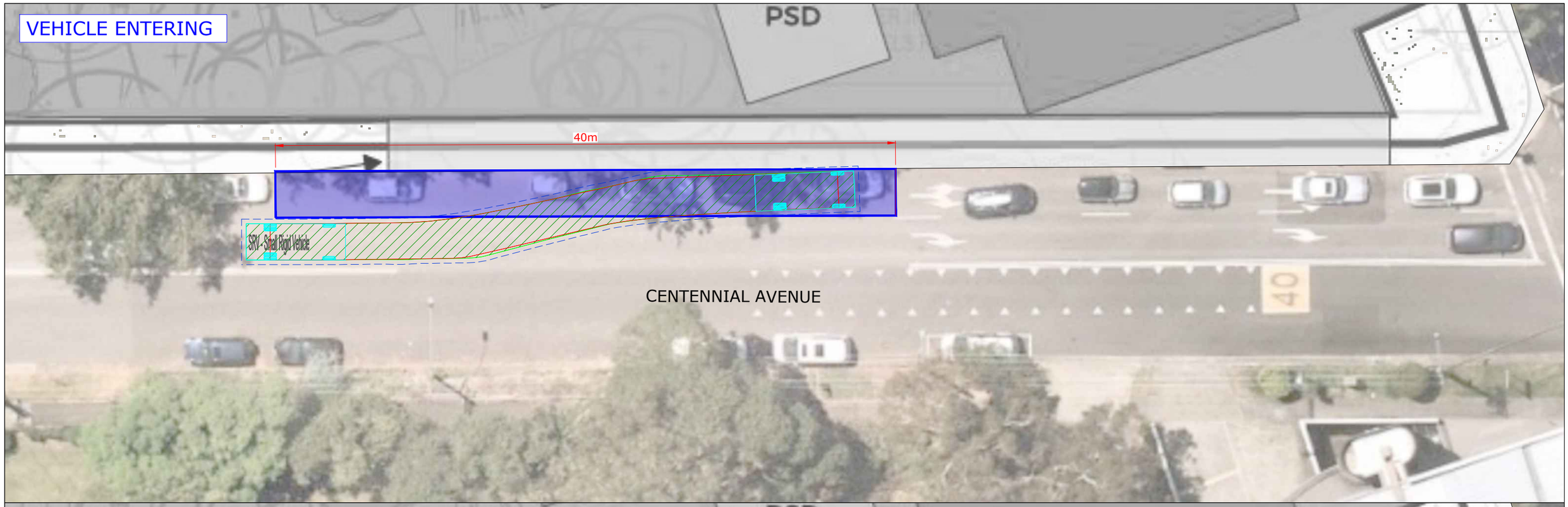
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - CENTENNIAL AVENUE WORK ZONE
AS2890.2 8.8m MEDIUM RIGID VEHICLE

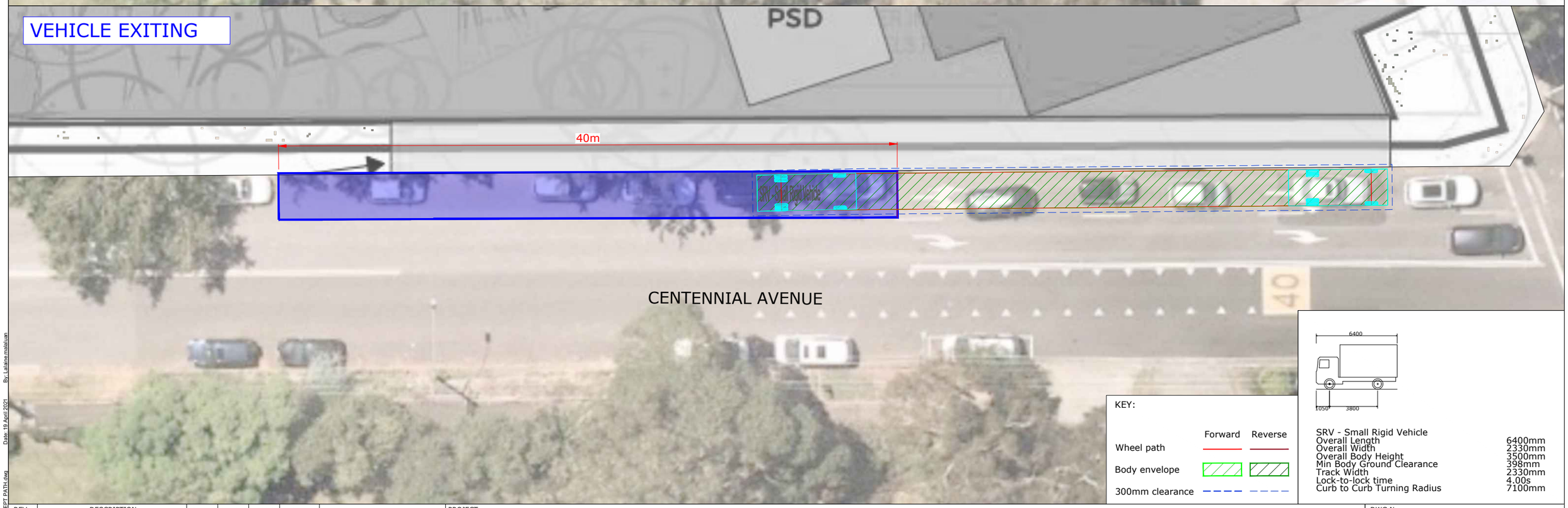
DWG No. 20182CAD020 FIGURE 17

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:250 @A3	A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Lalaine.malaluan





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	16/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

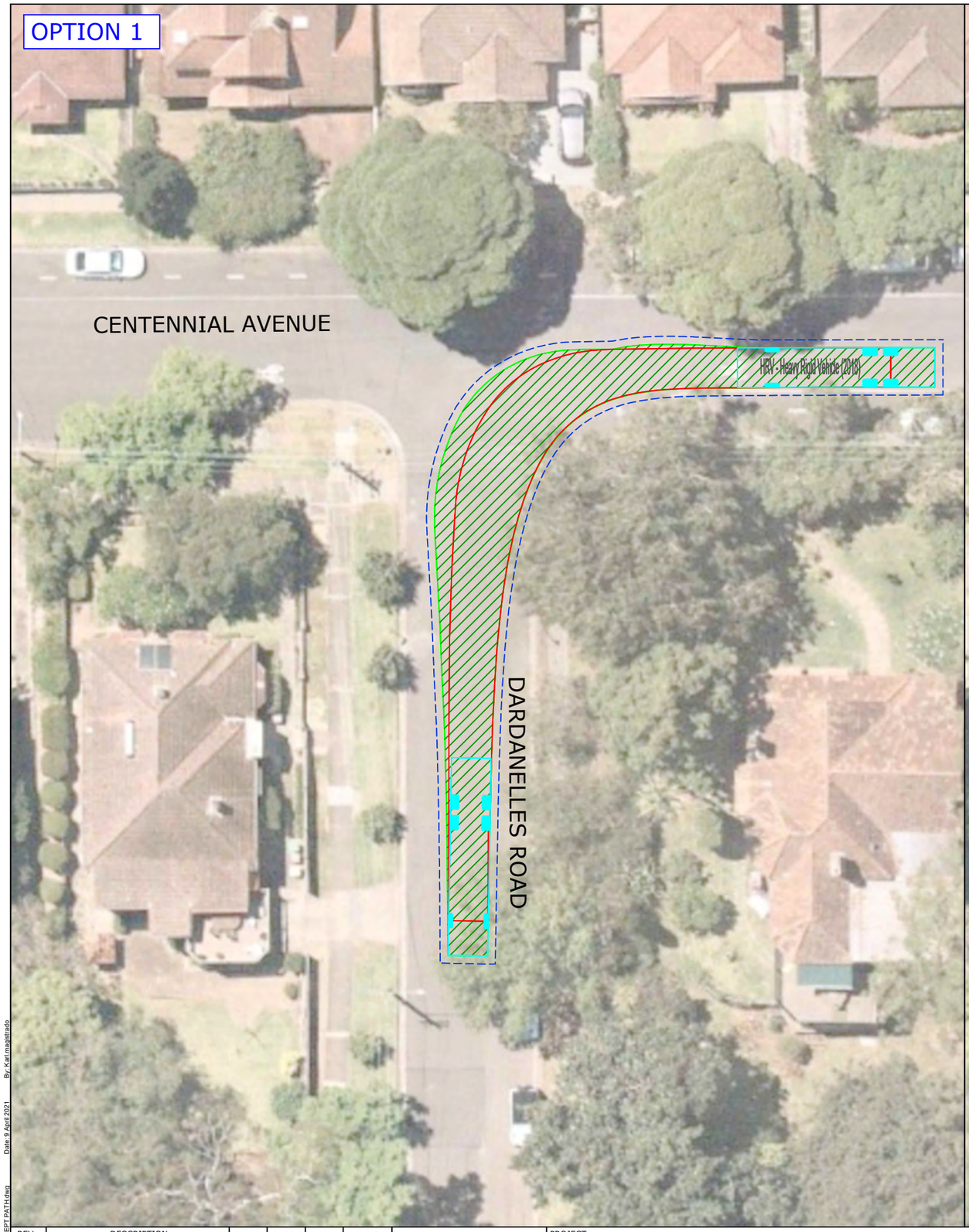
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - CENTENNIAL AVENUE WORK ZONE
AS2890.2 6.4m SMALL RIGID VEHICLE

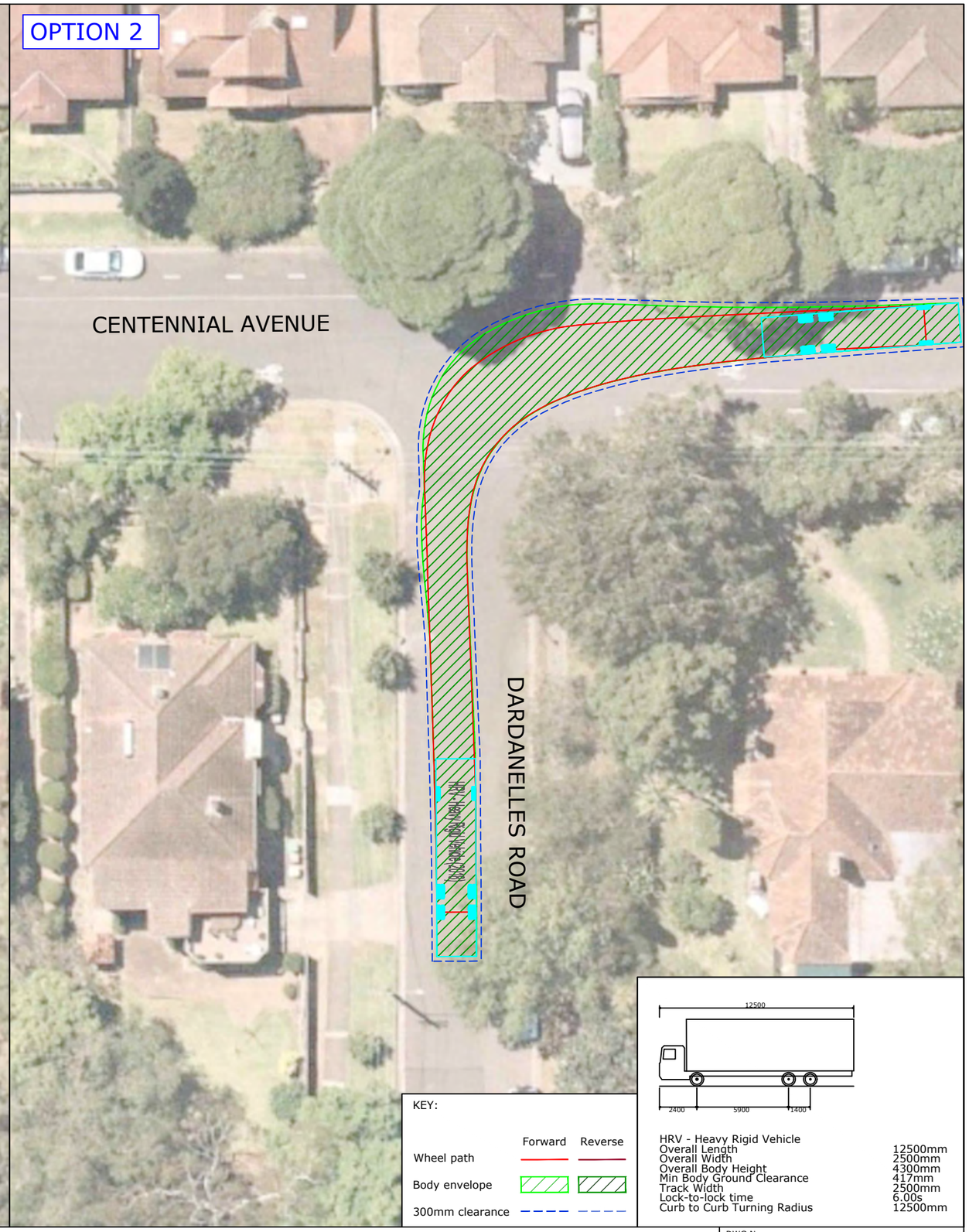
DWG No. 20182CAD020 FIGURE 18

DATE STAMP 19 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:250 @A3	A

Filename: 20182CAD020-210419-SWEPT PATH.dwg Date: 19 April 2021 By: Lalaine.malaluan





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

HRV - Heavy Rigid Vehicle

Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	417mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	09/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

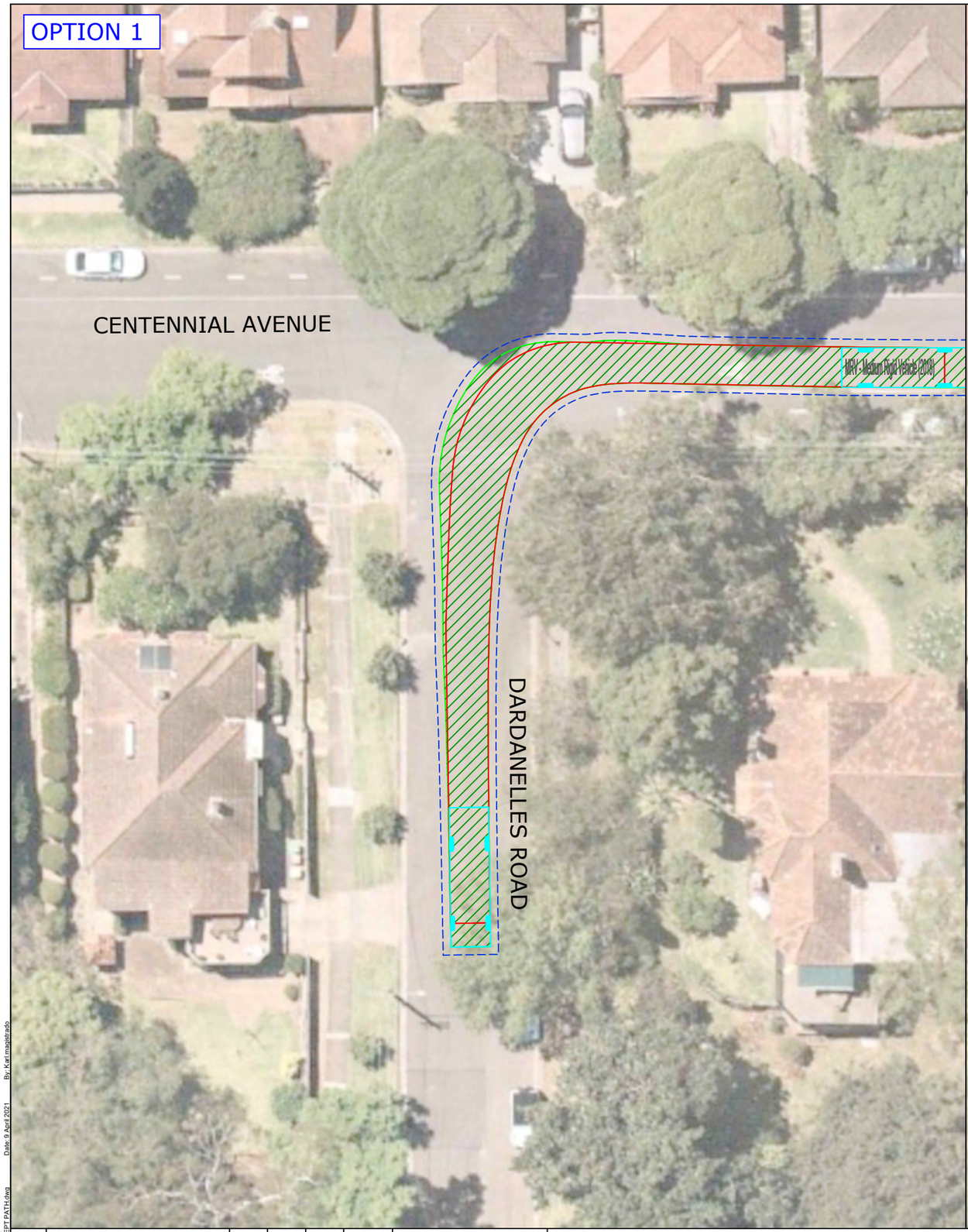
TITLE: SWEPT PATH ANALYSIS - CENTENNIAL AVENUE TO DARDANELLES ROAD
AS2890.2 12.5m HEAVY RIGID VEHICLE

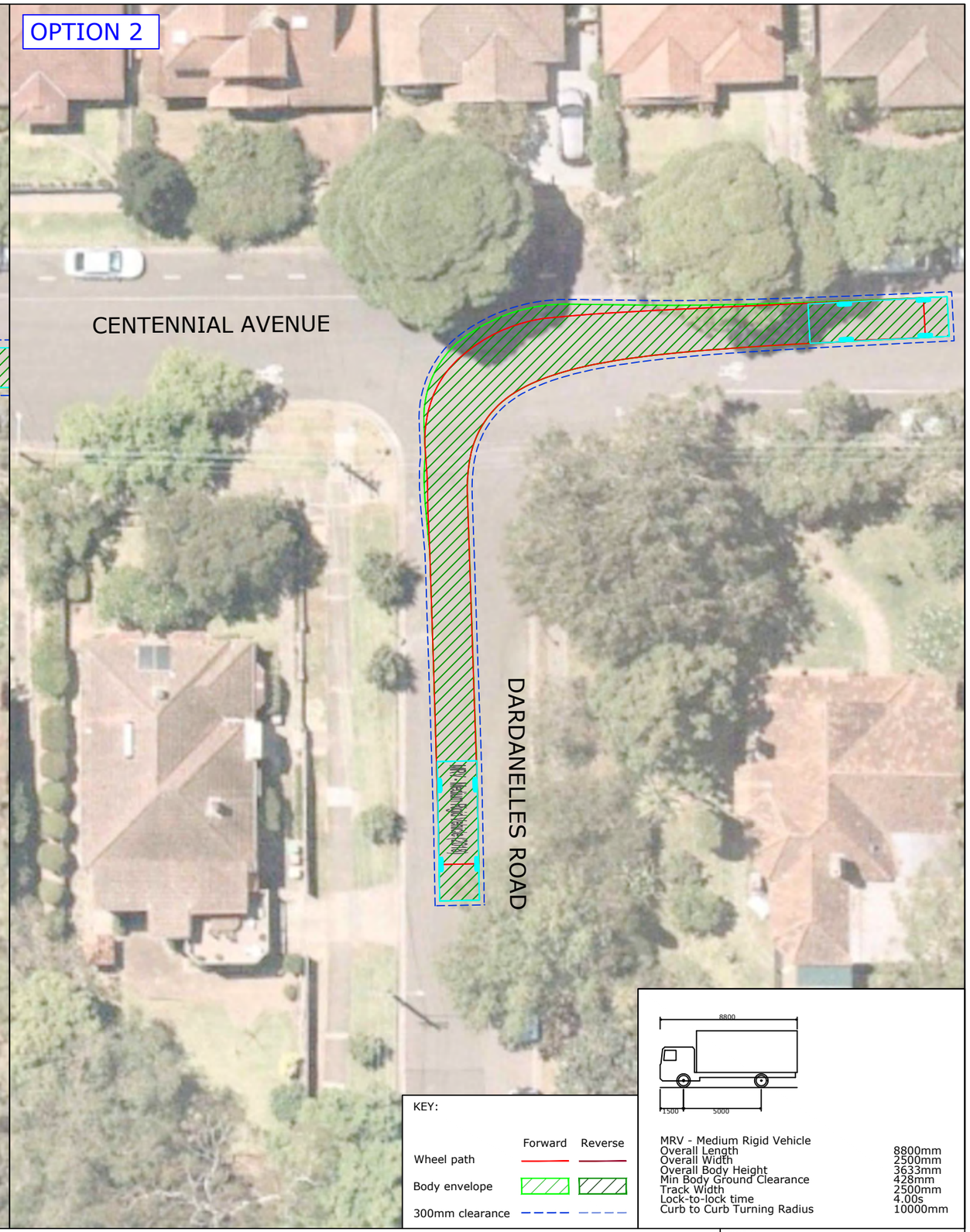
DWG No. 20182CAD012
FIGURE 1

DATE STAMP 09 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:300 @A3	A

Filename: 20182CAD012-210409-SWEPT PATH.dwg Date: 9 April 2021 By: Karl.magistrado





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

MRV - Medium Rigid Vehicle

Overall Length	8800mm
Overall Width	2500mm
Overall Body Height	3633mm
Min Body Ground Clearance	428mm
Track Width	2500mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	09/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

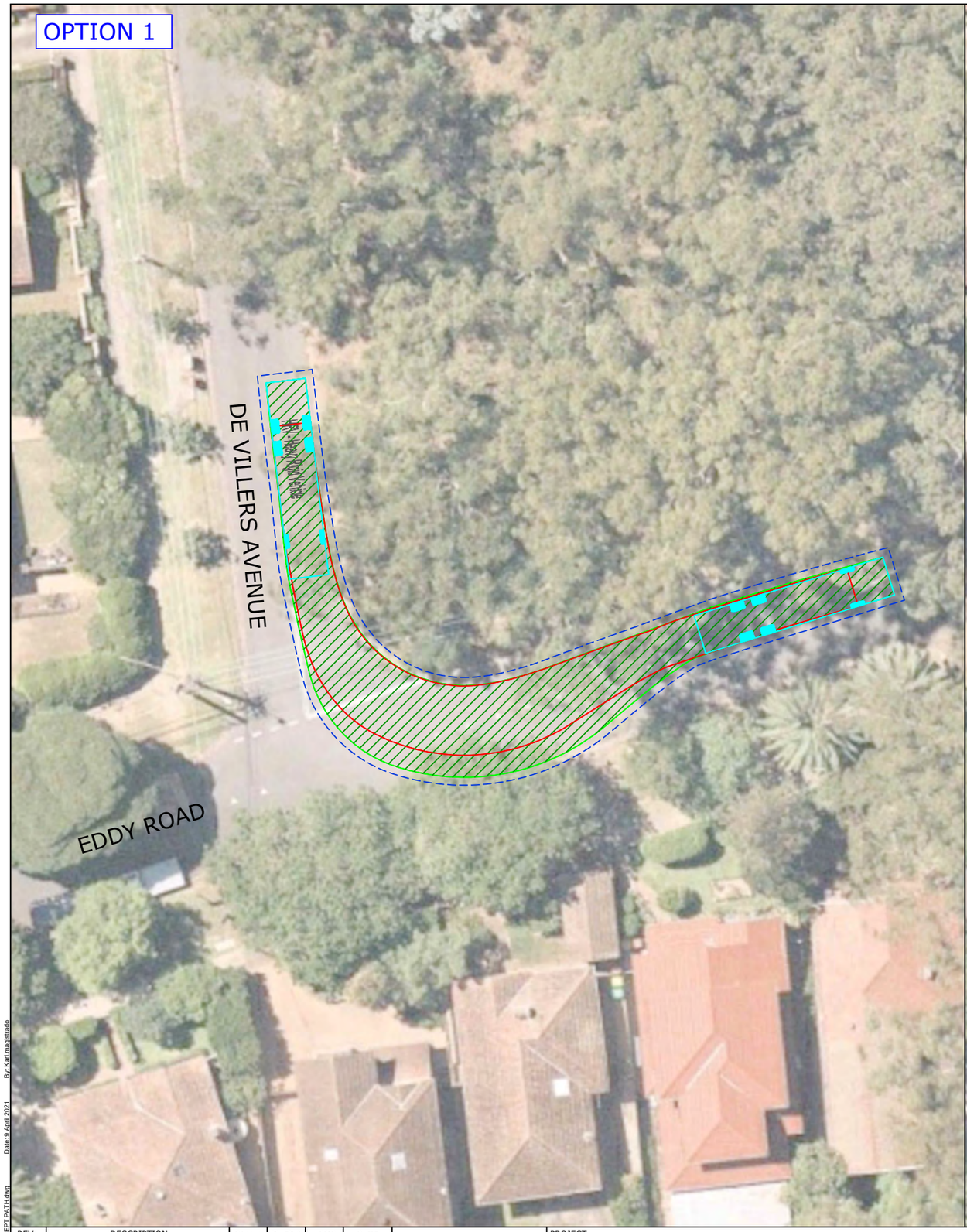
TITLE: SWEPT PATH ANALYSIS - CENTENNIAL AVENUE TO DARDANELLES ROAD
AS2890.2 8.8m MEDIUM RIGID VEHICLE

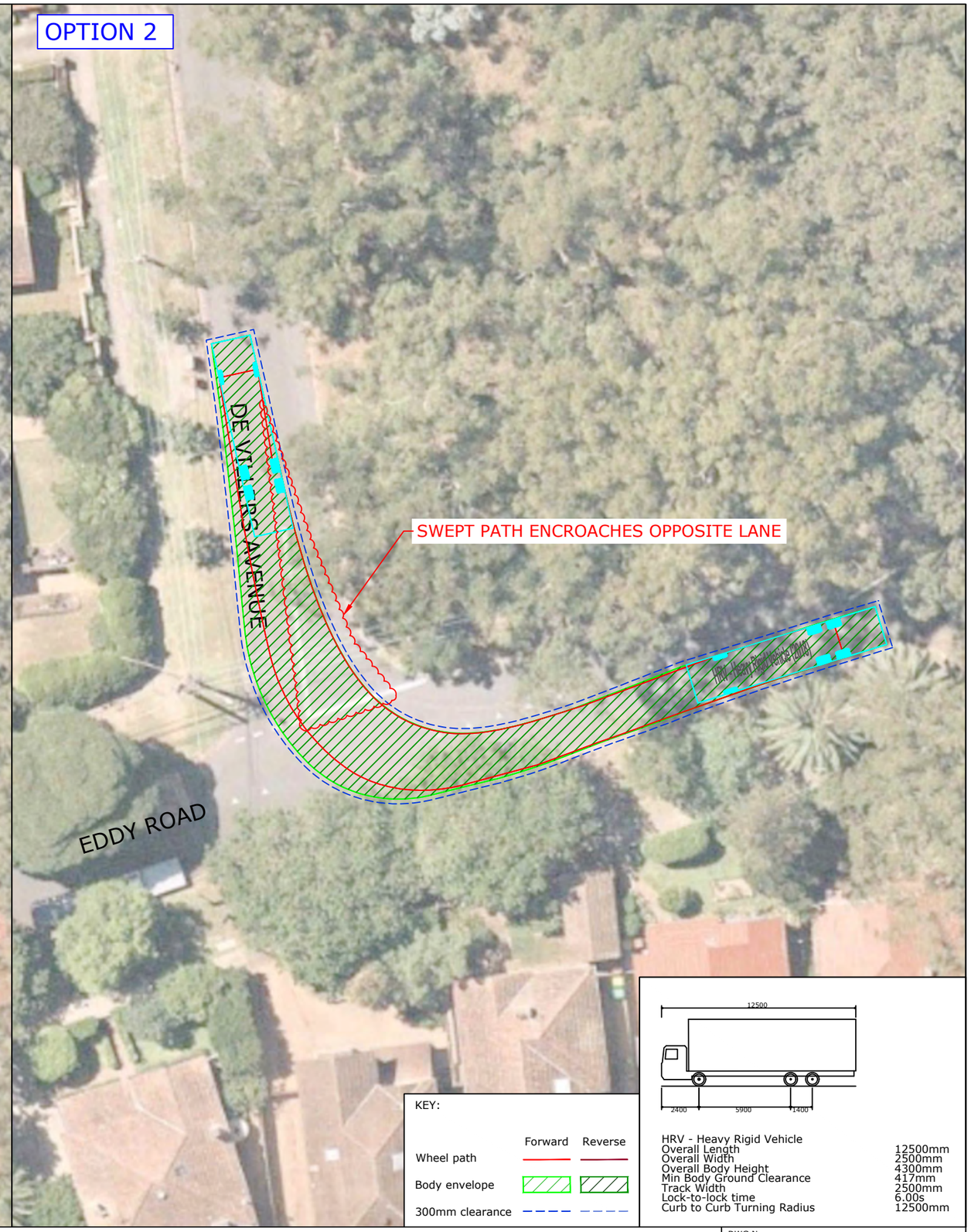
DWG No. 20182CAD012 FIGURE 2

DATE STAMP 09 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:300 @A3	A

Filename: 20182CAD012-210409-SWEPT PATH.dwg Date: 9 April 2021 By: Karl.magistrado





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

HRV - Heavy Rigid Vehicle

Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	417mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	09/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

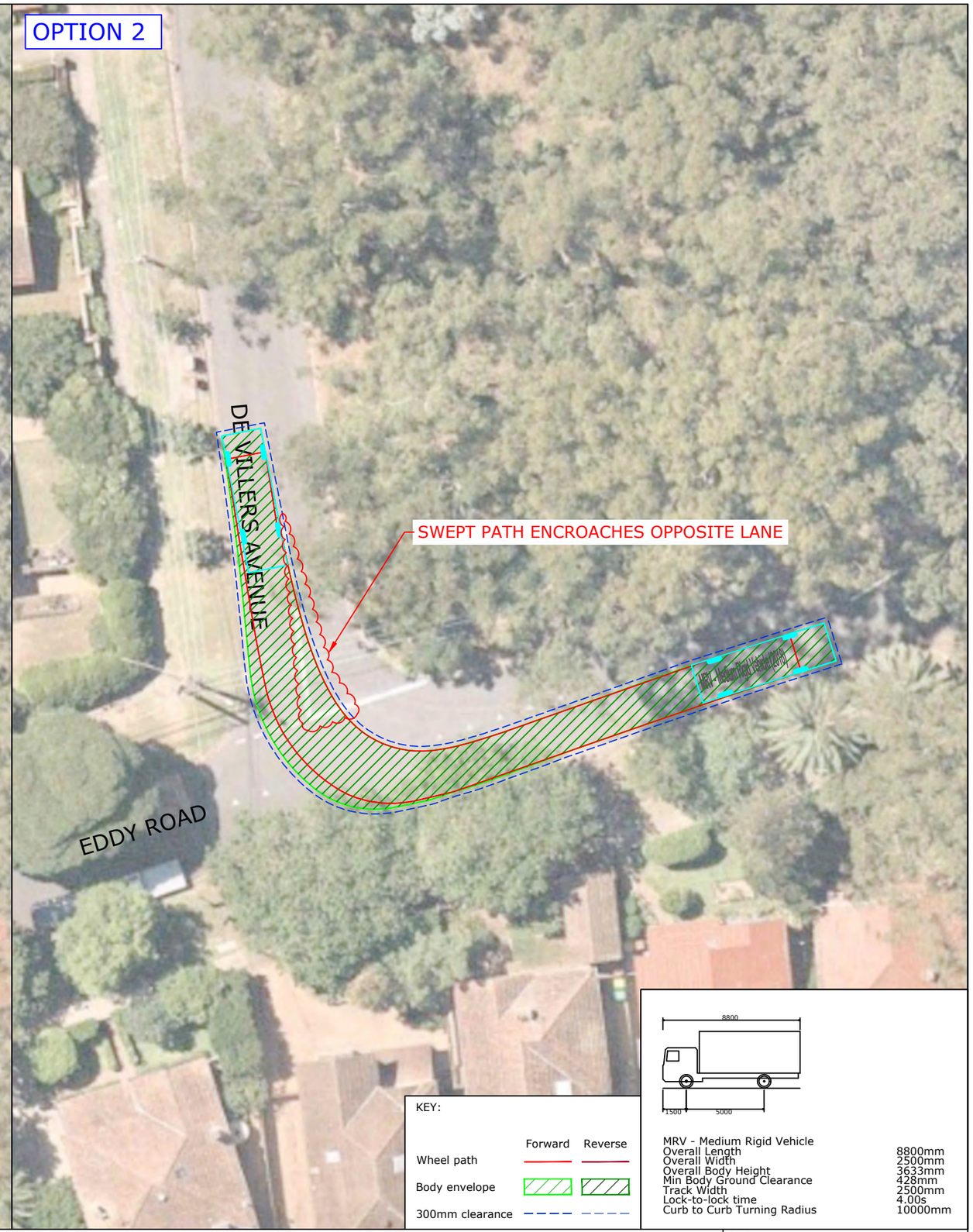
TITLE: SWEPT PATH ANALYSIS - DE VILLERS AVENUE TO EDDY ROAD
AS2890.2 12.5m HEAVY RIGID VEHICLE

DWG No. 20182CAD012
FIGURE 3

DATE STAMP 09 APRIL 2021

PROJECT No.	SCALE	REV.
20182	1:300 @A3	A

Filename: 20182CAD012-210409-SWEPT PATH.dwg Date: 9 April 2021 By: Karl magistrado



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

MRV - Medium Rigid Vehicle

Overall Length	8800mm
Overall Width	2500mm
Overall Body Height	3633mm
Min Body Ground Clearance	428mm
Track Width	2500mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	09/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

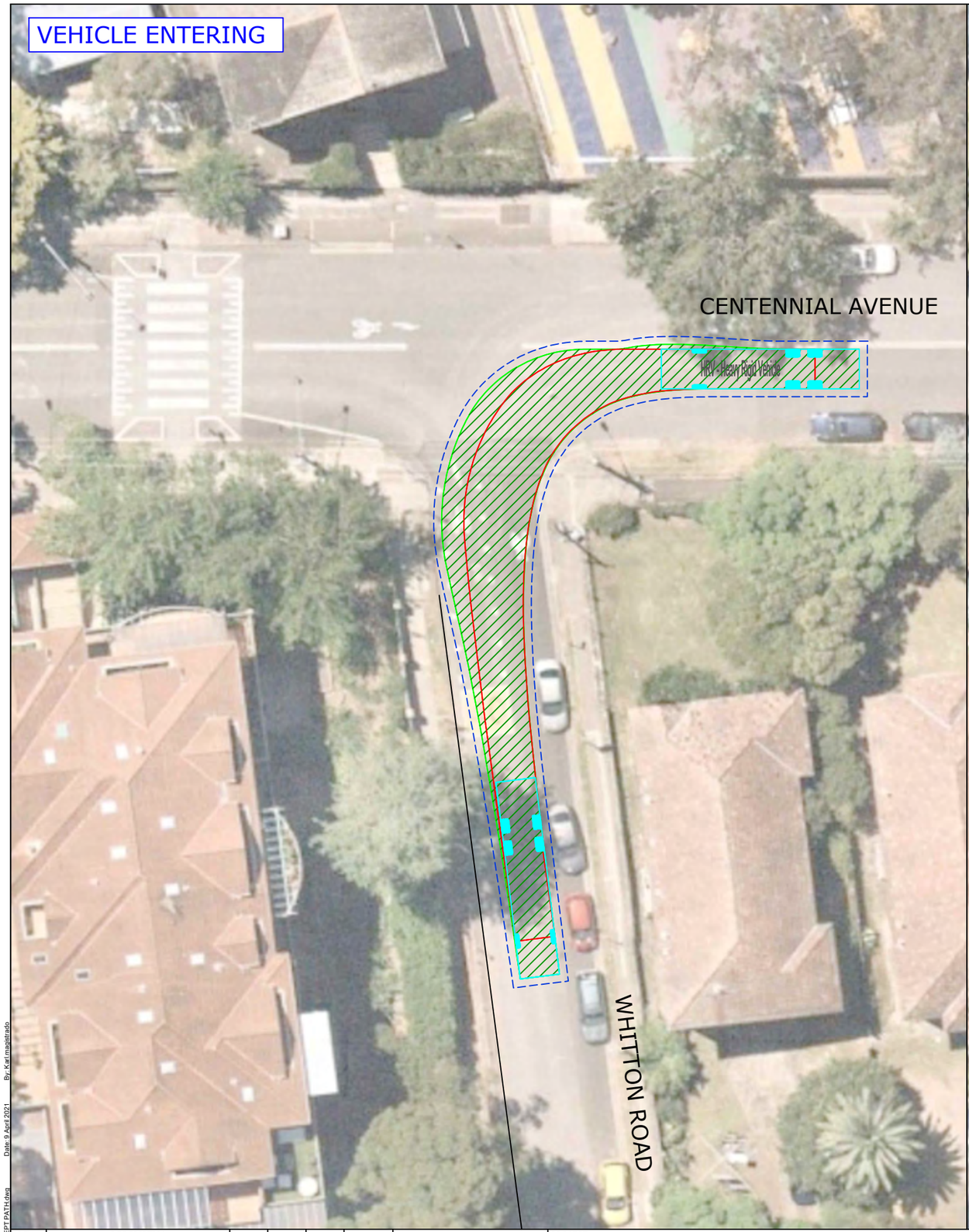
TITLE: SWEPT PATH ANALYSIS - DE VILLERS AVENUE TO EDDY ROAD
AS2890.2 8.8m MEDIUM RIGID VEHICLE

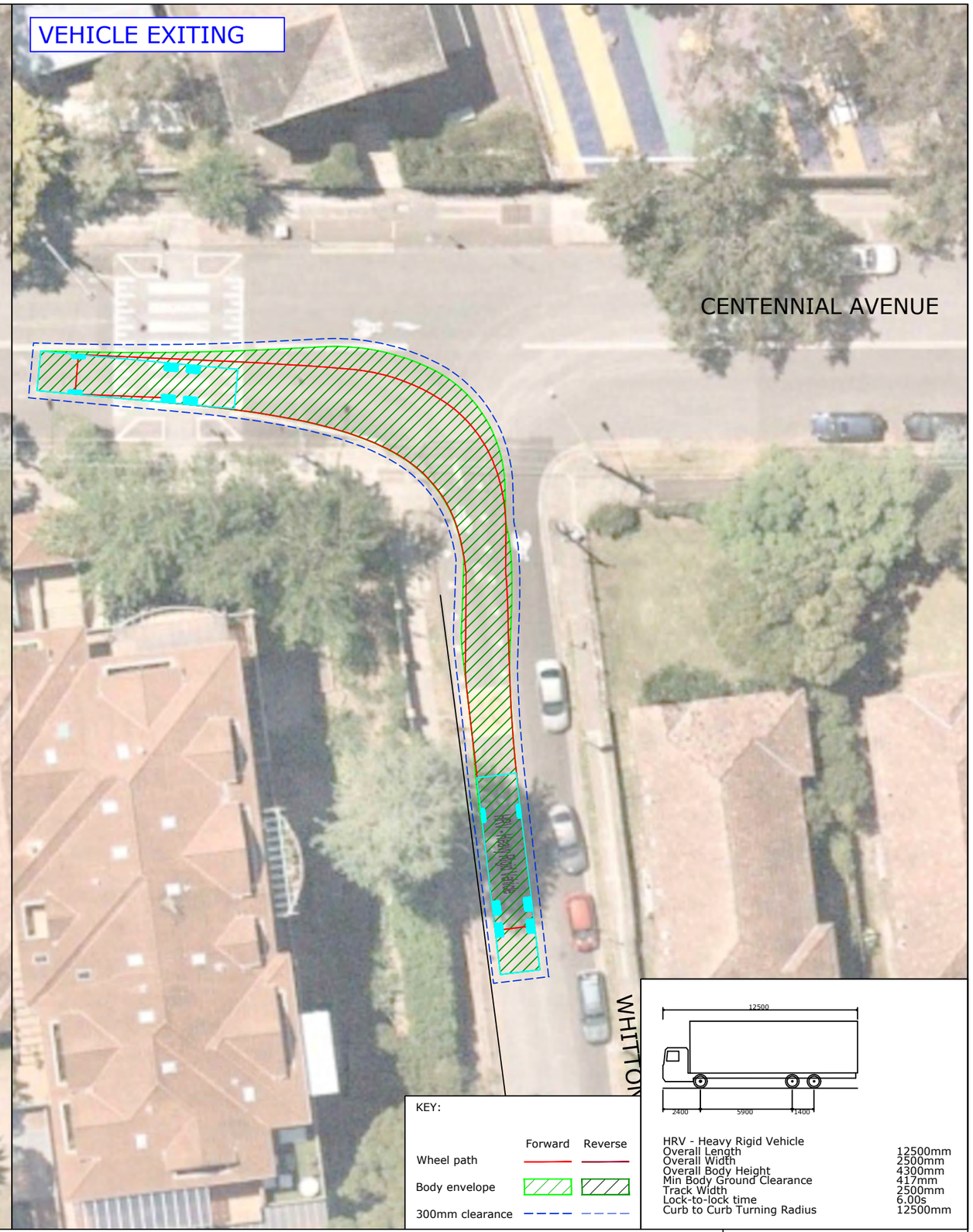
DWG No. 20182CAD012
FIGURE 4

DATE STAMP 09 APRIL 2021

PROJECT No. 20182 | SCALE 1:300 @A3 | REV. A

Filename: 20182CAD012-210409-SWEPT PATH.dwg Date: 9 April 2021 By: Karl magistrado





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

HRV - Heavy Rigid Vehicle

Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	417mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	09/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

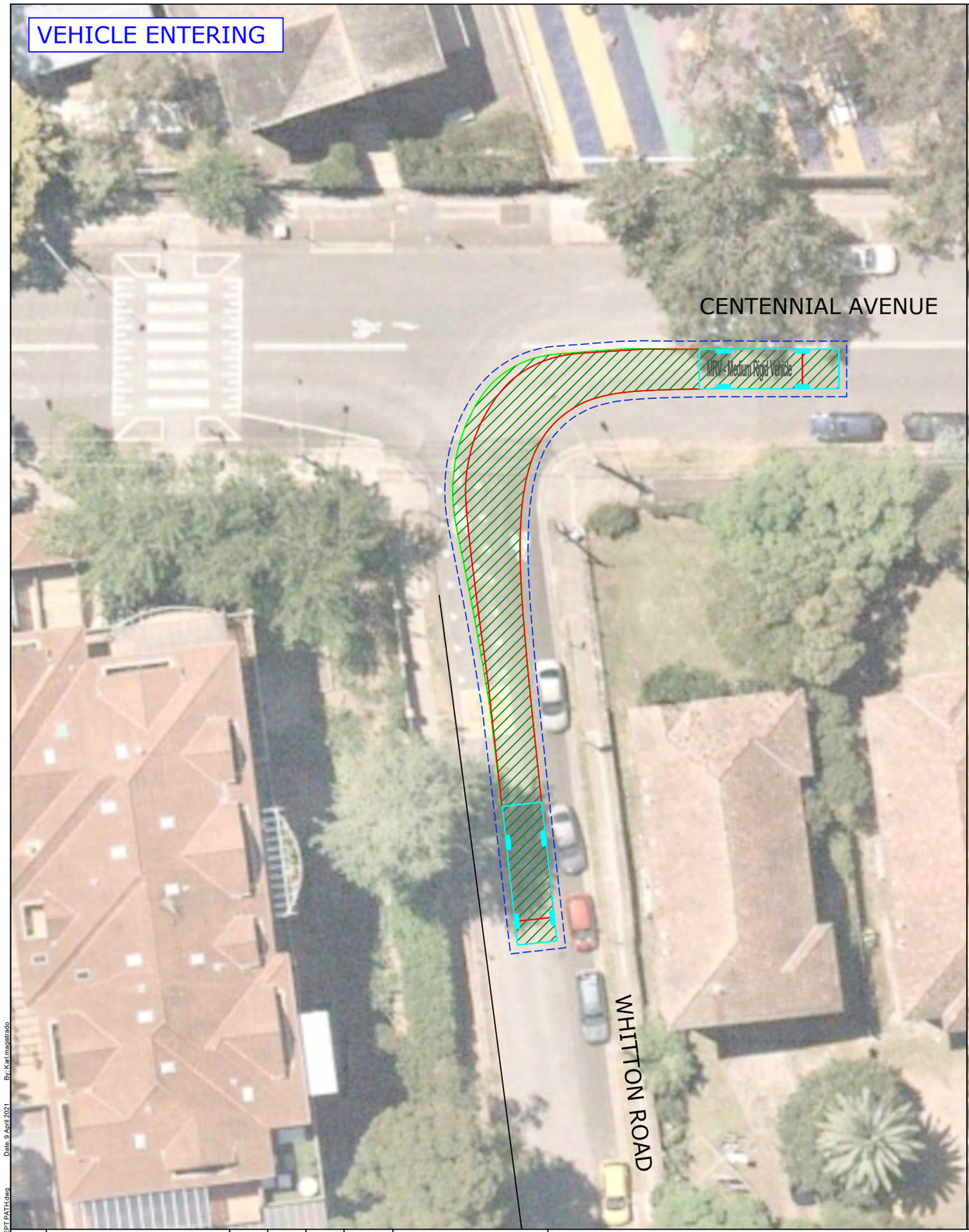
TITLE: SWEPT PATH ANALYSIS - CENTENNIAL AVENUE -WHITTON ROAD
AS2890.2 12.5m HEAVY RIGID VEHICLE

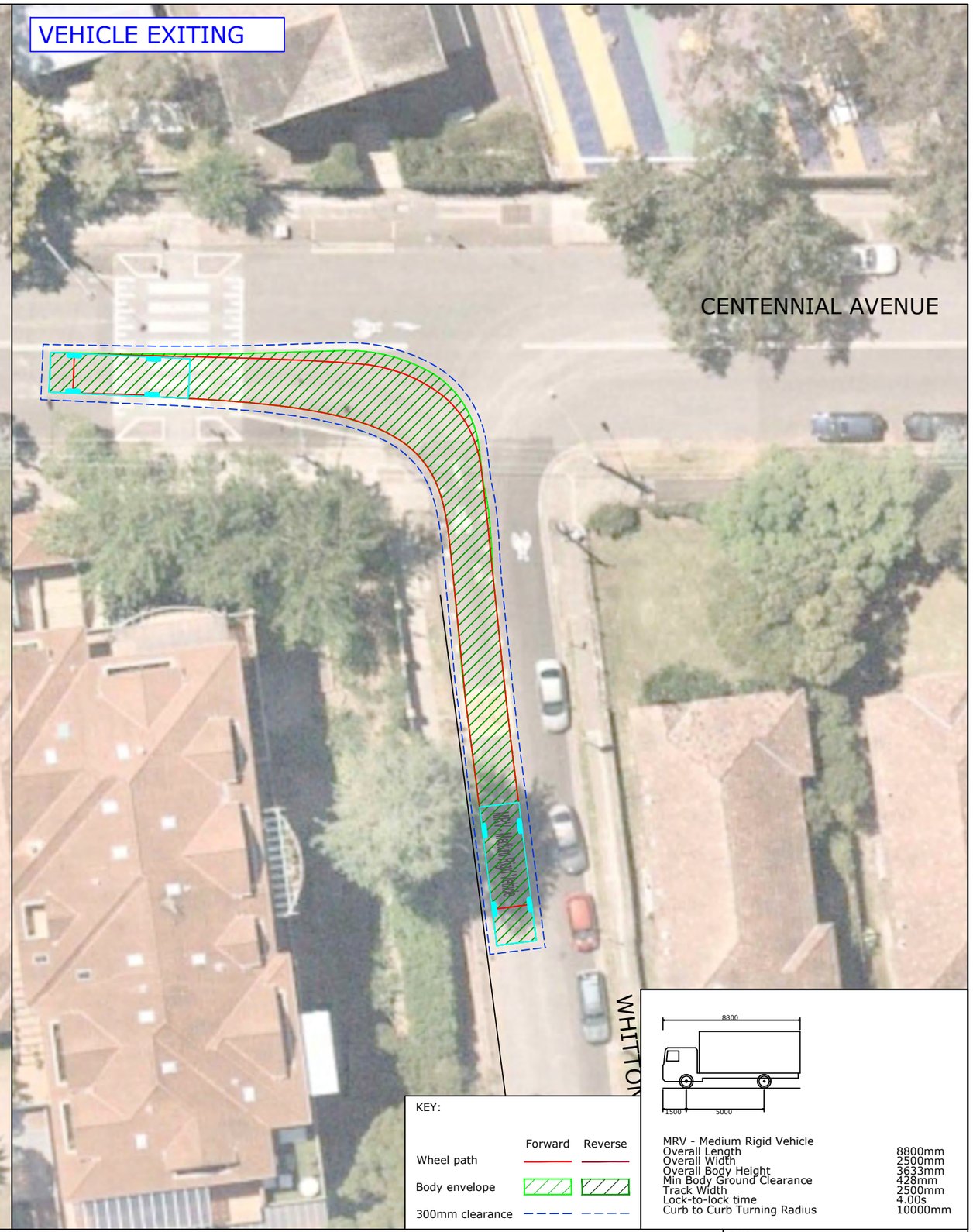
DWG No. 20182CAD012
FIGURE 5

DATE STAMP 09 APRIL 2021

PROJECT No. 20182 | SCALE 1:300 @A3 | REV. A

Filename: 20182CAD012-210409-SWEPT PATH.dwg Date: 9 April 2021 By: Karl magistrado





REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	09/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

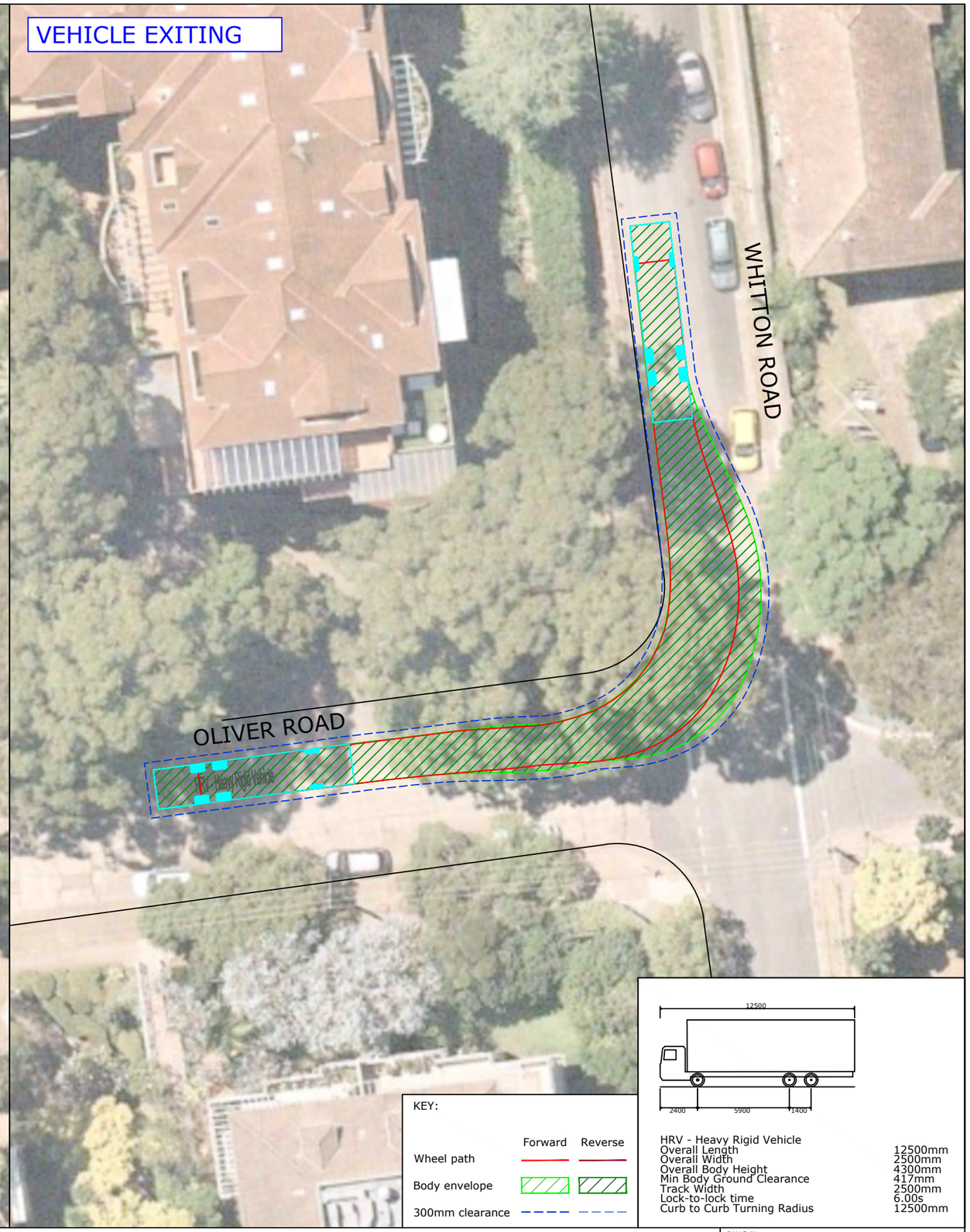
TITLE: SWEPT PATH ANALYSIS - CENTENNIAL AVENUE -WHITTON ROAD
AS2890.2 8.8m MEDIUM RIGID VEHICLE

DWG No. 20182CAD012 FIGURE 6

DATE STAMP 09 APRIL 2021

PROJECT No. 20182 | SCALE 1:300 @A3 | REV. A

Filename: 20182CAD012-210409-SWEPT PATH.dwg Date: 9 April 2021 By: Karl magistrado



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

HRV - Heavy Rigid Vehicle

Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	417mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	09/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

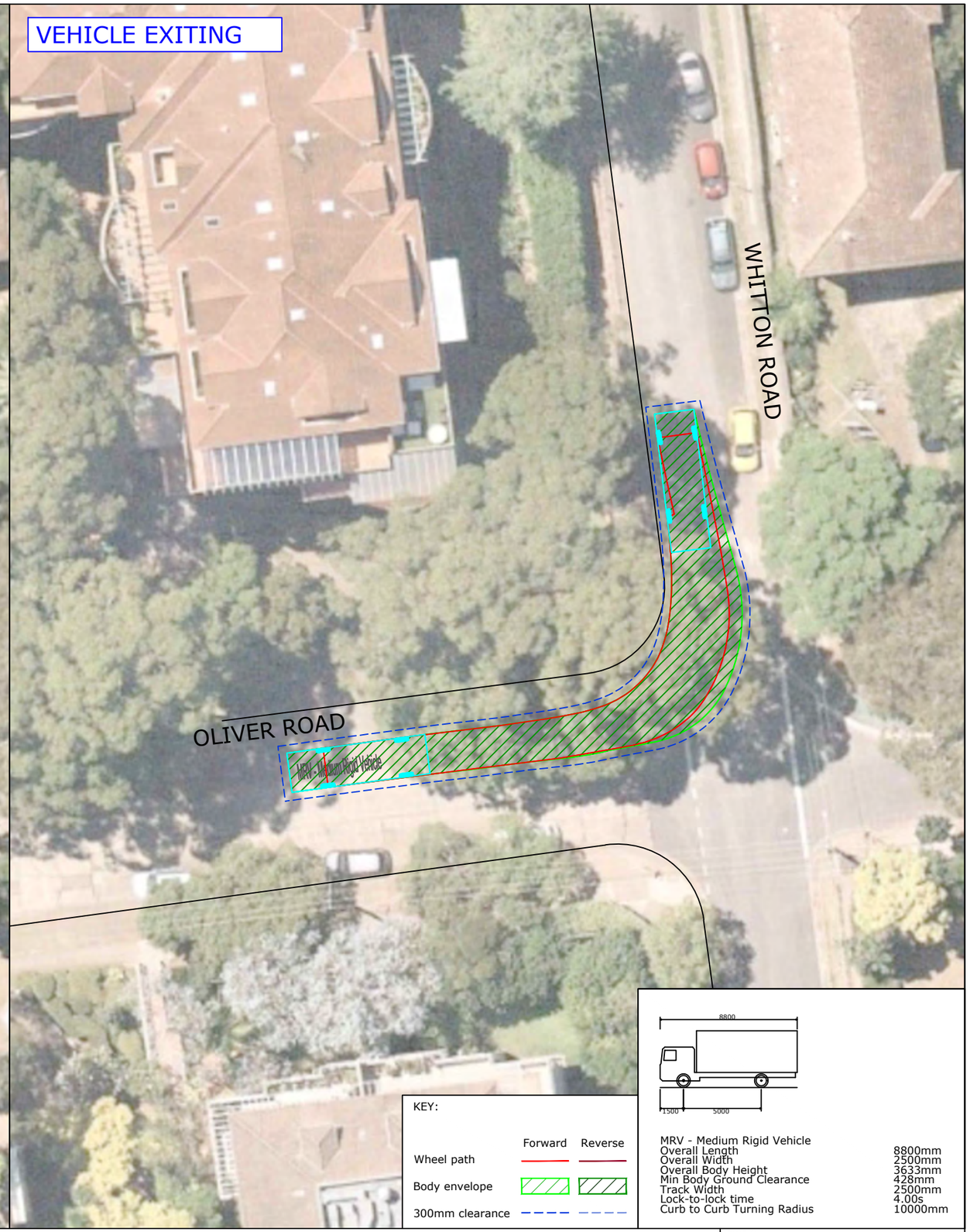
TITLE: SWEPT PATH ANALYSIS - WHITTON ROAD - OLIVER ROAD
AS2890.2 12.5m HEAVY RIGID VEHICLE

DWG No. 20182CAD012 FIGURE 7

DATE STAMP 09 APRIL 2021

PROJECT No.	SCALE	REV.
20182	Custom @A3	A

Filename: 20182CAD012-210409-SWEPT PATH.dwg Date: 9 April 2021 By: Karl.magistrado



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

MRV - Medium Rigid Vehicle	
Overall Length	8800mm
Overall Width	2500mm
Overall Body Height	3633mm
Min Body Ground Clearance	428mm
Track Width	2500mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	09/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

TITLE: SWEPT PATH ANALYSIS - WHITTON ROAD - OLIVER ROAD
AS2890.2 8.8m MEDIUM RIGID VEHICLE

DWG No. 20182CAD012 FIGURE 8

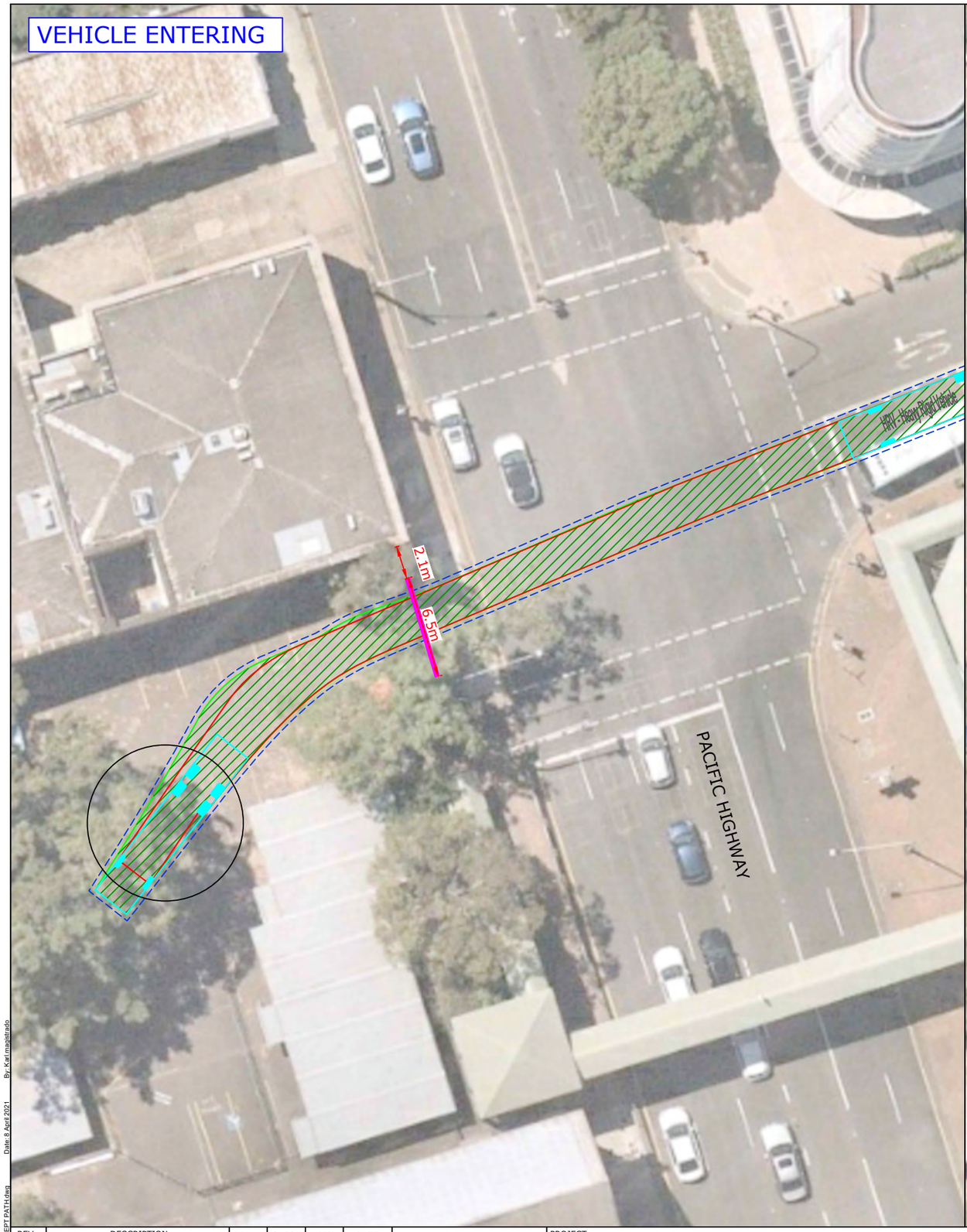
DATE STAMP 09 APRIL 2021

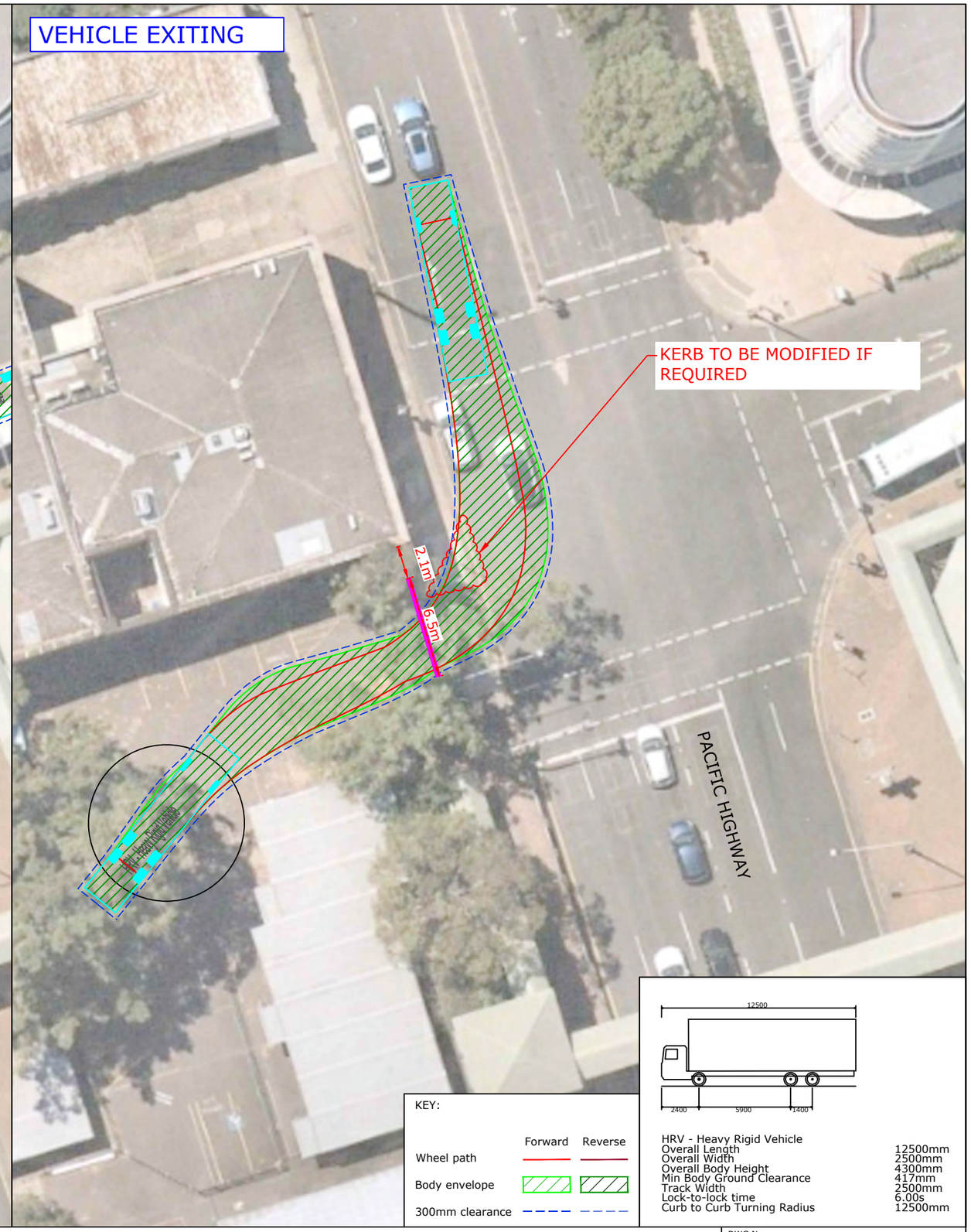
PROJECT No. 20182 | SCALE Custom @A3 | REV. A

Filename: 20182CAD012-210409-SWEPT PATH.dwg Date: 9 April 2021 By: Karl magistrado

Appendix C

Swept Paths (State Roads)





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

HRV - Heavy Rigid Vehicle	
Overall Length	12500mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	417mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	08/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

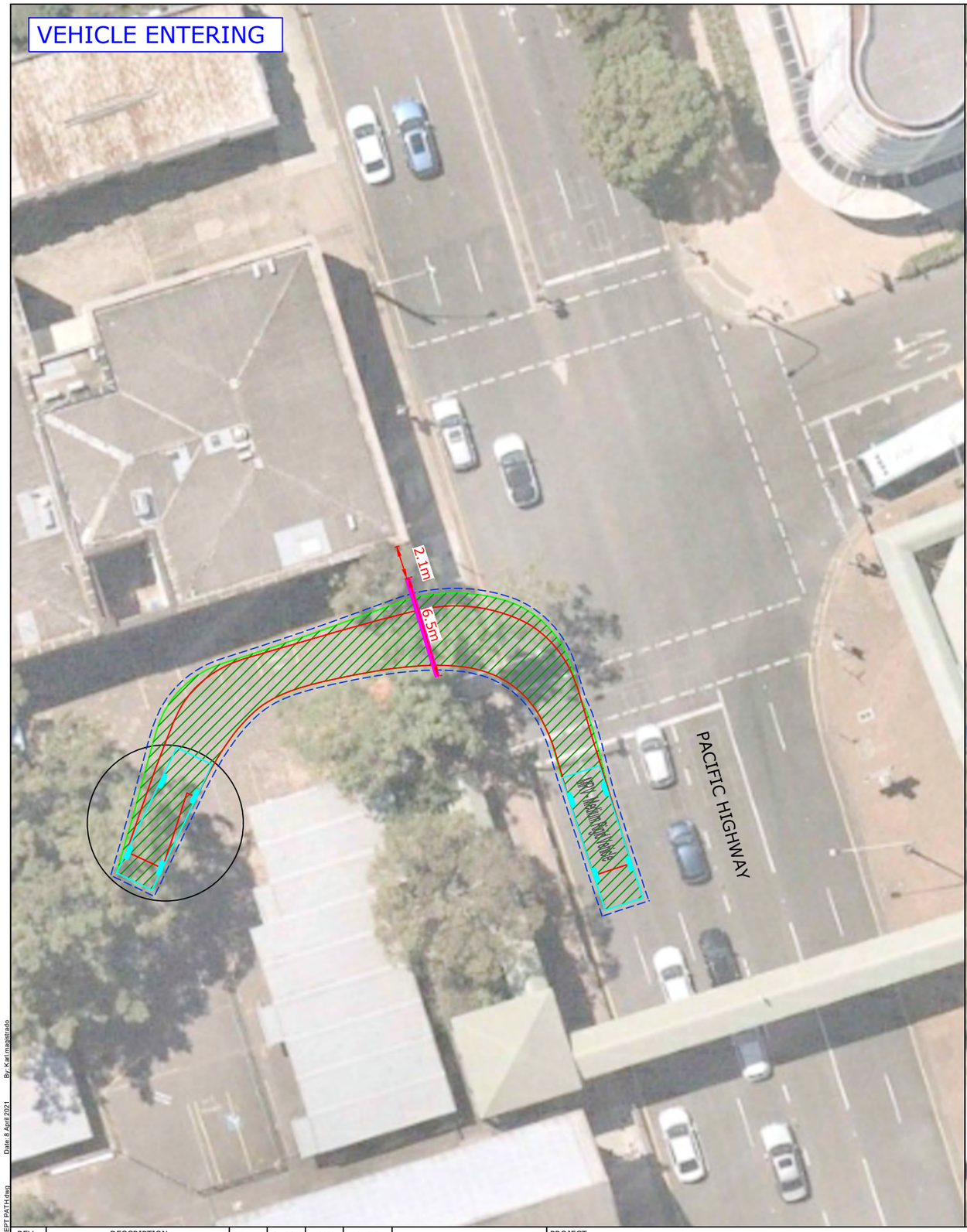
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - PACIFIC HIGHWAY ACCESS
AS2890.2 12.5m HEAVY RIGID VEHICLE

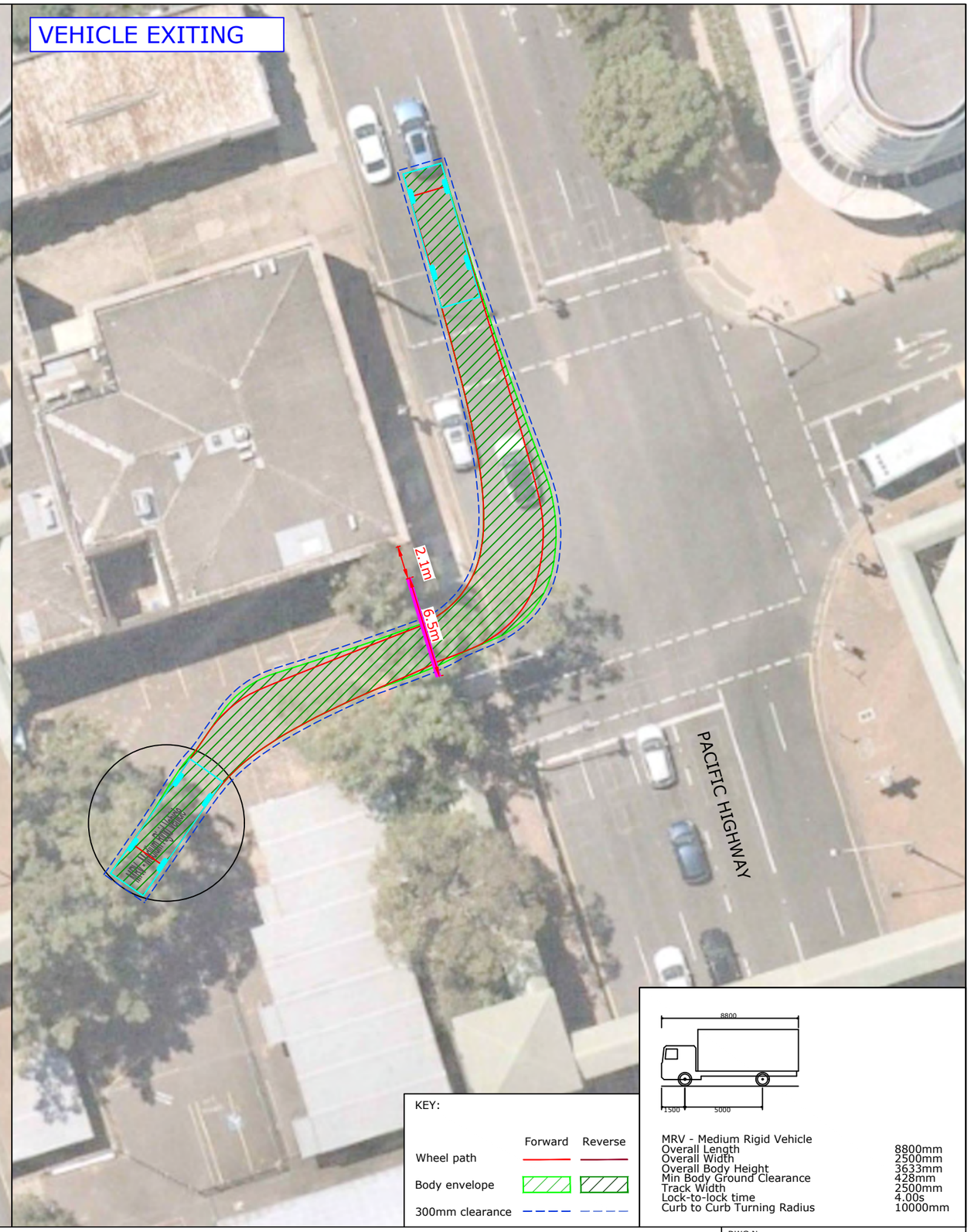
DWG No. 20182CAD013 FIGURE 1

DATE STAMP 08 APRIL 2021

PROJECT No. 20182 | SCALE 1:300 @A3 | REV. A

Filename: 20182CAD013-210408-SWEPT PATH.dwg Date: 8 April 2021 By: K.ar.magistrado





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

MRV - Medium Rigid Vehicle

Overall Length	8800mm
Overall Width	2500mm
Overall Body Height	3633mm
Min Body Ground Clearance	428mm
Track Width	2500mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	08/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

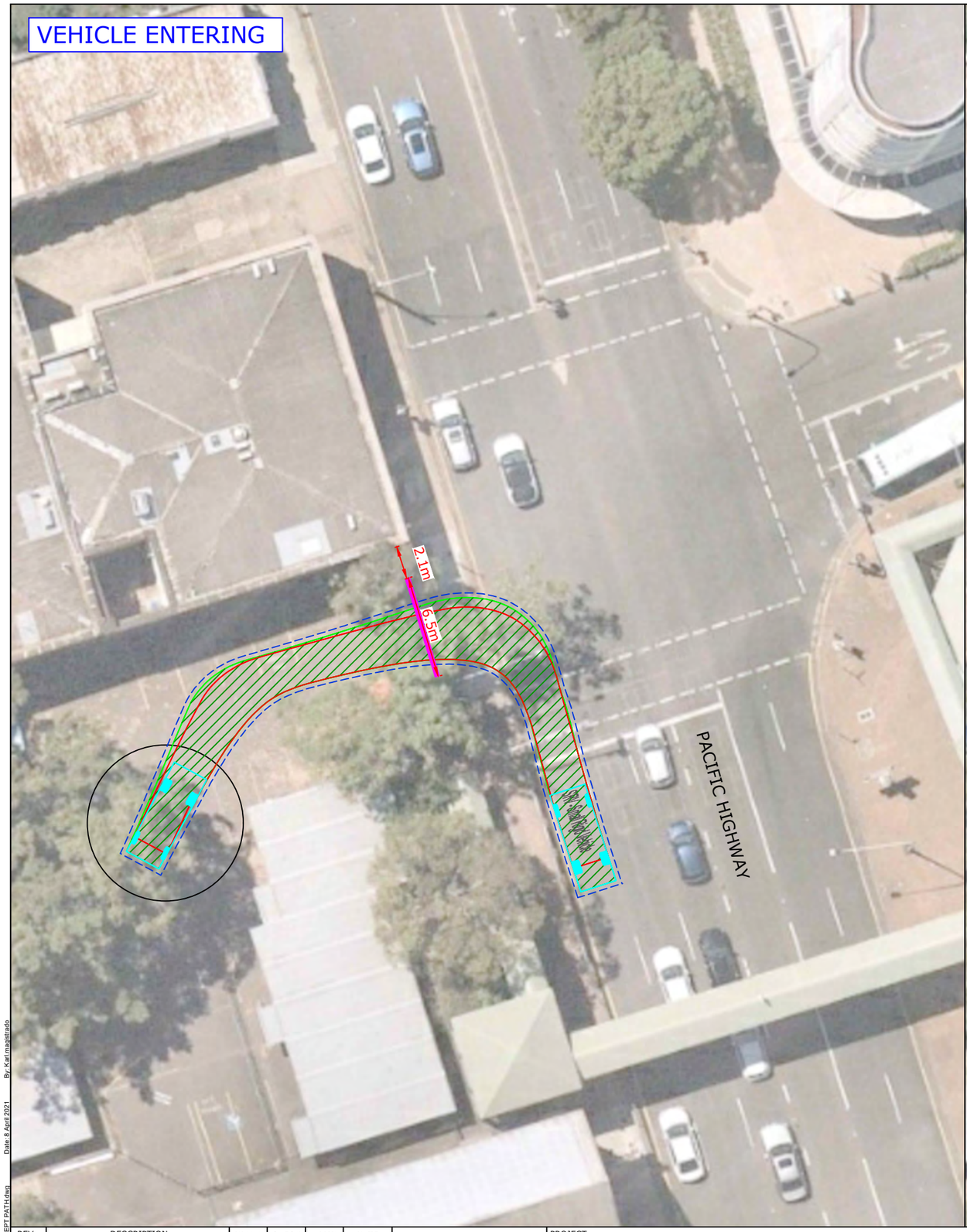
TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - PACIFIC HIGHWAY ACCESS
AS2890.2 8.8m MEDIUM RIGID VEHICLE

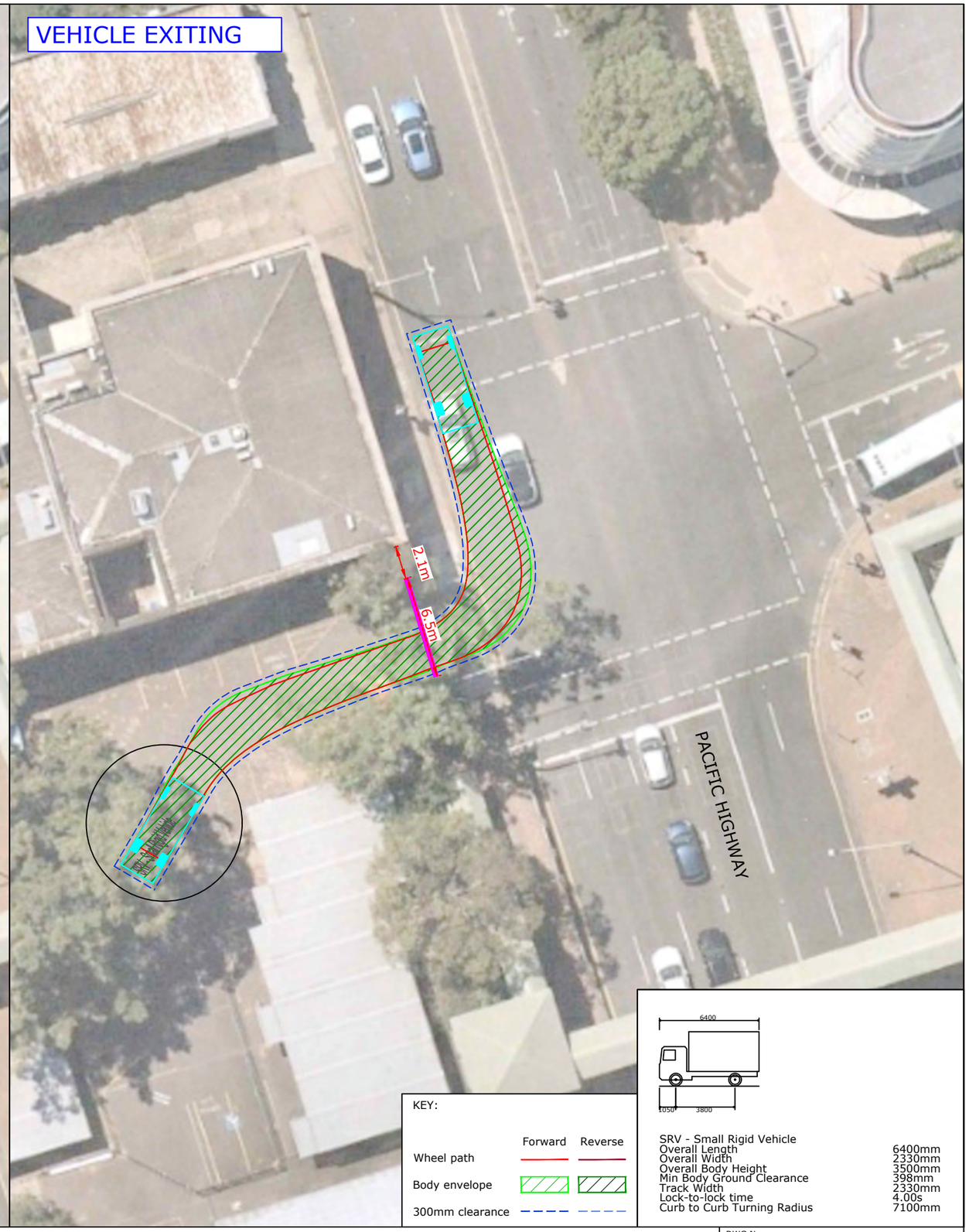
DWG No. 20182CAD013 FIGURE 2

DATE STAMP 08 APRIL 2021

PROJECT No. 20182 | SCALE 1:300 @A3 | REV. A

Filename: 20182CAD013-210408-SWEPT PATH.dwg Date: 8 April 2021 By: K.an.magistrado





KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

SRV - Small Rigid Vehicle

Overall Length	6400mm
Overall Width	2330mm
Overall Body Height	3500mm
Min Body Ground Clearance	398mm
Track Width	2330mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7100mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	08/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

TITLE: SWEPT PATH ANALYSIS - CHATSWOOD PUBLIC SCHOOL - PACIFIC HIGHWAY ACCESS
AS2890.2 6.4m SMALL RIGID VEHICLE

DWG No. 20182CAD013
FIGURE 3

DATE STAMP 08 APRIL 2021

PROJECT No. 20182 | SCALE 1:300 @A3 | REV. A

Filename: 20182CAD013-210408-SWEPT PATH.dwg
Date: 8 April 2021
By: K.et.magistrado

Appendix D

Traffic Control Plans

TRAFFIC MANAGEMENT NOTES:

1. NOT ALL DIMENSIONS SHOWN ARE TO SCALE.
2. LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY.
3. ALL SIGNS TO BE MINIMUM SIZE A.
4. ALL SIGNS TO BE CLASS 1 REFLECTIVE OR DIAMOND GRADE.
5. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
6. ALL TRAFFIC CONTROL PLANS ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE TFNSW "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER6 (2020) AND AUSTRALIAN STANDARDS AS1742.3:2009 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS.
7. THIS TRAFFIC CONTROL PLAN MUST BE SETUP BY A PERSON HOLDING AN "APPLY TRAFFIC CONTROL PLANS" (YELLOW TICKET) AND THE TFNSW TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION.
8. IT IS THE SITE FOREMAN'S RESPONSIBILITY TO ENSURE THE FOLLOWING:
   - THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURES 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
   - PEDESTRIAN ACCESS AROUND THE WORK AREA TO BE MAINTAINED AT ALL TIMES.
   - AT ALL TIMES UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES" SHOULD BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE
   - IF THERE IS NO DESIGNATED SITE FOREMAN, THE RESPONSIBILITY SHALL FALL ON THE CONTRACTOR OF WORKS
9. ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2009
10. ALL DISTANCES BETWEEN SIGNS ARE TO BE IN ACCORDANCE WITH THE SECTION 2.5.2 OF AS1742.3:2009. HOWEVER, MODIFICATIONS MADE TO SUIT SITE CONDITIONS.
11. ALL CONSTRUCTION VEHICLE ACTIVITY SHOULD BE MINIMISED, WHERE POSSIBLE, DURING PEAK PERIODS.
12. TRAFFIC CONTROLLER (T1-34) AND PREPARE TO STOP (T1-18) SIGNS TO BE COVERED OR REMOVED WHEN TRAFFIC CONTROLLER/S ARE NOT ON SITE.
13. ROAD WORK SIGNS TO BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
14. NO TRUCK QUEUING OR PARKING WILL BE PERMITTED IN ANY PUBLIC ROAD OUTSIDE THE PROPOSED WORKS ZONE.
15. VEHICLES ALREADY ON THE ROAD WILL HAVE A RIGHT OF WAY. AS SUCH EVERY VEHICLE LEAVING THE SITE MUST WAIT UNTIL A SUITABLE GAP IN TRAFFIC ALLOWS THEM TO EXIT UNDER THE DIRECTION OF QUALIFIED TRAFFIC AND PEDESTRIAN CONTROLLER.
16. PEDESTRIANS WILL ONLY BE HELD FOR SHORT TIME TO ALLOW TRUCKS TO ENTER AND EXIT FROM THE SITE. PEDESTRIANS HAVE THE RIGHT OF WAY ON THE FOOTPATH AND WILL NOT BE STOPPED IN ANTICIPATION.
17. ADJOINING PROPERTIES AND SIDE ROADS WILL NOT BE AFFECTED BY THE WORKS.
18. THE FOLLOWING WORK ZONE HOURS WILL BE IMPLEMENTED PENDING APPROVAL: MONDAY TO FRIDAY 7 AM - 6 PM AND SATURDAY 8 AM - 4 PM.

CERTIFICATION

THE UNDERSIGNED HAS OBTAINED "PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN" CERTIFICATION.

CERTIFICATE NO: TCT1008289
KARL MAGISTRADO

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	19/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

TITLE: TRAFFIC CONTROL PLAN

DWG No. 20182CAD019 FIGURE 1

DATE STAMP 19 APRIL 2021

PROJECT No. 20182 | SCALE NTS | REV. A

Date: 19 April 2021 By: Lalaine malakian

Filename: 20182CAD019-210419-TCP.dwg

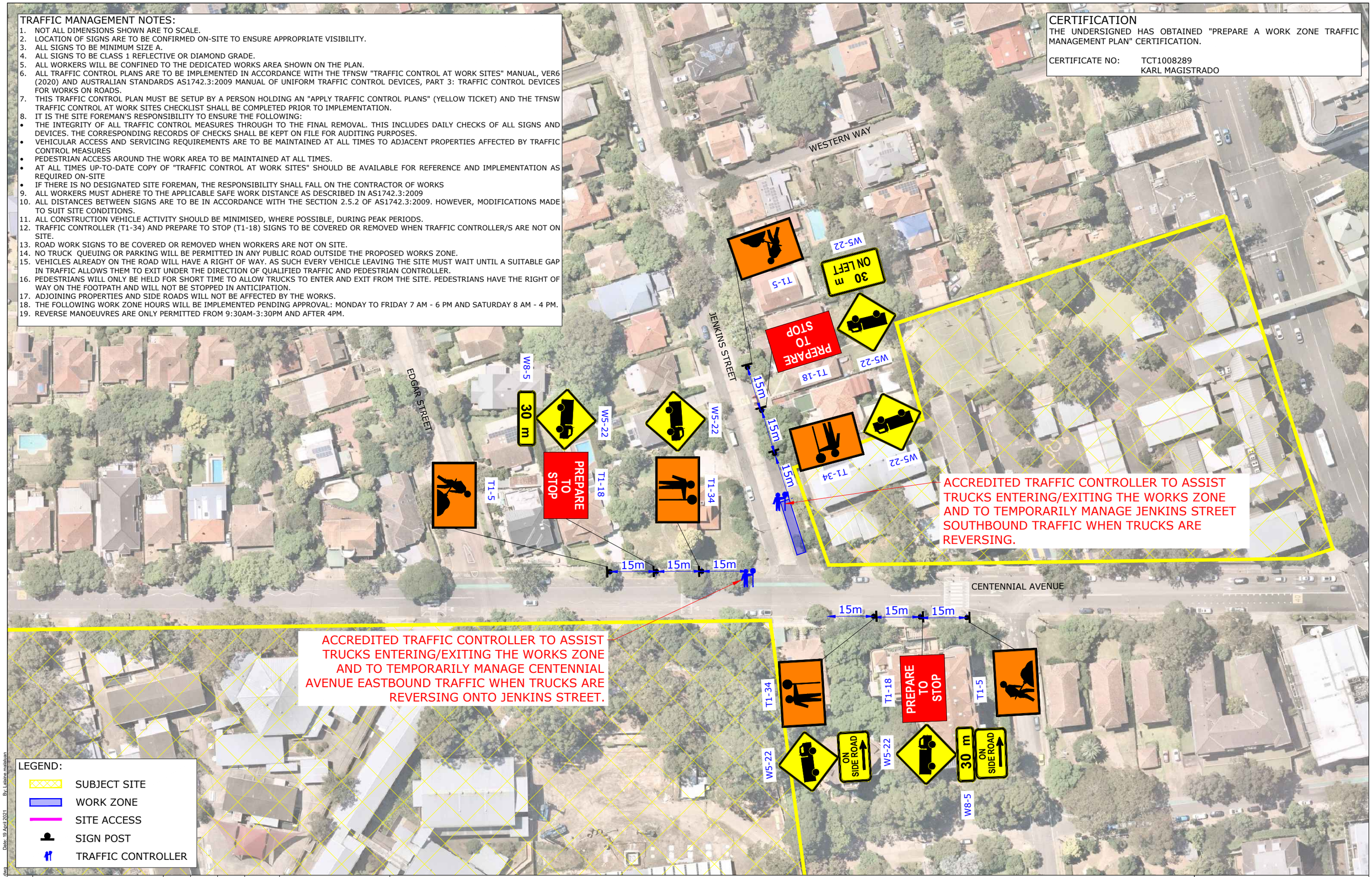
TRAFFIC MANAGEMENT NOTES:

1. NOT ALL DIMENSIONS SHOWN ARE TO SCALE.
2. LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY.
3. ALL SIGNS TO BE MINIMUM SIZE A.
4. ALL SIGNS TO BE CLASS 1 REFLECTIVE OR DIAMOND GRADE.
5. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
6. ALL TRAFFIC CONTROL PLANS ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE TFNSW "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER6 (2020) AND AUSTRALIAN STANDARDS AS1742.3:2009 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS.
7. THIS TRAFFIC CONTROL PLAN MUST BE SETUP BY A PERSON HOLDING AN "APPLY TRAFFIC CONTROL PLANS" (YELLOW TICKET) AND THE TFNSW TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION.
8. IT IS THE SITE FOREMAN'S RESPONSIBILITY TO ENSURE THE FOLLOWING:
   - THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURES 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
   - PEDESTRIAN ACCESS AROUND THE WORK AREA TO BE MAINTAINED AT ALL TIMES.
   - AT ALL TIMES UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES" SHOULD BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE
   - IF THERE IS NO DESIGNATED SITE FOREMAN, THE RESPONSIBILITY SHALL FALL ON THE CONTRACTOR OF WORKS
9. ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2009
10. ALL DISTANCES BETWEEN SIGNS ARE TO BE IN ACCORDANCE WITH THE SECTION 2.5.2 OF AS1742.3:2009. HOWEVER, MODIFICATIONS MADE TO SUIT SITE CONDITIONS.
11. ALL CONSTRUCTION VEHICLE ACTIVITY SHOULD BE MINIMISED, WHERE POSSIBLE, DURING PEAK PERIODS.
12. TRAFFIC CONTROLLER (T1-34) AND PREPARE TO STOP (T1-18) SIGNS TO BE COVERED OR REMOVED WHEN TRAFFIC CONTROLLER/S ARE NOT ON SITE.
13. ROAD WORK SIGNS TO BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
14. NO TRUCK QUEUING OR PARKING WILL BE PERMITTED IN ANY PUBLIC ROAD OUTSIDE THE PROPOSED WORKS ZONE.
15. VEHICLES ALREADY ON THE ROAD WILL HAVE A RIGHT OF WAY. AS SUCH EVERY VEHICLE LEAVING THE SITE MUST WAIT UNTIL A SUITABLE GAP IN TRAFFIC ALLOWS THEM TO EXIT UNDER THE DIRECTION OF QUALIFIED TRAFFIC AND PEDESTRIAN CONTROLLER.
16. PEDESTRIANS WILL ONLY BE HELD FOR SHORT TIME TO ALLOW TRUCKS TO ENTER AND EXIT FROM THE SITE. PEDESTRIANS HAVE THE RIGHT OF WAY ON THE FOOTPATH AND WILL NOT BE STOPPED IN ANTICIPATION.
17. ADJOINING PROPERTIES AND SIDE ROADS WILL NOT BE AFFECTED BY THE WORKS.
18. THE FOLLOWING WORK ZONE HOURS WILL BE IMPLEMENTED PENDING APPROVAL: MONDAY TO FRIDAY 7 AM - 6 PM AND SATURDAY 8 AM - 4 PM.
19. REVERSE MANOEUVRES ARE ONLY PERMITTED FROM 9:30AM-3:30PM AND AFTER 4PM.

CERTIFICATION

THE UNDERSIGNED HAS OBTAINED "PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN" CERTIFICATION.

CERTIFICATE NO: TCT1008289
KARL MAGISTRADO



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM/LM	JN	JR	19/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

TITLE: TRAFFIC CONTROL PLAN
JENKINS STREET WORK ZONE (WHEN TRUCKS ARE ACCESSING THE WORKS ZONE)

DWG No. 20182CAD019 FIGURE 2

DATE STAMP 19 APRIL 2021

PROJECT No. 20182 | SCALE NTS | REV. A

Filename: 20182CAD019-210419-TCP.dwg Date: 19 April 2021 By: Lalaine malaluan

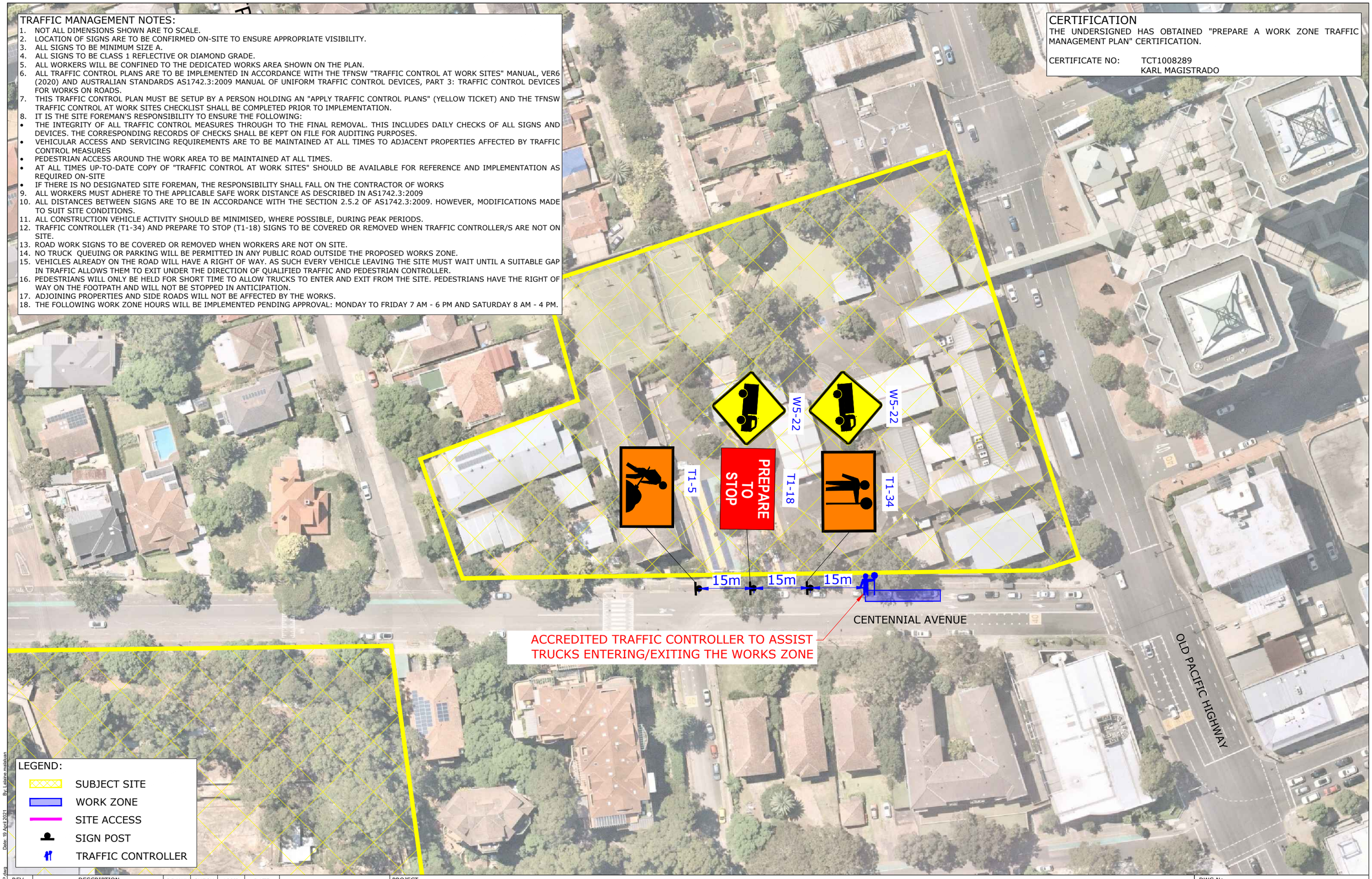
TRAFFIC MANAGEMENT NOTES:

1. NOT ALL DIMENSIONS SHOWN ARE TO SCALE.
2. LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY.
3. ALL SIGNS TO BE MINIMUM SIZE A.
4. ALL SIGNS TO BE CLASS 1 REFLECTIVE OR DIAMOND GRADE.
5. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
6. ALL TRAFFIC CONTROL PLANS ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE TFNSW "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER6 (2020) AND AUSTRALIAN STANDARDS AS1742.3:2009 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS.
7. THIS TRAFFIC CONTROL PLAN MUST BE SETUP BY A PERSON HOLDING AN "APPLY TRAFFIC CONTROL PLANS" (YELLOW TICKET) AND THE TFNSW TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION.
8. IT IS THE SITE FOREMAN'S RESPONSIBILITY TO ENSURE THE FOLLOWING:
   - THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURES 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
   - PEDESTRIAN ACCESS AROUND THE WORK AREA TO BE MAINTAINED AT ALL TIMES.
   - AT ALL TIMES UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES" SHOULD BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE
   - IF THERE IS NO DESIGNATED SITE FOREMAN, THE RESPONSIBILITY SHALL FALL ON THE CONTRACTOR OF WORKS
9. ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2009
10. ALL DISTANCES BETWEEN SIGNS ARE TO BE IN ACCORDANCE WITH THE SECTION 2.5.2 OF AS1742.3:2009. HOWEVER, MODIFICATIONS MADE TO SUIT SITE CONDITIONS.
11. ALL CONSTRUCTION VEHICLE ACTIVITY SHOULD BE MINIMISED, WHERE POSSIBLE, DURING PEAK PERIODS.
12. TRAFFIC CONTROLLER (T1-34) AND PREPARE TO STOP (T1-18) SIGNS TO BE COVERED OR REMOVED WHEN TRAFFIC CONTROLLER/S ARE NOT ON SITE.
13. ROAD WORK SIGNS TO BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
14. NO TRUCK QUEUING OR PARKING WILL BE PERMITTED IN ANY PUBLIC ROAD OUTSIDE THE PROPOSED WORKS ZONE.
15. VEHICLES ALREADY ON THE ROAD WILL HAVE A RIGHT OF WAY. AS SUCH EVERY VEHICLE LEAVING THE SITE MUST WAIT UNTIL A SUITABLE GAP IN TRAFFIC ALLOWS THEM TO EXIT UNDER THE DIRECTION OF QUALIFIED TRAFFIC AND PEDESTRIAN CONTROLLER.
16. PEDESTRIANS WILL ONLY BE HELD FOR SHORT TIME TO ALLOW TRUCKS TO ENTER AND EXIT FROM THE SITE. PEDESTRIANS HAVE THE RIGHT OF WAY ON THE FOOTPATH AND WILL NOT BE STOPPED IN ANTICIPATION.
17. ADJOINING PROPERTIES AND SIDE ROADS WILL NOT BE AFFECTED BY THE WORKS.
18. THE FOLLOWING WORK ZONE HOURS WILL BE IMPLEMENTED PENDING APPROVAL: MONDAY TO FRIDAY 7 AM - 6 PM AND SATURDAY 8 AM - 4 PM.

CERTIFICATION

THE UNDERSIGNED HAS OBTAINED "PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN" CERTIFICATION.

CERTIFICATE NO: TCT1008289
KARL MAGISTRADO



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	JN	JR	19/04/21

ttpp transport planning

PROJECT: CHATSWOOD SCHOOLS TENDER

TITLE: TRAFFIC CONTROL PLAN
CENTENNIAL AVENUE WORK ZONE

DWG No. 20182CAD019
FIGURE 3

DATE STAMP 19 APRIL 2021

PROJECT No. 20182 | SCALE NTS | REV. A

Filename: 20182CAD019-210419-TCP.dwg Date: 19 April 2021 By: Lalaine malabuan

Appendix E

Driver's Code of Conduct

Driver's Code of Conduct

Purpose and Objective

The Driver's Code of Conduct aims to minimise the impacts of construction traffic on the external road network, including adjoining properties. The purpose of this Code is to define and detail acceptable behaviour and procedures for all heavy vehicle drivers associated with the construction of the project.

Responsibilities of Drivers

- Drivers are to follow ALL rules and regulations required by law including:
  - Hold a current and valid license for the vehicle class they are operating
  - Always carry your current driver's license with you while you are on duty
  - Comply with all posted and/or Road Work speed limits on all roads
  - Adhere with the posted vehicle load limits on all roads
  - Comply with all construction traffic signs and devices
  - Do not overload vehicles beyond its maximum load limits and/or relevant approvals
- Drivers are to practise safe driving and behaviour which includes, but is not limited to:
  - Driving in a manner that is appropriate with road and weather conditions
  - Not operating any machines whilst suffering from fatigue or under the influence of drugs and/or alcohol.
- Drivers must behave in a professional manner at all times. No yelling at others.
- Drivers must adhere to the approved nominated routes for each specific construction activity and consistent with the CTPMSP (see Figure 3.3 and Figure 3.4) and they must not use roads if their weight is over the posted load limit
- Drivers must not consume or be under the influence of alcohol or drugs whilst on duty
- Drivers are to enter the site before stopping and are not to queue on any public road, unless approved and agreed with relevant authorities.
- Drivers are to arrive and depart from project construction sites during approved construction hours, 7am to 6pm Monday to Friday and 8am to 1pm on Saturday, unless otherwise approved with relevant authorities. Drivers will be turned away if they arrive outside of approved hours.
- Drivers must never leave the vehicle with the engine running. Drivers parking are to engage the park brake and leave the vehicle in gear.
- Drivers must attempt to limit the amount of reversing that they undertake on site.
- Drivers must not use engine braking on or within the vicinity of site.

- Drivers leaving their vehicle must wear appropriate personal protective equipment.
- Drivers must enter and exit the site gates in a forward direction, whenever possible.
- Vehicles must not transfer dirt or debris onto public roads. If any materials are deposited on the roads, then the Superintendents/ Supervisors/ Foremen must be contacted immediately.
- All drivers must carry out their duties in a way which does not adversely affect their health and safety or that of others
- All drivers must only perform tasks for which they have authorisation and/or the necessary training, and for which all necessary safety arrangements are in place
- Prior to leaving site covering truck loads is mandatory and when required, tailgates must be swept clean before leaving site.
- If approached by individuals with enquiries about the project, drivers are not to engage with the individual beyond providing them with the Community Liaison Manager contact details.
- As a courtesy to individuals who may be impacted by driver behaviour, drivers will:
  - Not use compression braking unless it is an emergency situation
  - Ensure no extended periods of idling
  - Ensure that there is no littering
  - Remain calm and courteous when in contact with other members of the public
  - Maintain trucks in good working order and a clean and tidy condition
  - Not block residential driveways or any other access points.

Monitoring

At the commencement of each shift or day's work, drivers will attend a Tool Box meeting held by the supervisor, where drivers will be updated on Work Health and Safety issues that may have arisen from the previous shift or day's work. In addition to this, supervisors will be required to undertake formal observations / review of compliance at three monthly intervals and document and undertake any remedial actions with personnel as required.

Failure to comply with this Driver's Code of Conduct may lead to either the issue of a warning notice or disciplinary action.

Some non-compliances may also carry penalties such as fines and demerit points under the Road Rules and environmental protection legislation.

This Code will be reviewed after six months of operation and updated as required.

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NSW GOVERNMENT | Education School Infrastructure

Post Approval Consultation Record

Identified Party to Consult:	Council
Consultation type:	Meetings, Teleconferences, Zoom Meetings, Email conversations, Phone Calls
When is consultation required?	Prior to commencement of construction
Why	B20 – Construction Traffic and Pedestrian Management Sub-Plan
When was consultation scheduled/held	**1. 16/04/19 – Meeting** **2. 29/11/19 – Meeting** **3. 03/03/21 – Email** **4. 24/03/21 – Email** **5. 26/03/21 – Meeting** **6. 30/03/21 – Email** **7. 01/04/21 – Meeting** **8. 09/04/21**
1. 16/04/19 – Meeting (Prior to SSD Approval)	
Identify persons/ positions involved.	*Attendees:* - Ian Arnott (Planning Manager Willoughby City Council) - Ritu Shankar (Planning Team Leader Willoughby City Council) - Daniel Sui (Senior Traffic Engineer Willoughby City Council) - Johnstaff Projects
Provide details of the consultation.	This consultation was a general meeting between Willoughby Council and Johnstaff. The purpose of the meeting was for Johnstaff to present a Project Overview and outline the requirements of the proposal. *Additional Information is not available.*
2. 29/11/19 – Meeting (Prior to SSD Approval)	
Identify persons/ positions involved.	*Attendees:* - Ian Arnott (Planning Manager Willoughby City Council) - Ritu Shankar (Planning Team Leader Willoughby City Council) - Johnstaff Projects

Provide details of the consultation.	This consultation was a general meeting between Willoughby Council and Johnstaff. The purpose of the meeting was for Johnstaff to present a Project Update relating to the Revised Masterplan of the proposed project. *Additional information is not available.*
3. 03/03/21 – Email	
Identify persons/ positions involved.	*From:* - Jessica Ng (Traffic Engineer, TTPP) *To:* - Gordon Farrelly (Traffic & Transport Team Leader Willoughby Council)
Provide details of the consultation.	*See attached email 'Council Consultation Record 3 - 030321 Email'.* This was an email submission from TTPP to Willoughby Council of the first revision of the CTPMSP.
What specific matters were discussed?	None, there was no response from Council to this submission.
What matters were resolved?	None, there was no response from Council to this submission.
What matters are unresolved?	None, there was no response from Council to this submission.
Any remaining points of disagreement?	None, there was no response from Council to this submission.
How will SINSW address matters not resolved?	None, there was no response from Council to this submission.
4. 24/03/21 – Email	
Identify persons/ positions involved.	*From:* - Obadiah Williams (Project Engineer, RCC) *To:* - Daniel Sui (Senior Traffic Engineer, Willoughby City Council)

Provide details of the consultation.	*See attached email 'Council Consultation Record 4 - 240321 Email'.* This was an email submission from RCC to Willoughby Council of the first revision of the CTPMSP. This email was preceeded by a phone call from Obadiah Williams to Daniel Sui, following up on the previous submission of the CTPMSP, seeking comment/feedback.
What specific matters were discussed?	Request for feedback/review/comment on the submitted CTPMSP.
What matters were resolved?	None, there was no response from Council to this submission.
What matters are unresolved?	None, there was no response from Council to this submission.
Any remaining points of disagreement?	None, there was no response from Council to this submission.
How will SINSW address matters not resolved?	None, there was no response from Council to this submission.
5. 26/03/21 – Meeting	
Identify persons/ positions involved.	*Attendees:* - Daniel Sui (Senior Traffic Engineer Willoughby City Council) - German Barragan (Traffic Engineer, Willoughby City Council) - Andrew Buchanan (Project Director, RCC)
Provide details of the consultation.	*See attached meeting summary 'Council Consultation Record 5 - 260321 Meeting Summary'.* This meeting was between RCC and relevant members of Willoughby City Council to present the project requirements and run through the first submission of the CTPMSP.
What specific matters were discussed?	- Construction phasing and methodology. - Existing consultation with school community to avoid interrupted construction works. - Construction traffic volumes - Jenkins Street works zone access - Edgar Ave vehicle size - Street parking availability - Pacific Highway access and pedestrian management.

What matters were resolved?	N/A – Council still to provide comment/feedback.
What matters are unresolved?	N/A – Council still to provide comment/feedback.
Any remaining points of disagreement?	N/A – Council still to provide comment/feedback.
How will SINSW address matters not resolved?	N/A – Council still to provide comment/feedback.
6. 30/03/21 – Email	
Identify persons/ positions involved.	*From:* - German Barragan (Traffic Engineer, Willoughby City Council) *To:* - Obadiah Williams (Project Engineer, RCC)
Provide details of the consultation.	*See attached email 'Council Consultation Record 6 - 300321 Email'.* This email was the first response from Council on the submitted CTPMSP, outlining their key comments and desired changes to the plan.
What specific matters were discussed?	- Construction vehicle traffic generation - Traffic generation and street parking - Construction vehicle types, demand, access routes to the site - Jenkins Street works zone - Monitoring and communication strategies
What matters were resolved?	N/A – Council raised issues to be addressed in a revised report.

What matters are unresolved?	Everything listed in the attached email from German Barragan.
Any remaining points of disagreement?	N/A – Council raised issues to be addressed in a revised report.
How will SINSW address matters not resolved?	RCC and TTPP to revise CTPSMSP based on comments received.
7. 01/04/21 – Meeting	
Identify persons/ positions involved.	*Attendees:* - Daniel Sui (Senior Traffic Engineer Willoughby City Council) - German Barragan (Traffic Engineer, Willoughby City Council) - Andrew Buchanan (Project Director, RCC) - Obadiah Williams (Project Engineer, RCC)
Provide details of the consultation.	*There are no minutes from this meeting, discussion items were from the previously received email from German Barragan.* This meeting was between RCC and Willoughby City Council, to go through the relevant parts of the CTPMSP and associated comments received from Council on the 30/03/21, prior to amending the CTPMSP.
What specific matters were discussed?	Every comment received from German Barragan on the 30/03/21.
What matters were resolved?	Council did acknowledge that a access to the Jenkins Street works zone would need to be available to RCC.
What matters are unresolved?	RCC and TTPP to amend the CTPMSP as per previous comments and general meeting discussion and re-submit.
Any remaining points of disagreement?	N/A – RCC and TTPP to re-submit revised CTPMSP for further review by Council.

How will SINSW address matters not resolved?	N/A – RCC and TTPP to re-submit revised CTPMSP for further review by Council.
8. 09/04/21 - Email	
Identify persons/ positions involved.	*From:* - Lalaine Malaluan (Traffic Engineer, TTPP) *To:* - Daniel Sui (Senior Traffic Engineer Willoughby City Council) - German Barragan (Traffic Engineer, Willoughby City Council)
Provide details of the consultation.	*See attached email 'Council Consultation Record 8 - 090421 Email'.* This was an email submission of the revised CTPMSP based on previous comments and discussion with Council. Also included is the CWSTS for information only, as requested by Council in the previous meeting.
What specific matters were discussed?	N/A – Re-submission only
What matters were resolved?	N/A – Re-submission only
What matters are unresolved?	N/A – Re-submission only
Any remaining points of disagreement?	N/A – Re-submission only
How will SINSW address matters not resolved?	N/A – Re-submission only
9. 14/04/21-19/04/21 – Email Chain	

Identify persons/ positions involved.	*Recipients* - German Barragan (Traffic Engineer, Willoughby City Council) - Andrew Buchanan (Project Director, RCC) - Obadiah Williams (Project Engineer, RCC) - Lalaine Malaluan (Traffic Engineer, TTPP) - Jessica Ng (Traffic Engineer, TTPP) - Jason Rudd (Director, TTPP)
Provide details of the consultation.	*See attached email chain 'Council Consultation Record 9 - 140421-190421 Email Chain'.* This email was a response from Council on the latest CTPMSP, with minor additional comment. Also shown is the return submissions of the revised CTPMSP and return comments.
What specific matters were discussed?	- Jenkins Street works zone. - Parking survey results. - CWSTS - Pedestrian Management
What matters were resolved?	All of the above.
What matters are unresolved?	N/A – all comments from Council had been captured and incorporated into the CTPMSP as required/where relevant.
Any remaining points of disagreement?	N/A – all comments from Council had been captured and incorporated into the CTPMSP as required/where relevant.
How will SINSW address matters not resolved?	N/A
10. 20/04/21-21/04/21 – Email Chain	
Identify persons/ positions involved.	*From:* - German Barragan (Traffic Engineer, Willoughby City Council) *To:* - Obadiah Williams (Project Engineer, RCC)

Provide details of the consultation.	*See attached email chain 'Council Consultation Record 10 - 200421-210421 Email Chain'.* This email chain included a request from RCC for Council to acknowledge they were satisfied with the CTPMSP, and the corresponding receipt of that statement from Council.
What specific matters were discussed?	N/A – Receipt of approval.
What matters were resolved?	Council satisfaction with e CTPMSP.
What matters are unresolved?	N/A – Only note is for RCC to conduct the parking survey in the local area if required during the first 3 months of construction.
Any remaining points of disagreement?	N/A
How will SINSW address matters not resolved?	Meeting scheduled for the 20th.

All Correspondence/minutes/summaries can be provided on request.

NSW GOVERNMENT | Education School Infrastructure

Post Approval Consultation Record

Identified Party to Consult:	TfNSW
Consultation type:	Meetings, Teleconferences, Zoom Meetings, Email conversations, Phone Calls
When is consultation required?	Prior to commencement of construction
Why	B20 – Construction Traffic and Pedestrian Management Sub-Plan
When was consultation scheduled/held	**1. 10/04/19 – Meeting** **2. 18/10/19 – Email** **3. 04/02/21 – Meeting (Online)** **4. 03/03/21 – Email Chain** **5. 16/04/21 – Email** **6. 19/04/21-20/04/21 – Email Chain** **7. 20/04/21 – Meeting** **8. 20/04/21 – Email** **9. 21/04/21 – Email** **10. 26/04/1 – Email Chain**
1. 10/04/19 – Meeting (Prior to SSD Approval)	
Identify persons/ positions involved.	*Attendees:* - Ken Ho (Transport Planning Manager, TfNSW) - Mark Ozinga (Manager Land Use & Transport Planning, TfNSW) - Allan Borg (TfNSW) - Pahee Rathan (Senior Land Use Assessment Coordinator, TfNSW) - Zhaled Alamouti (TfNSW) - John Staff Projects
Provide details of the consultation.	Discussion of project overview and requirements. *Additional information is not available.*
2. 18/10/19 – Email (Prior to SSD Approval)	

Identify persons/ positions involved.	*From:* John Staff Projects *To:* Ken Ho (Transport Planning Manager TfNSW)*:*
Provide details of the consultation.	Issuance of Project update (revised masterplan). *Additional information is not available.*
3. 04/02/21 – Meeting (Online)	
Identify persons/ positions involved.	*Attendees:* - Pahee Rathan (Senior Land Use Assessment Coordinator, TfNSW) - Zakaria Ahmad (Network & Safety Officer, TfNSW) - Peter Carruthers (Network & Safety Services Manager) - Andrew Buchanan (Project Director, RCC) - Obadiah Williams (Project Engineer, RCC) - Jessica Ng (Traffic Engineer, TTPP) - Jason Rudd (Director, TTPP) - Lilian Ghan (Project Manager, John Staff Projects)
Provide details of the consultation.	*See attached meeting minutes 'TfNSW Consultation Record 3 - 040221 Meeting Minutes'.* RCC, TTPP, TfNSW and JSP met via Zoom to discuss the project access requirements to satisfy Consent Condition preventing access from the Pacific Highway without TfNSW approval.
What specific matters were discussed?	SINSW/RCC explained that access from the pacific Highway would be needed to complete the job. TfNSW did not object in principle to this access but wanted more information on the assurance of safety and traffic impact reduction as a result of the construction vehicle access.
What matters were resolved?	TfNSW did not object to the access requirement, and indicated that approval would be granted pending review of the CTPMSP.
What matters are unresolved?	TfNSW needed to review the CTPMSP before further advice could be given.

Any remaining points of disagreement?	N/A.
How will SINSW address matters not resolved?	Submission of draft CTPMSP to TfNSW for review.
4. 04/03/21-15/04/21 – Email Chain	
Identify persons/ positions involved.	*Recipients:* - Jessica Ng (Traffic Engineer, TTPP) - Lalaine Malaluan (Traffic Engineer, TTPP) - Pahee Rahan (Senior Land Use Assessment Coordinator, TfNSW) - Zakaria Ahmad (Network & Safety Officer, TfNSW) - Peter Carruthers (Network & Safety Services Manager) - Obadiah Williams (Project Engineer RCC)
Provide details of the consultation.	*See attached email chain 'TfNSW Consultation Record 4 - 040321-150421 Email Chain'.* This consultation consisted of emails between relevant parties, as requested in a previous meeting with TfNSW.
What specific matters were discussed?	- Issue of draft CTPMSP for review. - Requests from TTPP to have a meeting with TfNSW to discuss submitted CTPSMP. - Responses from TfNSW and eventual comments received from TfNSW. - Submission of two revised CTPMSP's to TfNSW for review.
What matters were resolved?	More specific feedback from TfNSW was received than previous meeting. CTPMSP was able to be updated to satisfy these comments.
What matters are unresolved?	Approval to use the Pacific Highway vehicle access was still outstanding, and comments on the most recent CTPMPS at this point in time had not yet been received.
Any remaining points of disagreement?	N/A

How will SINSW address matters not resolved?	RCC and TTPP were able to secure a final meeting with TfNSW to go over final TfNSW comments, with the aim of receiving approval.
5. 16/04/21 – Email (with phone call prior to email being sent)	
Identify persons/ positions involved.	*From:* Obadiah Williams (Project Engineer, RCC) *To:* Zakaria Ahmad (Network & Safety Officer, TfNSW) and Pahee Rathan (Senior Land Use Assessment Coordinator, TfNSW)
Provide details of the consultation.	*See attached email 'TfNSW Consultation Record 5 - 160421 Email'.* Request from RCC to receive TfNSW comments on submitted CTPSMP, post phone call on the same day between O.W and Z.A.
What specific matters were discussed?	On phone call prior to follow up email, matters relating to hours of Pacific Highway vehicle entrance being in use, and the proposed safety measures were discussed, with RCC requesting any final comments/feedback from TfNSW on the CTPMSP, so that these could be addressed and the matter closed out in preparation of the meeting scheduled for the 20th. Zak communicated that he had not yet reviewed the latest CTPMSP, but would aim to get comments to RCC/TTPP before the meeting on the 20th.
What matters were resolved?	None.
What matters are unresolved?	Same as previous.
Any remaining points of disagreement?	N/A
How will SINSW address matters not resolved?	Meeting scheduled for the 20th.

6. 19/04/21-20/04/21 – Email Chain	
Identify persons/ positions involved.	*Recipients:* - Jessica Ng (Traffic Engineer, TTPP) - Jason Rudd (Director, TTPP) - Lalaine Malaluan (Traffic Engineer, TTPP) - Zakaria Ahmad (Network & Safety Officer, TfNSW) - Peter Carruthers (Network & Safety Services Manager) - Obadiah Williams (Project Engineer RCC)
Provide details of the consultation.	*See attached email chain 'TfNSW Consultation Record 6 - 190421-200421 Email Chain'.* This consultation consisted of emails between relevant parties, to receive and satisfy TfNSW comments on the CTPMSP before final meeting scheduled for the 20th.
What specific matters were discussed?	- Submission of revised CTPMSP based on comments received from Council - Receipt of final comments from TfNSW - Response comments from RCC for discussion at meeting that same day (20th).
What matters were resolved?	- Swept paths for De Villiers Avenue and Eddy Road. - Swept paths on local road network.
What matters are unresolved?	- Potential kerb modification on Pacific Highway. - Lane impact on vehicle egress from Pacific Highway vehicle access driveway.
Any remaining points of disagreement?	N/A
How will SINSW address matters not resolved?	Meeting scheduled for the 20th.
7. 20/04/21 – Meeting	

Identify persons/ positions involved.	*Attendees:* - Pahee Rathan (Senior Land Use Assessment Coordinator, TfNSW) - Zakaria Ahmad (Network & Safety Officer, TfNSW) - Peter Carruthers (Network & Safety Services Manager) - Andrew Buchanan (Project Director, RCC) - Obadiah Williams (Project Engineer, RCC) - Jessica Ng (Traffic Engineer, TTPP) - Jason Rudd (Director, TTPP) - Lilian Ghan (Project Manager, John Staff Projects)
Provide details of the consultation.	*There are no minutes from this meeting. The prior email chain and following updates to the consultation table and feedback summary within the final CTPMSP outline what was discussed in this meeting.* This meeting was a brief review of the previously received final comments from TfNSW on the CTPMSP.
What specific matters were discussed?	- Potential kerb modification on Pacific Highway. - Lane impact on vehicle egress from Pacific Highway vehicle access driveway.
What matters were resolved?	- Potential kerb modification on Pacific Highway (Not required). - Lane impact on vehicle egress from Pacific Highway vehicle access driveway (Not an issue post discussion about driveway width).
What matters are unresolved?	Receipt of TfNSW approval to use Pacific Highway access driveway. TfNSW advised they would issue this within 2 days. TfNSW also requested that they sight Council's acceptance of the current CTPMSP, which RCC issued the following day.
Any remaining points of disagreement?	N/A
How will SINSW address matters not resolved?	N/A
8. 21/04/21 – Email	
Identify persons/ positions involved.	From Obadiah Williams (Project Engineer, RCC) to Zakaria Ahmad (Network & Safety Officer, TfNSW)

Provide details of the consultation.	*See attached email 'TfNSW Consultation Record 8 - 210421 Email'.* Submission of email to TfNSW that displays Council's satisfaction with the CTPMSP based on Council consultation.
What specific matters were discussed?	TfNSW had previously requested that they sight Council's acceptance of the current CTPMSP. This email was RCC's submission of this to TfNSW.
What matters were resolved?	N/A
What matters are unresolved?	N/A
Any remaining points of disagreement?	N/A
How will SINSW address matters not resolved?	N/A
9. 20/04/21-26/04/21 – Email Chain	
Identify persons/ positions involved.	From Zakaria Ahmad (Network & Safety Officer, TfNSW) to Jessica Ng (Traffic Engineer, TTPP).
Provide details of the consultation.	*See attached email chain 'TfNSW Consultation Record 9 - 200421-260421 Email Chain'.* TTPP Submission of final CTPMSP and request for approval letter, TfNSW issue of approval letter for the Project CTPMSP.
What specific matters were discussed?	- Submission of final CTPMSP based on comments from meeting earlier that day. - Follow up requests from TTPP regarding TfNSW approval to use the Pacific Highway entrance. - Eventual submission of approval letter from TfNSW.

What matters were resolved?	Approval from TfNSW was received.
What matters are unresolved?	N/A
Any remaining points of disagreement?	N/A
How will SINSW address matters not resolved?	N/A

All Correspondence/minutes/summaries can be provided on request.

Jason Rudd
Director

Industry Experience

26 years

Qualifications & Memberships

- BSc (Hons) (1st Class): University of New South Wales
- Australian Institute of Traffic Planning & Management (AITPM)
- Engineers Australia, Companion Member
- Chairman, Transport Panel, Engineers Australia 2008–2009

Key Skills & Competencies

- Traffic, transport and parking impact assessments
- Transport planning
- Integrated transport plans,
- Parking assessments
- Construction traffic management

Professional Background

2015 – Present The Transport Planning Partnership

2012 – 2015 GTA Consultants

2001 – 2012 Masson Wilson Twiney / Halcrow

1999 – 2001 Sinclair Knight Merz

1993 – 1999 Environmental Resources Management (formerly Mitchell McCotter)

Professional Overview

Jason has over twenty five years consulting experience in the field of traffic and transport planning for a broad cross-section of clients across the Australasian private and public business sector.

Jason has particular expertise in the assessment of proposed land use developments and transport infrastructure with an emphasis on the preparation of traffic and transport impact assessments, integrated transport plans, parking assessments and construction traffic management.

Jason appears as an expert witness in the NSW Land and Environment Court.

Industry Experience

Public Domain Transport Planning Projects

Quay & Connecting Streets (China Town) Public Domain Plan with Spackman Mossop Michaels

Pine Park Master Plan (Ramsgate) with Spackman Mossop Michaels

Chatswood Chase Shopping Centre Redevelopment

Entertainment Quarter, Moore Park

World Square Development, Sydney

Energy & Extractive Industry Projects

Biala Wind Farm EIS

Taralga Wind Farm EIS, Road Safety Review

Solar Farm Construction Traffic Management Plans – Narromine, Parkes, Dubbo

Newcastle Coal Loader Upgrade (Newcastle Coal Infrastructure Group)

Transport Interchange Studies

Chatswood Transport Interchange Development

Epping Station Upgrade, Epping to Parramatta Rail Line Project

Lidcombe Railway Station Turnback Facility NSW

Randwick Racecourse Transit Hub Project

Fairfield Transport Interchange Upgrade

Commuter Car Park Programme (Waterfall, Emu Plains, Woonoona)

Sydney Metro, Martin Place Over Station Development

Sydney Metro. Pitt Street North Over Station Development

Traffic Management Plans

Sydney Harbour Casino and Pyrmont Point Construction Traffic Management Plans

New Life Ultimo – Harris Street, Construction Traffic Management Plans

University Transport Planning

University of Sydney Campus Master Plan Transport Planning

Numerous University of Sydney Development Projects including:

- USyd Central
- Darlington Campus Public Domain Plan
- City Road Pedestrian Bridge
- Faculty of Law Building
- F23 & Carslaw Building Redevelopment

University of NSW – Cliffbrook School of Business

Transport Management & Accessibility Plan

McQuoin Park Aged Care Facility

Sydney International Convention and Entertainment Centre Concept Plan Application & TMAP

Transport Planning & Assessments

NSW Ambulance Service, Site Selection and Feasibility Assessments for Ambulance Stations in Sydney Metropolitan Area

1 Bligh Street, Sydney (Commercial Development)

Newcastle CBD Light Rail Project Review (Newcastle city Council)

Jacksons Landing, Pyrmont, Residential Development

286 Sussex Street, Sydney Mixed Use Development

495 Harris Street, Pyrmont Mixed Use Development

Potts Hill Reservoir Employment and Residential

Kings Hills Urban Release Area

Roche Pharmaceuticals Relocation

McQuoin Park Aged Care Centre

Epping Park (former Ch 7 Site) Residential Development

6.8 CONSTRUCTION NOISE & VIBRATION MANAGEMENT SUB-PLAN

The Construction Noise & Vibration Management Sub-Plan has been prepared by Pulse White Noise Acoustics for the Project.

It is not embedded in this document; it is supplied as an attached appendix so that it can be displayed/updated/revised in isolation if required.

Chatswood Public & High School – Construction Noise Vibration Management Sub-Plan (CNVMSP)

Richard Crookes Constructions Pty Ltd

Level 3, 4 Broadcast Way,
Artarmon, NSW, 2040

Report number: 210069 - Chatswood Public & High School - CNVMSP - R5.docx
Date: 29 April 2021
Version: Issue 4

Project Number: 210069

PULSE WHITE NOISE ACOUSTICS Level 5, 73 Walker Street, North Sydney NSW 2060
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DOCUMENT CONTROL

Project Name	Chatswood Public & High School – Construction Noise Vibration Management Sub-Plan (CNVMSP)
Project Number	210069
Report Reference	210069 - Chatswood Public & High School - CNVMSP - R5.docx
Client:	Richard Crookes Constructions Pty Ltd

Revision	Description	Reference	Date	Prepared	Checked	Authorised
1	Issue 1	210069 - Chatswood Public & High School - CNVMSP - R1	1st March 2021	Matthew Furlong	Alex Danon	Ben White
2	Issue 2	210069 - Chatswood Public & High School - CNVMSP - R2	17th March 2021	Matthew Furlong	Alex Danon	Ben White
3	Issue 3	210069 - Chatswood Public & High School - CNVMSP - R3	30th March 2021	Matthew Furlong	Alex Danon	Ben White
4	Issue 4	210069 - Chatswood Public & High School - CNVMSP - R5.docx	19th April 2021	Matthew Furlong	Alex Danon	Ben White
5	Issue 5	210069 – Chatswood Public & High School – CNVMSP – R5.docx	29th April 2021	Matthew Furlong	Alex Danon	Ben White

PREPARED BY:

Pulse White Noise Acoustics Pty Ltd
ABN 95 642 886 306
Level 5, 73 Walker Street, North Sydney, 2060
1800 4 PULSE

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TABLES

FIGURES

1 INTRODUCTION

Pulse White Noise Acoustics (PWNA) has been engaged by Richard Crookes Constructions (RCC) to prepare a Construction Noise and Vibration Management Sub-Plan (CNVMSP) for the redevelopment of Chatswood Public School along the Pacific Highway and Chatswood High School located along Centennial Avenue, Chatswood, as part of the Chatswood Education Precinct project.

This CNVMSP has been prepared to satisfy the requirements of Conditions B19, B21 and C8 of the Consent given in the *Notice of Determination – Approval* issued for Development Application No. SSD 9483, dated 30th November 2020.

Onsite unattended noise levels have previously been determined for the project by Day Design Pty Ltd ("DD") in the site's *Acoustic Assessment Report* submitted as part of the SSD Application reference "6698-1.1R Rev A", dated 10th March 2020. These levels are adopted for this assessment.

A glossary of acoustic terminology used throughout this report is included in Appendix A.

1.1 Condition Satisfaction

In addressing the requirements of Condition B21 (see section 3.1), each item is addressed in the following section:

Table 1 Condition Satisfaction Table

CEMP Condition Satisfaction Table		
Condition	Condition Requirements	Document/Sub-Plan Reference
Condition B21	The Construction Noise and Vibration Management Sub-Plan must address, but not be limited to, the following:	-
	(a) be prepared by a suitably qualified and experienced noise expert;	Refer to Appendix C: Author Curriculum Vitae (CV) – Page 91
	(b) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009);	Refer to section 3.2.1 – Page 19.
	(c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;	Refer to section 5 – Page 75.
	(d) include strategies that have been developed with the community for managing high noise generating works;	Refer to section 5.4 – Page 80.
	(e) describe the community consultation undertaken to develop the strategies in condition B21(d);	
	(f) include a complaints management system that would be implemented for the duration of the construction; and	Refer to section 5.5 – Page 80.
	(g) include a program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the implemented management measures in accordance with the requirements of condition B18.	Refer to section 5.2.3 & 5.3.2 – Page 79 & 78.

1.2 Development Overview

In brief, the proposed redevelopment will entail the following works:

- Chatswood Public School:
  - 53 x homebase classrooms (25 existing and 28 new spaces);
  - 4 x special program classrooms;

- 3 x special support unit classrooms;
- New buildings P1, P2 and G (hall);
- Maximise COLA and quality play spaces including roof top;
- Demolition of buildings D, H, I and removal of demountables;
- New car parking facilities and sports court; and
- Associated site works and landscaping.

- Chatswood High School:
  - 119 x homebases (21 existing and 98 new spaces)
  - 4 x special support unit classrooms;
  - New buildings R, S, Q, T (hall); and
  - Associated site works and landscaping.

1.3 Project Staging

To ensure the successful delivery of the project whilst maintaining two (2) operating schools whilst the works are being completed it is proposed that the project is delivered in a staged approach. In this case staging of construction works will ensure some surrounding receivers are provided with respite from works as the works area will change throughout the project based on the size of the project.

1.4 Site Layout

The project is located over two separate sites located along Centennial Avenue. The Public School is located at 5 Centennial Avenue, Chatswood, and is located on the corner of Centennial Avenue and Pacific Highway. The High School is located further west along Centennial Avenue situated at 24 Centennial Avenue.

Surrounding the Chatswood Education Precinct are several sensitive receivers, these are summarised below for each site. For the Chatswood Public School, the site is surrounded by the following:

- Along the northern boundary of the Public-School site is existing residential dwellings and commercial building. The commercial building is approved to be future residences under approval DA-2017/300 & DA-2017/300/A. At this stage for the purpose of this assessment it is assumed the receiver is still commercial and will be updated if required during construction works.
- To the east of the site is Pacific Highway and additional residential and commercial receivers located opposite.
- Along the southern boundary is Centennial Avenue with existing residential with commercial receivers located opposite.
- Along the western boundary of the site is a combination of Jenkins Street along the southern portion and existing residential dwellings along the northern portion of the boundary.

Chatswood High School is surrounded by the following:

- Along the northern boundary of the High School site is Centennial Avenue and existing residential dwellings located opposite.
- Along the eastern boundary is the following (from north to south):

- Residential dwelling situated along the northern most part of the eastern boundary (along Centennial Avenue)
- Residential apartment block situated to south of the dwelling above which is also along the northern portion of Oliver Road (see below), which also overlooks the school campus.
- Cul-de-sac off Oliver Road (also acting as a one of the vehicle access points for the School).
- Residential apartment block situated to the south of Oliver Road and Freeman Road (see below), which overlooks the school campus.
- Cul-de-sac off Freeman Road with a major pedestrian access to the temporary bush campus for public school during the works.
- Residential apartment block between Freeman Road and Eddy Road (see below).

- Along the western boundary is the combination of De Villers Avenue for the southern portion of the boundary which also acts as the main vehicle access to the school campus. Along the northern portion of the western boundary is existing residential dwellings located along Dardanelles Road.

A summary of the surrounding receivers for each school are presented below.

Table 2 Surrounding Receiver Locations

Site	Receiver Number	Receiver Type	Address	Cardinal Direction
Chatswood Public School (5 Centennial Avenue, Chatswood)	Receiver 1	Residential	1 & 2 James Street, Chatswood	North
	Receiver 2	Residential	1-5 Jenkins Street, Chatswood	North-west
	Receiver 3 (see below)	Residential	9 Centennial Avenue, Chatswood (Dual Receiver – Both Schools) Dwelling currently vacated due to dwelling being derelict	West
Chatswood Public School (5 Centennial Avenue, Chatswood)	Receiver 4 (see below)	Residential	22 Centennial Avenue, Chatswood (Dual Receiver – Both Schools)	South-west corner
	Receiver 5	Residential	18 Centennial Avenue, Chatswood	South
	Receiver 6	Residential	8-14 Centennial Avenue, Chatswood	South
	Receiver 7	Commercial	676 Old Pacific Highway, Chatswood	South-east corner
	Receiver 8	Commercial	781-799 Pacific Highway, Chatswood	East
	Receiver 9	Residential	809-811 Pacific Highway, Chatswood	East
	Receiver 10	Residential	688 &692 Pacific Highway, Chatswood	North-east corner
Chatswood High School (24 Centennial Avenue, Chatswood)	Receiver 11	Residential	17-31 Centennial Avenue, Chatswood	North
	Receiver 12	Residential	13-15 Centennial Avenue, Chatswood	North
	Receiver 3 (see above)	Residential	9 Centennial Avenue, Chatswood (Dual Receiver – Both Sites)	North

Site	Receiver Number	Receiver Type	Address	Cardinal Direction
	Receiver 4 (see above)	Residential	22 Centennial Avenue, Chatswood (Dual Receiver – Both Sites)	North-east corner
	Receiver 13	Residential	1-3 Oliver Road & 18 Oliver Road, Chatswood	East
	Receiver 14	Residential	20 Freeman Road, Chatswood	East
	Receiver 15	Residential	25 Goodchap Road, Chatswood	South
	Receiver 16	Residential	36-38 Goodchap Road, 22-26 Eddy Road & 17-19A Lone Pine Avenue, Chatswood	South
	Receiver 17	Residential	16-18 Lone Pine Avenue, 28-36 Eddy Road Chatswood	South-west
	Receiver 18	Residential	69 Eddy Road & 2-2B De Villiers Avenue, Chatswood	West-south corner
	Receiver 19	Residential	1-9 Dardanelles Road, Chatswood	West
	Receiver 20	Residential	60 Centennial Avenue, Chatswood	West-north corner

Note 1: Several of the receivers outlined above were previously determined as part of the Acoustic Report prepared by Day Design for the SSD Submission. For the purposes of accuracy as well as a detailed assessment some receivers have been separated or added.

As detailed above, Receivers 3 & 4 are located equally between both the Public School and High School. As such, the individual and cumulative impacts on these receivers will be assessed below.

A map showing the site location, receiver locations and all measurement locations is provided in Figure 1 below.

Figure 1 Chatswood Education Precinct Site Map and Measurement Locations – Sourced from SixMaps NSW

Figure 2 Site Map and Receiver Locations Chatswood Public School – Sourced from SixMaps NSW

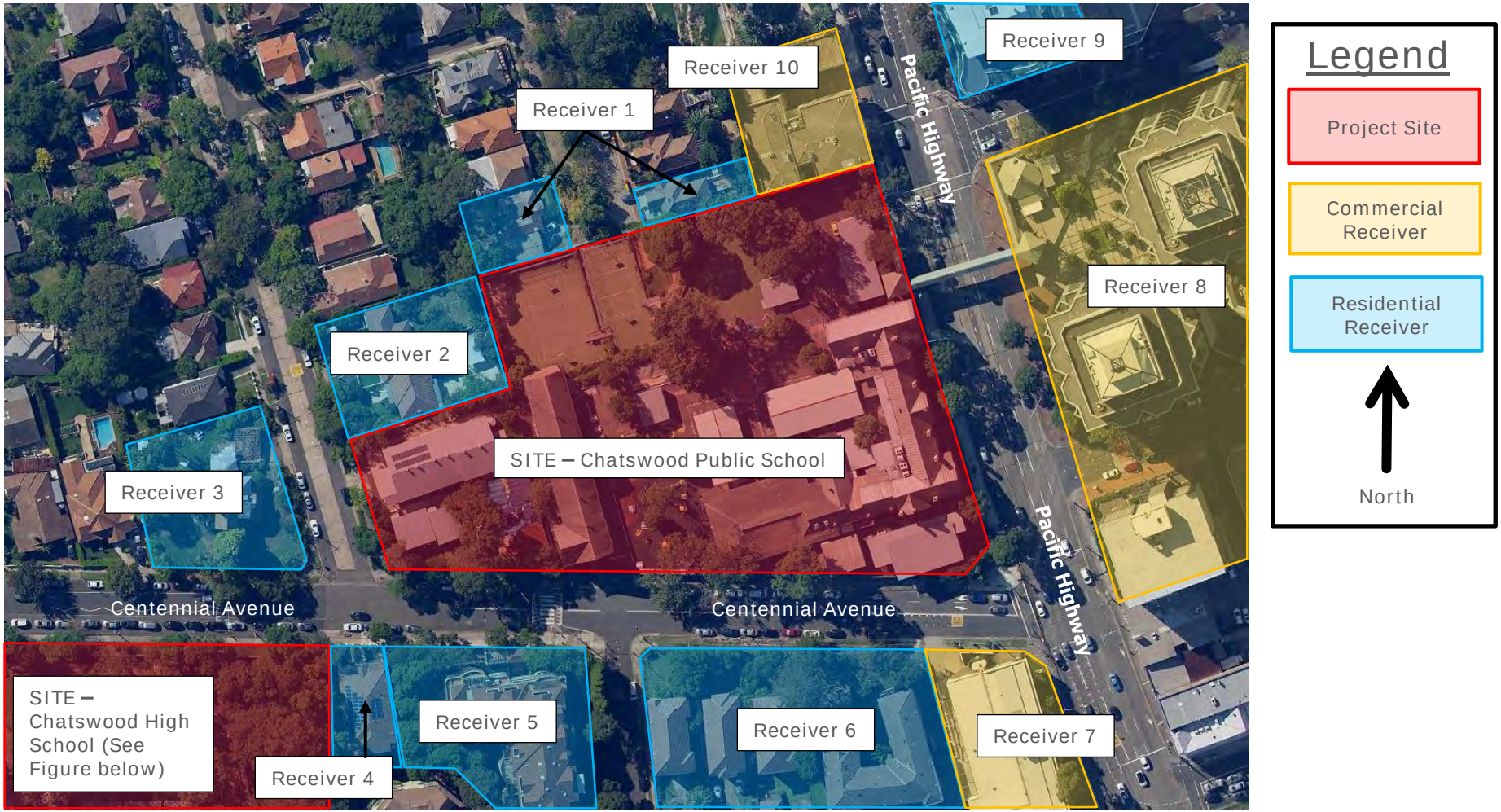
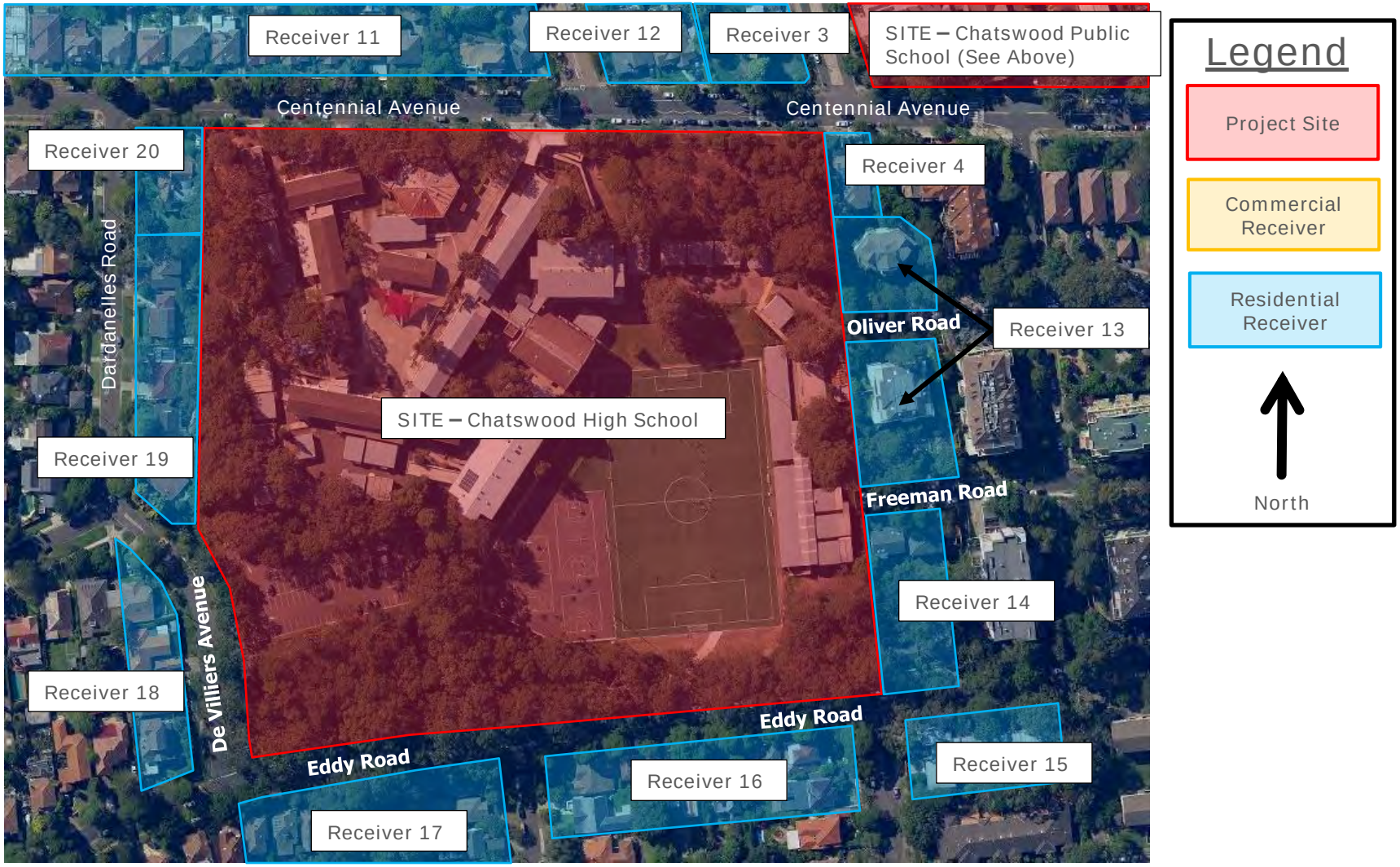


Figure 3 Site Map and Receiver Locations Chatswood High School – Sourced from SixMaps NSW



2 EXISTING ACOUSTIC ENVIRONMENT

Measurements of the existing background noise levels have previously been conducted by Day Design Pty Ltd as part of their *Acoustic Assessment Report* (reference 6698-1R REV A, dated 10th March 2020) which was submitted as part of the SSD Application. Information regarding the monitoring conducted by Day Design Pty Ltd is provided below.

Figure 4 Extract of Day Design *Acoustic Assessment Report*

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4.0 NOISE EMISSION CRITERIA

4.1 Background Noise Level

In order to assess the severity of a possible environmental noise problem in a residential area it is necessary to measure the ambient background noise level at the times and locations of worst possible annoyance. The lower the background noise level, the more perceptible the intrusive noise becomes and the more potentially annoying.

The ambient L_{90} background noise level is a statistical measure of the sound pressure level that is exceeded for 90% of the measuring period (typically 15 minutes).

The Rating Background Level (RBL) is defined by the NSW EPA as the median value of the (lower) tenth percentile of L_{90} ambient background noise levels for the day, evening or night time periods, measured over a number of days during the proposed days and times of operation.

The places of worst possible annoyance are the residences identified in Table 1. These potentially affected locations can be seen in Figure 2. The times of greatest annoyance will be during the day time when students are outdoors for breaks.

Five environmental noise loggers were placed surrounding the School sites as shown on Figure 1. Logger Location 'A', while located on the Chatswood Public School site, is representative of any residential premsies fronting Pacific Highway and considered a suitable monitoring location. Logger Location 'C', while located on the Chatswood High School site, was located directly adjacent to the residential presmies on Oliver Road, next to a metal pailing fence. The acoustic environment between the logger location and the residential location is considered to be idnentical and considered a suitable monitoring location.

Logger Location 'B', Logger Location 'D' and Logger Location 'E' were located on residential presmies in close proximity to the School sites. Logger Location 'E' was only able to be located on residential premises across from

Ref: 6698-1.1R REV A 10-Mar-20

Figure 4 Extract of Day Design *Acoustic Assessment Report* (Cont.)

The measured noise levels are presented in the attached Appendix A1 to A5 and also in Table 3 below.

Table 3 Ambient Noise Levels – Chatswood

Location	Time Period	L_{90} Rating Background Level (dBA)	Existing Ambient L_{eq} Noise Level (dBA)
Location 'A' – Chatswood Public School (Front of site, facing Pacific Highway)	Day (7 am to 6 pm)	57	70
	Evening (6 pm to 10 pm)	57	70
	Night (10 pm to 7 am)	48	67
Location 'B' – 1A James Street, Chatswood (Front Balcony, towards Public School Active Play)	Day (7 am to 6 pm)	45	53
	Evening (6 pm to 10 pm)	41	53
	Night (10 pm to 7 am)	37	48
Location 'C' – Chatswood High School (School grounds, adjacent to 1-3 Oliver Road, Chatswood)	Day (7 am to 6 pm)	46	54
	Evening (6 pm to 10 pm)	43	53
	Night (10 pm to 7 am)	40	51
Location 'D' – 21 Centennial Avenue, Chatswood (Front Yard, facing Centennial Avenue)	Day (7 am to 6 pm)	43	57
	Evening (6 pm to 10 pm)	41	58
	Night (10 pm to 7 am)	34	51
Location 'E' – 8 Dardanelles Street, Chatswood (Front Yard, facing Dardanelles Street)	Day (7 am to 6 pm)	37	52
	Evening (6 pm to 10 pm)	35	55
	Night (10 pm to 7 am)	30*	45

*Actual measured ambient noise level was 28 dBA

Extraneous noise from children playing in the outdoor areas of the School has been excluded from the measurements. Atmospheric conditions were ideal for noise monitoring. Noise measurements were therefore considered reliable and typical for the receptor area.

In the assessment of construction noise in NSW "Background + 10dBA" (or known as a *Noise Affected Level)* objective is applied. As such, to determine what the noise affected level is for each of the surrounding residential receivers, rating background noise levels presented in the table below have been adopted.

Note: As mentioned in the sections above, Day Design have previously determined the site's surrounding receivers and background noise levels. For this assessment, PWNA have adopted these noise level selections and applied them to our additional receivers (refer to Table 25 of the Day Design Report).

Table 3 Assumed ambient noise levels at residential receivers

Receiver Number	Receiver Location	Adopted Measured Rating Background Level at Receiver Location dBA L_{A90}[2]	
		7:00am to 6:00pm	6:00pm to 7:00pm
Receiver 1	1 & 2 James Street, Chatswood	45	41
Receiver 2	1-5 Jenkins Street, Chatswood	45	41
Receiver 3	9 Centennial Avenue, Chatswood	46	43
Receiver 4	22 Centennial Avenue, Chatswood	46	43
Receiver 5	18 Centennial Avenue, Chatswood	46	43
Receiver 6	8-14 Centennial Avenue, Chatswood	46	43
Receiver 9	809-811 Pacific Highway, Chatswood	57	57
Receiver 10	688 &692 Pacific Highway, Chatswood	57	57
Receiver 11	17-31 Centennial Avenue, Chatswood	43	41
Receiver 12	13-15 Centennial Avenue, Chatswood	43	41
Receiver 13	1-3 Oliver Road & 8 Oliver Road, Chatswood	43	41
Receiver 14	20 Freeman Road, Chatswood	43	41
Receiver 15	25 Goodchap Road, Chatswood	43	41
Receiver 16	36-38 Goodchap Road, 22-26 Eddy Road & 17-19A Lone Pine Avenue, Chatswood	43	41
Receiver 17	16-18 Lone Pine Avenue, 28-36 Eddy Road Chatswood	43	41
Receiver 18	69 Eddy Road & 2-2B De Villiers Avenue, Chatswood	37	35
Receiver 19	1-9 Dardanelles Road, Chatswood	37	35
Receiver 30	60 Centennial Avenue, Chatswood	43	41

Note 1: For Monday to Saturday, Daytime 7:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 7:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 8:00 am

Note 2: The L_{A90} noise level is representative of the "average minimum background sound level" (in the absence of the source under consideration), or simply the background level.

3 NOISE AND VIBRATION CRITERIA

Relevant noise and vibration criteria for construction activities are detailed below.

3.1 SSD 9483 Development Consent – Schedule 1 Conditions

Conditions of the consent which relate to construction noise and or vibration are detailed below.

Condition B18:

Environmental Management Plan Requirements

B18. Management plans required under this consent must be prepared having regard to the relevant guidelines, including but not limited to the *Environmental Management Plan Guideline: Guideline for Infrastructure Projects* (DPIE April 2020).

Note:

- *The Environmental Management Plan Guideline is available on the Planning Portal at: https://www.planningportal.nsw.gov.au/major-projects/assessment/post-approval*
- *The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.*

Condition B19:

Construction Environmental Management Plan

B19. Prior to the commencement of construction, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the Certifier and provide a copy to the Planning Secretary for information. The CEMP must include, but not be limited to, the following:

(a) Details of:

(i) hours of work;

(ii) 24-hour contact details of site manager;

(iii) management of dust and odour to protect the amenity of the neighbourhood;

(iv) external lighting in compliance with AS 4282-2019 Control of the obtrusive effects of outdoor lighting;

(v) community consultation and complaints handling as set out in the Community Communication Strategy required by condition B14;

(b) an unexpected finds protocol for contamination and associated communications procedure to ensure that potentially contaminated material is appropriately managed;

(c) an unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communications procedure;

(d) Construction Traffic and Pedestrian Management Sub-Plan (see condition B20);

(e) Construction Noise and Vibration Management Sub-Plan (see condition B21); and

(f) Construction Soil and Water Management Sub-Plan (see condition B23).

Condition B21:

B21. The Construction Noise and Vibration Management Sub-Plan 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);

(c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;

(d) include strategies that have been developed with the community for managing high noise generating works;

(e) describe the community consultation undertaken to develop the strategies in condition B21(d);

(f) include a complaints management system that would be implemented for the duration of the construction; and

(g) include a program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the implemented management measures in accordance with the requirements of condition B18.

Note:

- *In addressing item (a) above, refer to Appendix C.*
- *In addressing item (b) & (c) above, refer to section 5.*
- *In addressing item (d) & (e) above, refer to section 5.4 specifically.*
- *In addressing item (f) above, refer to section 5.4 & 5.5.*
- *In addressing item (g) above, refer to sections 5.2.3 & 5.3.2 specifically.*

Condition C4:

Construction Hours

C4. Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

(a) between 7am and 6pm, Mondays to Fridays inclusive; and

(b) between 8am and 1pm, Saturdays.

No work may be carried out on Sundays or public holidays.

Condition C5:

C5. Notwithstanding condition C4, provided noise levels do not exceed the existing background noise level plus 5dB, works may also be undertaken during the following hours:

(a) between 6pm and 7pm, Mondays to Fridays inclusive; and

(b) between 1pm and 4pm, Saturdays.

Condition C6:

C6. Construction activities may be undertaken outside of the hours in condition C4 and C5 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.

Condition C7:

C7. Notification of such construction activities as referenced in condition C6 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

Condition C8:

C8. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:

(a) 9am to 12pm, Monday to Friday;

(b) 2pm to 5pm Monday to Friday; and

(c) 9am to 12pm, Saturday.

Condition C13:

Construction Noise Limits

C13. The development must be constructed to achieve the construction noise management levels detailed in *the Interim Construction Noise Guideline* (DECC, 2009). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the management and mitigation measures identified in the approved Construction Noise and Vibration Management Plan.

Condition C14:

C14. The Applicant must ensure construction vehicles (including concrete agitator trucks) do not arrive at the site or surrounding residential precincts outside of the construction hours of work outlined under condition C4.

Condition C15:

C15. The Applicant must implement, where practicable and without compromising the safety of construction staff or members of the public, the use of 'quackers' to ensure noise impacts on surrounding noise sensitive receivers are minimised.

Condition C16:

Vibration Criteria

C16. Vibration caused by construction at any residence or structure outside the site must be limited to:

(a) for structural damage, the latest version of *DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures* (German Institute for Standardisation, 1999); and

(b) for human exposure, the acceptable vibration values set out in the *Environmental Noise Management Assessing Vibration: a technical guideline* (DEC, 2006) (as may be updated or replaced from time to time).

Condition C17:

C17. Vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria specified in condition C16.

Condition C18:

C18. The limits in conditions C16 and C17 apply unless otherwise outlined in a Construction Noise and Vibration Management Plan, approved as part of the CEMP required by condition B21 of this consent.

3.2 Construction Noise Criteria

3.2.1 NSW EPA Interim Construction Noise Guideline (ICNG) – DECC 2009

Noise criteria for construction and demolition activities are discussed in the *Interim Construction Noise Guideline* (ICNG). The ICNG also recommends procedures to address potential impacts of construction noise on residences and other sensitive land uses. The main objectives of the ICNG are summarised as follows:

- Promote a clear understanding of ways to identify and minimise noise from construction works;
- Focus on applying all "feasible" and "reasonable" work practices to minimise construction noise impacts;
- Encourage construction to be undertaken only during the recommended standard hours unless approval is given for works that cannot be undertaken during these hours;
- Streamline the assessment and approval stages and reduce time spent dealing with complaints at the project implementation stage; and

- Provide flexibility in selecting site-specific feasible and reasonable work practices in order to minimise noise impacts.

The ICNG contains a quantitative assessment method which is applicable to this project. Guidance levels are given for airborne noise at residences and other sensitive land uses.

The quantitative assessment method involves predicting noise levels at sensitive receivers and comparing them with the Noise Management Levels (NMLs). The NML affectation categories for residential receivers have been reproduced from the guideline and are listed in the table below.

Table 4 NMLs for quantitative assessment at residences

Time of Day	Noise Management Level $L_{Aeq(15minute)}$[1,2]	How to Apply
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	*"Noise Affected **Level**"* RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq(15minute)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	*"Highly Noise Affected **Level**"* 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.

Note 1 *Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.*

Note 2 *The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the NSW Noise Policy for Industry (EPA 2017).*

Note 3 *Requirements listed in the table above are in accordance with the Construction Hours listed in Condition C4 and C5.*

Construction noise levels at other noise receivers are outlined below:

- Construction noise levels within classrooms at schools and other educational institutions is not to exceed 45dB LAeq,15minute, when measured internally.
- Construction noise levels within places of worship is not to exceed 45dB LAeq,15minute, when measured internally.
- Construction noise levels at offices, retail outlets is not to exceed 70dB LAeq,15minute, when measured externally.

Based on the measured background noise levels summarised in section 3, and the NMLs outlined above the construction noise criteria to be used in this assessment are listed in Table 3-5.

Table 3-5 NMLs as basis for the acoustic assessment

Receiver Types		NML, dB $L_{Aeq(15minute)}$	
		Standard Hours Monday to Friday: 7:00am to 6:00pm Saturday: 8:00am to 1:00pm	Outside Standard Hours Monday to Friday: 6:00pm to 7:00pm Saturday 1:00pm to 4:00pm
Residences (Measured externally)	Receiver 1	55 + *HNAL* = 75	46
	Receiver 2	55 + *HNAL* = 75	46
	Receiver 3	56 + *HNAL* = 75	48
	Receiver 4	56 + *HNAL* = 75	48
	Receiver 5	56 + *HNAL* = 75	48
	Receiver 6	56 + *HNAL* = 75	48
	Receiver 9	67 + *HNAL* = 75	62
	Receiver 11	53 + *HNAL* = 75	46
	Receiver 12	53 + *HNAL* = 75	46
	Receiver 13	53 + *HNAL* = 75	46
	Receiver 14	53 + *HNAL* = 75	46
	Receiver 15	53 + *HNAL* = 75	46
	Receiver 16	53 + *HNAL* = 75	46
	Receiver 17	53 + *HNAL* = 75	46
	Receiver 18	47 + *HNAL* = 75	40
	Receiver 19	47 + *HNAL* = 75	40
	Receiver 20	53 + *HNAL* = 75	46
Education institutions (Measured internally)		45	
Education institutions (Measured internally)		45	
Offices & retail outlets (Measured externally)		70	

3.2.2 Construction Traffic Noise Criteria

For existing residences and other sensitive land uses affected by additional traffic on existing roads, the NSW *Road Noise Policy (RNP)* states that for noise associated with increased road traffic generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB during both day and night-time periods. An increase of 2 dB represents a minor impact that is considered barely perceptible to the average person.

3.3 Vibration Criteria

Effects of ground borne vibration on buildings may be segregated into the following three categories:

- Human comfort – vibration in which the occupants or users of the building are inconvenienced or possibly disturbed. Refer to further discussion in Section 3.3.1.
- Effects on building contents – where vibration can cause damage to fixtures, fittings and other non-building related objects. Refer to further discussion in Section 0.
- Effects on building structures – where vibration can compromise the integrity of the building or structure itself. Refer to further discussion in Section 0.

3.3.1 Vibration Criteria – Human Comfort

Vibration effects relating specifically to the human comfort aspects of the project are taken from the guideline titled *"Assessing Vibration – A Technical Guideline"*. (AVTG) This type of impact can be further categorised and assessed using the appropriate criterion as follows:

- Continuous vibration – from uninterrupted sources (refer to Table 6).
- Impulsive vibration – up to three instances of sudden impact e.g. dropping heavy items, per monitoring period (refer to Table 7).
- Intermittent vibration – such as from drilling, compacting or activities that would result in continuous vibration if operated continuously (refer to
- Table 8).

Table 6 Continuous vibration acceleration criteria (m/s^2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
		0.04	0.029	0.080	0.058
Workshops	Day or night-time	0.04	0.029	0.080	0.058

Table 7 Impulsive vibration acceleration criteria (m/s^2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

Table 8 Intermittent vibration impacts criteria ($m/s^{1.75}$) 1 Hz-80 Hz

Location	Daytime		Night-time	
	Preferred Values	Maximum Values	Preferred Values	Maximum Values
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

3.3.2 Vibration Criteria – Building Contents and Structure

The vibration effects on the building itself are assessed against international standards as follows:

- For transient vibration: British Standard BS 7385: Part 2-1993 *"Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration"* (BSI 1993); and
- For continuous or repetitive vibration: German DIN 4150: Part 3 – 1999 *"Effects of Vibration on Structure"* (DIN 1999).

Standard BS 7385 Part 2 - 1993

For transient vibration, as discussed in standard BS 7385 Part 2-1993, the criteria are based on peak particle velocity (mm/s) which is to be measured at the base of the building. These are summarised in Table 9 and illustrated in Figure 5.

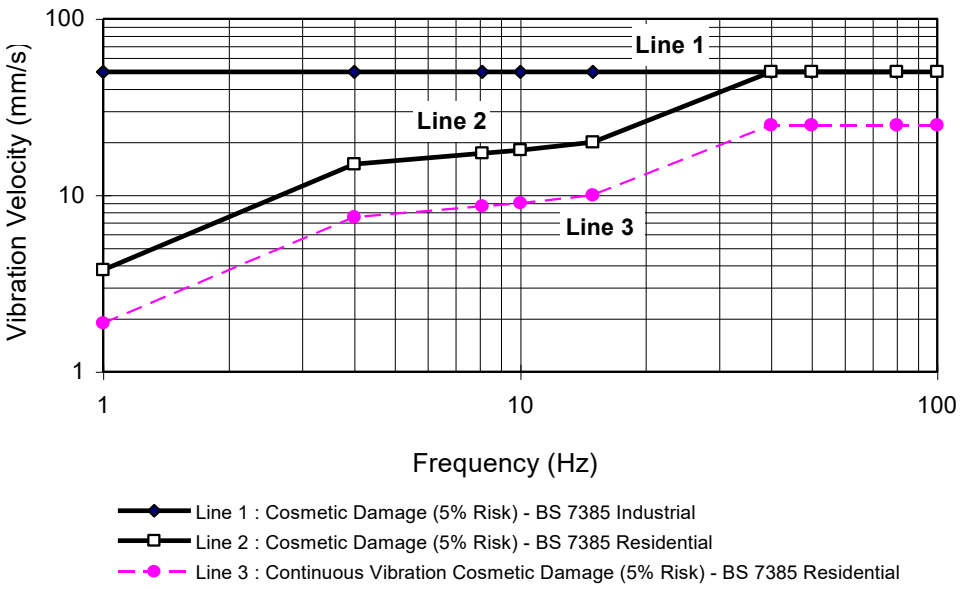
Table 9 Transient vibration criteria as per standard BS 7385 Part 2 - 1993

Line in Figure 5	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

Standard BS 7385 Part 2 – 1993 states that the values in Table 9 relate to transient vibration which does not cause resonant responses in buildings.

Where the dynamic loading caused by continuous vibration events is such as that results in dynamic magnification due to resonance (especially at the lower frequencies where lower guide values apply), then the values in Table 9 may need to be reduced by up to 50% (refer to Line 3 in Figure 5).

Figure 5 BS 7385 Part 2 – 1993, graph of transient vibration values for cosmetic damage



In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the recommended values corresponding to Line 2 are reduced. Below a frequency of 4 Hz where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz.

The standard also states that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 9, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the values in Table 9 should not be reduced for fatigue considerations.

Standard DIN 4150 Part 3 - 1999

For continuous or repetitive vibration, standard DIN 4150 Part 3-1999 provides criteria based on values for peak particle velocity (mm/s) measured at the foundation of the building; these are summarised in Table 10. The criteria are frequency dependent and specific to particular categories of structures.

Table 10 Structural damage criteria as per standard DIN 4150 Part 3 - 1999

Type of Structure	Peak Component Particle Velocity, mm/s			
	Vibration at the foundation at a frequency of			Vibration of horizontal plane of highest floor at all frequencies
	1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz[1]	
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
Structures that, because of their 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

Note 1: For frequencies above 100Hz, at least the values specified in this column shall be applied.

3.4 Ground-Borne Noise Criteria

According to the NSW EPA *Interim Construction Noise Guideline (*ICNG) 2009, the criteria for ground-borne noise at residences is defined as follows:

- Maximum internal noise levels of 40 dB $L_{Aeq(15mins)}$ between 6:00pm and 10:00pm.

It is noted that the ground borne criteria will apply for construction works undertaken outside of standard hours. That is, work conducted during the evening period Monday to Friday between 6:00pm and 7:00pm only.

4 NOISE AND VIBRATION ASSESSMENT

4.1 Construction Noise Assessment

Sound power levels have been predicted for the construction tasks identified in the project program. The equipment anticipated for use in each task is based on previous project experience. The sound power levels for the equipment likely to be used for each of the listed tasks are provided in Table 11 below.

Table 11 Summary of predicted sound power levels

Tasks	Equipment	Sound Power Levels (dBA re 1pW)	Aggregate Sound Power Level per Task (dBA re 1pW)
Site Establishment Works	Mobile crane	110	113
	Power hand tools	109	
	Semi Rigid Vehicle [1]	105	
Ground Works and Demolition	Excavator	112	120
	Hydraulic Hammer	118	
	Piling Rig	110	
	Handheld jack hammer [1]	111	
	Dump truck [1]	104	
	Concrete saw [1]	114	
	Skid steer	110	
	Power hand tools	109	
Structure	Handheld jack hammer [1]	106	117
	Concrete saw [1]	114	
	Power hand tools	109	
	Welder	101	
	Concrete pump truck	110	
	Concrete agitator truck	108	
Internal Works	Power hand tools	109	109
Common and External Works	Concrete agitator truck	108	114
	Saw cutter [1]	104	
	Dump truck [1]	104	
	Concrete saw [1]	114	
	Power hand tools	109	

Note 1: An assumed time correction has been applied, this being 5 minutes of operation in any 15-minute interval.

Table 12 Receiver 1 – Chatswood Public School - Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	59 to 88	61 to 91	Monday to Friday: 7:00am to 6:00pm: 55 Saturday: 8:00am to 1:00pm: 55	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		58 to 87			
	Semi Rigid Vehicle		49 to 78			
Ground Works and Demolition	Excavator	120	61 to 90	69 to 98		
	Hydraulic Hammer		67 to 96			
	Piling Rig		57 to 86			
	Handheld jack hammer		55 to 84			
	Dump truck		48 to 77			
	Concrete saw		58 to 87			
	Skid steer		59 to 88			
	Power hand tools		58 to 87			
Structure	Handheld jack hammer	117	50 to 79	66 to 95		
	Concrete saw		58 to 87			
	Power hand tools		58 to 87			
	Welder		50 to 79			
	Concrete pump truck		59 to 88			
	Concrete agitator truck		57 to 86			
Internal Works	Power hand tools	109	38 to 67	38 to 67		
Common and External Works	Concrete agitator truck	114	57 to 86	63 to 92		
	Saw cutter		48 to 77			
	Dump truck		48 to 77			
	Concrete saw		58 to 87			
	Power hand tools		58 to 87			

Table 13 Receiver 1 – Chatswood Public School - Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	59 to 88	61 to 91	Monday to Friday: 6:00pm to 7:00pm: 46 Saturday: 1:00pm to 4:00pm: 46	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		58 to 87			
	Semi Rigid Vehicle		49 to 78			
Ground Works and Demolition	Excavator	120	61 to 90	69 to 98		
	Hydraulic Hammer		67 to 96			
	Piling Rig		57 to 86			
	Handheld jack hammer		55 to 84			
	Dump truck		48 to 77			
	Concrete saw		58 to 87			
	Skid steer		59 to 88			
	Power hand tools		58 to 87			
Structure	Handheld jack hammer	117	50 to 79	66 to 95		
	Concrete saw		58 to 87			
	Power hand tools		58 to 87			
	Welder		50 to 79			
	Concrete pump truck		59 to 88			
	Concrete agitator truck		57 to 86			
Internal Works	Power hand tools	109	38 to 67	38 to 67		
Common and External Works	Concrete agitator truck	114	57 to 86	63 to 92		
	Saw cutter		48 to 77			
	Dump truck		48 to 77			
	Concrete saw		58 to 87			
	Power hand tools		58 to 87			

Table 14 Receiver 2 – Chatswood Public School - Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	61 to 88	64 to 91	Monday to Friday: 7:00am to 6:00pm: 55 Saturday: 8:00am to 1:00pm: 55	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		60 to 87			
	Semi Rigid Vehicle		51 to 78			
Ground Works and Demolition	Excavator	120	63 to 90	71 to 98		
	Hydraulic Hammer		69 to 96			
	Piling Rig		59 to 86			
	Handheld jack hammer		57 to 84			
	Dump truck		50 to 77			
	Concrete saw		60 to 87			
	Skid steer		61 to 88			
	Power hand tools		60 to 87			
Structure	Handheld jack hammer	117	52 to 79	68 to 95		
	Concrete saw		60 to 87			
	Power hand tools		60 to 87			
	Welder		52 to 79			
	Concrete pump truck		61 to 88			
	Concrete agitator truck		59 to 86			
Internal Works	Power hand tools	109	40 to 67	40 to 67		
Common and External Works	Concrete agitator truck	114	59 to 86	65 to 92		
	Saw cutter		50 to 77			
	Dump truck		50 to 77			
	Concrete saw		60 to 87			
	Power hand tools		60 to 87			

Table 15 Receiver 2 – Chatswood Public School - Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	61 to 88	64 to 91	Monday to Friday: 6:00pm to 7:00pm: 46 Saturday: 1:00pm to 4:00pm: 46	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		60 to 87			
	Semi Rigid Vehicle		51 to 78			
Ground Works and Demolition	Excavator	120	63 to 90	71 to 98		
	Hydraulic Hammer		69 to 96			
	Piling Rig		59 to 86			
	Handheld jack hammer		57 to 84			
	Dump truck		50 to 77			
	Concrete saw		60 to 87			
	Skid steer		61 to 88			
	Power hand tools		60 to 87			
Structure	Handheld jack hammer	117	52 to 79	68 to 95		
	Concrete saw		60 to 87			
	Power hand tools		60 to 87			
	Welder		52 to 79			
	Concrete pump truck		61 to 88			
	Concrete agitator truck		59 to 86			
Internal Works	Power hand tools	109	40 to 67	40 to 67		
Common and External Works	Concrete agitator truck	114	59 to 86	65 to 92		
	Saw cutter		50 to 77			
	Dump truck		50 to 77			
	Concrete saw		60 to 87			
	Power hand tools		60 to 87			

Table 16 Receiver 3 – Chatswood Public School - Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	61 to 75	63 to 78	Monday to Friday: 7:00am to 6:00pm: 56 Saturday: 8:00am to 1:00pm: 56	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		60 to 74			
	Semi Rigid Vehicle		51 to 65			
Ground Works and Demolition	Excavator	120	63 to 77	71 to 85		
	Hydraulic Hammer		69 to 83			
	Piling Rig		59 to 73			
	Handheld jack hammer		57 to 71			
	Dump truck		50 to 64			
	Concrete saw		60 to 74			
	Skid steer		61 to 75			
	Power hand tools		60 to 74			
Structure	Handheld jack hammer	117	52 to 66	68 to 82		
	Concrete saw		60 to 74			
	Power hand tools		60 to 74			
	Welder		52 to 66			
	Concrete pump truck		61 to 75			
	Concrete agitator truck		59 to 73			
Internal Works	Power hand tools	109	40 to 54	40 to 54		
Common and External Works	Concrete agitator truck	114	59 to 73	64 to 79		
	Saw cutter		50 to 64			
	Dump truck		50 to 64			
	Concrete saw		60 to 74			
	Power hand tools		60 to 74			

Table 17 Receiver 3 – Chatswood Public School - Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	61 to 75	63 to 78	Monday to Friday: 6:00pm to 7:00pm: 48 Saturday: 1:00pm to 4:00pm: 48	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		60 to 74			
	Semi Rigid Vehicle		51 to 65			
Ground Works and Demolition	Excavator	120	63 to 77	71 to 85		
	Hydraulic Hammer		69 to 83			
	Piling Rig		59 to 73			
	Handheld jack hammer		57 to 71			
	Dump truck		50 to 64			
	Concrete saw		60 to 74			
	Skid steer		61 to 75			
	Power hand tools		60 to 74			
Structure	Handheld jack hammer	117	52 to 66	68 to 82		
	Concrete saw		60 to 74			
	Power hand tools		60 to 74			
	Welder		52 to 66			
	Concrete pump truck		61 to 75			
	Concrete agitator truck		59 to 73			
Internal Works	Power hand tools	109	40 to 54	40 to 54		
Common and External Works	Concrete agitator truck	114	59 to 73	64 to 79		
	Saw cutter		50 to 64			
	Dump truck		50 to 64			
	Concrete saw		60 to 74			
	Power hand tools		60 to 74			

Table 18 Receiver 3 – Chatswood High School - Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	57 to 66	60 to 69	Monday to Friday: 7:00am to 6:00pm: 56 Saturday: 8:00am to 1:00pm: 56	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		56 to 65			
	Semi Rigid Vehicle		47 to 57			
Ground Works and Demolition	Excavator	120	59 to 68	67 to 76		
	Hydraulic Hammer		65 to 74			
	Piling Rig		55 to 65			
	Handheld jack hammer		53 to 63			
	Dump truck		46 to 56			
	Concrete saw		56 to 66			
	Skid steer		57 to 66			
	Power hand tools		56 to 65			
Structure	Handheld jack hammer	117	48 to 58	64 to 74		
	Concrete saw		56 to 66			
	Power hand tools		56 to 65			
	Welder		48 to 57			
	Concrete pump truck		57 to 66			
	Concrete agitator truck		55 to 64			
Internal Works	Power hand tools	109	36 to 45	36 to 45		
Common and External Works	Concrete agitator truck	114	55 to 64	61 to 70		
	Saw cutter		46 to 56			
	Dump truck		46 to 56			
	Concrete saw		56 to 66			
	Power hand tools		56 to 65			

Table 19 Receiver 3 – Chatswood High School - Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	57 to 66	60 to 69	Monday to Friday: 6:00pm to 7:00pm: 48 Saturday: 1:00pm to 4:00pm: 48	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		56 to 65			
	Semi Rigid Vehicle		47 to 57			
Ground Works and Demolition	Excavator	120	59 to 68	67 to 76		
	Hydraulic Hammer		65 to 74			
	Piling Rig		55 to 65			
	Handheld jack hammer		53 to 63			
	Dump truck		46 to 56			
	Concrete saw		56 to 66			
	Skid steer		57 to 66			
	Power hand tools		56 to 65			
Structure	Handheld jack hammer	117	48 to 58	64 to 74		
	Concrete saw		56 to 66			
	Power hand tools		56 to 65			
	Welder		48 to 57			
	Concrete pump truck		57 to 66			
	Concrete agitator truck		55 to 64			
Internal Works	Power hand tools	109	36 to 45	36 to 45		
Common and External Works	Concrete agitator truck	114	55 to 64	61 to 70		
	Saw cutter		46 to 56			
	Dump truck		46 to 56			
	Concrete saw		56 to 66			
	Power hand tools		56 to 65			

Table 20 Receiver 3 – Cumulative Impacts – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	62 to 76	65 to 79	Monday to Friday: 7:00am to 6:00pm: 56 Saturday: 8:00am to 1:00pm: 56	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		61 to 75			
	Semi Rigid Vehicle		52 to 66			
Ground Works and Demolition	Excavator	120	64 to 78	72 to 86		
	Hydraulic Hammer		70 to 84			
	Piling Rig		60 to 74			
	Handheld jack hammer		58 to 72			
	Dump truck		51 to 65			
	Concrete saw		61 to 75			
	Skid steer		62 to 76			
	Power hand tools		61 to 75			
Structure	Handheld jack hammer	117	53 to 67	69 to 83		
	Concrete saw		61 to 75			
	Power hand tools		61 to 75			
	Welder		53 to 67			
	Concrete pump truck		62 to 76			
	Concrete agitator truck		60 to 74			
Internal Works	Power hand tools	109	41 to 55	41 to 55		
Common and External Works	Concrete agitator truck	114	60 to 74	66 to 80		
	Saw cutter		51 to 65			
	Dump truck		51 to 65			
	Concrete saw		61 to 75			
	Power hand tools		61 to 75			

Table 21 Receiver 3 – Cumulative Impacts – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	62 to 76	65 to 79	Monday to Friday: 6:00pm to 7:00pm: 48 Saturday: 1:00pm to 4:00pm: 48	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		61 to 75			
	Semi Rigid Vehicle		52 to 66			
Ground Works and Demolition	Excavator	120	64 to 78	72 to 86		
	Hydraulic Hammer		70 to 84			
	Piling Rig		60 to 74			
	Handheld jack hammer		58 to 72			
	Dump truck		51 to 65			
	Concrete saw		61 to 75			
	Skid steer		62 to 76			
	Power hand tools		61 to 75			
Structure	Handheld jack hammer	117	53 to 67	69 to 83		
	Concrete saw		61 to 75			
	Power hand tools		61 to 75			
	Welder		53 to 67			
	Concrete pump truck		62 to 76			
	Concrete agitator truck		60 to 74			
Internal Works	Power hand tools	109	41 to 55	41 to 55		
Common and External Works	Concrete agitator truck	114	60 to 74	66 to 80		
	Saw cutter		51 to 65			
	Dump truck		51 to 65			
	Concrete saw		61 to 75			
	Power hand tools		61 to 75			

Table 22 Receiver 4 – Chatswood Public School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	61 to 74	64 to 76	Monday to Friday: 7:00am to 6:00pm: 56 Saturday: 8:00am to 1:00pm: 56	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		60 to 73			
	Semi Rigid Vehicle		51 to 64			
Ground Works and Demolition	Excavator	120	63 to 76	71 to 84		
	Hydraulic Hammer		69 to 82			
	Piling Rig		59 to 72			
	Handheld jack hammer		57 to 70			
	Dump truck		50 to 63			
	Concrete saw		60 to 73			
	Skid steer		61 to 74			
	Power hand tools		60 to 73			
Structure	Handheld jack hammer	117	52 to 65	68 to 81		
	Concrete saw		60 to 73			
	Power hand tools		60 to 73			
	Welder		52 to 65			
	Concrete pump truck		61 to 74			
	Concrete agitator truck		59 to 72			
Internal Works	Power hand tools	109	40 to 53	40 to 53		
Common and External Works	Concrete agitator truck	114	59 to 72	65 to 78		
	Saw cutter		50 to 63			
	Dump truck		50 to 63			
	Concrete saw		60 to 73			
	Power hand tools		60 to 73			

Table 23 Receiver 4 – Chatswood Public School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	61 to 74	64 to 76	Monday to Friday: 6:00pm to 7:00pm: 48 Saturday: 1:00pm to 4:00pm: 48	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		60 to 73			
	Semi Rigid Vehicle		51 to 64			
Ground Works and Demolition	Excavator	120	63 to 76	71 to 84		
	Hydraulic Hammer		69 to 82			
	Piling Rig		59 to 72			
	Handheld jack hammer		57 to 70			
	Dump truck		50 to 63			
	Concrete saw		60 to 73			
	Skid steer		61 to 74			
	Power hand tools		60 to 73			
Structure	Handheld jack hammer	117	52 to 65	68 to 81		
	Concrete saw		60 to 73			
	Power hand tools		60 to 73			
	Welder		52 to 65			
	Concrete pump truck		61 to 74			
	Concrete agitator truck		59 to 72			
Internal Works	Power hand tools	109	40 to 53	40 to 53		
Common and External Works	Concrete agitator truck	114	59 to 72	65 to 78		
	Saw cutter		50 to 63			
	Dump truck		50 to 63			
	Concrete saw		60 to 73			
	Power hand tools		60 to 73			

Table 24 Receiver 4 – Chatswood High School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	56 to 70	59 to 73	Monday to Friday: 7:00am to 6:00pm: 56 Saturday: 8:00am to 1:00pm: 56	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		55 to 69			
	Semi Rigid Vehicle		46 to 60			
Ground Works and Demolition	Excavator	120	58 to 72	66 to 80		
	Hydraulic Hammer		64 to 78			
	Piling Rig		54 to 68			
	Handheld jack hammer		52 to 66			
	Dump truck		45 to 59			
	Concrete saw		55 to 69			
	Skid steer		56 to 70			
	Power hand tools		55 to 69			
Structure	Handheld jack hammer	117	47 to 61	63 to 77		
	Concrete saw		55 to 69			
	Power hand tools		55 to 69			
	Welder		47 to 61			
	Concrete pump truck		56 to 70			
	Concrete agitator truck		54 to 68			
Internal Works	Power hand tools	109	35 to 49	35 to 49		
Common and External Works	Concrete agitator truck	114	54 to 68	60 to 74		
	Saw cutter		45 to 59			
	Dump truck		45 to 59			
	Concrete saw		55 to 69			
	Power hand tools		55 to 69			

Table 25 Receiver 4 – Chatswood High School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	56 to 70	59 to 73	Monday to Friday: 6:00pm to 7:00pm: 48 Saturday: 1:00pm to 4:00pm: 48	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		55 to 69			
	Semi Rigid Vehicle		46 to 60			
Ground Works and Demolition	Excavator	120	58 to 72	66 to 80		
	Hydraulic Hammer		64 to 78			
	Piling Rig		54 to 68			
	Handheld jack hammer		52 to 66			
	Dump truck		45 to 59			
	Concrete saw		55 to 69			
	Skid steer		56 to 70			
	Power hand tools		55 to 69			
Structure	Handheld jack hammer	117	47 to 61	63 to 77		
	Concrete saw		55 to 69			
	Power hand tools		55 to 69			
	Welder		47 to 61			
	Concrete pump truck		56 to 70			
	Concrete agitator truck		54 to 68			
Internal Works	Power hand tools	109	35 to 49	35 to 49		
Common and External Works	Concrete agitator truck	114	54 to 68	60 to 74		
	Saw cutter		45 to 59			
	Dump truck		45 to 59			
	Concrete saw		55 to 69			
	Power hand tools		55 to 69			

Table 26 Receiver 4 – Cumulative Impacts – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	62 to 75	65 to 78	Monday to Friday: 7:00am to 6:00pm: 56 Saturday: 8:00am to 1:00pm: 56	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		61 to 74			
	Semi Rigid Vehicle		52 to 65			
Ground Works and Demolition	Excavator	120	64 to 77	72 to 85		
	Hydraulic Hammer		70 to 83			
	Piling Rig		60 to 73			
	Handheld jack hammer		58 to 71			
	Dump truck		51 to 64			
	Concrete saw		61 to 74			
	Skid steer		62 to 75			
	Power hand tools		61 to 74			
Structure	Handheld jack hammer	117	53 to 66	69 to 83		
	Concrete saw		61 to 74			
	Power hand tools		61 to 74			
	Welder		53 to 66			
	Concrete pump truck		62 to 75			
	Concrete agitator truck		60 to 73			
Internal Works	Power hand tools	109	41 to 54	41 to 54		
Common and External Works	Concrete agitator truck	114	60 to 73	66 to 79		
	Saw cutter		51 to 64			
	Dump truck		51 to 64			
	Concrete saw		61 to 74			
	Power hand tools		61 to 74			

Table 27 Receiver 4 – Cumulative Impacts – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	62 to 75	65 to 78	Monday to Friday: 6:00pm to 7:00pm: 48 Saturday: 1:00pm to 4:00pm: 48	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		61 to 74			
	Semi Rigid Vehicle		52 to 65			
Ground Works and Demolition	Excavator	120	64 to 77	72 to 85		
	Hydraulic Hammer		70 to 83			
	Piling Rig		60 to 73			
	Handheld jack hammer		58 to 71			
	Dump truck		51 to 64			
	Concrete saw		61 to 74			
	Skid steer		62 to 75			
	Power hand tools		61 to 74			
Structure	Handheld jack hammer	117	53 to 66	69 to 83		
	Concrete saw		61 to 74			
	Power hand tools		61 to 74			
	Welder		53 to 66			
	Concrete pump truck		62 to 75			
	Concrete agitator truck		60 to 73			
Internal Works	Power hand tools	109	41 to 54	41 to 54		
Common and External Works	Concrete agitator truck	114	60 to 73	66 to 79		
	Saw cutter		51 to 64			
	Dump truck		51 to 64			
	Concrete saw		61 to 74			
	Power hand tools		61 to 74			

Table 28 Receiver 5 – Chatswood Public School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	62 to 74	64 to 77	Monday to Friday: 7:00am to 6:00pm: 56 Saturday: 8:00am to 1:00pm: 56	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		61 to 73			
	Semi Rigid Vehicle		52 to 64			
Ground Works and Demolition	Excavator	120	64 to 76	72 to 84		
	Hydraulic Hammer		70 to 82			
	Piling Rig		60 to 72			
	Handheld jack hammer		58 to 70			
	Dump truck		51 to 63			
	Concrete saw		61 to 73			
	Skid steer		62 to 74			
	Power hand tools		61 to 73			
Structure	Handheld jack hammer	117	53 to 65	69 to 81		
	Concrete saw		61 to 73			
	Power hand tools		61 to 73			
	Welder		53 to 65			
	Concrete pump truck		62 to 74			
	Concrete agitator truck		60 to 72			
Internal Works	Power hand tools	109	41 to 53	41 to 53		
Common and External Works	Concrete agitator truck	114	60 to 72	65 to 78		
	Saw cutter		51 to 63			
	Dump truck		51 to 63			
	Concrete saw		61 to 73			
	Power hand tools		61 to 73			

Table 29 Receiver 5 – Chatswood Public School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	62 to 74	64 to 77	Monday to Friday: 6:00pm to 7:00pm: 48 Saturday: 1:00pm to 4:00pm: 48	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		61 to 73			
	Semi Rigid Vehicle		52 to 64			
Ground Works and Demolition	Excavator	120	64 to 76	72 to 84		
	Hydraulic Hammer		70 to 82			
	Piling Rig		60 to 72			
	Handheld jack hammer		58 to 70			
	Dump truck		51 to 63			
	Concrete saw		61 to 73			
	Skid steer		62 to 74			
	Power hand tools		61 to 73			
Structure	Handheld jack hammer	117	53 to 65	69 to 81		
	Concrete saw		61 to 73			
	Power hand tools		61 to 73			
	Welder		53 to 65			
	Concrete pump truck		62 to 74			
	Concrete agitator truck		60 to 72			
Internal Works	Power hand tools	109	41 to 53	41 to 53		
Common and External Works	Concrete agitator truck	114	60 to 72	65 to 78		
	Saw cutter		51 to 63			
	Dump truck		51 to 63			
	Concrete saw		61 to 73			
	Power hand tools		61 to 73			

Table 30 Receiver 6 – Chatswood Public School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	60 to 71	63 to 74	Monday to Friday: 7:00am to 6:00pm: 56 Saturday: 8:00am to 1:00pm: 56	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		59 to 70			
	Semi Rigid Vehicle		50 to 62			
Ground Works and Demolition	Excavator	120	62 to 73	70 to 81		
	Hydraulic Hammer		68 to 79			
	Piling Rig		58 to 70			
	Handheld jack hammer		56 to 68			
	Dump truck		49 to 61			
	Concrete saw		59 to 71			
	Skid steer		60 to 71			
	Power hand tools		59 to 70			
Structure	Handheld jack hammer	117	51 to 63	67 to 79		
	Concrete saw		59 to 71			
	Power hand tools		59 to 70			
	Welder		51 to 62			
	Concrete pump truck		60 to 71			
	Concrete agitator truck		58 to 69			
Internal Works	Power hand tools	109	39 to 50	39 to 50		
Common and External Works	Concrete agitator truck	114	58 to 69	64 to 75		
	Saw cutter		49 to 61			
	Dump truck		49 to 61			
	Concrete saw		59 to 71			
	Power hand tools		59 to 70			

Table 31 Receiver 6 – Chatswood Public School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	60 to 71	63 to 74	Monday to Friday: 6:00pm to 7:00pm: 48 Saturday: 1:00pm to 4:00pm: 48	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		59 to 70			
	Semi Rigid Vehicle		50 to 62			
Ground Works and Demolition	Excavator	120	62 to 73	70 to 81		
	Hydraulic Hammer		68 to 79			
	Piling Rig		58 to 70			
	Handheld jack hammer		56 to 68			
	Dump truck		49 to 61			
	Concrete saw		59 to 71			
	Skid steer		60 to 71			
	Power hand tools		59 to 70			
Structure	Handheld jack hammer	117	51 to 63	67 to 79		
	Concrete saw		59 to 71			
	Power hand tools		59 to 70			
	Welder		51 to 62			
	Concrete pump truck		60 to 71			
	Concrete agitator truck		58 to 69			
Internal Works	Power hand tools	109	39 to 50	39 to 50		
Common and External Works	Concrete agitator truck	114	58 to 69	64 to 75		
	Saw cutter		49 to 61			
	Dump truck		49 to 61			
	Concrete saw		59 to 71			
	Power hand tools		59 to 70			

Table 32 Receiver 7 – Chatswood Public School – Summary of predicted construction noise levels (all times)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	60 to 71	63 to 74	Monday to Friday: 7:00am to 6:00pm: 70 6:00pm to 7:00pm: 70 Saturday: 8:00am to 1:00pm: 70 1:00pm to 4:00pm: 70	Works undertaken near the common boundary will exceed the 70dBA requirement for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		59 to 70			
	Semi Rigid Vehicle		50 to 62			
Ground Works and Demolition	Excavator	120	62 to 73	70 to 81		
	Hydraulic Hammer		68 to 79			
	Piling Rig		58 to 70			
	Handheld jack hammer		56 to 68			
	Dump truck		49 to 61			
	Concrete saw		59 to 71			
	Skid steer		60 to 71			
	Power hand tools		59 to 70			
Structure	Handheld jack hammer	117	51 to 63	67 to 79		
	Concrete saw		59 to 71			
	Power hand tools		59 to 70			
	Welder		51 to 62			
	Concrete pump truck		60 to 71			
	Concrete agitator truck		58 to 69			
Internal Works	Power hand tools	109	39 to 50	39 to 50		
Common and External Works	Concrete agitator truck	114	58 to 69	64 to 75		
	Saw cutter		49 to 61			
	Dump truck		49 to 61			
	Concrete saw		59 to 71			
	Power hand tools		59 to 70			

Table 33 Receiver 8 – Chatswood Public School – Summary of predicted construction noise levels (all times)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	56 to 70	59 to 73	Monday to Friday: 7:00am to 6:00pm: 70 6:00pm to 7:00pm: 70 Saturday: 8:00am to 1:00pm: 70 1:00pm to 4:00pm: 70	Works undertaken near the common boundary will exceed the 70dBA requirement for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		55 to 69			
	Semi Rigid Vehicle		46 to 61			
Ground Works and Demolition	Excavator	120	58 to 72	66 to 80		
	Hydraulic Hammer		64 to 78			
	Piling Rig		54 to 69			
	Handheld jack hammer		52 to 67			
	Dump truck		45 to 60			
	Concrete saw		55 to 70			
	Skid steer		56 to 70			
	Power hand tools		55 to 69			
Structure	Handheld jack hammer	117	47 to 62	63 to 78		
	Concrete saw		55 to 70			
	Power hand tools		55 to 69			
	Welder		47 to 61			
	Concrete pump truck		56 to 70			
	Concrete agitator truck		54 to 68			
Internal Works	Power hand tools	109	35 to 49	35 to 49		
Common and External Works	Concrete agitator truck	114	54 to 68	60 to 74		
	Saw cutter		45 to 60			
	Dump truck		45 to 60			
	Concrete saw		55 to 70			
	Power hand tools		55 to 69			

Table 34 Receiver 9 – Chatswood Public School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	56 to 71	59 to 74	Monday to Friday: 7:00am to 6:00pm: 67 Saturday: 8:00am to 1:00pm: 67	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		55 to 70			
	Semi Rigid Vehicle		46 to 62			
Ground Works and Demolition	Excavator	120	58 to 73	66 to 81		
	Hydraulic Hammer		64 to 79			
	Piling Rig		54 to 70			
	Handheld jack hammer		52 to 68			
	Dump truck		45 to 61			
	Concrete saw		55 to 71			
	Skid steer		56 to 71			
	Power hand tools		55 to 70			
Structure	Handheld jack hammer	117	47 to 63	63 to 79		
	Concrete saw		55 to 71			
	Power hand tools		55 to 70			
	Welder		47 to 62			
	Concrete pump truck		56 to 71			
	Concrete agitator truck		54 to 69			
Internal Works	Power hand tools	109	35 to 50	35 to 50		
Common and External Works	Concrete agitator truck	114	54 to 69	60 to 75		
	Saw cutter		45 to 61			
	Dump truck		45 to 61			
	Concrete saw		55 to 71			
	Power hand tools		55 to 70			

Table 35 Receiver 9 – Chatswood Public School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	56 to 71	59 to 74	Monday to Friday: 6:00pm to 7:00pm: 62 Saturday: 1:00pm to 4:00pm: 62	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		55 to 70			
	Semi Rigid Vehicle		46 to 62			
Ground Works and Demolition	Excavator	120	58 to 73	66 to 81		
	Hydraulic Hammer		64 to 79			
	Piling Rig		54 to 70			
	Handheld jack hammer		52 to 68			
	Dump truck		45 to 61			
	Concrete saw		55 to 71			
	Skid steer		56 to 71			
	Power hand tools		55 to 70			
Structure	Handheld jack hammer	117	47 to 63	63 to 79		
	Concrete saw		55 to 71			
	Power hand tools		55 to 70			
	Welder		47 to 62			
	Concrete pump truck		56 to 71			
	Concrete agitator truck		54 to 69			
Internal Works	Power hand tools	109	35 to 50	35 to 50		
Common and External Works	Concrete agitator truck	114	54 to 69	60 to 75		
	Saw cutter		45 to 61			
	Dump truck		45 to 61			
	Concrete saw		55 to 71			
	Power hand tools		55 to 70			

Table 36 Receiver 10 – Chatswood Public School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	59 to 88	62 to 91	Monday to Friday: 7:00am to 6:00pm: 70 6:00pm to 7:00pm: 70 Saturday: 8:00am to 1:00pm: 70 1:00pm to 4:00pm: 70	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		58 to 87			
	Semi Rigid Vehicle		49 to 78			
Ground Works and Demolition	Excavator	120	61 to 90	69 to 98		
	Hydraulic Hammer		67 to 96			
	Piling Rig		57 to 86			
	Handheld jack hammer		55 to 84			
	Dump truck		48 to 77			
	Concrete saw		58 to 87			
	Skid steer		59 to 88			
	Power hand tools		58 to 87			
Structure	Handheld jack hammer	117	50 to 79	66 to 95		
	Concrete saw		58 to 87			
	Power hand tools		58 to 87			
	Welder		50 to 79			
	Concrete pump truck		59 to 88			
	Concrete agitator truck		57 to 86			
Internal Works	Power hand tools	109	38 to 67	38 to 67		
Common and External Works	Concrete agitator truck	114	57 to 86	63 to 92		
	Saw cutter		48 to 77			
	Dump truck		48 to 77			
	Concrete saw		58 to 87			
	Power hand tools		58 to 87			

Table 37 Receiver 10 – Chatswood Public School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	59 to 88	62 to 91	Monday to Friday: 7:00am to 6:00pm: 70 6:00pm to 7:00pm: 70 Saturday: 8:00am to 1:00pm: 70 1:00pm to 4:00pm: 70	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		58 to 87			
	Semi Rigid Vehicle		49 to 78			
Ground Works and Demolition	Excavator	120	61 to 90	69 to 98		
	Hydraulic Hammer		67 to 96			
	Piling Rig		57 to 86			
	Handheld jack hammer		55 to 84			
	Dump truck		48 to 77			
	Concrete saw		58 to 87			
	Skid steer		59 to 88			
	Power hand tools		58 to 87			
Structure	Handheld jack hammer	117	50 to 79	66 to 95		
	Concrete saw		58 to 87			
	Power hand tools		58 to 87			
	Welder		50 to 79			
	Concrete pump truck		59 to 88			
	Concrete agitator truck		57 to 86			
Internal Works	Power hand tools	109	38 to 67	38 to 67		
Common and External Works	Concrete agitator truck	114	57 to 86	63 to 92		
	Saw cutter		48 to 77			
	Dump truck		48 to 77			
	Concrete saw		58 to 87			
	Power hand tools		58 to 87			

Table 38 Receiver 11 – Chatswood High School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	60 to 72	63 to 75	Monday to Friday: 7:00am to 6:00pm: 53 Saturday: 8:00am to 1:00pm: 53	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		59 to 71			
	Semi Rigid Vehicle		51 to 63			
Ground Works and Demolition	Excavator	120	62 to 74	70 to 82		
	Hydraulic Hammer		68 to 80			
	Piling Rig		59 to 71			
	Handheld jack hammer		57 to 69			
	Dump truck		50 to 62			
	Concrete saw		60 to 72			
	Skid steer		60 to 72			
	Power hand tools		59 to 71			
Structure	Handheld jack hammer	117	52 to 64	68 to 80		
	Concrete saw		60 to 72			
	Power hand tools		59 to 71			
	Welder		51 to 63			
	Concrete pump truck		60 to 72			
	Concrete agitator truck		58 to 70			
Internal Works	Power hand tools	109	39 to 51	39 to 51		
Common and External Works	Concrete agitator truck	114	58 to 70	64 to 76		
	Saw cutter		50 to 62			
	Dump truck		50 to 62			
	Concrete saw		60 to 72			
	Power hand tools		59 to 71			

Table 39 Receiver 11 – Chatswood High School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	60 to 72	63 to 75	Monday to Friday: 6:00pm to 7:00pm: 46 Saturday: 1:00pm to 4:00pm: 46	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		59 to 71			
	Semi Rigid Vehicle		51 to 63			
Ground Works and Demolition	Excavator	120	62 to 74	70 to 82		
	Hydraulic Hammer		68 to 80			
	Piling Rig		59 to 71			
	Handheld jack hammer		57 to 69			
	Dump truck		50 to 62			
	Concrete saw		60 to 72			
	Skid steer		60 to 72			
	Power hand tools		59 to 71			
Structure	Handheld jack hammer	117	52 to 64	68 to 80		
	Concrete saw		60 to 72			
	Power hand tools		59 to 71			
	Welder		51 to 63			
	Concrete pump truck		60 to 72			
	Concrete agitator truck		58 to 70			
Internal Works	Power hand tools	109	39 to 51	39 to 51		
Common and External Works	Concrete agitator truck	114	58 to 70	64 to 76		
	Saw cutter		50 to 62			
	Dump truck		50 to 62			
	Concrete saw		60 to 72			
	Power hand tools		59 to 71			

Table 40 Receiver 12 – Chatswood High School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	61 to 72	64 to 75	Monday to Friday: 7:00am to 6:00pm: 53 Saturday: 8:00am to 1:00pm: 53	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		60 to 71			
	Semi Rigid Vehicle		51 to 63			
Ground Works and Demolition	Excavator	120	63 to 74	71 to 82		
	Hydraulic Hammer		69 to 80			
	Piling Rig		59 to 71			
	Handheld jack hammer		57 to 69			
	Dump truck		50 to 62			
	Concrete saw		60 to 72			
	Skid steer		61 to 72			
	Power hand tools		60 to 71			
Structure	Handheld jack hammer	117	52 to 64	68 to 80		
	Concrete saw		60 to 72			
	Power hand tools		60 to 71			
	Welder		52 to 63			
	Concrete pump truck		61 to 72			
	Concrete agitator truck		59 to 70			
Internal Works	Power hand tools	109	40 to 51	40 to 51		
Common and External Works	Concrete agitator truck	114	59 to 70	65 to 76		
	Saw cutter		50 to 62			
	Dump truck		50 to 62			
	Concrete saw		60 to 72			
	Power hand tools		60 to 71			

Table 41 Receiver 12 – Chatswood High School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	60 to 72	63 to 75	Monday to Friday: 6:00pm to 7:00pm: 46 Saturday: 1:00pm to 4:00pm: 46	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		59 to 71			
	Semi Rigid Vehicle		51 to 63			
Ground Works and Demolition	Excavator	120	62 to 74	70 to 82		
	Hydraulic Hammer		68 to 80			
	Piling Rig		59 to 71			
	Handheld jack hammer		57 to 69			
	Dump truck		50 to 62			
	Concrete saw		60 to 72			
	Skid steer		60 to 72			
	Power hand tools		59 to 71			
Structure	Handheld jack hammer	117	52 to 64	68 to 80		
	Concrete saw		60 to 72			
	Power hand tools		59 to 71			
	Welder		51 to 63			
	Concrete pump truck		60 to 72			
	Concrete agitator truck		58 to 70			
Internal Works	Power hand tools	109	39 to 51	39 to 51		
Common and External Works	Concrete agitator truck	114	58 to 70	64 to 76		
	Saw cutter		50 to 62			
	Dump truck		50 to 62			
	Concrete saw		60 to 72			
	Power hand tools		59 to 71			

Table 42 Receiver 13 – Chatswood High School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	56 to 74	59 to 77	Monday to Friday: 7:00am to 6:00pm: 53 Saturday: 8:00am to 1:00pm: 53	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		55 to 73			
	Semi Rigid Vehicle		46 to 64			
Ground Works and Demolition	Excavator	120	58 to 76	66 to 84		
	Hydraulic Hammer		64 to 82			
	Piling Rig		54 to 72			
	Handheld jack hammer		52 to 70			
	Dump truck		45 to 63			
	Concrete saw		55 to 73			
	Skid steer		56 to 74			
	Power hand tools		55 to 73			
Structure	Handheld jack hammer	117	47 to 65	63 to 81		
	Concrete saw		55 to 73			
	Power hand tools		55 to 73			
	Welder		47 to 65			
	Concrete pump truck		56 to 74			
	Concrete agitator truck		54 to 72			
Internal Works	Power hand tools	109	35 to 53	35 to 53		
Common and External Works	Concrete agitator truck	114	54 to 72	60 to 78		
	Saw cutter		45 to 63			
	Dump truck		45 to 63			
	Concrete saw		55 to 73			
	Power hand tools		55 to 73			

Table 43 Receiver 13 – Chatswood High School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	56 to 74	59 to 77	Monday to Friday: 6:00pm to 7:00pm: 46 Saturday: 1:00pm to 4:00pm: 46	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		55 to 73			
	Semi Rigid Vehicle		46 to 64			
Ground Works and Demolition	Excavator	120	58 to 76	66 to 84		
	Hydraulic Hammer		64 to 82			
	Piling Rig		54 to 72			
	Handheld jack hammer		52 to 70			
	Dump truck		45 to 63			
	Concrete saw		55 to 73			
	Skid steer		56 to 74			
	Power hand tools		55 to 73			
Structure	Handheld jack hammer	117	47 to 65	63 to 81		
	Concrete saw		55 to 73			
	Power hand tools		55 to 73			
	Welder		47 to 65			
	Concrete pump truck		56 to 74			
	Concrete agitator truck		54 to 72			
Internal Works	Power hand tools	109	35 to 53	35 to 53		
Common and External Works	Concrete agitator truck	114	54 to 72	60 to 78		
	Saw cutter		45 to 63			
	Dump truck		45 to 63			
	Concrete saw		55 to 73			
	Power hand tools		55 to 73			

Table 44 Receiver 14 – Chatswood High School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	54 to 60	57 to 63	Monday to Friday: 7:00am to 6:00pm: 53 Saturday: 8:00am to 1:00pm: 53	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		53 to 59			
	Semi Rigid Vehicle		44 to 50			
Ground Works and Demolition	Excavator	120	56 to 62	64 to 70		
	Hydraulic Hammer		62 to 68			
	Piling Rig		52 to 58			
	Handheld jack hammer		50 to 56			
	Dump truck		43 to 49			
	Concrete saw		53 to 59			
	Skid steer		54 to 60			
	Power hand tools		53 to 59			
Structure	Handheld jack hammer	117	45 to 51	61 to 67		
	Concrete saw		53 to 59			
	Power hand tools		53 to 59			
	Welder		45 to 51			
	Concrete pump truck		54 to 60			
	Concrete agitator truck		52 to 58			
Internal Works	Power hand tools	109	33 to 39	33 to 39		
Common and External Works	Concrete agitator truck	114	52 to 58	58 to 64		
	Saw cutter		43 to 49			
	Dump truck		43 to 49			
	Concrete saw		53 to 59			
	Power hand tools		53 to 59			

Table 45 Receiver 14 – Chatswood High School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	54 to 60	57 to 63	Monday to Friday: 6:00pm to 7:00pm: 46 Saturday: 1:00pm to 4:00pm: 46	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		53 to 59			
	Semi Rigid Vehicle		44 to 50			
Ground Works and Demolition	Excavator	120	56 to 62	64 to 70		
	Hydraulic Hammer		62 to 68			
	Piling Rig		52 to 58			
	Handheld jack hammer		50 to 56			
	Dump truck		43 to 49			
	Concrete saw		53 to 59			
	Skid steer		54 to 60			
	Power hand tools		53 to 59			
Structure	Handheld jack hammer	117	45 to 51	61 to 67		
	Concrete saw		53 to 59			
	Power hand tools		53 to 59			
	Welder		45 to 51			
	Concrete pump truck		54 to 60			
	Concrete agitator truck		52 to 58			
Internal Works	Power hand tools	109	33 to 39	33 to 39		
Common and External Works	Concrete agitator truck	114	52 to 58	58 to 64		
	Saw cutter		43 to 49			
	Dump truck		43 to 49			
	Concrete saw		53 to 59			
	Power hand tools		53 to 59			

Table 46 Receiver 15 – Chatswood High School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	52 to 57	55 to 60	Monday to Friday: 7:00am to 6:00pm: 53 Saturday: 8:00am to 1:00pm: 53	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		51 to 56			
	Semi Rigid Vehicle		43 to 47			
Ground Works and Demolition	Excavator	120	54 to 59	62 to 67		
	Hydraulic Hammer		60 to 65			
	Piling Rig		51 to 55			
	Handheld jack hammer		49 to 53			
	Dump truck		42 to 46			
	Concrete saw		52 to 56			
	Skid steer		52 to 57			
	Power hand tools		51 to 56			
Structure	Handheld jack hammer	117	44 to 48	60 to 64		
	Concrete saw		52 to 56			
	Power hand tools		51 to 56			
	Welder		43 to 48			
	Concrete pump truck		52 to 57			
	Concrete agitator truck		50 to 55			
Internal Works	Power hand tools	109	31 to 36	31 to 36		
Common and External Works	Concrete agitator truck	114	50 to 55	56 to 61		
	Saw cutter		42 to 46			
	Dump truck		42 to 46			
	Concrete saw		52 to 56			
	Power hand tools		51 to 56			

Table 47 Receiver 15 – Chatswood High School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	52 to 57	55 to 60	Monday to Friday: 6:00pm to 7:00pm: 46 Saturday: 1:00pm to 4:00pm: 46	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		51 to 56			
	Semi Rigid Vehicle		43 to 47			
Ground Works and Demolition	Excavator	120	54 to 59	62 to 67		
	Hydraulic Hammer		60 to 65			
	Piling Rig		51 to 55			
	Handheld jack hammer		49 to 53			
	Dump truck		42 to 46			
	Concrete saw		52 to 56			
	Skid steer		52 to 57			
	Power hand tools		51 to 56			
Structure	Handheld jack hammer	117	44 to 48	60 to 64		
	Concrete saw		52 to 56			
	Power hand tools		51 to 56			
	Welder		43 to 48			
	Concrete pump truck		52 to 57			
	Concrete agitator truck		50 to 55			
Internal Works	Power hand tools	109	31 to 36	31 to 36		
Common and External Works	Concrete agitator truck	114	50 to 55	56 to 61		
	Saw cutter		42 to 46			
	Dump truck		42 to 46			
	Concrete saw		52 to 56			
	Power hand tools		51 to 56			

Table 48 Receiver 16 – Chatswood High School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	54 to 62	57 to 65	Monday to Friday: 7:00am to 6:00pm: 53 Saturday: 8:00am to 1:00pm: 53	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		53 to 61			
	Semi Rigid Vehicle		44 to 52			
Ground Works and Demolition	Excavator	120	56 to 64	64 to 72		
	Hydraulic Hammer		62 to 70			
	Piling Rig		52 to 60			
	Handheld jack hammer		50 to 58			
	Dump truck		43 to 51			
	Concrete saw		53 to 61			
	Skid steer		54 to 62			
	Power hand tools		53 to 61			
Structure	Handheld jack hammer	117	45 to 53	61 to 69		
	Concrete saw		53 to 61			
	Power hand tools		53 to 61			
	Welder		45 to 53			
	Concrete pump truck		54 to 62			
	Concrete agitator truck		52 to 60			
Internal Works	Power hand tools	109	33 to 41	33 to 41		
Common and External Works	Concrete agitator truck	114	52 to 60	58 to 66		
	Saw cutter		43 to 51			
	Dump truck		43 to 51			
	Concrete saw		53 to 61			
	Power hand tools		53 to 61			

Table 49 Receiver 16 – Chatswood High School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	54 to 62	57 to 65	Monday to Friday: 6:00pm to 7:00pm: 46 Saturday: 1:00pm to 4:00pm: 46	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		53 to 61			
	Semi Rigid Vehicle		44 to 52			
Ground Works and Demolition	Excavator	120	56 to 64	64 to 72		
	Hydraulic Hammer		62 to 70			
	Piling Rig		52 to 60			
	Handheld jack hammer		50 to 58			
	Dump truck		43 to 51			
	Concrete saw		53 to 61			
	Skid steer		54 to 62			
	Power hand tools		53 to 61			
Structure	Handheld jack hammer	117	45 to 53	61 to 69		
	Concrete saw		53 to 61			
	Power hand tools		53 to 61			
	Welder		45 to 53			
	Concrete pump truck		54 to 62			
	Concrete agitator truck		52 to 60			
Internal Works	Power hand tools	109	33 to 41	33 to 41		
Common and External Works	Concrete agitator truck	114	52 to 60	58 to 66		
	Saw cutter		43 to 51			
	Dump truck		43 to 51			
	Concrete saw		53 to 61			
	Power hand tools		53 to 61			

Table 50 Receiver 17 – Chatswood High School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	54 to 62	57 to 65	Monday to Friday: 7:00am to 6:00pm: 53 Saturday: 8:00am to 1:00pm: 53	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		53 to 61			
	Semi Rigid Vehicle		44 to 52			
Ground Works and Demolition	Excavator	120	56 to 64	64 to 72		
	Hydraulic Hammer		62 to 70			
	Piling Rig		52 to 60			
	Handheld jack hammer		50 to 58			
	Dump truck		43 to 51			
	Concrete saw		53 to 61			
	Skid steer		54 to 62			
	Power hand tools		53 to 61			
Structure	Handheld jack hammer	117	45 to 53	61 to 69		
	Concrete saw		53 to 61			
	Power hand tools		53 to 61			
	Welder		45 to 53			
	Concrete pump truck		54 to 62			
	Concrete agitator truck		52 to 60			
Internal Works	Power hand tools	109	33 to 41	33 to 41		
Common and External Works	Concrete agitator truck	114	52 to 60	58 to 66		
	Saw cutter		43 to 51			
	Dump truck		43 to 51			
	Concrete saw		53 to 61			
	Power hand tools		53 to 61			

Table 51 Receiver 17 – Chatswood High School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	54 to 62	57 to 65	Monday to Friday: 6:00pm to 7:00pm: 46 Saturday: 1:00pm to 4:00pm: 46	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		53 to 61			
	Semi Rigid Vehicle		44 to 52			
Ground Works and Demolition	Excavator	120	56 to 64	64 to 72		
	Hydraulic Hammer		62 to 70			
	Piling Rig		52 to 60			
	Handheld jack hammer		50 to 58			
	Dump truck		43 to 51			
	Concrete saw		53 to 61			
	Skid steer		54 to 62			
	Power hand tools		53 to 61			
Structure	Handheld jack hammer	117	45 to 53	61 to 69		
	Concrete saw		53 to 61			
	Power hand tools		53 to 61			
	Welder		45 to 53			
	Concrete pump truck		54 to 62			
	Concrete agitator truck		52 to 60			
Internal Works	Power hand tools	109	33 to 41	33 to 41		
Common and External Works	Concrete agitator truck	114	52 to 60	58 to 66		
	Saw cutter		43 to 51			
	Dump truck		43 to 51			
	Concrete saw		53 to 61			
	Power hand tools		53 to 61			

Table 52 Receiver 18 – Chatswood High School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	54 to 68	57 to 71	Monday to Friday: 7:00am to 6:00pm: 47 Saturday: 8:00am to 1:00pm: 47	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		53 to 67			
	Semi Rigid Vehicle		44 to 58			
Ground Works and Demolition	Excavator	120	56 to 70	64 to 78		
	Hydraulic Hammer		62 to 76			
	Piling Rig		52 to 66			
	Handheld jack hammer		50 to 64			
	Dump truck		43 to 57			
	Concrete saw		53 to 67			
	Skid steer		54 to 68			
	Power hand tools		53 to 67			
Structure	Handheld jack hammer	117	45 to 59	61 to 75		
	Concrete saw		53 to 67			
	Power hand tools		53 to 67			
	Welder		45 to 59			
	Concrete pump truck		54 to 68			
	Concrete agitator truck		52 to 66			
Internal Works	Power hand tools	109	66 to 80	66 to 80		
Common and External Works	Concrete agitator truck	114	52 to 66	58 to 72		
	Saw cutter		43 to 57			
	Dump truck		43 to 57			
	Concrete saw		53 to 67			
	Power hand tools		53 to 67			

Table 53 Receiver 18 – Chatswood High School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	54 to 68	57 to 71	Monday to Friday: 6:00pm to 7:00pm: 40 Saturday: 1:00pm to 4:00pm: 40	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		53 to 67			
	Semi Rigid Vehicle		44 to 58			
Ground Works and Demolition	Excavator	120	56 to 70	64 to 78		
	Hydraulic Hammer		62 to 76			
	Piling Rig		52 to 66			
	Handheld jack hammer		50 to 64			
	Dump truck		43 to 57			
	Concrete saw		53 to 67			
	Skid steer		54 to 68			
	Power hand tools		53 to 67			
Structure	Handheld jack hammer	117	45 to 59	61 to 75		
	Concrete saw		53 to 67			
	Power hand tools		53 to 67			
	Welder		45 to 59			
	Concrete pump truck		54 to 68			
	Concrete agitator truck		52 to 66			
Internal Works	Power hand tools	109	33 to 47	33 to 47		
Common and External Works	Concrete agitator truck	114	52 to 66	58 to 72		
	Saw cutter		43 to 57			
	Dump truck		43 to 57			
	Concrete saw		53 to 67			
	Power hand tools		53 to 67			

Table 54 Receiver 19 – Chatswood High School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	55 to 76	58 to 79	Monday to Friday: 7:00am to 6:00pm: 47 Saturday: 8:00am to 1:00pm: 47	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		54 to 75			
	Semi Rigid Vehicle		45 to 66			
Ground Works and Demolition	Excavator	120	57 to 78	65 to 86		
	Hydraulic Hammer		63 to 84			
	Piling Rig		53 to 74			
	Handheld jack hammer		51 to 72			
	Dump truck		44 to 65			
	Concrete saw		54 to 75			
	Skid steer		55 to 76			
	Power hand tools		54 to 75			
Structure	Handheld jack hammer	117	46 to 67	62 to 83		
	Concrete saw		54 to 75			
	Power hand tools		54 to 75			
	Welder		46 to 67			
	Concrete pump truck		55 to 76			
	Concrete agitator truck		53 to 74			
Internal Works	Power hand tools	109	34 to 55	34 to 55		
Common and External Works	Concrete agitator truck	114	53 to 74	59 to 80		
	Saw cutter		44 to 65			
	Dump truck		44 to 65			
	Concrete saw		54 to 75			
	Power hand tools		54 to 75			

Table 55 Receiver 19 – Chatswood High School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	55 to 76	58 to 79	Monday to Friday: 6:00pm to 7:00pm: 40 Saturday: 1:00pm to 4:00pm: 40	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		54 to 75			
	Semi Rigid Vehicle		45 to 66			
Ground Works and Demolition	Excavator	120	57 to 78	65 to 86		
	Hydraulic Hammer		63 to 84			
	Piling Rig		53 to 74			
	Handheld jack hammer		51 to 72			
	Dump truck		44 to 65			
	Concrete saw		54 to 75			
	Skid steer		55 to 76			
	Power hand tools		54 to 75			
Structure	Handheld jack hammer	117	46 to 67	62 to 83		
	Concrete saw		54 to 75			
	Power hand tools		54 to 75			
	Welder		46 to 67			
	Concrete pump truck		55 to 76			
	Concrete agitator truck		53 to 74			
Internal Works	Power hand tools	109	34 to 55	34 to 55		
Common and External Works	Concrete agitator truck	114	53 to 74	59 to 80		
	Saw cutter		44 to 65			
	Dump truck		44 to 65			
	Concrete saw		54 to 75			
	Power hand tools		54 to 75			

Table 56 Receiver 20 – Chatswood High School – Summary of predicted construction noise levels during Standard Hours (BG + 10dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\text{-}15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	55 to 76	58 to 79	Monday to Friday: 7:00am to 6:00pm: 53 Saturday: 8:00am to 1:00pm: 53	Works undertaken near the common boundary will exceed the BG +10dBA requirement and in some cases the *Highly Noise Affected Level* of 75dBA for noisy plant items such as hydraulic hammering. It is recommended that several acoustic mitigation measures are implemented. Refer to Table 59 and following sections below.
	Power hand tools		54 to 75			
	Semi Rigid Vehicle		45 to 66			
Ground Works and Demolition	Excavator	120	57 to 78	65 to 86		
	Hydraulic Hammer		63 to 84			
	Piling Rig		53 to 74			
	Handheld jack hammer		51 to 72			
	Dump truck		44 to 65			
	Concrete saw		54 to 75			
	Skid steer		55 to 76			
	Power hand tools		54 to 75			
Structure	Handheld jack hammer	117	46 to 67	62 to 83		
	Concrete saw		54 to 75			
	Power hand tools		54 to 75			
	Welder		46 to 67			
	Concrete pump truck		55 to 76			
	Concrete agitator truck		53 to 74			
Internal Works	Power hand tools	109	34 to 55	34 to 55		
Common and External Works	Concrete agitator truck	114	53 to 74	59 to 80		
	Saw cutter		44 to 65			
	Dump truck		44 to 65			
	Concrete saw		54 to 75			
	Power hand tools		54 to 75			

Table 57 Receiver 20 – Chatswood High School – Summary of predicted construction noise levels during Outside Standard Hours (BG + 5dBA)

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Criteria dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	55 to 76	58 to 79	Monday to Friday: 6:00pm to 7:00pm: 40 Saturday: 1:00pm to 4:00pm: 40	In accordance with Condition C5, works may only be undertaken if they do not exceed the BG + 5dBA requirement.
	Power hand tools		54 to 75			
	Semi Rigid Vehicle		45 to 66			
Ground Works and Demolition	Excavator	120	57 to 78	65 to 86		
	Hydraulic Hammer		63 to 84			
	Piling Rig		53 to 74			
	Handheld jack hammer		51 to 72			
	Dump truck		44 to 65			
	Concrete saw		54 to 75			
	Skid steer		55 to 76			
	Power hand tools		54 to 75			
Structure	Handheld jack hammer	117	46 to 67	62 to 83		
	Concrete saw		54 to 75			
	Power hand tools		54 to 75			
	Welder		46 to 67			
	Concrete pump truck		55 to 76			
	Concrete agitator truck		53 to 74			
Internal Works	Power hand tools	109	34 to 55	34 to 55		
Common and External Works	Concrete agitator truck	114	53 to 74	59 to 80		
	Saw cutter		44 to 65			
	Dump truck		44 to 65			
	Concrete saw		54 to 75			
	Power hand tools		54 to 75			

4.2 Construction Traffic Noise Assessment

It is proposed that the construction traffic could access the site via Pacific Highway and Centennial Avenue to access the site. However, vehicles larger than SRV will be advised to use Edgar Street to access Jenkins Street driveway and works zone. Heavy rigid vehicles will also access Pacific Highway driveway via Victoria Road.

From the criteria discussed in Section 3, it is noted that vehicle numbers on surrounding roads would need to increase by around 60% from existing traffic flows, for a 2 dB increase in road traffic noise to occur. As noted previously, a 2 dB increase in road traffic noise is not considered to be noticeable.

Based on the number of vehicles projected over each of the phases, it is concluded that noise impacts from construction traffic is unlikely to have an impact at the nearest affected properties. As a result, no further assessment is required.

4.3 Vibration Assessment

In order to maintain compliance with the human comfort vibration criteria discussed in Section 3, it is recommended that the indicative safe distances listed in Table 58 should be maintained. These indicative safe distances should be validated at the start of construction works by undertaking measurements of vibration levels generated by construction and demolition equipment to be used on site.

If applicable, the criteria for scientific or medical equipment (should any of these exist close to the site) can be more stringent than those required for human comfort. Vibration validating measurements should be conducted at each site to determine the vibration level and potential impact to this sensitive equipment.

Additionally, any vibration levels should be assessed in accordance with the criteria discussed in Section 3. This information should also be included as part of the CNVMSP.

Table 58 Recommended indicative safe working distances for vibration intensive plant

Plant	Rating / Description	Safe Working Distances (m)	
		Cosmetic Damage (BS 7385: Part 2 DIN 4150: Part 3)	Human Comfort (AVTG)
Vibratory roller	< 50 kN (Typically 1 – 2 tonnes)	5	15 – 20
	< 100 kN (Typically 2 – 4 tonnes)	6	20
	< 200 kN (Typically 4 – 6 tonnes)	12	40
	< 300 kN (Typically 7 – 13 tonnes)	15	100
	> 300 kN (Typically more than 13 tonnes)	20	100
Small hydraulic hammer	300 kg, typically 5 – 12 tonnes excavator	2	7
Medium hydraulic hammer	900 kg, typically 12 – 18 tonnes excavator	7	23
Large hydraulic hammer	1600 kg, typically 18 – 34 tonnes excavator	22	73
Vibratory pile driver	Sheet piles	2 – 20	20
Jackhammer	Hand held	1	Avoid contact with structure and steel reinforcements

5 NOISE AND VIBRATION MANAGEMENT PLAN

5.1 Acoustic Management Procedures

5.1.1 Summary of Management Procedures

Table 59 below summarises the management procedures recommended for airborne noise and vibration impacts. These procedures are also further discussed in the report. Hence, where applicable, links to further references are provided in Table 59.

Table 59 Summary of mitigation procedures

Procedure	Abbreviation	Description	Further Reference
General Management Measures	GMM	Introduce best-practice general mitigation measures in the workplace which are aimed at reducing the acoustic impact onto the nearest affected receivers.	Refer to Section 5.7 For noise impact, also refer to Section 5.2 For vibration impact, also refer to Section 5.3
Project Notification	PN	Issue project updates to stakeholders, discussing overviews of current and upcoming works. Advanced warning of potential disruptions can be included. Content and length to be determined on a project-by-project basis.	Refer to Section 5.4.
Verification Monitoring	V	Monitoring to comprise attended or unattended acoustic surveys. The purpose of the monitoring is to confirm measured levels are consistent with the predictions in the acoustic assessment, and to verify that the mitigation procedures are appropriate for the affected receivers. If the measured levels are higher than those predicted, then the measures will need to be reviewed and the management plan will need to be amended.	For noise impact, refer to Section 5.2.3 and Section 5.2.4. For vibration impact, refer to Section 5.3.2
Complaints Management System	CMS	Implement a management system which includes procedures for receiving and addressing complaints from affected stakeholders	Refer to Section 5.5
Specific Notification	SN	Individual letters or phone calls to notify stakeholders that noise levels are likely to exceed noise objectives. Alternatively, contractor could visit stakeholders individually in order to brief them in regards to the noise impact and the mitigation measures that will be implemented.	Refer to Section 5.4.
Respite Offer	RO	Offer provided to stakeholders subjected to an ongoing impact. The offer could include movie tickets, meal vouchers, gift cards or equivalent measures.	Refer to Section 5.2.1
Alternative Construction Methodology	AC	Contractor to consider alternative construction options that achieve compliance with relevant criteria. Alternative option to be determined on a case-by-case basis. It is recommended that the selection of the alternative option should also be determined by considering the assessment of on-site measurements (refer to Verification Monitoring above).	Refer to Section 5.7.1 and 5.7.2

The application of these procedures is in relation to the exceedances over the relevant criteria. For airborne noise, the criteria are based on NMLs. The allocation of these procedures is discussed in Section 5.1.2

For vibration, the criteria either correspond to human comfort, building damage or scientific and medical equipment. The application of these procedures is discussed in Section 5.1.3.

5.1.2 Allocation of Noise Management Procedures

For residences, the management procedures have been allocated based on noise level exceedances at the affected properties, which occur over the designated NMLs (refer to Section 3). The allocation of these procedures is summarised in Table 60 below.

Table 60 Allocation of noise management procedures – residential receivers

Construction Hours	Exceedance over NML (dB)	Management Procedures (see definition above)
Standard Hours Mon – Fri: 7:00 am to 6:00 pm Sat: 8:00 am – 1:00 pm	0 - 3	GMM
	4 - 10	GMM, PN, V [1], CMS, AC
	> 10	GMM, PN, V, CMS, SN, AC
Outside Standard Hours Mon – Fri: 6:00 pm to 7:00 pm Sat: 1:00 pm to 4:00 pm	0 - 10	GMM, AC
	11 - 20	GMM, PN, V [1], CMS, AC
	> 20	GMM, PN, V, CMS, SN, RO, AC

Notes

1. Verification monitoring to be undertaken upon complaints received from affected receivers

Please note the following regarding the allocation of these procedures:

- The exceedances have been estimated as part of the acoustic assessment, and these are summarised in Section 4.1.
- The allocation of procedures is based on the assumptions used for noise level predictions (refer to Section 4.1). Consequently, these allocations can be further refined once onsite works are undertaken and further development of the construction program.

For non-residential receivers (such as commercial), management measures are provided in Section 5.2.4.

5.1.3 Allocation of Vibration Management Procedures

Table 61 below summarises the vibration management procedures to be adopted based on exceedance scenarios (i.e., whether the exceedance occurs over human comfort criteria, building damage criteria, or criteria for scientific and medical equipment). Please note these management procedures apply for any type of affected receiver (i.e., for residences as well as non-residential receivers).

Table 61 Allocation of vibration management procedures

Construction Hours	Exceedance Scenario	Management Procedures
Standard Hours Mon – Fri: 7:00 am to 6:00 pm Sat: 8:00 am – 1:00 pm	Over human comfort criteria (refer to Section 3)	GMM, PN, V, RO
	Over building damage criteria (refer to Section 3)	GMM, V, AC
Outside Standard Hours Mon – Fri: 6:00 pm to 7:00 pm Sat: 1:00 pm to 4:00 pm	Over human comfort criteria (refer to Section 3)	GMM, SN, V, RO, CMS
	Over building damage criteria (refer to Section 3)	GMM, V, AC

5.2 Site Specific Noise Mitigation Measures

5.2.1 Respite Periods

Predicted noise levels outlined in Section 4.1 indicate that in some cases when works are being undertaken within proximity of receiver boundaries, exceedances above the Noise Management Levels (NMLs) may occur. In addition, in accordance with Condition C8 respite periods are recommended for noisy activities. As such the following respite conditions are recommended in accordance with C8 or when works extended periods of noisy works are affecting a surrounding receiver above the HNAL of 75dBA. See below.

Table 62 Recommended Respite Periods

Monday to Friday	Saturday
7:00am to 9:00am – No rock breaking, rock hammering, sheet piling, pile driving and similar activities. (Respite Period)	8:00am to 9:00am – No rock breaking, rock hammering, sheet piling, pile driving and similar activities. (Respite Period)
9:30am to 12:00pm – Works	9:00am to 12:00pm – Works
12:00pm to 2:00pm – No rock breaking, rock hammering, sheet piling, pile driving and similar activities. (Respite Period)	12:00pm to 4:00pm – No rock breaking, rock hammering, sheet piling, pile driving and similar activities. (Respite Period)
2:00pm to 5:00pm – Works	
5:00pm to 7:00pm – No rock breaking, rock hammering, sheet piling, pile driving and similar activities. (Respite Period)	

Note: Recommended respite periods for noisy works has been formulated in accordance with Condition C8 from the *Notice of Determination – Approval.*

5.2.2 General Comments

The contractor will, where reasonable and feasible, apply best practice noise mitigation measures. These measures shall include the following:

- Maximising the offset distance between plant items and nearby noise sensitive receivers.
- Preventing noisy plant working simultaneously and adjacent to sensitive receivers.
- Minimising consecutive works in the same site area.
- Orienting equipment away from noise sensitive areas.
- Carrying out loading and unloading away from noise sensitive areas.

In order to minimise noise impacts during the works, the contractor will take all reasonable and feasible measures to mitigate noise effects.

The contractor will also take reasonable steps to control noise from all plant and equipment. Examples of appropriate noise control include efficient silencers and low noise mufflers.

The contractor should apply all feasible and reasonable work practices to meet the NMLs and inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels, duration of noise generating construction works, and the contact details for the proposal.

5.2.3 Noise Monitoring

Unattended noise monitoring is proposed to be undertaken by the contractor as a process for providing regular feedback with regards to the management of construction noise levels. Unattended noise monitoring will be targeted for high noise generating works. In addition, attended vibration measurements may be undertaken from time to time to supplement the unattended monitoring.

The system which is proposed for the unattended noise monitoring results will be accessible by the project team via an online portal and monitored by the project acoustic consultant to provide real-time feedback with notifications and data analysis.

The survey methodology and equipment will comply with the monitoring requirements as discussed in Australian Standard AS 1055.1-1997.

All onsite measurements will be undertaken to investigate compliance against the noise management levels (NML's) which are formulated in section 3 above (i.e., Project Approval and NSW EPA ICNG).

The location of the monitors will be determined by the location and type of works being undertaken on each site, and will be reviewed monthly, or as work location and type progresses (whichever is first). Due to the extent of works area and the complex nature of the project sequencing, several monitors may be required throughout the duration of the project.

Monthly reporting is recommended to be undertaken which should include the following noise descriptors: L_{Amin}, L_{A90}, L_{A10}, L_{A1}, L_{Amax} and L_{Aeq}.

In the case of an exceedance, the unattended automated system will alert the project team, who will be able to begin an immediate investigation by use the project's "Noise and Vibration Investigation Checklist" (see Appendix A). This checklist will be used by the project team to determine the appropriate course of action which may or may not include involvement from the project's Acoustic Consultant. A summary of the available alternate mitigation measures will be provided as part of the monthly report. However, we do note in some cases alternate methodologies may not be available or cannot be implemented due to other project constraints.

5.2.4 Noise Mitigation Measures for Non-Residential Receivers

Where exceedances have been identified in Section 4, the following mitigation measures are recommended:

- Undertake general mitigation measures as discussed in Section 5.7
- Issue project updates to tenants in affected premises. The updates can include overview of current and upcoming works, as well as advanced warning of potential disruptions.
- Signage to be posted in order to provide stakeholders information regarding project details, emergency contacts and enquiry contact information.

5.2.5 Alternate Equipment or Process

Exceedance of the site's NMLs should result in an investigation as to whether alternate equipment could be used, or a difference process could be undertaken.

In some cases, the investigation may conclude that the use of other equipment is not possible, however, a different process could be undertaken.

5.2.6 Acoustic Enclosures/Screening

Typically, on a construction site there are three different types of plant that will be used: mobile plant (i.e., excavators, skid steers, etc.), semi mobile plant (i.e., hand tools generally) or static plant (i.e., diesel generators).

For plant items which are static it is recommended that, in the event exceedances are being measured due to operation of the plant item, an acoustic enclosure/screen is constructed to reduce impacts. These systems can be constructed from Fibre Cement (FC) sheeting or, if airflow is required, acoustic attenuators or louvres.

For semi mobile plant, relocation of plant should be investigated to either be operated in an enclosed space or at locations away from a receiver.

With mobile plant it is generally not possible to treat these sources. However, investigations into the machine itself may result in a reduction of noise (i.e., mufflers/attenuators etc).

5.3 Vibration Mitigation Measures

5.3.1 General Comments

As part of the CNVMSP, the following vibration mitigation measures should be implemented:

- Any vibration generating plant and equipment is to be in areas within the site in order to lower the vibration impacts.
- Investigate the feasibility of rescheduling the hours of operation of major vibration generating plant and equipment.
- Use lower vibration generating items of construction plant and equipment; that is, smaller capacity plant, where feasible
- Minimise conducting vibration generating works consecutively in the same area (if applicable).
- Schedule a minimum respite period of at least 30 minutes before activities commence which are to be undertaken for a continuous 4-hour period.
- Use only dampened rock breakers and/or "city" rock breakers to minimise the impacts associated with rock breaking works.

5.3.2 Vibration Monitoring

Similar to the methodology outlined for the noise monitoring above, unattended vibration monitoring is proposed to be undertaken by the contractor as a process for providing regular feedback with regards to the management levels. Vibration monitoring will target demolition, civil and vibratory works. In addition, attended vibration measurements may be undertaken from time to time to supplement the unattended monitoring.

The vibration monitoring results will also be accessible by the project team via an online portal, and monitored by the project acoustic consultant.

All vibration measurements are to be undertaken in accordance with the methodologies outlined in British Standard 7385-1:1990 Evaluation and measurement for vibration in buildings, DIN V 4150-1 Vibrations in Building; Influence On Persons In Buildings and DIN 4150-1 Effects On Structures.

The monitoring locations would be on a stiff part of the structure (at the foundation) on the side of the structure adjacent to the subject demolition and construction works, or in a suitable location at the site boundary.

Unattended monitoring systems will be configured to record the peak vibration levels and to trigger an alarm when predetermined vibration thresholds are exceeded. The thresholds correspond to an "Operator Warning Level" and an "Operator Halt Level", where the Warning Level is 75% of the Halt Level. The Halt Level should be determined based on the vibration criteria for building contents and structure (refer to Section 2).

Exceedance of the "Operator Warning Level" would not require excavation or demolition work to cease, but rather, alerts the site manager to proceed with caution at a reduced force or load.

An exceedance of the "Operator Halt Level" would require the contractor to implement an alternative excavation technique pending further analysis of the vibration frequency content in order to determine any potential exceedance of the criteria.

The location of the monitors will be determined by the location and type of works being undertaken on each site, and will be reviewed monthly, or as work location and type progresses (whichever is first). Due to the extent of works and the complex nature of the project sequence, several monitors will be required throughout the duration of the project.

If an exceedance above the management criteria is identified, an alert will be issued to the project team, who will assess whether it is at a 'Warning' or a 'Halt' level. If it is a 'Halt' level exceedance, the project team will complete a Noise and Vibration Investigation Checklist (see appendix A) to determine the appropriate course of action. A summary of the available alternate mitigation measures is to be provided as part of the monthly report. However, we do note in some cases alternate methodologies may not be available or cannot be implemented due to other project constraints.

5.4 SINSW Complaints management process as outlined in the Community Communication Strategy (CCS)

5.4.1 Enquiries and complaints management

SINSW manages enquiries (called interactions in our CRM, Darzin), and complaints in a timely and responsive manner.

Prior to project delivery, a complaint could be related to lack of community consultation, design of the project, lack of project progress, etc.

During project delivery, a complaint is defined as in regard to construction impacts – such as – safety, dust, noise, traffic, congestion, loss of parking, contamination, loss of amenity, hours of work, property damage, property access, service disruption, conduct or behaviour of construction workers, other environmental impacts, unplanned or uncommunicated disruption to the school.

As per our planning approval conditions, a complaints register is updated monthly and is publicly available on the project's website page on the SINSW website. The complaints register will record the number of complaints received, the nature of the complaints and how the complaint was resolved.

5.4.2 Complaints management process

If SINSW receives a complaint about the project during construction, it must be logged in our CRM system, actively managed, closed out and resolved by SINSW within 24-48 hours of receipt by the SINSW Community Engagement Manager, as outlined in Table 6 below. If this is not possible, the complaint must be escalated internally as required and resolved within 7 business days.

Complaints received via the following channels will be directed to the SINSW Community Engagement Manager for resolution:

- Phone: 1300 482 651 (24 hour toll free number)
- Email: schoolinfrastructure@det.nsw.edu.au
- Postal address: GPO Box 33, Sydney, NSW 2001
- Face to face
- School executive
- Project team

If the complainant is not satisfied with the SINSW response, and they approach SINSW for rectification, the process will involve a secondary review of their complaint as per the outlined process.

Complaints will be escalated when:

- An activity generates three complaints within a 24-hour period (separate complainants).
- Any construction site receives three different complaints within a 24-hour period.
- A single complainant reports three or more complaints within a three day period.
- A complainant threatens to escalate their issue to the media or government representative.
- The complaint was avoidable.
- The complaint relates to a compliance matter.

Complaints will be first escalated to the Senior Manager, Community and Engagement or Director of Communications for SINSW as the designated complaints handling management representatives for our projects. Further escalation will be made to the Executive Director, Office of the Chief Executive to mediate if required.

If a complaint still cannot be resolved by SINSW to the satisfaction of the complainant, we will advise them to contact the NSW Ombudsman - https://www.ombo.nsw.gov.au/complaints.

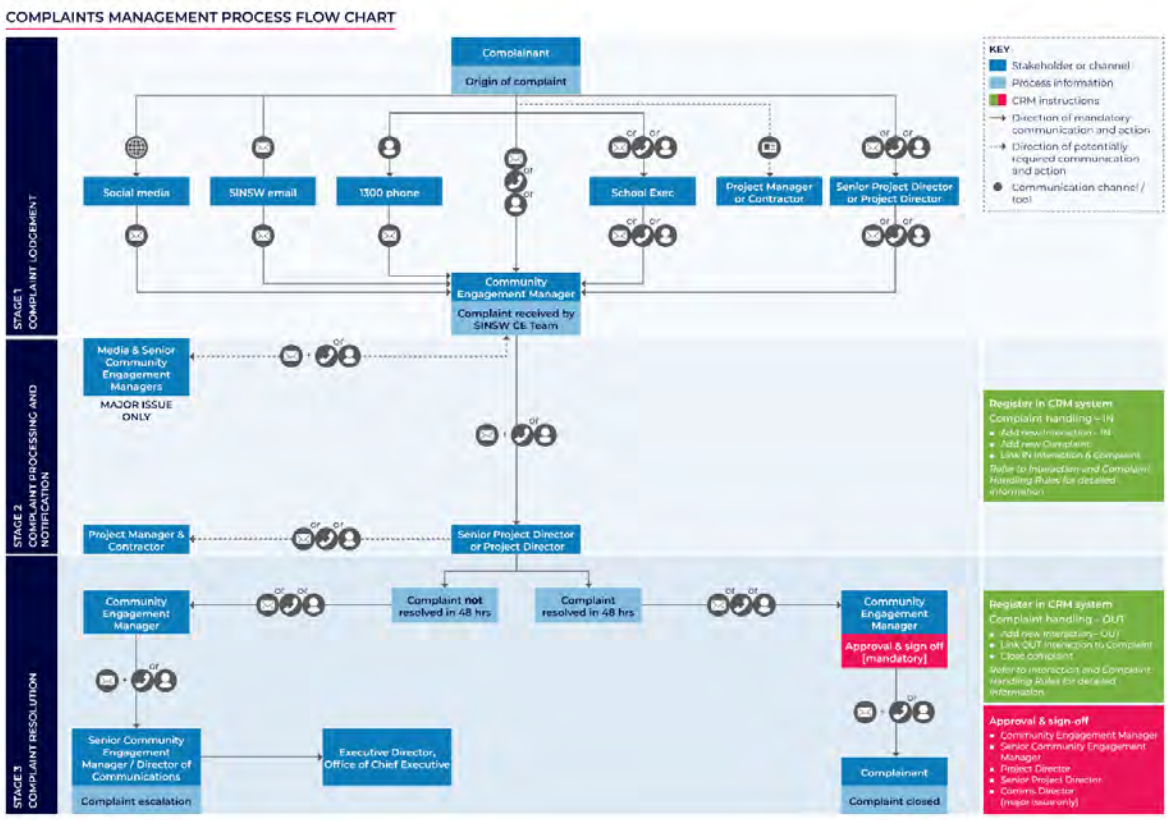
The below table summarises timeframes for responding to enquiries and complaints, through each correspondence method:

Table 63 Recommended Respite Periods

Complaint	Acknowledgement times	Response time
Phone call during business hours	At time of call – and agree with caller estimated timeframe for resolution.	Complaint to be closed out within 48 hours. If not possible, continue contact, escalate as required and resolve within 7 business days.
Phone call after hours*	Within two (2) hours of receiving message upon returning to office.	Following acknowledgement, complaint to be closed out within 48 hours. If not possible, continue contact, escalate as required and resolve within 7 business days.
Email during business hours	At time of email (automatic response)	Complaint to be closed out within 48 hours. If not possible, continue contact, escalate internally as required and resolve within 7 business days.
Email outside of business hours	At time of email (automatic response)	Complaint to be closed out within 48 hours (once return to business hours). If not possible, continue contact, escalate internally as required and resolve within 7 business days.
Letter	NA	Complaint to be closed out within 48 hours following receipt. If phone or email contact details are not provided a written response to be sent within 48 hours following receipt. If not possible, continue contact, escalate internally as required and resolve within 7 business days.
Interaction/ Enquiry		
Phone call during business hours	At time of call – and agree with caller estimated timeframe for response.	Interaction to be logged and closed out within 7 business days.
Phone call after hours	Within two (2) hours of receiving message upon returning to office.	Interaction to be logged and closed out within 7 business days.

Email during business hours	At time of email (automatic response)	Interaction to be logged and closed out within 7 business days.
Email outside of business hours	At time of email (automatic response)	Interaction to be logged and closed out within 7 business days.
Letter	N/A	Interaction to be logged and closed out within 10 business days following receipt.

The below diagram outlines our internal process for managing complaints.



5.4.3 Complaints in common community languages

Complaints can be made in common community languages using the Translating and Interpreting Service (TIS), managed by the Department of Home Affairs. Community members can be connected to an interpreter by calling TIS on 131 450. TIS contact details are included on all project communications. Once TIS has the interpreter on the line, the interpreter and community member are connected to School Infrastructure and phone interpretation can begin. School Infrastructure NSW receives the complaint via the translator and begins the complaints management process as outlined above.

5.4.4 Community Notifications

Prior to the works onsite being undertaken, it is recommended that community consultation with the neighbouring affected parties be undertaken. These include:

Table 64 Receiver Locations

Receiver Number	Receiver Type	Address
Receiver 1	Residential	1 & 2 James Street, Chatswood
Receiver 2	Residential	1-5 Jenkins Street, Chatswood
Receiver 3	Residential	9 Centennial Avenue, Chatswood
Receiver 4	Residential	22 Centennial Avenue, Chatswood
Receiver 5	Residential	18 Centennial Avenue, Chatswood
Receiver 6	Residential	8-14 Centennial Avenue, Chatswood
Receiver 7	Commercial	676 Old Pacific Highway, Chatswood
Receiver 8	Commercial	781-799 Pacific Highway, Chatswood
Receiver 9	Residential	809-811 Pacific Highway, Chatswood
Receiver 10	Residential	688 &692 Pacific Highway, Chatswood
Receiver 11	Residential	17-31 Centennial Avenue, Chatswood
Receiver 12	Residential	13-15 Centennial Avenue, Chatswood
Receiver 13	Residential	1-3 Oliver Road & 18 Oliver Road, Chatswood
Receiver 14	Residential	20 Freeman Road, Chatswood
Receiver 15	Residential	25 Goodchap Road, Chatswood
Receiver 16	Residential	36-38 Goodchap Road, 22-26 Eddy Road & 17-19A Lone Pine Avenue, Chatswood
Receiver 17	Residential	16-18 Lone Pine Avenue, 28-36 Eddy Road Chatswood
Receiver 18	Residential	69 Eddy Road & 2-2B De Villiers Avenue, Chatswood
Receiver 19	Residential	1-9 Dardanelles Road, Chatswood
Receiver 20	Residential	60 Centennial Avenue, Chatswood

The communication, however, should not be limited to the beginning of the onsite works but throughout, providing the community with constant updates on the progress and upcoming works. In our experience these could include:

- Project website.
- Email notifications; and
- Letterbox drops.

5.4.5 Community Engagement (Condition B21, (d) & (e))

In addressing the requirement for the community consultation when formulating onsite noise and vibration mitigation measures in accordance with Condition B21(d) and (e) we note the following.

5.4.5.1 Condition B21(d) – *"Strategies that have been developed with the community for managing high noise generating works."*

It is proposed that throughout the duration of the project, continued meetings with both the school principals will be undertaken on a regular basis to monitor and mitigate any impacts of construction noise and vibration on the school community.

5.4.5.2 Condition B21 (e) – *"**Describe the community consultation** undertaken to develop the strategies in condition **b21(d).**"*

In formulating the mitigation measure outlined above, SINSW, in conjunction with the project team, issued a letter to both schools and the surrounding community requesting their feedback regarding the formulation of noise and vibration mitigation measures.

Some feedback was received from one parent (which is included in the CNVMP consultation register completed by RCC/SINSW) which has led to enforcing the requirement of meeting weekly with the school Principals, which was an existing strategy. Any further information on community consultation should be found by referring to the SINSW Community Consultation Strategy.

5.5 Complaints Management System

Should complaints arise they must be dealt with in a responsible and uniform manner, therefore, a management system to deal with complaints is detailed above through SINSW.

5.6 Contingency Plans

Contingency plans are required to address noise or vibration problems if excessive levels are measured at surrounding sensitive receivers and/or if justified complaints occur. Such plans include:

- Stop the onsite works.
- Identify the source of the main equipment within specific areas of the site which is producing the most construction noise and vibration at the sensitive receivers; and
- Review the identified equipment and determine if an alternate piece of equipment can be used or the process can be altered.
- In the event an alternate piece of equipment or process can be used, works can re-commence.
- In the event an alternate piece of equipment or process cannot be determined implement a construction assessment to be performed by a suitably qualified acoustic consultant.

The Superintendent shall have access to view the Contractor's noise measurement records on request. The Superintendent may undertake noise monitoring if and when required.

5.7 General Mitigation Measures (Australia Standard 2436-2010)

As well as the above project specific noise mitigation controls, AS 2436-2010 "*Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites*" sets out numerous practical recommendations to assist in mitigating construction noise emissions. Examples of strategies that could be implemented on the subject project are listed below, including the typical noise reduction achieved, where applicable.

5.7.1 Adoption of Universal Work Practices

- Regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration.
- Regular identification of noisy activities and adoption of improvement techniques.
- Avoiding the use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon nearby sensitive receivers.
- Where possible, avoiding the use of equipment that generates impulsive noise.

- Minimising the need for vehicle reversing for example (particularly at night), by arranging for one-way site traffic routes.
- Use of broadband audible alarms on vehicles and elevating work platforms used on site.
- Minimising the movement of materials and plant and unnecessary metal-on-metal contact.
- Minimising truck movements.

5.7.2 Plant and Equipment

- Choosing quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks.
- Selecting plant and equipment with low vibration generation characteristics, where feasible.
- Operating plant and equipment in the quietest and most efficient manner.

5.7.3 On Site Noise Mitigation

- Maximising the distance between noise activities and noise sensitive land uses.
- Installing purpose-built noise barriers, acoustic sheds and enclosures around static plant.

5.7.4 Work Scheduling

- Providing respite periods which could include restricting very noisy activities to time periods that least affect the nearby noise sensitive locations, restricting the number of nights that after-hours work is conducted near residences or by determining any specific requirements.
- Scheduling work to coincide with non-sensitive periods.
- Planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from the sensitive receivers.
- Optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours.
- Including contract conditions that include penalties for non-compliance with reasonable instructions by the principal to minimise noise or arrange suitable scheduling.

5.7.5 Source Noise Control Strategies

Some ways of controlling noise at the source are:

- Where reasonably practical, noisy plant or processes should be replaced by less noisy alternatives.
- Modify existing equipment: Engines and exhausts are typically the dominant noise sources on mobile plant such as cranes, graders, excavators, trucks, etc. In order to minimise noise emissions, residential grade mufflers should be fitted on all mobile plant utilised on site.
- Siting of equipment: locating noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area; or orienting the equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise.
- Regular and effective maintenance.

5.7.6 Miscellaneous Comments

Deliveries should be undertaken, where possible, during standard construction hours.

Maximise hammer penetration (and reduce blows) by using sharp hammer tips. Keep stocks of sharp profiles at site and monitor the profiles in use.

"As per Consent Condition C15, where practicable, the use of "quackers" will be used to ensure noise impacts on surrounding noise sensitive receivers are minimised. This will not be implemented where it is deemed the use of quackers (as opposed to standard vehicle notification devices) would compromise the safety of construction staff or members of the public.

No public address system should be used on site.

APPENDIX A: ACOUSTIC GLOSSARY

The following is a brief description of the acoustic terminology used in this report:

Ambient Sound	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.
Audible Range	The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for some people to detect frequencies outside these limits.
Character, acoustic	The total of the qualities making up the individuality of the noise. The pitch or shape of a sound's frequency content (spectrum) dictate a sound's character.
Decibel [dB]	The level of noise is measured objectively using a Sound Level Meter. The following are examples of the decibel readings of every day sounds; 0dB the faintest sound we can hear 30dB a quiet library or in a quiet location in the country 45dB typical office space. Ambience in the city at night 60dB Martin Place at lunch time 70dB the sound of a car passing on the street 80dB loud music played at home 90dB the sound of a truck passing on the street 100dB the sound of a rock band 115dB limit of sound permitted in industry 120dB deafening
dB(A)	*A-weighted decibels* The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.
Frequency	Frequency is synonymous to *pitch*. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Loudness	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on
LMax	The maximum sound pressure level measured over a given period.
LMin	The minimum sound pressure level measured over a given period.
L1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L10	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L90	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L_{90} noise level expressed in units of dB(A).
Leq	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
dB (A)	'A' Weighted overall sound pressure level
Sound Pressure Level, LP dB	A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.

Sound Power Level, Lw dB	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt

APPENDIX B: NOISE & VIBRATION INVESIGATION CHECKLIST

Chatswood Public School & High School – Noise & Vibration Investigation Checklist

210069 - Chatswood HS & PS - Noise & Vibration Investigation Checklist - R2.docx

RICHARD CROOKES CONSTRUCTIONS

Pulse White Noise Acoustics (PWNA) and Richard Crookes Constructions (RCC) have prepared the following noise and vibration investigation checklist to assist the onsite construction team in investigation any received noise and vibration complaint or identifying an exceedance over the management levels. This checklist should be completed in conjunction with the *Chatswood Public & High School – Construction Noise Vibration Management Sub-Plan* prepared by PWNA.

Should any noise and vibration complaint be received, RCC must complete the following steps:

Exceedance/Complaint Information

Complaint reference number:.....

Date Received: .....

Location of Complaint: .....

Complainant Contact Details:.....

Step	Task	Completed Response
1	Pause onsite works	
2	Identify the main source(s) construction noise and/or vibration within specific areas of the site which is impacting the most at the sensitive receiver.	
3	Review the identified equipment and determine if an alternate piece of equipment can be used or the process can be altered. ***(If no, skip to step 5)***	
4	In the event an alternate piece of equipment or process can be used, works can re-commence incorporating possible and practical mitigation measures.	
5	In the event an alternate piece of equipment or process cannot be determined implement a construction assessment to be performed by a suitably qualified acoustic consultant. This may include additional respite periods.	

PULSE WHITE NOISE ACOUSTICS Level 5, 73 Walker Street, North Sydney NSW 2060
P 1800 4 PULSE (1800 478 573) **E** info@pwna.com.au **pwna.com.au** ABN 95 642 886 306

APPENDIX C: AUTHOR CURRICULUM VITAE (CV)

MATTHEW FURLONG
SENIOR ACOUSTIC CONSULTANT

QUALIFICATIONS

Bachelor of Creative Technology (Audio Engineering and Sound Production)

Matthew Furlong has 8 years' experience in delivering acoustic design on architectural, environmental and infrastructure projects, including conceptual, detailed design, construction and post-construction stages.

He has consulted for mixed use of commercial and residential developments, developing in-principle recommendations for the client and managing contractor providing detailed design advice as well as full construction services.

In addition to the above, Matthew has being part of many consulting teams in many education, health, fitouts and Land and Environmental Court (LEC) proceedings across the state.

SELECTED PROJECT EXPERIENCE

Residential Developments

- Acoustic Design for Crown Casino Sydney
- Acoustic Design and Construction Services 130 Elizabeth Street, Sydney (One30Hyde)
- Acoustic Design and Construction Services Trinity Terraces Rosebery
- Construction Services 1a Coulson Street, Erskinville
- Construction Services for the Erko Apartments Erskinville
- Construction Services for the Eve Apartments Erskinville
- Acoustic Design 54-56 Riley Street and 1 Crown Lane, Darlinghurst
- Development Application, Acoustic Design and Construction Services New Life Darling Harbour, 495 Harris Street, Ultimo
- Development Application, Acoustic Design and Construction Services Meriton Developments (Mascot, Rosebery, Epping, Parramatta, Pagewood, Bondi, Dee Why, Zetland, Waterloo, North Sydney, Sydney, Macquarie Park)
- Development Application, Acoustic Design and Construction Services Summer Hill Flourmill Stages 1, 2, 3 and 4.
- Acoustic Design and Construction Services Macquarie Park Village
- Acoustic Design and Construction Services Ryde Gardens
- Acoustic Design and Construction Services Tempo Apartments Victoria Road Drummoyne
- Development Application, Acoustic Design and Construction Services Winston Hills Mall Residential
- Construction Services Presbyterian Aged Care Paddington
- Acoustic Design and Construction Services Wahroonga Nursing Home
- Acoustic Design and Construction Anglicare Castle Hill (ARV)
- Acoustic Design and Construction Cardinal Freeman Village, Ashfield

MATTHEW FURLONG
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Commercial / Educational / Health Facilities

- Formulation of the new Victorian Health Engineering Guidelines (Acoustics)
- Development Application and Acoustic Design 210-220 George Street Sydney
- Acoustic Design and Construction Services 151 Clarence Street, Sydney
- Development Application for 390-396 Pitt Street, Haymarket
- Acoustic Design and Construction Services Chifley Plaza Internal Works
- Development Application 371-375 Pitt Street, Sydney
- Construction Services Fitout of the Department of Premier and Cabinet
- Noise Investigations for Transport NSW (Chatswood and Burwood)
- SSDA and Acoustic Design Meadowbank Education Precinct
- CNVMP and Construction Services Anzac Park Public School
- CNVMP and Construction Services Alexandria Park Public School
- Construction Services for Wagga Wagga Base Hospital Stage 2
- Construction Services for North Shore Public Hospital
- SSDA and Acoustic Design for Concord Repatriation General Hospital
- SSDA and Acoustic Design Nepean Public Hospital
- Construction Services for South East Regional Hospital (Bega)
- Acoustic Design for North Shore Health Hub
- Acoustic Design Sydney Children's Hospital Stage 1 & Children's Comprehensive Cancer Centre (SCH1/CCCC), Randwick

Licensed Premises

- Development Application for The Cauliflower Hotel, Waterloo
- Development Application for Christopher Hanna Salon and Bar, 13-15a Bridge Street, Sydney

Industrial Developments

- Acoustic Design Erskine Park Industrial Area
- Acoustic Design and Construction Services Snackbrands Orchard Hills

Chatswood Public School & High School – Noise & Vibration Investigation Checklist

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NSW GOVERNMENT | Education School Infrastructure

Post Approval Consultation Record

Identified Party to Consult:	Community
Consultation type:	SINSW Comms Letter to affected residents, requesting feedback on the proposed construction and noise/vibration management measures. This was distributed with the SINSW Comm monthly project update. *See attached letter drop flyer 'CNVMP Letter Box Drop Community Consultation'.*
When is consultation required?	Prior to commencement of construction
Why	B21 – Construction Noise & Vibration Management Sub-Plan
When was consultation scheduled/held	Letter was distributed with the March monthly project update. Residents received the letter on approx.. the 15th March 2021. Feedback from one parent was received after the distribution of this letter.
Identify persons and positions who were involved	Residents adjacent to the development sites.
Provide the details of the consultation	*See attached email 'Consultation Record - 240321 Email'.* Introduction to project noise & vibration management measures. Request for feedback on the proposed works.
What specific matters were discussed?	Construction works, timing and noise & vibration management measures. The CHS parent requested that contractors consider the needs of students and conduct noisy works outside of school hours.
What matters were resolved?	The parent was told that: - The hours stated are the conditions of consent, issued by the Department of Planning, Industry and Environment, and include respite hours. - The project team meets with the Principal weekly and takes their lead on the timing of noisy works. - Recommended the parent contact the CHS Principal directly with noise concerns (as requested by the CHS Principal). - Feedback will be passed onto the project team.
What matters are unresolved?	N/A

Any remaining points of disagreement?	N/A
How will SINSW address matters not resolved?	N/A

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- Acoustic Design Erskine Park Industrial Area
- Acoustic Design and Construction Services Snackbrands Orchard Hills

6.9 CONSTRUCTION SOIL & WATER MANAGEMENT SUB-PLAN

The Construction Soil & Water Management sub-Plan has been prepared by SCP Consulting for the Project.

It is not embedded in this document; it is supplied as an attached appendix so that it can be displayed/updated/revised in isolation if required.

Construction Soil and Water Management Plan

Chatswood Public School (CPS) & Chatswood High School (CHS)

SCP Ref: X-CIV-W-REP-01_CSWMP

Client Richard Crookes Constructions

Project Upgrades to Chatswood Public School and Chatswood High School

Date 20 April 2021

Revision table

Revision #	Date	Issue description	Prepared by	Reviewed by	Issued by
A	25/02/2021	Issue for Information	LS	JC	JC
B	20/04/21	Issue for Information	LS	JC	JB

Statement of Competency

I, James Clare, of SCP Consulting Pty Ltd at Level 2, 507 Kent Street, Sydney NSW 2000, am an appropriately qualified and competent person in this area being listed in the National Professional Engineers Register (NPER) and as such can certify that the contents of this report complies with relevant standards and guidelines.

James Clare
BEng (Civil), MiEAust, NER
Associate Civil Engineer

Copyright

Contents

Appendices

Condition Satisfaction Table		
Condition	**Condition Requirements**	**Document/Sub-Plan Reference**
B23	The Applicant must prepare a Construction Soil and Water Management Sub-Plan (CSWMSP) and the plan must address, but not be limited to the following:	-
	(a) be prepared by a suitable qualified expert, in consultation with Council;	Qualification statement on Page 2 and Consultation via email 13/04/21
	(b) measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;	Chapter 2 of this report
	(c) describe all erosion and sediment controls to be implemented during construction, including as a minimum, measures in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th Edition, Landcom 2004) commonly referred to as the 'Blue Book';	Chapter 2.2
	(d) provide a plan of how all construction works will be managed in a wet-weather events (i.e. storage of equipment, stabilisation of the Site);	Chapter 2.1
	(e) detail all off-Site flows from the Site; and	Chapter 2.4
	(f) describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to 1 in 5-year ARI and 1 in 100-year ARI.	Chapter 3

1 Introduction

As part of the detailed design process for the Civil works associated with the 'Upgrades to Chatswood Public School and Chatswood High School' project, SCP Consulting have been engaged by Richard Crookes Construction (RCC) to prepare a Construction Soil and Water Management Plan (CSWMP) in order to address soil and water issues that may occur during construction. This assessment is currently required under Condition B23 of the State Significant Development Application Consent Conditions (SSD 9483) and Landcom's '*Soil & Construction – Managing Urban Stormwater*' 4th Edition (March 2004) Guidelines, more commonly known as the 'Blue Book'.

1.1 Purpose of Report

The purpose of this report is to:

- Describe measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;
- Describe all erosion and sediment controls to be implemented during construction;
- Describe how erosion and sediment control measures will be maintained during construction works;
- Provide a plan for how all construction works will be managed in a wet-weather event;
- Detail all off-site flows, and;
- Describe the measures that must be implemented to manage stormwater and flood flows for small and large sized storm events.

1.2 Proposed Development

The project is located across two (2) sites along Centennial Avenue, Chatswood, NSW, approximately 12km north of the Sydney CBD. The existing Chatswood Public School (CPS) site is bound by Centennial Avenue to the south, Pacific Highway to the east, Jenkins Street to the west, and existing commercial and residential buildings to the north. The existing Chatswood High School (CHS) site is bound by Centennial Avenue to the north, Eddy Road to the south, and low-density residential buildings to the east and west. Refer to Figure 1 for an aerial view of the site boundaries.

Figure 1: Aerial View of Site Boundary (Source: Google Maps)

The proposed development includes the construction of a number of new learning facilities across both schools. Due to the size of the proposed development and considerable impact it will have to the landscape of the site, a sufficient site management plan must be implemented to ensure minimal impact to the environment and surrounding sites. It is pivotal that erosion, sediment and run-off from the site are controlled throughout excavation and construction, until completion of the development.

This report details the measures to be taken on-site from the start of excavation until the completion of construction in order to effectively manage all sediment, run-off and erosion, and to protect the surrounding properties and infrastructure.

1.3 Site Management

This Construction Soil and Water Management Plan (CSWMP) relates to the proposed CPS and CHS upgrades. As the project is structured to be constructed in different stages, this CSWMP is to be read in conjunction with the Erosion and Sediment Control plans prepared by SCP Consulting for each stage of the development, and the environmental and geotechnical investigations. The CSWMP is also to be read in conjunction with the architectural plans, engineering plans, and any other plans or written instructions that may be issued in relation to the development at the subject site.

This CSWMP has been prepared to outline how soil and water issues are to be identified, planned, managed and monitored during the construction period. The CSWMP addresses erosion, sedimentation and water pollution management and outlines measures to minimise adverse impact on downstream waterways and floodplains.

Particular effort must be made to protect and have minimal or no disturbance on the downstream areas. The measures should control all flow off site via sediment fencing and diversion banks during construction, which will be specified within the staged erosion and sediment control plans for both sites.

Contractors shall ensure that all soil and water management works are undertaken as instructed in this specification and constructed following the guidelines stated the Blue Book.

The Contractor shall ensure that all subcontractors are informed of their responsibilities in minimising the potential for soil erosion and pollution to down slope and downstream areas. The plans shall be reviewed and updated for each stage of construction and every six (6) months (whichever is more frequent) to ensure that it is in accordance with this CSWMP and Willoughby City Council requirements.

2 Soil and Water Management

Soil and water management measures are to be in place to manage the impact of construction on the local environment. The following measures are to be implemented prior to the start of construction works and to remain installed until the completion of works. These measures cover both small, 20% Annual Exceedance Probably (AEP), storm events and large ,1% AEP, storm events. Following the various storm events, maintenance is to occur for the implemented soil and water management controls, in accordance with maintenance procedures within Section 3 of this report.

2.1 Soil and Water Management Implementation

Soil and water management measures shall be undertaken as follows:

a. Input drainage and storm management systems to transport stormwater and run-off through or around site safely and without contamination of waterways.

b. Any temporary sediment basins must be constructed and in service prior to the start of bulk excavation and earthworks, where the disturbed earthworks area exceeds 2,500 m^2 and the annual soil loss exceeds 150m^3/yr at any one time. The basin is to remain until the disturbed area has been stabilised. The following works are required to be undertaken during the installation of sediment basins:

- Installation of a fence around the perimeter of the basin;
- Removal of existing reeds;
- Installation of rip rap to allow for bobcat access for periodic removal of sediment, and;
- Installation of a perforated riser pipe to pump and filter sediments from the stormwater collected in the sediment basin and discharge it to the Council stormwater system. Perforated riser pipe is to make direct connection to an existing pit.

c. Install sediment fencing and cut drains to meet the requirements of the staged erosion and sediment management drawings prepared by SCP.

d. Waste collection bins shall be installed adjacent to site office – yet not in a position which, in the case of overflowing or a spill, compromises the safety of waterways – for collection of all construction refuse. All waste materials must be disposed of off-site in a safe and legal manner, or stored safely, well clear of streambanks and flood-prone areas.

e. Staff facilities to be located such that all effluent and wastewater is easily contained and managed within the site management area and drained to a suitable location.

f. Construct stabilised site access in the location nominated on the staged erosion and sediment management drawings prepared by SCP.

g. Install sediment control protection measures such as geotextile filters or sandbags, at all natural and man-made drainage structures. Maintain until all the disturbed areas are stabilised.

h. Clear and strip the work areas. Minimise the damage to the grass and low ground cover of non-disturbed areas. At all times, minimise the area of the site being disturbed and stockpile all topsoil for reuse in rehabilitation works.

i. Ensure that land disturbance is no further than five (5) metres from the edge of construction activities, where possible.

j. Vehicle and equipment maintenance to occur offsite, or, where appropriate, in a designated area onsite that is impervious and bunded or similarly confined to prevent contamination of waterways.

k. Do not use invasive species in rehabilitation.

l. Do not use herbicides or other chemicals where they might pollute waterways.

m. Works should not cause new seepage areas.

n. Protect all stockpiles of materials from scour and erosion.

o. Apply permanent stabilisation to site (landscaping) within twenty (20) days of completion.

p. Sediment fencing is to remain until construction is complete, and the site is fully stabilised.

2.2 Erosion and Sediment Control

All erosion and sedimentation control measures, where possible, are to be installed prior to the commencement of any excavation or construction works on-site. The erosion and sediment control plans for each stage of construction, as shown in the drawings prepared by SCP, nominates the required measures. The devices are to be maintained throughout the entire excavation and construction process and must be maintained for a minimum of three (3) months after the completion of works, where necessary or approved otherwise at completion.

The erosion and sedimentation control measures shall be undertaken as follows:

a. Clearly visible barrier fencing shall be installed on the site to assist in controlling the movement of traffic within the site and prohibit unnecessary site disturbance.

b. Vehicular access to the site shall be stabilised and limited to only that essential for construction work and shall enter the site only through the designated stabilised construction vehicle entry point which consists of a minimum 5m long by 3m wide 'shaker grid'. The following should be adhered to with regards to the vehicle entry:

- All construction vehicles entering/exiting the site shall be required to pass over the vehicle entry to prevent them becoming the source of sediment. The vehicle entry may consist of a timber, concrete or steel shaker grid, or rubble area;
- The vehicle exit area is to be maintained in a clean and serviceable condition throughout construction;
- All public roads are to be cleaned immediately in the case that sediment is tracked onto the public roadway by vehicles leaving the construction site, and;
- Unsealed roads within the site are to be topped with 100mm compacted thickness, 40mm nom. aggregate.

Note: Shaker grids can be removed upon the establishment of a sealed vehicular route utilised by all construction vehicles. Site runoff in driveways will still need to be managed, either by the installation of stormwater infrastructure or bunding at the entrance.

c. Proprietary sediment fencing shall be installed in accordance with the staged erosion and sediment management drawings prepared by SCP and elsewhere at the discretion of the site superintendent to contain coarser sediment fractions as near as possible to their source. In accordance with the Department of Conservation and Land Management and the Clean Waters Act 1970, the sediment fence is to be constructed with geotextile fabric preventing suspended particles greater than 50mg/L non-filterable solids to pass through. The sediment fence is to be constructed at a minimum in accordance with the following:

- Geotextile fabric to be buried 150mm below surface level;
- 150mm overlaps will be provided at joins in the fabric at support posts;
- The ends of the fabric will be turned up for a length of one (1) metre in order to prevent volumes of suspended solids escaping in a storm event;
- Sediment fence will be installed as close as parallel to the contours of the site or at the toe of a slope;
- 1.5m long star pickets are to be driven into the ground at 3m centres to provide rigid support for the fence. Where there is insufficient soil depth over rock, holes are to be drilled into rock to accept the star pickets;
- Backfill trench over base of fabric and compact;
- On hard/rocky ground, smooth a 500mm wide strip upslope of a fence line, turn the bottom 500mm of the fabric upslope and anchor in place with suitable aggregate, and;
- Where a sediment fence is constructed down slope from a disturbed batter, the sediment fence shall be located approximately two (2) metres down slope from the toe of the batter.

d. Stockpiles shall be located in accordance with the staged erosion and sediment management drawings prepared by SCP. Where stockpiles are to be in place longer than ten (10) days they shall be stabilised by covering with mattering or tarps. Use sediment fences and earth banks downstream of stockpiles, as required, to manage erosion.

e. Stockpile material may be removed from site to reduce the risk of further pollution of site runoff.

f. Soil materials shall be replaced in the same layers they are removed from the ground i.e. all subsoils are to be buried and topsoil is to be respread on the surface at the completion of works.

g. All disturbed areas are to be stabilised within twenty (20) working days of the completion of site works. All disturbed areas are to be protected so that the land is permanently stabilised within three (3) months. Topsoil shall be respread over the site as required to achieve a minimum depth of 75mm of hydromulchable soil (exact required depth to be confirmed by supplier). The site shall be stabilised and revegetated using a hydromulch mix (or equivalent) to be specified by the supplier, as appropriate for the site. Soil testing may be required to tailor the mix for the site.

If hydromulching is not suitable for site stabilisation, refer to Table 1 for the seed mix that can be used for temporary stabilisation, assuming topsoil depths are sufficient.

Table 1: Proposed Stabilisation Seed Mix

SEASON	STABILISATION SEED MIX
Autumn/Winter	Oats at 40kg/ha and Japanese millet at 10 kg/ha
Spring/Summer	Oats at 20kg/ha and Japanese millet at 20 kg/ha

The above seed mix will provide temporary protection for up to six (6) months until such time as more permanent stabilisation measures can be implemented for permanent stabilisation of the site.

Any areas that remain exposed after disturbance, where no further works are to take place for a period of twelve (12) weeks must be stabilised by the methods mentioned in point (g) or an equivalent.

h. The following dust control procedures will be adhered to within the construction site:

- All vehicles shall leave the site via the stabilised site access as nominated on the drawings prepared by SCP. Vehicles shall have sediment removed from tyres and wheel guards prior to leaving the site;

- All fences will have shade cloth fixed to the inside of the fence;
- Dust will be suppressed within the construction site through the use of water sprinklers or water carts across ground surfaces when the surface has dried and there is potential to generate visible levels of dust. Dust can be generated through the operation of equipment or wind;
- Water will be sprayed at a rate of not less 3L/s and not less than 700kPa pressure to suppress dust within the site. The area within which sprays are used will be small enough to maintain damp surfaces but not generate runoff;
- Materials will not be burned on site;
- Soil transportation into the site will be done from the main access into the site, and;
- Loose loads entering/leaving the construction site will be secured using a tarpaulin or similar material in accordance with Roads & Maritime Services (RMS) and local Council guidelines.

2.3 Groundwater Protection

All erosion and sedimentation control measures also act as protection measures for groundwater during construction. The erosion and sediment control plan within Appendix A nominate required measures. The devices are to be maintained throughout the entire excavation and construction process.

From geotechnical reporting, prepared 3rd November 2020 by PSM Consulting, no groundwater was observed within the boreholes during the investigation. However, long term groundwater monitoring was not undertaken as part of the investigation.

2.4 Off-Site Flow Controls

Off-site flow from the site is currently managed within measures detailed in the staged erosion and sediment control management drawings prepared by SCP . Off-site flow is anticipated to occur via the following means, with management strategy within the ESCP detailed beside:

- Through existing internal stormwater pits on site - sediment trap barriers and geotextile linings are proposed around all pits. All new pits installed during construction to have same detail upon installation.
- Leaving site along the downstream boundary - sediment fencing and impermeable fencing provided.
- Leaving site along the driveway entrance - Raised construction entry/ cattlegrid and removable sediment sock in storm events as required.
- Through existing external stormwater pits in the external surrounding streets - Sediment not anticipated to reach these, but in the event it does, sediment trap barriers are placed around existing pits closest to site.

As mentioned earlier in this report, to ensure that off-site runoff is controlled during all phases of the development, erosion and sediment control measures have been staged to ensure runoff is adequately managed. The staging of measures is to be adhered to by the managing contractor.

The soil and water management measures have been designed in accordance with the Blue Book. All measures shown within the CSWMP and ESCP are designed for up to and including the 20% AEP storm flows. Any potential sediment basin required on site, if the area of disturbance or annual soil loss exceeds those nominated on the ESCP (for each stage of the development), will have its sediment and runoff volume sized on the methodology detailed within the Blue Book, which is based on a 1 Exceedance per Year (EY) storm event.

The Blue Book specified and effective control measures are difficult to achieve within the 1% AEP storm event due to the velocity and volume of floodwaters. It is noted that CPS is not subject to flooding during the 1% AEP storm event. CHS observes minor flooding for all storm events up to, and including, the 1% AEP storm event. The proposed stormwater network and existing network are designed to accommodate flows up to, and including, the 5% AEP storm. Sediment barriers and measures nominated within the ESCP are likely to be effective in larger storm events such as the 5% AEP storm, however it cannot be guaranteed to have full control of the sediment.

Erosion and sediment control measures specific to major storm events on an urban project like this are not recommended as it has the potential to cause obstruction to overland flow paths and raise the flood levels. Localised raising of flood levels in urban areas can lead to inundation of existing properties surrounding the proposed development areas.

3 Maintenance During Construction

A regular site maintenance program shall be established for the site based upon:

- Daily site walk-over by site foreman/manager to ensure adequate condition of erosion control measures;
- A weekly site audit of erosion control measures during periods of dry weather, and;
- A site audit of all erosion control measures following a rainfall event.

The site maintenance program shall be conducted until site stabilisation measures have been established on site, and shall ensure (as a minimum) that the following activities are routinely conducted:

a. Waste bins are to be emptied at least weekly and refuse is to be disposed of via an approved waste facility.

b. All potential dust and air pollutants vulnerable to wind erosion must be controlled effectively. This includes waste bins, unsealed access tracks, and stockpiles etc.

c. Ensure that all drains are operating effectively and make any necessary repairs.

d. Remove any spilled material from areas subject to runoff or concentrated flow.

e. Remove trapped sediment where the capacity of the trapping device falls below 60%. Sediment removed from any trapping device shall be relocated where further pollution to downslope lands and waterways cannot occur.

f. Construct additional erosion or sediment control works as may be appropriate to ensure the protection of downslope lands and waterways.

g. Maintain erosion and sediment control measures in a fully functioning condition at all times until the site is rehabilitated, making repairs to measures as necessary; always keeping all potential hazards of soil erosion and any potential pollutants to downslope areas to a minimum.

h. Ensure rehabilitated lands have effectively reduced the erosion hazard and initiate upgrading or repair as appropriate.

i. Ensure that the revegetation scheme is adhered to and that the all grass covers are kept healthy, including watering and mowing. Excessive growth should be controlled as necessary.

j. Remove temporary soil conservation structures as the last activity in the rehabilitation program.

For further and more detailed maintenance measures, refer to Chapter 8 of Landcom's *Soils & Construction - Managing Urban Stormwater*.

Reports covering a variety of anticipated environmental issues were prepared during the planning and design phase of this project. Contractors are to make themselves aware of these reports and the objectives and outcomes identified. The following reports should be read in conjunction with this Construction Soil and Water Management Plan:

- Geotechnical, Environmental and Hazmat Investigation Report, prepared by PSM Consulting. Date: 18 February 2020, Ref: PSM3730-006R Rev 3;
- Geotechnical Investigation Report, prepared by PSM Consulting. Date: 3 November 2020, Ref: PSM4133-003R;

- Geotechnical and Site Investigation Report, prepared by Coffey Services Australia. Date: 2 November 2020, Ref: SYDGE280081-AB;
- Environmental Impact Statement, prepared by Planning Urban Design. Date: 23 March 2020, Ref: 20618A.EIS;
- Preliminary Construction Traffic and Pedestrian Management Plan, prepared by The Transport Planning Partnership. Date: 16 March 2020, Ref: 17356;
- Operational Waste Management Plan, prepared by Foresight Environmental. Date: 25 February 2020;
- Construction Waste Management Plan, prepared by Foresight Environmental. Date: 17 February 2020;
- Preliminary Construction Management Plan, prepared by Johnstaff Projects, Date: 10 March 2020, and;
- Remediation Action Plan, prepared by JBS&G. Date: 20 February 2020, Ref: 55579/127236 (Rev 0).

4 Unexpected Finds Protocol

All stockpiles and materials on-site must be controlled and managed using the advice provided in Section 2 and 3. For uncontrolled fill identified by the Contractor, geotechnical engineer or civil engineer, the material should be assessed and if not suitable for reuse, stockpiled in the relevant locations. At the conclusion of construction, all unused materials must be removed from site and disposed of off-site in an approved manner. Unused fill material must either be integrated into the landscaping of the site or disposed of off-site in an approved manner. This is to prevent contamination of the site and surrounding areas, and to maintain the aesthetics of the development.

Should fly tipping be found on site during construction, Council recommends that you should not attempt to remove or touch any dumped rubbish as it may be harmful and/or hazardous. A site representative should report this to Council immediately, by calling 02 9391 7000

A site hygienist and heritage consultant are engaged within this project and should be consulted with in the event of unexpected contamination or heritage finds.

Below are the details of potentially relevant contacts in the case of finding various materials or services on-site:

- **Dial Before You Dig:** **1100**
- **Willoughby City Council** **02 9777 1000**
- **Jemena:** **131 909**
- **Telstra:** **13 22 03**
- **All About Asbestos:** **0411 650 980**
- **Endeavour Energy:** **13 10 81**
- **Sydney Water:** **13 20 90**

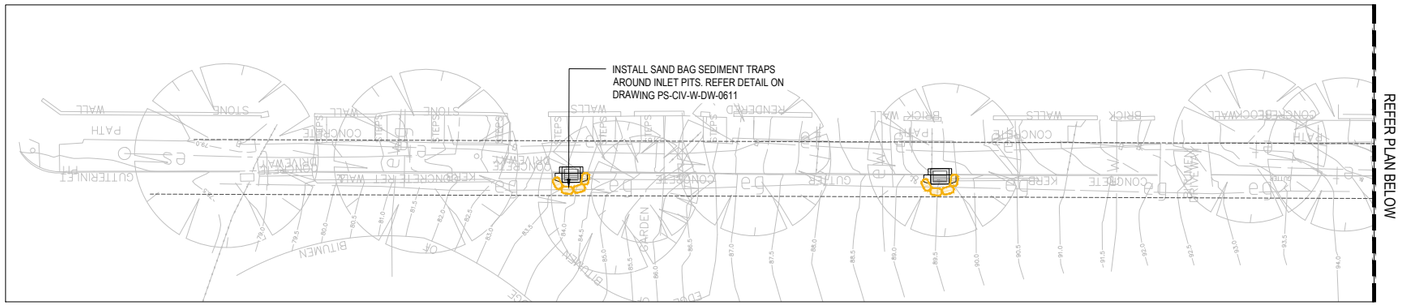
5 Conclusion

The following strategies have been documented and require implementation to ensure that the requirements of the SSD Condition of Consent are achieved:

- Erosion and Sediment Control measures, as per the staged drawings prepared by SCP.
- Monitoring and maintaining the installed measures, as per details in Section 3.
- Following recommendations within the various reports listed within Section 3 is achieved.
- Ensure hazardous materials and unexpected finds are managed in accordance relevant standards and as described in Section 4.

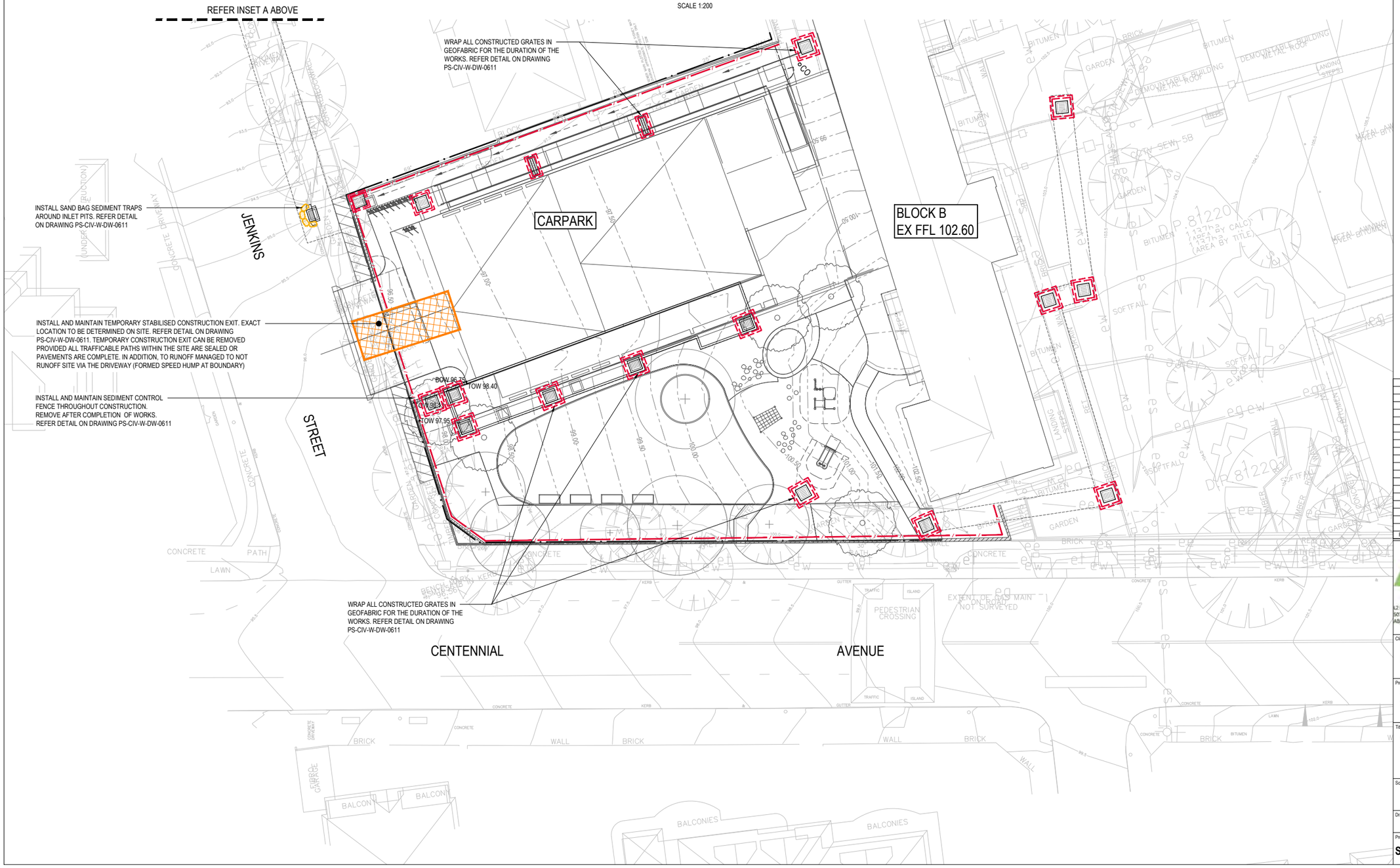
Throughout construction site conditions and construction methodologies can change. Therefore, it is recommended that soil and water management measures are reviewed and amended if necessary, to ensure that the development has minimal to no impact on the local environment.

Appendix A CPS Erosion and Sediment Control Plans



INSET A

SCALE 1:200



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NOTE:

1. EXISTING TREES TO REMAIN TO BE PROTECTED IN ACCORDANCE WITH ARBORIST REPORT AND RECOMMENDATIONS

Rev	Revision Description	Date
D	DETAILED DESIGN REPORT	20-04-21
C	80% DESIGN DELEVOPMENT	11/12/20
B	80% DESIGN DELEVOPMENT	13/11/20
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www.scpconsult.com.au

Client
NSW GOVERNMENT DEPARTMENT OF EDUCATION - SCHOOL INFRASTRUCTURE

Project
UPGRADES TO CHATSWOOD PUBLIC SCHOOL AND HIGH SCHOOL

Title
CPS STAGE 01 - EROSION AND SEDIMENT CONTROL PLAN

Scale
0 4000 10000
1:200 @ A1

Drawn	Designed	Checked	Approved
LCh	JC	JB	-

Project Number	Drawing Number	Revision
S201075	PS-CIV-ST1-DW-0601	D

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Client
NSW GOVERNMENT DEPARTMENT OF EDUCATION - SCHOOL INFRASTRUCTURE

Project
UPGRADES TO CHATSWOOD PUBLIC SCHOOL AND HIGH SCHOOL

Title
CPS STAGE 02 - EROSION AND SEDIMENT CONTROL PLAN

Scale
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Drawn	Designed	Checked	Approved
LCh	JC	JB	-

Project Number	Drawing Number	Revision
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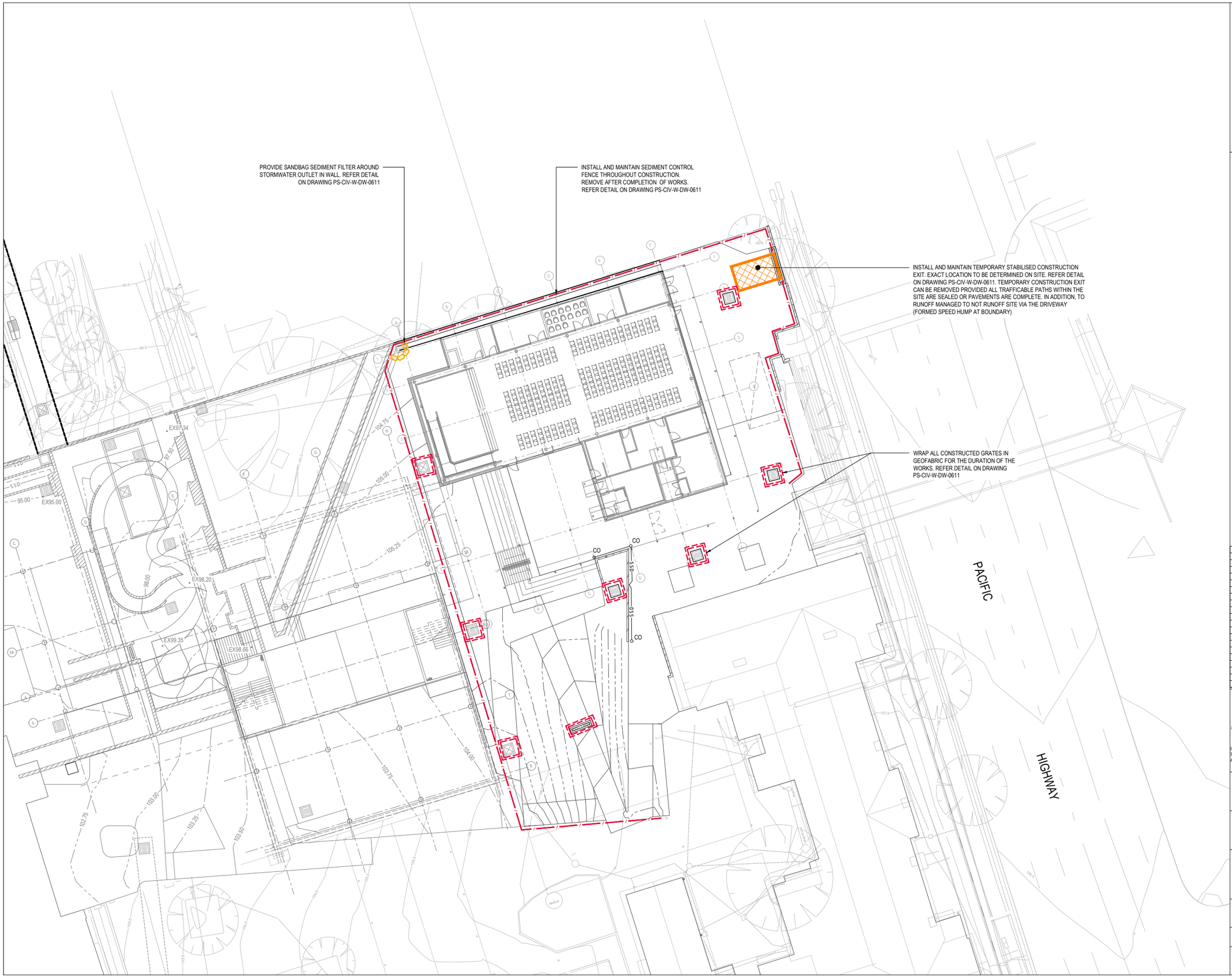

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Client
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Project
UPGRADES TO CHATSWOOD PUBLIC SCHOOL AND HIGH SCHOOL

Title
CPS STAGE 03 - EROSION AND SEDIMENT CONTROL PLAN

Scale
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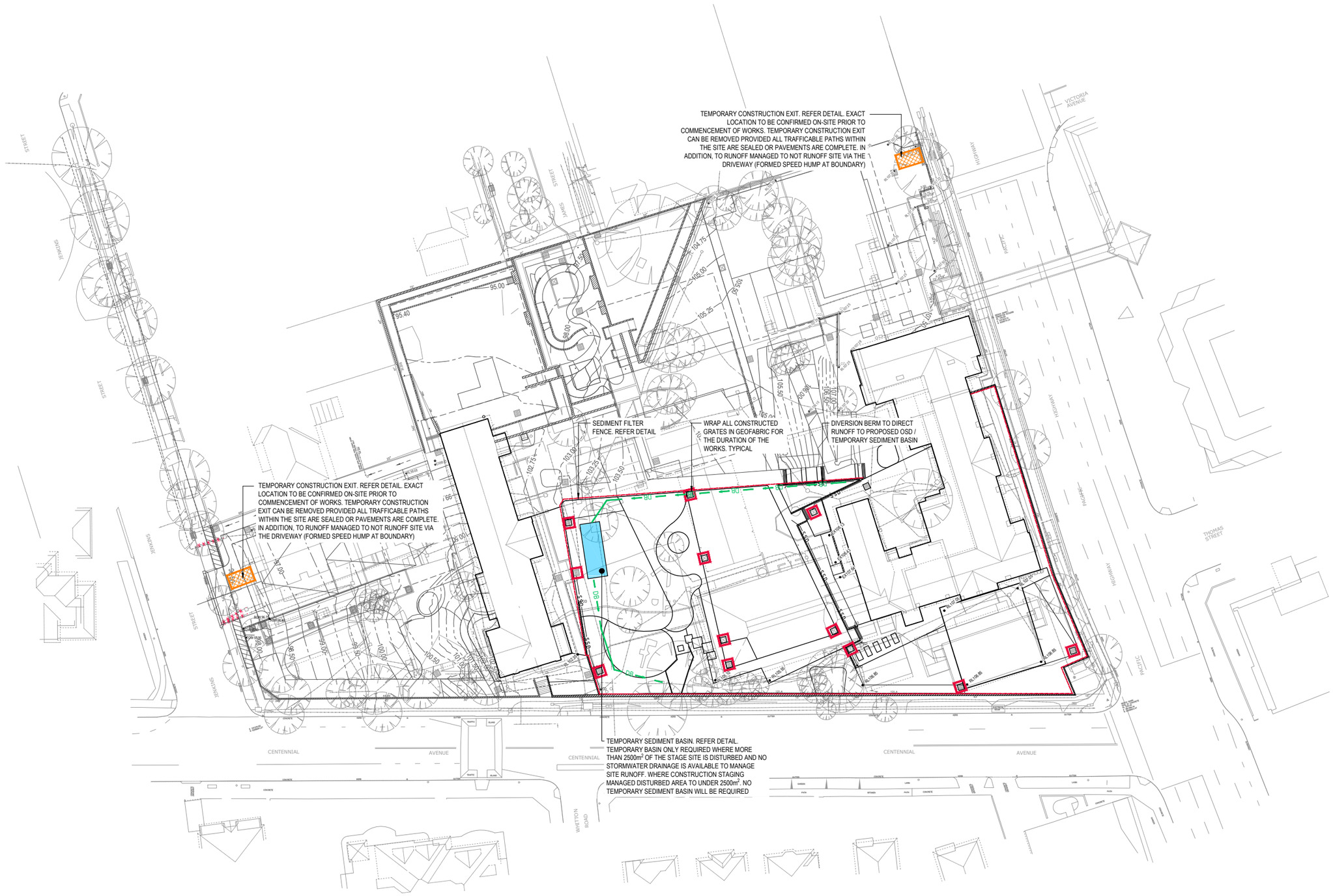
Drawn	Designed	Checked	Approved
LCh	JC	JB	-

Project Number	Drawing Number	Revision
S201075	PS-CIV-ST3-DW-0601	D



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Client
NSW GOVERNMENT DEPARTMENT OF EDUCATION - SCHOOL INFRASTRUCTURE

Project
UPGRADES TO CHATSWOOD PUBLIC SCHOOL AND HIGH SCHOOL

Title
CPS STAGE 04 - EROSION AND SEDIMENT CONTROL PLAN

Scale
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LCh	JC	JB	-

Project Number	Drawing Number	Revision
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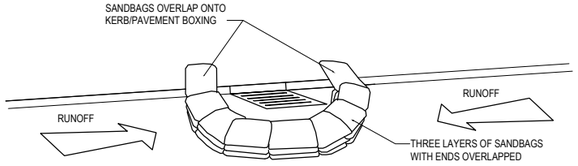
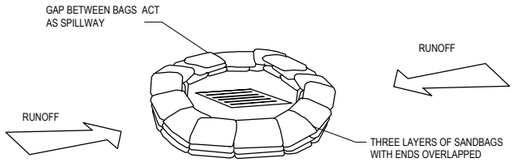


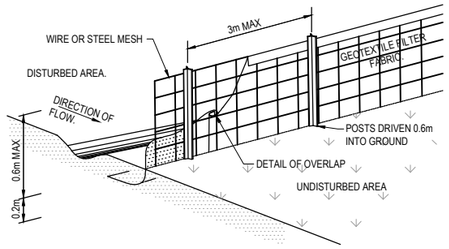
SANDBAG SEDIMENT TRAP - AT KERB SAG PIT



SANDBAG SEDIMENT TRAP - AT OTHER THAN KERB SAG PIT

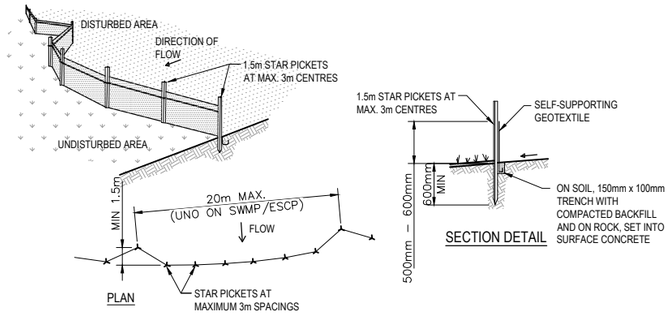
SANDBAG SEDIMENT TRAP DETAILS

NTS



SEDIMENT CONTROL FENCE

NTS

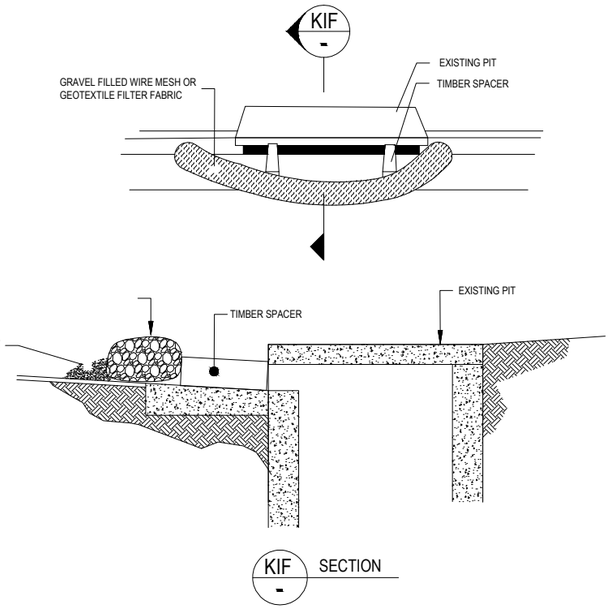


CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
2. DRIVE 1.5m LONG STAR PICKETS INTO GROUND, 3 METRES APART.
3. DIG A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
4. BACKFILL TRENCH OVER BASE OF FABRIC.
5. FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY GEOTEXTILE MANUFACTURER.
6. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.

SEDIMENT CONTROL FENCE

NTS

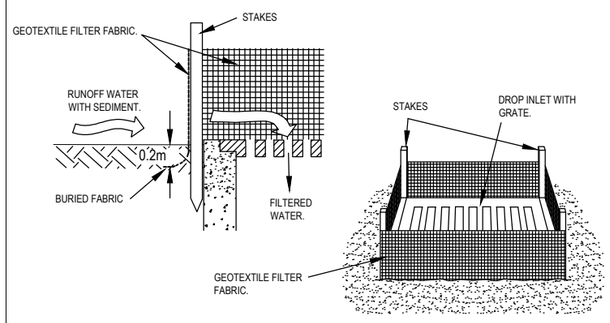


KERB INLET FILTER

NTS

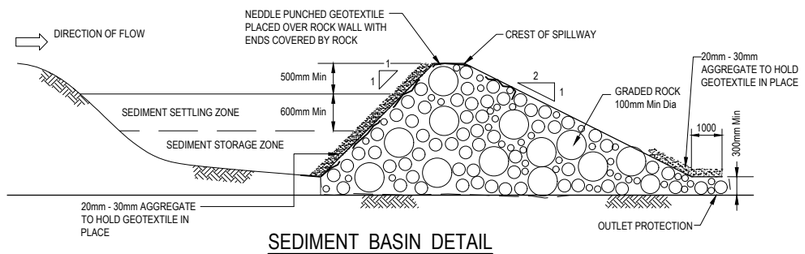
CONSTRUCTION NOTES:

1. INSTALL KERB INLET FILTERS TO KERB INLETS ONLY AT SAG POINTS OR AS SHOWN ON PLAN
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
4. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.



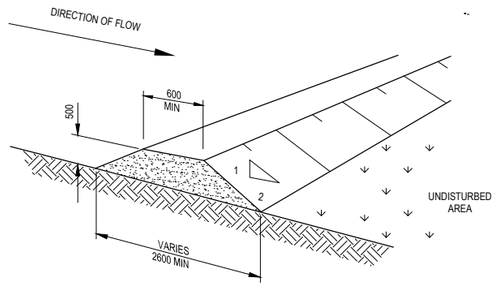
GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP

NTS



SEDIMENT BASIN DETAIL

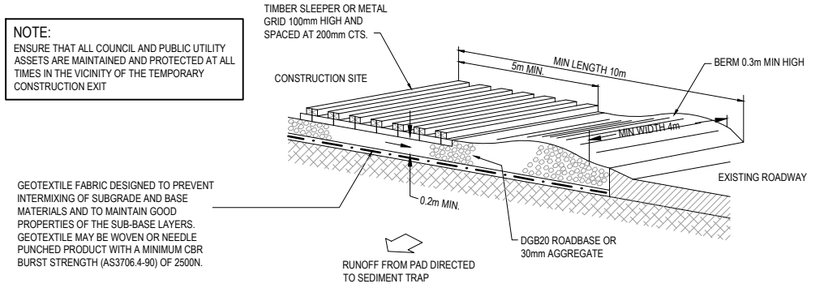
NTS



DIVERSION BANK

NTS

NOTE:
ENSURE THAT ALL COUNCIL AND PUBLIC UTILITY ASSETS ARE MAINTAINED AND PROTECTED AT ALL TIMES IN THE VICINITY OF THE TEMPORARY CONSTRUCTION EXIT



CONSTRUCTION NOTES

1. STRIP TOPSOIL AND LEVEL SITE.
2. COMPACT SUBGRADE.
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE.
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP WHERE THE SEDIMENT IS COLLECTED AND REMOVED.

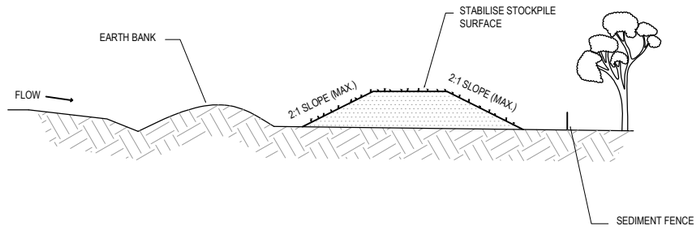
MAINTENANCE NOTES

THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH PREVENTS TRACKING OR FLOWING OF SEDIMENT OFF THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED OFF THE CONSTRUCTION SITE MUST BE REMOVED IMMEDIATELY.

TEMPORARY STABILISED CONSTRUCTION EXIT

NTS

SOURCE: MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION THIRD EDITION, AUGUST 1998 PRODUCED BY THE DEPARTMENT OF HOUSING



CONSTRUCTION NOTES

1. LOCATE STOCKPILE AT LEAST 5 METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOWS, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS A LOW, FLAT, ELONGATED MOUND.
3. WHERE THERE IS SUFFICIENT AREA TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METERS IN HEIGHT.
4. REHABILITATE IN ACCORDANCE WITH THE SWMP/ESCP.
5. CONSTRUCT EARTH BANK (STANDARD DRAWING 5-2) ON THE UPSLOPE SIDE TO DIVERT RUN OFF AROUND THE STOCKPILE AND A SEDIMENT FENCE (STANDARD DRAWING 6-7) 1 TO 2 METRES DOWNSLOPE OF STOCKPILE.

STOCKPILES

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B	80% DESIGN DEVELOPMENT	13/11/20
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Client
NSW GOVERNMENT DEPARTMENT OF EDUCATION - SCHOOL INFRASTRUCTURE

Project
UPGRADES TO CHATSWOOD PUBLIC SCHOOL AND HIGH SCHOOL

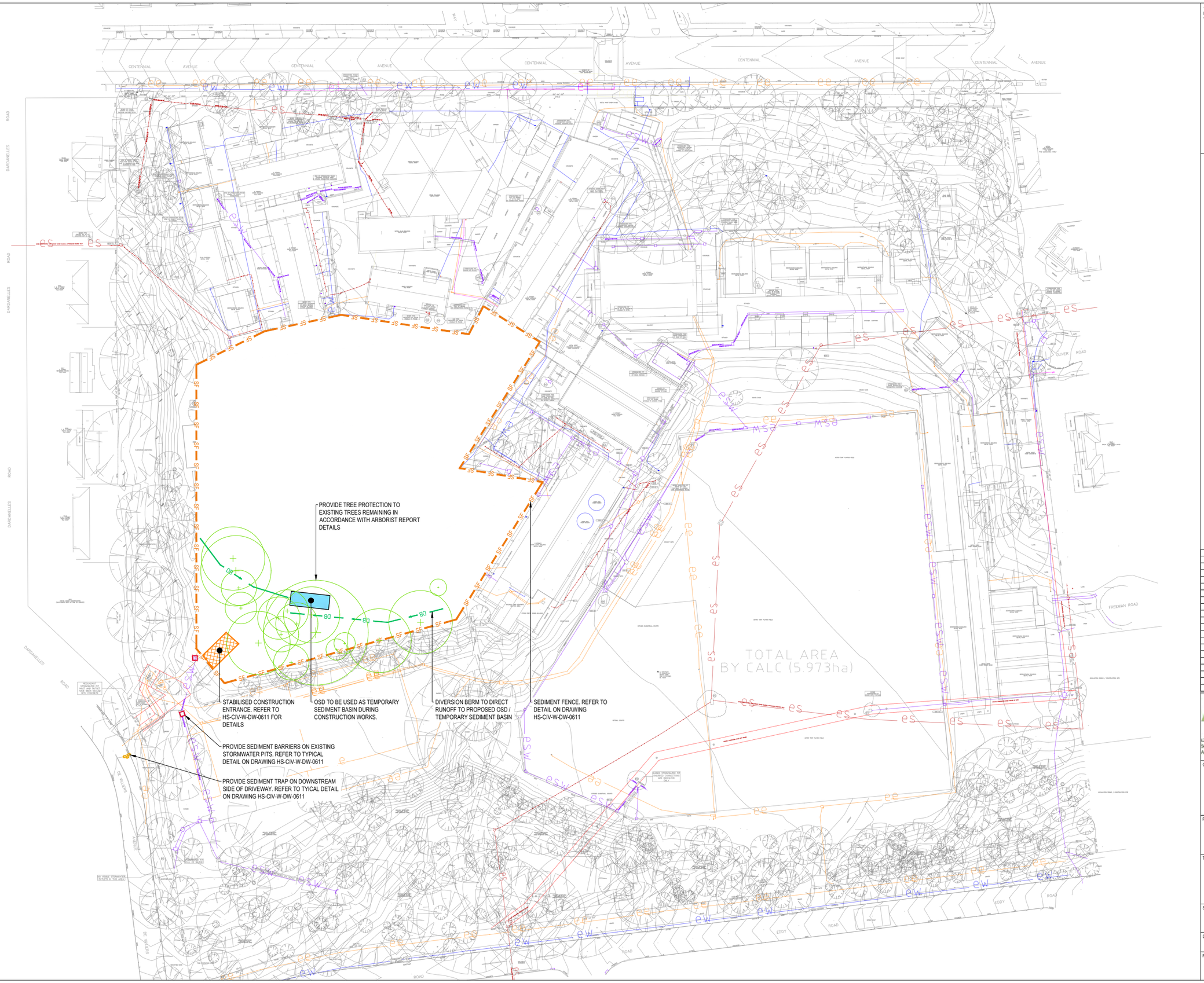
Title
CPS - EROSION AND SEDIMENT CONTROL DETAILS

Scale
AS SHOWN AT A1

Drawn	Designed	Checked	Approved
LCh	JC	JB	-

Project Number	Drawing Number	Revision
S201075	PS-CIV-W-DW-0611	C

Appendix B CHS Erosion and Sediment Control Plans



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B	80% DESIGN DEVELOPMENT	23-11-20
A	80% DD ISSUE FOR COORDINATION	06-11-20

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Client
NSW GOVERNMENT Education

Project
UPGRADES TO CHATSWOOD HIGHSCOOL PACIFIC HWY SITE

Title
CHS STAGE 1 - EROSION AND SEDIMENT CONTROL PLAN

Scale
0 10000 25000
1:500 at A1

Drawn	Designed	Checked	Approved
BH	DK	JC	JB

Project Number	Drawing Number	Revision
S201075	HS-CIV-ST1-DW-0601	C

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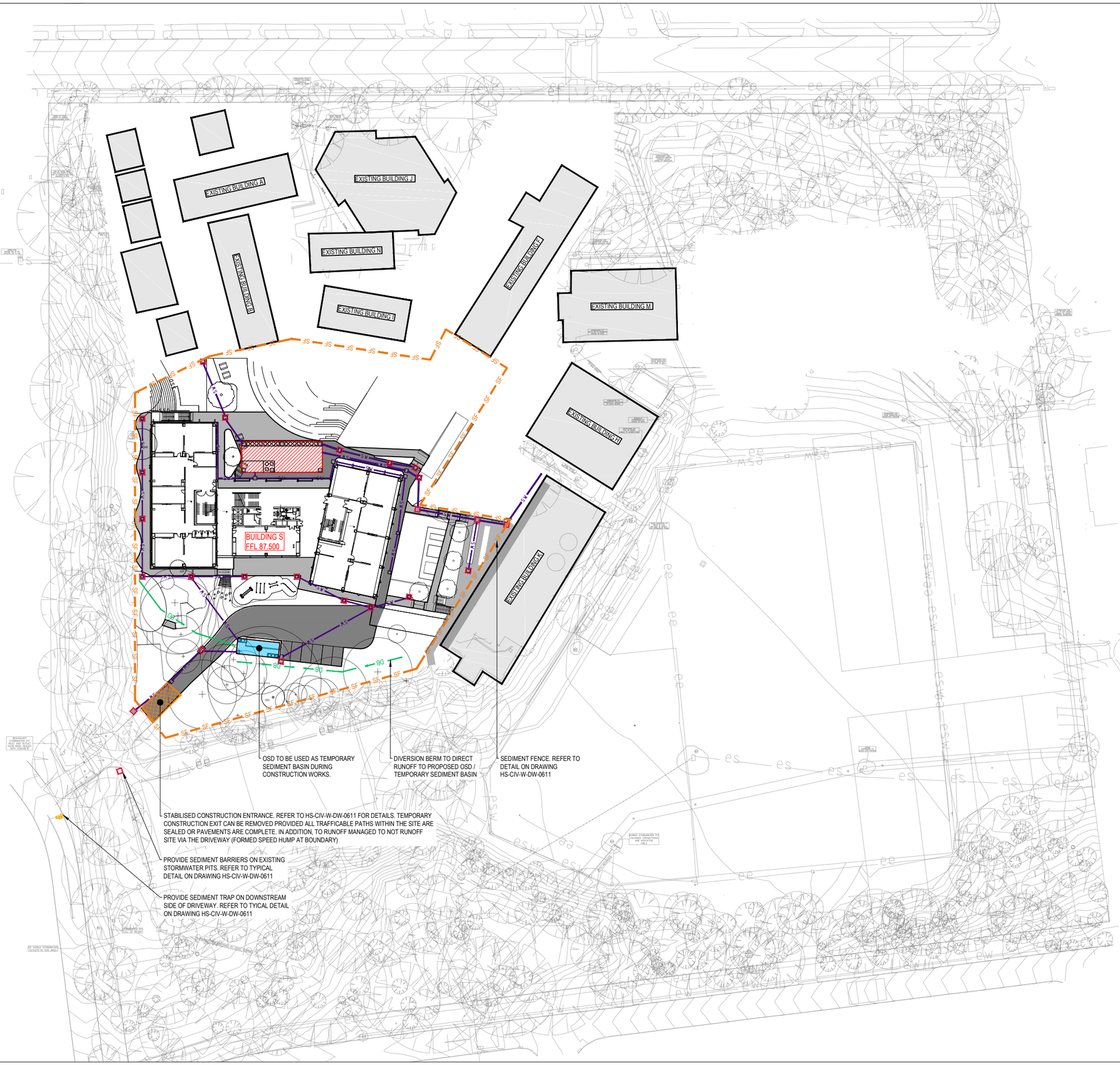

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A	80% DD ISSUE FOR COORDINATION	06-11-20

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Client
NSW GOVERNMENT Education

Project
UPGRADES TO CHATSWOOD HIGHSCOOL PACIFIC HWY SITE

Title
CHS STAGE 2 - EROSION AND SEDIMENT CONTROL PLAN

Scale
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1:500 at A1

Drawn	Designed	Checked	Approved
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Project Number	Drawing Number	Revision
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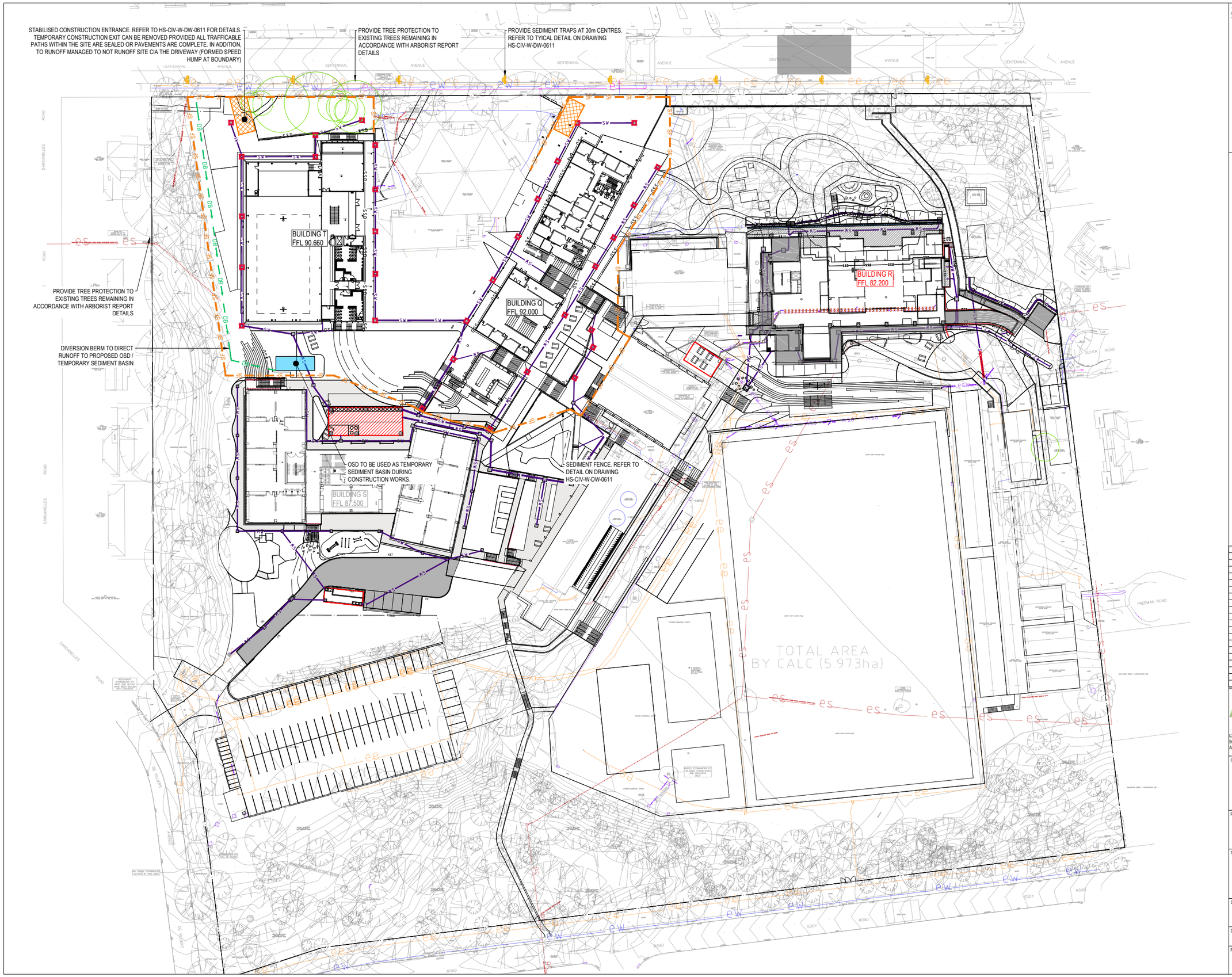

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Client
NSW GOVERNMENT Education

Project
UPGRADES TO CHATSWOOD HIGHSCOOL PACIFIC HWY SITE

Title
CHS STAGE 3 - EROSION AND SEDIMENT CONTROL PLAN

Scale
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Drawn	Designed	Checked	Approved
BH	DK	JC	JB

Project Number	Drawing Number	Revision
S201075	HS-CIV-ST3-DW-0601	D

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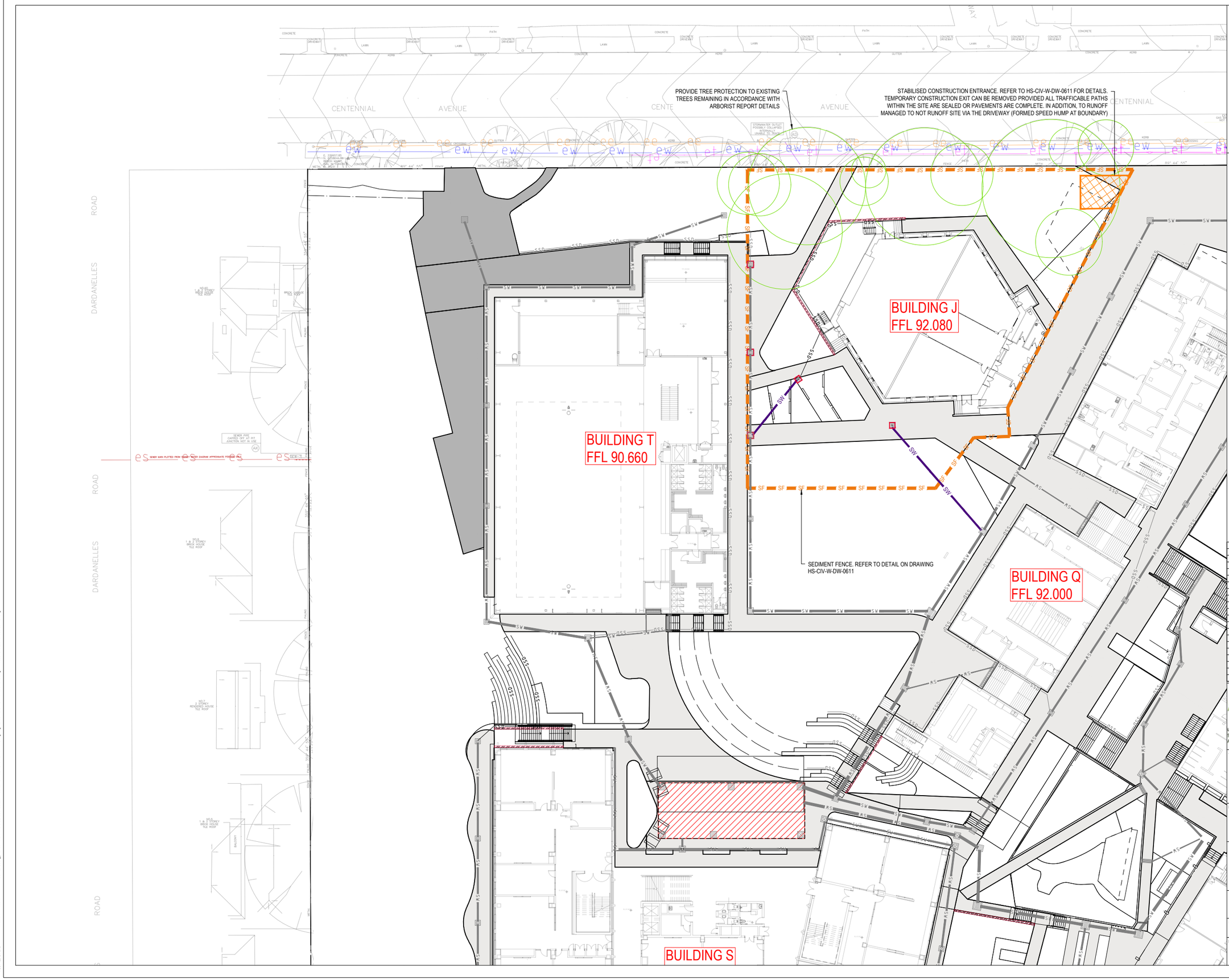

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Rev	Revision Description	Date
C	DETAILED DESIGN REPORT	20-04-21
B	DETAILED DESIGN REPORT	11-12-20
A	80% DESIGN DEVELOPMENT	23-11-20

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507 Kent St Sydney NSW 2000
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info@scpconsult.com.au
www.scpconsult.com.au

Client
NSW GOVERNMENT Education

Project
UPGRADES TO CHATSWOOD HIGHSCOOL PACIFIC HWY SITE

Title
CHS STAGE 4 - EROSION AND SEDIMENT CONTROL PLAN

Scale
0 5000 12500
1:250 @ A1

Drawn	Designed	Checked	Approved
BH	DK	JC	JB

Project Number	Drawing Number	Revision
S201075	HS-CIV-ST4-DW-0601	C

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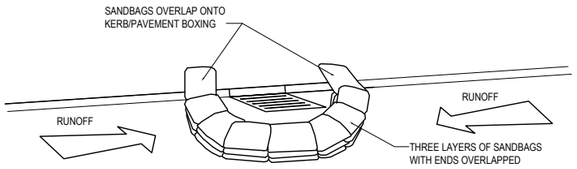
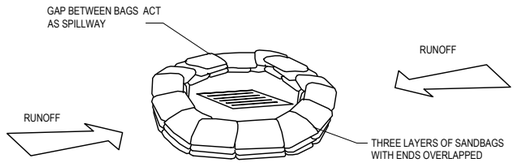


SANDBAG SEDIMENT TRAP - AT KERB SAG PIT

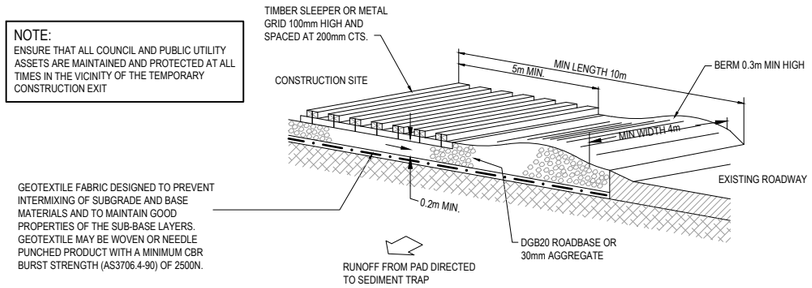


SANDBAG SEDIMENT TRAP - AT OTHER THAN KERB SAG PIT

SANDBAG SEDIMENT TRAP DETAILS

NTS

NOTE:
ENSURE THAT ALL COUNCIL AND PUBLIC UTILITY ASSETS ARE MAINTAINED AND PROTECTED AT ALL TIMES IN THE VICINITY OF THE TEMPORARY CONSTRUCTION EXIT



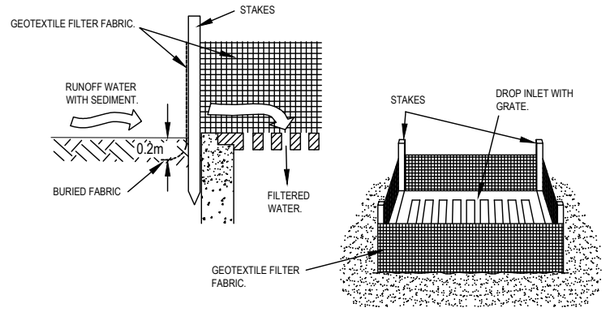
CONSTRUCTION NOTES

1. STRIP TOPSOIL AND LEVEL SITE.
2. COMPACT SUBGRADE.
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE.
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP WHERE THE SEDIMENT IS COLLECTED AND REMOVED.

MAINTENANCE NOTES

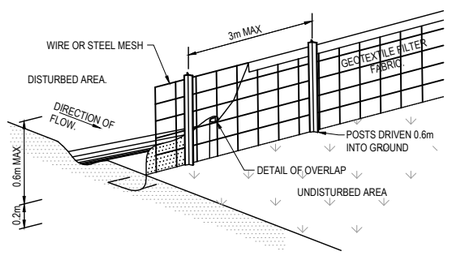
THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH PREVENTS TRACKING OR FLOWING OF SEDIMENT OFF THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED OFF THE CONSTRUCTION SITE MUST BE REMOVED IMMEDIATELY.

TEMPORARY STABILISED CONSTRUCTION EXIT



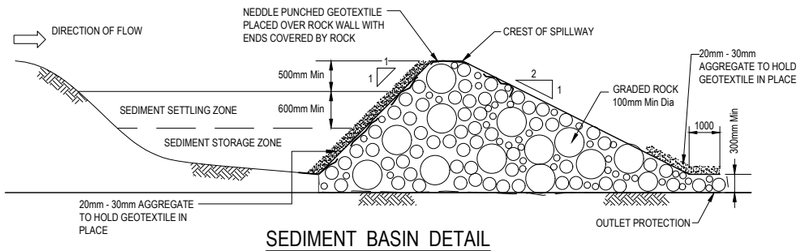
GEOTEXTILE FILTER TABRIC DROP INLET SEDIMENT TRAP

NTS



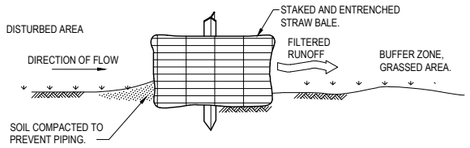
SEDIMENT CONTROL FENCE

NTS



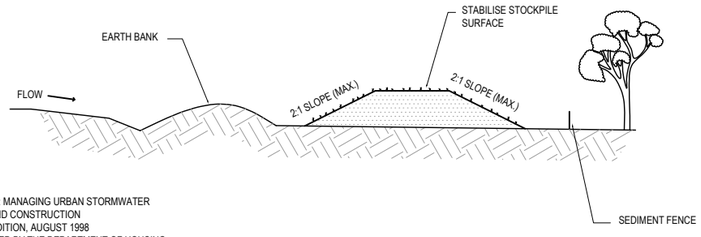
SEDIMENT BASIN DETAIL

NTS



SECTION STRAW BALE BUND

NTS



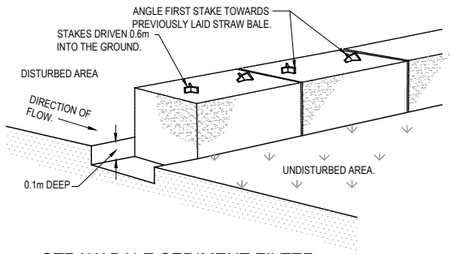
SOURCE: MANAGING URBAN STORMWATER
SOILS AND CONSTRUCTION
THIRD EDITION, AUGUST 1998
PRODUCED BY THE DEPARTMENT OF HOUSING

CONSTRUCTION NOTES

1. LOCATE STOCKPILE AT LEAST 5 METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOWS, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS A LOW, FLAT, ELONGATED MOUND.
3. WHERE THERE IS SUFFICIENT AREA TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METERS IN HEIGHT.
4. REHABILITATE IN ACCORDANCE WITH THE SWMP/ESCP.
5. CONSTRUCT EARTH BANK (STANDARD DRAWING 5-2) ON THE UPSLOPE SIDE TO DIVERT RUN OFF AROUND THE STOCKPILE AND A SEDIMENT FENCE (STANDARD DRAWING 6-7) 1 TO 2 METRES DOWNSLOPE OF STOCKPILE.

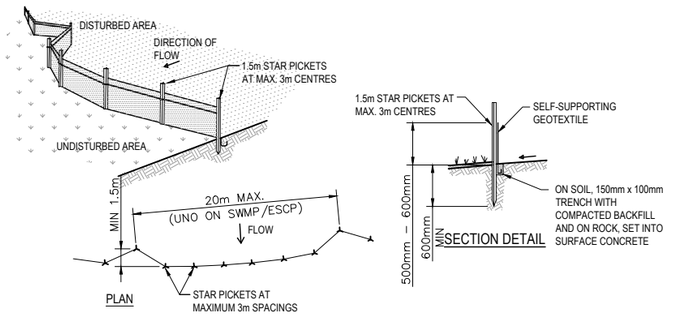
STOCKPILES

NTS



STRAW BALE SEDIMENT FILTER

NTS



CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
2. DRIVE 1.5m LONG STAR PICKETS INTO GROUND, 3 METRES APART.
3. DIG A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
4. BACKFILL TRENCH OVER BASE OF FABRIC.
5. FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY GEOTEXTILE MANUFACTURER.
6. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.

SEDIMENT CONTROL FENCE

NTS

NORTH

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Rev	Revision Description	Date
C	DETAILED DESIGN REPORT	11-12-20
B	80% DESIGN DEVELOPMENT	23-11-20
A	80% DD ISSUE FOR COORDINATION	06-11-20

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Client
NSW GOVERNMENT Education

Project
UPGRADES TO CHATSWOOD HIGHSCOOL PACIFIC HWY SITE

Title
CHS - EROSION AND SEDIMENT CONTROL DETAILS

Scale
AS SHOWN AT A1

Drawn	Designed	Checked	Approved
BH	DK	JC	JB

Project Number	Drawing Number	Revision
S201075	HS-CIV-W-DW-0611	C

PLOTTED BY CAD 16/12/2020 - 12:19:59 PM SCP Consulting, File Path: K:\S201075 Chatswood education project\hs project\01 civil\BIM\Drawing\hs-civil-W-DW-0611-CHS - Erosion and Sediment Control Details.dwg

NSW GOVERNMENT | Education School Infrastructure

Post Approval Consultation Record

Identified Party to Consult:	Council
Consultation type:	Email
When is consultation required?	Prior to commencement of construction
Why	B23 – Construction Soil & Water Management Sub-Plan
When was consultation scheduled/held	1. 23/03/21 – Emails (5) 2. 8/04/21 – Email 3. 9/04/21 – Email 4. 12/04/21-13/04/21 – Email Chain
Identify persons and positions who were involved	Robert Lam Joseph Bazergy
Provide the details of the consultation	The Soil & Water Management Sub-Plan was submitted to Council via email, and followed up several times with phone calls and emails (emails attached for reference).
What specific matters were discussed?	N/A – Council never responded apart from the submission of acceptance of the CSWMP.
What matters were resolved?	N/A – Council never responded apart from the submission of acceptance of the CSWMP.
What matters are unresolved?	N/A – Council never responded apart from the submission of acceptance of the CSWMP.

Any remaining points of disagreement?	N/A – Council never responded apart from the submission of acceptance of the CSWMP.
How will SINSW address matters not resolved?	N/A – Council never responded apart from the submission of acceptance of the CSWMP.

All correspondence can be provided upon request.

Jackson Bramley

Associate Civil Engineer

Bachelor of Engineering (Civil)
Member, Institute of Engineers Australia (MIEA)

Jackson joined SCP Consulting in September 2018 and has a background in a variety of aspects of construction-based projects, from concept design and project planning, to detailed design and construction management.

He has experience in both civil, traffic and structural engineering design disciplines, with typical projects including bulk excavation, stormwater drainage upgrade, road design, flood studies and structural design associated with rural and pedestrian bridges, commercial buildings and industrial facilities. Jackson's design work has been based around compliance with Australian Standards and other relevant local statutory regulations.

Jackson has developed design management experience through his role as design project manager on several large projects for both the public and private sector, while construction management experience has been gained through site and office work on several infrastructure construction projects for Department of Defence, RMS and local government.

Skills and Expertise

- Client liaison and project management on multi-disciplinary projects
- Contract preparation and administration
- Tender document preparation
- Civil/Stormwater design and documentation for medium to large scale projects in a variety of areas and degrees of environmental sensistivity.
- Traffic consultant for development of traffic impact assessments, traffic management in design and construction traffic management planning.
- Site management throughout project construction phase

Value Add

- Experience in both civil and structural design, together with knowledge of building service disciplines
- Involvement in projects involving a range of Local and State Government authorities
- Value management to achieve significant project cost savings
- Experience in a broad range of software

Key Projects

- **HMAS Watson Base Redevelopment, Watsons Bay, NSW/ $430M**

  Project Manager/ Civil Team Lead

  Civil infrastructure design, coordination and management of stormwater, road network, landscape grading, base security upgrades, water quality and traffic management. Management of facility stakeholders throughout design development and the managing contractor during construction.

- **AIR555-1 Facility, RAAF Base Edinbugh, SA/ $280M**

  Civil Design Lead

  Civil infrastructure design, coordination and management of stormwater, road network, landscape grading, water quality and traffic management. Management of flood study requirements and coordination with Base stakeholders. Development of bulk earthworks strategies to manage contaminated soils.

- **RAAF Base Tindal Redevelopment & KC-30A Facilities Project, NT/ $900M**

  Senior Civil and Traffic Engineer

  Lead traffic consultant for impact assessments, design integration and construction management planning for the Managing Contractor. Also provided civil design and peer review assistance for the design of project work elements.

- **Smalls Road Public School, Ryde NSW / $40M**

  Project Manager/ Civil Team Lead

  This project included the design of site drainage, civil design of pathways, carpark pavements and public domain, structural design of retaining walls and other architectural elements within the school, inspections and coordination during construction works.

- **PARQ on Flinders, Mixed Use Multistorey Development, Wollongong, NSW / $85M**

  Project Manager and Client/Architect Liaison, Lead Civil/Stormwater Engineer

  Proposed 224 unit development, services included site drainage, roof drainage and road frontage design, design of Council's trunk drainage network, coordination and design for the structural design.

- **The Gallery, Mixed Use Multistorey Development, Engadine, NSW / $55M**

  Project Manager and Client/Architect Liaison, Lead Civil/Stormwater and Traffic Engineer

  Proposed 121 residential unit and commercial space development, completed DA and CC documentation including site drainage, traffic impact modelling and reporting.

- **IRT Kanahooka, Independent Living Unit Facility, NSW / $50M**

  Project Manager and Client/Architect Liaison

  This project comprising 100 villas, the project included significant bulk earthworks to manage flood affection and cut/fill balancing. Stormwater, water quality, road, kerb and gutter, road frontage and continuous path of travel design, coordination of internal structural and hydraulic services.

James Clare

Associate Civil Engineer
Stormwater & Flood Modelling Specialist

Bachelor of Engineering (Civil, Construction)
Diploma in Engineering Practice
Member, Institute of Engineers Australia (MIEA)
National Engineering Register (NER)

James has honed his impressive Civil Engineering skills working over the last ten years with some of Australia's largest engineering groups, such as Lendlease Building and ACOR Consultants. He has also spent a year working for a small civil contractor providing James with valuable construction knowledge which he now applies to his current projects.

Joining SCP Consulting in 2016, James' knowledge and experience assisted him in achieving the position of Associate in June 2017. James is a highly proficient project manager and regularly manages multi-disciplinary projects delivered by SCP as a single point of contact for clients. This leads to successful development of engineering concepts through to construction and strong client relationships. James is known for his design expertise, attention to detail and enthusiasm to produce excellent results. Specialising in stormwater management and flood modelling, James has a wealth of knowledge across many stormwater and flood modelling software packages including HEC-RAS, DRAINS, WBNM and TUFLOW allowing him to provide in depth analysis of stormwater and flooding issues.

Skills and Expertise

- Flood modelling using hydrodynamic software models
- Stormwater hydraulics
- Environmental treatment systems
- Innovative approach to achieve significant cost benefits and best practice solutions to complex engineering problems
- Disciplined on-time and on-budget professional delivery on all projects
- Sound understanding of Local Government and Defence requirements
- Broad knowledge base across multiple disciplines resulting in the holistic delivery of projects

Value Add

- Recent experience at HMAS *Watson* Redevelopment creating the stormwater management plan
- Major project experience as civil engineering lead and stormwater designer
- Lead Civil Design Consultant on BaptistCare Affordable Housing (500 units across 8 sites) for Lendlease displaying a strong capacity for prioritising project elements across multiple large-scale developments
- Lead Civil Design Consultant on South Coast Correctional Centre for Lendlease optimising and finalising design for fast-tracked commencement of works on-site

Key Projects

- **South Coast Correctional Centre, NSW / $170M**
  360 bed expansion of existing correctional centre, civil, stormwater, pavements and earthworks.
- **BaptistCare Affordable Housing, NSW / $260M**
  500 units across 8 sites, master planning of civil infrastructure including stormwater, earthworks, pavements, and services coordination.
- **Royal Randwick Racecourse, NSW / $50M**
  Multi-storey car park, Kensington Track upgrade, earthworks, water quality and quantity management.
- **ATC Warwick Farm, NSW / $8M**
  Grass Track (A-Track), Stables Precinct, multiple sheds within the site, earthworks, water quality and quantity management.
- **University of Sydney Regiment, NSW / $80M**
  Mixed use development, civil and stormwater.
- **Hornsby Kuring-gai Hospital, NSW / $20M**
  Multi-storey car park, civil, stormwater, pavement and earthworks.
- **EST00346 TDL Redev & EST00347 KC-30A Facilities Project, NT**
  Civil, Traffic, Aerodrome Pavements, Hydraulic Building Services, Hydraulic Infrastructure, Hydraulic Building Services and Fire Protection (Wet) services were provided.
- **N2232 HMAS Watson Redevelopment, NSW / $160M**
  Development of a Stormwater Management Plan as part of the civil works.
- **Base Security Improvement Program (BSIP) / $200M**
  16x Defence bases / establishments across NSW, VIC, ACT and QLD.
- **Moorebank Units Relocation (MUR) Project, Holsworthy Army Base NSW / $800M**
- **MH-60R Romeo Seahawk Aviation Facilities Project, HMAS Albatross & Twofold Bay NSW / $200M**
  Naval Airfield Station Base including taxiways and Aprons.

6.10 EXTERNAL LIGHTING

The design certificates attached as Appendix 6.10 detail compliance with this SSD Consent Condition for the proposed works.

JHA

ABN 48 612 666 172

Sydney | Brisbane | Melbourne

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North Sydney NSW 2060

PO Box 3
North Sydney NSW 2059
Ph (02) 94371000

22 January 2021

Richard Crookes Construction

Level 3/ 4 Broadcast Way,

ARTARMON NSW 2064

SSDA 9483 B16 - CERTIFICATE OF DESIGN ELECTRICAL SERVICES

JOB NO.: 200311

REVISION NO.: [B]

SUBJECT PREMISES : **Chatswood Education Precinct – High School**

Pursuant to the provisions of **Clause A5.2 of the National Construction Code 2019**, I hereby certify that the above design is in accordance with normal engineering practice, and meets the requirements of the Building Code of Australia and relevant Australian Standards. In particular, the design is in accordance with the following:

- NCC 2019 — Part J6, J8, E2.2, & F4.4
- AS/NZS 3000 - 2018 — Wiring Rules
- AS/NZS 1680 - 2009 — Artificial Lighting
- AS/NZS 2293.1 – 2018 — Emergency Lighting and Exit Signs for Buildings
- AS/NZS 1158.3.1 – 2005 — Lighting for Roads and Public Spaces
- AS 4282 – 2019 — Obtrusive Effects of Outdoor Lighting
- EFSG

I am an appropriately qualified and competent person in this area and as such can certify that the design complies with the above and which are detailed on the following drawings:

DRAWING NUMBER	DRAWING NAME
HS-EL-W-DW-0000	CENTENNIAL AVENUE COVER SHEET AND DRAWING LIST
HS-EL-W-DW-0001	CENTENNIAL AVENUE LEGEND AND GENERAL NOTES
HS-EL-W-DW-0100	SITE A CENTENNIAL AVENUE EXTERNAL LIGHTING
HS-EL-W-DW-0300	SITE A CENTENNIAL AVENUE EXTERNAL SECURITY
HS-EL-W-DW-0901	SITE A CENTENNIAL AVENUE SITE PLAN PHASE 1
HS-EL-W-DW-0902	SITE A CENTENNIAL AVENUE SITE PLAN PHASE 2
HS-EL-W-DW-0903	SITE A CENTENNIAL AVENUE SITE PLAN PHASE 3
HS-EL-W-DW-0904	SITE A CENTENNIAL AVENUE SITE PLAN PHASE 4
HS-EL-W-DW-0905	SITE A CENTENNIAL AVENUE SITE PLAN PHASE 5,6,7,8

HS-EL-W-DW-0906	SITE A CENTENNIAL AVENUE OVERALL SITE PLAN
HS-EL-W-DW-7001	SITE A CENTENNIAL AVENUE SITE PLAN PHASE 1 SCHEMATIC AND DETAILS
HS-EL-W-DW-7002	SITE A CENTENNIAL AVENUE SITE PLAN PHASE 2 SCHEMATIC AND DETAILS
HS-EL-W-DW-7003	SITE A CENTENNIAL AVENUE SITE PLAN PHASE 3 SCHEMATIC AND DETAILS
HS-EL-W-DW-7004	SITE A CENTENNIAL AVENUE SITE PLAN PHASE 4 SCHEMATIC AND DETAILS
HS-EL-W-DW-7005	SITE A CENTENNIAL AVENUE SITE PLAN PHASE 5,6,7,8 SCHEMATIC AND DETAILS
HS-EL-W-DW-8000	MAIN SWITCHBOARD SINGLE LINE DIAGRAM
HS-EL-W-DW-8001	DISTRIBUTION BOARD SINGLE LINE DIAGRAM
HS-EL-W-DW-8002	DISTRIBUTION BOARD SINGLE LINE DIAGRAM
HS-EL-W-DW-8003	DISTRIBUTION BOARD SINGLE LINE DIAGRAM
HS-EL-W-DW-8004	DISTRIBUTION BOARD SINGLE LINE DIAGRAM
HS-EL-W-DW-8005	DISTRIBUTION BOARD SINGLE LINE DIAGRAM
HS-EL-W-DW-8006	DISTRIBUTION BOARD SINGLE LINE DIAGRAM
HS-EL-W-DW-8007	DISTRIBUTION BOARD SINGLE LINE DIAGRAM
HS-EL-W-DW-8008	DISTRIBUTION BOARD SINGLE LINE DIAGRAM
HS-EL-W-DW-8009	DISTRIBUTION BOARD SINGLE LINE DIAGRAM
HS-EL-W-DW-9000	COMMUNICATIONS SCHEMATIC AND DETAILS
HS-EL-W-DW-9001	SECURITY SCHEMATIC AND DETAILS
HS-EL-W-DW-9002	SCHEMATIC AND DETAILS SHEET 1
HS-EL-W-DW-9003	SCHEMATIC AND DETAILS SHEET 2
HS-EL-H-DW-1000	BUILDING H GROUND FLOOR LIGHTING LAYOUT
HS-EL-H-DW-2000	BUILDING H GROUND FLOOR POWER AND COMMUNICATIONS LAYOUT
HS-EL-H-DW-2001	BUILDING H LEVEL 2 POWER AND COMMUNICATIONS LAYOUT
HS-EL-H-DW-3000	BUILDING H GROUND FLOOR SECURITY LAYOUT
HS-EL-H-DW-3001	BUILDING H LEVEL 2 SECURITY LAYOUT
HS-EL-H-DW-4000	BUILDING H GROUND FLOOR CABLE TRAY LAYOUT
HS-EL-J-DW-1000	BUILDING J GROUND FLOOR LIGHTING LAYOUT
HS-EL-J-DW-2000	BUILDING J GROUND FLOOR POWER AND COMMUNICATIONS LAYOUT
HS-EL-J-DW-3000	BUILDING J GROUND FLOOR SECURITY LAYOUT
HS-EL-J-DW-4000	BUILDING J GROUND FLOOR CABLE TRAY LAYOUT
HS-EL-K-DW-1000	BUILDING K GROUND FLOOR LIGHTING LAYOUT
HS-EL-K-DW-1001	BUILDING K LEVEL 1 LIGHTING LAYOUT
HS-EL-K-DW-2000	BUILDING K GROUND FLOOR POWER AND COMMUNICATIONS LAYOUT
HS-EL-K-DW-2001	BUILDING K LEVEL 1 POWER AND COMMUNICATIONS LAYOUT
HS-EL-K-DW-3000	BUILDING K GROUND FLOOR SECURITY LAYOUT
HS-EL-K-DW-3001	BUILDING K LEVEL 1 SECURITY LAYOUT
HS-EL-K-DW-4000	BUILDING K LEVEL 1 CABLE TRAY LAYOUT
HS-EL-M-DW-1000	BUILDING M LEVEL 2 LIGHTING LAYOUT
HS-EL-M-DW-1001	BUILDING M LEVEL 3 LIGHTING LAYOUT
HS-EL-M-DW-2000	BUILDING M LEVEL 2 POWER AND COMMUNICATIONS LAYOUT
HS-EL-M-DW-2001	BUILDING M LEVEL 3 POWER AND COMMUNICATIONS LAYOUT
HS-EL-M-DW-3000	BUILDING M LEVEL 2 SECURITY LAYOUT

HS-EL-M-DW-3001	BUILDING M LEVEL 3 SECURITY LAYOUT
HS-EL-M-DW-4000	BUILDING M LEVEL 2 CABLE TRAY LAYOUT
HS-EL-M-DW-4001	BUILDING M LEVEL 3 CABLE TRAY LAYOUT
HS-EL-Q-DW-1000	BUILDING Q LOWER GROUND LIGHTING LAYOUT 1
HS-EL-Q-DW-1001	BUILDING Q LOWER GROUND LIGHTING LAYOUT 2
HS-EL-Q-DW-1002	BUILDING Q GROUND FLOOR LIGHTING LAYOUT 1
HS-EL-Q-DW-1003	BUILDING Q GROUND FLOOR LIGHTING LAYOUT 2
HS-EL-Q-DW-1004	BUILDING Q LEVEL 1 LIGHTING LAYOUT 1
HS-EL-Q-DW-1005	BUILDING Q LEVEL 1 LIGHTING LAYOUT 2
HS-EL-Q-DW-1006	BUILDING Q LEVEL 2 LIGHTING LAYOUT 1
HS-EL-Q-DW-1007	BUILDING Q LEVEL 2 LIGHTING LAYOUT 2
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HS-EL-Q-DW-2005	BUILDING Q LEVEL 1 POWER AND COMMUNICATIONS LAYOUT 2
HS-EL-Q-DW-2006	BUILDING Q LEVEL 2 POWER AND COMMUNICATIONS LAYOUT 1
HS-EL-Q-DW-2007	BUILDING Q LEVEL 2 POWER AND COMMUNICATIONS LAYOUT 2
HS-EL-Q-DW-2008	BUILDING Q ROOF POWER AND COMMUNICATIONS LAYOUT 1
HS-EL-Q-DW-2009	BUILDING Q ROOF POWER AND COMMUNICATIONS LAYOUT 2
HS-EL-Q-DW-3000	BUILDING Q LOWER GROUND SECURITY LAYOUT 1
HS-EL-Q-DW-3001	BUILDING Q LOWER GROUND SECURITY LAYOUT 2
HS-EL-Q-DW-3002	BUILDING Q GROUND FLOOR SECURITY LAYOUT 1
HS-EL-Q-DW-3003	BUILDING Q GROUND FLOOR SECURITY LAYOUT 2
HS-EL-Q-DW-3004	BUILDING Q LEVEL 1 SECURITY LAYOUT 1
HS-EL-Q-DW-3005	BUILDING Q LEVEL 1 SECURITY LAYOUT 2
HS-EL-Q-DW-3006	BUILDING Q LEVEL 2 SECURITY LAYOUT 1
HS-EL-Q-DW-3007	BUILDING Q LEVEL 2 SECURITY LAYOUT 2
HS-EL-Q-DW-4000	BUILDING Q LOWER GROUND CABLE TRAY LAYOUT 1
HS-EL-Q-DW-4001	BUILDING Q LOWER GROUND CABLE TRAY LAYOUT 2
HS-EL-Q-DW-4002	BUILDING Q GROUND FLOOR CABLE TRAY LAYOUT 1
HS-EL-Q-DW-4003	BUILDING Q GROUND FLOOR CABLE TRAY LAYOUT 2
HS-EL-Q-DW-4004	BUILDING Q LEVEL 1 CABLE TRAY LAYOUT 1
HS-EL-Q-DW-4005	BUILDING Q LEVEL 1 CABLE TRAY LAYOUT 2
HS-EL-Q-DW-4006	BUILDING Q LEVEL 2 CABLE TRAY LAYOUT 1
HS-EL-Q-DW-4007	BUILDING Q LEVEL 2 CABLE TRAY LAYOUT 2
HS-EL-S-DW-1000	BUILDING S LOWER GROUND LIGHTING LAYOUT
HS-EL-S-DW-1001	BUILDING S GROUND FLOOR LIGHTING LAYOUT 1
HS-EL-S-DW-1002	BUILDING S GROUND FLOOR LIGHTING LAYOUT 2
HS-EL-S-DW-1003	BUILDING S LEVEL 1 LIGHTING LAYOUT 1
HS-EL-S-DW-1004	BUILDING S LEVEL 1 LIGHTING LAYOUT 2

HS-EL-S-DW-1005	BUILDING S LEVEL 2 LIGHTING LAYOUT 1
HS-EL-S-DW-1006	BUILDING S LEVEL 2 LIGHTING LAYOUT 2
HS-EL-S-DW-1007	BUILDING S LEVEL 3 LIGHTING LAYOUT 1
HS-EL-S-DW-1008	BUILDING S LEVEL 3 LIGHTING LAYOUT 2
HS-EL-S-DW-2000	BUILDING S LOWER GROUND POWER AND COMMUNICATIONS LAYOUT
HS-EL-S-DW-2001	BUILDING S GROUND FLOOR POWER AND COMMUNICATIONS LAYOUT 1
HS-EL-S-DW-2002	BUILDING S GROUND FLOOR POWER AND COMMUNICATIONS LAYOUT 2
HS-EL-S-DW-2003	BUILDING S LEVEL 1 POWER AND COMMUNICATIONS LAYOUT 1
HS-EL-S-DW-2004	BUILDING S LEVEL 1 POWER AND COMMUNICATIONS LAYOUT 2
HS-EL-S-DW-2005	BUILDING S LEVEL 2 POWER AND COMMUNICATIONS LAYOUT 1
HS-EL-S-DW-2006	BUILDING S LEVEL 2 POWER AND COMMUNICATIONS LAYOUT 2
HS-EL-S-DW-2007	BUILDING S LEVEL 3 POWER AND COMMUNICATIONS LAYOUT 1
HS-EL-S-DW-2008	BUILDING S LEVEL 3 POWER AND COMMUNICATIONS LAYOUT 2
HS-EL-S-DW-2009	BUILDING S ROOF POWER AND COMMUNICATIONS LAYOUT 1
HS-EL-S-DW-2010	BUILDING S ROOF POWER AND COMMUNICATIONS LAYOUT 2
HS-EL-S-DW-3000	BUILDING S LOWER GROUND SECURITY LAYOUT
HS-EL-S-DW-3001	BUILDING S GROUND FLOOR SECURITY LAYOUT 1
HS-EL-S-DW-3002	BUILDING S GROUND FLOOR SECURITY LAYOUT 2
HS-EL-S-DW-3003	BUILDING S LEVEL 1 SECURITY LAYOUT 1
HS-EL-S-DW-3004	BUILDING S LEVEL 1 SECURITY LAYOUT 2
HS-EL-S-DW-3005	BUILDING S LEVEL 2 SECURITY LAYOUT 1
HS-EL-S-DW-3006	BUILDING S LEVEL 2 SECURITY LAYOUT 2
HS-EL-S-DW-3007	BUILDING S LEVEL 3 SECURITY LAYOUT 1
HS-EL-S-DW-3008	BUILDING S LEVEL 3 SECURITY LAYOUT 2
HS-EL-S-DW-4000	BUILDING S LOWER GROUND CABLE TRAY LAYOUT
HS-EL-S-DW-4001	BUILDING S GROUND FLOOR CABLE TRAY LAYOUT 1
HS-EL-S-DW-4002	BUILDING S GROUND FLOOR CABLE TRAY LAYOUT 2
HS-EL-S-DW-4003	BUILDING S LEVEL 1 CABLE TRAY LAYOUT 1
HS-EL-S-DW-4004	BUILDING S LEVEL 1 CABLE TRAY LAYOUT 2
HS-EL-S-DW-4005	BUILDING S LEVEL 2 CABLE TRAY LAYOUT 1
HS-EL-S-DW-4006	BUILDING S LEVEL 2 CABLE TRAY LAYOUT 2
HS-EL-S-DW-4007	BUILDING S LEVEL 3 CABLE TRAY LAYOUT 1
HS-EL-S-DW-4008	BUILDING S LEVEL 3 CABLE TRAY LAYOUT 2
HS-EL-T-DW-1000	BUILDING T LOWER GROUND LIGHTING LAYOUT
HS-EL-T-DW-1001	BUILDING T GROUND FLOOR LIGHTING LAYOUT
HS-EL-T-DW-2000	BUILDING T LOWER GROUND POWER AND COMMUNICATIONS LAYOUT
HS-EL-T-DW-2001	BUILDING T GROUND FLOOR POWER AND COMMUNICATIONS LAYOUT
HS-EL-T-DW-2002	BUILDING T ROOF POWER AND COMMUNICATIONS LAYOUT
HS-EL-T-DW-3000	BUILDING T LOWER GROUND SECURITY LAYOUT
HS-EL-T-DW-3001	BUILDING T GROUND FLOOR SECURITY LAYOUT
HS-EL-T-DW-4000	BUILDING T LOWER GROUND CABLE TRAY LAYOUT
HS-EL-T-DW-4001	BUILDING T GROUND FLOOR CABLE TRAY LAYOUT

Full Name of Designer:	Marc Estimada
Qualifications:	BE(Elec) Hons MIEAust, CPEng, NER (2903203) Registered Engineer – Electrical (BDC04559)
Address of Designer:	Level 23, 101 Miller Street North Sydney NSW 2060
Business Telephone No:	(02) 9437 1000
Name of Employer:	JHA Consulting Engineers

Yours sincerely,

Marc Estimada

Director

JHA

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22 January 2021

Richard Crookes Construction

Level 3/ 4 Broadcast Way,

ARTARMON NSW 2064

SSDA 9483 B16 - CERTIFICATE OF DESIGN ELECTRICAL SERVICES

JOB NO.: 200311

REVISION NO.: [B]

SUBJECT PREMISES : **Chatswood Education Precinct – Public School**

Pursuant to the provisions of **Clause A5.2 of the National Construction Code 2019**, I hereby certify that the above design is in accordance with normal engineering practice, and meets the requirements of the Building Code of Australia and relevant Australian Standards. In particular, the design is in accordance with the following:

- NCC 2019 — Part J6, J8, E2.2, & F4.4
- AS/NZS 3000 - 2018 — Wiring Rules
- AS/NZS 1680 - 2009 — Artificial Lighting
- AS/NZS 2293.1 – 2018 — Emergency Lighting and Exit Signs for Buildings
- AS/NZS 1158.3.1 – 2005 — Lighting for Roads and Public Spaces
- AS 4282 – 2019 — Obtrusive Effects of Outdoor Lighting
- EFSG

I am an appropriately qualified and competent person in this area and as such can certify that the design complies with the above and which are detailed on the following drawings:

DRAWING NUMBER	DRAWING NAME
PS-EL-W-DW-0000	PACIFIC HIGHWAY COVER SHEET AND DRAWING LIST
PS-EL-W-DW-0001	PACIFIC HIGHWAY LEGEND AND GENERAL NOTES
PS-EL-W-DW-0100	SITE B PACIFIC HIGHWAY EXTERNAL LIGHTING
PS-EL-W-DW-0200	SITE B PACIFIC HIGHWAY STE PLAN
PS-EL-W-DW-0201	SITE B PACIFIC HIGHWAY COMMUNICATIONS SITE DIAGRAM
PS-EL-W-DW-0202	SITE B PACIFIC HIGHWAY SECURITY SCHEMATIC
PS-EL-W-DW-0203	SITE B PACIFIC HIGHWAY COMMUNICATIONS SCHEMATIC

PS-EL-W-DW-0204	SITE B PACIFIC HIGHWAY SECURITY SITE DIAGRAM
PS-EL-W-DW-0901	SITE B PACIFIC HIGHWAY SITE PLAN PHASE 1
PS-EL-W-DW-0902	SITE B PACIFIC HIGHWAY SITE PLAN PHASE 2
PS-EL-W-DW-0903	SITE B PACIFIC HIGHWAY SITE PLAN PHASE 3
PS-EL-W-DW-0904	SITE B PACIFIC HIGHWAY SITE PLAN PHASE 4
PS-EL-W-DW-0905	SITE B PACIFIC HIGHWAY SITE PLAN PHASE 5
PS-EL-W-DW-0906	SITE B PACIFIC HIGHWAY SITE PLAN PHASE 6
PS-EL-W-DW-0907	SITE B PACIFIC HIGHWAY SITE PLAN PHASE 7
PS-EL-W-DW-0908	SITE B PACIFIC HIGHWAY SITE PLAN PHASE 8
PS-EL-W-DW-0909	SITE B PACIFIC HIGHWAY SITE PLAN PHASE 9
PS-EL-W-DW-0910	SITE B PACIFIC HIGHWAY SITE PLAN PHASE 10
PS-EL-W-DW-0911	SITE B PACIFIC HIGHWAY SITE PLAN PHASE 11
PS-EL-W-DW-5004	SITE B PACIFIC HIGHWAY SINGLE LINE DIAGRAM
PS-EL-A-DW-1000	BUILDING A GROUND FLOOR LIGHTING LAYOUT
PS-EL-A-DW-1001	BUILDING A LEVEL 1 LIGHTING LAYOUT
PS-EL-A-DW-2000	BUILDING A GROUND FLOOR POWER AND COMMUNICATIONS LAYOUT
PS-EL-A-DW-2001	BUILDING A LEVEL 1 POWER AND COMMUNICATIONS LAYOUT
PS-EL-A-DW-2002	BUILDING A ROOF POWER AND COMMUNICATIONS LAYOUT
PS-EL-A-DW-3000	BUILDING A GROUND FLOOR SECURITY LAYOUT
PS-EL-A-DW-3001	BUILDING A LEVEL 1 SECURITY LAYOUT
PS-EL-A-DW-3002	BUILDING A ROOF SECURITY LAYOUT
PS-EL-A-DW-4000	BUILDING A GROUND FLOOR CABLE TRAY LAYOUT
PS-EL-A-DW-4001	BUILDING A LEVEL 1 CABLE TRAY LAYOUT
PS-EL-A-DW-5000	BUILDING A SINGLE LINE DIAGRAM
PS-EL-A-DW-5001	BUILDING A SCHEMATICS AND DETAILS SHEET 1
PS-EL-A-DW-5002	BUILDING A SCHEMATICS AND DETAILS SHEET 2
PS-EL-CP-DW-1000	CARPARK / SPORTS COURT LIGHTING LAYOUT
PS-EL-CP-DW-2000	CARPARK / SPORTS COURT POWER AND COMMUNICATIONS LAYOUT
PS-EL-CP-DW-3000	CARPARK / SPORTS COURT SECURITY LAYOUT

PS-EL-G-DW-1000	BUILDING G LOWER GROUND LIGHTING LAYOUT
PS-EL-G-DW-1001	BUILDING G GROUND FLOOR LIGHTING LAYOUT
PS-EL-G-DW-2000	BUILDING G LOWER GROUND POWER AND COMMUNICATIONS LAYOUT
PS-EL-G-DW-2001	BUILDING G GROUND FLOOR POWER AND COMMUNICATIONS LAYOUT
PS-EL-G-DW-2002	BUILDING G ROOF POWER AND COMMUNICATIONS LAYOUT
PS-EL-G-DW-3000	BUILDING G LOWER GROUND SECURITY LAYOUT
PS-EL-G-DW-3001	BUILDING G GROUND FLOOR SECURITY LAYOUT
PS-EL-G-DW-3002	BUILDING G ROOF SECURITY LAYOUT
PS-EL-G-DW-4000	BUILDING G LOWER GROUND CABLE TRAY LAYOUT
PS-EL-G-DW-4001	BUILDING G GROUND FLOOR CABLE TRAY LAYOUT
PS-EL-G-DW-5000	BUILDING G SINGLE LINE DIAGRAM
PS-EL-G-DW-5001	BUILDING G SCHEMATICS AND DETAILS SHEET 1
PS-EL-G-DW-5002	BUILDING G SCHEMATICS AND DETAILS SHEET 2
PS-EL-P-DW-1000	BUILDING P1 LOWER GROUND 2 LIGHTING LAYOUT
PS-EL-P-DW-1001	BUILDING P1 LOWER GROUND 1 LIGHTING LAYOUT
PS-EL-P-DW-1002	BUILDING P1 GROUND FLOOR LIGHTING LAYOUT
PS-EL-P-DW-1003	BUILDING P1 LEVEL 1 LIGHTING LAYOUT
PS-EL-P-DW-1004	BUILDING P1 LEVEL 2 LIGHTING LAYOUT
PS-EL-P-DW-1005	BUILDING P1 LEVEL 3 LIGHTING LAYOUT
PS-EL-P-DW-1006	BUILDING P1 LEVEL 4 LIGHTING LAYOUT
PS-EL-P-DW-1007	BUILDING P2 GROUND FLOOR LIGHTING LAYOUT
PS-EL-P-DW-1008	BUILDING P2 LEVEL 1 LIGHTING LAYOUT
PS-EL-P-DW-1009	BUILDING P2 LEVEL 2 LIGHTING LAYOUT
PS-EL-P-DW-1010	BUILDING P2 LEVEL 3 LIGHTING LAYOUT
PS-EL-P-DW-1011	BUILDING P2 LEVEL 4 LIGHTING LAYOUT
PS-EL-P-DW-2000	BUILDING P1 LOWER GROUND 2 POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2001	BUILDING P1 LOWER GROUND 1 POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2002	BUILDING P1 GROUND FLOOR POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2003	BUILDING P1 LEVEL 1 POWER AND COMMUNICATIONS LAYOUT

PS-EL-P-DW-2004	BUILDING P1 LEVEL 2 POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2005	BUILDING P1 LEVEL 3 POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2006	BUILDING P1 LEVEL 4 POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2007	BUILDING P1 ROOF POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2008	BUILDING P2 GROUND FLOOR POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2009	BUILDING P2 LEVEL 1 POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2010	BUILDING P2 LEVEL 2 POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2011	BUILDING P2 LEVEL 3 POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2012	BUILDING P2 LEVEL 4 POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-2013	BUILDING P2 ROOF POWER AND COMMUNICATIONS LAYOUT
PS-EL-P-DW-3000	BUILDING P1 LOWER GROUND 2 SECURITY LAYOUT
PS-EL-P-DW-3001	BUILDING P1 LOWER GROUND 1 SECURITY LAYOUT
PS-EL-P-DW-3002	BUILDING P1 GROUND FLOOR SECURITY LAYOUT
PS-EL-P-DW-3003	BUILDING P1 LEVEL 1 SECURITY LAYOUT
PS-EL-P-DW-3004	BUILDING P1 LEVEL 2 SECURITY LAYOUT
PS-EL-P-DW-3005	BUILDING P1 LEVEL 3 SECURITY LAYOUT
PS-EL-P-DW-3006	BUILDING P1 LEVEL 4 SECURITY LAYOUT
PS-EL-P-DW-3007	BUILDING P1 ROOF SECURITY LAYOUT
PS-EL-P-DW-3008	BUILDING P2 GROUND FLOOR SECURITY LAYOUT
PS-EL-P-DW-3009	BUILDING P2 LEVEL 1 SECURITY LAYOUT
PS-EL-P-DW-3010	BUILDING P2 LEVEL 2 SECURITY LAYOUT
PS-EL-P-DW-3011	BUILDING P2 LEVEL 3 SECURITY LAYOUT
PS-EL-P-DW-3012	BUILDING P2 LEVEL 4 SECURITY LAYOUT
PS-EL-P-DW-3013	BUILDING P2 ROOF SECURITY LAYOUT
PS-EL-P-DW-4000	BUILDING P1 LOWER GROUND 2 CABLE TRAY LAYOUT
PS-EL-P-DW-4001	BUILDING P1 LOWER GROUND 1 CABLE TRAY LAYOUT
PS-EL-P-DW-4002	BUILDING P1 GROUND FLOOR CABLE TRAY LAYOUT
PS-EL-P-DW-4003	BUILDING P1 LEVEL 1 CABLE TRAY LAYOUT
PS-EL-P-DW-4004	BUILDING P1 LEVEL 2 CABLE TRAY LAYOUT

PS-EL-P-DW-4005	BUILDING P1 LEVEL 3 CABLE TRAY LAYOUT
PS-EL-P-DW-4006	BUILDING P1 LEVEL 4 CABLE TRAY LAYOUT
PS-EL-P-DW-4007	BUILDING P2 GROUND FLOOR CABLE TRAY LAYOUT
PS-EL-P-DW-4008	BUILDING P2 LEVEL 1 CABLE TRAY LAYOUT
PS-EL-P-DW-4009	BUILDING P2 LEVEL 2 CABLE TRAY LAYOUT
PS-EL-P-DW-4010	BUILDING P2 LEVEL 3 CABLE TRAY LAYOUT
PS-EL-P-DW-4011	BUILDING P2 LEVEL 4 CABLE TRAY LAYOUT
PS-EL-P-DW-5000	SINGLE LINE DIAGRAM
PS-EL-P-DW-5001	SCHEMATICS AND DETAILS SHEET 1
PS-EL-P-DW-5002	SCHEMATICS AND DETAILS SHEET 2
PS-EL-P-DW-5003	SCHEMATICS AND DETAILS SHEET 3
PS-EL-P-DW-5004	SCHEMATICS AND DETAILS SHEET 4
PS-EL-W-SCH-0000	Public School Luminaire Schedule
PS-EL-W-SCH-0001	Public School Cable Schedule
PS-EL-W-SPEC-0000	Public School Electrical Specification

Full Name of Designer:	Marc Estimada
Qualifications:	BE(Elec) Hons MIEAust, CPEng, NER (2903203) Registered Engineer – Electrical (BDC04559)
Address of Designer:	Level 23, 101 Miller Street North Sydney NSW 2060
Business Telephone No:	(02) 9437 1000
Name of Employer:	JHA Consulting Engineers

Yours sincerely,

Marc Estimada

Director

6.11 COMMUNITY CONSULTATION AND COMPLAINTS HANDLING

The CCS has been generated as required by Condition B14. An excerpt from the CCS regarding the complaints management process is provided as Appendix 6.11

SINSW Complaints management process as outlined in the Community Communication Strategy (CCS)

8.5 Enquiries and complaints management

SINSW manages enquiries (*called interactions in our CRM, Darzin*), and complaints in a timely and responsive manner.

Prior to project delivery, a complaint could be related to lack of community consultation, design of the project, lack of project progress, etc.

During project delivery, a complaint is defined as in regards to construction impacts – *such as* – safety, dust, noise, traffic, congestion, loss of parking, contamination, loss of amenity, hours of work, property damage, property access, service disruption, conduct or behaviour of construction workers, other environmental impacts, unplanned or uncommunicated disruption to the school.

As per our planning approval conditions, a complaints register is updated monthly and is publicly available on the project's website page on the SINSW website. The complaints register will record the number of complaints received, the nature of the complaints and how the complaint was resolved.

8.5.1 Complaints management process

If SINSW receives a complaint about the project during construction, it must be logged in our CRM system, actively managed, closed out and resolved by SINSW within 24-48 hours of receipt by the SINSW Community Engagement Manager, as outlined in Table 6 below. If this is not possible, the complaint must be escalated internally as required and resolved within 7 business days.

Complaints received via the following channels will be directed to the SINSW Community Engagement Manager for resolution:

- Phone: 1300 482 651 (24 hour toll free number)
- Email: schoolinfrastructure@det.nsw.edu.au
- Postal address: GPO Box 33, Sydney, NSW 2001
- Face to face
- School executive
- Project team

If the complainant is not satisfied with the SINSW response, and they approach SINSW for rectification, the process will involve a secondary review of their complaint as per the outlined process.

Complaints will be escalated when:

- An activity generates three complaints within a 24-hour period (separate complainants).
- Any construction site receives three different complaints within a 24-hour period.
- A single complainant reports three or more complaints within a three day period.
- A complainant threatens to escalate their issue to the media or government representative.
- The complaint was avoidable.
- The complaint relates to a compliance matter.

Complaints will be first escalated to the Senior Manager, Community and Engagement or Director of Communications for SINSW as the designated complaints handling management representatives for our projects. Further escalation will be made to the Executive Director, Office of the Chief Executive to mediate if required.

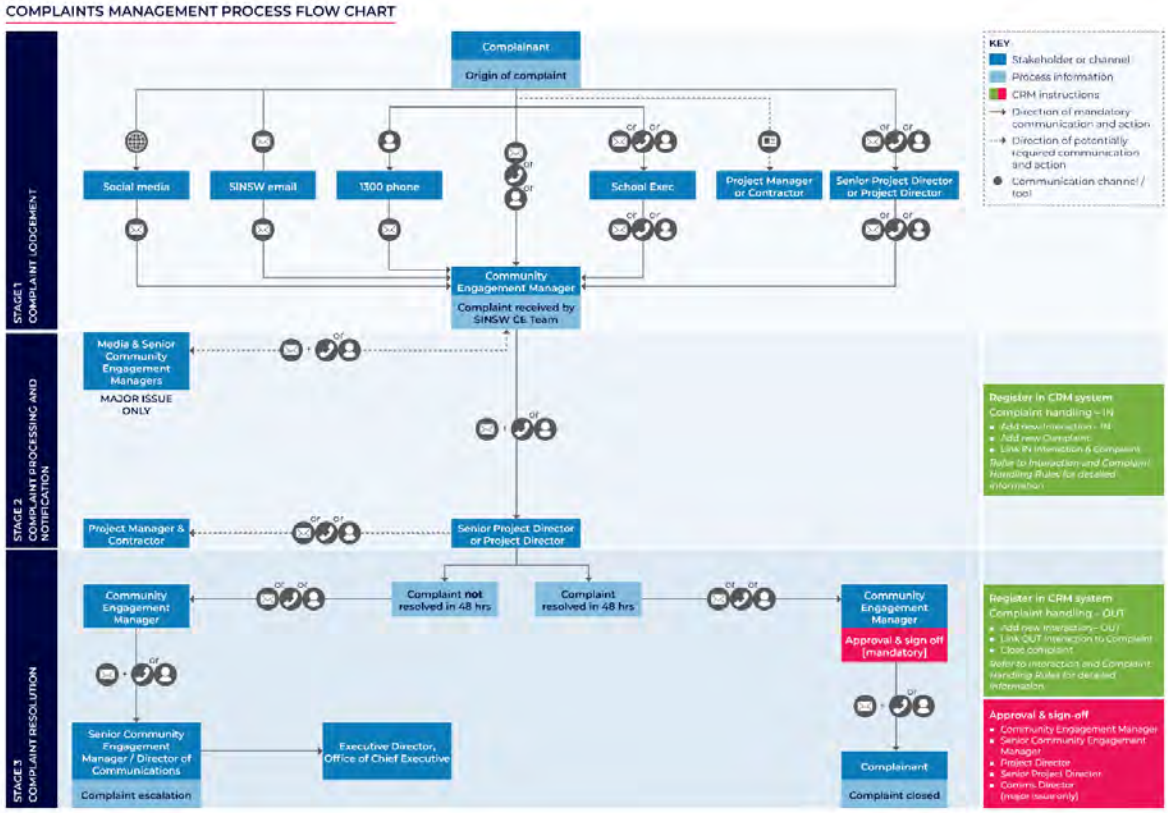
If a complaint still cannot be resolved by SINSW to the satisfaction of the complainant, we will advise them to contact the NSW Ombudsman - https://www.ombo.nsw.gov.au/complaints.

The below table summarises timeframes for responding to enquiries and complaints, through each correspondence method:

Table 6: Complaint and enquiry response time

Complaint	Acknowledgement times	Response times
Phone call during business hours	At time of call – and agree with caller estimated timeframe for resolution.	Complaint to be closed out within 48 hours. If not possible, continue contact, escalate as required and resolve within 7 business days.
Phone call after hours*	Within two (2) hours of receiving message upon returning to office.	Following acknowledgement, complaint to be closed out within 48 hours. If not possible, continue contact, escalate as required and resolve within 7 business days.
Email during business hours	At time of email (automatic response)	Complaint to be closed out within 48 hours. If not possible, continue contact, escalate internally as required and resolve within 7 business days.
Email outside of business hours	At time of email (automatic response)	Complaint to be closed out within 48 hours (once return to business hours). If not possible, continue contact, escalate internally as required and resolve within 7 business days.
Letter	NA	Complaint to be closed out within 48 hours following receipt. If phone or email contact details are not provided a written response to be sent within 48 hours following receipt. If not possible, continue contact, escalate internally as required and resolve within 7 business days.
Interaction/ Enquiry		
Phone call during business hours	At time of call – and agree with caller estimated timeframe for response.	Interaction to be logged and closed out within 7 business days.
Phone call after hours	Within two (2) hours of receiving message upon returning to office.	Interaction to be logged and closed out within 7 business days.
Email during business hours	At time of email (automatic response)	Interaction to be logged and closed out within 7 business days.
Email outside of business hours	At time of email (automatic response)	Interaction to be logged and closed out within 7 business days.
Letter	N/A	Interaction to be logged and closed out within 10 business days following receipt.

The below diagram outlines our internal process for managing complaints.



8.5.2 Complaints in common community languages

Complaints can be made in common community languages using the Translating and Interpreting Service (TIS), managed by the Department of Home Affairs. Community members can be connected to an interpreter by calling TIS on 131 450. TIS contact details are included on all project communications. Once TIS has the interpreter on the line, the interpreter and community member are connected to School Infrastructure and phone interpretation can begin. School Infrastructure NSW receives the complaint via the translator and begins the complaints management process as outlined above.

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